

05/05/03



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**UTILITY  
PATENT APPLICATION  
TRANSMITTAL**

(Only for new nonprovisional applications under 37 CFR 1.53(b))

Attorney Docket No.	OPTOLUM-003
First Inventor	JOEL M DRY
Title	LIGHT EMITTING DIODE LIGHT SOURCE
Express Mail Label No.	EU788250035US

**APPLICATION ELEMENTS**

See MPEP chapter 600 concerning utility patent application contents.

1. ☐ Fee Transmittal Form (e.g., PTO/SB/17)  
(Submit an original and a duplicate for fee processing)
2. ☒ Applicant claims small entity status.  
See 37 CFR 1.27.
3. ☒ Specification [Total Pages 22]  
(preferred arrangement set forth below)
  - Descriptive title of the invention
  - Cross Reference to Related Applications
  - Statement Regarding Fed sponsored R & D
  - Reference to sequence listing, a table, or a computer program listing appendix
  - Background of the Invention
  - Brief Summary of the Invention
  - Brief Description of the Drawings (if filed)
  - Detailed Description
  - Claim(s)
  - Abstract of the Disclosure
4. ☒ Drawing(s) (35 U.S.C. 113) [Total Sheets 3]
5. ☒ Oath or Declaration [Total Pages ]
  - a. ☐ Newly executed (original or copy)
  - b. ☐ Copy from a prior application (37 CFR 1.63 (d))  
(for continuation/divisional with Box 18 completed)
  - i. ☐ **DELETION OF INVENTOR(S)**  
Signed statement attached deleting inventor(s)  
named in the prior application, see 37 CFR  
1.63(d)(2) and 1.33(b).
6. ☐ Application Data Sheet. See 37 CFR 1.76

**ADDRESS TO:** Assistant Commissioner for Patents  
Box Patent Application  
Washington, DC 20231

7. ☐ CD-ROM or CD-R in duplicate, large table or  
Computer Program (Appendix)
8. Nucleotide and/or Amino Acid Sequence Submission  
(if applicable, all necessary)
  - a. ☐ Computer Readable Form (CRF)
  - b. Specification Sequence Listing on:
    - i. ☐ CD-ROM or CD-R (2 copies); or
    - ii. ☐ paper
  - c. ☐ Statements verifying identity of above copies

**ACCOMPANYING APPLICATION PARTS**

9. ☐ Assignment Papers (cover sheet & document(s))
10. ☐ 37 CFR 3.73(b) Statement ☐ Power of  
(when there is an assignee) Attorney
11. ☐ English Translation Document (if applicable)
12. ☐ Information Disclosure ☐ Copies of IDS  
Statement (IDS)/PTO-1449 Citations
13. ☐ Preliminary Amendment
14. ☒ Return Receipt Postcard (MPEP 503)  
(Should be specifically itemized)
15. ☐ Certified Copy of Priority Document(s)  
(if foreign priority is claimed)
16. ☐ Nonpublication Request under 35 U.S.C. 122  
(b)(2)(B)(i). Applicant must attach form PTO/SB/35  
or its equivalent.
17. ☐ Other: .....

18. If a CONTINUING APPLICATION, check appropriate box, and supply the requisite information below and in a preliminary amendment,  
or in an Application Data Sheet under 37 CFR 1.76:☐ Continuation ☐ Divisional ☒ Continuation-in-part (CIP)

of prior application No.: 10, 156,810

Prior application information:

Examiner: TU TU V HO

Group Art Unit: 2818

For CONTINUATION OR DIVISIONAL APPS only: The entire disclosure of the prior application, from which an oath or declaration is supplied under  
Box 5b, is considered a part of the disclosure of the accompanying continuation or divisional application and is hereby incorporated by reference.  
The incorporation can only be relied upon when a portion has been inadvertently omitted from the submitted application parts.**19. CORRESPONDENCE ADDRESS**☐ Customer Number or Bar Code Label  
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Signature		Date	05/05/2003

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**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**  
**APPLICATION FOR UNITED STATES PATENT**

*Title:* **LIGHT EMITTING DIODE LIGHT SOURCE**

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## LIGHT EMITTING DIODE LIGHT SOURCE

### RELATED APPLICATIONS

**[0001]** This application is a continuation-in-part of my co-pending application Serial No. 10/156,810 filed 05/29/2002.

### FIELD OF THE INVENTION

**[0002]** This invention pertains to lighting sources, in general, and to a lighting source that utilizes Light Emitting Diodes (LED's), in particular.

### BACKGROUND OF THE INVENTION

**[0003]** LED's have many advantages as light sources. However, in the past LED's have found application only as specialized light sources such as for vehicle brake lights, and other vehicle related lighting, and recently as flashlights. In these prior applications, the LED's are typically mounted in a planar fashion in a single plane that is disposed so as to be perpendicular to the viewing area. Typically the LED planar array is not used to provide illumination, but to provide signaling.

**[0004]** Recent attempts to provide LED light sources as sources of illumination have been few, and generally unsatisfactory from a general lighting standpoint.

**[0005]** It is highly desirable to provide a light source utilizing LED's that provides sufficient light output so as to be used as a general lighting source rather than as a signaling source.

**[0006]** One problem that has limited the use of LED's to specialty signaling and limited general illumination sources is that LED's typically generate significant amounts of heat. The heat is such that unless the heat is dissipated, the LED internal temperature will rise causing degradation or destruction of the LED.

**[0007]** It is therefore further desirable to provide an LED light source that efficiently conducts heat away from the LED's.

#### SUMMARY OF THE INVENTION

**[0008]** In accordance with the principles of the invention, an improved light source is provided. The light source includes an elongate thermally conductive member having an outer surface. A plurality of light emitting diodes is carried on the elongate member outer surface. At least some of the light emitting diodes are disposed in a first plane and others of said light emitting diodes are disposed in a second plane not coextensive with the first plane. Electrical conductors are carried by the elongate thermally conductive member and are connected to the plurality of light emitting diodes to supply electrical power thereto. The elongate thermally conductive member conducts heat away from the



light emitting diodes to a thermally conductive fluid medium. A cooling device is utilized to remove heat from the light emitting diodes. In one aspect of the invention, the cooling device comprises a fluid moving device utilized to cause the fluid medium to flow to cause cooling of the elongate thermally conductive member and therefore to dissipate heat from the light emitting diodes. In another aspect of the invention, the cooling device may be an electronic or solid state device such as a Piezoelectric device or a device that uses the Peltier effect, known as a Peltier device.

**[0009]** In the illustrative embodiment of the invention, the fluid medium is air and the fluid moving device is an air moving device.

**[0010]** In accordance with one aspect of the invention, an illustrative embodiment of the invention utilizes light emitting diodes that emit white light. However, other embodiments of the invention may utilize light emitting diodes that are of different colors to produce monochromatic light or the colors may be chosen to produce white light or other colors.

**[0011]** In accordance with another aspect of the invention the elongate thermally conductive member transfers heat from the light emitting diodes to a medium within said elongate thermally conductive member. In the illustrative embodiment of the invention, the medium is air.

**[0012]** In accordance with another aspect of the invention, the elongate thermally conductive member has one or more projections or fins to enhance heat transfer to the medium. The projections or fins may be disposed on the outer surface or inner surface of the elongate thermally conductive member or may be disposed on both the outer and inner surfaces.

**[0013]** In accordance with another aspect of the invention the elongate thermally conductive member comprises a tube. In one embodiment of the invention, the tube has a cross-section in the shape of a polygon. In another embodiment of the invention, the tube has a cross-section having flat portions.

**[0014]** In accordance with another embodiment of the invention, the elongate thermally conductive member comprises a channel.

**[0015]** In accordance with the principles of the invention, the elongate thermally conductive member may comprise an extrusion, and the extrusion can be highly thermally conductive material such as aluminum.

**[0016]** In one preferred embodiment of the invention the elongate thermally conductive member is a tubular member. The tubular member has a polygon cross-section. However, other embodiments may have a tubular member of triangular cross-section.

**[0017]** In one embodiment of the invention, a flexible circuit is carried on a surface of said elongate thermally conductive member; the flexible circuit includes the electrical conductors.

**[0018]** In another aspect of the invention, the flexible circuit comprises a plurality of apertures for receiving said plurality of light emitting diodes. Each of the light emitting diodes is disposed in a corresponding one of the apertures and affixed in thermally conductive contact with said elongate thermally conductive member.

**[0019]** The elongate thermally conductive member includes a thermal transfer media disposed therein in a flow channel.

**[0020]** At least one clip for mounting the elongate thermally conductive member in a fixture may be included.

#### BRIEF DESCRIPTION OF THE DRAWING

**[0021]** The invention will be better understood from a reading of the following detailed description of a preferred embodiment of the invention taken in conjunction with the drawing figures, in which like reference indications identify like elements, and in which:

**[0022]** FIG.1 is a planar side view of a light source in accordance with the principles of the invention;

[0023] FIG. 2 is a top planar view of the light source of FIG. 1;

[0024] Fig. 3 is a perspective view of the light source of FIG. 1 with mounting clips;

[0025] FIG. 4 is a planar side view of the light source of FIG. 3 showing mounting clips separated from the light source;

[0026] FIG. 5 is a top view of the light source and mounting clips of FIG. 4;

[0027] FIG. 6 is a partial cross-section of the light source of FIG. 1;

[0028] FIG. 7 is a top view of an alternate elongate thermally conductive member; and

[0029] FIG. 8 is a side view of the member of FIG. 7.

#### DETAILED DESCRIPTION

[0030] A light source in accordance with the principles of the invention may be used as a decorative lighting element or may be utilized as a general illumination device. As shown in FIG. 1, a light source 100 in accordance with the invention includes an elongate thermally conductive member or heat sink 101. Elongate heat sink 101 is formed of a material that provides excellent thermal conductivity. Elongate heat sink 101

in the illustrative embodiment of the invention is a tubular aluminum extrusion. To improve the heat dissipative properties of light source 100, elongate heat sink 101 is configured to provide convective heat dissipation and cooling. As more clearly seen in FIG. 2, tubular heat sink 101 is hollow and has an interior cavity 103 that includes one or more surface discontinuities or heat dissipating protrusions 105. In the illustrative embodiment the surface discontinuities or heat dissipating protrusions 105 are triangular shaped fins, but may take on other shapes. In yet other embodiments, the surface discontinuities may include apertures or blind bores either alone or in combinations with heat dissipation protrusions. Protrusions 105 are integrally formed on the interior of elongate heat sink 101. In the illustrative embodiment movement of a medium 102 through elongate heat sink 101 provides cooling. Medium 102 utilized in the illustrative embodiment is air, but may in some applications be a fluid other than air to provide for greater heat dissipation and cooling.

**[0031]** Cooling device 199 is coupled to elongate thermally conductive member 101 to enhance cooling of the LED's. Cooling device in one embodiment of the invention is a medium moving device in fluid coupling with elongate thermally conductive member 101 to enhance the movement of medium 102. Medium moving device 199 is utilized to enhance fluid medium 102 to flow to cause cooling of the elongate thermally conductive member and therefore to dissipate heat from the light emitting diodes. Medium moving device 199 in a first illustrative embodiment is a fan and may be an electromechanical fan, electronic fan, or solid-state device such as a piezoelectric fan. In a second embodiment of the invention, cooling device 199 may comprise one or more solid state

cooling devices utilizing the Peltier effect, otherwise known as Peltier devices. Although cooling device 199 is shown at one end of the light source 100, it will be appreciated by those skilled in the art that where solid state devices are utilized, a plurality of solid state devices may be positioned at locations other than on an end of the light source 100. It will also be appreciated by those skilled in the art that solid state cooling devices such as Piezoelectric and Peltier devices are known.

[0032] The exterior surface 107 of elongate heat sink 101 has a plurality of Light Emitting Diodes 109 disposed thereon. Each LED 109 in the illustrative embodiment comprises a white light emitting LED of a type that provides a high light output. Each LED 109 also generates significant amount of heat that must be dissipated to avoid thermal destruction of the LED. As noted above cooling device 199 provides cooling to avoid thermal destruction. By combining a plurality of LEDs 109 on elongate thermally conductive member or heat sink 101, a high light output light source that may be used for general lighting is provided.

[0033] Conductive paths 129 are provided to connect LEDs 109 to an electrical connector 111. The conductive paths may be disposed on an electrically insulating layer 131 or layers disposed on exterior surface 107. In the illustrative embodiment shown in the drawing figures, the conductive paths and insulating layer are provided by means of one or more flexible printed circuits 113 that are permanently disposed on surface 107. As more easily seen in FIG. 6, printed circuit 113 includes an electrically insulating layer

131 that carries conductive paths 129. As will be appreciated by those skilled in the art, other means of providing the electrically conductive paths may be provided.

**[0034]** Flexible printed circuit 113 has LED's 109 mounted to it in a variety of orientations ranging from 360 degrees to 180 degrees and possibly others depending on the application. Electrical connector 111 is disposed at one end of printed circuit 113. Connector 113 is coupleable to a separate power supply to receive electrical current. Flexible printed circuit 113, in the illustrative embodiment is coated with a non-electrically conductive epoxy that may be infused with optically reflective materials. Flexible printed circuit 113 is adhered to the tube 101 with a heat conducting epoxy to aid in the transmission of the heat from LEDs 109 to tube 101. Flexible printed circuit 113 has mounting holes 134 for receiving LEDs 109 such that the backs of LEDs 109 are in thermal contact with the tube surface 107.

**[0035]** Tubular heat sink 101 in the illustrative embodiment is formed in the shape of a polygon and may have any number of sides. Although tubular heat sink 101 in the illustrative embodiment is extruded aluminum, tubular heat sink 101 may comprise other thermal conductive material. Fins 105 may vary in number and location depending on particular LED layouts and wattage. In some instances, heat dissipation protrusions or fins may be added to the exterior surface of tubular heat sink 101. In addition, apertures may be added to the tubular heat sink to enhance heat flow.

[0036] FIGs. 7 and 8 show an alternate elongate thermally conductive member 201 that has both exterior surface discontinuities or heat dissipation protrusions or fins 205 in addition to interior surface discontinuities or heat dissipation protrusions or fins 241.

[0037] Light source 100 is mounted into a fixture and retained in position by mounting clips 121,123 as most clearly seen in FIGs. 3, 4, and 5. Each of the clips is shaped so as to engage and retain light source 100. Each clip is affixed on one surface 122, 124 to a light fixture.

[0037] Although light source 100 is shown as comprising elongate tubular thermally conductive members or heat sinks 101, 201, other extruded elongate members may be used such as channels.

[0038] In the illustrative embodiment shown, cooling by flow of air through elongate thermally conductive members or tubular heat sinks 101, 201 is utilized such that cool or unheated air enters elongate thermally conductive members 101, 201 by fluid movement device 199, passes over the surface discontinuities or heat dissipation protrusions, and exits from the opposite end of elongate thermally conductive member 101, 201 as heated air. In higher wattage light sources, rather than utilizing air as the cooling medium, other fluids may be utilized. In particular, convective heat pumping may be used to remove heat from the interior of the heat sink.



**[0039]** In one particularly advantageous embodiment of the invention, the light source of the invention is configured to replace compact fluorescent lighting in decorative applications.

**[0040]** It will be appreciated by those skilled in the art that although the invention has been described in terms of light emitting diodes, the invention is equally applicable to other non-filament miniature lights sources such as organic light emitting diodes (OLED's) and polymer type light sources. It is intended that the term "light emitting diode" or "LED" as used in the claims is intended to not be limited to solid state light emitting diodes, but is intended to include such other miniature light sources.

**[0041]** It has further been determined that the uniformity of light distribution of a light source having an elongate thermally conductive member with heat dissipation protrusions or fins 205 on the outer surface of the elongate thermally conductive member 201 is enhanced by utilization of an appropriately selected coating or treatment to the outer or exterior surfaces of elongate thermally conductive member 201. In particular, in a comparison of various surface coatings or treatments, it has been found that the use of a non-reflective or black surface on the protrusions or fins 205 provides a more uniform light output. It has been determined that the use of reflective or white surfaces on protrusions results in the protrusions producing shadows in the light output.

**[0042]** As will be appreciated by those skilled in the art, the principles of the invention are not limited to the use of light emitting diodes that emit white light. Different colored

light emitting diodes may be used to produce monochromatic light or to produce light that is the combination of different colors.

**[0043]** Although the invention has been described in terms of illustrative embodiments, it is not intended that the invention be limited to the illustrative embodiments shown and described. It will be apparent to those skilled in the art that various changes and modifications may be made to the embodiments shown and described without departing from the spirit or scope of the invention. It is intended that the invention be limited only by the claims appended hereto.

**WHAT IS CLAIMED IS:****CLAIM 1.** A light source comprising:

an elongate thermally conductive member having an outer surface;

a plurality of light emitting diodes carried on said elongate member outer surface  
at least some of said light emitting diodes being disposed in a first plane and others of  
said light emitting diodes being disposed in a second plane not coextensive with said first  
plane;

said elongate thermally conductive member being configured to conduct heat  
away from said light emitting diodes to fluid contained by said elongate thermally  
conductive member;

said elongate thermally conductive member comprises one or more surface  
discontinuities to enhance heat dissipation; and

a fluid movement device in fluid communication with said elongate thermally  
conductive member to enhance movement of said fluid over at least some of said heat  
surface discontinuities.

**CLAIM 2.** A light source in accordance with claim 1, wherein:

said fluid movement device comprises an electromechanical device.

**CLAIM 3.** A light source in accordance with claim 2, wherein:

said electromechanical device comprises a fan.

**CLAIM 4.** A light source in accordance with claim 1, wherein:

said fluid movement device comprises an electronic device.

**CLAIM 5.** A light source in accordance with claim 1, wherein:

said fluid movement device comprises a solid state device.

**CLAIM 6.** A light source in accordance with claim 1, wherein:

said fluid movement device comprises an piezoelectric device.

**CLAIM 7.** A light source in accordance with claim 1, wherein:

said elongate thermally conductive member is configured to conduct heat away from said light emitting diodes to fluid proximate said elongate member outer surface.

**CLAIM 8.** A light source in accordance with claim 7, wherein:

said fluid proximate said elongate member outer surface comprises air.

**CLAIM 9.** A light source in accordance with claim 7, wherein:

said fluid movement device comprises an electromechanical device.

**CLAIM 10.** A light source in accordance with claim 9, wherein:

said electromechanical device comprises a fan.

**CLAIM 11.** A light source in accordance with claim 7, wherein:

said fluid movement device comprises an electronic device.

**CLAIM 12.** A light source in accordance with claim 7, wherein:

said fluid movement device comprises a solid state device.

**CLAIM 13.** A light source in accordance with claim 12, wherein:

said fluid movement device comprises an piezoelectric device.

**CLAIM 14.** A light source in accordance with claim 1, wherein:

said fluid contained by said elongate thermally conductive member is a cooling medium other than air.

**CLAIM 15.** A light source in accordance with claim 1, wherein:

said elongate thermally conductive member comprises a tube.

**CLAIM 16.** A light source in accordance with claim 15, wherein:

said tube has a cross-section in the shape of a polygon.

**CLAIM 17.** A light source in accordance with claim 6, wherein:

said tube has a cross-section having flat portions.

**CLAIM 18.** A light source in accordance with claim 1, wherein:

said elongate thermally conductive member comprises a channel.

**CLAIM 19.** A light source in accordance with claim 18, wherein:

said elongate thermally conductive member comprises an extrusion.

**CLAIM 20.** A light source in accordance with claim 18, wherein:

said extrusion is an aluminum extrusion.

**CLAIM 21.** A light source in accordance with claim 1, wherein:

each of said light emitting diodes emits white light.

**CLAIM 22.** A light source in accordance with claim 1, wherein:

at least some of said light emitting diodes emit colored light.

**CLAIM 23.** A light source comprising:

an elongate thermally conductive member having an outer surface;

a plurality of light emitting diodes carried on said elongate member outer surface

at least some of said light emitting diodes being disposed in a first plane and others of  
said light emitting diodes being disposed in a second plane not coextensive with said first  
plane;

said elongate thermally conductive member being configured to conduct heat  
away from said light emitting diodes to fluid contained by said elongate thermally  
conductive member; and

a cooling apparatus coupled to said elongate thermally conductive member to  
enhance cooling of said plurality of light emitting diodes.

**CLAIM 24.** A light source in accordance with claim 23, wherein:

said cooling device comprises a solid state cooling device.

**CLAIM 25.** A light source in accordance with claim 23 wherein:

said cooling device comprises a Peltier device.

**CLAIM 26.** A light source in accordance with claim 23 wherein:

said cooling device comprises a Piezoelectric device.

**CLAIM 27.** A light source comprising:

an elongate thermally conductive member having an outer surface;

at least one light emitting diode carried on said elongate member outer surface;

said elongate thermally conductive member being configured to conduct heat away from said at least one light emitting diode; and

a cooling apparatus coupled to said elongate thermally conductive member to enhance cooling of said at least one light emitting diode.

**CLAIM 28.** A light source in accordance with claim 27, wherein:

said cooling device comprises a solid state cooling device.

**CLAIM 29.** A light source in accordance with claim 27 wherein:

said cooling device comprises a Peltier device.

**CLAIM 30.** A light source in accordance with claim 27 wherein:

said cooling device comprises a Piezoelectric device.

**CLAIM 31.** A light source comprising:

an elongate thermally conductive member having an outer surface;

at least one light emitting diodes carried on said elongate member outer surface;

one or more electrical conductors carried by said elongate thermally conductive member and connected to said at least one light emitting diodes to supply electrical power thereto;

said elongate thermally conductive member being configured to conduct heat away from said at least one light emitting diode to fluid contained by said elongate thermally conductive member; and

a fluid moving device in fluid communication with said elongate thermally conductive member to move said fluid.

**CLAIM 32.** A light source comprising:

an elongate thermally conductive member having an outer surface;

a plurality of light emitting diodes carried on said elongate member outer surface at least some of said light emitting diodes being disposed in a first plane and others of said light emitting diodes being disposed in a second plane not coextensive with said first plane;



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electrical conductors carried by said elongate thermally conductive member and  
connected to said plurality of light emitting diodes to supply electrical power thereto; and

said elongate thermally conductive member being configured to conduct heat  
away from said light emitting diodes to fluid contained by said elongate thermally  
conductive member; and

a coating carried on said elongate thermally conductive member.

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**CLAIM 33.** A light source in accordance with claim 32, wherein:

said coating is infused with optically reflective material.

## ABSTRACT OF THE DISCLOSURE

A light source that utilizes light emitting diodes that emit white light is disclosed. The diodes are mounted on an elongate member having at least two surfaces upon which the light emitting diodes are mounted. The elongate member is thermally conductive and is utilized to cool the light emitting diodes. In the illustrative embodiment, the elongate member is a tubular member through which a heat transfer medium flows. A cooling or fluid movement device coupled with the elongate thermally conductive member enhances cooling of the light emitting diodes.

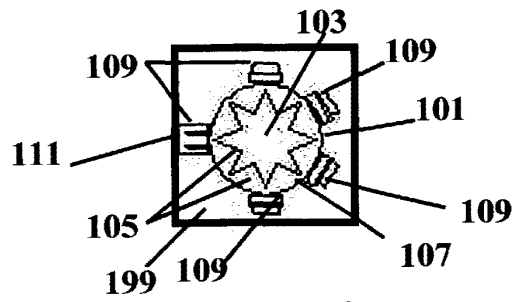


FIG. 2

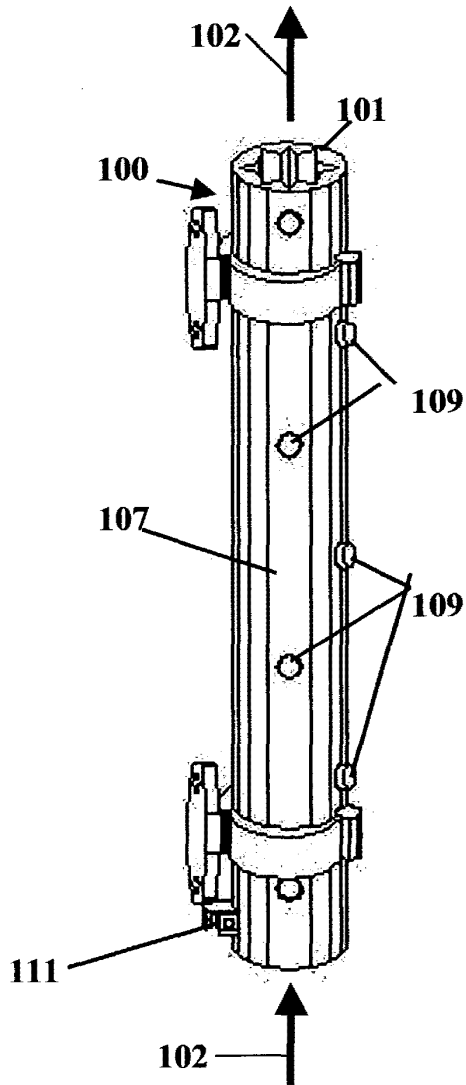


FIG. 3

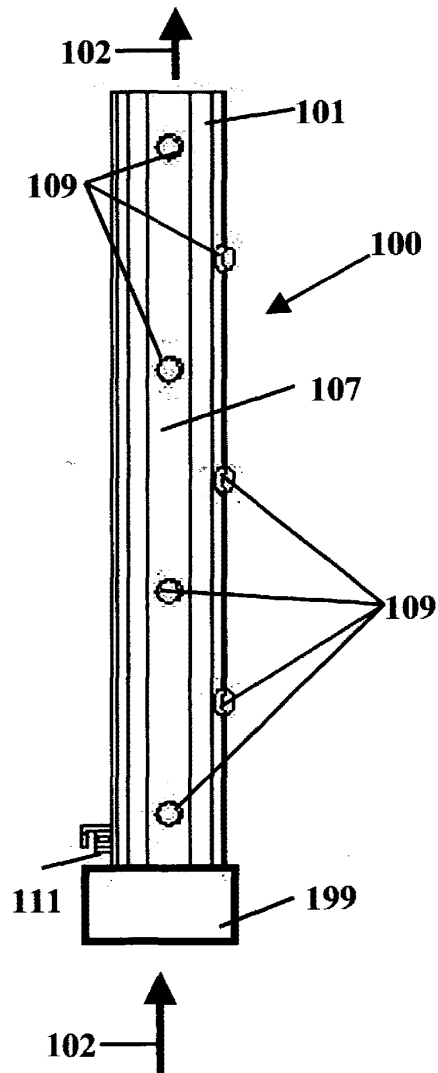
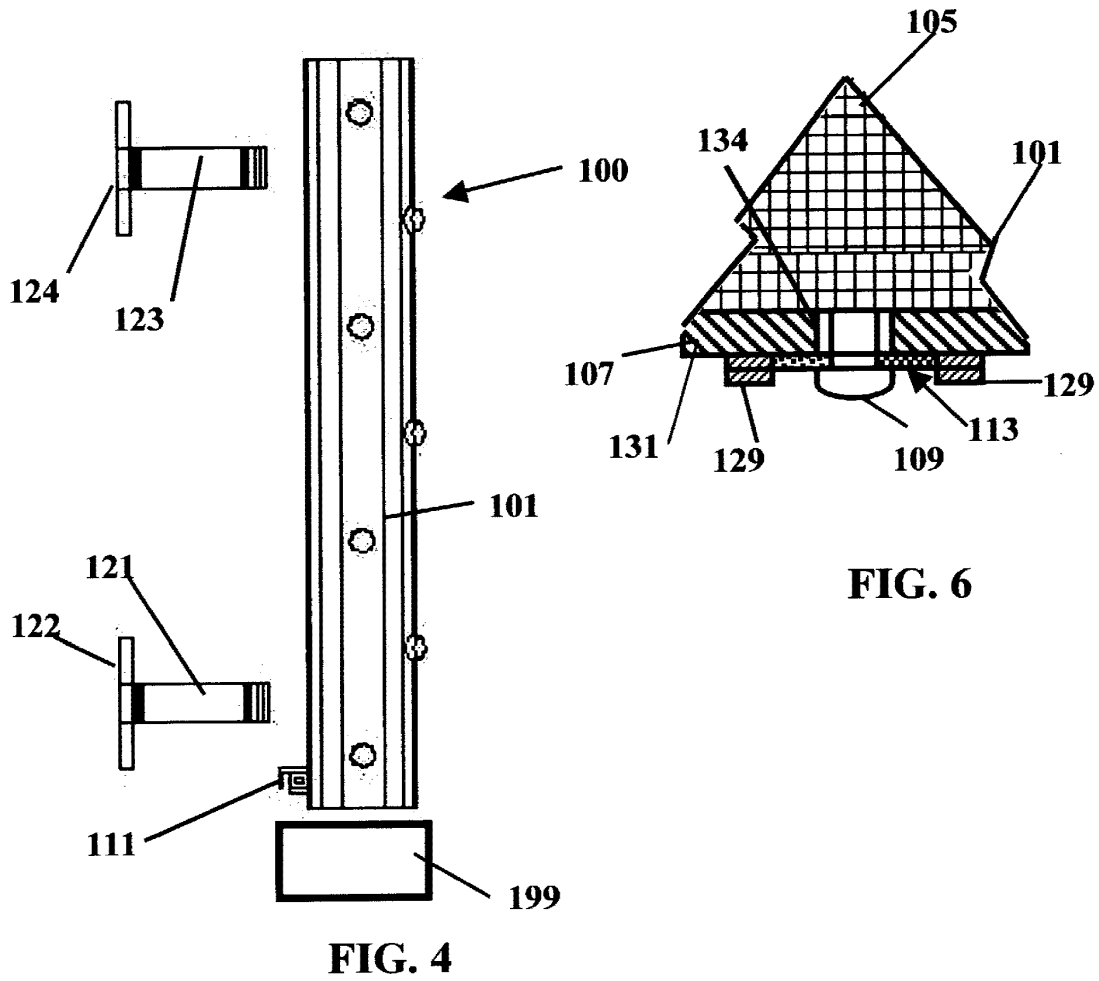
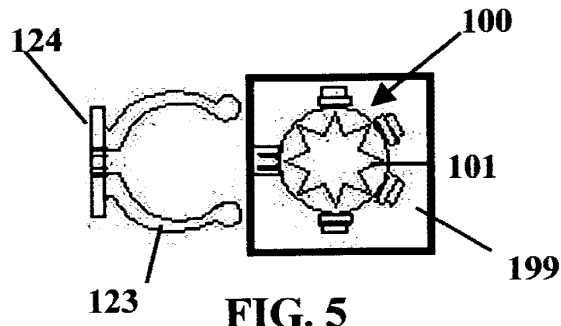
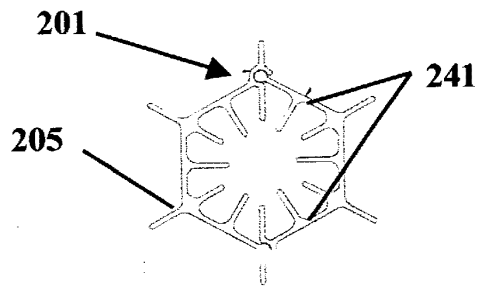
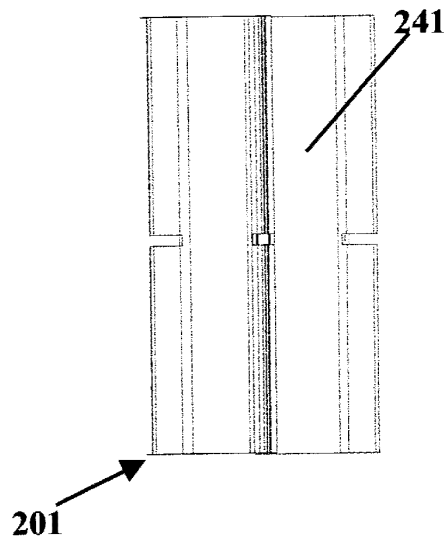


FIG. 1





**FIG. 7**



**FIG. 8**

# PATENT APPLICATION FEE DETERMINATION RECORD

Effective January 1, 2003

Application or Docket Number

## CLAIMS AS FILED - PART I

	(Column 1)	(Column 2)
TOTAL CLAIMS	33	
FOR	NUMBER FILED	NUMBER EXTRA
TOTAL CHARGEABLE CLAIMS	33 minus 20 = *	13
INDEPENDENT CLAIMS	5 minus 3 = *	2
MULTIPLE DEPENDENT CLAIM PRESENT <input type="checkbox"/>		

\* If the difference in column 1 is less than zero, enter "0" in column 2

## CLAIMS AS AMENDED - PART II

	(Column 1)	(Column 2)	(Column 3)
AMENDMENT A	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA
	Total *	Minus **	=
	Independent *	Minus ***	=
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM <input type="checkbox"/>		

	(Column 1)	(Column 2)	(Column 3)
AMENDMENT B	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA
	Total *	Minus **	=
	Independent *	Minus ***	=
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM <input type="checkbox"/>		

	(Column 1)	(Column 2)	(Column 3)
AMENDMENT C	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA
	Total *	Minus **	=
	Independent *	Minus ***	=
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM <input type="checkbox"/>		

\* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

\*\* If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20."

\*\*\* If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3."  
The Highest Number Previously Paid For (Total or Independent) is the highest number found in the appropriate box in column 3.

## SMALL ENTITY TYPE ☐

RATE	FEE
BASIC FEE	375.00
X\$ 9=	
X42=	
+140=	
TOTAL	

## OTHER THAN SMALL ENTITY

RATE	FEE
BASIC FEE	750.00
X\$18=	
X84=	
+280=	
TOTAL	

## SMALL ENTITY ☐

RATE	ADDITIONAL FEE
X\$ 9=	
X42=	
+140=	
TOTAL	
ADDIT. FEE	

## OTHER THAN SMALL ENTITY

RATE	ADDITIONAL FEE
X\$18=	
X84=	
+280=	
TOTAL	
ADDIT. FEE	

RATE	ADDITIONAL FEE
X\$ 9=	
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RATE	ADDITIONAL FEE
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TOTAL	
ADDIT. FEE	



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 Alexandria, Virginia 22313-1450  
 www.uspto.gov

APPLICATION NUMBER	FILING OR 371 (c) DATE	FIRST NAMED APPLICANT	ATTORNEY DOCKET NUMBER
10/430,696	05/05/2003	Joel M. Dry	OPTOLUM-003

CONFIRMATION NO. 3639

DONALD J LENKSZUS  
 PO BOX 3064  
 CAREFREE, AZ 85377-3064

## FORMALITIES LETTER



\*OC000000010532350\*

Date Mailed: 07/22/2003

## NOTICE TO FILE MISSING PARTS OF NONPROVISIONAL APPLICATION

FILED UNDER 37 CFR 1.53(b)

*Filing Date Granted***Items Required To Avoid Abandonment:**

An application number and filing date have been accorded to this application. The item(s) indicated below, however, are missing. Applicant is given **TWO MONTHS** from the date of this Notice within which to file all required items and pay any fees required below to avoid abandonment. Extensions of time may be obtained by filing a petition accompanied by the extension fee under the provisions of 37 CFR 1.136(a).

- The statutory basic filing fee is missing.  
*Applicant must submit \$ 375 to complete the basic filing fee for a small entity.*
- The oath or declaration is missing.  
*A properly signed oath or declaration in compliance with 37 CFR 1.63, identifying the application by the above Application Number and Filing Date, is required.*
- To avoid abandonment, a late filing fee or oath or declaration surcharge as set forth in 37 CFR 1.16(e) of \$65 for a small entity in compliance with 37 CFR 1.27, must be submitted with the missing items identified in this letter.

The application is informal since it does not comply with the regulations for the reason(s) indicated below.

The required item(s) identified below must be timely submitted to avoid abandonment:

- Replacement drawings in compliance with 37 CFR 1.84 and 37 CFR 1.121 are required. The drawings submitted are not acceptable because:
  - The drawings have a line quality that is too light to be reproduced (weight of all lines and letters must be heavy enough to permit adequate reproduction) or text that is illegible (reference characters, sheet numbers, and view numbers must be plain and legible) see 37 CFR 1.84(l) and (p)(1)); See Figure(s) 7.

**Items Required To Avoid Processing Delays:**

The item(s) indicated below are also required and should be submitted with any reply to this notice to avoid further processing delays.



- Additional claim fees of \$201 as a small entity, including any required multiple dependent claim fee, are required. Applicant must submit the additional claim fees or cancel the additional claims for which fees are due.

**SUMMARY OF FEES DUE:**

Total additional fee(s) required for this application is **\$641** for a Small Entity

- \$375 Statutory basic filing fee.
- \$65 Late oath or declaration Surcharge.
- Total additional claim fee(s) for this application is **\$201**
  - \$117 for 13 total claims over 20 .
  - \$84 for 2 independent claims over 3 .

---

*A copy of this notice **MUST** be returned with the reply.*



Customer Service Center  
Initial Patent Examination Division (703) 308-1202

PART 3 - OFFICE COPY

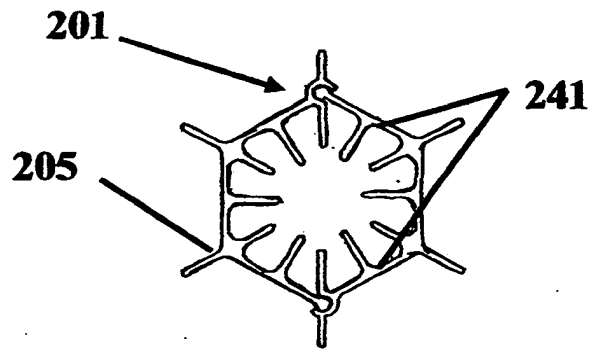


FIG. 7

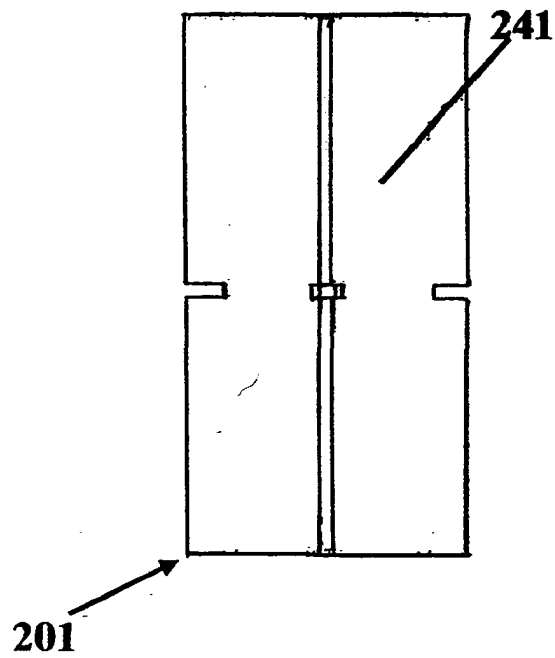
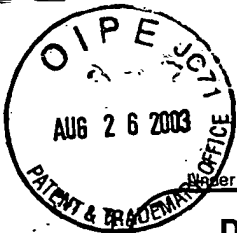


FIG. 8



Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

**DECLARATION FOR UTILITY OR  
DESIGN  
PATENT APPLICATION  
(37 CFR 1.63)**



Declaration  
Submitted  
With Initial  
Filing

OR



Declaration  
Submitted after Initial  
Filing (surcharge  
(37 CFR 1.16 (e))  
required)

Attorney Docket Number

OPTOLUM -003

First Named Inventor

JOEL M. DRY

COMPLETE IF KNOWN

Application Number

10/430,696

Filing Date

05/05/2003

Art Unit

2818

Examiner Name

**I hereby declare that:**

Each inventor's residence, mailing address, and citizenship are as stated below next to their name.

I believe the inventor(s) named below to be the original and first inventor(s) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

**LIGHT EMITTING DIODE LIGHT SOURCE**

(Title of the Invention)

the specification of which



is attached hereto

OR



was filed on (MM/DD/YYYY)

05/05/2003

as United States Application Number or PCT International

Application Number

10/430,696

and was amended on (MM/DD/YYYY)

(if applicable).

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment specifically referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR 1.56, including for continuation-in-part applications, material information which became available between the filing date of the prior application and the national or PCT international filing date of the continuation-in-part application.

I hereby claim foreign priority benefits under 35 U.S.C. 119(a)-(d) or (f), or 365(b) of any foreign application(s) for patent, inventor's or plant breeder's rights certificate(s), or 365(a) of any PCT international application which designated at least one country other than the United States of America, listed below and have also identified below, by checking the box, any foreign application for patent, inventor's or plant breeder's rights certificate(s), or any PCT international application having a filing date before that of the application on which priority is claimed.

Prior Foreign Application Number(s)	Country	Foreign Filing Date (MM/DD/YYYY)	Priority Not Claimed	Certified Copy Attached?	
				Yes	No
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

☐ Additional foreign application numbers are listed on a supplemental priority data sheet PTO/SB/02B attached hereto.

[Page 1 of 2]

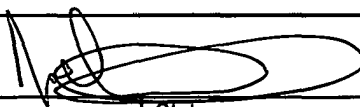
This collection of information is required by 35 U.S.C. 115 and 37 CFR 1.63. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 21 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.



Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

## DECLARATION — Utility or Design Patent Application

Direct all correspondence to: <input type="checkbox"/> Customer Number: <input type="text"/>				OR <input checked="" type="checkbox"/> Correspondence address below	
Name DONALD J LENKSZUS					
Address PO BOX 3064					
City CAREFREE		State AZ		ZIP 85377-3064	
Country USA		Telephone 602-463-2010		Fax 480-575-1321	
I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. 1001 and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.					
NAME OF SOLE OR FIRST INVENTOR:				<input type="checkbox"/> A petition has been filed for this unsigned inventor	
Given Name (first and middle [if any]) JOEL M.				Family Name or Surname DRY	
Inventor's Signature 				Date 8-22-03	
Residence: City WINTERS		State TEXAS		Citizenship USA	
Mailing Address 99 JOHN STREET, SUITE 926					
City NEW YORK		State NEW YORK		ZIP 10038	
Country USA					
NAME OF SECOND INVENTOR:				<input type="checkbox"/> A petition has been filed for this unsigned inventor	
Given Name (first and middle [if any])				Family Name or Surname	
Inventor's Signature				Date	
Residence: City		State		Citizenship	
Mailing Address					
City		State		ZIP	
Country					
<input type="checkbox"/> Additional inventors or a legal representative are being named on the _____ supplemental sheet(s) PTO/SB/02A or 02LR attached hereto.					

[Page 2 of 2]



Attorney Docket No.: OPTOLUM-003  
**PATENT**

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re Application of:  
JOEL M. DRY  
Filed: 05/05/2003  
Title: LIGHT EMITTING DIODE LIGHT SOURCE:  
Serial No.: 10/430,696

**POWER OF ATTORNEY**

OPTOLUM, INC. is the owner of the above-identified patent, pursuant to an Assignment from the owners of record, JOEL M. DRY to OPTOLUM, INC. In accordance with 37 C.F.R. § 3.73(b), a copy of the Assignment is attached hereto. A copy of the Assignment has also been filed or is being filed contemporaneously herewith for recordation with the Assignment Branch.

OPTOLUM, INC. hereby revokes all previous powers of attorney and appoints

Donald J. Lenkszus, Reg. No. 28,096  
DONALD J. LENKSZUS, P.C.  
P.O. BOX 3064  
CAREFREE, AZ 85377  
telephone (602) 463-2010  
facsimile (480) 575- 1321

as its attorney with full powers of substitution, revocation and association, to transact all business in the United States Patent and Trademark Office in connection with the above-identified patent application.

Please direct all correspondence regarding this patent application to Donald J. Lenkszus at the above address and telephone number.

OPTOLUM, INC.

Dated: AUGUST 22, 2003

By: 

Name: JOEL M. DRY  
Title: CEO



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/430,696	05/05/2003	Joel M. Dry	OPTOLUM-003	3639
7590 06/10/2004				
DONALD J LENKSZUS PO BOX 3064 CAREFREE, AZ 85377-3064			EXAMINER HO, TU TU V	
			ART UNIT 2818	PAPER NUMBER

DATE MAILED: 06/10/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/430,696

Applicant(s)

DRY, JOEL M.

Examiner

Tu-Tu Ho

Art Unit

2818

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 05 May 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-33 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-33 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 May 2003 and 26 August 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION*****Double Patenting***

1. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

2. Claims 1-33 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-23 of U.S. Patent No. 6,573,536 (the '536 patent).

Although the conflicting claims are not identical, they are not patentably distinct from each other. Claims 1-33 of the present invention is a similar version of the claimed invention in claims 1-23 of the above-identified U.S. Patent with similar intended scope.

With respect to claims 2-3 and 7-10, the claims of the '536 patent recite an LED light source comprising an elongated thermally conductive member as claimed including a thermal transfer media but fails to recite an electromechanical device including a fan. However, at the time the invention was made, the use of an electromechanical device including a fan for the purpose of removing thermal energy (heat), in particular for the purpose of removing thermal



Art Unit: 2818

energy from an LED light source so that the light source maintains a set value, was known. See, for example, U.S. Patent Application Publication No. 20020056804 by Konagaya, paragraphs [0007] through [0009]. Therefore, it would have been obvious to incorporate an electromechanical device including a fan into the claims of the '536 patent. One would have been motivated to make such a modification for the purpose of removing thermal energy from a device, particularly an LED light source.

Referring to claims 24-25 and 28-29, the claims of the '536 patent recite an LED light source comprising an elongated thermally conductive member as claimed but fails to recite a solid state cooling apparatus comprising a Peltier device coupled to the elongated thermally conductive member. However, at the time the invention was made, the use of a solid state cooling apparatus comprising a Peltier device coupled to the elongated thermally conductive member for the purpose of removing thermal energy from an LED light source so that the light source maintains a set value was known. See, for example, U.S. Patent Application Publication No. 20020056804 by Konagaya, paragraphs [0007] through [0009]. Therefore, it would have been obvious to incorporate a solid state cooling apparatus comprising a Peltier device into the claims of the '536 patent. One would have been motivated to make such a modification for the purpose of removing thermal energy from an LED light source.

Referring to claims 6, 12-13, 26, and 30, the claims of the '536 patent recite an LED light source comprising an elongated thermally conductive member as claimed but fails to recite a solid state cooling apparatus comprising a piezoelectric device coupled to the elongated thermally conductive member. However, at the time the invention was made, the use of a solid state cooling apparatus comprising a piezoelectric device for cooling electronic circuits was

Art Unit: 2818

known. See, for example, U.S. Patent 5,861,703 to Losinski, who discloses that piezoelectric fans offer significant advantages in that they have fewer moving parts, generate very little heat, and can be used in harsh environments with wide temperature ranges, wide humidity ranges (column 1, lines 23-29). Therefore, it would have been obvious to incorporate a solid state cooling apparatus comprising a piezoelectric device into the claims of the '536 patent. One would have been motivated to make such a modification for the purpose of cooling an electronic circuit, particularly one including an LED light source, in view of the suggestion by Losisski that piezoelectric fans offer significant advantages because they have fewer moving parts, generate very little heat, and can be used in harsh environments with wide temperature ranges, wide humidity ranges.

Referring to claims 32 and 33, the claims of the '536 patent recite an LED light source comprising an elongated thermally conductive member as claimed including LEDs on an outer surface of the elongated thermally conductive member - the LED carrier - but fails to recite a coating infused with an optically reflective material carried on the LED carrier. However, at the time the invention was made, the use of an LED carrier coated with a reflective was known. See, for example, U.S. Patent 5,949,347 to Wu, who discloses in Figures 3C, 5C, 7C and column 4, lines 15-21 that a light source 20 having an LED carrier coated with a reflective material results in a light source with an even illumination. Therefore, it would have been obvious to incorporate a coating infused with a reflective material into the LED-carrier, elongated-thermally-conductive member of the claims of the '536 patent. One would have been motivated to make such a modification for the purpose of providing an LED light source having even illumination.

Art Unit: 2818

3. A rejection based on double patenting of the "same invention" type finds its support in the language of 35 U.S.C. 101 which states that "whoever invents or discovers any new and useful process ... may obtain a patent therefor ..." (Emphasis added). Thus, the term "same invention," in this context, means an invention drawn to identical subject matter. See *Miller v. Eagle Mfg. Co.*, 151 U.S. 186 (1894); *In re Ockert*, 245 F.2d 467, 114 USPQ 330 (CCPA 1957); and *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970).

A statutory type (35 U.S.C. 101) double patenting rejection can be overcome by canceling or amending the conflicting claims so they are no longer coextensive in scope. The filing of a terminal disclaimer cannot overcome a double patenting rejection based upon 35 U.S.C. 101.

4. Claims 32-33 are provisionally rejected under 35 U.S.C. 101 as claiming the same invention as that of claims 22-23 of copending Application No. 10/430,732.

This is a provisional double patenting rejection since the conflicting claims have not in fact been patented.

### ***Conclusion***

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

a. U.S. Patent 5,890,794 to Abtahi et al. discloses a light source comprising:  
an elongate insulating member 42 having an outer surface;  
at least one light emitting diode carried on said insulating member outer surface;  
one or more electrical conductors carried by said elongate insulating member and  
connected to said at least one light emitting diodes to supply electrical power thereto; and

said elongate insulating member being configured to conduct heat away from said at least one light emitting diode to fluid contained by said elongate insulating member.

b. U.S. Patent 6,274,924 to Carey et al. discloses a light emitting die assembly comprising: metal leads, an insulating body attached to the metal leads, the insulating body having a cavity, a heat sink connected to the insulating body and positioned relative to the cavity for being thermally coupled to a die, and a lens positioned relative to the cavity for transmitting light emitted from the die.


6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tu-Tu Ho whose telephone number is (571) 272-1778. The examiner can normally be reached on 6:30 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, DAVID NELMS can be reached on (571) 272-1787. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9306 for regular communications and (703) 872-9306 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-1782.

TH

Tu-Tu Ho  
June 01, 2004

  
David Nelms  
Supervisory Patent Examiner  
Technology Center 2800

<b>Notice of References Cited</b>	Application/Control No. 10/430,696	Applicant(s)/Patent Under Reexamination DRY, JOEL M.	
	Examiner Tu-Tu Ho	Art Unit 2818	Page 1 of 1

**U.S. PATENT DOCUMENTS**

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
	A	US-5,861,703	01-1999	Losinski, Armand	310/330
	B	US-5,890,794	04-1999	Abtahi et al.	362/294
	C	US-5,949,347	09-1999	Wu, Chen H.	340/815.45
	D	US-6,274,924	08-2001	Carey et al.	257/676
	E	US-6,573,536	06-2003	Dry, Joel M.	257/88
	F	US-2002/0056804	05-2002	Konagaya, Tatsuya	250/208.1
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

**FOREIGN PATENT DOCUMENTS**

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
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	P					
	Q					
	R					
	S					
	T					

**NON-PATENT DOCUMENTS**

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
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	W	
	X	

\*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)  
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

# Index of Claims



Application No.

10/430,696

Examiner

Tu-Tu Ho

Applicant(s)

DRY, JOEL M.

Art Unit

2818

✓	Rejected
=	Allowed

—	(Through numeral) Cancelled
+	Restricted

N	Non-Elected
I	Interference

A	Appraised
O	Objected

Claim	Date
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1	40/69
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**Search Notes**

Applicati n No.

10/430,696

Examiner

Tu-Tu Ho

Applicant(s)

DRY, JOEL M.

Art Unit

2818

**SEARCHED**

Class	Subclass	Date	Examiner
257	88	06/04	TH
362	555	↓	↓

**INTERFERENCE SEARCHED**

Class	Subclass	Date	Examiner

**SEARCH NOTES  
(INCLUDING SEARCH STRATEGY)**

	DATE	EXMR
East, attached	06/04	TH



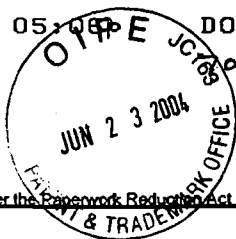


Jun 23 04 05:00

DONALD J LENKSZUS, P.C.

480-595-7695

OFFICIAL



03-872-9806

PTO/SB/21 (02-04)

Approved for use through 07/31/2006. OMB 0651-0031

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

<b>TRANSMITTAL FORM</b> (to be used for all correspondence after initial filing)	Application Number	10/430,696	
	Filing Date	05/05/2003	
	First Named Inventor	JOEL DRY	
	Art Unit	2818	
	Examiner Name	TU TU HO	
Total Number of Pages in This Submission	14	Attorney Docket Number	OPTOLUM-003

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Firm or Individual name	DONALD J LENKSZUS, PC
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Date	JUNE 23, 2004

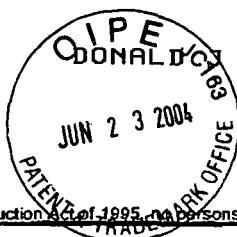
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PTO/SB/17 (10-03)

Approved for use through 07/31/2006. OMB 0851-0032  
U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

# FEE TRANSMITTAL for FY 2004

Effective 10/01/2003. Patent fees are subject to annual revision.

☒ Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT (\$ 55

## Complete if Known

Application Number 10/430,696  
Filing Date 05/05/2003  
First Named Inventor JOEL DRY  
Examiner Name TU TU HO  
Art Unit 2818  
Attorney Docket No. OPTOLUM-003

## METHOD OF PAYMENT (check all that apply)

☐ Check ☐ Credit card ☐ Money Order ☐ Other ☐ None

☐ Deposit Account:

Deposit Account Number  
Deposit Account Name

The Director is authorized to: (check all that apply)

☐ Charge fee(s) indicated below ☐ Credit any overpayments

☐ Charge any additional fee(s) or any underpayment of fee(s)

☐ Charge fee(s) indicated below, except for the filing fee to the above-identified deposit account.

## FEE CALCULATION

### 1. BASIC FILING FEE

Large Entity Fee Code (\$)	Small Entity Fee Code (\$)	Fee Description	Fee Paid
1001 770	2001 385	Utility filing fee	
1002 340	2002 170	Design filing fee	
1003 530	2003 265	Plant filing fee	
1004 770	2004 385	Reissue filing fee	
1005 180	2005 80	Provisional filing fee	
SUBTOTAL (1)			(\$ 0

### 2. EXTRA CLAIM FEES FOR UTILITY AND REISSUE

Total Claims	Extra Claims	Fee from below	Fee Paid
Independent Claims	-20** =	X	
Multiple Dependent	-3** =	X	

Large Entity Fee Code (\$)	Small Entity Fee Code (\$)	Fee Description
1202 18	2202 9	Claims in excess of 20
1201 86	2201 43	Independent claims in excess of 3
1203 290	2203 145	Multiple dependent claim, if not paid
1204 86	2204 43	** Reissue independent claims over original patent
1205 18	2205 9	** Reissue claims in excess of 20 and over original patent

SUBTOTAL (2) (\$ 0

\*\*or number previously paid, if greater; For Reissues, see above

## FEE CALCULATION (continued)

### 3. ADDITIONAL FEES

Large Entity Fee Code (\$)	Small Entity Fee Code (\$)	Fee Description	Fee Paid
1051 130	2051 65	Surcharge - late filing fee or oath	
1052 50	2052 25	Surcharge - late provisional filing fee or cover sheet	
1053 130	1053 130	Non-English specification	
1812 2,520	1812 2,520	For filing a request for ex parte reexamination	
1804 920*	1804 920*	Requesting publication of SIR prior to Examiner action	
1805 1,840*	1805 1,840*	Requesting publication of SIR after Examiner action	
1251 110	2251 55	Extension for reply within first month	
1252 420	2252 210	Extension for reply within second month	
1253 950	2253 475	Extension for reply within third month	
1254 1,480	2254 740	Extension for reply within fourth month	
1255 2,010	2255 1,005	Extension for reply within fifth month	
1401 330	2401 165	Notice of Appeal	
1402 330	2402 165	Filing a brief in support of an appeal	
1403 290	2403 145	Request for oral hearing	
1451 1,510	1451 1,510	Petition to institute a public use proceeding	
1452 110	2452 55	Petition to revive - unavoidable	
1453 1,330	2453 665	Petition to revive - unintentional	
1501 1,330	2501 665	Utility issue fee (or reissue)	
1502 480	2502 240	Design issue fee	
1503 640	2503 320	Plant issue fee	
1460 130	1460 130	Petitions to the Commissioner	
1807 50	1807 50	Processing fee under 37 CFR 1.17(q)	
1806 180	1806 180	Submission of Information Disclosure Stmt	
8021 40	8021 40	Recording each patent assignment per property (times number of properties)	
1809 770	2809 385	Filing a submission after final rejection (37 CFR 1.129(a))	
1810 770	2810 385	For each additional invention to be examined (37 CFR 1.129(b))	
1801 770	2801 385	Request for Continued Examination (RCE)	
1802 900	1802 900	Request for expedited examination of a design application	
Other fee (specify) <u>Terminal disclaimer fee</u>			55.00

\*Reduced by Basic Filing Fee Paid

SUBTOTAL (3) (\$

## SUBMITTED BY

Name (Print/Type) DONALD J LENKSZUS

Registration No. 28,096

(Complete if applicable)

Telephone 602-463-2010

Signature

Date 06/23/2004

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Jun 23 04 05:06p

DONALD J LENKSZUS, P.C.

480-595-7695

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*Attorney Docket OPTOLUM -003*

**OFFICIAL**

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re Application of:

JOEL DRY

:

Group Art No.: 2818

Serial No.: 10/430,696

:

Filed: 05/05/2002

:

Title: LIGHT EMITTING DIODE LIGHT SOURCE

:

Commissioner of Patents

PO Box 1450

Alexandria, VA 22313-1450

**AMENDMENT**

Responsive to the Office Action dated 06/10/2004, please amend the above-identified application as follows:

## IN THE CLAIMS:

**CLAIM 1 (ORIGINAL).** A light source comprising:

an elongate thermally conductive member having an outer surface;

a plurality of light emitting diodes carried on said elongate member outer surface at least some of said light emitting diodes being disposed in a first plane and others of said light emitting diodes being disposed in a second plane not coextensive with said first plane;

said elongate thermally conductive member being configured to conduct heat away from said light emitting diodes to fluid contained by said elongate thermally conductive member;

said elongate thermally conductive member comprises one or more surface discontinuities to enhance heat dissipation; and

a fluid movement device in fluid communication with said elongate thermally conductive member to enhance movement of said fluid over at least some of said heat surface discontinuities.

**CLAIM 2 (ORIGINAL).** A light source in accordance with claim 1, wherein:

said fluid movement device comprises an electromechanical device.

**CLAIM 3 (ORIGINAL).** A light source in accordance with claim 2, wherein:

said electromechanical device comprises a fan.

**CLAIM 4 (ORIGINAL).** A light source in accordance with claim 1, wherein:

said fluid movement device comprises an electronic device.

**CLAIM 5 (ORIGINAL).** A light source in accordance with claim 1, wherein:

said fluid movement device comprises a solid state device.

**CLAIM 6 (ORIGINAL).** A light source in accordance with claim 1, wherein:

said fluid movement device comprises an piezoelectric device.

**CLAIM 7 (ORIGINAL).** A light source in accordance with claim 1, wherein:

said elongate thermally conductive member is configured to conduct heat away from said light emitting diodes to fluid proximate said elongate member outer surface.

**CLAIM 8 (ORIGINAL).** A light source in accordance with claim 7, wherein:

said fluid proximate said elongate member outer surface comprises air.

**CLAIM 9 (ORIGINAL).** A light source in accordance with claim 7, wherein:

said fluid movement device comprises an electromechanical device.

**CLAIM 10 (ORIGINAL).** A light source in accordance with claim 9, wherein:

said electromechanical device comprises a fan.

**CLAIM 11 (ORIGINAL).** A light source in accordance with claim 7, wherein:

said fluid movement device comprises an electronic device.

**CLAIM 12 (ORIGINAL).** A light source in accordance with claim 7, wherein:

said fluid movement device comprises a solid state device.

**CLAIM 13 (ORIGINAL).** A light source in accordance with claim 12, wherein:

said fluid movement device comprises an piezoelectric device.

**CLAIM 14 (ORIGINAL).** A light source in accordance with claim 1, wherein:

said fluid contained by said elongate thermally conductive member is a cooling medium other than air.

**CLAIM 15 (ORIGINAL).** A light source in accordance with claim 1, wherein:

said elongate thermally conductive member comprises a tube.

**CLAIM 16 (ORIGINAL).** A light source in accordance with claim 15, wherein:

said tube has a cross-section in the shape of a polygon.

**CLAIM 17 (ORIGINAL).** A light source in accordance with claim 6, wherein:

said tube has a cross-section having flat portions.

**CLAIM 18 (ORIGINAL).** A light source in accordance with claim 1, wherein:

said elongate thermally conductive member comprises a channel.

**CLAIM 19 (ORIGINAL).** A light source in accordance with claim 18, wherein:  
said elongate thermally conductive member comprises an extrusion.

**CLAIM 20 (ORIGINAL).** A light source in accordance with claim 18, wherein:  
said extrusion is an aluminum extrusion.

**CLAIM 21 (ORIGINAL).** A light source in accordance with claim 1, wherein:  
each of said light emitting diodes emits white light.

**CLAIM 22 (ORIGINAL).** A light source in accordance with claim 1, wherein:  
at least some of said light emitting diodes emit colored light.

**CLAIM 23 (ORIGINAL).** A light source comprising:  
an elongate thermally conductive member having an outer surface;  
a plurality of light emitting diodes carried on said elongate member outer surface  
at least some of said light emitting diodes being disposed in a first plane and others of  
said light emitting diodes being disposed in a second plane not coextensive with said first  
plane;

said elongate thermally conductive member being configured to conduct heat  
away from said light emitting diodes to fluid contained by said elongate thermally  
conductive member; and

a cooling apparatus coupled to said elongate thermally conductive member to  
enhance cooling of said plurality of light emitting diodes.

**CLAIM 24 (ORIGINAL).** A light source in accordance with claim 23, wherein:  
said cooling device comprises a solid state cooling device.

**CLAIM 25 (ORIGINAL).** A light source in accordance with claim 23 wherein:  
said cooling device comprises a Peltier device.

**CLAIM 26 (ORIGINAL).** A light source in accordance with claim 23 wherein:  
said cooling device comprises a Piezoelectric device.

**CLAIM 27 (ORIGINAL).** A light source comprising:  
an elongate thermally conductive member having an outer surface;  
at least one light emitting diode carried on said elongate member outer surface;  
said elongate thermally conductive member being configured to conduct heat  
away from said at least one light emitting diode; and  
a cooling apparatus coupled to said elongate thermally conductive member to  
enhance cooling of said at least one light emitting diode.

**CLAIM 28 (ORIGINAL).** A light source in accordance with claim 27, wherein:  
said cooling device comprises a solid state cooling device.

**CLAIM 29 (ORIGINAL).** A light source in accordance with claim 27 wherein:  
said cooling device comprises a Peltier device.



**CLAIM 30 (ORIGINAL).** A light source in accordance with claim 27 wherein:  
said cooling device comprises a Piezoelectric device.

**CLAIM 31 (CURRENTLY AMENDED).** A light source comprising:  
an elongate thermally conductive member having an outer surface;  
at least one light emitting ~~diodes~~ diode carried on said elongate member outer surface;  
one or more electrical conductors carried by said elongate thermally conductive member and connected to said at least one light emitting ~~diodes~~ diode to supply electrical power thereto;  
said elongate thermally conductive member being configured to conduct heat away from said at least one light emitting diode to fluid contained by said elongate thermally conductive member; and  
a fluid moving device in fluid communication with said elongate thermally conductive member to move said fluid.

**CLAIM 32 (CURRENTLY AMENDED).** A light source comprising:  
an elongate thermally conductive member having an outer surface;  
a plurality of light emitting diodes carried on said elongate member outer surface  
at least some of said light emitting diodes being disposed in a first plane and others of said light emitting diodes being disposed in a second plane not coextensive with said first plane;

electrical conductors carried by said elongate thermally conductive member and connected to said plurality of light emitting diodes to supply electrical power thereto; and

said elongate thermally conductive member being configured to conduct heat away from said light emitting diodes to fluid contained by said elongate thermally conductive member;

a fluid moving device in fluid communication with said elongate thermally conductive member to move said fluid; and

a coating carried on said elongate thermally conductive member.

**CLAIM 33 (ORIGINAL).** A light source in accordance with claim 32, wherein:

said coating is infused with optically reflective material.

**REMARKS**

Claims 1-33 are in the application as filed.

Claims 1-33 stand rejected under the judicially created doctrine of obviousness-type double patenting over U.S. Patent 6,573,536.

The Examiner's basis for the rejection is that the claims in the present invention are a "similar version" of the claimed invention in claims 1-23 of the '536 patent

A terminal disclaimer is filed herewith thereby removing the basis for the obviousness type double patenting rejection.

Claims 32 and 33 additionally stand provisionally rejected under 35 USC 101 as claiming the same invention as that of claims 22-23 of copending Application No. 10/430,732.

By the foregoing amendment claim 32 has been amended to include "a fluid moving device in fluid communication with said elongate thermally conductive member to move said fluid". No new matter has been added by this amendment.

The claims of the copending application do not have such a limitation.

Since claim 33 depends from claim 32, the amendment removes the 35USC 101 double patenting rejection of claims 32 and 33.

Claim 31 has been amended to correct minor errors.

It is believed that the claims in the application are now in condition for allowance. Reexamination and reconsideration are requested. It is also requested that the claims be allowed and this application be passed to issue. An early notice of allowance would be appreciated.

Respectfully submitted,



Donald J. Lenkszus  
Reg No 28,096

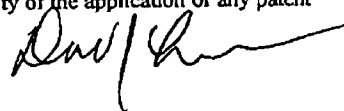
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DONALD J. LENKSZUS, REG. NO. 28,096



**TERMINAL DISCLAIMER TO OBTAIN A DOUBLE PATENTING  
REJECTION OVER A PRIOR PATENT**Docket Number (Optional)  
OPTOLUM-003

In re Application of: JOEL DRY

Application No.: 10/430,696

Filed: 05/05/2003

For: LIGHT EMITTING DIODE LIGHT SOURCE

The owner\*, OPTOLUM, INC., of 100 percent interest in the instant application hereby disclaims, except as provided below, the terminal part of the statutory term of any patent granted on the instant application, which would extend beyond the expiration date of the full statutory term defined in 35 U.S.C. 154 and 173, as presently shortened by any terminal disclaimer, of prior Patent No. 6,573,536. The owner hereby agrees that any patent so granted on the instant application shall be enforceable only for and during such period that it and the prior patent are commonly owned. This agreement runs with any patent granted on the instant application and is binding upon the grantee, its successors or assigns.

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2. ☒ The undersigned is an attorney or agent of record.

Signature

Date

06/25/2004 EFLORES 00000109 10430695

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DONALD J. LENKSZUS

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602-463-2010

Telephone Number

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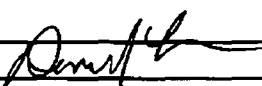
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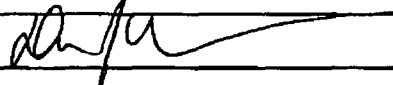
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<b>TRANSMITTAL FORM</b>  (to be used for all correspondence after initial filing)	Application Number	10/430,696	
	Filing Date	05/05/2002	
	First Named Inventor	JOEL DRY	
	Art Unit	2818	
	Examiner Name	TU TU HO	
Total Number of Pages in This Submission	2	Attorney Docket Number	OPTOLUM-003

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Signature	
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**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re Application of:

JOEL DRY

:

Group Art No.: 2818

Serial No.: 10/430,696

:

Filed: 05/05/2002

:

Title: LIGHT EMITTING DIODE LIGHT SOURCE

Commissioner of Patents and Trademarks

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**STATUS REQUEST**

Please advise me as to the status of the above-identified application.

I am attorney of record in the application.

DONALD J. LENKSZUS, P.C.

Dated: December 1, 2004

By: 

DONALD J. LENKSZUS, Reg. No.28,096

P. O. BOX 3064

CAREFREE, AZ 85377

Tel: 602-463-2010

Fax 480-575-1321.

0282 2003 1 1 \*

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1. Quelle  
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12-1-1964

{ 3 H<sub>2</sub> → 2 OH { 90 41H }



**PATENT APPLICATION FEE DETERMINATION RECORD**  
Effective January 1, 2003

Application or Docket Number

10430696

**CLAIMS AS FILED - PART I**

	(Column 1)	(Column 2)
TOTAL CLAIMS	33	
FOR	NUMBER FILED	NUMBER EXTRA
TOTAL CHARGEABLE CLAIMS	33 minus 20 = *	13
INDEPENDENT CLAIMS	5 minus 3 = *	2
MULTIPLE DEPENDENT CLAIM PRESENT <input type="checkbox"/>		

\* If the difference in column 1 is less than zero, enter "0" in column 2

**CLAIMS AS AMENDED - PART II**

	(Column 1)	(Column 2)	(Column 3)
AMENDMENT A	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA
Total	* 33	Minus ** 33	= -
Independent	* 5	Minus *** 3	= -
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM <input type="checkbox"/>			

	(Column 1)	(Column 2)	(Column 3)
AMENDMENT B	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA
Total	*	Minus **	=
Independent	*	Minus ***	=
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM <input type="checkbox"/>			

	(Column 1)	(Column 2)	(Column 3)
AMENDMENT C	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA
Total	*	Minus **	=
Independent	*	Minus ***	=
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM <input type="checkbox"/>			

- \* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
  - \*\* If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20."
  - \*\*\* If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3."
- The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

SMALL ENTITY TYPE ☐

RATE	FEE
BASIC FEE	375.00
X\$ 9=	
X42=	
+140=	
TOTAL	

OR OTHER THAN SMALL ENTITY

RATE	FEE
BASIC FEE	750.00
X\$18=	
X84=	
+280=	
TOTAL	

SMALL ENTITY

RATE	ADDITIONAL FEE
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OR OTHER THAN SMALL ENTITY

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X84=	
+280=	
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+280=	
TOTAL ADDIT. FEE	

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+140=	
TOTAL ADDIT. FEE	

RATE	ADDITIONAL FEE
X\$18=	
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+280=	
TOTAL ADDIT. FEE	

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# Index of Claims



Application No.

10/430,696

Examiner

Tu-Tu Ho

Applicant(s)

DRY, JOEL M.

Art Unit

2818

✓	Reject d
=	Allowed

-	(Through num ral) Cancell d
+	Restricted

N	Non-Elected
I	Interference


A	App al
O	Objected

Claim		Date	
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143	144		
145	146		
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<b>Application Number</b> 	<b>Application No.</b> 10/430,696	<b>Applicant(s)</b> DRY, JOEL M.	

<b>TERMINAL DISCLAIMER</b> filed 6/23/04 has been:	<input checked="" type="checkbox"/> <b>APPROVED</b>	<input type="checkbox"/> <b>DISAPPROVED</b>
<b>Document Code - DISQ</b>	<b>This patent is subject to a Terminal Disclaimer</b>	
<b>INTERNAL DOCUMENT – DO NOT MAIL</b>		

U.S. Patent and Trademark Office

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/430,696	05/05/2003	Joel M. Dry	OPTOLUM-003	3639
7590 02/17/2005 DONALD J LENKSZUS PO BOX 3064 CAREFREE, AZ 85377-3064			EXAMINER HO, TU TU V	
			ART UNIT 2818	PAPER NUMBER
DATE MAILED: 02/17/2005				

Please find below and/or attached an Office communication concerning this application or proceeding.

CT

**Office Action Summary**

Application No.

10/430,696

Applicant(s)

DRY, JOEL M.

Examiner

Tu-Tu Ho

Art Unit

2818

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 23 June 2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-33 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-13 and 15-33 is/are rejected.
- 7) ☒ Claim(s) 14 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05/05/2003 and 08/26/2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |                                                                                                                        |                                                                                         |
|------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                            | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____                                                |

## DETAILED ACTION

### *Drawings*

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the **“piezoelectric device” of claims 6, 13, 26, and 30, the “Peltier device” of claims 25 and 29, and the “cooling medium other than air” of claim 14** must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as “amended.” If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled “Replacement Sheet” in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

*Claim Objections*

2. **Claim 17** is objected to because of the following informalities:

Claim 17 recites:

“A light source in accordance with claim 6, wherein: said tube”  
which should be

“A light source in accordance with claim 15, wherein: said tube”

because only claim 15 provides proper antecedent basis for “said tube”

Appropriate correction is required.

*Claim Rejections*

3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

*Claim Rejections - 35 USC § 102 or 103*

4. **Claims 23, 27, and 31** are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Zhang U.S. Patent 6,715,900 (the ‘900 patent).

The ‘900 patent discloses in the figures, particularly Fig. 1, and respective portions of the specification a device as claimed or substantially as claimed.

Referring to **claim 27**, the ‘900 patent discloses a light source comprising:

an elongate thermally conductive member (“supporting frame” 21, made of a good heat conduction material and is hollow, column 3, lines 38-50) having an outer surface (“peripheral surface” 213, column 3, lines 30-32);

at least one light emitting device (“high efficiency solid-state light source”, column 1, lines 4-10, or “luminary element” 222, column 3, lines 30-35) carried on said elongate member outer surface (best seen in Figs. 2 and 4);

said elongate thermally conductive member being configured to conduct heat away from said at least one light emitting diode; and

a cooling apparatus (30, column 5, lines 1-10) coupled to said elongate thermally conductive member to enhance cooling of said at least one light emitting device.

However, the reference, in the detailed description and in the claims, does not explicitly disclose that the light emitting device is a light emitting diode. Nevertheless, the reference appears to disclose and claim the at least one light emitting device as a light emitting diode because it disclose so in the “Description of Related Arts” section. Furthermore, the symbol depicted in Fig. 5 is that for a light emitting diode. On the one hand, if one subscribes to the notion that generally features disclosed in the “Description of Related Arts” section are carried over to the detailed description – unless the features are something that the inventor in question is trying to change or improve – then the claim is anticipated by the reference. On the other hand, it would have been obvious to one of ordinary skill in the art at the time the invention was made to change from light emitting device to light emitting diode with easy because light emitting diodes offer advantage such as lower power consumption and instant light emission



Art Unit: 2818

(column 1, lines 14-20). For ease of explanation, the reference's light emitting device is referred to as light emitting diode hereinafter.

Referring to **claims 23 and 31**, the reference further disclose that the light emitting diode comprises a plurality of light emitting diodes (Figs. 1 and 5) and that the reference's cooling apparatus 30 is the same as a "fluid moving device" as claimed, but fails to explicitly teach that said elongate thermally conductive member 21 contains fluid so that the "fluid moving device in fluid communication with said elongate thermally conductive member to move said fluid". Nevertheless, the reference discloses that said elongate thermally conductive member 21 could be an elongate hallow member (column 3, lines 42-47). As such, the elongate hallow thermally conductive member must contain a fluid (air) since the reference fails to disclose that the elongate hallow thermally conductive member is devoid of air (i.e., the reference fails to disclose efforts to remove the naturally occurring air in the elongate hallow thermally conductive member). Since the fluid (air) is naturally present in this embodiment, this embodiment discloses or appears to disclose that the fluid moving device is in fluid communication with said elongate thermally conductive member to move said fluid.

### ***Claim Rejections - 35 USC § 103***

**5. Claims 1, 15-17, and 18-22** are rejected under 35 U.S.C. 103(a) as being unpatentable over the '900 patent for being obvious.

Referring to **claim 1**, the '900 patent discloses a light source as claimed or substantially as claimed and as detailed above for claims 23, 27, and 31-32, but fails to disclose surface discontinuities in the elongated thermally conductive member 21 to enhance heat dissipation and

Art Unit: 2818

a fluid movement device. However, the reference's device having an elongated thermally conductive member 21/30 and the fluid movement device 30, when the portion 21 of the elongated thermally conductive member 21/30 is hollow (as detailed above), is functionally indistinguishable from the claim. To be specific, the reference discloses a light source comprising:

- an elongate thermally conductive member (21/30) having an outer surface;

- a plurality of light emitting diodes carried on said elongate member outer surface at least some of said light emitting diodes being disposed in a first plane and others of said light emitting diodes being disposed in a second plane not coextensive with said first plane;

- said (hollow) elongate thermally conductive member being configured to conduct heat away from said light emitting diodes to fluid contained by said elongate thermally conductive member;

- said elongate thermally conductive member comprises one or more surface discontinuities (defined by fins 33) to enhance heat dissipation; and

- a portion (30) of the elongate thermally conductive member (21/30) functioning as a fluid movement device in fluid communication with said elongate thermally conductive member (21/30) to enhance movement of said fluid over at least some of said heat surface discontinuities.

Since the disclosed device is functionally indistinguishable from the claimed device, the claimed device is not patentable.

Referring to **claims 15 and 17**, the reference further discloses that said elongate thermally conductive member comprises a tube (hollow portion 21) and that said tube inherently has a cross-section having flat portions. Referring to **claim 16**, although the reference does not

Art Unit: 2818

disclose that the tube could be a polygon, the change to the specific shape would not result in an unexpected outcome to the operation of the device and therefore would have been obvious to one of ordinary skill in the art at the time the invention was made.

Referring to **claims 18 and 19**, the reference further discloses that said elongate thermally conductive member (21/30) comprises a channel (defined by blades 33) and that said elongate thermally conductive member comprises an extrusion (blade 33).

Referring to **claim 20**, although the reference fails to disclose aluminum as a material for extrusion 33, the reference teaches that the portion 30 of the elongate thermally conductive member (21/30) is made of a material having good heat conductivity (column 5, lines 10-14), and since aluminum is known to be a good heat conductivity, the use of good heat conductivity aluminum for extrusion 33 would have been obvious to one of ordinary skill in the art at the time the invention was made.

Referring to **claims 21 and 22**, the reference further discloses that light emitting diodes could generate various colors including white (column 1, lines 40-45).

**6. Claims 1-3, 7-10** are rejected under 35 U.S.C. 103(a) as being unpatentable over the '900 patent for being obvious in view of common knowledge or in view of Konagaya U.S. Patent Application Publication No. 20020056804 (the '804 publication).

Claim 1 is unpatentable over the '900 patent as detailed above including the fluid movement device 30. Alternately, the '900 patent's light source does not comprise a fluid movement device. In other words, the reference discloses a light source comprising:

an elongate thermally conductive member (21/30) having an outer surface; (and)

Art Unit: 2818

a plurality of light emitting diodes carried on said elongate member outer surface at least some of said light emitting diodes being disposed in a first plane and others of said light emitting diodes being disposed in a second plane not coextensive with said first plane;

said (hollow) elongate thermally conductive member being configured to conduct heat away from said light emitting diodes to fluid contained by said elongate thermally conductive member; and

said elongate thermally conductive member (21/30) comprises one or more surface discontinuities (defined by fins 33) to enhance heat dissipation.

However, the reference fails to disclose a “a fluid movement device in fluid communication with said elongate thermally conductive member to enhance movement of said fluid over at least some of said heat surface discontinuities”, which fluid movement device is an electromechanical fan.

Nevertheless, at the time the invention was made, the use of an electromechanical fan to remove heat, specifically heat from a light source, is known; therefore the use of an electromechanical fan to remove heat from the light source would have been obvious to one of ordinary skill in the art and would not be patentable. See, for example, the ‘804 publication, paragraphs [0008] and [0009], for such a usage.

7. **Claims 1, 4-6, 7, 11-13, 23-24, 26, 27-28, and 30** are rejected under 35 U.S.C. 103(a) as being unpatentable over the ‘900 patent in view of Losinski U.S. Patent 5,861,703 (the ‘703 patent).

Claims 1, 23, and 27 are unpatentable over the '900 patent as detailed above including the fluid movement device 30 or the cooling apparatus 30. Alternately, the '900 patent's light source does not comprise a fluid movement device or a cooling apparatus. In other words, the reference discloses a light source comprising:

- an elongate thermally conductive member (21 or 21/30) having an outer surface; (and)
- a plurality of light emitting diodes carried on said elongate member outer surface at least some of said light emitting diodes being disposed in a first plane and others of said light emitting diodes being disposed in a second plane not coextensive with said first plane;

- said (hollow) elongate thermally conductive member being configured to conduct heat away from said light emitting diodes to fluid contained by said elongate thermally conductive member; and

- said elongate thermally conductive member (21/30) comprises one or more surface discontinuities (defined by fins 33) to enhance heat dissipation.

However, the reference fails to disclose a "a fluid movement device in fluid communication with said elongate thermally conductive member to enhance movement of said fluid over at least some of said heat surface discontinuities" or fails to disclose a cooling apparatus so as to be coupled to said elongate thermally conductive member to enhance cooling of said light emitting diodes, which fluid movement device or which cooling apparatus is an electronic solid-state piezoelectric device.

Nevertheless, at the time the invention was made, the use of an electronic solid-state piezoelectric device to remove heat, specifically heat from a light source, is known; therefore the use of an electronic solid-state piezoelectric device to remove heat from the light source would

Art Unit: 2818

have been obvious to one of ordinary skill in the art and would not be patentable. See, for example, the '703 patent, column 1, lines 23-29, for such a usage.

8. **Claims 23-25 and 27-29** are rejected under 35 U.S.C. 103(a) as being unpatentable over the '900 patent in view of the '804 publication.

Claims 23 and 27 are unpatentable over the '900 patent as detailed above including the cooling apparatus 30. Alternately, the '900 patent's light source does not comprise a cooling apparatus. In other words, the reference discloses a light source comprising:

an elongate thermally conductive member (21) having an outer surface; (and)

a plurality of light emitting diodes carried on said elongate member outer surface at least some of said light emitting diodes being disposed in a first plane and others of said light emitting diodes being disposed in a second plane not coextensive with said first plane;

said (hollow) elongate thermally conductive member being configured to conduct heat away from said light emitting diodes to fluid contained by said elongate thermally conductive member.

However, the reference fails to disclose a cooling apparatus so as to be coupled to said elongate thermally conductive member to enhance cooling of said light emitting diodes, said cooling apparatus is an electronic solid-state Peltier device.

Nevertheless, at the time the invention was made, the use of an electronic solid-state Peltier device to remove heat, specifically heat from a light source, is known; therefore the use of an electronic solid-state Peltier device to remove heat from the light source would have been

Art Unit: 2818

obvious to one of ordinary skill in the art and would not be patentable. See, for example, the '804 publication, paragraphs [0008] and [0009], for such a usage.

9. **Claims 32-33** are rejected under 35 U.S.C. 103(a) as being unpatentable over the '900 patent in view of Wu U.S. Patent 5,949,347 (the '347 patent).

Similarly as detailed above for claims 23, 27, and 31, the '900 patent discloses a light source as claimed including the elongate thermally conductive member (or LED carrier 21/30), but fails to disclose a coating carried on said elongate thermally conductive member or LED carrier as claimed.

Wu, in disclosing a light source, teaches that an LED carrier coated with a reflective material results in a light source with an even illumination (column 4, lines 15-21). Therefore, it would have been obvious to one of ordinary skill in the art the time the invention was made to form the reference's light carrier 21 of the elongate thermally conductive member/ light carrier 21/30 so that it has a coating of a reflective material so as to result in a light source with an even illumination.

#### *Allowable Subject Matter*

10. Claim 14 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is an examiner's statement of reasons for the indication of allowable subject matter: The cited art, whether taken singularly or in combination, especially when all

Art Unit: 2818

limitations are considered within the claimed specific combination, fails to teach or render obvious a light source having all limitations as recited in claims 1 and 14, characterized in that the elongated thermally conductive member comprises surface discontinuities and the fluid contained by said elongate thermally conductive member is a cooling medium other than air.

### *Conclusion*

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tu-Tu Ho whose telephone number is (571) 272-1778. The examiner can normally be reached on 6:30 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, DAVID NELMS can be reached on (571) 272-1787. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9306 for regular communications and (703) 872-9306 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-1782.



Tu-Tu Ho  
February 16, 2005



<b>Notice of References Cited</b>	Application/Control No. 10/430,696	Applicant(s)/Patent Under Reexamination DRY, JOEL M.	
	Examiner Tu-Tu Ho	Art Unit 2818	Page 1 of 1

#### U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
	A	US-5,861,703	01-1999	Losinski, Armand	310/330
	B	US-5,949,347	09-1999	Wu, Chen H.	340/815.45
	C	US-6,715,900	04-2004	Zhang, Long Bao	362/294
	D	US-2002/0056804	05-2002	Konagaya, Tatsuya	250/208.1
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

#### FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

#### NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

\*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)  
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

[illegible]

Tu-Tu Ho

2818

[illegible]

INTERFERENCE SEARCHED			
Class	Subclass	Date	Examiner

[illegible]

# Index of Claims



Application No.

10/430,696

Examiner

Tu-Tu Ho

Applicant(s)

DRY, JOEL M.

Art Unit

2818

✓	Rejected
=	Allowed

-	(Through numeral) Cancelled
+	Restricted

N	Non-Elected
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A	Appraised
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Claim	Date
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**MAY 17 2005**

*Attorney Docket OPTOLUAI-003*

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re Application of:

JOEL DRY

Group Art No.: 2818

Serial No. 10/430,696

Filed: 05/05/2002

Title: LIGHT EMITTING DIODE LIGHT SOURCE

Commissioner of Patents

PO Box 1450

Alexandria, VA 22313-1450

**AMENDMENT**

Responsive to the Office Action dated 02/17/2005, please amend the above-identified application as follows:

Serial No. 10/430,696

IN THE CLAIMS:

**CLAIM 1 (ORIGINAL).** A light source comprising:

an elongate thermally conductive member having an outer surface;

a plurality of light emitting diodes carried on said elongate member outer surface  
at least some of said light emitting diodes being disposed in a first plane and others of  
said light emitting diodes being disposed in a second plane not coextensive with said first  
plane;

said elongate thermally conductive member being configured to conduct heat  
away from said light emitting diodes to fluid contained by said elongate thermally  
conductive member;

said elongate thermally conductive member comprises one or more surface  
discontinuities to enhance heat dissipation; and

a fluid movement device in fluid communication with said elongate thermally  
conductive member to enhance movement of said fluid over at least some of said heat  
surface discontinuities.

**CLAIM 2 (ORIGINAL).** A light source in accordance with claim 1, wherein:

said fluid movement device comprises an electromechanical device.

**CLAIM 3 (ORIGINAL).** A light source in accordance with claim 2, wherein:

said electromechanical device comprises a fan.

Serial No. 10/430,696

**CLAIM 4 (ORIGINAL).** A light source in accordance with claim 1, wherein:

said fluid movement device comprises an electronic device.

**CLAIM 5 (ORIGINAL).** A light source in accordance with claim 1, wherein:

said fluid movement device comprises a solid state device.

**CLAIM 6 (ORIGINAL).** A light source in accordance with claim 1, wherein:

said fluid movement device comprises an piezoelectric device.

**CLAIM 7 (ORIGINAL).** A light source in accordance with claim 1, wherein:

said elongate thermally conductive member is configured to conduct heat away from said light emitting diodes to fluid proximate said elongate member outer surface.

**CLAIM 8 (ORIGINAL).** A light source in accordance with claim 7, wherein:

said fluid proximate said elongate member outer surface comprises air.

**CLAIM 9 (ORIGINAL).** A light source in accordance with claim 7, wherein:

said fluid movement device comprises an electromechanical device.

**CLAIM 10 (ORIGINAL).** A light source in accordance with claim 9, wherein:

said electromechanical device comprises a fan.

**CLAIM 11 (ORIGINAL).** A light source in accordance with claim 7, wherein:

Serial No. 10/430,696

said fluid movement device comprises an electronic device.

**CLAIM 12 (ORIGINAL).** A light source in accordance with claim 7, wherein:

said fluid movement device comprises a solid state device.

**CLAIM 13 (ORIGINAL).** A light source in accordance with claim 12, wherein:

said fluid movement device comprises an piezoelectric device.

**CLAIM 14 (ORIGINAL).** A light source in accordance with claim 1, wherein:

said fluid contained by said elongate thermally conductive member is a cooling medium other than air.

**CLAIM 15 (ORIGINAL).** A light source in accordance with claim 1, wherein:

said elongate thermally conductive member comprises a tube.

**CLAIM 16 (ORIGINAL).** A light source in accordance with claim 15, wherein:

said tube has a cross-section in the shape of a polygon.

**CLAIM 17 (CURRENTLY AMENDED).** A light source in accordance with claim

[[6]]15, wherein:

said tube has a cross-section having flat portions.

**CLAIM 18 (ORIGINAL).** A light source in accordance with claim 1, wherein:

Serial No. 10/430,696

said elongate thermally conductive member comprises a channel.

**CLAIM 19 (ORIGINAL).** A light source in accordance with claim 18, wherein:

said elongate thermally conductive member comprises an extrusion.

**CLAIM 20 (ORIGINAL).** A light source in accordance with claim 18, wherein:

said extrusion is an aluminum extrusion.

**CLAIM 21 (ORIGINAL).** A light source in accordance with claim 1, wherein:

each of said light emitting diodes emits white light.

**CLAIM 22 (ORIGINAL).** A light source in accordance with claim 1, wherein:

at least some of said light emitting diodes emit colored light.

**CLAIM 23 (ORIGINAL).** A light source comprising:

an elongate thermally conductive member having an outer surface;

a plurality of light emitting diodes carried on said elongate member outer surface

at least some of said light emitting diodes being disposed in a first plane and others of said light emitting diodes being disposed in a second plane not coextensive with said first plane;

said elongate thermally conductive member being configured to conduct heat away from said light emitting diodes to fluid contained by said elongate thermally conductive member; and



Serial No. 10/430,696

a cooling apparatus coupled to said elongate thermally conductive member to enhance cooling of said plurality of light emitting diodes.

**CLAIM 24 (ORIGINAL).** A light source in accordance with claim 23, wherein:  
said cooling device comprises a solid state cooling device.

**CLAIM 25 (ORIGINAL).** A light source in accordance with claim 23 wherein:  
said cooling device comprises a Peltier device.

**CLAIM 26 (ORIGINAL).** A light source in accordance with claim 23 wherein:  
said cooling device comprises a Piezoelectric device.

**CLAIM 27 (CURRENTLY AMENDED).** A light source comprising:  
an elongate thermally conductive member having an outer surface;  
at least one light emitting diode carried on said elongate member outer surface;  
said elongate thermally conductive member being configured to conduct heat away from said at least one light emitting diode; and  
~~a cooling apparatus in thermal communication with~~ coupled to said elongate thermally conductive member to enhance cooling of said at least one light emitting diode,  
said cooling apparatus being selected from one of a solid state cooling device, a Peltier cooling device, and a Piezoelectric device.

**CLAIM 28 (CANCELED).**

Serial No. 10/430,696

**CLAIM 29 (CANCELED).**

**CLAIM 30 (CANCELED).**

**CLAIM 31 (PREVIOUSLY PRESENTED).** A light source comprising:

an elongate thermally conductive member having an outer surface;

at least one light emitting diode carried on said elongate member outer surface;

one or more electrical conductors carried by said elongate thermally conductive member and connected to said at least one light emitting diode to supply electrical power thereto;

said elongate thermally conductive member being configured to conduct heat away from said at least one light emitting diode to fluid contained by said elongate thermally conductive member; and

a fluid moving device in fluid communication with said elongate thermally conductive member to move said fluid.

**CLAIM 32 (PREVIOUSLY PRESENTED).** A light source comprising:

an elongate thermally conductive member having an outer surface;

a plurality of light emitting diodes carried on said elongate member outer surface at least some of said light emitting diodes being disposed in a first plane and others of said light emitting diodes being disposed in a second plane not coextensive with said first plane;

electrical conductors carried by said elongate thermally conductive member and connected to said plurality of light emitting diodes to supply electrical power thereto; and

Serial No. 10/430,696

said elongate thermally conductive member being configured to conduct heat away from said light emitting diodes to fluid contained by said elongate thermally conductive member;

a fluid moving device in fluid communication with said elongate thermally conductive member to move said fluid; and

a coating carried on said elongate thermally conductive member.

**CLAIM 33 (ORIGINAL).** A light source in accordance with claim 32, wherein:

said coating is infused with optically reflective material.

Serial No. 10/430,696

### REMARKS

Claims 1-33 are in the application as filed.

Claims 1-13 and 15-33 stand rejected

Claim 14 stands objected to as depending from a rejected base claim, but would be allowable if rewritten in independent form including all the limitations of the base claim and any intermediate claims.

The Examiner is thanked for this indication of allowable subject matter. It is however believed, as set forth below, that all the claims in the application are allowable over the art of record.

Claim 17 stands objected to as erroneously designating the incorrect claim that is depended from.

By the foregoing amendment, claim 17 has been amended to correct the error noted by the Examiner.

The Drawings stand objected to.

In response to the objection to the drawing, the drawings have been amended to clearly label the arrows 102 as "cooling medium" and to label box 199 as a "cooling device." It is believed that so labeling the drawing elements traverses the Examiner's objection that the drawings must show a piezoelectric device, Peltier device, and a cooling medium other than air. It is believed that so labeling the drawing elements is in full compliance with 37 C.F.R. 1.83(a) since these are conventional features that are disclosed in the description and claims and their detailed illustration is not essential for a proper understanding of the invention. Accordingly the use of a graphical drawing symbol or labeled representation fully meets the requirements of 37 C.F.R. 1.83(a).

The following sections are numbered to correspond to the numbered sections in the office action.

4. Claims 23, 27, and 31 stand rejected under 35 U.S.C. 102(e) as anticipated by or in the alternative under 35 U.S.C. 103(a) as obvious over Zhang U.S. Patent 6,715,900 (the '900 patent)

Claim 27 has been amended to read, inter alia:

cooling apparatus in thermal communication with said elongate thermally conductive member to enhance cooling of said at least one light emitting diode, said cooling apparatus being selected from one of a solid state cooling device, a Peltier cooling device, and a Piezoelectric device.

Page 10 of 28

Serial No. 10/430,696

The '900 patent is absolutely silent on providing a cooling apparatus that is either a solid state cooling device or a Peltier cooling device or a Piezoelectric device.

Accordingly, claim 27 is not shown, taught or made obvious the '900 patent.

Claim 23 recites, inter alia:

"said elongate thermally conductive member being configured to conduct heat away from said light emitting diodes to fluid contained by said elongate thermally conductive member; and

a cooling apparatus coupled to said elongate thermally conductive member to enhance cooling of said plurality of light emitting diodes."

Claim 31 recites, inter alia:

"said elongate thermally conductive member being configured to conduct heat away from said at least one light emitting diode to fluid contained by said elongate thermally conductive member; and

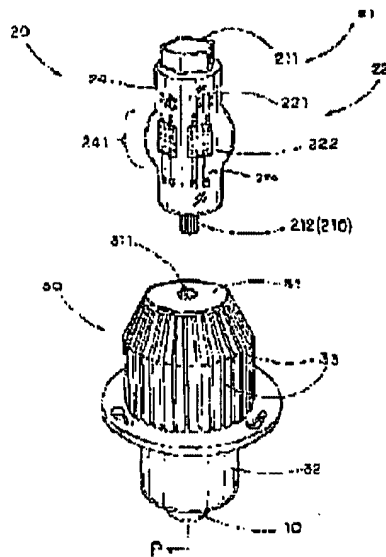
a fluid moving device in fluid communication with said elongate thermally conductive member to move said fluid."

With respect to claims 23 and 31, the Examiner states:

Referring to claims 23 and 31, the reference further disclose that the light emitting diode comprises a plurality of light emitting diodes (Figs. 1 and 5) and that the reference's cooling apparatus 30 is the same as a "fluid moving device" as claimed, but fails to explicitly teach that said elongate thermally conductive member 21 contains fluid so that the "fluid moving device in fluid communication with said elongate thermally conductive member to move said fluid".

The Examiner errs in assuming that the heat dissipating member 30 is a "fluid moving device." Heat dissipator 30 is merely a finned heat sink structure that relies upon its large heat conductive mass and fins 33 to move heat away from structure 21.

Serial No. 10/430,696



The Examiner is correct in his analysis that the '900 patent does not teach transfer of heat to fluid contained by the elongate member. On this basis alone, the '900 patent does not anticipate the novel structures of the rejected claims.

However, the Examiner then in an attempt to meet the claimed structure of applicant's claimed invention states:

Nevertheless, the reference discloses that said elongate thermally conductive member 21 could be an elongate hollow member (column 3, lines 42-47). As such, the elongate hollow thermally conductive member must contain a fluid (air) since the reference fails to disclose that the elongate hollow thermally conductive member is devoid of air (i.e., the reference fails to disclose efforts to remove the naturally occurring air in the elongate hollow thermally conductive member). Since the fluid (air) is naturally present in this embodiment, this embodiment discloses or appears to disclose that the fluid moving device is in fluid communication with said elongate thermally conductive member to move said fluid.

The Examiner's analysis ignores the plain teachings of the '900 patent. The entirety of the teaching of the disclosure of the '900 patent is directed to the transfer of heat from the LEDs to the ends of the support member 21 and from the ends of support member 21 to a massive heat sink.

Serial No. 10/430,696

Col. 2 of the '900 patent clearly indicates that the object of the invention is to provide a supporting frame to which is mounted a heat dissipating member. The supporting frame has good heat conductivity to transfer the heat to the heat dissipating member.

Another object of the present invention is to provide a light source arrangement, which comprises a heat dissipating member mounted to the supporting frame having good heat conductivity, in such a manner that the heat dissipating member can highly increase the cooling effect of the light source arrangement to vanish the heat from the light head through the supporting frame so as to prolong the service life span thereof.

This is further emphasized in the summary of the invention at Col 2 where it is stated that the objects of the invention are fulfilled by a structure described as:

a light head, comprising:  
a supporting frame having first dissipating end, an opposed second dissipating end, and a peripheral surface provided between the first and second dissipating ends; and

At Col 3, the structure is described, in part, as having a first dissipating end, a second dissipating end and a peripheral surface between the two heat dissipating ends:

The light head 20 comprises a supporting frame 21 having first dissipating end 211, an opposed second dissipating end 212, and a peripheral surface 213 provided between the first and second dissipating ends 211, 212, and a luminary unit 22 comprising a circuit board 221 provided on the peripheral

The supporting frame 21 is described as preferably being solid at col.3, but may be hollow to reduce weight:

According to the preferred embodiment, the supporting frame 21 which is made of good heat conduction material, is constructed to have an elongated solid member solidly extended from the first dissipating end 211 to the second dissipating end 212 so as to rigidly support the luminary unit 22 thereon. However, the supporting frame is adapted to be constructed as an elongated hollow member to reduce the overall weight of the light head 20. Accordingly, the sup-

At no point is there any description or suggestion that the air that may be in a hollow member serves any part of the heat dissipation or that there is any transfer of heat to the air or fluid. To the contrary, since the purpose of the supporting frame is to transfer heat

Serial No. 10/430,696

to the first and second heat dissipating ends and since the frame is of good heat conduction material, it may be fairly assumed that there is no significant heat transfer to the air.

This becomes clearly evident at col. 4 where the transfer of heat via the heat dissipating ends is further described:

Since the first and second heat dissipating ends 211, 212 of the supporting frame 21 are exposed outside without sealedly covering by the light shelter 24, the heat generated by the luminary element 222 can be effectively dissipated at the first and second heat dissipating ends 211, 212 of the supporting frame 21.

At col. 5 it is made clear that the heat dissipation is performed by a separate member, a heat dissipating member that is coupled to one of the heat dissipating ends:

According to the preferred embodiment, the light source arrangement further comprises a heat dissipating member 30 mounted to the second dissipating end 212 of the supporting frame 21 to dissipate heat generated from the light head 20. As shown in FIG. 1, the second dissipating end 212 of the supporting frame 21 is embodied as a heat sink connector 210 to securely connect with the heat dissipating member 30 so as to directly distribute the heat from the light head 20 to the heat dissipating member 30.

At col. 5, beginning at line 24, it is again made clear the heat dissipation is provided by the external heat dissipating member 30.

light head 20. Due to the structure of the heat dissipating blades 33, the contacting surface of the heat dissipating member 30 will be substantially increased to effectively dissipate the heat from the light head 20.

In fact, it is further emphasized that heat is transferred from the support structure 21 to the heat dissipater 30 at col. 5, beginning at line 29:



Serial No. 10/430,696

As shown in FIG. 1, the heat sink connector 210 having  
a cog-like cross sectional is fittedly inserted into the head  
socket 311 having the corresponding shaped so as to sub-  
stantially increase the contacting surface area between the  
light head 20 and the heat dissipating member 30 for further  
enhancing the heat transfer from the light head 20 to the heat  
dissipating member 30. Moreover, the cog-like cross sec-  
tional heat sink connector 210 is adapted to prevent an  
unwanted rotational movement of the light head 20 with  
respect to the heat dissipating member 30 when the heat sink  
connector 210 is engaged with the heat dissipating member  
30.

It is worth mentioning that when the light head 20 is

From the foregoing portions of the '900 patent, it is clear that the supporting frame serves to transfer heat from the LEDs to the end portions of the support frame 21 of light head 20. Whether the support frame is solid or hollow is not significant in the context of the invention described. The heat is not transferred from the LEDs to air or fluid contained in the supporting frame 21. The support frame 21 is utilized to conduct heat to the dissipater 30 and not to fluid or air contained in support frame 21.

As is well known in the art of heat transfer, heat will conduct via the path of least thermal resistance. Air is of higher of higher thermal resistance than metal. In the totally enclosed hollow support frame structure 21, heat is transferred to the ends of the structure for dissipation via a heat dissipater 30.

The Examiner's contention that trapped air in the totally enclosed support structure 21 provides for heat transfer from the LEDs is not supported from the description of the structures in the '900 patent. It is respectfully submitted that there can be no effective heat transfer to air that may be trapped in the small volume presented by the enclosed hollow structure that is only merely suggested in one line of this reference and is at no other place in the reference described.

Still further, it is respectfully submitted that to the extent that heat is transferred to the air in the closed supporting frame 21, that heat will be returned to the supporting frame and since, as an enclosed volume, the heat has no place to go except to be returned to the supporting frame 21 to then be dissipated by heat dissipating member 30. In that instance, the heat is not conducted away, but is stored and returned to the heat dissipating member and accordingly back to the LEDs.

In contrast to the structure that is shown and described in the '900 patent, Applicant's novel structures presents in claims 23 and 31 that:

"said elongate thermally conductive member being configured to conduct heat away ... to fluid contained by said elongate thermally conductive member"

Serial No. 10/430,696

The structure of the '900 patent does not show, teach or suggest such a structure. In fact, the '900 patent teaches away from the present invention by requiring that a separate heat dissipater be provided to conduct the heat away.

Accordingly, on this basis claims 23 and 31 are not shown, taught or made obvious by the '900 patent.

In addition, the Examiner's statement that heat dissipating member 30 is the same as a "fluid moving device" is not well founded. Heat dissipating member is merely a finned heat dissipater. Nothing in the '900 patent shows, teaches or suggests that heat dissipating member 30 is a "fluid moving device."

Still further, claim 31 recites, inter alia:

"a fluid moving device in fluid communication with said elongate thermally conductive member to move said fluid"

The Examiner has not explained how the heat dissipating member 30 is in fluid communication with the support member 21 to move fluid contained by support member 21. As pointed out above, support member 21 is either solid, in which case it does not contain fluid, or is closed at both ends thereby prohibiting heat dissipating member from being in fluid communication therewith.

On this additional basis, claim 31 is not shown, taught or made obvious by the '900 patent.

5. Claims 1, 15-17, and 18-22 stand rejected under 35 U.S.C. 103(a) as being obvious over the '900 patent.

The Examiner's basis for rejecting claim 1 is stated as:

Referring to claim 1, the '900 patent discloses a light source as claimed or substantially as claimed and as detailed above for claims 23, 27, and 31-32, but fails to disclose surface discontinuities in the elongated thermally conductive member 21 to enhance heat dissipation and a fluid movement device. However, the reference's device having an elongated thermally conductive member 21/30 and the fluid movement device 30, when the portion 21 of the elongated thermally conductive member 21/30 is hollow (as detailed above), is functionally indistinguishable from the claim.

Claim 1 recites, inter alia:

Serial No. 10/430,696

“ said elongate thermally conductive member being configured to conduct heat away from said light emitting diodes to fluid contained by said elongate thermally conductive member;

said elongate thermally conductive member comprises one or more surface discontinuities to enhance heat dissipation; and

a fluid movement device in fluid communication with said elongate thermally conductive member to enhance movement of said fluid over at least some of said heat surface discontinuities.”

The Examiner's statement is inconsistent on its face. On the one hand the Examiner states that the '900 patent “fails to disclose surface discontinuities in the elongated thermally conductive member 21 to enhance heat dissipation and a fluid movement device.”

In the very next sentence, as set forth above, the Examiner refers to heat dissipation member 30 as a “fluid movement device.”

However, as pointed out above, heat dissipation member 30 is not a fluid movement device and is not in fluid communication with the support member 21 to enhance movement of fluid over surface discontinuities.

It is also pointed out that the Examiner is inferring that he now defines the elongated thermally conductive member as being both supporting frame 21 and heat dissipator 30 and that the combination is hollow. However, heat dissipating member 30 is at no place in the '900 patent described as being hollow.

The Examiner details his analysis by stating:

Serial No. 10/430,696

To be specific, the reference discloses a light source

comprising:

an elongate thermally conductive member (21/30) having an outer surface;

a plurality of light emitting diodes carried on said elongate member outer surface at least some of said light emitting diodes being disposed in a first plane and others of said light emitting diodes being disposed in a second plane not coextensive with said first plane;

said (hollow) elongate thermally conductive member being configured to conduct heat away from said light emitting diodes to fluid contained by said elongate thermally conductive member;

said elongate thermally conductive member comprises one or more surface discontinuities (defined by fins 33) to enhance heat dissipation; and

a portion (30) of the elongate thermally conductive member (21/30) functioning as a fluid movement device in fluid communication with said elongate thermally conductive member (21/30) to enhance movement of said fluid over at least some of said heat surface discontinuities.

It is respectfully submitted that the Examiner is misconstruing the plain teachings of the '900 patent. The Examiner is reconstructing the device shown and described in the '900 patent by selectively combining elements of the device shown in the '900 patent and then redefining the structure. The Examiner has determined that the two members 21 and 30 are now "an elongate thermally conductive member." However, the Examiner without pointing to any hollow portion of heat dissipating member 30 states that the elongate thermally conductive member is 1. hollow and 2. contains fluid.

However, heat dissipating member 30 is neither hollow nor contains fluid.

The Examiner then states that the elongate conductive member (meaning the combined structure of the two separate elements, i.e., support structure 21 and heat dissipating member 30) comprises one or more surface discontinuities to enhance heat dissipation.

Then, the Examiner states that the heat dissipating member 30 is a portion of the elongate thermally conductive member which he has defined as the combined structure of support structure 21 and heat dissipating member 30 functions as a fluid movement device, that is in fluid communication with itself (21/30) to enhance movement of the fluid over at least some of the heat surface discontinuities.

Serial No. 10/430,696

It is respectfully submitted that the Examiner can not assemble parts of a device in a reference in order to meet one element of a claim and then disassemble the parts in order to meet a second element of a claim. The Examiner must take each reference for what it fairly teaches within its four corners and not use hindsight in order to reconstruct the plain teachings of a reference in order to meet structure of a claimed invention.

Claim 1 does not recite that a portion of the elongate thermally conductive member is a fluid movement device. Claim 1 recites the elongate thermally conductive member as one element and the fluid movement device as another element.

The Examiner has misread not only the '900 patent but also claim 1. Claim 1 recites, inter alia:

"said elongate thermally conductive member being configured to conduct heat away from said light emitting diodes to fluid contained by said elongate thermally conductive member" and

"a fluid movement device in fluid communication with said elongate thermally conductive member to enhance movement of said fluid over at least some of said heat surface discontinuities."

Even it is assumed, for purposes of argument, that the heat dissipating member 30 of the '900 patent is a fluid movement device, which it is not, it does not enhance movement of fluid which is contained in the structural member 21. Nor can it since structural member 21 is totally enclosed, i.e., it is closed at both ends.

Accordingly, claim 1 is not shown, taught or made obvious by the '900 patent.

Claims 15-22 all depend from claim 1 and for the same reasons set forth above that claim 1 is not shown, taught or made obvious by the '900 patent, claims 15-22 are also not shown, taught or made obvious by the '900 patent.

6. Claims 1-3 and 7-10 stand rejected under 35 U.S.C. 103(a) "as being unpatentable over the '900 patent for being obvious in view of common knowledge or in view of Konagaya U.S. Patent Application No. 20020056804 (the '804 publication).

Claim 1 recites, inter alia:

"said elongate thermally conductive member being configured to conduct heat away from said light emitting diodes to fluid contained by said elongate thermally conductive member;

said elongate thermally conductive member comprises one or more surface discontinuities to enhance heat dissipation; and

a fluid movement device in fluid communication with said elongate thermally conductive member to enhance movement of said fluid over at least some of said heat surface discontinuities."

Serial No. 10/430,696

The Examiner in making this rejection states:

Claim 1 is unpatentable over the '900 patent as detailed above including the fluid movement device 30.

As pointed out above, there is no suggestion in the '900 patent that there is any fluid movement device that "enhance(s) movement of said fluid over at least some of said heat surface discontinuities." The Examiner has not pointed to any fluid movement device that provides such functionality. The Examiner points only to the heat dissipating device 30 and mis-identifies it as a heat movement device. The Examiner fails to show how the heat dissipation device which is the only portion of the structure of the '900 patent to have fins or heat dissipating surface discontinuities also functions as a fluid moving device.

Apparently the Examiner recognizes this failure in the teachings of the '900 patent because the immediate next statement is that:

Alternately, the '900 patent's light source does not comprise a fluid movement device.

It is respectfully submitted that either the '900 reference must show, teach or suggest a fluid movement device or it must not. The Examiner's positions are inconsistent.

The correct reading of the '900 patent is that it does not comprise a fluid movement device. However, the Examiner then attempts to show obviousness by stating:

Serial No. 10/430,696

In other words, the

reference discloses a light source comprising:

an elongate thermally conductive member (21 or 21/30) having an outer surface; (and)

a plurality of light emitting diodes carried on said elongate member outer surface at least some of said light emitting diodes being disposed in a first plane and others of said light emitting diodes being disposed in a second plane not coextensive with said first plane;

said (hollow) elongate thermally conductive member being configured to conduct heat away from said light emitting diodes to fluid contained by said elongate thermally conductive member; and

said elongate thermally conductive member (21/30) comprises one or more surface discontinuities (defined by fins 33) to enhance heat dissipation.

And again, the Examiner takes inconsistent and fatally defective positions. He states that the elongate thermally conductive member is support structure 21 or is support structure 21 and heat dissipating member 30. The Examiner, in an attempt to meet the language of claim 1 states that the elongate thermally conductive member 21 or 21/30 conducts heat away from the LEDs to fluid contained by the elongate thermally conductive member 21 or 21/30.

If the elongate thermally conductive member is support structure 21, then it does not have surface discontinuities defined by fins 33 as pointed to by the Examiner.

If the elongate thermally conductive member is the combination of support structure 21 and heat dissipating member 30 it is not seen how heat dissipating member 30 which is not hollow contains fluid.

In addition, claim 1 recites that the fluid movement device: "enhance(s) movement of said fluid over at least some of said heat surface discontinuities." The antecedent for "said fluid" is "fluid contained by said elongate thermally conductive member."

It is not seen how fins 33 are contained inside support structure 21. They are not.

The Examiner correctly notes that

Serial No. 10/430,696

However, the reference fails to disclose a "a fluid movement device in fluid communication with said elongate thermally conductive member to enhance movement of said fluid over at least some of said heat surface discontinuities", which fluid movement device is an electromechanical fan.

The Examiner again fails to appreciate that the fluid movement device of claim 1 "enhance(s) movement of said fluid over at least some of said heat surface discontinuities" when he states that

Nevertheless, at the time the invention was made, the use of an electromechanical fan to remove heat, specifically heat from a light source, is known; therefore the use of an electromechanical fan to remove heat from the light source would have been obvious to one of ordinary skill in the art and would not be patentable. See, for example, the '804 publication, paragraphs [0008] and [0009], for such a usage.

It is again pointed out that the antecedent for "said fluid" is "fluid contained by said elongate thermally conductive member." Since the fluid that the Examiner relies on in the teaching of the '900 patent is totally enclosed in the support structure 21, it is not seen how any fluid movement device could enhance movement of fluid within support structure 21. It is also not seen how fins 33 on the exterior of heat dissipator 30 are in contact with fluid contained in support structure 21.

The modifications suggested by the Examiner are structurally impossible to achieve to the extent that the Examiner attempts to utilize the modifications to the structure of the '900 patent to meet the structure of claim 1.

Accordingly, claim 1 is not shown, taught or made obvious by the '900 patent in view of the "common knowledge" and/or the '804 publication.

Since claims 2, 3, and 7-10 depend from claim 1, claims 2, 3, and 7-10 are likewise not shown, taught or made obvious by the '900 patent, in view of the "common knowledge" and/or the '804 publication.

7. Claims 1, 4-6, 7, 11-13, 23-24, 26, 27-28, and 30 stand rejected under 35 U.S.C. 103(a) "as being unpatentable over the '900 patent in view of Losinski U.S. Patent 5,861,703 (the '703 patent)



Serial No. 10/430,696

The Examiner again points to several bases for rejection that are inconsistent with the teachings of the '900 patent. First the Examiner states that

Claims 1, 23, and 27 are unpatentable over the '900 patent as detailed above including the fluid movement device 30 or the cooling apparatus 30.

However, as pointed out above, the '900 patent does not show, teach or suggest a fluid movement device. In addition, to the extent that the '900 patent shows a heat dissipating member 30, such a heat dissipating member does not lead to the conclusion that the claims are unpatentable.

The Examiner's inconsistent reading of the '900 reference arises where he then states  
Alternately, the '900 patent's light

source does not comprise a fluid movement device or a cooling apparatus.

Applicant agrees that the '900 patent does not show, teach or suggest a fluid movement device. However, the heat dissipating member is a cooling apparatus.

The Examiner goes through the same analysis that he did in Section 6. by stating that  
In other words, the

reference discloses a light source comprising:

an elongate thermally conductive member (21 or 21/30) having an outer surface; (and)  
a plurality of light emitting diodes carried on said elongate member outer surface at least some of said light emitting diodes being disposed in a first plane and others of said light emitting diodes being disposed in a second plane not coextensive with said first plane;  
said (hollow) elongate thermally conductive member being configured to conduct heat away from said light emitting diodes to fluid contained by said elongate thermally conductive member; and  
said elongate thermally conductive member (21/30) comprises one or more surface discontinuities (defined by fins 33) to enhance heat dissipation.

Claim 1 recites, inter alia:

said elongate thermally conductive member being configured to conduct heat away from said light emitting diodes to fluid contained by said elongate thermally conductive member.

Serial No. 10/430,696

said elongate thermally conductive member comprises one or more surface discontinuities to enhance heat dissipation; and

a fluid movement device in fluid communication with said elongate thermally conductive member to enhance movement of said fluid over at least some of said heat surface discontinuities.

As pointed out above, nothing in the '900 patent shows, teaches or suggests such a structure. It is structurally impossible to move the air in the one suggested embodiment of the '900 patent that has hollow and totally enclosed support member 21.

The Examiner cites the '703 patent solely for teaching a piezoelectric fan. The '703 patent is silent on utilization of the piezoelectric fan for cooling a lighting device. The Examiner has not indicates how structurally the device in the '900 patent would be modified to include a piezoelectric fan.

Accordingly, Claim 1 is not shown, taught or made obvious by the '900 patent and the '703 patent taken singly or in combination.

Claims 4-6, 7, and 11-13 all depend from claim 1, and for the same reason that claim 1 is not shown, taught or made obvious by the references taken singly or in combination, claims 4-6, 7 and 11-13 are not shown, taught or made obvious.

Claim 23 recites, inter alia: "said elongate thermally conductive member being configured to conduct heat away from said light emitting diodes to fluid contained by said elongate thermally conductive member; and

a cooling apparatus coupled to said elongate thermally conductive member to enhance cooling of said plurality of light emitting diodes.

As pointed out above where portions of the '900 patent are reproduced, it is clear that the supporting frame serves to transfer heat from the LEDs to the end portions of the support frame 21 of light head 20. Whether the support frame is solid or hollow is not significant in the context of the invention described. The heat is not transferred from the LEDs to air or fluid contained in the supporting frame 21. The support frame 21 is utilized to conduct heat to the dissipater 30 and not to fluid or air contained in support frame 21.

As is well known in the art of heat transfer, heat will conduct via the path of least thermal resistance. Air is of higher of higher thermal resistance than metal. In the totally enclosed hollow support frame structure 21, heat is transferred to the ends of the structure for dissipation via a heat dissipater 30.

The contention that trapped air in the totally enclosed support structure 21 provides for heat transfer from the LEDs is not supported from the description of the structures in the '900 patent. It is respectfully submitted that there can be no effective heat transfer to air that may be trapped in the small volume presented by the enclosed hollow structure that

Serial No. 10/430,696

is only merely suggested in one line of this reference and is at no other place in the reference described.

Still further, it is respectfully submitted that to the extent that heat is transferred to the air in the closed supporting frame 21, that heat will be returned to the supporting frame and since, as an enclosed volume, the heat has no place to go except to be returned to the supporting frame 21 to then be dissipated by heat dissipating member 30. In that instance, the heat is not conducted away, but is stored and returned to the heat dissipating member and accordingly back to the LEDs.

Accordingly, claim 23 is not shown, taught or made obvious by the '900 patent and the '703 patent taken singly or in combination.

Similarly, claims 24 and 26 depend from claim 23 and for the same reasons that claim 1 is not shown, taught or made obvious by the '900 patent and the '703 patent taken singly or in combination, claims 24 and 26 are not shown, taught or made obvious by the referenced taken singly or in combination.

Claim 27 recites: A light source comprising:

an elongate thermally conductive member having an outer surface:

at least one light emitting diode carried on said elongate member outer surface:

said elongate thermally conductive member being configured to conduct heat away from said at least one light emitting diode: and

cooling apparatus in thermal communication with said elongate thermally conductive member to enhance cooling of said at least one light emitting diode, said cooling apparatus being selected from one of a solid state cooling device, a Peltier cooling device, and a Piezoelectric device.

The '900 patent is absolutely silent on providing an cooling apparatus being selected from one of a solid state cooling device, a Peltier device and a Piezoelectric device. The Examiner attempts to overcome this deficiency of the teachings of the '900 patent by pointing to the solid state piezoelectric device of the '703 patent and make the conclusionary statement that.

Nevertheless, at the time the invention was made, the use of an electronic solid-state piezoelectric device to remove heat, specifically heat from a light source, is known; therefore the use of an electronic solid-state piezoelectric device to remove heat from the light source would have been obvious to one of ordinary skill in the art and would not be patentable. See, for example, the '703 patent, column 1, lines 23-29, for such a usage.

Serial No. 10/430,696

However, the failing of the Examiner's approach is that there is no suggestion in the '900 patent or the '703 patent or anywhere else in the prior art that a cooling apparatus being selected from one of a solid state cooling device, a Peltier device and a Piezoelectric device may be used to enhance cooling of the LEDs.

The examiner's conclusionary statement finds no support in the prior art. Accordingly, claim 27 is not shown, taught or made obvious by the '900 patent taken singly or in combination with the '703 patent.

Claims 28, 29, and 30 have been cancelled and the limitations contained therein have been incorporated into claim 27.

8. Claims 23-25 and claims 27-29 stand rejected under 35 U.S.C. 103(a) "as being unpatentable over the '900 patent in view of the '804 publication."

The Examiner cites the '804 publication solely for its teaching of a Peltier device and points to paragraphs 0008 and 0009 of the reference. The Examiner has misread the '804 publication.

Paragraph 0009 states

[0009] However, in the technique disclosed in JP-A No. 7-175035, a Peltier element having a great amount of radiation heat is used to adjust the temperature of the light source. Therefore, a large-size fan is required for discharging radiation heat. As a result, there exists a problem in that an entire apparatus is made larger.

A Peltier element may be used to achieve both cooling and heating. In the teachings of the '804 publication, a Peltier element is utilized to maintain a specific temperature by heating the LED. This becomes clear when paragraph 0011 is read:

[0011] Moreover, the technique disclosed in JP-A No. 7-175035 has a problem in that, when the temperature of the light source is rapidly raised by the Peltier element, moisture condensation may be caused in the light source or members provided in the vicinity of the light source. In this case, there exist problems in that the apparatus is apt to fail, and when moisture condensation occurs in the light source, uniformity of light emitted from the light source is not maintained, thereby resulting in no high quality image data being obtained.

It is therefore apparent, that one skilled in the art would not be likely to combine a Peltier element as taught by the '804 publication with the structure of the '900 patent, since the specific use taught by the '804 publication is exact opposite of that claimed in the novel structures of claims 23-25 and 27.

Page 26 of 28

Serial No. 10/430,696

Accordingly claims 23-25 and 27 are not shown taught or made obvious by the '900 Patent and the '804 publication taken singly or in combination.

9. Claims 32-33 stand rejected under 35 U.S.C. 103(a) "as being unpatentable over the '900 patent in view of Wu U.S. Patent 5,949,347 (the '347 Patent)."

The Examiner cites Wu for teaching the use of a reflective coating.

Claim 32 recites, inter alia:

"electrical conductors carried by said elongate thermally conductive member and connected to said plurality of light emitting diodes to supply electrical power thereto; and said elongate thermally conductive member being configured to conduct heat away from said light emitting diodes to fluid contained by said elongate thermally conductive member;

a fluid moving device in fluid communication with said elongate thermally conductive member to move said fluid; and

a coating carried on said elongate thermally conductive member."

As pointed out above, the '900 patent does not show, teach or suggest a structure that conducts heat to fluid contained in an elongate thermally conductive member nor does the '900 patent show, teach or suggest a fluid moving device that moves the fluid contained by the elongate thermally conductive member.

The Examiner cites the '374 patent solely for teaching the use of a reflective coating. The '374 patent does not show, teach or suggest a structure that conducts heat to fluid contained in an elongate thermally conductive member nor does the '374 patent show, teach or suggest a fluid moving device that moves the fluid contained by the elongate thermally conductive member.

Accordingly, since neither the '900 patent or the '374 patent shows, teaches or suggests, the structure of claim 32, these two patents taken singly or in combination do not show teach or make obvious the novel structure of claim 32.

Claims 33 depends from claim 32. Since claim 32 is not shown taught or made obvious by the '900 patent and the '374 patent taken singly or in combination, claim 33 is not shown, taught or made obvious by the '900 patent taken singly or in combination with the '347 patent.

#### 10. Claim 14

The Examiner has indicated that claim 14 would be allowable if rewritten to independent format. However, as presented above, all the claims in the application are not shown, taught or made obvious by the references taken singly or in combination.

Serial No. 10/430,696

It is believed that the claims in the application are now in condition for allowance. Reexamination and reconsideration are requested. It is also requested that the claims be allowed and this application be passed to issue. An early notice of allowance would be appreciated.

Respectfully submitted,

/Donald J. Lenkszus/

Donald J. Lenkszus  
Reg No 28,096

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/Donald J Lenkszus/

DONALD J. LENKSZUS, REG. NO. 28,096

**Serial No. 10/430,696**

**IN THE DRAWING**

Please substitute the attached two drawing sheets for the corresponding two drawing sheets in the application.

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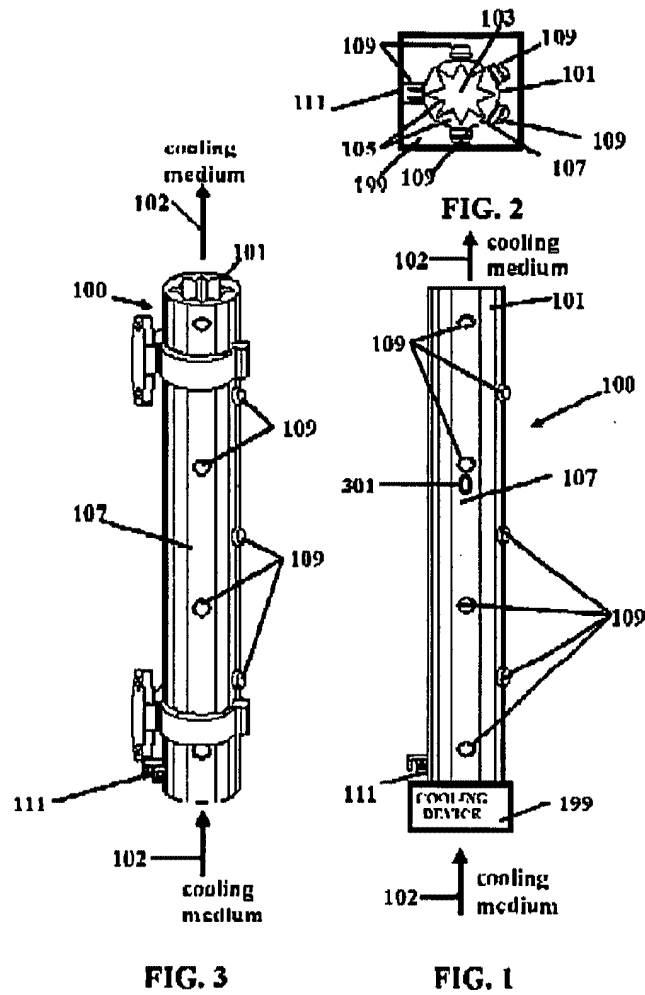
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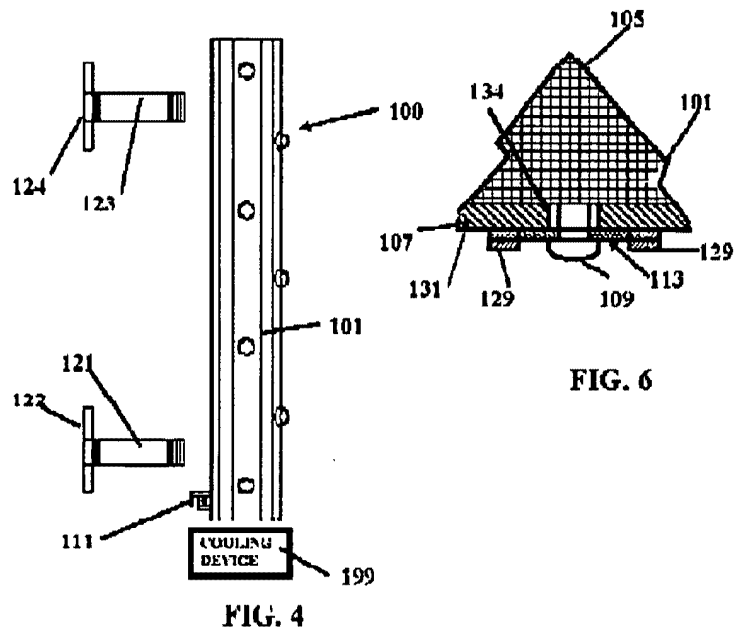
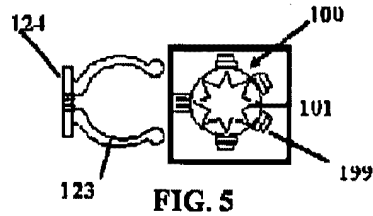
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Serial No. 10/430,696  
REPLACEMENT SHEET



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*Attorney Docket OPTOLUNA-003*

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

JOEL DRY : Group Art No.: 2818  
Serial No.: 10/430,696 : Examiner Tu Tu V Ho  
Filed: 05/05/2002 :  
Title: LIGHT EMITTING DIODE LIGHT SOURCE

Commissioner of Patents and Trademarks  
PO BOX 1450  
Alexandria, VA 22312-1450

INFORMATION DISCLOSURE STATEMENT  
UNDER 37 C.F.R. 1.97(c)(1)

Attached hereto and submitted herewith is PCT/SB/08A for consideration by the Examiner. Also enclosed is a copy of a summary of the Published Japanese application listed on the attached forms and copies of the references listed on attached PCT/SB/08A.

The references identified on PCT/SB/08A are believed to not be any more material to examination of the application than the references considered by the Examiner.

Applicant submits this information disclosure statement under 37 CFR 1.97(c)(1).

The undersigned makes the following statement:

Non item of information contained in this information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the undersigned, after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37C.F.R. 1.56(c) more than three months prior to the filing date of this information disclosure statement.

Respectfully submitted,

/Donald J Lenkszus/

Donald J. Lenkszus, Attorney for Applicant  
(Reg. No. 28,096)

PTO/SB/08A (09-03)

Approved for use through 07/31/2006. OMB 0651-0031

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Substitute for form 1449/PTO

## INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Sheet	1	of	1
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**Complete if Known**

Application Number	10/430,696
Filing Date	05/05/2002
First Named Inventor	JOEL DRY
Art Unit	2818
Examiner Name	TU TU HO
Attorney Docket Number	OPTOLUM-003

## U. S. PATENT DOCUMENTS

[illegible]

**FOREIGN PATENT DOCUMENTS**

FOREIGN PATENT DOCUMENTS						
Examiner Initials <sup>1</sup>	Cite No.	Foreign Patent Document	Publication Date	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages Or Relevant Figures Appear	T <sup>2</sup>
		Country Code <sup>3</sup> Number <sup>2</sup> Kind Code <sup>4</sup> (if known)	MM-DD-YYYY			
		JP 2002-093206	03/29/2003	HIROYUKI ET AL		

Examiner Signature		Date Considered	
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# 1/ 2

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1/2 ページ

77311-142121

## PATENT ABSTRACTS OF JAPAN

(11)Publication number : 2002-093206

(43)Date of publication of application : 28.03.2002

(51)Int.Cl.

F21S 2/00  
 F21S 8/04  
 F21V 29/00  
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 G09F 9/33  
 H01L 33/00  
 // B61L 5/12  
 G08G 1/095  
 F21Y101:02

(21)Application number : 2000-281501

(71)Applicant : STANLEY ELECTRIC CO LTD

(22)Date of filing : 18.09.2000

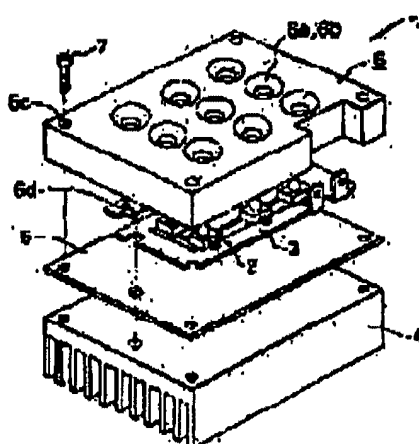
(72)Inventor : ITO HIROYUKI  
 UMEMOTO MASAKI  
 AKIMOTO MASAHIRO

## (54) LED SIGNAL LIGHT

(57)Abstract:

**PROBLEM TO BE SOLVED:** To radiate heat concentrated by miniaturizing a base in a condition where no heat conduction is dispersed, in a LED signal light adopting as a light source a LED lamp consuming large electric power with increased heat energy per piece.

**SOLUTION:** In this LED signal light 1, a base 3 to hold a LED lamp is formed as a self-sustaining structure of a metallic plate having an enough thickness to conduct heat when it is turned on, the base 3 mounted with the LED lamp 2 is placed on a radiating fin 4 through an insulating heat conductive sheet 5, and the base 3 and the insulating heat conductive sheet 5 are mounted by holding them between a pressure plate 6 of resin serving also as a reflecting mirror and the radiating fin and bringing them into pressure contact with the radiating fin by the pressure plate.



## LEGAL STATUS

[Date of request for examination] 03.08.2001

[Date of sending the examiner's decision of rejection] 14.12.2004

[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]

[Date of final disposal for application]

[Patent number]

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[Date of registration]

[Number of appeal against examiner's decision of rejection]

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<b>TRANSMITTAL FORM</b>  (to be used for all correspondence after initial filing)	Application Number	10/430,696	
	Filing Date	05/05/2002	
	First Named Inventor	JOEL DRY	
	Art Unit	2818	
	Examiner Name		
Total Number of Pages in This Submission	35	Attorney Docket Number	OPTOLUM 003

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<div style="border: 1px solid black; padding: 2px;">Remarks</div>		

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Signature	/Donald J Lenkszus/		
Printed name	DONALD J LENKSZUS		
Date	05/17/2005	Reg. No.	28.006

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**PATENT APPLICATION FEE DETERMINATION RECORD**  
Effective January 1, 2003

Application or Docket Number

10-430626

**CLAIMS AS FILED - PART I**

	(Column 1)	(Column 2)
TOTAL CLAIMS	33	
FOR	NUMBER FILED	NUMBER EXTRA
TOTAL CHARGEABLE CLAIMS	33 minus 20 =	13
INDEPENDENT CLAIMS	5 minus 3 =	2
MULTIPLE DEPENDENT CLAIM PRESENT <input type="checkbox"/>		

\* If the difference in column 1 is less than zero, enter "0" in column 2

**CLAIMS AS AMENDED - PART II**

102304

	(Column 1)	(Column 2)	(Column 3)
AMENDMENT A	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA
Total	33	33	-
Independent	5	5	-
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM <input type="checkbox"/>			

5-17-05

	(Column 1)	(Column 2)	(Column 3)
AMENDMENT B	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA
Total	30	33	-
Independent	5	5	-
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM <input type="checkbox"/>			

	(Column 1)	(Column 2)	(Column 3)
AMENDMENT C	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA
Total			
Independent			
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM <input type="checkbox"/>			

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\*\* If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20."

\*\*\* If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3."

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OR OTHER THAN SMALL ENTITY

RATE	FEE
BASIC FEE	375.00
X\$ 9=	
X42=	
+140=	
TOTAL	

RATE	FEE
BASIC FEE	750.00
X\$18=	
X84=	
+280=	
TOTAL	

SMALL ENTITY

OR OTHER THAN SMALL ENTITY

RATE	ADDI-TIONAL FEE
X\$ 9=	
X42=	
+140=	
TOTAL	

RATE	ADDI-TIONAL FEE
X\$18=	
X84=	
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TOTAL	

RATE	ADDI-TIONAL FEE
25 X\$ 9=	
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RATE	ADDI-TIONAL FEE
50 X\$18=	
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RATE	ADDI-TIONAL FEE
X\$ 9=	
X42=	
+140=	
TOTAL	

RATE	ADDI-TIONAL FEE
X\$18=	
X84=	
+280=	
TOTAL	

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# Index of Claims



Application No.

10/430,686

Examiner

Tu-Tu Ho

Applicant(s)

DRY, JOEL M.

Art Unit

2818

✓	Reject d
=	Allowed

-	(Through num ral) Cancell d
+	Restricted

N	Non-Elected
I	Interference

A	App al
O	Objected

Claim		Date		Claim		Date		Claim		Date	
Final	Original			Final	Original			Final	Original		
	1				51				101		
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	49				99				149		
	50				100				150		

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/430,696	05/05/2003	Joel M. Dry	OPTOLUM-003	3639
7590 07/20/2005 DONALD J LENKSZUS PO BOX 3064 CAREFREE, AZ 85377-3064			EXAMINER HO, TU TU V	
			ART UNIT 2818	PAPER NUMBER

DATE MAILED: 07/20/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/430,696

Applicant(s)

DRY, JOEL M.

Examiner

Tu-Tu Ho

Art Unit

2818

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**Period for Reply**

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- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 17 May 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-27 and 31-33 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☐ Claim(s) \_\_\_\_\_ is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☒ Claim(s) 1-27 and 31-33 are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

### DETAILED ACTION

1. Applicant's Amendment filed 05/17/2005 has been reviewed and placed of record in the file.

#### *Election/ Restriction*

Claims 1-27 and 31-33 are pending in this application.

2. The claims are directed to the following patently distinct species of the claimed invention:

**Species I.** Directed to a light source including an electromechanical fluid movement cooling device.

**Species II.** Directed to a light source including a solid state non-mechanical cooling apparatus.

3. Applicant is required under 35 U.S.C. 121 to elect a single disclosed species for prosecution on the merits to which the claims shall be restricted if no generic claim is finally held to be allowable. Currently, 23 is generic.

Applicant is advised that a reply to this requirement must include an identification of the species that is elected consonant with this requirement, and a listing of all claims readable thereon, including any claims subsequently added. An argument that a claim is allowable or that all claims are generic is considered nonresponsive unless accompanied by an election.

Upon the allowance of a generic claim, applicant will be entitled to consideration of claims to additional species which are written in dependent form or otherwise include all the

Art Unit: 2818

limitations of an allowed generic claim as provided by 37 CFR 1.141. If claims are added after the election, applicant must indicate which are readable upon the elected species. MPEP § 809.02(a).

Should applicant traverse on the ground that the species are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the species to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the inventions unpatentable over the prior art, the evidence or admission may be used in a rejection under 35 U.S.C. 103(a) of the other invention.

4. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art because of their recognized divergent subject matter, restriction for examination purposes as indicated is proper.

5. Applicant is advised that the response to this requirement to be complete must include an election of the invention to be examined even though the requirement be traversed (37 CFR 1.143).

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tu-Tu Ho whose telephone number is (571) 272-1778. The examiner can normally be reached on 6:30 am - 5:00 pm.

Art Unit: 2818

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, DAVID NELMS can be reached on (571) 272-1787. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Tu-Tu Ho  
July 19, 2005

# Index of Claims



Application No.

10/430,696

Examiner

Tu-Tu Ho

Applicant(s)

DRY, JOEL M.

Art Unit

2818

✓	Rejected
=	Allowed

—	(Through numeral) Cancelled
÷	Restricted

N	Non-Elected
I	Interference

A	Appeal
O	Objected

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AUG 06 2005

Approved for use through 07/31/2006, OMB 0651-0031

U.S. Patent and Trademark Office, U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

<b>TRANSMITTAL FORM</b>  (to be used for all correspondence after initial filing)	Application Number	10/430,696	
	Filing Date	05/05/2002	
	First Named Inventor	JOEL DRY	
	Art Unit	2818	
	Examiner Name		
Total Number of Pages in This Submission	4	Attorney Docket Number	OPTOLUM 003

ENCLOSURES (Check all that apply)		
<input type="checkbox"/> Fee Transmittal Form <input type="checkbox"/> Fee Attached <input checked="" type="checkbox"/> Amendment/Reply <input type="checkbox"/> After Final <input type="checkbox"/> Affidavits/declaration(s) <input type="checkbox"/> Extension of Time Request <input type="checkbox"/> Express Abandonment Request <input type="checkbox"/> Information Disclosure Statement  <input type="checkbox"/> Certified Copy of Priority Document(s) <input type="checkbox"/> Reply to Missing Parts/Incomplete Application <input type="checkbox"/> Reply to Missing Parts under 37 CFR 1.52 or 1.53	<input type="checkbox"/> Drawing(s) <input type="checkbox"/> Licensing-related Papers <input type="checkbox"/> Petition <input type="checkbox"/> Petition to Convert to a Provisional Application <input type="checkbox"/> Power of Attorney, Revocation <input type="checkbox"/> Change of Correspondence Address <input type="checkbox"/> Terminal Disclaimer <input type="checkbox"/> Request for Refund <input type="checkbox"/> CD. Number of CD(s) _____ <input type="checkbox"/> Landscape Table on CD	<input type="checkbox"/> After Allowance Communication to TC <input type="checkbox"/> Appeal Communication to Board of Appeals and Interferences <input type="checkbox"/> Appeal Communication to TC (Appeal Notice, Brief, Reply Brief) <input type="checkbox"/> Proprietary Information <input type="checkbox"/> Status Letter <input type="checkbox"/> Other Enclosure(s) (please identify below):
Remarks _____		

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT			
Firm Name	DONALD J LENKSZUS, PC		
Signature	/Donald J Lenkszus/		
Printed name	DONALD J LENKSZUS		
Date	08/08/2005	Reg. No.	28.006

CERTIFICATE OF TRANSMISSION/MAILING			
I hereby certify that this correspondence is being facsimile transmitted to the USPTO or deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on the date shown below:			
Signature	/Donald J Lenkszus/		
Typed or printed name	DONALD J LENKSZUS	Date	08/08/2005

This collection of information is required by 37 CFR 1.5. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount or time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing this form, call 1-800-PTO-9100 and select option 2.



Attorney Docket OPTOLUNA-003

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

JOEL DRY

Group Art No.: 2818

Serial No. 10/430,696

Filed: 05/05/2002

Title: LIGHT EMITTING DIODE LIGHT SOURCE

Commissioner of Patents

PO Box 1450

Alexandria, VA 22313-1450

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AUG 06 2005

RESPONSE

This is responsive to the Office Action dated 07/20/2005.

Claims 1-27 and 31-33 are in the application.

The Examiner has made an election requirement and has identified two patentably distinct species of the invention. The species that the Examiner identifies are:

Species I. directed to a light source including an electromechanical fluid movement cooling device; and

Species II. directed to a light source including a solid state non-mechanical cooling apparatus.

The Examiner has identified claim 23 as being generic.

The Examiner's restriction requirement is traversed.

The Examiner errs in identifying only claim 23 as being generic.

Claim 1, 31 and 32 are also generic in that the structures claimed are not limited to either an electromechanical fluid movement cooling device or to a solid state non-mechanical cooling apparatus.

Claim 23 recites, inter alia: "a cooling apparatus coupled to said elongate thermally conductive member to enhance cooling of said plurality of light emitting diodes."

Claim 1 recites, inter alia: "a fluid movement device in fluid communication with said elongate thermally conductive member to enhance movement of said fluid over at least some of said heat surface discontinuities."

Claim 31, recites, inter alia: "a fluid moving device in fluid communication with said elongate thermally conductive member to move said fluid."

Claim 32 recites, inter alia: "a fluid moving device in fluid communication with said elongate thermally conductive member to move said fluid."

Serial No. 10/430,696

Neither claim 1 nor claim 23 nor claim 31 nor claim 33 is limited to either "a light source including an electromechanical fluid movement cooling device" or to "a light source including a solid state non-mechanical cooling apparatus"

In addition, claims 7, 8, 14, 15, 16, 17, 18, 19, 20, 21, and 22 depend from claim 1 and are also not limited to either "a light source including an electromechanical fluid movement cooling device" or to "a light source including a solid state non-mechanical cooling apparatus."

Still further, claim 33 depends from claim 32 and is not limited to either "a light source including an electromechanical fluid movement cooling device" or to "a light source including a solid state non-mechanical cooling apparatus."

Applicant also disagrees that solid state cooling devices are inherently non-mechanical. Piezoelectric devices are both solid state cooling devices but are mechanical in that they include members that physically move.

Applicant therefore disagrees with the Examiner's characterization of species.

Applicant requests that the Examiner withdraw the restriction requirement and continue to proceed with examination of all claims in the application.

To the extent that the applicant must make a provisional election of species, Applicant provisionally elects Species II. Claims 1, 7, 8, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 31, 32 and 33 are generic and are included in Species II. In addition, claims 4, 5, 6, 11, 12, 13, 24, 25, and 26 are includable in Species II.

Species I which the Examiner identifies as being directed to electromechanical devices includes only claims 2, 3, 9, and 10.

It is believed that the claims in the application are now in condition for allowance. Reexamination and reconsideration are requested. It is also requested that the claims be allowed and this application be passed to issue. An early notice of allowance would be appreciated.

Respectfully submitted,

/Donald J. Lenkszus/

Donald J. Lenkszus  
Reg No 28,096

CERTIFICATE OF TRANSMISSION

I hereby certify that this document (and any as referred to as being attached or enclosed) is being transmitted by facsimile to the United States Patent and Trademark Office on AUGUST 6, 2005.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

/Donald J Lenkszus/

DONALD J. LENKSZUS, REG. NO. 28,096

Page 2 of 3

Serial No. 10/430,696

Page 3 of 3



# UNITED STATES PATENT AND TRADEMARK OFFICE

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United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
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Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/430,696	05/05/2003	Joel M. Dry	OPTOLUM-003	3639
7590 10/28/2005 DONALD J LENKSZUS PO BOX 3064 CAREFREE, AZ 85377-3064			EXAMINER HO, TU TU V	
			ART UNIT 2818	PAPER NUMBER

DATE MAILED: 10/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/430,696

Applicant(s)

DRY, JOEL M.

Examiner

Tu-Tu Ho

Art Unit

2818

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 1 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 06 August 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-27 and 31-33 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☐ Claim(s) \_\_\_\_\_ is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☒ Claim(s) 1-27 and 31-33 are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |                                                                                         |                                                                             |
|-----------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____                                                |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____                                                             | 6) <input type="checkbox"/> Other: _____                                    |

## DETAILED ACTION

### *Election/ Restriction*

1. Claims 1-27 and 31-33 are pending in this application.
2. Applicant's election with traverse of Species II, claims 1, 4-8, 11-27, and 31-33, in the reply filed on 08/06/2005 is acknowledged. The traversal has been considered but has been found moot because the Requirement has been withdrawn in favor of a new requirement as follows.
3. The claims are directed to the following patently distinct species of the claimed invention:
  - Species I.** Directed to a light source including at least one light emitting diode and a fluid movement device comprising a fan.
  - Species II.** Directed to a light source including at least one light emitting diode and a fluid movement device comprising a piezoelectric device.
  - Species III.** Directed to a light source including at least one light emitting diode and a fluid movement device comprising a Peltier device.
4. Applicant is required under 35 U.S.C. 121 to elect a single disclosed species for prosecution on the merits to which the claims shall be restricted if no generic claim is finally held to be allowable. Currently, claim 31 appears to be generic.

Applicant is advised that a reply to this requirement must include an identification of the species that is elected consonant with this requirement, and a listing of all claims readable thereon, including any claims subsequently added. An argument that a claim is allowable or that all claims are generic is considered nonresponsive unless accompanied by an election.

Upon the allowance of a generic claim, applicant will be entitled to consideration of claims to additional species which are written in dependent form or otherwise include all the limitations of an allowed generic claim as provided by 37 CFR 1.141. If claims are added after the election, applicant must indicate which are readable upon the elected species. MPEP § 809.02(a).

Should applicant traverse on the ground that the species are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the species to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the inventions unpatentable over the prior art, the evidence or admission may be used in a rejection under 35 U.S.C. 103(a) of the other invention.

5. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art because of their recognized divergent subject matter, restriction for examination purposes as indicated is proper.

6. Applicant is advised that the response to this requirement to be complete must include an election of the invention to be examined even though the requirement be traversed (37 CFR 1.143).

Art Unit: 2818

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tu-Tu Ho whose telephone number is (571) 272-1778. The examiner can normally be reached on 6:30 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, DAVID NELMS can be reached on (571) 272-1787. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Tu-Tu Ho  
October 22, 2005



# Index of Claims



Application No.

10/430,696

Examiner

Tu-Tu Ho

Applicant(s)

DRY, JOEL M.

Art Unit

2818

✓	Rejected
=	Allowed

—	(Through numeral) Cancelled
÷	Restricted

N	Non-Elected
I	Interference

A	Appeal
O	Objected

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JAN 26 2006

Serial No. 10/430,696

Attorney Docket OPTOLUNA-003

## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

JOEL DRY

Group Art No.: 2818

Serial No. 10/430,696

Examiner: Tu Tu V Ho

Filed: 05/05/2002

Title: LIGHT EMITTING DIODE LIGHT SOURCE

Commissioner of Patents  
PO Box 1450  
Alexandria, VA 22313-1450

## RESPONSE

**REQUEST FOR TELEPHONIC INTERVIEW**

In the event that the Examiner does not allow the claims presently in the application, Applicant specifically requests a telephonic interview with the Examiner and his supervisor to discuss the outstanding issues.

This is responsive to the Office Action dated 10/28/2005.

Claims 1-27 and 31-33 are in the application.

At the outset, **Applicant objects to the piecemeal prosecution** that the Examiner is utilizing in the present application.

A substantive Office Action applying art to all the claims in the application was followed by an Office Action imposing a first election requirement.

The first election has now been replaced with a second election.

The Examiner has made an election requirement and has identified three patentably distinct species of the invention. The species that the Examiner identifies are:

- Species I. directed to a light source including a fluid movement device comprising a fan;
- Species II. directed to a light source including a fluid movement device comprising a piezoelectric device; and
- Species III. directed to a light source including a fluid movement device comprising a Peltier device.

The Examiner has identified claim 31 as being generic without setting forth any basis why only claim 31 is generic.

The Examiner's restriction requirement is traversed.

The Examiner errs in identifying only claim 31 as being generic.

Page 1 of 3

Serial No. 10/430,696

Claims 1, 23, 27, 31 and 32 are generic in that the structures claimed are not limited to either a fan, a piezoelectric device or a Peltier device.

Claim 1 recites, inter alia: "a fluid movement device in fluid communication with said elongate thermally conductive member to enhance movement of said fluid over at least some of said heat surface discontinuities."

Claim 23 recites, inter alia: "a cooling apparatus coupled to said elongate thermally conductive member to enhance cooling of said plurality of light emitting diodes."

Claim 27 recited, inter alia: "cooling apparatus in thermal communication with said elongate thermally conductive member to enhance cooling of said at least one light emitting diode, said cooling apparatus being selected from one of a solid state cooling device, a Peltier cooling device, and a Piezoelectric device.

Claim 31, recites, inter alia: "a fluid moving device in fluid communication with said elongate thermally conductive member to move said fluid."

Claim 32 recites, inter alia: "a fluid moving device in fluid communication with said elongate thermally conductive member to move said fluid."

It is also noted that each and every claim includes "at least one light emitting diode," since a "plurality of light emitting diodes" is inclusive of "at least one light emitting diode." In other words, one can not have a "plurality" without having "at least one" even though a structure having "at least one" does not necessarily include a "plurality".

The Examiner in the first office action cited U.S. Patent 5,861,703 to Losinski as disclosing piezoelectric fans. Based upon the prior art that the Examiner has already cited and considered, it is respectfully submitted that Species I and II are not separable species.

Applicant therefore disagrees with the Examiner's characterization of species.

Applicant requests that the Examiner withdraw the restriction requirement and continue to proceed with examination of all claims in the application.

To the extent that the applicant must make a provisional election of species, Applicant provisionally elects Species I. Claims 1-24, 26, 27 and 31-33 are included in Species I. Claim 25 is includable in Species III.

Species II which the Examiner identifies as being directed to piezoelectric devices are included by in Species I as fans since as the Examiner has previously noted, the prior art shows piezoelectric fans.

The Examiner has searched the prior art, examined the claims and issued a substantive office action. Applicant has traversed all prior art rejections of the claims.

Serial No. 10/430,696

It is believed that all the claims in the application are now in condition for allowance. Reexamination and reconsideration are requested. It is also requested that the claims be allowed and this application be passed to issue. An early notice of allowance would be appreciated.

Respectfully submitted,  
/Donald J. Lenkszus/

Donald J. Lenkszus, Reg No 28,096

CERTIFICATE OF TRANSMISSION

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PTO/SB/21 (09-04)

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<b>TRANSMITTAL FORM</b>  (to be used for all correspondence after initial filing)	Application Number	10/430,898	
	Filing Date	05/05/2002	
	First Named Inventor	JOEL DRY	
	Art Unit	2818	
	Examiner Name	Tu Tu V Ho	
Total Number of Pages in This Submission	8	Attorney Docket Number	OPTOLUM 003

ENCLOSURES (Check all that apply)		
<input type="checkbox"/> Fee Transmittal Form <input type="checkbox"/> Fee Attached <input checked="" type="checkbox"/> Amendment/Reply <input type="checkbox"/> After Final <input type="checkbox"/> Affidavits/declaration(s) <input type="checkbox"/> Extension of Time Request <input type="checkbox"/> Express Abandonment Request <input type="checkbox"/> Information Disclosure Statement  <input type="checkbox"/> Certified Copy of Priority Document(s) <input type="checkbox"/> Reply to Missing Parts/Incomplete Application <input type="checkbox"/> Reply to Missing Parts under 37 CFR 1.52 or 1.53	<input type="checkbox"/> Drawing(s) <input type="checkbox"/> Licensing-related Papers <input type="checkbox"/> Petition <input type="checkbox"/> Petition to Convert to a Provisional Application <input type="checkbox"/> Power of Attorney, Revocation <input type="checkbox"/> Change of Correspondence Address <input type="checkbox"/> Terminal Disclaimer <input type="checkbox"/> Request for Refund <input type="checkbox"/> CD, Number of CD(s) _____ <input type="checkbox"/> Landscape Table on CD	<input type="checkbox"/> After Allowance Communication to TC <input type="checkbox"/> Appeal Communication to Board of Appeals and Interferences <input type="checkbox"/> Appeal Communication to TC (Appeal Notice, Brief, Reply Brief) <input type="checkbox"/> Proprietary Information <input type="checkbox"/> Status Letter <input checked="" type="checkbox"/> Other Enclosure(s) (please identify below): Petition for extension: form 2038
Remarks		

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT			
Firm Name	DONALD J LENKSZUS, PC		
Signature	/Donald J Lenkszus/		
Printed name	DONALD J LENKSZUS		
Date	01/26/2006	Reg. No.	28,008

CERTIFICATE OF TRANSMISSION/MAILING			
I hereby certify that this correspondence is being facsimile transmitted to the USPTO or deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on the date shown below:			
Signature	/Donald J Lenkszus/		
Typed or printed name	DONALD J LENKSZUS	Date	01/26/2006

This collection of information is required by 37 CFR 1.5. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount or time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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JAN 26 2006

PTO/SB/22 (12-04)

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<b>PETITION FOR EXTENSION OF TIME UNDER 37 CFR 1.138(a)</b> FY 2005 (Fee pursuant to the Consolidated Appropriations Act, 2005 (H.R. 4818).)		Docket Number (Optional) <u>OPTULUM-003</u>	
Application Number <u>10/430,656</u>		Filed <u>05/05/2003</u>	
For <u>LIGHT EMITTING DIODE LIGHT SOURCE</u>			
Art Unit <u>2818</u>		Examiner <u>TU TU V MO</u>	

This is a request under the provisions of 37 CFR 1.138(a) to extend the period for filing a reply in the above identified application.

The requested extension and fee are as follows (check time period desired and enter the appropriate fee below):

	Fee	Small Entity Fee	
<input type="checkbox"/> One month (37 CFR 1.17(a)(1))	\$120	\$60	\$
<input checked="" type="checkbox"/> Two months (37 CFR 1.17(a)(2))	\$450	\$225	\$ <u>225</u>
<input type="checkbox"/> Three months (37 CFR 1.17(a)(3))	\$1020	\$510	\$
<input type="checkbox"/> Four months (37 CFR 1.17(a)(4))	\$1590	\$795	\$
<input type="checkbox"/> Five months (37 CFR 1.17(a)(5))	\$2160	\$1080	\$

☐ Applicant claims small entity status. See 37 CFR 1.27. 01/27/2006 TL0111 00000016 10430696

☐ A check in the amount of the fee is enclosed. 01 FC:2252 225.00 OP

☐ Payment by credit card. Form PTO-2038 is attached.

☐ The Director has already been authorized to charge fees in this application to a Deposit Account.

☐ The Director is hereby authorized to charge any fees which may be required, or credit any overpayment, to Deposit Account Number \_\_\_\_\_ I have enclosed a duplicate copy of this sheet.

**WARNING:** Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

I am the ☐ applicant/inventor.

☐ assignee of record of the entire interest. See 37 CFR 3.71.  
Statement under 37 CFR 3.73(b) is enclosed (Form PTO/SB/98).

☒ attorney or agent of record. Registration Number 28,096

☐ attorney or agent under 37 CFR 1.34.  
Registration number if acting under 37 CFR 1.34 \_\_\_\_\_

[Signature] Signature 1/26/2006 Date

DONALD J. LENKSZUS Typed or printed name 602-463-2010 Telephone Number

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below.

☐ Total of \_\_\_\_\_ forms are submitted.

This collection of information is required by 37 CFR 1.138(a). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 6 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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## EAST Search History

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S124	509	S123 and S121	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/04/19 07:52
S125	3394177	(led light near emitting optoelectronic opto adj electronic oled emitting adj (device diode) (EL luminescen\$2 electroluminescen\$2 electro adj luminescen\$2) ) light	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/04/19 07:52
S126	2079958	S125.ti. S125.ab. S125.clm.	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/04/19 07:52
S127	5619433	(tub\$6 cylind\$6 elongat\$3 pip\$4)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/04/19 07:52
S128	6146066	gas air cool\$4 fluid	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/04/19 07:52
S129	254675	S125 with S127	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/04/19 07:52
S130	1457821	S128 with S127	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/04/19 07:52
S131	41538	S129 same S130	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/04/19 07:52
S132	29102	S131 and S126	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/04/19 07:52
S133	28991720	(@ad @pd)< "20020529"	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/04/19 07:52

## EAST Search History

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S13 5	395839	fan	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/04/19 07:52
S13 6	230898	S128 with S135	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/04/19 07:52
S13 7	1442	S134 and S136	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/04/19 07:52
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S14 0	509	S139 and S137	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/04/19 10:42
S14 1	7469687	surface	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/04/19 08:04
S14 2	5625195	outer mount\$4	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/04/19 08:04
S14 3	168738	S127 near3 S141 near3 S142	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/04/19 08:05



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S14 4	12	10/156810	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/04/19 08:21
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S14 6	19962	peltier	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/04/19 08:19
S14 7	226770	(piezoelectric piezo)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/04/19 08:20
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## EAST Search History

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S17 1	509	S170 and S168	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/04/19 10:51
S17 2	314009	temperature near4 (sensor sensing detector detecting)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/04/19 10:52
S17 3	3069449	controller controlling	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/04/19 10:53

## EAST Search History

S17 4	1905	S163 and S167	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/04/19 10:56
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S17 7	272	S175 and S173	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/04/19 10:57
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S18 0	685	S174 not S179	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/04/19 13:21
S18 1	45	10/230610 10/415810 10/463510 10/612913 10/644902 10/645710 10/648510 10/649704 10/650810 10/665210 10/670216 10/682277 10/704514 10/726508 10/753914 10/820415 10/867903	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/04/19 15:25
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S19 1	3	"6897486"	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/04/19 17:56
S19 2	31	("20030057573"   "20030168670"   "20030168720"   "20030193080"   "20040079957"   "20040173804"   "4267559"   "5173839"   "5785418"   "5789772"   "5841177"   "5869883"   "5959316"   "5998925"   "6238599"   "6274924"   "6307272"   "6329706"   "6335548"   "6429513"   "6444498"   "6456766"   "6457645"   "6468821"   "6492725"   "6541800"   "6559525"   "6680491"   "6707069"   "D465207"   "RE37707").PN.	US-PGPUB; USPAT; USOCR	OR	ON	2006/04/19 18:25
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S19 4	23	S193 same S169	US-PGPUB; USPAT; USOCR	OR	ON	2006/04/19 18:32

## EAST Search History

S19 5	394	S193 and S169	US-PGPUB; USPAT; USOCR	OR	ON	2006/04/19 18:32
S19 6	107	S195 and S157	US-PGPUB; USPAT; USOCR	OR	ON	2006/04/19 18:36
S19 7	97	microfan micro adj S190	US-PGPUB; USPAT; USOCR	OR	ON	2006/04/19 18:37
S19 8	2	S197 with S189	US-PGPUB; USPAT; USOCR	OR	ON	2006/04/19 18:38
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S20 3	556	S193 and S202	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/04/19 18:39
S20 4	535	S203 and S201	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/04/19 18:39
S20 5	316	S193.ab.	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/04/19 18:40
S20 6	268	S205 and S200	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/04/19 18:40

## EAST Search History

S20 7	74	S206 and S202	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/04/19 18:40
S20 8	230731	electronic adj device	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/04/19 18:41
S20 9	15	S206 and S208	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/04/19 18:43
S21 0	19962	peltier	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/04/19 18:44
S21 1	12	S210 with S189	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/04/19 19:28
S21 2	2	10/430696	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/04/19 19:32
S21 3	12	10/156810	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/04/19 19:51
S21 4	26	10/380189 10/822579 10/423140 10/299870 10/979903 10/941081 10/063924 10/721641 10/822579 09/754636 09/966140 09/781485 10/308177 10/009656	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/04/19 19:56
S21 5	3	S210 and S214	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/04/19 19:57



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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/430,696	05/05/2003	Joel M. Dry	OPTOLUM-003	3639

7590 04/27/2006

DONALD J LENKSZUS  
PO BOX 3064  
CAREFREE, AZ 85377-3064

EXAMINER

HO, TU TU V

ART UNIT PAPER NUMBER

2818

DATE MAILED: 04/27/2006

Please find below and/or attached an Office communication concerning this application or proceeding.



6.0

<b>Office Action Summary</b>	<b>Application No.</b> 10/430,696	<b>Applicant(s)</b> DRY, JOEL M.	
	<b>Examiner</b> Tu-Tu Ho	<b>Art Unit</b> 2818	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 26 January 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-27 and 31-33 is/are pending in the application.
- 4a) Of the above claim(s) 25 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-24, 26, 27 and 31-33 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 May 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |                                                                                                                                   |                                                                                         |
|-----------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                                       | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                              | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____                                                |

## **DETAILED ACTION**

### ***Request for Telephonic Interview***

1. The examiner is available for a telephonic interview in accordance with MPEP 713.01. As for the matter of allowability of the claims, the claims are allowable when a complete search and examination have been performed and it is determined that the prior art of record fails to teach or render obvious the claims.

### ***Election/ Restriction***

2. Applicant's election with traverse of Species I, claims 1-24, 26, 27, and 31-33, in the reply filed on 01/26/2006 is acknowledged. The traversal is on the ground(s) that all claims in the application should be examined. This is not found persuasive because claim-25 invention, readable on Species III, is clearly patentably distinct over the claimed inventions of Species I and II.

However, Applicant is persuasive in identifying claims 1, 23, 27, 31, and 32 as being generic and in pointing out that a piezoelectric fan (Species II) is an electromechanical fan (Species I). Accordingly, the restriction requirement between Species I and II is hereby withdrawn and claims 1-24, 26, 27, and 31-33 are present for examination in this office action.

3. Claim 25 is withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected species, there being no allowable generic or linking claim. Applicant

timely traversed the restriction (election) requirement in the reply filed on 01/26/2006, as noted above.

***Claim Rejections - 35 USC § 102***

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

**4. Claim 27** is rejected under 35 U.S.C. 102(e) as being anticipated by Jones et al. U.S. Patent Application Publication 20050055070 (the '070 reference).

The '070 reference discloses light source comprising:

an elongate thermally conductive member (generally indicated at "heat pipe" 5, Fig. 3, paragraph [0071]) having an outer surface;

at least one light emitting diode (generally indicated at array 2 of LEDs 7) carried on said elongate member outer surface;

said elongate thermally conductive member being configured to conduct heat away from said at least one light emitting diode (paragraph [0071]-[0073]); and

a cooling apparatus (4) in thermal communication with said elongate thermally conductive member to enhance cooling of said at least one light emitting diode, said cooling apparatus being a solid state cooling device.

**5. Claim 27** is rejected under 35 U.S.C. 102(e) as being anticipated by Yoneda et al. U.S. Patent 6,832,849 (the '849 reference).

The '849 reference discloses light source comprising:

an elongate thermally conductive member (generally indicated at cooling plate 9, Fig. 20, col. 22, lines 28+) having an outer surface;  
at least one light emitting diode (2) carried on said elongate member outer surface;  
said elongate thermally conductive member being configured to conduct heat away from said at least one light emitting diode (col. 22, lines 28+); and  
a cooling apparatus (10) in thermal communication with said elongate thermally conductive member to enhance cooling of said at least one light emitting diode, said cooling apparatus being a solid state cooling device.

***Claim Rejections - 35 USC § 103***

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

**6. Claims 1-4, 7-11, 15-22, 23, 31, 32, and 33** are rejected under 35 U.S.C. §103(a) as being unpatentable over Arndt et al. U.S. Patent 6,848,819 (the '819 reference) in view of knowledge in the art as evident by Pal et al. U.S. Patent 6,293,753.

The '819 reference discloses in Figs. 1 through 2B and respective portions of the specification a light source as claimed including an elongate thermally conductive member having a flowing fluid, such as air, therein but does not disclose a fluid movement device as claimed to move the flowing fluid.

Specifically,

in reference to **claim 1**, Arndt discloses a light source comprising:

an elongate thermally conductive member (tubularly shaped, cylindrical, hollow cooling member 3, Figs. 1 through 2B, col. 4, lines 42-61) having an outer surface;

a plurality of light emitting diodes (2) carried on said elongate member outer surface at least some of said light emitting diodes being disposed in a first plane and others of said light emitting diodes being disposed in a second plane not coextensive with said first plane;

said elongate thermally conductive member being configured to conduct heat away from said light emitting diodes to fluid contained by said elongate thermally conductive member (col. 4, lines 42-61); and

said elongate thermally conductive member comprising one or more surface discontinuities (cooling ribs or surface roughening, col. 4, lines 15-25) to enhance heat dissipation.

as for **claim 23**, the reference discloses, with the same reference characters, citations, and interpretations as detailed above for claim 1 where applicable, a light source comprising:

an elongate thermally conductive member having an outer surface;

a plurality of light emitting diodes carried on said elongate member outer surface at least some of said light emitting diodes being disposed in a first plane and others of said light emitting diodes being disposed in a second plane not coextensive with said first plane; and  
said elongate thermally conductive member being configured to conduct heat away from said light emitting diodes to fluid contained by said elongate thermally conductive member.

as for **claim 31**, the reference discloses, with the same reference characters, citations, and interpretations as detailed above for claim 1 where applicable, a light source comprising:

an elongate thermally conductive member having an outer surface;

at least one light emitting diode carried on said elongate member outer surface;

one or more electrical conductors (electrical conductors, not shown, col. 3, lines 1-17) carried by said elongate thermally conductive member and connected to said at least one light emitting diodes to supply electrical power thereto; and

said elongate thermally conductive member being configured to conduct heat away from said light emitting diodes to fluid contained by said elongate thermally conductive member.

and

for **claims 32-33**, the reference discloses, with the same reference characters, citations, and interpretations as detailed above for claim 1 where applicable, a light source comprising:

an elongate thermally conductive member having an outer surface;

a plurality of light emitting diodes carried on said elongate member outer surface at least some of said light emitting diodes being disposed in a first plane and others of said light emitting diodes being disposed in a second plane not coextensive with said first plane;

electrical conductors (electrical conductors, not shown, col. 3, lines 1-17) carried by said elongate thermally conductive member and connected to said plurality of light emitting diodes to supply electrical power thereto;

said elongate thermally conductive member being configured to conduct heat away from said light emitting diodes to fluid contained by said elongate thermally conductive member; and

a coating carried on said elongate thermally conductive member (“To this end, this surface is blackened and/or provided with cooling ribs and/or implemented with some other suitable surface structure or roughening”, col. 4, lines 15-25).

As noted above, the reference further discloses that said fluid, such as air, is moved in said elongate thermally conductive member. However, also as noted above, the reference does not disclose a fluid movement device as claimed to move said flowing fluid.

Nevertheless, at the time the invention was made, there existed a fluid movement device, an electromechanical fan device, such as one disclosed by Pal, Fig. 1, for the purpose of moving a fluid, such as air.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the reference's device such that it include a fluid movement device. One would have been motivated to include such a fluid movement device to move said fluid for the purpose of heat elimination.

Referring to **claim 7**, such a modified device should be able to conduct heat away from said light emitting diodes to fluid proximate said elongate member outer surface.

Referring to **claim 8**, as noted above, said fluid comprises air.

Referring to **claims 2 and 9**, as noted above, said fluid movement device comprises an electromechanical device.

Referring to **claims 3 and 10**, as noted above, said electromechanical device comprises a fan.

Referring to **claims 4 and 11**, said electromechanical device comprises an electronic device.

Referring to **claim 15**, as noted above, said elongate thermally conductive member comprises a tube.

Referring to **claim 16**, the '819 reference discloses as detailed above that said elongate thermally conductive member comprises a tube. The reference further discloses that said elongate thermally conductive member has a cross-section in the shape of a circle (Fig. 2B). Although the reference does not disclose that the shape could be a polygon, the shape differences are considered obvious and are not patentable unless unobvious or unexpected results are obtained from these changes.

Referring to **claim 17**, said tubular thermally conductive member (comprising cooling member 3, thermally conductive adhesive 6, good-thermal conductive layer 4, and cooling ribs, col. 4, lines 1-61) should have a cross-section having flat portions.

Referring to **claim 18**, said tubular thermally conductive member (comprising cooling member 3, thermally conductive adhesive 6, good-thermal conductive layer 4, and cooling ribs, col. 4, lines 1-61) configured so as a fluid, such as air, flowing through it (col.4, lines 55-61), should comprise a channel.

Referring to **claims 19-20**, the reference further discloses that said elongate thermally conductive member comprises an extrusion ("ribs"), and although the reference does not a material as claimed for said elongate thermally conductive member including said extrusion, aluminum was available as a known thermally conductive material at the time the invention was made.

Referring to **claim 22**, the reference further discloses that some of said light emitting diodes emit colored light (col. 1, lines 60-67).

Referring to **claim 21**, although the reference does not disclose that said LEDs could emit white light, the reference does not particularly preclude such selection of emitted colors. In



Art Unit: 2818

addition, at the time the present invention was made, it was known that solid state light sources with various colors, including white light, and various power consumptions, including the then and now labeled HBLEDs, had been manufactured. Therefore, it would be fair to conclude that it would have been obvious to one of ordinary skill in the art at the time the invention was made to form the reference's device with various emitted lights including white light based on the known and availability of the various solid state light sources. See, for example, reference U, *Archive of Selected Headline News (2002)*, Solid-State Lighting.

7. **Claims 5-6, 12-13, 24, and 26** are rejected under 35 U.S.C. 103(a) as being unpatentable over Arndt et al. U.S. Patent 6,848,819 (the '819 reference) in view of knowledge in the art and further in view of Losinski U.S. Patent 5,861,703 (the '703 reference, cited in a previous office action).

The '819 reference, as detailed above for claims 1, 7, and 23, discloses a light source in view of knowledge in the art including said fluid movement device.

However, the reference does not disclose that said fluid movement device is a solid-state piezoelectric device as claimed.

Losinski, at the time the invention was made, teaches the use of a solid-state piezoelectric device to remove heat, and further teaches that a piezoelectric device has many advantages, such as a longer life, over traditional fans (column 1, lines 23-29). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to form the reference's device such that its fluid movement device is a solid-state piezoelectric device. One

would have been motivated to make such a change in view of the teachings in Losinski that a solid-state piezoelectric fan is better than a traditional fan.

*Conclusion*

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tu-Tu Ho whose telephone number is (571) 272-1778. The examiner can normally be reached on 7:30 am - 6:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, DAVID NELMS can be reached on (571) 272-1787. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Tu-Tu Ho  
April 20, 2006

PTO/SB/D8A (03-03)

Approved for use through 07/31/2008, OMB 0651-0031

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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Substitute for form 1449/PTO

# INFORMATION DISCLOSURE STATEMENT BY APPLICANT

Sheet	1	of	1
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**Complete if Known**

Application Number	10/430,696
Filing Date	05/05/2002
First Named Inventor	JOEL DRY
Art Unit	2818
Examiner Name	TU TU HO
Attorney Docket Number	OPTOLUM-003

[illegible]

FOREIGN PATENT DOCUMENTS						
Examiner Initials*	Cite No.*	Foreign Patent Document	Publication Date	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages Or Relevant Figures Appear	T
		Country Code* Number* (if known)	MM-DD-YYYY			
THP		JP 2002-093206	03/29/2003	HIROYUKI ET AL		

Examiner Signature	Tu - Tu - Ho	Date Considered	Apr 2006
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\* EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered, include copy of this form with next communication to applicant. Applicant's unique citation designation number (optional). \* See Kinds Codes of USPTO Patent Documents at [www.uspto.gov](http://www.uspto.gov) or MPEP 601.04. \* Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). \* For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. \* Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. \* Applicant is to place a check mark here if English language translation is attached.

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450. **DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 (1-800-785-9199) and select option 2.

<b>Notice of References Cited</b>	Application/Control No. 10/430,696	Applicant(s)/Patent Under Reexamination DRY, JOEL M.	
	Examiner Tu-Tu Ho	Art Unit 2818	Page 1 of 1

**U.S. PATENT DOCUMENTS**

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-6,293,753	09-2001	Pal et al.	415/221
*	B	US-6,832,849	12-2004	Yoneda et al.	362/551
*	C	US-6,848,819	02-2005	Arndt et al.	362/545
*	D	US-2005/0055070	03-2005	Jones et al.	607/088
	E	US-			
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	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

**FOREIGN PATENT DOCUMENTS**

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

**NON-PATENT DOCUMENTS**

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	Archive of Selected Headline News (2002), Solid-State Lighting
	V	
	W	
	X	

\*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)  
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

# Index of Claims



Application No.

10/430,696

Examiner

Tu-Tu Ho

Applicant(s)

DRY, JOEL M.

Art Unit

2818

✓	Rejected
=	Allowed

—	(Through numeral) Cancelled
+	Restricted

N	Non-Elected
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A	Appeal
O	Objected

Claim	Date				
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**Search Notes**

Application No.

10/430,696

Examiner

Tu-Tu Ho

Applicant(s)

DRY, JOEL M.

Art Unit

2818

**SEARCHED**

Class	Subclass	Date	Examiner
257	88	4/19/2006	TH

**INTERFERENCE SEARCHED**

Class	Subclass	Date	Examiner
(N/A)			TH

**SEARCH NOTES  
(INCLUDING SEARCH STRATEGY)**

	DATE	EXMR
362/555,294,373 - updated (text search only - see search history printout)	4/19/2006	TH

Serial No. 10/430,696

EXPRESS MAIL NO. ED673279790US

*Attorney Docket OPTOLUM -003*

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re Application of:

JOEL DRY

:

Group Art No.: 2818

Serial No. 10/430,696

:

Examiner: Tu Tu V Ho

Filed: 05/05/2003

:

Title: LIGHT EMITTING DIODE LIGHT SOURCE

Commissioner of Patents

PO Box 1450

Alexandria, VA 22313-1450

**RESPONSE**

This is responsive to the Office Action dated 04/27/2006. A petition for extension is filed herewith.

Please amend the application as follows.

A listing of the claims presently in the application begins at page 2.

An amendment to the drawing is at page 9.

Remarks are at page 10.

IN THE CLAIMS:

**CLAIM 1 (ORIGINAL).** A light source comprising:

an elongate thermally conductive member having an outer surface;

a plurality of light emitting diodes carried on said elongate member outer surface at least some of said light emitting diodes being disposed in a first plane and others of said light emitting diodes being disposed in a second plane not coextensive with said first plane;

said elongate thermally conductive member being configured to conduct heat away from said light emitting diodes to fluid contained by said elongate thermally conductive member;

said elongate thermally conductive member comprises one or more surface discontinuities to enhance heat dissipation; and

a fluid movement device in fluid communication with said elongate thermally conductive member to enhance movement of said fluid over at least some of said heat surface discontinuities.

**CLAIM 2 (ORIGINAL).** A light source in accordance with claim 1, wherein:

said fluid movement device comprises an electromechanical device.

**CLAIM 3 (ORIGINAL).** A light source in accordance with claim 2, wherein:

said electromechanical device comprises a fan.

**CLAIM 4 (ORIGINAL).** A light source in accordance with claim 1, wherein:

said fluid movement device comprises an electronic device.



**CLAIM 5 (ORIGINAL).** A light source in accordance with claim 1, wherein:

said fluid movement device comprises a solid state device.

**CLAIM 6 (ORIGINAL).** A light source in accordance with claim 1, wherein:

said fluid movement device comprises an piezoelectric device.

**CLAIM 7 (ORIGINAL).** A light source in accordance with claim 1, wherein:

said elongate thermally conductive member is configured to conduct heat away from said light emitting diodes to fluid proximate said elongate member outer surface.

**CLAIM 8 (ORIGINAL).** A light source in accordance with claim 7, wherein:

said fluid proximate said elongate member outer surface comprises air.

**CLAIM 9 (ORIGINAL).** A light source in accordance with claim 7, wherein:

said fluid movement device comprises an electromechanical device.

**CLAIM 10 (ORIGINAL).** A light source in accordance with claim 9, wherein:

said electromechanical device comprises a fan.

**CLAIM 11 (ORIGINAL).** A light source in accordance with claim 7, wherein:

said fluid movement device comprises an electronic device.

**CLAIM 12 (ORIGINAL).** A light source in accordance with claim 7, wherein:

said fluid movement device comprises a solid state device.

**CLAIM 13 (ORIGINAL).** A light source in accordance with claim 12, wherein:

said fluid movement device comprises an piezoelectric device.

**CLAIM 14 (ORIGINAL).** A light source in accordance with claim 1, wherein:

said fluid contained by said elongate thermally conductive member is a cooling medium other than air.

**CLAIM 15 (ORIGINAL).** A light source in accordance with claim 1, wherein:

said elongate thermally conductive member comprises a tube.

**CLAIM 16 (ORIGINAL).** A light source in accordance with claim 15, wherein:

said tube has a cross-section in the shape of a polygon.

**CLAIM 17 (PREVIOUSLY PRESENTED).** A light source in accordance with claim 15, wherein:

said tube has a cross-section having flat portions.

**CLAIM 18 (ORIGINAL).** A light source in accordance with claim 1, wherein:

said elongate thermally conductive member comprises a channel.

**CLAIM 19 (ORIGINAL).** A light source in accordance with claim 18, wherein:

said elongate thermally conductive member comprises an extrusion.

**CLAIM 20 (ORIGINAL).** A light source in accordance with claim 18, wherein:

said extrusion is an aluminum extrusion.

**CLAIM 21 (ORIGINAL).** A light source in accordance with claim 1, wherein:

each of said light emitting diodes emits white light.

**CLAIM 22 (ORIGINAL).** A light source in accordance with claim 1, wherein:

at least some of said light emitting diodes emit colored light.

**CLAIM 23 (ORIGINAL).** A light source comprising:

an elongate thermally conductive member having an outer surface;

a plurality of light emitting diodes carried on said elongate member outer surface at least some of said light emitting diodes being disposed in a first plane and others of said light emitting diodes being disposed in a second plane not coextensive with said first plane;

said elongate thermally conductive member being configured to conduct heat away from said light emitting diodes to fluid contained by said elongate thermally conductive member; and

a cooling apparatus coupled to said elongate thermally conductive member to enhance cooling of said plurality of light emitting diodes.

**CLAIM 24 (ORIGINAL).** A light source in accordance with claim 23, wherein:

said cooling device comprises a solid state cooling device.

**CLAIM 25 (WITHDRAWN).** A light source in accordance with claim 23 wherein:

said cooling device comprises a Peltier device.

**CLAIM 26 (ORIGINAL).** A light source in accordance with claim 23 wherein:

said cooling device comprises a Piezoelectric device.

**CLAIM 27 (PREVIOUSLY PRESENTED).** A light source comprising:

an elongate thermally conductive member having an outer surface;

at least one light emitting diode carried on said elongate member outer surface;

said elongate thermally conductive member being configured to conduct heat away from  
said at least one light emitting diode; and

cooling apparatus in thermal communication with said elongate thermally conductive  
member to enhance cooling of said at least one light emitting diode, said cooling apparatus being  
selected from one of a solid state cooling device, a Peltier cooling device, and a Piezoelectric  
device.

**CLAIM 28 (CANCELED).**

**CLAIM 29 (CANCELED).**

**CLAIM 30 (CANCELED).**

**CLAIM 31 (PREVIOUSLY PRESENTED).** A light source comprising:

an elongate thermally conductive member having an outer surface;

at least one light emitting diode carried on said elongate member outer surface;  
one or more electrical conductors carried by said elongate thermally conductive member  
and connected to said at least one light emitting diode to supply electrical power thereto;  
said elongate thermally conductive member being configured to conduct heat away from  
said at least one light emitting diode to fluid contained by said elongate thermally conductive  
member; and  
a fluid moving device in fluid communication with said elongate thermally conductive  
member to move said fluid.

**CLAIM 32 (PREVIOUSLY PRESENTED).** A light source comprising:

an elongate thermally conductive member having an outer surface;  
a plurality of light emitting diodes carried on said elongate member outer surface at least  
some of said light emitting diodes being disposed in a first plane and others of said light emitting  
diodes being disposed in a second plane not coextensive with said first plane;  
electrical conductors carried by said elongate thermally conductive member and  
connected to said plurality of light emitting diodes to supply electrical power thereto; and  
said elongate thermally conductive member being configured to conduct heat away from  
said light emitting diodes to fluid contained by said elongate thermally conductive member;  
a fluid moving device in fluid communication with said elongate thermally conductive  
member to move said fluid; and  
a coating carried on said elongate thermally conductive member.

**CLAIM 33 (ORIGINAL).** A light source in accordance with claim 32, wherein:

said coating is infused with optically reflective material.

**IN THE DRAWING**

Please substitute the attached drawing sheet having FIGs 4,5 and 6 thereon for the corresponding drawing sheets in the application. FIG. 6 has been amended to more closely correspond to the description and to show more clearly the drawing elements. No new matter has been added.

**REMARKS**

Claims 1-27 and 31-33 are in the application.

At the outset, **Applicant again objects to the piecemeal prosecution** that the Examiner is utilizing in the present application.

A substantive Office Action applying art to all the claims in the application was followed by an Office Action imposing a first election requirement.

The first election has now been replaced with a second election.

The Examiner's restriction requirement was traversed.

Once again, it is brought to the Examiner's attention that a prior office action provided a substantive search and examination of claim 25. **It is requested that the Examiner provide an explanation as to why the claim was examinable before the two office actions with restriction requirements but somehow is not now examinable in conjunction with the other claims.**

In addition, the Examiner states "The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior office action." **The Examiner is requested to identify which prior office action included the text. Applicant has been unable to find any such text.**

Claim 25 stands withdrawn from consideration. Claim 25 depends from claim 23 and should claim 23 be found allowable, applicant requests that claim 25 also be considered and the restriction requirement withdrawn.

Claim 27 stands rejected under 35 U.S.C. 102(e) as anticipated by Jones et al.

Claim 27 stands rejected under 35 U.S.C. 102(e) as anticipated by Yoneda et al.

Claims 1-4, 7-11, 15-22, 23, 31, 32, and 33 stand rejected under 35 U.S.C. 103(a) as unpatentable over Arndt et al. "in view of knowledge in the art as evident by Pal et al."

Claims 5-6, 12, 13, 24, and 26 stand rejected under 35 U.S.C. 103(a) as "being unpatentable over Arndt et al. ...in view of knowledge in the art and further in view of Losinski..."

**35 U.S.C. 102(E) REJECTIONS****Standard for anticipation**

The standard for anticipation under 35 U.S.C. 102 is set forth in M.P.E.P. 2131:

'A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described in a single prior art reference.' *Verdegaal Bros. v.*



*Union Oil Co. of California*, 814 F.2d 628, 631... ‘The identical invention must be shown in as complete detail as is contained in the claim.’ *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989)....

For anticipation under 35 USC 102, the reference must teach every aspect of the claimed invention either explicitly or implicitly. Any feature not directly taught must be inherently present.

**The Examiner has not met the standards for anticipation under 35 USC 102 of:**

**‘A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described in a single prior art reference.’ or**  
**‘The identical invention must be shown in as complete detail as is contained in the claim.’**

The Examiner is not permitted to change the teachings of a reference in order to meet the structure claimed by an applicant.

As will be specifically pointed out below, the Examiner has failed to follow this clear directive for determining anticipation.

**JONES ET AL.**

Claim 27 recites:

A light source comprising:  
an elongate thermally conductive member having an outer surface;  
at least one light emitting diode carried on said elongate member outer surface;  
said elongate thermally conductive member being configured to conduct heat away from said at least one light emitting diode; and  
cooling apparatus in thermal communication with said elongate thermally conductive member to enhance cooling of said at least one light emitting diode, said cooling apparatus being selected from one of a solid state cooling device, a Peltier cooling device, and a Piezoelectric device.

The Examiner points to Paragraph [0071] of Jones et al. Paragraph [0071] states:

Referring to FIG. 3, there is shown illuminating device (generally designated 1) comprising, in sequence, an LED diode array 2, a high thermal conductivity heat spreader layer 3, a Peltier type thermoelectric cooler 4 and a heat pipe arrangement 5 (including a distal condenser 6).

The Examiners attention is drawn to Paragraphs [0073], [0074], and [0075].

Paragraph [0073] of Jones et al states:

Heat flowing from the LED diode array 2 is spread over a larger area by the high conductivity spreader layer 3. This layer is typically only a few millimeters thick and

provides rapid and highly efficient heat transfer away from the diode array 2. Heat flows into the cold end of the thermoelectric Peltier cooler 4. **The hot end of thermoelectric Peltier cooler 4 is in heat transfer coupling with the heat pipe 5.** The high thermal conductivity layer 3 includes a diamond material, which is laid down by means of a plasma/chemical vapor deposition material.

It is clear from a reading of the above paragraph as well as paragraphs [0074] and [0075] that the heat pipe 5 is intended to conduct heat from Peltier cooler 4.

Claim 27 recites, inter alia:

**said elongate thermally conductive member being configured to conduct heat away from said at least one light emitting diode**

**In contrast, Jones et al clearly shows and describes that heat pipe 5 is configured to conduct heat away from the Peltier cooler 4 and not from the LED array 2.**

Accordingly, Jones et al does not show, teach or suggest Applicant's novel structure.

In addition, claim 27 recites, inter alia:

**an elongate thermally conductive member having an outer surface;  
at least one light emitting diode carried on said elongate member outer surface.**

**At no place does Jones et al show or describe any light emitting diode carried on an outer surface of heat pipe 5.**

Jones specifically shows Peltier cooler 4 carried on an end of the heat pipe 5. The LED diode array is carried by Peltier cooler 4 via an intermediate heat spreader layer 3. Accordingly, Jones teaches away from carrying an LED diode array on the outer surface of heat pipe 5.

Jones et al does not show or describe or suggest or anticipate the structure set out in claim 27.

#### **YONEDA ET AL.**

Yoneda et al does not show, teach or suggest or anticipate Applicant's invention of Claim 27.

The Examiner points to FIG. 20 and states that cooling plate 9 is an elongate thermally conductive member. However, cooling plate 9 is not elongate.

The American Heritage® Dictionary defines elongate:

elongate (adj.) Made longer; extended.

elongate (adj.) Having more length than width; slender.

Fig. 20 shows the plate in cross-section and is not representative of the shape of plate 9 As clearly shown in FIG. 23, **substrate K which is coextensive with plate 9 is square and therefore is not elongate, nor is plate 9.**

In addition, the LEDs of Yoneda et al are not carried on an outer surface of plate 9, but rather are supported on a substrate K which is described at col. 20, lines 15-29, as comprising two glass-epoxy layers 17 and 1.

Accordingly, plate 9 also does not carry the LEDs on its outer surface. This is made particularly clear at col. 20, lines 54-65 wherein it is specifically stated that the LEDs of Fig. 20 are directly mounted on the upper substrate 17.

Yoneda et al does not show, teach or suggest or anticipate every element of claim 27. Accordingly, Yoneda et al does not show, teach, suggest or anticipate Applicant's novel structure of claim 27.

#### **ARNDT '819**

The Examiner relies upon the '819 patent as the primary reference for rejecting all claims in the application under 35 U.S.C. 103.

It is respectfully submitted that the '819 patent does not anticipate or make obvious the novel structures of Applicant's invention as claimed.

The '819 patent teaches away from Applicant's novel structures.

The '819 patent is directed to the dissipation of heat away from a printed circuit board and relies upon heat conduction through the printed circuit board from the copper bonding pads for the LEDs to a metal layer plated on the bottom of the pc board and then to a heat sink.

The specific problem to which the '819 patent is set out beginning at col. 1, line 60. The '819 patent teaches that heat from a LED chip is eliminated via the electrical terminal of the LED. Depending on the LED structure to which the teachings of '819 is addressed, the heat is conducted by the electrical onto solder points that are on copper solder pads on a printed circuit board. "From the solder points, the heat at first propagates in the copper pads and then on the epoxy resin material in the plane of the printed circuit board. Subsequently, the heat is output large-area to the environment by thermal radiation and thermal conduction." (col 2, lines 2-7)

The '819 patent continues on to state that the thermal resistance for one LED on a pc board is relatively slight, but becomes significant when many LEDs are "arranged in close proximity on a circuit board." (Col 2, lines 11-12). This is explained in the '819 patent as a result of a "smaller percentual area of the PCB is now available for each individual LED for heat transmission to the environment."

"An object of the ('819) invention is to specify a surface-mounted LED arrangement that is distinguished by an improved heat elimination from the LEDs." (Col. 2, lines, 37-39)

The structures of the '819 patent are each a printed circuit board having surface mounted LEDs on one side of the circuit board, the side of the board opposite the LEDs has a metallic layer that

is electrically insulated from the LEDs by the circuit board. The metal surface is applied to a cooling member. The cooling member is copper or aluminum or a cooling plate. The cooling member is secured to the circuit board by thermally conductive adhesive. (Col. 2, lines 44-62)

The printed circuit board is of plastic material that conducts heat poorly. (Col. 2, lines 63-65)

The copper pads on the circuit board "should be as large as possible in order to broaden the heat path through the printed circuit board material. (Col. 3, lines 6-9).

**It is clearly apparent that the teachings of the '819 patent are directed to and limited to a structure in which a circuit board carries the LEDs. The LEDs are soldered to metal pads on the same surface of the circuit board. Heat is transferred from the pads, through the circuit board to a metal surface on the other surface of the circuit board, through an adhesive layer to a cooling member.**

Thus, the structures of the '819 patent require that the LEDs are carried on copper solder pads on one surface of a circuit board and heat transfer is via solder pads through the circuit board to a metallization layer on the opposite surface of the circuit board and then to the cooling member via an adhesive layer.

The LEDs are not carried by the cooling member.

The '819 patent shows and teaches structures that are fundamentally different from Applicant's claimed invention.

More specifically, the structures shown and described in the '819 patent all utilize surface mount LEDs. The LEDs are mounted to and carried on one surface of a thermally and electrically insulating printed circuit board. More specifically, the printed circuit board is a plastic material. A cooling member is provided on the other surface of the PC board. The printed circuit other surface is secured to the cooling member.

#### PRESENTLY PREFERRED EMBODIMENTS

The embodiment of the present invention shown in FIG. 1A contains a printed circuit board 1 on which a plurality of preferably surface-mounted LEDs 2 are applied. In a known way, the printed circuit board 1 thereby forms a circuit that comprises terminal surfaces for the mounting of the LEDs at defined locations. These terminal surfaces are provided, for example, with lands for soldering in an automatic surface mount device (SMD) equipping unit, and the LEDs 2 have their electrical contacts 2a soldered to these terminal surfaces in a subsequent mounting step.

The printed circuit board 1 can be a rigid printed circuit board, such as type FR4, and constructed of an epoxy resin

It is clearly evident that the printed circuit board is plastic or epoxy and is not a thermal conductor. This is explicitly stated at col. 3, lines 1-5

flexible plastic. For example, it can be composed of polyester or polyamide film, or it may comprise what is often referred to as flex-board. Flex board is generally multi-layer printed circuit boards that are uniformly constructed of a plurality of polyamide carrier films.

5

The relevant structure of the devices of the '819 patent are clearly set out in claim 1 of the '819 patent:

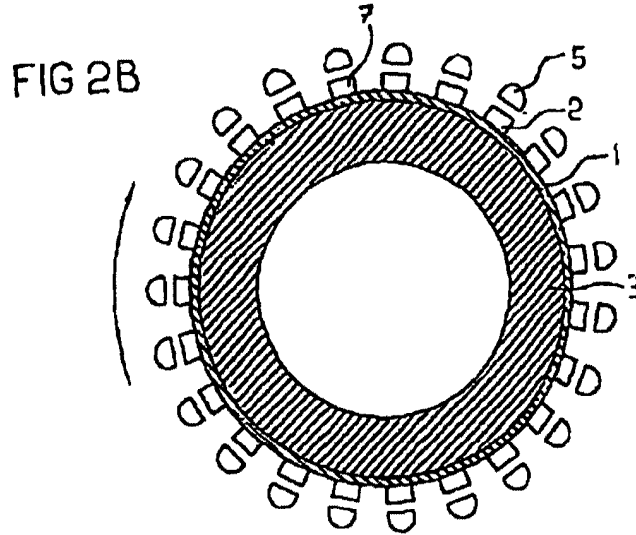
1. A surface-mounted LED arrangement, comprising:
  - a printed circuit board having a principal surface and a secondary surface, said printed circuit board comprising a plastic material,
  - a plurality of LEDs arranged on said principal surface,
  - a metallic layer provided on said secondary surface that is electrically insulated from said plurality of LEDs,
  - a cooling member connected to said secondary surface,
  - wherein said printed circuit board is secured to said cooling member with at least one of a thermally conductive paste, a thermally conductive adhesive and a thermally conductive film, and

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Claim 1 of the '819 patent clearly states that the LEDs are carried on one surface of a printed circuit board and a cooling member to the opposite surface of the circuit board.

The Examiner points to the specific embodiment of FIG. 2B and what he identifies member "3" as being the elongate thermally conductive member. FIG. 2b is reproduced below.



First, the structure of FIG. 2B is not an elongate structure.

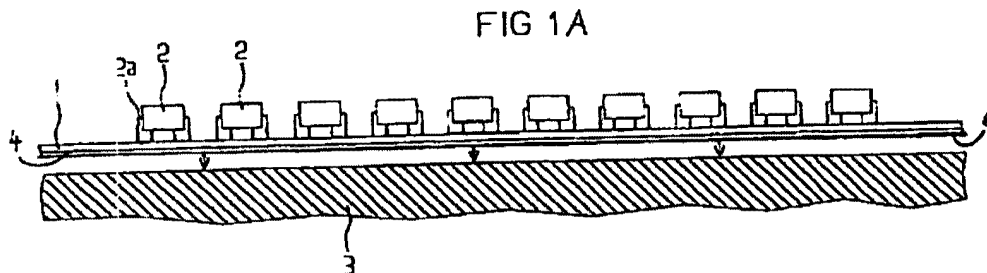
The American Heritage® Dictionary defines elongate:

elongate (adj.) Made longer; extended.

elongate (adj.) Having more length than width; slender.

FIG. 2B does not show an elongate structure. The description of FIG. 2B fails to describe any structure that is clearly elongate. Similarly none of the drawings 1A, 2A, 2B, 2D show elongate members since they are all cross sections and as such show only at best a portion of one of the length or width of the member 3. FIG. 1B shows the only PC board 1 in its entirety and the structure is square not elongate. The squareness of the structure of FIG. 1B is easily determined by measuring the length and width of the structure. Little can be determined from the drawing of FIG. 2C since neither the drawing or description shows the cooling member or members 3 of FIG. 2C.

In addition, it is respectfully submitted that the Examiner mischaracterizes the structure of FIG. 2B. The arrangement of "3" is shown and described more clearly in the alternate embodiment of FIG.1A.



It is clear from the descriptions of the structures of FIG.1A and 2B that **element 1 in all drawings is a plastic or epoxy electrically insulating and thermally insulating printed circuit board.** Element 3 is a thermally conductive member to which printed circuit board 1 is attached with an adhesive layer 6. Layer 4 is a metal layer on the back side of the printed circuit board 1.

It is clear from the drawings that the thermally conductive member 3 does not carry its LEDs 2 on its outer surface. **Rather, the thermally non-conductive printed circuit board 1 carries the LEDs 2.** The Examiner's attention is again directed to the reproduced portions of the reference above which clearly state that the LEDs are carried on the printed circuit board 1 and not on the structure 3.

**It is clear from a plain reading of the descriptions of the structures in the '819 patent that the printed circuit board 1 carries LEDs 2 on one surface and carries the heat sink 3 (thermally conductive member) on its opposite surface.**

In other words, **the '819 patent teaches away from the novel structures of applicant's claimed invention** which set forth structure in which the LEDs, solid state light sources, radiation emitting semiconductor devices, and radiation emitting solid state devices are carried on an elongate thermally conductive member.

In addition, the Examiner points to FIG. 2B as showing solid state light sources that are in a first plane and a second plane not coextensive with the first plane. The Examiner is mistaken. **All the LEDs shown in FIG. 2B are in the same plane, i.e., the plane defined by the drawing sheet.**

It is clearly evident from a careful reading of the '819 patent that the **'819 patent does not show, teach or describe a structure in which an elongate thermally conductive member has an outer surface that carries a plurality of light emitting diodes carried on the elongate member outer surface as called for in claim 1.**

The '819 patent teaches away from Applicant's novel structures.

Claim 1 recites: "A light source comprising:

**an elongate thermally conductive member having an outer surface;**

**a plurality of light emitting diodes carried on said elongate member outer surface at least some of said light emitting diodes being disposed in a first plane and others of said light emitting diodes being disposed in a second plane not coextensive with said first plane;**

said elongate thermally conductive member being configured to conduct heat away from said light emitting diodes to fluid contained by said elongate thermally conductive member;

said elongate thermally conductive member comprises one or more surface discontinuities to enhance heat dissipation; and

**a fluid movement device** in fluid communication with said elongate thermally conductive member to enhance movement of said fluid over at least some of said heat surface discontinuities.

The '819 patent does not show, teach or describe an elongate thermally conductive member.

The '819 patent does not show, teach or describe a plurality of LEDs carried on an outer surface of an elongate thermally conductive member.

The '819 patent does not show, teach or describe LEDs disposed on a first plane and a second plane coextensive with the first plane.

The '819 patent does not provide any enabling disclosure of surface discontinuities.

The '819 patent does not show, teach or describe any fluid movement devices.

Accordingly, the '819 patent does not show, teach or makes obvious the structure of claim 1. The '819 patent makes not suggestion or teaching of using any fluid movement device.

## **PAL**

The Pal reference is directed to a rotary fan and housing of the type that is intended to be driven by a motor assembly and which is intended for use in "high density electronic systems" such as computers and the like. There is no suggestion in the PAL reference of the applicability of such a fan to a structure such as described in the '819 patent.

Apparently the Examiner is citing the PAL reference as representative of knowledge in the art. As such, the knowledge in the art is silent on providing any cooling member to the structure of Applicant's invention.

## **STANDARDS FOR DETERMINING OBVIOUSNESS**

It is respectfully submitted that the Examiner pay attention to the examination standards for determination of obviousness. The Examiner's attention is drawn, in particular, to MPEP 706.02(j) and MPEP 2143 and the three basic criteria that must be set out to establish a prima facie case of obviousness.

The first criteria is that **"there must be some suggestion of motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings."**

"Second, there must be a reasonable expectation of success."

"Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success **must both be found in the prior art and not based on applicants disclosure.**" MPEP 2143 quoting *In re Vaack*

MPEP 706.02(j) quotes *Ex Parte Clapp*: "To support the conclusion that the claimed invention is directed to obvious subject matter, either the references must expressly or impliedly suggest the



claimed invention, or the Examiner must present a convincing line of reasoning as to why the artisan would have found the claimed invention to be obvious in light of the teachings of the references.”

There is no reasonable basis for modifying the structure of the ‘819 patent as suggested by the Examiner. Even assuming one were to modify the structure of the ‘819 patent in view of the PAL patent, the resulting structure would not teach or suggest the limitations in the claims. For example, where do the references suggest that the fan of the PAL patent would be “in fluid communication with said elongate thermally conductive member to enhance movement of said fluid over at least some of said heat surface discontinuities.” There is no such suggestion in the references. The suggestion comes about only from the Examiner’s use of hindsight in order to combine references to meet the structure of claim 1.

It is respectfully submitted that the Examiner has not followed the examination standards for determination of obviousness.

It is respectfully submitted that the Examiner has failed to follow the factual inquiries set forth in *Graham v John Deere*.

“The factual inquiries set forth in *Graham v. John Deere Co.*, 148 USPQ 459, that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or unobviousness.”

1. It is inherent in these inquiries that the Examiner must have an evidentiary basis for the determinations made. The Examiner must consider each piece of prior art for what it fairly teaches within its four corners.

2. The Examiner acknowledges the failure of the ‘819 reference to show or disclose significant aspects of the claimed invention. However, the Examiner without pointing to any linking reference and without providing any evidentiary affidavit makes pronouncements as to what is “knowledge in the art”.

This is a complete failure to properly determine the differences between the prior art and the invention as claimed.

What the Examiner has failed to do is acknowledge that there is no teaching in the prior art PAL reference of its applicability to a structure such as in claim 1.

3. The Examiner makes no effort to resolve the level of skill of one skilled in the lighting arts.

For the foregoing reasons, the references taken singly or in combination do not show, teach or make obvious Applicant's novel invention as set forth in claim 1.

Claims 2 through 22 depend from claim 1. For the same reasons that claim 1 is not shown, taught or made obvious by the '819 patent and/or the PAL et al. patent, taken singly or in combination, claims 2 through 22 are likewise not shown, taught or made obvious by the '819 patent and/or the PAL et al patent taken singly or in combination.

Claim 23 recites:

A light source comprising:

**an elongate thermally conductive member having an outer surface;**  
**a plurality of light emitting diodes carried on said elongate member outer surface at least some of said light emitting diodes being disposed in a first plane and others of said light emitting diodes being disposed in a second plane not coextensive with said first plane;**

said elongate thermally conductive member being configured to conduct heat away from said light emitting diodes to fluid contained by said elongate thermally conductive member; and

**a cooling apparatus coupled to said elongate thermally conductive member to enhance cooling of said plurality of light emitting diodes.**

The '819 patent does not show, teach or describe an elongate thermally conductive member.

The '819 patent does not show, teach or describe a plurality of LEDs carried on an outer surface of an elongate thermally conductive member.

The '819 patent does not show, teach or describe LEDs disposed on a first plane and a second plane coextensive with the first plane.

The '819 patent does not show, teach or describe any fluid movement devices.

Accordingly, the '819 patent does not show, teach or makes obvious the structure of claim 23.

The PAL et al reference does not show, teach or suggest using a fan with a light source of any kind. The '819 patent does not show, teach or suggest the use of a fan.

Thus for the same reasons that claim 1 is not shown, taught, or made obvious by the '819 patent and/or the PAL patent taken singly or in combination, claim 23 is not shown, taught or made obvious by the references taken singly or in combination.

Claims 24-26 depend from claim 23. For the same reasons that claims 1 and 23 are not shown, taught, or made obvious by the '819 patent and/or the PAL patent taken singly or in combination, claims 24-26 are not shown, taught or made obvious by the references taken singly or in combination.

Claim 31 recites:

A light source comprising:

**an elongate thermally conductive member having an outer surface;**  
**at least one light emitting diode carried on said elongate member outer surface;**

one or more electrical conductors carried by said elongate thermally conductive member and connected to said at least one light emitting diode to supply electrical power thereto;

said elongate thermally conductive member being configured to conduct heat away from said at least one light emitting diode to fluid contained by said elongate thermally conductive member; and

**a fluid moving device in fluid communication with said elongate thermally conductive member to move said fluid.**

The '819 patent does not show, teach or describe an elongate thermally conductive member.

The '819 patent does not show, teach or describe a plurality of LEDs carried on an outer surface of an elongate thermally conductive member.

The '819 patent does not show, teach or describe LEDs disposed on a first plane and a second plane coextensive with the first plane.

The '819 patent does not show, teach or describe any fluid movement devices.

Accordingly, the '819 patent does not show, teach or makes obvious the structure of claim 31.

The PAL et al reference does not show, teach or suggest using a fan with a light source of any kind. The '819 patent does not show, teach or suggest the use of a fan.

Thus for the same reasons that claim 1 is not shown, taught, or made obvious by the '819 patent and/or the PAL patent taken singly or in combination, claim 31 is not shown, taught or made obvious by the references taken singly or in combination.

Claim 32 recites:

A light source comprising:

**an elongate thermally conductive member having an outer surface;**  
**a plurality of light emitting diodes carried on said elongate member outer surface at least some of said light emitting diodes being disposed in a first plane and others of said light emitting diodes being disposed in a second plane not coextensive with said first plane;**

electrical conductors carried by said elongate thermally conductive member and connected to said plurality of light emitting diodes to supply electrical power thereto; and

said elongate thermally conductive member being configured to conduct heat away from said light emitting diodes to fluid contained by said elongate thermally conductive member;

**a fluid moving device in fluid communication with said elongate thermally conductive member to move said fluid; and**  
a coating carried on said elongate thermally conductive member.

As with claim 1, the '819 patent does not show, teach or describe an elongate thermally conductive member.

The '819 patent does not show, teach or describe a plurality of LEDs carried on an outer surface of an elongate thermally conductive member.

The '819 patent does not show, teach or describe LEDs disposed on a first plane and a second plane coextensive with the first plane.

The '819 patent does now show, teach or describe any fluid movement devices.

Accordingly, the '819 patent does not show, teach or makes obvious the structure of claim 32.

The PAL et al. patent does not show, teach or suggest use of the fan disclosed therein for any type of light source.

For the same reasons that claim 1 is not shown, taught, or made obvious by the '819 patent and/or the PAL patent taken singly or in combination, claim 32 is not shown, taught or made obvious by the references taken singly or in combination.

The Examiner also states, with respect to claims 4 and 11 that "the electromechanical device comprises and electronic device."

At no point in the PAL et al or '819 patents is there any showing, teaching or even suggestion of the use of an electronic cooling device.

For this additional reason, claims 4 and 11 are not shown, taught or made obvious by the '819 and PAL et al patents taken singly or in combination.

With respect to claim 16, the Examiner states that "Although the reference does not disclose that the shape could be a polygon, the shape differences are considered obvious and are not patentable unless unobvious or unexpected results are obtained from these changes."

With respect to claim 17, the Examiner states; "said tubular thermally conductive member...**should have a cross-section having flat portions.**"

With respect to claim 18, the Examiner states; "said tubular thermally conductive member...**should comprise a channel.**"

The Examiner provides no basis for his conclusion that shape differences are considered obvious. The Examiner provides no basis as to why the thermally conductive member "should" anything. If the Examiner persists in his rejection of claims 16, 17, and 18, **the Examiner is specifically**

**requested to provide the prior art citation or basis for his conclusionary statements with respect to these claims or alternatively to provide an affidavit setting forth the factual basis for the conclusionary statements.**

In view of the foregoing, claims 1-4, 7-11, 15-22, 23, 31, 32, and 33 are not shown taught or made obvious by the Arndt et al. and Pal et al references taken singly or in combination.

## **LOSINSKI**

The Examiner in rejecting claims 5-6, 12, 13, 24, and 26 under 35 U.S.C. 103(a) states that the claims are “unpatentable over Arndt et al. ...**in view of knowledge in the art** and further in view of Losinski...”

The Examiner cites Losinski as teaching “the use of a solid-state piezoelectric device to remove heat, and further teaches that a piezoelectric device has many advantages.... Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to form the reference’s device such that its fluid movement device is a solid-state piezoelectric device. One would have been motivated to make such a change in view of the teachings of Losinski that a solid state fan is better than a traditional fan.”

**The Examiner has not provided any basis “knowledge in the art.” Accordingly, the basis for this rejection fails.**

The Examiner’s attention is directed to MPEP 2144.03 which clearly sets forth the standards, in accordance with *In re Zurko* and the other cases cited therein, for reliance on “well known” prior art. The Examiner’s attention in particular is directed to 2144.03 C wherein “If applicant challenges a factual assertion as not properly officially noticed or **not properly based upon common knowledge, the Examiner must support the finding with adequate evidence.**”

The Examiner has failed to support his contention of “knowledge in the art.” **Applicant specifically requests that the Examiner support his assertion with evidence as mandated by the MPEP.**

The Examiner’s suggestion that one would have been motivated to utilize a solid state fan with the structure of the ‘819 patent is based upon unsupportable and flawed logic.

The ‘819 patent does not show, teach or suggest the use of any cooling device. The ‘819 patent does not show, teach or suggest the use of a “traditional fan.”

The Losinski patent does not show, teach or suggest that the piezoelectric fan may be used with a light source.

The Losinski patent does not state that “a solid state fan is better than a traditional fan” as the Examiner represents. Rather, Losinski states that “rotary fans have many drawbacks” (col. 1,

line 15). In addition, Losinski states that the piezoelectric fans provide axial flow and that “Axial flow is advantageous for applications involving a substantially flat circuit board or electronic component system in a housing assembly that provides little clearance for airflow.”

Thus there is no suggestion in Losinski that the piezoelectric fan may be used in a structure such as that of Applicant’s invention.

The Examiner’s attention is drawn, in particular, to MPEP 706.02(j) and MPEP 2143 and the three basic criteria that must be set out to establish a *prima facie* case of obviousness.

The first criteria is that “there must be some suggestion of motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings.”

“Second, there must be a reasonable expectation of success.”

“Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success **must both be found in the prior art and not based on applicants disclosure.**” MPEP 2143 quoting *In re Vaeck*

MPEP 706.02(j) quotes *Ex Parte Clapp*: “To support the conclusion that the claimed invention is directed to obvious subject matter, **either the references must expressly or impliedly suggest the claimed invention, or the Examiner must present a convincing line of reasoning as to why the artisan would have found the claimed invention to be obvious in light of the teachings of the references.**”

MPEP 2143.01 clearly points out that the **“level of skill in the art cannot be relied upon to provide the suggestion to combine references”** *Al-Site Corp. v. VSI Int’l Inc.*

MPEP 2143.01 further provides the clear guidance that: **“A statement that modifications of the prior art to meet the claimed invention would have been ‘well within the ordinary skill of the art at the time the claimed invention was made’ because the references relied upon teach that all aspects of the claimed invention were individually known in the art is not sufficient to establish a *prima facie* case of obviousness without some objective reason to combine the teachings of the references.”** citing *Ex parte Levengood*

MPEP 2143.01 further clearly provides the guidance that the proposed modification of the prior art cannot change the principle of operation of the prior art reference.

**The ‘819 patent fails to even suggest using any device for enhancing heat removal from the LEDs.** The additional references cited by the Examiner fail to suggest use with a light source or removal of heat from LEDs. The Examiner has failed to provide any convincing line of reasoning as to why the Arndt reference would be modified as the Examiner suggests.

It is clearly evident that the Examiner is relying on Applicant's disclosure to make the suggestion of utilizing "a fluid movement device in fluid communication with said elongate thermally conductive member to enhance movement of said fluid over at least some of said heat surface discontinuities," as called for in claim 1 and similar recitations in the remaining claims.

There is no suggestion in any of the references to combine them as the Examiner suggests. Even the selection of references made by the Examiner is being made with hindsight.

It is therefore respectfully submitted that none of the references taken singly or in combination show, teach or make obvious Applicant's novel structures.

It is believed that all the claims in the application are now in condition for allowance. Reexamination and reconsideration are requested. It is also requested that the claims be allowed and this application be passed to issue.

It is further requested that claim 25 be reinstated and that claim 25 also be allowed.

An early notice of allowance would be appreciated.

Respectfully submitted,  
/Donald J. Lenkszus/

Donald J. Lenkszus, Reg No 28,096

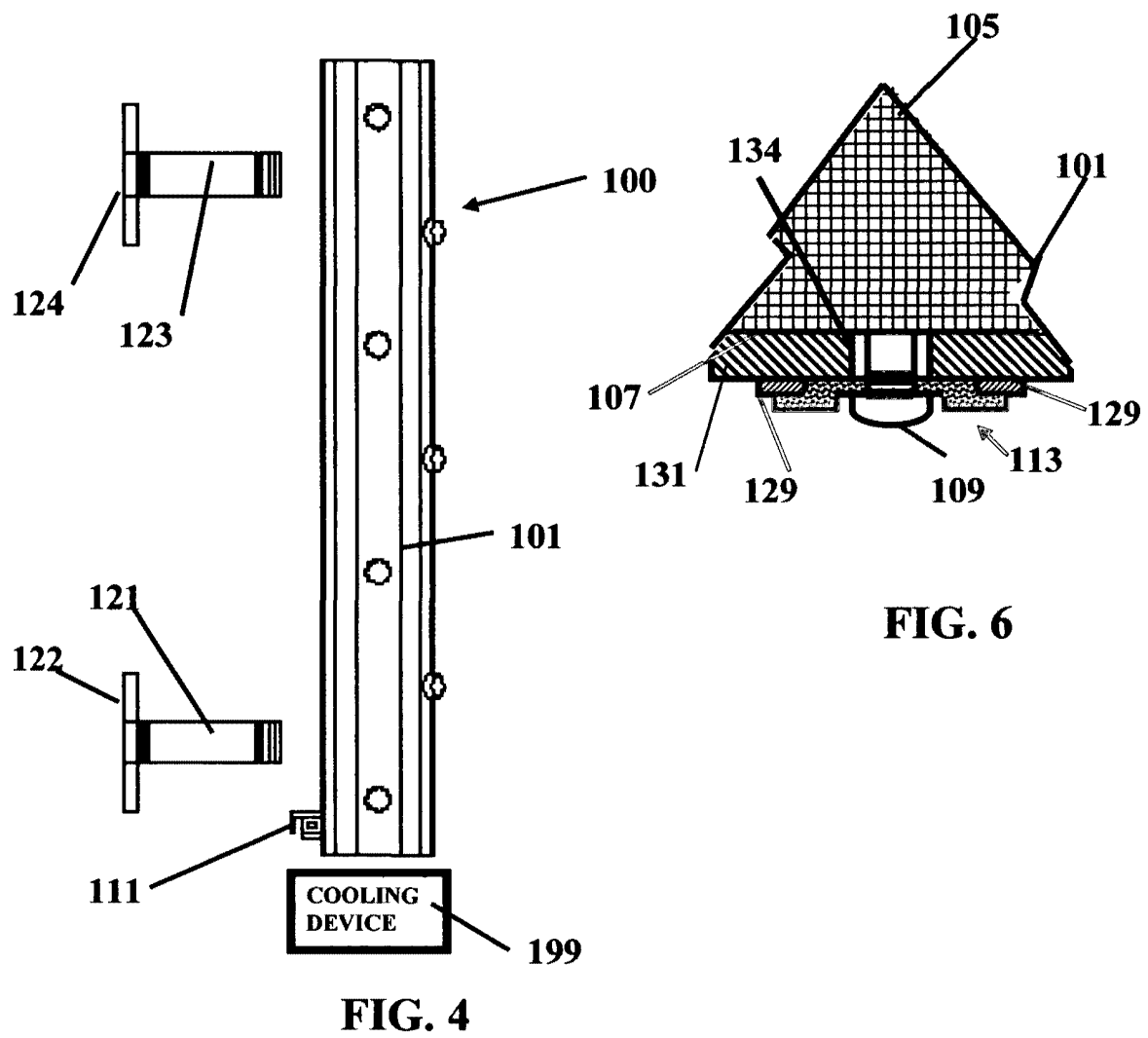
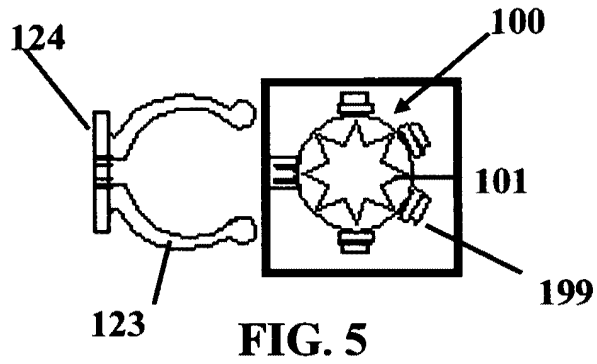
CERTIFICATE OF MAILING

I hereby certify that this document (and any as referred to as being attached or enclosed) is being transmitted by EXPRESS MAIL NO. ED673279790US to the United States Patent and Trademark Office on AUGUST 28, 2006.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

/Donald J Lenkszus/

DONALD J. LENKSZUS, REG. NO. 28,096





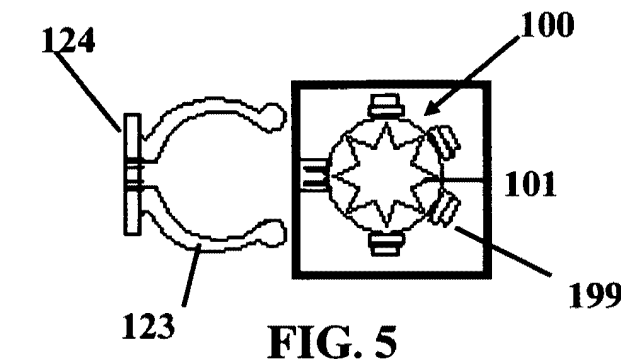


FIG. 5

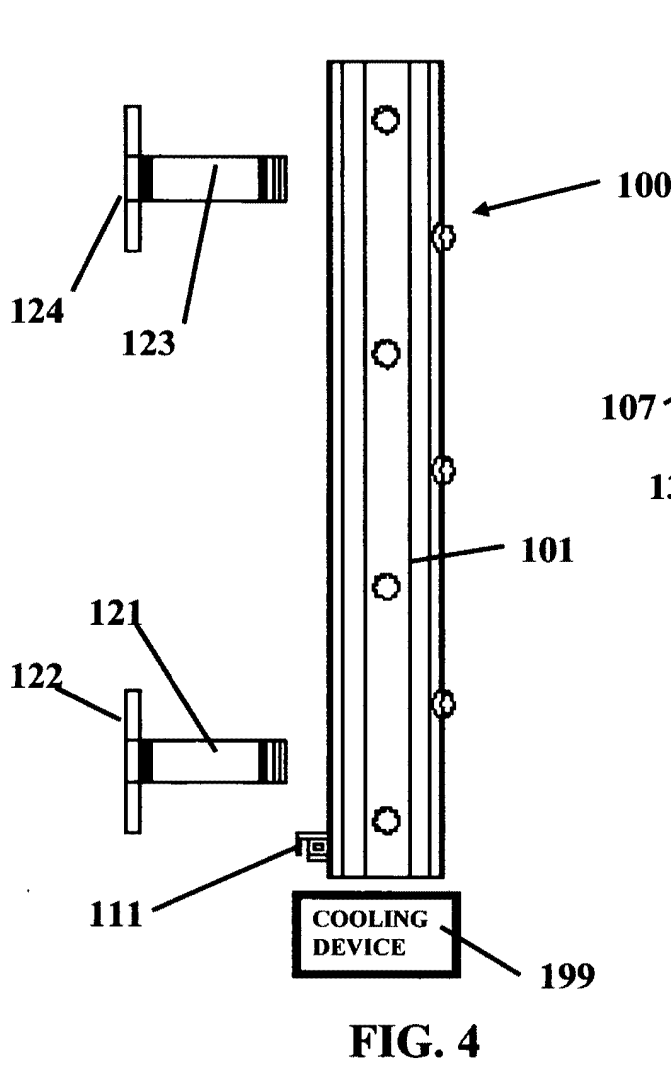


FIG. 4

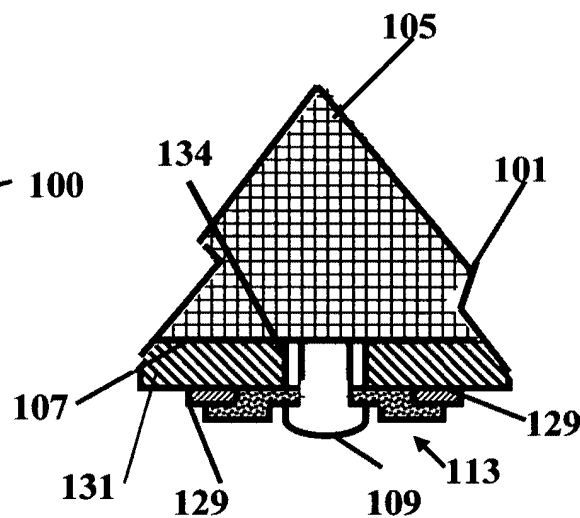


FIG. 6

08-29-06

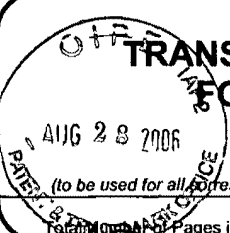
TFW

2.8/18

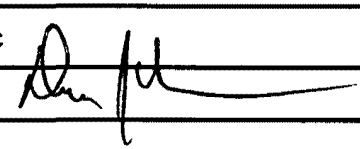
PTO/SB/21 (07-06)

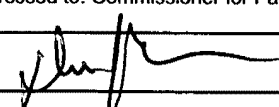
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<b>TRANSMITTAL FORM</b>  (to be used for all correspondence after initial filing)	Application Number	10/430,696
	Filing Date	05/05/2003
	First Named Inventor	JOEL DRY
	Art Unit	2818
	Examiner Name	TU TU V HO
	Attorney Docket Number	OPTOLUM-003

Total Number of Pages in This Submission **32**

ENCLOSURES (Check all that apply)		
<input checked="" type="checkbox"/> Fee Transmittal Form	<input type="checkbox"/> Drawing(s)	<input type="checkbox"/> After Allowance Communication to TC
<input checked="" type="checkbox"/> Fee Attached	<input type="checkbox"/> Licensing-related Papers	<input type="checkbox"/> Appeal Communication to Board of Appeals and Interferences
<input checked="" type="checkbox"/> Amendment/Reply	<input type="checkbox"/> Petition	<input type="checkbox"/> Appeal Communication to TC (Appeal Notice, Brief, Reply Brief)
<input type="checkbox"/> After Final	<input type="checkbox"/> Petition to Convert to a Provisional Application	<input type="checkbox"/> Proprietary Information
<input type="checkbox"/> Affidavits/declaration(s)	<input type="checkbox"/> Power of Attorney, Revocation	<input type="checkbox"/> Status Letter
<input checked="" type="checkbox"/> Extension of Time Request	<input type="checkbox"/> Change of Correspondence Address	<input checked="" type="checkbox"/> Other Enclosure(s) (please identify below):
<input type="checkbox"/> Express Abandonment Request	<input type="checkbox"/> Terminal Disclaimer	POSTCARD
<input type="checkbox"/> Information Disclosure Statement	<input type="checkbox"/> Request for Refund	CHECK IN AMOUNT OF \$60.00
<input type="checkbox"/> Certified Copy of Priority Document(s)	<input type="checkbox"/> CD, Number of CD(s) _____	
<input type="checkbox"/> Reply to Missing Parts/Incomplete Application	<input type="checkbox"/> Landscape Table on CD	
<input type="checkbox"/> Reply to Missing Parts under 37 CFR 1.52 or 1.53	<b>Remarks</b> EXPRESS MAIL NO. ED673279790US	
SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT		
Firm Name	DONALD J LENKSZUS, PC	
Signature		
Printed name	DONALD J LENKSZUS	
Date	08/28/2006	Reg. No. 28,096

CERTIFICATE OF TRANSMISSION/MAILING		
I hereby certify that this correspondence is being facsimile transmitted to the USPTO or deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on the date shown below:		
Signature	/Donald J Lenkszus/ 	
Typed or printed name	DONALD J LENKSZUS	Date 08/28/2006

This collection of information is required by 37 CFR 1.5. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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Effective on 12/08/2004. Fees pursuant to the Consolidated Appropriations Act, 2005 (H.R. 4818). <b>FEE TRANSMITTAL</b> <b>For FY 2005</b>		<b>Complete if Known</b>	
AUG 28 2006 <input checked="" type="checkbox"/> Applicant claims small entity status. See 37 CFR 1.27		Application Number	10/430,696
		Filing Date	05/05/2003
		First Named Inventor	JOEL DRY
		Examiner Name	TU TU V HO
		Art Unit	2818
TOTAL AMOUNT OF PAYMENT (\$)		60.00	
		Attorney Docket No.	OPTOLUM-003

**METHOD OF PAYMENT (check all that apply)**

☒ Check  
 ☐ Credit Card  
 ☐ Money Order  
 ☐ None  
 ☐ Other (please identify): \_\_\_\_\_

☐ Deposit Account  
 Deposit Account Number: \_\_\_\_\_  
 Deposit Account Name: \_\_\_\_\_

For the above-identified deposit account, the Director is hereby authorized to: (check all that apply)

☐ Charge fee(s) indicated below  
 ☐ Charge fee(s) indicated below, except for the filing fee

☐ Charge any additional fee(s) or underpayments of fee(s) under 37 CFR 1.16 and 1.17  
 ☐ Credit any overpayments

**WARNING:** Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

**FEE CALCULATION****1. BASIC FILING, SEARCH, AND EXAMINATION FEES**

Application Type	FILING FEES		SEARCH FEES		EXAMINATION FEES		Fees Paid (\$)
	Fee (\$)	Small Entity Fee (\$)	Fee (\$)	Small Entity Fee (\$)	Fee (\$)	Small Entity Fee (\$)	
Utility	300	150	500	250	200	100	
Design	200	100	100	50	130	65	
Plant	200	100	300	150	160	80	
Reissue	300	150	500	250	600	300	
Provisional	200	100	0	0	0	0	

**2. EXCESS CLAIM FEES**

Fee Description	Fee (\$)	Small Entity Fee (\$)
Each claim over 20 (including Reissues)	50	25
Each independent claim over 3 (including Reissues)	200	100
Multiple dependent claims	360	180
<b>Total Claims</b>	<b>Extra Claims</b>	<b>Fee (\$)</b>
- 20 or HP = _____	x _____	= _____
HP = highest number of total claims paid for, if greater than 20.		
<b>Indep. Claims</b>	<b>Extra Claims</b>	<b>Fee (\$)</b>
- 3 or HP = _____	x _____	= _____
HP = highest number of independent claims paid for, if greater than 3.		

**3. APPLICATION SIZE FEE**

If the specification and drawings exceed 100 sheets of paper (excluding electronically filed sequence or computer listings under 37 CFR 1.52(e)), the application size fee due is \$250 (\$125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).

Total Sheets	Extra Sheets	Number of each additional 50 or fraction thereof	Fee (\$)	Fee Paid (\$)
- 100 = _____	/ 50 = _____	(round up to a whole number) x _____	= _____	

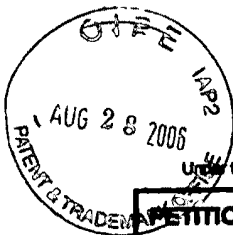
**4. OTHER FEE(S)**

Non-English Specification, \$130 fee (no small entity discount)	<b>Fees Paid (\$)</b>
Other (e.g., late filing surcharge): EXTENSION FEE	60

<b>SUBMITTED BY</b>			
Signature	/Donald J Lenkszus/	Registration No. (Attorney/Agent) 28,096	Telephone 602-463-2010
Name (Print/Type)	DONALD J LENKSZUS		Date 08/28/2006

This collection of information is required by 37 CFR 1.136. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 30 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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<b>PETITION FOR EXTENSION OF TIME UNDER 37 CFR 1.136(a)</b> FY 2005 (Fee pursuant to the Consolidated Appropriations Act, 2005 (H.R. 4918).)		Docket Number (Optional) <b>OPTULUM - 003</b>	
Application Number <b>10/430,696</b>		Filed <b>05/05/2003</b>	
For <b>LIGHT EMITTING DIODE LIGHT SOURCES</b>			
Art Unit <b>2818</b>		Examiner <b>TU TU V HO</b>	
This is a request under the provisions of 37 CFR 1.136(a) to extend the period for filing a reply in the above identified application.			
The requested extension and fee are as follows (check time period desired and enter the appropriate fee below):			
	Fee	Small Entity Fee	
<input checked="" type="checkbox"/> One month (37 CFR 1.17(a)(1))	\$120	\$60	\$ <u>60</u>
<input type="checkbox"/> Two months (37 CFR 1.17(a)(2))	\$450	\$225	\$ _____
<input type="checkbox"/> Three months (37 CFR 1.17(a)(3))	\$1020	\$510	\$ _____
<input type="checkbox"/> Four months (37 CFR 1.17(a)(4))	\$1590	\$795	\$ _____
<input type="checkbox"/> Five months (37 CFR 1.17(a)(5))	\$2160	\$1080	\$ _____
<input checked="" type="checkbox"/> Applicant claims small entity status. See 37 CFR 1.27.			
<input type="checkbox"/> A check in the amount of the fee is enclosed.			
<input checked="" type="checkbox"/> Payment by credit card. Form PTO-2038 is attached.			
<input type="checkbox"/> The Director has already been authorized to charge fees in this application to a Deposit Account.			
<input type="checkbox"/> The Director is hereby authorized to charge any fees which may be required, or credit any overpayment, to Deposit Account Number _____ I have enclosed a duplicate copy of this sheet.			
WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.			
I am the <input type="checkbox"/> applicant/inventor.			
<input type="checkbox"/> assignee of record of the entire interest. See 37 CFR 3.71. Statement under 37 CFR 3.73(b) is enclosed (Form PTO/SB/96).			
<input checked="" type="checkbox"/> attorney or agent of record. Registration Number <u>28,096</u>			
<input type="checkbox"/> attorney or agent under 37 CFR 1.34. Registration number if acting under 37 CFR 1.34 _____			
Signature <u>Donald J. Lenkszas</u>		Date <u>08/28/2006</u>	
Typed or printed name <u>DONALD J. LENKSZAS</u>		Telephone Number <u>602-463-2010</u>	
NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below.			
<input type="checkbox"/> Total of _____ forms are submitted.			

This collection of information is required by 37 CFR 1.136(a). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 6 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1460, Alexandria, VA 22313-1460.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

09/30/2006 EPLRES 00000006 10430595

01 FC:2251

60.00 37

**PATENT APPLICATION FEE DETERMINATION RECORD**  
Effective December 8, 2004

10/430696

AMENDMENT	(Column 1)		(Column 2)		(Column 3)
		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA
	Total	*	Minus	**	=
	Independent	*	Minus	***	=
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM					<input type="checkbox"/>

RATE	ADDI- TIONAL FEE	OR	RATE	ADDI- TIONAL FEE
X\$ 25=			X\$50=	
X100=			X200=	
+180=			+360=	
TOTAL ADDIT. FEE			TOTAL ADDIT. FEE	

AMENDMENT	(Column 1)		(Column 2)		(Column 3)
		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA
	9/7/06 Total	* 30	Minus	** 33	=
	Independent	* 5	Minus	*** 5	=
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM					<input type="checkbox"/>

RATE	ADDI- TIONAL FEE	OR	RATE	ADDI- TIONAL FEE
X\$ 25=			X\$50=	
X100=			X200=	
+180=			+360=	
TOTAL ADDIT. FEE			TOTAL ADDIT. FEE	

AMENDMENT	(Column 1)		(Column 2)		(Column 3)
		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA
	Total	*	Minus	**	=
	Independent	*	Minus	***	=
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM					<input type="checkbox"/>

RATE	ADDI- TIONAL FEE	OR	RATE	ADDI- TIONAL FEE
X\$ 25=			X\$50=	
X100=			X200=	
+180=			+360=	
TOTAL ADDIT. FEE			TOTAL ADDIT. FEE	

AMENDMENT	(Column 1)		(Column 2)		(Column 3)
		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA
	Total	*	Minus	**	=
	Independent	*	Minus	***	=
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM					<input type="checkbox"/>

RATE	ADDI- TIONAL FEE	OR	RATE	ADDI- TIONAL FEE
X\$ 25=			X\$50=	
X100=			X200=	
+180=			+360=	



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H/A

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/430,696

05/05/2003

Joel M. Dry

OPTOLUM-003

3639

7590

11/08/2006

DONALD J LENKSZUS

PO BOX 3064

CAREFREE, AZ 85377-3064

EXAMINER

HO, TU TU V

ART UNIT

PAPER NUMBER

2818

DATE MAILED: 11/08/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/430,696

Applicant(s)

DRY, JOEL M.

Examiner

Tu-Tu Ho

Art Unit

2818

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 28 August 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-27 and 31-33 is/are pending in the application.
- 4a) Of the above claim(s) 25 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-24, 26, 27 and 31-33 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 August 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Introduction***

1. As correctly quoted by Applicant, the examiner ordinarily should reject each claim on all valid grounds available, and piecemeal prosecution should be avoided as much as possible. In the instant case, at least one valid ground such as flowing fluid contained by an elongate thermally conductive member was not publicly available until Feb. 01, 2005, well after the first action on the merit; and certain limitation, for example, "carried on an outer surface", might carry different interpretations when examined in light of different disclosures such as as-filed Fig. 6 and Fig. 6 filed 08/19/2006, for example.

However, Applicant is correct by pointing out that the text of the appropriate sections of Title 35, U.S. Code has not been cited. As such, the text of the appropriate sections is included in this office action.

2. Applicant's arguments with respect to claims 1-24, 26-27, and 31-33, filed 08/28/2006, have been fully considered but they are not persuasive.

### ***Election/Restrictions***

3. Claim 25 is still withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected species, there still being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on 01/26/2006.



***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in

(1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or

(2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. **Claim 27** is rejected under 35 U.S.C. 102(e) as being anticipated by Jones et al. U.S. Patent Application Publication 20050055070 (the '070 reference, cited in a previous office action).

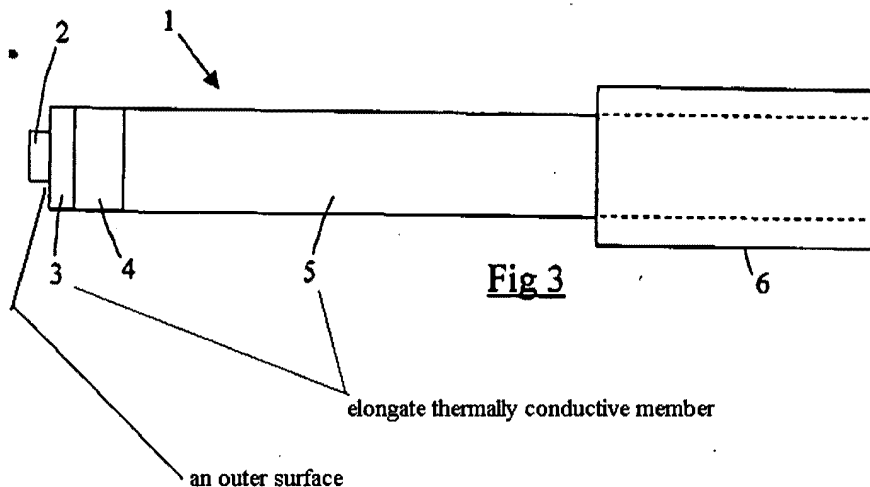
The '070 reference discloses light source comprising:

an elongate thermally conductive member (generally indicated at heat pipe 5/ heat spreader 3, Fig. 3, paragraph [0071], "member" is broadly interpreted) having an outer surface ("an outer surface", reproduced below or next page, "member" is broadly interpreted);

at least one light emitting diode (generally indicated at array 2 of LEDs 7) carried on said elongate member outer surface;

said elongate thermally conductive member being configured to conduct heat away from said at least one light emitting diode (paragraph [0071]-[0073]); and

a cooling apparatus (4) in thermal communication with said elongate thermally conductive member to enhance cooling of said at least one light emitting diode, said cooling apparatus being a solid state cooling device.



5. **Claim 27** is rejected under 35 U.S.C. 102(e) as being anticipated by Yoneda et al. U.S. Patent 6,832,849 (the '849 reference, cited in a previous office action).

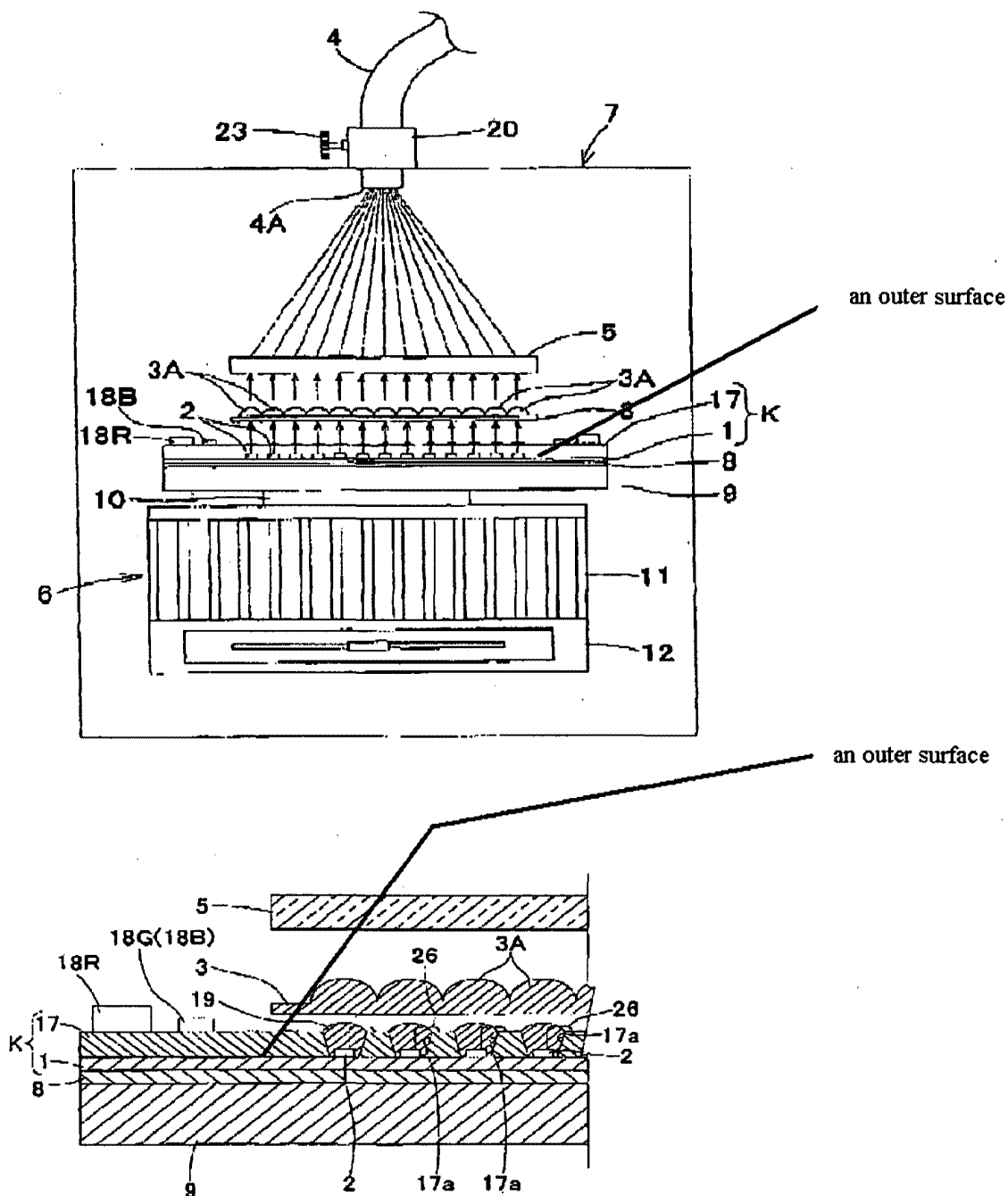
The '849 reference discloses light source comprising:

an elongate thermally conductive member (generally indicated at cooling plate 9/heat grease 8/base substrate 1, Figs. 20-21, col. 22, lines 28+, "member" is broadly interpreted) having an outer surface ("an outer surface", reproduced below or next page, "member" is broadly interpreted);

at least one light emitting diode (2) carried on said elongate member outer surface (best seen in Fig. 21);

said elongate thermally conductive member being configured to conduct heat away from said at least one light emitting diode (col. 22, lines 28+); and

a cooling apparatus (10) in thermal communication with said elongate thermally conductive member to enhance cooling of said at least one light emitting diode, said cooling apparatus being a solid state cooling device.



*Claim Rejections - 35 USC § 103*

Art Unit: 2818

The following is a quotation of 35 U.S.C. §103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. **Claims 1-4, 7-11, 15-22, 23, 31, 32, and 33** are rejected under 35 U.S.C. §103(a) as being unpatentable over Arndt et al. U.S. Patent 6,848,819 (the '819 reference, cited in a previous office action) in view of common knowledge, as evident by Pal et al. U.S. Patent 6,293,753 (cited in a previous office action).

The '819 reference discloses in Figs. 1 through 2B and respective portions of the specification a light source as claimed including an elongate thermally conductive member having a flowing fluid, such as air, therein but does not disclose a fluid movement device as claimed to move the flowing fluid.

Specifically,

in reference to **claim 1**, Arndt discloses a light source comprising:

an elongate thermally conductive member (generally indicated at 3/1, the "tubularly shaped, cylindrical, hollow cooling member 3" and the flexible printed circuit board (PCB) 1 that wraps around member 3, Fig. 2B, col. 3, line 55, through col. 4, line 61, particularly col. 4, lines 1-23 and lines 41-61, "elongate" is broadly interpreted and so are "member" and all other terms in all the claims hereinafter, and note that "thermally conductive member" does not require the entirety of the member to be conductive) having an outer surface;

a plurality of light emitting diodes (2) carried on said elongate member outer surface at least some of said light emitting diodes being disposed in a first plane and others of said light emitting diodes being disposed in a second plane not coextensive with said first plane;

said elongate thermally conductive member being configured to conduct heat away from said light emitting diodes to fluid contained by said elongate thermally conductive member (col. 4, lines 42-61); and

said elongate thermally conductive member comprising one or more surface discontinuities (cooling ribs or surface roughening, col. 4, lines 15-25) to enhance heat dissipation.

as for **claim 23**, the reference discloses, with the same reference characters, citations, and interpretations as detailed above for claim 1 where applicable, a light source comprising:

an elongate thermally conductive member having an outer surface;

a plurality of light emitting diodes carried on said elongate member outer surface at least some of said light emitting diodes being disposed in a first plane and others of said light emitting diodes being disposed in a second plane not coextensive with said first plane; and

said elongate thermally conductive member being configured to conduct heat away from said light emitting diodes to fluid contained by said elongate thermally conductive member.

as for **claim 31**, the reference discloses, with the same reference characters, citations, and interpretations as detailed above for claim 1 where applicable, a light source comprising:

an elongate thermally conductive member having an outer surface;

at least one light emitting diode carried on said elongate member outer surface;

one or more electrical conductors (electrical conductors, not shown, col. 3, lines 1-17) carried by said elongate thermally conductive member and connected to said at least one light emitting diodes to supply electrical power thereto; and

said elongate thermally conductive member being configured to conduct heat away from said light emitting diodes to fluid contained by said elongate thermally conductive member.

and

for **claims 32-33**, the reference discloses, with the same reference characters, citations, and interpretations as detailed above for claim 1 where applicable, a light source comprising:

an elongate thermally conductive member having an outer surface;

a plurality of light emitting diodes carried on said elongate member outer surface at least some of said light emitting diodes being disposed in a first plane and others of said light emitting diodes being disposed in a second plane not coextensive with said first plane;

electrical conductors (electrical conductors, not shown, col. 3, lines 1-17) carried by said elongate thermally conductive member and connected to said plurality of light emitting diodes to supply electrical power thereto;

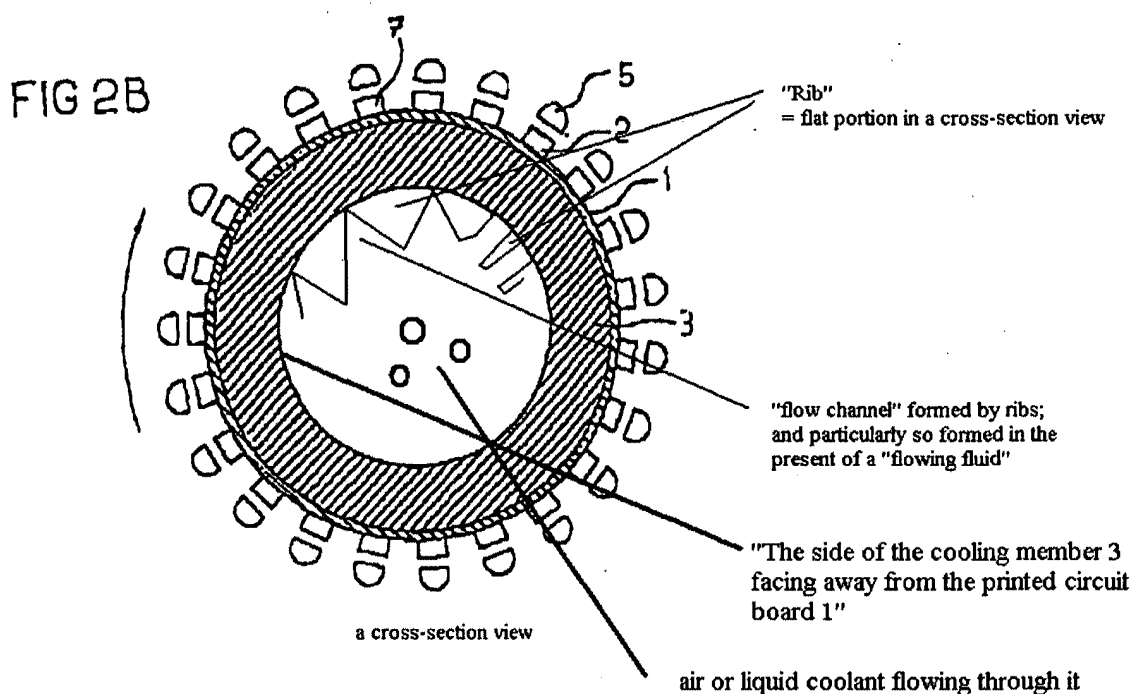
said elongate thermally conductive member being configured to conduct heat away from said light emitting diodes to fluid contained by said elongate thermally conductive member; and

a coating carried on said elongate thermally conductive member (“To this end, this surface is blackened and/or provided with cooling ribs and/or implemented with some other suitable surface structure or roughening”, col. 4, lines 15-25).

As noted above, the reference further discloses that said fluid, such as air, is moved in said elongate thermally conductive member. Specifically, the reference discloses, col. 4, lines

Art Unit: 2818

17+: "The side of the cooling member 3 facing away from the printed circuit board 1 is preferably designed such that heat output to the environment is maximized. To this end, this surface is blackened and/or provided with cooling ribs and/or implemented with some other suitable surface structure or roughening", and lines 59: "As desired, the cylindrical cooling member 3 can also have a gas, such as air or a liquid coolant, flowing through it for further improvement of the heat elimination" (emphases added).



However, also as noted above, the reference does not disclose a fluid movement device as claimed to move said flowing fluid.

Nevertheless, at the time the invention was made, there existed a fluid movement device, an electromechanical fan device, such as one disclosed by Pal, Fig. 1, for the purpose of moving fluidal air. And since it has been held to be within the general skill of a worker in the art to select a known and available device, an electromechanical rotary fan in the instant case, on the

Art Unit: 2818

basis of its suitability for the intended use (air “flowing through it”), to move the disclosed flowing air in the instant case, such a selection of known and available apparatus for its intended use would have been obvious to one of ordinary skill in the art at the time the invention was made.

Referring to **claim 7**, such a modified device should be able to conduct heat away from said light emitting diodes to fluid proximate said elongate member outer surface.

Referring to **claim 8**, as noted above, said fluid comprises air.

Referring to **claims 2 and 9**, as noted above, said fluid movement device comprises an electromechanical device.

Referring to **claims 3 and 10**, as noted above, said electromechanical device comprises a fan.

Referring to **claims 4 and 11**, said electromechanical device comprises an electronic device.

Referring to **claim 15**, as noted above, said elongate thermally conductive member comprises a tube.

Referring to **claim 16**, the ‘819 reference discloses as detailed above that said elongate thermally conductive member comprises a tube. The reference further discloses that said elongate thermally conductive member has a cross-section in the shape of a circle (Fig. 2B).

Although the reference does not disclose that the shape could be a polygon, the shape differences are considered obvious and are not patentable unless unobvious or unexpected results are obtained from these changes.



Referring to **claim 17**, said tubular thermally conductive member (comprising cooling member 3, thermally conductive adhesive 6, good-thermal conductive layer 4, and cooling ribs, col. 4, lines 1-61) has a cross-section having flat portions ("flat portions", Fig. 2B, reproduced on a previous page).

Referring to **claim 18**, although the '819 reference does not explicitly disclose that said elongate thermally conductive member comprises a channel, said elongate thermally conductive member comprises a channel which is defined by ribs and/or the inner passage defined by the thermally conductive tubular member 1/3 – in other words, and/or the tube itself - col. 4, lines 17-23 and lines 41-62, particularly in the presence of a flowing fluid flowing through said hollow tubular member 1/3, col. 4, lines 55-62).

Referring to **claims 19-20**, the reference further discloses that said elongate thermally conductive member comprises an extrusion ("ribs"), and although the reference does not state a material as claimed for said elongate thermally conductive member including said extrusion, aluminum was available as a known thermally conductive material at the time the invention was made.

Referring to **claim 22**, the reference further discloses that some of said light emitting diodes emit colored light (col. 1, lines 60-67).

Referring to **claim 21**, although the reference does not disclose that said LEDs could emit white light, the reference does not particularly preclude such selection of emitted colors. In addition, at the time the present invention was made, it was known that solid state light sources with various colors, including white light, and various power consumptions, including the then and now labeled HBLEDs, had been manufactured. Therefore, it would be fair to conclude that

Art Unit: 2818

it would have been obvious to one of ordinary skill in the art at the time the invention was made to form the reference's device with various emitted lights including white light based on the known and availability of the various solid state light sources. See, for example, reference U, *Archive of Selected Headline News (2002)*, Solid-State Lighting, line items April 14, 2002 and January 3, 2002, for example.

**7. Claims 5-6, 12-13, 24, and 26** are rejected under 35 U.S.C. 103(a) as being unpatentable over Arndt et al. U.S. Patent 6,848,819 (the '819 reference, cited in a previous office action) in view of common knowledge and further in view of Losinski U.S. Patent 5,861,703 (the '703 reference, cited in a previous office action).

The '819 reference, as detailed above for claims 1, 7, and 23, discloses a light source in view of common knowledge including said fan for operating said moving air.

However, the reference does not disclose that said fluid movement device ("fan") is a solid-state piezoelectric device as claimed.

Losinski, at the time the invention was made, teaches the use of a solid-state piezoelectric device to remove heat, and further teaches that a piezoelectric device has many advantages, such as a longer life, over traditional fans (column 1, lines 23-29). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to form the reference's device such that its fluid movement device is a solid-state piezoelectric device. One would have been motivated to make such a change in view of the teachings in Losinski that a solid-state piezoelectric fan is better than a traditional non-solid state fan, i.e., a rotary fan with bearings and with many moving parts.

*Response to Arguments*

8. In response to applicant's argument that Jones (the '070 reference) does not teach: "said elongate thermally conductive member being configured to conduct heat away from said at least one light emitting diode" (page 12), it is respectfully pointed out that the reference discloses "said elongate thermally conductive member (generally indicated at heat pipe 5/ heat spreader 3, Fig. 3, paragraph [0071]) being configured to conduct heat away from said at least one light emitting diode (paragraph [0071]-[0073]). While it is true that the "hot end of the thermoelectric Peltier cooler layer 4 is in heat transfer coupling with the heat pipe 5", it is also disclosed that "Heat flowing from the LED diode array 2 is spread over a larger area by the high conductivity spreader layer 3. This layer is typically only a few millimetres thick and provides rapid and highly efficient heat transfer away from the diode array 2. Heat then flows into the cold end of the thermoelectric Peltier cooler 4" (emphases added).

9. In response to applicant's argument that cooling plate 9 Fig. 20 (of the '849 reference) is not an elongate thermally conductive member (page 12), it is respectfully pointed out that the rejection does not rely solely on Fig. 20 but also pertinent teachings. As pointed out by Applicant, "elongate" is something "extended" (page 12), the cross-section view of Fig. 20 must be extended to some extent to be(come) the plate.

In addition, Applicant argued on page 13 that the outer surface is not that of plate 9 but of substrate K. This is partly true in that the outer surface is, to be exact, that of layer 1 (Figs. 20-21, best seen in Fig. 21). In order to mount the LEDs 2 on the plate 9, it is customary to use sub-

Art Unit: 2818

layers such as thermal grease (8) and conductive layer such as 1, and the examiner thought that a thermal grease and a sub-layer was not worth mentioning.

Therefore the reference discloses: an elongate thermally conductive member (generally indicated at cooling plate 9/heat grease 8/base substrate 1, Figs. 20-21, col. 22, lines 28+, "member" is broadly interpreted) having an outer surface ("an outer surface", reproduced on a previous page, "member" is broadly interpreted); at least one light emitting diode (2) carried on said elongate member outer surface (best seen in Fig. 21), and not on substrate K as alleged by Applicant.

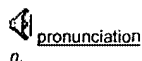
10. In response to applicant's argument that Fig. 2B (of the '819 reference) does not show an elongate structure (page 16), it is respectfully pointed out that the rejection does not rely solely on Fig. 2B ("(generally indicated at 3/1, the "tubularly shaped, cylindrical, hollow cooling member 3" and the flexible printed circuit board (PCB) 1 that wraps around member 3, Fig. 2B, col. 3, line 55, through col. 4, line 61, particularly col. 4, lines 1-23 and lines 41-61, "elongate" is broadly interpreted and so are "member" and all other terms in all the claims hereinafter, and note that "thermally conductive member" does not require the entirety of the member to be conductive)"). While Fig. 2B does not show an elongate structure, col. 4, lines 41-61 discloses:

"The exemplary embodiment of FIG. 2B shows an axial cross-section through a rotating light of a type that can, be employed in emergency vehicles, for example. For the rotating light of FIG. 2B, the flex board 1 is provided with an array of LEDs 2 is laminated around a tubularly shaped, cylindrical, hollow cooling member 3"

Art Unit: 2818

and as such, the tubularly shaped, cylindrical, hollow cooling member 3, together with the flexible printed circuit board (PCB) 1 that wraps around the tube 3 constitutes the elongate member. As correctly quoted by Applicant, “elongate” is something “extended” (page 16), the cross-section view of Fig. 2B must be extended to be(come) the tube; furthermore, if one were to interpret “elongate” using only the narrow meaning “having more length than width” as quoted by Applicant, one of ordinary skill in the art would find it hard to accept that the tube 3/1, having an infinite combinations of various lengths and widths and only a few occurrence of length = width, not having more length than width. As for the limitation “member”, member is a distinct part of a whole or a structural unit such as a limb, a wall, or a beam, each of which comprises other members.

mem•ber



- n.*
1. A distinct part of a whole, especially:
    - a. **Linguistics.** A syntactic unit of a sentence; a clause.
    - b. **Logic.** A proposition of a syllogism.
    - c. **Mathematics.** An element in a set.
  2. A part or an organ of a human or animal body, as:
    - a. A limb, such as an arm or a leg.
    - b. The penis.
    3. A part of a plant.
  4. One that belongs to a group or an organization: *a club member; a bank that is a member of the FDIC.*
  5. **Mathematics.** The expression on either side of an equality sign.
  6. A structural unit, such as a beam or wall.
- [Middle English *membre*, from Old French, from Latin *membrum*.]

The American Heritage Dictionary of the English Language, © Houghton Mifflin Company 2003

APA | MLA | Chicago: [Citing this entry](#)  
 member. The American Heritage® Dictionary of the English Language (2003). Retrieved 27 October 2006, from xreferplus. <http://www.xreferplus.com/entry/4107983>

In addition, Applicant argued that PCB 1 is a thermally non-conductive member (page 17); however, the examiner could not find any teachings in the reference that expressly discloses

Art Unit: 2818

that PCB 1 is thermally non-conductive. While PCB 1 may conduct heat poorly, PCB 1 is not thermally non-conductive as argued. Furthermore, normal language usage allows for expressions such as “a white house” or “a white car”, wherein the white house or the white car is characterized in that they are white and do not require, in any practical meaning, that the entire house or the entire car be white; in the instant case, the member 3/1 comprises member 3 which is the bulk of the member 3/1 and which is thermally conductive, therefore member 3/1 is characterized in that it is thermally conductive and therefore it is a thermally conductive member. In addition, as taught in reference U in the Notice of Reference Cited attached to this office action, even the so-called insulators possess some degree of thermal conductivity, which is better than that of air. Furthermore, the ‘819 reference teaches “As desired, the cylindrical cooling member 3 can also have a gas, such as air or a liquid coolant, flowing through it for further improvement of the heat elimination” (col. 4, lines 59+), and as such, said PCB 1 must be thermally conductive to conduct thermal energy from LED 7 to the inside of said tube 3 for the device to function as taught.

Furthermore, Applicant argued that all the LEDs shown in Fig. 2B are in the same plane, i.e., the plane defined by the drawing sheet (page 17). It is respectfully pointed out that Fig. 2B is only a two-dimensional cross-section of the not-shown three-dimension view of the tubularly shaped, cylindrical, hollow cooling member 3/1, whose cross-section view is depicted in Fig. 2B, col. 3, line 55, through col. 4, line 61, particularly col. 4, lines 1-23 and lines 41-61.

Therefore, the reference anticipates “an elongate thermally conductive member having an outer surface; a plurality of light emitting diodes carried on said elongate member outer surface at least some of said light emitting diodes being disposed in a first plane and others of said light

Art Unit: 2818

emitting diodes being disposed in a second plane not coextensive with said first plane” as claimed.

11. With respect to Applicant’s argument that the examiner does not make an evidentiary affidavit as to the use of a mechanical fan to move air (pages 19 and 23-24), it is pointed out that, as detailed above, it is well within a general skill of one of ordinary skill, therefore obvious, to chose a device for its intended use: a fan to move the air “flowing through it” (col. 4, lines 59-61). Although MPEP 2144.03 [R-1] provides that “If Applicant Challenges a Factual Assertion as Not Properly Officially Noticed or not Properly Based Upon Common Knowledge, the Examiner Must Support the Finding With Adequate Evidence” as quoted by Applicant, the same section also provides: “To adequately traverse such a finding, an applicant must specifically point out the supposed errors in the examiner’s action, which would include stating why the noticed fact is not considered to be common knowledge or well-known in the art”. In the instant case, the line of logic is simple: using a fan to move the disclosed flowing air; and Applicant has not adequately demonstrated in the record why one of ordinary skill would not use a fan to move the disclosed flowing air.

Furthermore, because the Pal (the ‘753 reference) teachings is directed to a high-density electrical/electronic system, one of ordinary skill in the art quickly recognizes that the LED array arrangement of the ‘819 reference is also a high-density electrical/electronic system.

12. As for the argument that there is no suggestion in Losinski (the ‘703 reference) that the piezoelectric fan may be used in a structure such as that of Applicant’s invention (page 24), it is

respectfully pointed out that the motivation to use the Losinski's piezoelectric is that piezoelectric fan is better than a traditional rotary fan, as noted above.

***Conclusion***

**13. THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

**14.** Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tu-Tu Ho whose telephone number is (571) 272-1778. The examiner can normally be reached on 7:30 am - 6:00 pm, Monday through Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Minsun Harvey can be reached on (571) 272-1835. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



Art Unit: 2818

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Tu-Tu Ho  
October 31, 2006

<b>Notice of References Cited</b>	Application/Control No. 10/430,696	Applicant(s)/Patent Under Reexamination DRY, JOEL M.	
	Examiner Tu-Tu Ho	Art Unit 2818	Page 1 of 1

**U.S. PATENT DOCUMENTS**

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
	A	US-			
	B	US-			
	C	US-			
	D	US-			
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			


**FOREIGN PATENT DOCUMENTS**

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

**NON-PATENT DOCUMENTS**

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	Thermal Conductivity Science, Hukseflux, <a href="http://www.hukseflux.com/thermal%20conductivity/thermal.htm">http://www.hukseflux.com/thermal%20conductivity/thermal.htm</a> , searched and printed 07/22/2005
	V	
	W	
	X	

\*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)  
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

<b>Index of Claims</b> 	Application No.	Applicant(s)	
	10/430,696	DRY, JOEL M.	
	Examiner	Art Unit	
	Tu-Tu Ho	2818	

✓	Rejected
≡	Allowed

-	(Through numeral) Cancelled
+	Restricted

N	Non-Elected
I	Interference

A	Appeal
O	Objected

Claim		Date					
Final	Original	8/10/04	2/17/05	7/20/05	10/22/05	2/10/06	
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APR 09 2007

Serial No. 10/430,696

*Attorney Docket* OPTOLUAI-003

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

JOEL DRY

Group Art No.: 2818

Serial No. 10/430,696

Examiner: Tu Tu V Ho

Filed: 05/05/2003

Title: LIGHT EMITTING DIODE LIGHT SOURCE

Commissioner of Patents

PO Box 1450

Alexandria, VA 22313-1450

RESPONSE

This is responsive to the Office Action dated 11/08/2006. A petition for extension is filed herewith.

Please amend the application as follows.

An amendment to the Specification begins at page 2.

A listing of the claims presently in the application begins at page 3.

Remarks are at page 10.

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APR 09 2007

Serial No. 10/430,696

**IN THE SPECIFICATION:**

Please amend the specification by adding the following paragraph

[0044] As used in the foregoing description and in the claims appended hereto, certain terms are utilized that may be interpreted by some in a non-conventional manner. So that the meaning of those certain terms is clear, the following terms are defined as follows:

“Elongate” as used herein means having more length than width;

“Member” as used herein means “a structural unit” and as such does not refer to the elements that may form the structural unit.

“Conductive” as used herein is an adjective that is used to describe a “conductor” as contrasted with an “insulator.” Conductors have a “conductivity” property that is high as contrasted to insulators that have a low “conductivity” (“conductivity” is a physical property referred to as the conductance of a material);

“Thermally conductive member” is structural unit that is a thermal conductor. Typical thermal conductors include metals as contrasted with thermal insulators such as polyamide, glass-epoxy and similar conventional materials utilized for printed circuit boards.

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APR 09 2007

Serial No. 10/430,696

IN THE CLAIMS:

**CLAIM 1 (ORIGINAL).** A light source comprising:

an elongate thermally conductive member having an outer surface;

a plurality of light emitting diodes carried on said elongate member outer surface at least some of said light emitting diodes being disposed in a first plane and others of said light emitting diodes being disposed in a second plane not coextensive with said first plane;

said elongate thermally conductive member being configured to conduct heat away from said light emitting diodes to fluid contained by said elongate thermally conductive member;

said elongate thermally conductive member comprises one or more surface discontinuities to enhance heat dissipation; and

a fluid movement device in fluid communication with said elongate thermally conductive member to enhance movement of said fluid over at least some of said heat surface discontinuities.

**CLAIM 2 (ORIGINAL).** A light source in accordance with claim 1, wherein:

said fluid movement device comprises an electromechanical device.

**CLAIM 3 (ORIGINAL).** A light source in accordance with claim 2, wherein:

said electromechanical device comprises a fan.

**CLAIM 4 (ORIGINAL).** A light source in accordance with claim 1, wherein:

said fluid movement device comprises an electronic device.

Serial No. 10/430,696

**CLAIM 5 (ORIGINAL).** A light source in accordance with claim 1, wherein:  
said fluid movement device comprises a solid state device.

**CLAIM 6 (ORIGINAL).** A light source in accordance with claim 1, wherein:  
said fluid movement device comprises an piezoelectric device.

**CLAIM 7 (ORIGINAL).** A light source in accordance with claim 1, wherein:  
said elongate thermally conductive member is configured to conduct heat away from said  
light emitting diodes to fluid proximate said elongate member outer surface.

**CLAIM 8 (ORIGINAL).** A light source in accordance with claim 7, wherein:  
said fluid proximate said elongate member outer surface comprises air.

**CLAIM 9 (ORIGINAL).** A light source in accordance with claim 7, wherein:  
said fluid movement device comprises an electromechanical device.

**CLAIM 10 (ORIGINAL).** A light source in accordance with claim 9, wherein:  
said electromechanical device comprises a fan.

**CLAIM 11 (ORIGINAL).** A light source in accordance with claim 7, wherein:  
said fluid movement device comprises an electronic device.

**CLAIM 12 (ORIGINAL).** A light source in accordance with claim 7, wherein:

Serial No. 10/430,696

said fluid movement device comprises a solid state device.

CLAIM 13 (ORIGINAL). A light source in accordance with claim 12, wherein:

said fluid movement device comprises an piezoelectric device.

CLAIM 14 (ORIGINAL). A light source in accordance with claim 1, wherein:

said fluid contained by said elongate thermally conductive member is a cooling medium other than air.

CLAIM 15 (ORIGINAL). A light source in accordance with claim 1, wherein:

said elongate thermally conductive member comprises a tube.

CLAIM 16 (ORIGINAL). A light source in accordance with claim 15, wherein:

said tube has a cross-section in the shape of a polygon.

CLAIM 17 (PREVIOUSLY PRESENTED). A light source in accordance with claim 15, wherein:

said tube has a cross-section having flat portions.

CLAIM 18 (ORIGINAL). A light source in accordance with claim 1, wherein:

said elongate thermally conductive member comprises a channel.

CLAIM 19 (ORIGINAL). A light source in accordance with claim 18, wherein:



Serial No. 10/430,696

said elongate thermally conductive member comprises an extrusion.

**CLAIM 20 (ORIGINAL).** A light source in accordance with claim 18, wherein:

said extrusion is an aluminum extrusion.

**CLAIM 21 (ORIGINAL).** A light source in accordance with claim 1, wherein:

each of said light emitting diodes emits white light.

**CLAIM 22 (ORIGINAL).** A light source in accordance with claim 1, wherein:

at least some of said light emitting diodes emit colored light.

**CLAIM 23 (ORIGINAL).** A light source comprising:

an elongate thermally conductive member having an outer surface;

a plurality of light emitting diodes carried on said elongate member outer surface at least some of said light emitting diodes being disposed in a first plane and others of said light emitting diodes being disposed in a second plane not coextensive with said first plane;

said elongate thermally conductive member being configured to conduct heat away from said light emitting diodes to fluid contained by said elongate thermally conductive member; and

a cooling apparatus coupled to said elongate thermally conductive member to enhance cooling of said plurality of light emitting diodes.

**CLAIM 24 (ORIGINAL).** A light source in accordance with claim 23, wherein:

said cooling device comprises a solid state cooling device.

Serial No. 10/430,696

**CLAIM 25 (WITHDRAWN).** A light source in accordance with claim 23 wherein:  
said cooling device comprises a Peltier device.

**CLAIM 26 (ORIGINAL).** A light source in accordance with claim 23 wherein:  
said cooling device comprises a Piezoelectric device.

**CLAIM 27 (PREVIOUSLY PRESENTED).** A light source comprising:  
an elongate thermally conductive member having an outer surface;  
at least one light emitting diode carried on said elongate member outer surface;  
said elongate thermally conductive member being configured to conduct heat away from  
said at least one light emitting diode; and  
cooling apparatus in thermal communication with said elongate thermally conductive  
member to enhance cooling of said at least one light emitting diode, said cooling apparatus being  
selected from one of a solid state cooling device, a Peltier cooling device, and a Piezoelectric  
device.

**CLAIM 28 (CANCELED).**

**CLAIM 29 (CANCELED).**

**CLAIM 30 (CANCELED).**

**CLAIM 31 (PREVIOUSLY PRESENTED).** A light source comprising:  
an elongate thermally conductive member having an outer surface;

Serial No. 10/430,696

at least one light emitting diode carried on said elongate member outer surface;

one or more electrical conductors carried by said elongate thermally conductive member and connected to said at least one light emitting diode to supply electrical power thereto;

said elongate thermally conductive member being configured to conduct heat away from said at least one light emitting diode to fluid contained by said elongate thermally conductive member; and

a fluid moving device in fluid communication with said elongate thermally conductive member to move said fluid.

**CLAIM 32 (PREVIOUSLY PRESENTED).** A light source comprising:

an elongate thermally conductive member having an outer surface;

a plurality of light emitting diodes carried on said elongate member outer surface at least some of said light emitting diodes being disposed in a first plane and others of said light emitting diodes being disposed in a second plane not coextensive with said first plane;

electrical conductors carried by said elongate thermally conductive member and connected to said plurality of light emitting diodes to supply electrical power thereto; and

said elongate thermally conductive member being configured to conduct heat away from said light emitting diodes to fluid contained by said elongate thermally conductive member;

a fluid moving device in fluid communication with said elongate thermally conductive member to move said fluid; and

a coating carried on said elongate thermally conductive member.

**CLAIM 33 (ORIGINAL).** A light source in accordance with claim 32, wherein:

Serial No. 10/430,696

said coating is infused with optically reflective material.

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APR 09 2007

Serial No. 10/430,696

## REMARKS

Claims 1-27 and 31-33 are in the application.

Claim 25 stands withdrawn from consideration.

The Examiner's restriction requirement was traversed.

Claim 25 stands withdrawn from consideration. Claim 25 depends from claim 23 and should claim 23 be found allowable, applicant requests that claim 25 also be considered and the restriction requirement withdrawn.

Claim 27 stands rejected under 35 U.S.C. 102(e) as anticipated by Jones et al.

Claim 27 stands rejected under 35 U.S.C. 102(e) as anticipated by Yoneda et al.

Claims 1-4, 7-11, 15-22, 23, 31, 32, and 33 stand rejected under 35 U.S.C. 103(a) as unpatentable over Arndt et al. "in view of common knowledge in the art as evident by Pal et al."

Claims 5-6, 12, 13, 24, and 26 stand rejected under 35 U.S.C. 103(a) as "being unpatentable over Arndt et al. ... in view of common knowledge and further in view of Losinski..."

## DEFINITIONS

It is respectfully submitted that the Examiner's analysis of the references is fundamentally flawed on the basis that the Examiner cites definitions and references, but does not properly apply the definitions and references.

### "CONDUCTIVITY vs CONDUCTIVE

First, it is respectfully submitted that the Examiner fails to understand the difference between "conductivity" and "conductive". The Examiner treats the terms as being synonymous and is apparently interchanging the terms.

In physics, thermal conductivity,  $k$ , is the intensive property of a material that indicates its ability to conduct heat.

It is defined as the quantity of heat,  $Q$ , transmitted in time  $t$  through a thickness  $L$ , in a direction normal to a surface of area  $A$ , due to a temperature difference  $\Delta T$ , under steady state conditions and when the heat transfer is dependent only on the temperature gradient.

The Examiner's attention is directed to the Hukseflux article that he has cited.

The second paragraph on page 1 states:

Serial No. 10/430,696

**Thermal conductivity is a property of materials** that expresses the heat flux  $f$  ( $W/m^2$ ) that will flow through the material if a certain temperature gradient  $DT$  ( $K/m$ ) exists over the material.

The fourth paragraph on page 1 states:

**It should be noted that thermal conductivity is a property ....**

The Hukseflux article lists "Orders of magnitude of the thermal conductivity" of several materials.

In the engineering and physical sciences, it is common to classify materials as electrical conductors and electrical insulators depending upon whether the material is "conductive" or not. **Similarly, it is common to classify materials as thermal conductors and thermal insulators depending on whether the material is thermally "conductive" or not.**

The Examiner makes no distinction as to whether a material is conductive or not based upon the fact that conductivity (which is a material property) may be measured for all materials. The Examiner's approach is not consistent with engineering and scientific understanding. It is respectfully submitted that the Examiner's approach is wrong and does extreme violence to all electrical, electronic, semiconductor, material science, and physics based inventions and teachings. The Examiner's approach destroys any meaning to "conductive" and "insulative"

Still further, the Examiner has selectively read the dictionary and various references in an attempt to meet the structural limitations of Applicant's novel structures. It is respectfully submitted that although a broad interpretation of terms is a permissible, and even desirable, methodology in the determination as to claim coverage, it is not permissible to utilize an interpretation that is not applicable to the invention claimed.

#### DEFINITION OF MEMBER

The Examiner points to the definition of "member", selects an inappropriate specialized one of the several definitions and then applies a "gloss over" of the inappropriate definition to meet the structure of the claim element.

1. A distinct part of a whole, especially:
  - a. *Linguistics*. A syntactic unit of a sentence; a clause.
  - b. *Logic*. A proposition of a syllogism.
  - c. *Mathematics*. An element in a set.
2. A part or an organ of a human or animal body, as:
  - a. A limb, such as an arm or a leg.
  - b. The penis.
3. A part of a plant.

Serial No. 10/430,696

4. One that belongs to a group or an organization: *a club member; a bank that is a member of the FDIC.*
5. *Mathematics.* The expression on either side of an equality sign.
6. A structural unit, such as a beam or wall.

How does the Examiner conclude from the foregoing definition of member that:

"As for the limitation 'member', member is a distinct part of a whole or a structural unit such as a limb, a wall, or a beam, each of which comprises other members"?

The first definition is not relevant to the present invention. The instant invention does not relate to "Linguistics", "Logic", or "Mathematics". However, the "member" of the structure recited is a "distinct part of a whole". That definition does not state, as the Examiner is attempting to find, that the "distinct part" includes the "whole."

The instant invention is not a part or an organ of human or an animal body.

The instant invention is not a part of a plant.

The instant invention is not related to a group or organization.

The instant invention does not pertain to mathematics.

**The most relevant definition of member is "a structural unit".**

It is respectfully submitted that the Examiner has turned the definition of "member" on its head. The definition of "member" in the context of the present invention is "a structural unit"

Where in the definition that the Examiner relies on is there any statement that a "member is ... a structural unit... each of which comprises other members."?

Does a "beam" comprise other "beams"? Does a "wall" comprise other "walls"?

It is respectfully submitted that nothing in the definition of a "member" states that a member comprises other members. It is also respectfully requested that the Examiner is not relying on the cited definition of "member" but rather is distorting the definition in an attempt to meet the structural limitations of the claimed invention.

If it is a wall that is referred to, it is respectfully submitted that one would refer to a "wall member", placing the term "member" in context. If the term "wall member" were used, it would include the structure of that wall, but would not include, for example, a ceiling supported by the wall or a floor upon which the wall is supported. However, the attempted modification that the Examiner is relying on is so expansive that a "wall member" could include the floor, the ceiling, and even connecting walls. All terms must be considered in context- no matter how broad or expansive the definition.

#### DEFINITION OF ELONGATE

The American Heritage® Dictionary defines elongate when used as an adjective as follows:  
elongate (adj.) Made longer; extended.

Serial No. 10/430,696

elongate (adj.) Having more length than width; slender.

The Examiner has at page 20 presented an argument with respect to the definition of elongate. The Examiner states:

As correctly quoted by Applicant, 'elongate' is something 'extended' (page 24), the cross-section view of Fig. 2B must be extended to be(come) the tube; furthermore, if one were to interpret 'elongate' using only the narrow meaning 'having more length than width' as quoted by Applicant, one of ordinary skill in the art would find it hard to accept that the tube 3/1, having an infinite combinations (sic) of various lengths and widths and only a few occurrences of length= width, not having more length than width (sic).

Applicant can not make sense of what the Examiner is attempting to state since the statement makes no logical sense.

However, Applicant has consistently utilized the term "elongate" in the specification consistent with the definition of "having more length than width."

If what the Examiner is attempting to argue is that somehow the statement at col.4, lines 41-61 of the '819 reference teaches or suggests an elongate structure. However, the passage relied makes no mention of an elongate structure and merely states that "an array of LEDs 2 is laminated around a tubularly shaped, cylindrical hollow cooling member."

It is respectfully submitted that the length of a tubularly shaped, cylindrical member is measured along its axis and that the width of such a member is its diameter. Typical rotating lights for emergency vehicles are "squat" in shape, i.e., the length is equal to or less than the width of the light.

#### AMENDMENT TO THE SPECIFICATION

To make it perfectly clear and to remove any ambiguity, a definitional paragraph is added to the Specification as paragraph [0044] as follows:

[0044] As used in the foregoing description and in the claims appended hereto, certain terms are utilized that may be interpreted by some in a non-conventional manner. So that the meaning of those certain terms is clear, the following terms are defined as follows:

"Elongate" as used herein means having more length than width:

"Member" as used herein means "a structural unit" and as such does not refer to the elements that may form the structural unit:

"Conductive" as used herein is an adjective that is used to describe a "conductor" as contrasted with an "insulator." Conductors have a "conductivity" property that is high as contrasted to insulators that have a low "conductivity" ("conductivity" is a physical property referred to as the conductance of a material):



Serial No. 10/430,696

“Thermally conductive member” is structural unit that is a thermal conductor. Typical thermal conductors include metals as contrasted with thermal insulators such as polyamide and similar conventional materials utilized for printed circuit boards.

It is believed that the foregoing amendment to the specification provides a limitation to the claimed structures that results in a clarification such that much of the Examiner’s bases for rejection are traversed.

### 35 U.S.C. 102(E) REJECTIONS

#### Standard for anticipation

The standard for anticipation under 35 U.S.C. 102 is set forth in M.P.E.P. 2131:

‘A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described in a single prior art reference.’ *Verdegal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631... ‘The identical invention must be shown in as complete detail as is contained in the claim.’ *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989)....

For anticipation under 35 USC 102, the reference must teach every aspect of the claimed invention either explicitly or implicitly. Any feature not directly taught must be inherently present.

The Examiner has not met the standards for anticipation under 35 USC 102 of:

‘A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described in a single prior art reference.’ or  
‘The identical invention must be shown in as complete detail as is contained in the claim.’

The Examiner is not permitted to change the teachings of a reference in order to meet the structure claimed by an applicant.

As will be specifically pointed out below, the Examiner has failed to follow this clear directive for determining anticipation.

JONES ET AL.

Claim 27 recites:

A light source comprising:  
an elongate thermally conductive member having an outer surface;  
at least one light emitting diode carried on said elongate member outer surface;  
said elongate thermally conductive member being configured to conduct heat away from said at least one light emitting diode; and

Serial No. 10/430,696

cooling apparatus in thermal communication with said elongate thermally conductive member to enhance cooling of said at least one light emitting diode, said cooling apparatus being selected from one of a solid state cooling device, a Peltier cooling device, and a Piezoelectric device.

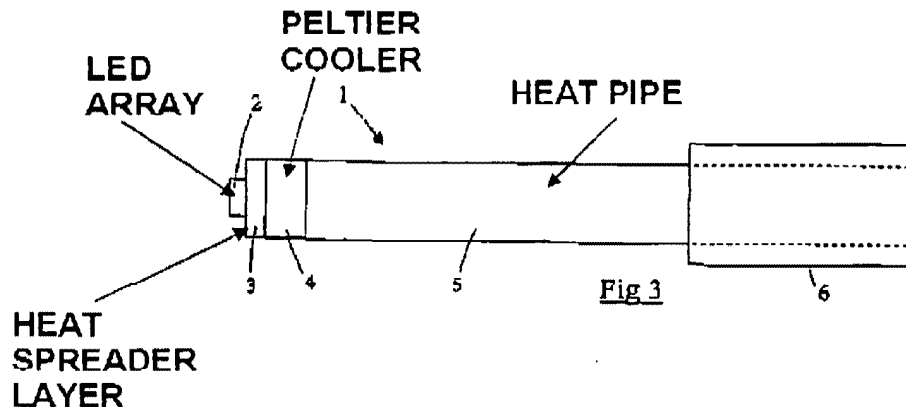
The Examiner states that the Jones et al reference discloses:

an elongate thermally conductive member (generally indicated at heat pipe 5/ heat spreader 3, Fig. 3, paragraph [0071], "member" is broadly interpreted) having an outer surface ("an outer surface", reproduced below or next page, "member" is broadly interpreted)

Paragraph [0071] of Jones et al. Paragraph [0071] states:

Referring to FIG. 3, there is shown illuminating device (generally designated 1) comprising, in sequence, an LED diode array 2, a high thermal conductivity heat spreader layer 3, a Peltier type thermoelectric cooler 4 and a heat pipe arrangement 5 (including a distal condenser 6).

Fig. 3 is reproduced below with each of LED diode array 2, a high thermal conductivity heat spreader layer 3, a Peltier type thermoelectric cooler 4 and a heat pipe arrangement 5 identified.



Heat pipe 5 is separated from heat spreader layer 3 by the Peltier Cooler 4. If the Examiner contends that Jones discloses an elongate thermally conductive member including heat pipe 5 and heat spreader layer 3, that member must of necessity include Peltier cooler 4. If it does not include the Peltier cooler which is disposed "in sequence" with and in between heat pipe 5 and heat spreader layer 3, then what the Examiner is relying on is not one "member" but two "members" (heat pipe 5 and layer 3) separated by a third member (Peltier cooler 4).

Serial No. 10/430,696

The Examiner also state that Jones et al, in addition to the elongate thermally conductive member discloses:

a cooling apparatus (4) in thermal communication with said elongate thermally conductive member to enhance cooling of said at least one light emitting diode, said cooling apparatus being a solid state device.

However, the Peltier device (4) separates the layer 3 from heat pipe 5.

The Examiners attention is drawn to Paragraphs [0073], [0074], and [0075].

Paragraph [0073] of Jones et al states:

Heat flowing from the LED diode array 2 is spread over a larger area by the high conductivity spreader layer 3. This layer is typically only a few millimeters thick and provides rapid and highly efficient heat transfer away from the diode array 2. Heat flows into the cold end of the thermoelectric Peltier cooler 4. The hot end of thermoelectric Peltier cooler 4 is in heat transfer coupling with the heat pipe 5. The high thermal conductivity layer 3 includes a diamond material, which is laid down by means of a plasma/chemical vapor deposition material.

It is clear from a reading of the above paragraph as well as paragraphs [0074] and [0075] that the heat pipe 5 is intended to conduct heat from Peltier cooler 4.

It is respectfully submitted that the Examiner is not taking the Jones reference for what it fairly teaches. The Examiner apparently considers that the heat pipe 5, Peltier cooler 4, and heat spreader layer 3 is "an elongate thermally conductive member having an outer surface"; but then considers Peltier cooler 4 as a separate element.

The Examiner must do this to meet the structural limitation set forth in claim 27.

However, the Examiner does violence to the structural teachings of Jones et al and does not properly consider the reference for what it teaches.

Claim 27 recites, inter alia:

said elongate thermally conductive member being configured to conduct heat away from said at least one light emitting diode

In contrast, Jones et al clearly shows and describes that heat pipe 5 is configured to conduct heat away from the Peltier cooler 4 and not from the LED array 2.

Accordingly, Jones et al does not show, teach or suggest Applicant's novel structure.

At no place does Jones et al show or describe any light emitting diode carried on an outer surface of heat pipe 5.

Jones specifically shows Peltier cooler 4 carried on an end of the heat pipe 5. The LED diode array is carried by Peltier cooler 4 via

Serial No. 10/430,696

**an intermediate heat spreader layer 3.** Accordingly, Jones teaches away from carrying an LED diode array on the outer surface of heat pipe 5.

Jones et al does not show or describe or suggest or anticipate the structure set out in claim 27.

YONEDA ET AL.

Yoneda et al does not show, teach or suggest or anticipate Applicant's invention of Claim 27.

Claim 27 recites:

A light source comprising:  
an elongate thermally conductive member having an outer surface;  
at least one light emitting diode carried on said elongate member outer surface;  
said elongate thermally conductive member being configured to conduct heat away from said at least one light emitting diode; and  
cooling apparatus in thermal communication with said elongate thermally conductive member to enhance cooling of said at least one light emitting diode, said cooling apparatus being selected from one of a solid state cooling device, a Peltier cooling device, and a Piezoelectric device.

The Examiner points to FIG. 20 and states that cooling plate 9 is an elongate thermally conductive member. However, cooling plate 9 is not elongate.

The American Heritage® Dictionary defines elongate:

elongate (adj.) Made longer; extended.

elongate (adj.) Having more length than width; slender.

Fig. 20 shows the plate in cross-section and is not representative of the shape of plate 9. As clearly shown in FIG. 23, substrate K which is coextensive with plate 9 is square and therefore is not elongate, nor is plate 9.

The amendment to the specification makes it clear that the term elongate in the claim means "having more length than width."

In addition, "member" is defined in the specification as "'a structural unit' and as such does not refer to the elements that may form the structural unit"

Still further, "thermally conductive member" is defined as a "structural unit that is a thermal conductor. Typical thermal conductors include metals as contrasted with thermal insulators such as polyamide and similar conventional materials utilized for printed circuit boards."

Serial No. 10/430,696

The LEDs of Yoneda et al are not carried on an outer surface of plate 9, but rather are supported on a substrate K which is described at col. 20, lines 15-29, as comprising two glass-epoxy layers 17 and 1.

Plate 9 does not carry the LEDs on its outer surface. This is made particularly clear at col. 20, lines 54-65 wherein it is specifically stated that the LEDs of Fig. 20 are directly mounted on the upper substrate 17.

Properly read, Yoneda et al describes that the LEDs are carried on a thermal insulator (17)- not on the outer surface of an "elongate thermally conductive member"

Properly read, the LEDs are carried on an inner surface of substrate K. There is no teaching or suggestion that the LEDs are carried on the outer surface of plate 9 which is a thermally conductive member.

Yoneda et al does not show, teach or suggest or anticipate every element of claim 27.

Accordingly, Yoneda et al does not show, teach, suggest or anticipate Applicant's novel structure of claim 27.

#### ARNDT '819

The Examiner relies upon the '819 patent as the primary reference for rejecting all claims in the application under 35 U.S.C. 103.

It is respectfully submitted that the '819 patent does not anticipate or make obvious the novel structures of Applicant's invention as claimed.

The '819 patent teaches away from Applicant's novel structures.

The '819 patent is directed to the dissipation of heat away from a printed circuit board and relies upon heat conduction through the printed circuit board from the copper bonding pads for the LEDs to a metal layer plated on the bottom of the pc board and then to a heat sink.

The specific problem to which the '819 patent is set out beginning at col. 1, line 60. The '819 patent teaches that heat from a LED chip is eliminated via the electrical terminal of the LED. Depending on the LED structure to which the teachings of '819 is addressed, the heat is conducted by the electrical onto solder points that are on copper solder pads on a printed circuit board. "From the solder points, the heat at first propagates in the copper pads and then on the epoxy resin material in the plane of the printed circuit board. Subsequently, the heat is output large-area to the environment by thermal radiation and thermal conduction." (col 2, lines 2-7)

The '819 patent continues on to state that the thermal resistance for one LED on a pc board is relatively slight, but becomes significant when many LEDs are "arranged in close proximity on a circuit board." (Col 2, lines 11-12). This is explained in the '819 patent as a

Serial No. 10/430,696

result of a "smaller percentual area of the PCB is now available for each individual LED for heat transmission to the environment."

"An object of the ('819) invention is to specify a surface-mounted LED arrangement that is distinguished by an improved heat elimination from the LEDs." (Col. 2, lines, 37-39)

The structures of the '819 patent are each a printed circuit board having surface mounted LEDs on one side of the circuit board, the side of the board opposite the LEDs has a metallic layer that is electrically insulated from the LEDs by the circuit board. The metal surface is applied to a cooling member. The cooling member is copper or aluminum or a cooling plate. The cooling member is secured to the circuit board by thermally conductive adhesive. (Col. 2, lines 44-62)

The printed circuit board is of plastic material that conducts heat poorly. (Col. 2, lines 63-65)

The copper pads on the circuit board "should be as large as possible in order to broaden the heat path through the printed circuit board material. (Col. 3, lines 6-9).

It is clearly apparent that the teachings of the '819 patent are directed to and limited to a structure in which a circuit board carries the LEDs. The LEDs are soldered to metal pads on the same surface of the circuit board. Heat is transferred from the pads, through the circuit board to a metal surface on the other surface of the circuit board, through an adhesive layer to a cooling member.

Thus, the structures of the '819 patent require that the LEDs are carried on copper solder pads on one surface of a circuit board and heat transfer is via solder pads through the circuit board to a metallization layer on the opposite surface of the circuit board and then to the cooling member via an adhesive layer.

The LEDs are not carried by the cooling member.

The '819 patent shows and teaches structures that are fundamentally different from Applicant's claimed invention.

More specifically, the structures shown and described in the '819 patent all utilize surface mount LEDs. The LEDs are mounted to and carried on one surface of a thermally and electrically insulating printed circuit board. More specifically, the printed circuit board is a plastic material. A cooling member is provided on the other surface of the PC board. The printed circuit other surface is secured to the cooling member.

Serial No. 10/430,696

## BRIEF DESCRIPTION OF THE DRAWINGS

The embodiment of the present invention shown in FIG. 1A contains a printed circuit board 1 on which a plurality of preferably surface-mounted LEDs 2 are applied. In a known way, the printed circuit board 1 thereby forms a circuit that comprises terminal surfaces for the mounting of the LEDs at defined locations. These terminal surfaces are provided, for example, with lands for soldering in an automatic surface mount device (SMD) equipping unit, and the LEDs 2 have their electrical contacts 2a soldered to these terminal surfaces in a subsequent mounting step.

The printed circuit board 1 can be a rigid printed circuit board, such as type FR4, and constructed of an epoxy resin

It is clearly evident that the printed circuit board is plastic or epoxy and is not a thermal conductor. This is explicitly stated at col. 3, lines 1-5

flexible plastic. For example, it can be composed of polyester or polyamide film, or it may comprise what is often referred to as flex-board. Flex board is generally multi-layer printed circuit boards that are uniformly constructed of a plurality of polyamide carrier films.

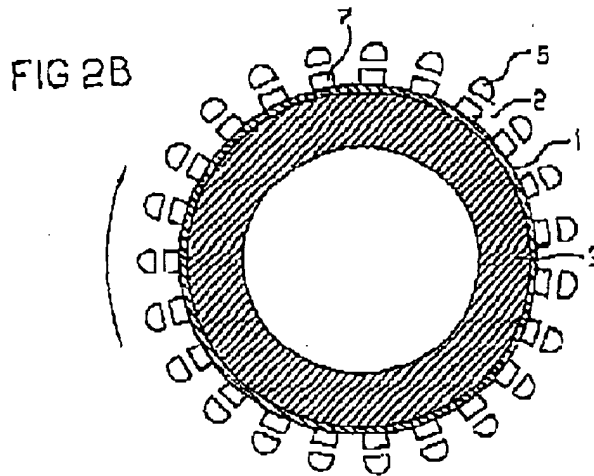
The relevant structure of the devices of the '819 patent are clearly set out in claim 1 of the '819 patent:

1. A surface-mounted LED arrangement, comprising:
  - a printed circuit board having a principal surface and a secondary surface, said printed circuit board comprising a plastic material,
  - a plurality of LEDs arranged on said principal surface,
  - a metallic layer provided on said secondary surface that is electrically insulated from said plurality of LEDs,
  - a cooling member connected to said secondary surface, wherein said printed circuit board is secured to said cooling member with at least one of a thermally conductive paste, a thermally conductive adhesive and a thermally conductive film, and

Serial No. 10/430,696

Claim 1 of the '819 patent clearly states that the LEDs are carried on one surface of a printed circuit board and a cooling member to the opposite surface of the circuit board.

The Examiner points to the specific embodiment of FIG. 2B and what he identifies member "3" as being the elongate thermally conductive member. FIG. 2b is reproduced below.



First, the structure of FIG. 2B is not an elongate member.

The American Heritage® Dictionary defines elongate:

elongate (adj.) Made longer; extended.

elongate (adj.) Having more length than width; slender.

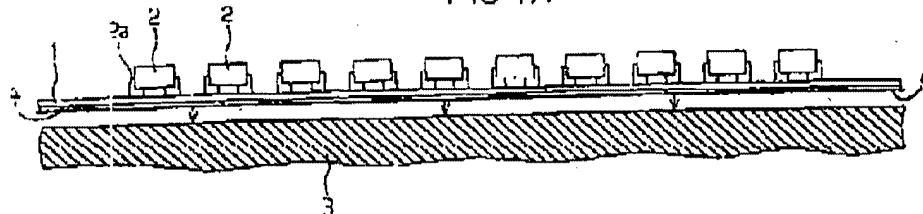
FIG. 2B does not show an elongate structure. The description of FIG. 2B fails to describe any structure that is clearly elongate. Similarly none of the drawings 1A, 2A, 2B, 2D show elongate members since they are all cross sections and as such show only at best a portion of one of the length or width of the member 3. FIG. 1B shows the only PC board 1 in its entirety and the structure is square not elongate. The squareness of the structure of FIG. 1B is easily determined by measuring the length and width of the structure. Little can be determined from the drawing of FIG. 2C since neither the drawing or description shows the cooling member or members 3 of FIG. 2C.

In addition, it is respectfully submitted that the Examiner mischaracterizes the structure of FIG. 2B. The arrangement of "3" is shown and described more clearly in the alternate embodiment of FIG. 1A.



Serial No. 10/430,696

FIG 1A



It is clear from the descriptions of the structures of FIG.1A and 2B that element 1 in all drawings is a plastic or epoxy electrically insulating and thermally insulating printed circuit board. Element 3 is a thermally conductive member to which printed circuit board 1 is attached with an adhesive layer 6. Layer 4 is a metal layer on the back side of the printed circuit board 1.

It is clear from the drawings that the thermally conductive member 3 does not carry its LEDs 2 on its outer surface. Rather, the thermally non-conductive printed circuit board 1 carries the LEDs 2. The Examiner's attention is again directed to the reproduced portions of the reference above which clearly state that the LEDs are carried on the printed circuit board 1 and not on the structure 3.

It is clear from a plain reading of the descriptions of the structures in the '819 patent that the printed circuit board 1 carries LEDs 2 on one surface and carries the heat sink 3 (thermally conductive member) on its opposite surface.

In other words, the '819 patent teaches away from the novel structures of applicant's claimed invention which set forth structure in which the LEDs, solid state light sources, radiation emitting semiconductor devices, and radiation emitting solid state devices are carried on an elongate thermally conductive member.

In addition, the Examiner points to FIG. 2B as showing solid state light sources that are in a first plane and a second plane not coextensive with the first plane. The Examiner is mistaken. All the LEDs shown in FIG. 2B are in the same plane, i.e., the plane defined by the drawing sheet.

It is clearly evident from a careful reading of the '819 patent that the '819 patent does not show, teach or describe a structure in which an elongate thermally conductive member has an outer surface that carries a plurality of light emitting diodes carried on the elongate member outer surface as called for in claim 1.

The '819 patent teaches away from Applicant's novel structures.

Claim 1 recites: "A light source comprising:  
an elongate thermally conductive member having an outer surface:

Serial No. 10/430,696

a plurality of light emitting diodes carried on said elongate member outer surface at least some of said light emitting diodes being disposed in a first plane and others of said light emitting diodes being disposed in a second plane not coextensive with said first plane;

said elongate thermally conductive member being configured to conduct heat away from said light emitting diodes to fluid contained by said elongate thermally conductive member;

said elongate thermally conductive member comprises one or more surface discontinuities to enhance heat dissipation; and

a fluid movement device in fluid communication with said elongate thermally conductive member to enhance movement of said fluid over at least some of said heat surface discontinuities.

The '819 patent does not show, teach or describe an elongate thermally conductive member.

The '819 patent does not show, teach or describe a plurality of LEDs carried on an outer surface of an elongate thermally conductive member.

The '819 patent does not show, teach or describe LEDs disposed on a first plane and a second plane coextensive with the first plane.

The '819 patent does not provide any enabling disclosure of surface discontinuities.

The '819 patent does not show, teach or describe any fluid movement devices. The Examiner acknowledges this failure in the teachings of the '819 patent. However, the Examiner fails to note that the teachings with respect to FIG. 2B that the Examiner relies on do not speak to any apparatus for providing any fluid movement device. One skilled in the art would assume that the fluid would move by convection.

Accordingly, the '819 patent does not show, teach or make obvious the structure of claim 1. The '819 patent makes no suggestion or teaching of using any fluid movement device.

#### PAL

The Pal reference is directed to a rotary fan and housing of the type that is intended to be driven by a motor assembly and which is intended for use in "high density electronic systems" such as computers and the like. There is no suggestion in the PAL reference of the applicability of such a fan to a structure such as described in the '819 patent.

Apparently the Examiner is citing the PAL reference as representative of knowledge in the art. As such, the knowledge in the art is silent on providing any cooling member to the structure of Applicant's invention.

#### STANDARDS FOR DETERMINING OBVIOUSNESS

It is respectfully submitted that the Examiner pay attention to the examination standards for determination of obviousness. The Examiner's attention is drawn, in particular, to MPEP

Serial No. 10/430,696

706.02(j) and MPEP 2143 and the three basic criteria that must be set out to establish a prima facie case of obviousness.

The first criteria is that "there must be some suggestion of motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings."

"Second, there must be a reasonable expectation of success."

"Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art and not based on applicant's disclosure." MPEP 2143 quoting *In re Tack*

MPEP 706.02(j) quotes *Ex Parte Clapp*: "To support the conclusion that the claimed invention is directed to obvious subject matter, either the references must expressly or impliedly suggest the claimed invention, or the Examiner must present a convincing line of reasoning as to why the artisan would have found the claimed invention to be obvious in light of the teachings of the references."

There is no reasonable basis for modifying the structure of the '819 patent as suggested by the Examiner. Even assuming one were to modify the structure of the '819 patent in view of the PAL patent, the resulting structure would not teach or suggest the limitations in the claims. For example, where do the references suggest that the fan of the PAL patent would be "in fluid communication with said elongate thermally conductive member to enhance movement of said fluid over at least some of said heat surface discontinuities." There is no such suggestion in the references. The suggestion comes about only from the Examiner's use of hindsight in order to combine references to meet the structure of claim 1.

It is respectfully submitted that the Examiner has not followed the examination standards for determination of obviousness.

It is respectfully submitted that the Examiner has failed to follow the factual inquiries set forth in *Graham v John Deere*.

"The factual inquiries set forth in *Graham v. John Deere Co.*, 148 USPQ 459, that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or unobviousness."

Serial No. 10/430,696

1. It is inherent in these inquiries that the Examiner must have an evidentiary basis for the determinations made. The Examiner must consider each piece of prior art for what it fairly teaches within its four corners.

2. The Examiner acknowledges the failure of the '819 reference to show or disclose significant aspects of the claimed invention. However, the Examiner without pointing to any linking reference and without providing any evidentiary affidavit makes pronouncements as to what is "knowledge in the art".

This is a complete failure to properly determine the differences between the prior art and the invention as claimed.

What the Examiner has failed to do is acknowledge that there is no teaching in the prior art PAL reference of its applicability to a structure such as in claim 1.

3. The Examiner makes no effort to resolve the level of skill of one skilled in the lighting arts.

For the foregoing reasons, the references taken singly or in combination do not show, teach or make obvious Applicant's novel invention as set forth in claim 1.

Claims 2 through 22 depend from claim 1. For the same reasons that claim 1 is not shown, taught or made obvious by the '819 patent and/or the PAL et al. patent, taken singly or in combination, claims 2 through 22 are likewise not shown, taught or made obvious by the '819 patent and/or the PAL et al. patent taken singly or in combination.

Claim 23 recites:

A light source comprising:

an elongate thermally conductive member having an outer surface;  
a plurality of light emitting diodes carried on said elongate member outer surface at least some of said light emitting diodes being disposed in a first plane and others of said light emitting diodes being disposed in a second plane not coextensive with said first plane;

said elongate thermally conductive member being configured to conduct heat away from said light emitting diodes to fluid contained by said elongate thermally conductive member; and

a cooling apparatus coupled to said elongate thermally conductive member to enhance cooling of said plurality of light emitting diodes.

The '819 patent does not show, teach or describe an elongate thermally conductive member.

The '819 patent does not show, teach or describe a plurality of LEDs carried on an outer surface of an elongate thermally conductive member.

The '819 patent does not show, teach or describe LEDs disposed on a first plane and a second plane coextensive with the first plane.

Serial No. 10/430,696

The '819 patent does not show, teach or describe any fluid movement devices.

Accordingly, the '819 patent does not show, teach or makes obvious the structure of claim 23.

The PAL et al reference does not show, teach or suggest using a fan with a light source of any kind. The '819 patent does not show, teach or suggest the use of a fan.

Thus for the same reasons that claim 1 is not shown, taught, or made obvious by the '819 patent and/or the PAL patent taken singly or in combination, claim 23 is not shown, taught or made obvious by the references taken singly or in combination.

Claims 24-26 depend from claim 23. For the same reasons that claims 1 and 23 are not shown, taught, or made obvious by the '819 patent and/or the PAL patent taken singly or in combination, claims 24-26 are not shown, taught or made obvious by the references taken singly or in combination.

Claim 31 recites:

A light source comprising:

an elongate thermally conductive member having an outer surface;  
at least one light emitting diode carried on said elongate member outer  
surface;

one or more electrical conductors carried by said elongate thermally conductive member and connected to said at least one light emitting diode to supply electrical power thereto;

said elongate thermally conductive member being configured to conduct heat away from said at least one light emitting diode to fluid contained by said elongate thermally conductive member; and

a fluid moving device in fluid communication with said elongate thermally conductive member to move said fluid.

The '819 patent does not show, teach or describe an elongate thermally conductive member.

The '819 patent does not show, teach or describe a plurality of LEDs carried on an outer surface of an elongate thermally conductive member.

The '819 patent does not show, teach or describe LEDs disposed on a first plane and a second plane coextensive with the first plane.

The '819 patent does not show, teach or describe any fluid movement devices.

Accordingly, the '819 patent does not show, teach or makes obvious the structure of claim 31.

The PAL et al reference does not show, teach or suggest using a fan with a light source of any kind. The '819 patent does not show, teach or suggest the use of a fan.

Serial No. 10/430,696

Thus for the same reasons that claim 1 is not shown, taught, or made obvious by the '819 patent and/or the PAL patent taken singly or in combination, claim 31 is not shown, taught or made obvious by the references taken singly or in combination.

**Claim 32** recites:

A light source comprising:

an elongate thermally conductive member having an outer surface;

a plurality of light emitting diodes carried on said elongate member outer surface at least some of said light emitting diodes being disposed in a first plane and others of said light emitting diodes being disposed in a second plane not coextensive with said first plane;

electrical conductors carried by said elongate thermally conductive member and connected to said plurality of light emitting diodes to supply electrical power thereto; and said elongate thermally conductive member being configured to conduct heat away from said light emitting diodes to fluid contained by said elongate thermally conductive member;

a fluid moving device in fluid communication with said elongate thermally conductive member to move said fluid; and

a coating carried on said elongate thermally conductive member.

As with claim 1, the '819 patent does not show, teach or describe an elongate thermally conductive member.

The '819 patent does not show, teach or describe a plurality of LEDs carried on an outer surface of an elongate thermally conductive member.

The '819 patent does not show, teach or describe LEDs disposed on a first plane and a second plane coextensive with the first plane.

The '819 patent does not show, teach or describe any fluid movement devices.

Accordingly, the '819 patent does not show, teach or makes obvious the structure of claim 32.

The PAL et al. patent does not show, teach or suggest use of the fan disclosed therein for any type of light source.

For the same reasons that claim 1 is not shown, taught, or made obvious by the '819 patent and/or the PAL patent taken singly or in combination, claim 32 is not shown, taught or made obvious by the references taken singly or in combination.

The Examiner also states, with respect to claims 4 and 11 that "the electromechanical device comprises an electronic device."

Serial No. 10/430,696

At no point in the PAL et al or '819 patents is there any showing, teaching or even suggestion of the use of an electronic cooling device.

For this additional reason, claims 4 and 11 are not shown, taught or made obvious by the '819 and PAL et al patents taken singly or in combination.

With respect to claim 16, the Examiner states that "Although the reference does not disclose that the shape could be a polygon, the shape differences are considered obvious and are not patentable unless unobvious or unexpected results are obtained from these changes."

With respect to claim 17, the Examiner states: "said tubular thermally conductive member...should have a cross-section having flat portions."

With respect to claim 18, the Examiner states: "said tubular thermally conductive member...should comprise a channel."

The Examiner provides no basis for his conclusion that shape differences are considered obvious. The Examiner provides no basis as to why the thermally conductive member "should" anything. If the Examiner persists in his rejection of claims 16, 17, and 18, the Examiner is specifically requested to provide the prior art citation or basis for his conclusionary statements with respect to these claims or alternatively to provide an affidavit setting forth the factual basis for the conclusionary statements.

In view of the foregoing, claims 1-4, 7-11, 15-22, 23, 31, 32, and 33 are not shown taught or made obvious by the Arndt et al. and Pal et al references taken singly or in combination.

#### LOSINSKI

The Examiner in rejecting claims 5-6, 12, 13, 24, and 26 under 35 U.S.C. 103(a) states that the claims are "unpatentable over Arndt et al. ...in view of common knowledge and further in view of Losinski..."

The Examiner cites Losinski as teaching "the use of a solid-state piezoelectric device to remove heat, and further teaches that a piezoelectric device has many advantages.... Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to form the reference's device such that its fluid movement device is a solid-state piezoelectric device. One would have been motivated to make such a change in view of the teachings of Losinski that a solid state fan is better than a traditional fan."

The Examiner has not provided any basis "common knowledge." The mere citation to a reference showing a fan is not a basis that ties the use of a fan to the specific structures recited in the claims. Accordingly, the basis for this rejection fails.

The Examiner's attention is directed to MPEP 2144.03 which clearly sets forth the standards, in accordance with *In re Zurko* and the other cases cited therein, for reliance on "well known" prior art. The Examiner's attention in particular is directed to 2144.03 C wherein "If applicant

Serial No. 10/430,696

challenges a factual assertion as not properly officially noticed or not properly based upon common knowledge, the Examiner must support the finding with adequate evidence."

The Examiner has failed to support his contention of "common knowledge." Applicant specifically requests that the Examiner support his assertion with evidence as mandated by the MPEP.

The Examiner's suggestion that one would have been motivated to utilize a solid state fan with the structure of the '819 patent is based upon unsupportable and flawed logic.

The '819 patent does not show, teach or suggest the use of any cooling device. The '819 patent does not show, teach or suggest the use of a "traditional fan."

The Losinski patent does not show, teach or suggest that the piezoelectric fan may be used with a light source.

The Losinski patent does not state that "a solid state fan is better than a traditional fan" as the Examiner represents. Rather, Losinski states that "rotary fans have many drawbacks" (col. 1, line 15). In addition, Losinski states that the piezoelectric fans provide axial flow and that "Axial flow is advantageous for applications involving a substantially flat circuit board or electronic component system in a housing assembly that provides little clearance for airflow."

Thus there is no suggestion in Losinski that the piezoelectric fan may be used in a structure such as that of Applicant's invention.

The Examiner's attention is drawn, in particular, to MPEP 706.02(j) and MPEP 2143 and the three basic criteria that must be set out to establish a prima facie case of obviousness.

The first criteria is that "there must be some suggestion of motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings."

"Second, there must be a reasonable expectation of success."

"Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art and not based on applicants disclosure." MPEP 2143 quoting *In re Iacch*

MPEP 706.02(j) quotes *Ex Parte Clapp*: "To support the conclusion that the claimed invention is directed to obvious subject matter, either the references must expressly or impliedly suggest the claimed invention, or the Examiner must present a convincing line of reasoning as to why the artisan would have found the claimed invention to be obvious in light of the teachings of the references."



Serial No. 10/430,696

MPEP 2143.01 clearly points out that the "level of skill in the art cannot be relied upon to provide the suggestion to combine references" *Al-Site Corp. v. ISI Int'l Inc.*

MPEP 2143.01 further provides the clear guidance that: "A statement that modifications of the prior art to meet the claimed invention would have been 'well within the ordinary skill of the art at the time the claimed invention was made' because the references relied upon teach that all aspects of the claimed invention were individually known in the art is not sufficient to establish a *prima facie* case of obviousness without some objective reason to combine the teachings of the references." citing *Ex parte Levensgood*

MPEP 2143.01 further clearly provides the guidance that the proposed modification of the prior art cannot change the principle of operation of the prior art reference.

The '819 patent fails to even suggest using any device for enhancing heat removal from the LEDs. The additional references cited by the Examiner fail to suggest use with a light source or removal of heat from LEDs. The Examiner has failed to provide any convincing line of reasoning as to why the Arndt reference would be modified as the Examiner suggests. One skilled in the art would, in the absence of a specific teaching to the contrary not associate the use of a fan or a Peltier device in conjunction with an emergency vehicle rotating light. At best, one skilled in the art would assume rotation of the device itself could provide fluid movement, or alternatively convective movement of air. Accordingly, Applicant has traversed the basis for the Examiner's "common knowledge" argument and if the Examiner does not withdraw the argument and its basis, Applicant requests that the Examiner provide adequate evidence to support his position.

It is clearly evident that the Examiner is relying on Applicant's disclosure to make the suggestion of utilizing "a fluid movement device in fluid communication with said elongate thermally conductive member to enhance movement of said fluid over at least some of said heat surface discontinuities," as called for in claim 1 and similar recitations in the remaining claims.

There is no suggestion in any of the references to combine them as the Examiner suggests. Even the selection of references made by the Examiner is being made with hindsight.

Applicant does not acquiesce in any of the Examiner's positions taken in sections 8 through 12. It is believed that the foregoing comments reaffirm Applicant's positions and show the failings in the logic employed by the Examiner. In addition, with respect to the '849 reference, the Examiner's attention is further drawn to Col. 20, lines 15-20 where it is clearly stated that the substrate K comprising layer 1 is a "gla-epoxy" substrate- a well known heat insulator.

It is therefore respectfully submitted that none of the references taken singly or in combination show, teach or make obvious Applicant's novel structures.

It is believed that all the claims in the application are now in condition for allowance. Reexamination and reconsideration are requested. It is also requested that the claims be allowed and this application be passed to issue.

Serial No. 10/430,696

It is further requested that claim 25 be reinstated and that claim 25 also be allowed.

An early notice of allowance would be appreciated.

Respectfully submitted,

Donald J. Lenkszus

Donald J. Lenkszus, Reg No 28,096

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PTO/GB/30 (09-08)

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Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

<b>Request for Continued Examination (RCE) Transmittal</b>  Address to: Mail Stop RCE Commissioner for Patents P.O. Box 1450 Alexandria, VA 22313-1450	Application Number	10/430,696
	Filing Date	05/05/2003
	First Named Inventor	JOEL DRY
	Art Unit	2818
	Examiner Name	TU TU V HO
	Attorney Docket Number	OPTOLUM-003

This is a Request for Continued Examination (RCE) under 37 CFR 1.114 of the above-identified application. Request for Continued Examination (RCE) practice under 37 CFR 1.114 does not apply to any utility or plant application filed prior to June 8, 1995, or to any design application. See Instruction Sheet for RCEs (not to be submitted to the USPTO) on page 2.

- 1. Submission required under 37 CFR 1.114** Note: If the RCE is proper, any previously filed unentered amendments and amendments enclosed with the RCE will be entered in the order in which they were filed unless applicant instructs otherwise. If applicant does not wish to have any previously filed unentered amendment(s) entered, applicant must request non-entry of such amendment(s).

a. ☐ Previously submitted. If a final Office action is outstanding, any amendments filed after the final Office action may be considered as a submission even if this box is not checked.

i. ☐ Consider the arguments in the Appeal Brief or Reply Brief previously filed on \_\_\_\_\_

ii. ☐ Other \_\_\_\_\_

b. ☒ Enclosed

i. ☒ Amendment/Reply

ii. ☐ Affidavit(s)/ Declaration(s)

iii. ☐ Information Disclosure Statement (IDS)

iv. ☒ Other PETITION FOR EXTENSION OF TIME
- 2. Miscellaneous**

a. ☐ Suspension of action on the above-identified application is requested under 37 CFR 1.103(c) for a period of \_\_\_\_\_ months. (Period of suspension shall not exceed 3 months; Fee under 37 CFR 1.17(i) required)

b. ☐ Other \_\_\_\_\_
- 3. Fees** The RCE fee under 37 CFR 1.17(e) is required by 37 CFR 1.114 when the RCE is filed. The Director is hereby authorized to charge the following fees, any underpayment of fees, or credit any overpayments, to Deposit Account No. \_\_\_\_\_. I have enclosed a duplicate copy of this sheet.

a. ☐ \_\_\_\_\_

i. ☒ RCE fee required under 37 CFR 1.17(e)

ii. ☒ Extension of time fee (37 CFR 1.139 and 1.17)

iii. ☐ Other \_\_\_\_\_

b. ☐ Check in the amount of \$ \_\_\_\_\_ enclosed

c. ☒ Payment by credit card (Form PTO-2038 enclosed)

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## SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT REQUIRED

Signature	/Donald J Lenkszus/	Date	04/09/2007
Name (Print/Type)	DONALD J LENKSZUS	Registration No.	28,086

## CERTIFICATE OF MAILING OR TRANSMISSION

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Mail Stop RCE, Commissioner for Patents, P. O. Box 1450, Alexandria, VA 22313-1450 or facsimile transmitted to the U.S. Patent and Trademark Office on the date shown below.	
Signature	/Donald J Lenkszus/
Name (Print/Type)	DONALD J LENKSZUS
Date	04/09/2007

This collection of information is required by 37 CFR 1.114. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Mail Stop RCE, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450. If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

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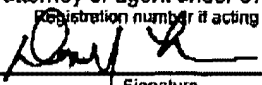
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<b>PETITION FOR EXTENSION OF TIME UNDER 37 CFR 1.136(a)</b> FY 2006 (Fees pursuant to the Consolidated Appropriations Act, 2006 (H.R. 4518).)		Docket Number (Optional) <b>OPTO LUM-003</b>	
Application Number <b>10/430,696</b>		Filed <b>5/5/2003</b>	
For <b>LIGHT EMITTING DIODE LIGHT SOURCE</b>			
Art Unit <b>2818</b>		Examiner <b>TU TU V HO</b>	
This is a request under the provisions of 37 CFR 1.136(a) to extend the period for filing a reply in the above identified application.			
The requested extension and fee are as follows (check time period desired and enter the appropriate fee below):			
		<b>Fee</b>	<b>Small Entity Fee</b>
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<input checked="" type="checkbox"/>	Two months (37 CFR 1.17(a)(2))	\$450	\$225
<input type="checkbox"/>	Three months (37 CFR 1.17(a)(3))	\$1020	\$510
<input type="checkbox"/>	Four months (37 CFR 1.17(a)(4))	\$1590	\$795
<input type="checkbox"/>	Five months (37 CFR 1.17(a)(5))	\$2160	\$1080
<input checked="" type="checkbox"/> Applicant claims small entity status. See 37 CFR 1.27. <input type="checkbox"/> A check in the amount of the fee is enclosed. <input checked="" type="checkbox"/> Payment by credit card. Form PTO-2038 is attached. <input type="checkbox"/> The Director has already been authorized to charge fees in this application to a Deposit Account. <input type="checkbox"/> The Director is hereby authorized to charge any fees which may be required, or credit any overpayment, to Deposit Account Number _____ I have enclosed a duplicate copy of this sheet.			
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I am the <input type="checkbox"/> applicant/inventor. <input type="checkbox"/> assignee of record of the entire interest. See 37 CFR 3.71. Statement under 37 CFR 3.73(b) is enclosed (Form PTO/SB/98). <input checked="" type="checkbox"/> attorney or agent of record. Registration Number <b>28096</b> <input type="checkbox"/> attorney or agent under 37 CFR 1.34. Registration number if acting under 37 CFR 1.34 _____			
Signature  Typed or printed name <b>Donald J. Lenkszus</b>		Date <b>04/09/2007</b> Telephone Number <b>602-463-2010</b>	
NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below.			
<input type="checkbox"/> Total of _____ forms are submitted.			

This collection of information is required by 37 CFR 1.136(a). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 5 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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Serial No. 10/430,696

*Attorney Docket OPTOLUM-003*

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

JOEL DRY

Group Art No.: 2818

Serial No. 10/430,696

Examiner: Tu Tu V Ho

Filed: 05/05/2003

Title: LIGHT EMITTING DIODE LIGHT SOURCE

Commissioner of Patents

PO Box 1450

Alexandria, VA 22313-1450

RESPONSE

This is responsive to the Office Action dated 11/08/2006. A petition for extension is filed herewith.

Please amend the application as follows.

An amendment to the Specification begins at page 2.

A listing of the claims presently in the application begins at page 3.

Remarks are at page 10.

Serial No. 10/430,696

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**IN THE SPECIFICATION:**

Please amend the specification by adding the following paragraph

[0044] As used in the foregoing description and in the claims appended hereto, certain terms are utilized that may be interpreted by some in a non-conventional manner. So that the meaning of those certain terms is clear, the following terms are defined as follows:

□Elongate□as used herein means having more length than width;

□Member□as used herein means □a structural unit□and as such does not refer to the elements that may form the structural unit.

□Conductive□as used herein is an adjective that is used to describe a □conductor□as contrasted with an □insulator.□ Conductors have a □conductivity□property that is high as contrasted to insulators that have a low □conductivity□(□conductivity□is a physical property referred to as the conductance of a material);

□Thermally conductive member□is structural unit that is a thermal conductor. Typical thermal conductors include metals as contrasted with thermal insulators such as polyamide, glass-epoxy and similar conventional materials utilized for printed circuit boards.

Serial No. 10/430,696

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IN THE CLAIMS:

**CLAIM 1 (ORIGINAL).** A light source comprising:

an elongate thermally conductive member having an outer surface;

a plurality of light emitting diodes carried on said elongate member outer surface at least some of said light emitting diodes being disposed in a first plane and others of said light emitting diodes being disposed in a second plane not coextensive with said first plane;

said elongate thermally conductive member being configured to conduct heat away from said light emitting diodes to fluid contained by said elongate thermally conductive member;

said elongate thermally conductive member comprises one or more surface discontinuities to enhance heat dissipation; and

a fluid movement device in fluid communication with said elongate thermally conductive member to enhance movement of said fluid over at least some of said heat surface discontinuities.

**CLAIM 2 (ORIGINAL).** A light source in accordance with claim 1, wherein:

said fluid movement device comprises an electromechanical device.

**CLAIM 3 (ORIGINAL).** A light source in accordance with claim 2, wherein:

said electromechanical device comprises a fan.

**CLAIM 4 (ORIGINAL).** A light source in accordance with claim 1, wherein:

said fluid movement device comprises an electronic device.



Serial No. 10/430,696

**CLAIM 5 (ORIGINAL).** A light source in accordance with claim 1, wherein:  
said fluid movement device comprises a solid state device.

**CLAIM 6 (ORIGINAL).** A light source in accordance with claim 1, wherein:  
said fluid movement device comprises an piezoelectric device.

**CLAIM 7 (ORIGINAL).** A light source in accordance with claim 1, wherein:  
said elongate thermally conductive member is configured to conduct heat away from said  
light emitting diodes to fluid proximate said elongate member outer surface.

**CLAIM 8 (ORIGINAL).** A light source in accordance with claim 7, wherein:  
said fluid proximate said elongate member outer surface comprises air.

**CLAIM 9 (ORIGINAL).** A light source in accordance with claim 7, wherein:  
said fluid movement device comprises an electromechanical device.

**CLAIM 10 (ORIGINAL).** A light source in accordance with claim 9, wherein:  
said electromechanical device comprises a fan.

**CLAIM 11 (ORIGINAL).** A light source in accordance with claim 7, wherein:  
said fluid movement device comprises an electronic device.

**CLAIM 12 (ORIGINAL).** A light source in accordance with claim 7, wherein:

Serial No. 10/430,696

said fluid movement device comprises a solid state device.

**CLAIM 13 (ORIGINAL).** A light source in accordance with claim 12, wherein:

said fluid movement device comprises an piezoelectric device.

**CLAIM 14 (ORIGINAL).** A light source in accordance with claim 1, wherein:

said fluid contained by said elongate thermally conductive member is a cooling medium other than air.

**CLAIM 15 (ORIGINAL).** A light source in accordance with claim 1, wherein:

said elongate thermally conductive member comprises a tube.

**CLAIM 16 (ORIGINAL).** A light source in accordance with claim 15, wherein:

said tube has a cross-section in the shape of a polygon.

**CLAIM 17 (PREVIOUSLY PRESENTED).** A light source in accordance with claim 15, wherein:

said tube has a cross-section having flat portions.

**CLAIM 18 (ORIGINAL).** A light source in accordance with claim 1, wherein:

said elongate thermally conductive member comprises a channel.

**CLAIM 19 (ORIGINAL).** A light source in accordance with claim 18, wherein:

Serial No. 10/430,696

said elongate thermally conductive member comprises an extrusion.

**CLAIM 20 (ORIGINAL).** A light source in accordance with claim 18, wherein:

said extrusion is an aluminum extrusion.

**CLAIM 21 (ORIGINAL).** A light source in accordance with claim 1, wherein:

each of said light emitting diodes emits white light.

**CLAIM 22 (ORIGINAL).** A light source in accordance with claim 1, wherein:

at least some of said light emitting diodes emit colored light.

**CLAIM 23 (ORIGINAL).** A light source comprising:

an elongate thermally conductive member having an outer surface;

a plurality of light emitting diodes carried on said elongate member outer surface at least some of said light emitting diodes being disposed in a first plane and others of said light emitting diodes being disposed in a second plane not coextensive with said first plane;

said elongate thermally conductive member being configured to conduct heat away from said light emitting diodes to fluid contained by said elongate thermally conductive member; and

a cooling apparatus coupled to said elongate thermally conductive member to enhance cooling of said plurality of light emitting diodes.

**CLAIM 24 (ORIGINAL).** A light source in accordance with claim 23, wherein:

said cooling device comprises a solid state cooling device.

Serial No. 10/430,696

**CLAIM 25 (WITHDRAWN).** A light source in accordance with claim 23 wherein:  
said cooling device comprises a Peltier device.

**CLAIM 26 (ORIGINAL).** A light source in accordance with claim 23 wherein:  
said cooling device comprises a Piezoelectric device.

**CLAIM 27 (PREVIOUSLY PRESENTED).** A light source comprising:  
an elongate thermally conductive member having an outer surface;  
at least one light emitting diode carried on said elongate member outer surface;  
said elongate thermally conductive member being configured to conduct heat away from  
said at least one light emitting diode; and  
cooling apparatus in thermal communication with said elongate thermally conductive  
member to enhance cooling of said at least one light emitting diode, said cooling apparatus being  
selected from one of a solid state cooling device, a Peltier cooling device, and a Piezoelectric  
device.

**CLAIM 28 (CANCELED).**

**CLAIM 29 (CANCELED).**

**CLAIM 30 (CANCELED).**

**CLAIM 31 (PREVIOUSLY PRESENTED).** A light source comprising:  
an elongate thermally conductive member having an outer surface;

Serial No. 10/430,696

at least one light emitting diode carried on said elongate member outer surface;

one or more electrical conductors carried by said elongate thermally conductive member and connected to said at least one light emitting diode to supply electrical power thereto;

said elongate thermally conductive member being configured to conduct heat away from said at least one light emitting diode to fluid contained by said elongate thermally conductive member; and

a fluid moving device in fluid communication with said elongate thermally conductive member to move said fluid.

**CLAIM 32 (PREVIOUSLY PRESENTED).** A light source comprising:

an elongate thermally conductive member having an outer surface;

a plurality of light emitting diodes carried on said elongate member outer surface at least some of said light emitting diodes being disposed in a first plane and others of said light emitting diodes being disposed in a second plane not coextensive with said first plane;

electrical conductors carried by said elongate thermally conductive member and connected to said plurality of light emitting diodes to supply electrical power thereto; and

said elongate thermally conductive member being configured to conduct heat away from said light emitting diodes to fluid contained by said elongate thermally conductive member;

a fluid moving device in fluid communication with said elongate thermally conductive member to move said fluid; and

a coating carried on said elongate thermally conductive member.

**CLAIM 33 (ORIGINAL).** A light source in accordance with claim 32, wherein:

**Serial No. 10/430,696**

said coating is infused with optically reflective material.

Serial No. 10/430,696

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## REMARKS

Claims 1-27 and 31-33 are in the application.

Claim 25 stands withdrawn from consideration.

The Examiner's restriction requirement was traversed.

Claim 25 stands withdrawn from consideration. Claim 25 depends from claim 23 and should claim 23 be found allowable, applicant requests that claim 25 also be considered and the restriction requirement withdrawn.

Claim 27 stands rejected under 35 U.S.C. 102(e) as anticipated by Jones et al.

Claim 27 stands rejected under 35 U.S.C. 102(e) as anticipated by Yoneda et al.

Claims 1-4, 7-11, 15-22, 23, 31, 32, and 33 stand rejected under 35 U.S.C. 103(a) as unpatentable over Arndt et al. In view of common knowledge in the art as evident by Pal et al.

Claims 5-6, 12, 13, 24, and 26 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Arndt et al. in view of common knowledge and further in view of Losinski.

DEFINITIONS

It is respectfully submitted that the Examiner's analysis of the references is fundamentally flawed on the basis that the Examiner cites definitions and references; but does not properly apply the definitions and references.

"CONDUCTIVITY" vs CONDUCTIVE

First, it is respectfully submitted that the Examiner fails to understand the difference between "conductivity" and "conductive". The Examiner treats the terms as being synonymous and is apparently interchanging the terms.

In physics, thermal conductivity,  $k$ , is the intensive property of a material that indicates its ability to conduct heat.

It is defined as the quantity of heat,  $Q$ , transmitted in time  $t$  through a thickness  $L$ , in a direction normal to a surface of area  $A$ , due to a temperature difference  $\Delta T$ , under steady state conditions and when the heat transfer is dependent only on the temperature gradient.

The Examiner's attention is directed to the Hukseflux article that he has cited.

The second paragraph on page 1 states:

Page 10 of 31

BEST AVAILABLE COPY

Serial No. 10/430,696

**Thermal conductivity is a property of materials** that expresses the heat flux  $f$  ( $W/m^2$ ) that will flow through the material if a certain temperature gradient  $DT$  ( $K/m$ ) exists over the material.

The fourth paragraph on page 1 states:

**It should be noted that thermal conductivity is a property** □ .

The Hukseflux article lists □Orders of magnitude of the thermal conductivity□of several materials.

In the engineering and physical sciences, it is common to classify materials as electrical conductors and electrical insulators depending upon whether the material is “conductive” or not. **Similarly, it is common to classify materials as thermal conductors and thermal insulators depending on whether the material is thermally “conductive” or not.**

The Examiner makes no distinction as to whether a material is conductive or not based upon the fact that conductivity (which is a material property) may be measured for all materials. The Examiner's approach is not consistent with engineering and scientific understanding. It is respectfully submitted that the Examiner's approach is wrong and does extreme violence to all electrical, electronic, semiconductor, material science, and physics based inventions and teachings. The Examiner's approach destroys any meaning to □conductive□and □insulative□

Still further, the Examiner has selectively read the dictionary and various references in an attempt to meet the structural limitations of Applicant's novel structures. It is respectfully submitted that although a broad interpretation of terms is a permissible, and even desirable, methodology in the determination as to claim coverage, it is not permissible to utilize an interpretation that is not applicable to the invention claimed.

#### DEFINITION OF MEMBER

The Examiner points to the definition of □member□ selects an inappropriate specialized one of the several definitions and then applies a □gloss over□of the inappropriate definition to meet the structure of the claim element.

1. A distinct part of a whole, especially:
  - a. *Linguistics*. A syntactic unit of a sentence: a clause.
  - b. *Logic*. A proposition of a syllogism.
  - c. *Mathematics*. An element in a set.
2. A part or an organ of a human or animal body, as:
  - a. A limb, such as an arm or a leg.
  - b. The penis.
3. A part of a plant.



Serial No. 10/430,696

4. One that belongs to a group or an organization: *a club member; a bank that is a member of the FDIC.*
5. *Mathematics.* The expression on either side of an equality sign.
6. A structural unit, such as a beam or wall.

How does the Examiner conclude from the foregoing definition of member that:

☐As for the limitation ☐member☐member is a distinct part of a whole or a structural unit such as a limb, a wall, or a beam, each of which comprises other members☐

The first definition is not relevant to the present invention. The instant invention does not relate to ☐Linguistics☐ ☐Logic☐ or ☐Mathematics☐ However, the ☐member☐of the structure recited is a ☐distinct part of a whole☐ That definition does not state, as the Examiner is attempting to find, that the ☐distinct part☐includes the ☐whole.☐

The instant invention is not a part or an organ of human or an animal body.

The instant invention is not a part of a plant.

The instant invention is not related to a group or organization.

The instant invention does not pertain to mathematics.

**The most relevant definition of member is "a structural unit".**

It is respectfully submitted that the Examiner has turned the definition of ☐member☐on its head. The definition of ☐member☐in the context of the present invention is ☐a structural unit☐

Where in the definition that the Examiner relies on is there any statement that a ☐member is ☐ a structural unit☐ each of which comprises other members.☐

Does a ☐beam☐comprise other ☐beams☐ Does a ☐wall☐comprise other ☐walls☐

It is respectfully submitted that nothing in the definition of a ☐member☐states that a member comprises other members. It is also respectfully requested that the Examiner is not relying on the cited definition of ☐member☐but rather is distorting the definition in an attempt to meet the structural limitations of the claimed invention.

If it is a wall that is referred to, it is respectfully submitted that one would refer to a ☐wall member☐ placing the term ☐member☐in context. If the term ☐wall member☐were used, it would include the structure of that wall, but would not include, for example, a ceiling supported by the wall or a floor upon which the wall is supported. However, the attempted modification that the Examiner is relying on is so expansive that a ☐wall member☐could include the floor, the ceiling, and even connecting walls. All terms must be considered in context- no matter how broad or expansive the definition.

#### DEFINITION OF ELONGATE

The American Heritage® Dictionary defines elongate when used as an adjective as follows:  
elongate (adj.) Made longer; extended.

Serial No. 10/430,696

elongate (adj.) Having more length than width; slender.

The Examiner has at page 20 presented an argument with respect to the definition of elongate. The Examiner states:

As correctly quoted by Applicant, [elongate] is something [extended] (page 24), the cross-section view of Fig. 2B must be extended to be (come) the tube; furthermore, if one were to interpret [elongate] using only the narrow meaning [having more length than width] as quoted by Applicant, one of ordinary skill in the art would find it hard to accept that the tube 3/1, having an infinite combinations (sic) of various lengths and widths and only a few occurrences of length= width, not having more length than width (sic).

Applicant can not make sense of what the Examiner is attempting to state since the statement makes no logical sense.

However, Applicant has consistently utilized the term [elongate] in the specification consistent with the definition of [having more length than width].

If what the Examiner is attempting to argue is that somehow the statement at col 4, lines 41-61 of the [B19] reference teaches or suggests an elongate structure. However, the passage relied makes no mention of an elongate structure and merely states that [an array of LEDs 2 is laminated around a tubularly shaped, cylindrical hollow cooling member].

It is respectfully submitted that the length of a tubularly shaped, cylindrical member is measured along its axis and that the width of such a member is its diameter. Typical rotating lights for emergency vehicles are [quat] in shape, i.e., the length is equal to or less than the width of the light.

#### AMENDMENT TO THE SPECIFICATION

To make it perfectly clear and to remove any ambiguity, a definitional paragraph is added to the Specification as paragraph [0044] as follows:

[0044] As used in the foregoing description and in the claims appended hereto, certain terms are utilized that may be interpreted by some in a non-conventional manner. So that the meaning of those certain terms is clear, the following terms are defined as follows:

[Elongate] as used herein means having more length than width:

[Member] as used herein means [a structural unit] and as such does not refer to the elements that may form the structural unit:

[Conductive] as used herein is an adjective that is used to describe a [conductor] as contrasted with an [insulator]. Conductors have a [conductivity] property that is high as contrasted to insulators that have a low [conductivity] ([conductivity] is a physical property referred to as the conductance of a material):

Serial No. 10/430,696

□Thermally conductive member□is structural unit that is a thermal conductor. Typical thermal conductors include metals as contrasted with thermal insulators such as polyamide and similar conventional materials utilized for printed circuit boards.

It is believed that the foregoing amendment to the specification provides a limitation to the claimed structures that results in a clarification such that much of the Examiner's bases for rejection are traversed.

### 35 U.S.C. 102(E) REJECTIONS

#### Standard for anticipation

The standard for anticipation under 35 U.S.C. 102 is set forth in M.P.E.P. 2131:

□A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described in a single prior art reference. □*Merdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631 □ □The identical invention must be shown in as complete detail as is contained in the claim. □*Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913,1920 (Fed. Cir. 1989) □ .

For anticipation under 35 USC 102, the reference must teach every aspect of the claimed invention either explicitly or implicitly. Any feature not directly taught must be inherently present.

The Examiner has not met the standards for anticipation under 35 USC 102 of:

'A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described in a single prior art reference.' or  
'The identical invention must be shown in as complete detail as is contained in the claim.'

The Examiner is not permitted to change the teachings of a reference in order to meet the structure claimed by an applicant.

As will be specifically pointed out below, the Examiner has failed to follow this clear directive for determining anticipation.

JONES ET AL.

Claim 27 recites:

A light source comprising:  
an elongate thermally conductive member having an outer surface;  
at least one light emitting diode carried on said elongate member outer surface;  
said elongate thermally conductive member being configured to conduct heat away from said at least one light emitting diode; and

Serial No. 10/430,696

cooling apparatus in thermal communication with said elongate thermally conductive member to enhance cooling of said at least one light emitting diode, said cooling apparatus being selected from one of a solid state cooling device, a Peltier cooling device, and a Piezoelectric device.

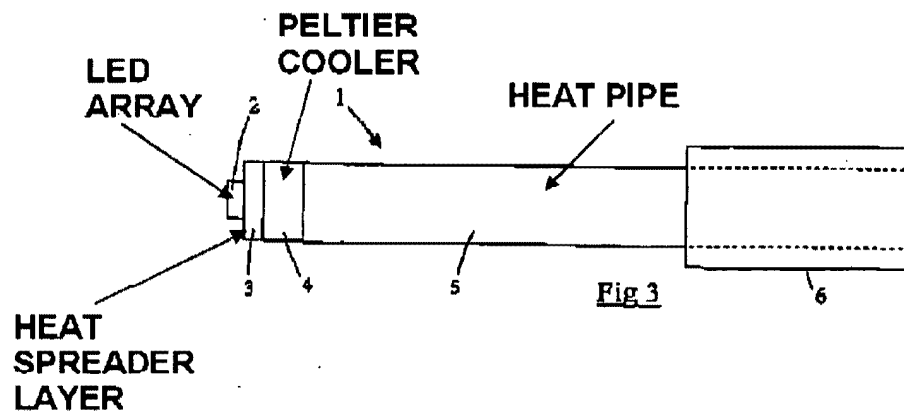
The Examiner states that the Jones et al reference discloses:

an elongate thermally conductive member (generally indicated at heat pipe 5/ heat spreader 3, Fig. 3, paragraph [0071], [member] is broadly interpreted) having an outer surface ([an outer surface] reproduced below or next page, [member] is broadly interpreted)

Paragraph [0071] of Jones et al. Paragraph [0071] states:

Referring to FIG. 3, there is shown illuminating device (generally designated 1) comprising, in sequence, an LED diode array 2, a high thermal conductivity heat spreader layer 3, a Peltier type thermoelectric cooler 4 and a heat pipe arrangement 5 (including a distal condenser 6).

Fig. 3 is reproduced below with each of LED diode array 2, a high thermal conductivity heat spreader layer 3, a Peltier type thermoelectric cooler 4 and a heat pipe arrangement 5 identified.



Heat pipe 5 is separated from heat spreader layer 3 by the Peltier Cooler 4. If the Examiner contends that Jones discloses an elongate thermally conductive member including heat pipe 5 and heat spreader layer 3, that member must of necessity include Peltier cooler 4. If it does not include the Peltier cooler which is disposed [in sequence] with and in between heat pipe 5 and heat spreader layer 3, then what the Examiner is relying on is not one [member] but two [members] (heat pipe 5 and layer 3) separated by a third member (Peltier cooler 4).

Serial No. 10/430,696

The Examiner also state that Jones et al, in addition to the elongate thermally conductive member discloses:

a cooling apparatus (4) in thermal communication with said elongate thermally conductive member to enhance cooling of said at least one light emitting diode, said cooling apparatus being a solid state device.

However, the Peltier device (4) separates the layer 3 from heat pipe 5.

The Examiners attention is drawn to Paragraphs [0073], [0074], and [0075].

Paragraph [0073] of Jones et al states:

Heat flowing from the LED diode array 2 is spread over a larger area by the high conductivity spreader layer 3. This layer is typically only a few millimeters thick and provides rapid and highly efficient heat transfer away from the diode array 2. Heat flows into the cold end of the thermoelectric Peltier cooler 4. The hot end of thermoelectric Peltier cooler 4 is in heat transfer coupling with the heat pipe 5. The high thermal conductivity layer 3 includes a diamond material, which is laid down by means of a plasma/chemical vapor deposition material.

It is clear from a reading of the above paragraph as well as paragraphs [0074] and [0075] that the heat pipe 5 is intended to conduct heat from Peltier cooler 4.

It is respectfully submitted that the Examiner is not taking the Jones reference for what it fairly teaches. The Examiner apparently considers that the heat pipe 5, Peltier cooler 4, and heat spreader layer 3 is an elongate thermally conductive member having an outer surface□ but then considers Peltier cooler 4 as a separate element.

The Examiner must do this to meet the structural limitation set forth in claim 27. However, the Examiner does violence to the structural teachings of Jones et al and does not properly consider the reference for what it teaches.

Claim 27 recites, inter alia:

said elongate thermally conductive member being configured to conduct heat away from said at least one light emitting diode

In contrast, Jones et al clearly shows and describes that heat pipe 5 is configured to conduct heat away from the Peltier cooler 4 and not from the LED array 2.

Accordingly, Jones et al does not show, teach or suggest Applicant's novel structure.

At no place does Jones et al show or describe any light emitting diode carried on an outer surface of heat pipe 5.

Jones specifically shows Peltier cooler 4 carried on an end of the heat pipe 5. The LED diode array is carried by Peltier cooler 4 via

Serial No. 10/430,696

**an intermediate heat spreader layer 3.** Accordingly, Jones teaches away from carrying an LED diode array on the outer surface of heat pipe 5.

Jones et al does not show or describe or suggest or anticipate the structure set out in claim 27.

YONEDA ET AL.

Yoneda et al does not show, teach or suggest or anticipate Applicant's invention of Claim 27.

Claim 27 recites:

A light source comprising:  
an elongate thermally conductive member having an outer surface;  
at least one light emitting diode carried on said elongate member outer surface;  
said elongate thermally conductive member being configured to conduct heat away from said at least one light emitting diode; and  
cooling apparatus in thermal communication with said elongate thermally conductive member to enhance cooling of said at least one light emitting diode, said cooling apparatus being selected from one of a solid state cooling device, a Peltier cooling device, and a Piezoelectric device.

The Examiner points to FIG. 20 and states that cooling plate 9 is an elongate thermally conductive member. However, cooling plate 9 is not elongate.

The American Heritage® Dictionary defines elongate:

elongate (adj.) Made longer; extended.

elongate (adj.) Having more length than width; slender.

Fig. 20 shows the plate in cross-section and is not representative of the shape of plate 9. As clearly shown in FIG. 23, **substrate K which is coextensive with plate 9 is square and therefore is not elongate, nor is plate 9.**

The amendment to the specification makes it clear that the term elongate in the claim means having more length than width. □

In addition, [member] is defined in the specification as [a structural unit] and as such does not refer to the elements that may form the structural unit □

Still further, [thermally conductive member] is defined as a [structural unit that is a thermal conductor. Typical thermal conductors include metals as contrasted with thermal insulators such as polyamide and similar conventional materials utilized for printed circuit boards. □

Serial No. 10/430,696

The LEDs of Yoneda et al are not carried on an outer surface of plate 9, but rather are supported on a substrate K which is described at col. 20, lines 15-29, as comprising two glass-epoxy layers 17 and 1.

Plate 9 does not carry the LEDs on its outer surface. This is made particularly clear at col. 20, lines 54-65 wherein it is specifically stated that the LEDs of Fig. 20 are directly mounted on the upper substrate 17.

Properly read, Yoneda et al describes that the LEDs are carried on a thermal insulator (17)- not on the outer surface of an elongate thermally conductive member.

Properly read, the LEDs are carried on an inner surface of substrate K. There is no teaching or suggestion that the LEDs are carried on the outer surface of plate 9 which is a thermally conductive member.

Yoneda et al does not show, teach or suggest or anticipate every element of claim 27.

Accordingly, Yoneda et al does not show, teach, suggest or anticipate Applicant's novel structure of claim 27.

#### ARNDT '819

The Examiner relies upon the '819 patent as the primary reference for rejecting all claims in the application under 35 U.S.C. 103.

It is respectfully submitted that the '819 patent does not anticipate or make obvious the novel structures of Applicant's invention as claimed.

The '819 patent teaches away from Applicant's novel structures.

The '819 patent is directed to the dissipation of heat away from a printed circuit board and relies upon heat conduction through the printed circuit board from the copper bonding pads for the LEDs to a metal layer plated on the bottom of the pc board and then to a heat sink.

The specific problem to which the '819 patent is set out beginning at col. 1, line 60. The '819 patent teaches that heat from a LED chip is eliminated via the electrical terminal of the LED. Depending on the LED structure to which the teachings of '819 is addressed, the heat is conducted by the electrical onto solder points that are on copper solder pads on a printed circuit board. From the solder points, the heat at first propagates in the copper pads and then on the epoxy resin material in the plane of the printed circuit board. Subsequently, the heat is output large-area to the environment by thermal radiation and thermal conduction. (col 2, lines 2-7)

The '819 patent continues on to state that the thermal resistance for one LED on a pc board is relatively slight, but becomes significant when many LEDs are "arranged in close proximity on a circuit board." (Col 2, lines 11-12). This is explained in the '819 patent as a

Serial No. 10/430,696

result of a smaller percentual area of the PCB is now available for each individual LED for heat transmission to the environment.

An object of the (B19) invention is to specify a surface-mounted LED arrangement that is distinguished by an improved heat elimination from the LEDs. (Col. 2, lines, 37-39)

The structures of the B19 patent are each a printed circuit board having surface mounted LEDs on one side of the circuit board, the side of the board opposite the LEDs has a metallic layer that is electrically insulated from the LEDs by the circuit board. The metal surface is applied to a cooling member. The cooling member is copper or aluminum or a cooling plate. The cooling member is secured to the circuit board by thermally conductive adhesive. (Col. 2, lines 44-62)

The printed circuit board is of plastic material that conducts heat poorly. (Col. 2, lines 63-65)

The copper pads on the circuit board should be as large as possible in order to broaden the heat path through the printed circuit board material. (Col. 3, lines 6-9).

It is clearly apparent that the teachings of the '819 patent are directed to and limited to a structure in which a circuit board carries the LEDs. The LEDs are soldered to metal pads on the same surface of the circuit board. Heat is transferred from the pads, through the circuit board to a metal surface on the other surface of the circuit board, through an adhesive layer to a cooling member.

Thus, the structures of the B19 patent require that the LEDs are carried on copper solder pads on one surface of a circuit board and heat transfer is via solder pads through the circuit board to a metallization layer on the opposite surface of the circuit board and then to the cooling member via an adhesive layer.

The LEDs are not carried by the cooling member.

The B19 patent shows and teaches structures that are fundamentally different from Applicant's claimed invention.

More specifically, the structures shown and described in the B19 patent all utilize surface mount LEDs. The LEDs are mounted to and carried on one surface of a thermally and electrically insulating printed circuit board. More specifically, the printed circuit board is a plastic material. A cooling member is provided on the other surface of the PC board. The printed circuit other surface is secured to the cooling member.



Serial No. 10/430,696

FIGURE 1A AND FIGURE 1B

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The embodiment of the present invention shown in FIG. 1A contains a printed circuit board 1 on which a plurality of preferably surface-mounted LEDs 2 are applied. In a known way, the printed circuit board 1 thereby forms a circuit that comprises terminal surfaces for the mounting of the LEDs at defined locations. These terminal surfaces are provided, for example, with lands for soldering in an automatic surface mount device (SMD) equipping unit, and the LEDs 2 have their electrical contacts 2a soldered to these terminal surfaces in a subsequent mounting step.

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The printed circuit board 1 can be a rigid printed circuit board, such as type FR4, and constructed of an epoxy resin

It is clearly evident that the printed circuit board is plastic or epoxy and is not a thermal conductor. This is explicitly stated at col. 3, lines 1-5

flexible plastic. For example, it can be composed of polyester or polyamide film, or it may comprise what is often referred to as flex-board. Flex board is generally multi-layer printed circuit boards that are uniformly constructed of a plurality of polyamide carrier films.

5

The relevant structure of the devices of the B19 patent are clearly set out in claim 1 of the B19 patent:

1. A surface-mounted LED arrangement, comprising:
  - a printed circuit board having a principal surface and a secondary surface, said printed circuit board comprising a plastic material,
  - a plurality of LEDs arranged on said principal surface,
  - a metallic layer provided on said secondary surface that is electrically insulated from said plurality of LEDs,
  - a cooling member connected to said secondary surface, wherein said printed circuit board is secured to said cooling member with at least one of a thermally conductive paste, a thermally conductive adhesive and a thermally conductive film, and

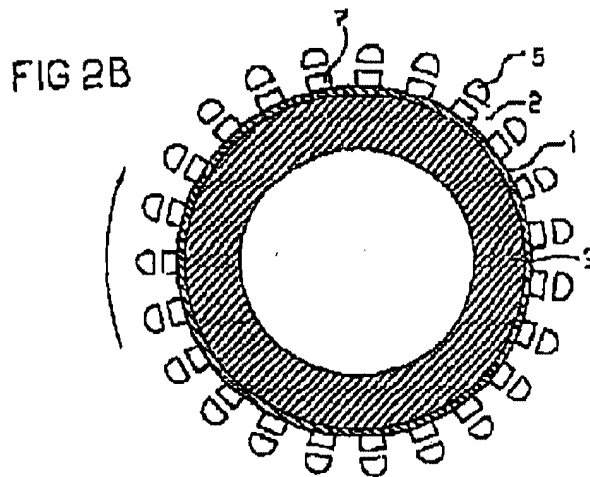
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**Serial No. 10/430,696**

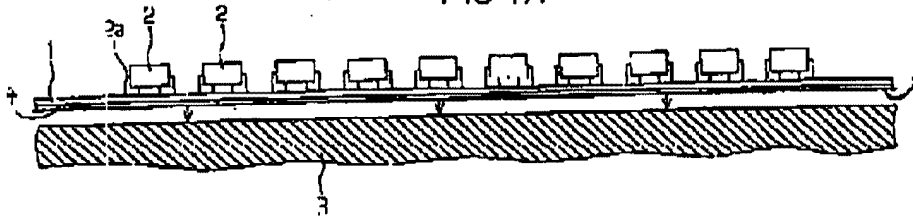
Claim 1 of the '819 patent clearly states that the LEDs are carried on one surface of a printed circuit board and a cooling member to the opposite surface of the circuit board.

The Examiner points to the specific embodiment of FIG. 2B and what he identifies member 22 as being the elongate thermally conductive member. FIG. 2b is reproduced below.



Serial No. 10/430,696

FIG 1A



It is clear from the descriptions of the structures of FIG.1A and 2B that element 1 in all drawings is a plastic or epoxy electrically insulating and thermally insulating printed circuit board. Element 3 is a thermally conductive member to which printed circuit board 1 is attached with an adhesive layer 6. Layer 4 is a metal layer on the back side of the printed circuit board 1.

It is clear from the drawings that the thermally conductive member 3 does not carry its LEDs 2 on its outer surface. Rather, the thermally non-conductive printed circuit board 1 carries the LEDs 2. The Examiner's attention is again directed to the reproduced portions of the reference above which clearly state that the LEDs are carried on the printed circuit board 1 and not on the structure 3.

It is clear from a plain reading of the descriptions of the structures in the '819 patent that the printed circuit board 1 carries LEDs 2 on one surface and carries the heat sink 3 (thermally conductive member) on its opposite surface.

In other words, the '819 patent teaches away from the novel structures of applicant's claimed invention which set forth structure in which the LEDs, solid state light sources, radiation emitting semiconductor devices, and radiation emitting solid state devices are carried on an elongate thermally conductive member.

In addition, the Examiner points to FIG. 2B as showing solid state light sources that are in a first plane and a second plane not coextensive with the first plane. The Examiner is mistaken. All the LEDs shown in FIG. 2B are in the same plane, i.e., the plane defined by the drawing sheet.

It is clearly evident from a careful reading of the '819 patent that the '819 patent does not show, teach or describe a structure in which an elongate thermally conductive member has an outer surface that carries a plurality of light emitting diodes carried on the elongate member outer surface as called for in claim 1.

The '819 patent teaches away from Applicant's novel structures.

Claim 1 recites: □A light source comprising:

an elongate thermally conductive member having an outer surface:

Serial No. 10/430,696

a plurality of light emitting diodes carried on said elongate member outer surface at least some of said light emitting diodes being disposed in a first plane and others of said light emitting diodes being disposed in a second plane not coextensive with said first plane;  
 said elongate thermally conductive member being configured to conduct heat away from said light emitting diodes to fluid contained by said elongate thermally conductive member;  
 said elongate thermally conductive member comprises one or more surface discontinuities to enhance heat dissipation; and  
a fluid movement device in fluid communication with said elongate thermally conductive member to enhance movement of said fluid over at least some of said heat surface discontinuities.

The B19 patent does not show, teach or describe an elongate thermally conductive member.

The B19 patent does not show, teach or describe a plurality of LEDs carried on an outer surface of an elongate thermally conductive member.

The B19 patent does not show, teach or describe LEDs disposed on a first plane and a second plane coextensive with the first plane.

The B19 patent does not provide any enabling disclosure of surface discontinuities.

The B19 patent does not show, teach or describe any fluid movement devices. The Examiner acknowledges this failure in the teachings of the B19 patent. However, the Examiner fails to note that the teachings with respect to FIG. 2B that the Examiner relies on do not speak to any apparatus for providing any fluid movement device. One skilled in the art would assume that the fluid would move by convection.

Accordingly, the B19 patent does not show, teach or make obvious the structure of claim 1. The B19 patent makes no suggestion or teaching of using any fluid movement device.

#### PAL

The Pal reference is directed to a rotary fan and housing of the type that is intended to be driven by a motor assembly and which is intended for use in high density electronic systems such as computers and the like. There is no suggestion in the PAL reference of the applicability of such a fan to a structure such as described in the B19 patent.

Apparently the Examiner is citing the PAL reference as representative of knowledge in the art. As such, the knowledge in the art is silent on providing any cooling member to the structure of Applicant's invention.

#### STANDARDS FOR DETERMINING OBVIOUSNESS

It is respectfully submitted that the Examiner pay attention to the examination standards for determination of obviousness. The Examiner's attention is drawn, in particular, to MPEP

Serial No. 10/430,696

706.02(j) and MPEP 2143 and the three basic criteria that must be set out to establish a prima facie case of obviousness.

The first criteria is that there must be some suggestion of motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings.

Second, there must be a reasonable expectation of success.

Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art and not based on applicants disclosure. MPEP 2143 quoting *In re Tack*

MPEP 706.02(j) quotes *Ex Parte Clapp*: To support the conclusion that the claimed invention is directed to obvious subject matter, either the references must expressly or impliedly suggest the claimed invention, or the Examiner must present a convincing line of reasoning as to why the artisan would have found the claimed invention to be obvious in light of the teachings of the references.

There is no reasonable basis for modifying the structure of the B19 patent as suggested by the Examiner. Even assuming one were to modify the structure of the B19 patent in view of the PAL patent, the resulting structure would not teach or suggest the limitations in the claims. For example, where do the references suggest that the fan of the PAL patent would be in fluid communication with said elongate thermally conductive member to enhance movement of said fluid over at least some of said heat surface discontinuities. There is no such suggestion in the references. The suggestion comes about only from the Examiner's use of hindsight in order to combine references to meet the structure of claim 1.

It is respectfully submitted that the Examiner has not followed the examination standards for determination of obviousness.

It is respectfully submitted that the Examiner has failed to follow the factual inquiries set forth in *Graham v John Deere*.

The factual inquiries set forth in *Graham v. John Deere Co.*, 148 USPQ 459, that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or unobviousness.

Serial No. 10/430,696

1. It is inherent in these inquiries that the Examiner must have an evidentiary basis for the determinations made. The Examiner must consider each piece of prior art for what it fairly teaches within its four corners.

2. The Examiner acknowledges the failure of the B19 reference to show or disclose significant aspects of the claimed invention. However, the Examiner without pointing to any linking reference and without providing any evidentiary affidavit makes pronouncements as to what is "knowledge in the art".

This is a complete failure to properly determine the differences between the prior art and the invention as claimed.

What the Examiner has failed to do is acknowledge that there is no teaching in the prior art PAL reference of its applicability to a structure such as in claim 1.

3. The Examiner makes no effort to resolve the level of skill of one skilled in the lighting arts.

For the foregoing reasons, the references taken singly or in combination do not show, teach or make obvious Applicant's novel invention as set forth in claim 1.

Claims 2 through 22 depend from claim 1. For the same reasons that claim 1 is not shown, taught or made obvious by the B19 patent and/or the PAL et al. patent, taken singly or in combination, claims 2 through 22 are likewise not shown, taught or made obvious by the B19 patent and/or the PAL et al patent taken singly or in combination.

Claim 23 recites:

A light source comprising:

an elongate thermally conductive member having an outer surface;  
a plurality of light emitting diodes carried on said elongate member outer surface at least some of said light emitting diodes being disposed in a first plane and others of said light emitting diodes being disposed in a second plane not coextensive with said first plane;

said elongate thermally conductive member being configured to conduct heat away from said light emitting diodes to fluid contained by said elongate thermally conductive member; and

a cooling apparatus coupled to said elongate thermally conductive member to enhance cooling of said plurality of light emitting diodes.

The B19 patent does not show, teach or describe an elongate thermally conductive member.

The B19 patent does not show, teach or describe a plurality of LEDs carried on an outer surface of an elongate thermally conductive member.

The B19 patent does not show, teach or describe LEDs disposed on a first plane and a second plane coextensive with the first plane.

Serial No. 10/430,696

The B19 patent does not show, teach or describe any fluid movement devices.

Accordingly, the B19 patent does not show, teach or makes obvious the structure of claim 23.

The PAL et al reference does not show, teach or suggest using a fan with a light source of any kind. The B19 patent does not show, teach or suggest the use of a fan.

Thus for the same reasons that claim 1 is not shown, taught, or made obvious by the B19 patent and/or the PAL patent taken singly or in combination, claim 23 is not shown, taught or made obvious by the references taken singly or in combination.

Claims 24-26 depend from claim 23. For the same reasons that claims 1 and 23 are not shown, taught, or made obvious by the B19 patent and/or the PAL patent taken singly or in combination, claims 24-26 are not shown, taught or made obvious by the references taken singly or in combination.

Claim 31 recites:

A light source comprising:

an elongate thermally conductive member having an outer surface;  
at least one light emitting diode carried on said elongate member outer  
surface;

one or more electrical conductors carried by said elongate thermally conductive member and connected to said at least one light emitting diode to supply electrical power thereto;

said elongate thermally conductive member being configured to conduct heat away from said at least one light emitting diode to fluid contained by said elongate thermally conductive member; and

a fluid moving device in fluid communication with said elongate thermally conductive member to move said fluid.

The B19 patent does not show, teach or describe an elongate thermally conductive member.

The B19 patent does not show, teach or describe a plurality of LEDs carried on an outer surface of an elongate thermally conductive member.

The B19 patent does not show, teach or describe LEDs disposed on a first plane and a second plane coextensive with the first plane.

The B19 patent does not show, teach or describe any fluid movement devices.

Accordingly, the B19 patent does not show, teach or makes obvious the structure of claim 31.

The PAL et al reference does not show, teach or suggest using a fan with a light source of any kind. The B19 patent does not show, teach or suggest the use of a fan.

Serial No. 10/430,696

Thus for the same reasons that claim 1 is not shown, taught, or made obvious by the B19 patent and/or the PAL patent taken singly or in combination, claim 31 is not shown, taught or made obvious by the references taken singly or in combination.

**Claim 32 recites:**

A light source comprising:

an elongate thermally conductive member having an outer surface;

a plurality of light emitting diodes carried on said elongate member outer surface at least some of said light emitting diodes being disposed in a first plane and others of said light emitting diodes being disposed in a second plane not coextensive with said first plane;

electrical conductors carried by said elongate thermally conductive member and connected to said plurality of light emitting diodes to supply electrical power thereto; and said elongate thermally conductive member being configured to conduct heat away from said light emitting diodes to fluid contained by said elongate thermally conductive member;

a fluid moving device in fluid communication with said elongate thermally conductive member to move said fluid; and

a coating carried on said elongate thermally conductive member.

As with claim 1, the B19 patent does not show, teach or describe an elongate thermally conductive member.

The B19 patent does not show, teach or describe a plurality of LEDs carried on an outer surface of an elongate thermally conductive member.

The B19 patent does not show, teach or describe LEDs disposed on a first plane and a second plane coextensive with the first plane.

The B19 patent does not show, teach or describe any fluid movement devices.

Accordingly, the B19 patent does not show, teach or makes obvious the structure of claim 32.

The PAL et al. patent does not show, teach or suggest use of the fan disclosed therein for any type of light source.

For the same reasons that claim 1 is not shown, taught, or made obvious by the B19 patent and/or the PAL patent taken singly or in combination, claim 32 is not shown, taught or made obvious by the references taken singly or in combination.

The Examiner also states, with respect to claims 4 and 11 that [The electromechanical device comprises and electronic device.]



Serial No. 10/430,696

At no point in the PAL et al or B19 patents is there any showing, teaching or even suggestion of the use of an electronic cooling device.

For this additional reason, claims 4 and 11 are not shown, taught or made obvious by the B19 and PAL et al patents taken singly or in combination.

With respect to claim 16, the Examiner states that ☐ Although the reference does not disclose that the shape could be a polygon, the shape differences are considered obvious and are not patentable unless unobvious or unexpected results are obtained from these changes. ☐

With respect to claim 17, the Examiner states: ☐ said tubular thermally conductive member ☐ should have a cross-section having flat portions. ☐

With respect to claim 18, the Examiner states: ☐ said tubular thermally conductive member ☐ should comprise a channel. ☐

The Examiner provides no basis for his conclusion that shape differences are considered obvious. The Examiner provides no basis as to why the thermally conductive member ☐ should ☐ anything. If the Examiner persists in his rejection of claims 16, 17, and 18, the Examiner is specifically requested to provide the prior art citation or basis for his conclusionary statements with respect to these claims or alternatively to provide an affidavit setting forth the factual basis for the conclusionary statements.

In view of the foregoing, claims 1-4, 7-11, 15-22, 23, 31, 32, and 33 are not shown taught or made obvious by the Arndt et al. and Pal et al references taken singly or in combination.

#### LOSINSKI

The Examiner in rejecting claims 5-6, 12, 13, 24, and 26 under 35 U.S.C. 103(a) states that the claims are ☐ unpatentable over Arndt et al. ☐ in view of common knowledge and further in view of Losinski ☐ ☐

The Examiner cites Losinski as teaching ☐ the use of a solid-state piezoelectric device to remove heat, and further teaches that a piezoelectric device has many advantages ☐ . Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to form the reference ☐ device such that its fluid movement device is a solid-state piezoelectric device. One would have been motivated to make such a change in view of the teachings of Losinski that a solid state fan is better than a traditional fan. ☐

The Examiner has not provided any basis "common knowledge." The mere citation to a reference showing a fan is not a basis that ties the use of a fan to the specific structures recited in the claims Accordingly, the basis for this rejection fails.

The Examiner's attention is directed to MPEP 2144.03 which clearly sets forth the standards, in accordance with *In re Zurko* and the other cases cited therein, for reliance on ☐ well known ☐ prior art. The Examiner's attention in particular is directed to 2144.03 C wherein ☐ if applicant

Serial No. 10/430,696

challenges a factual assertion as not properly officially noticed or not properly based upon common knowledge, the Examiner must support the finding with adequate evidence.

The Examiner has failed to support his contention of Common knowledge. Applicant specifically requests that the Examiner support his assertion with evidence as mandated by the MPEP.

The Examiner's suggestion that one would have been motivated to utilize a solid state fan with the structure of the '819 patent is based upon unsupportable and flawed logic.

The '819 patent does not show, teach or suggest the use of any cooling device. The '819 patent does not show, teach or suggest the use of a traditional fan.

The Losinski patent does not show, teach or suggest that the piezoelectric fan may be used with a light source.

The Losinski patent does not state that a solid state fan is better than a traditional fan as the Examiner represents. Rather, Losinski states that rotary fans have many drawbacks (col. 1, line 15). In addition, Losinski states that the piezoelectric fans provide axial flow and that axial flow is advantageous for applications involving a substantially flat circuit board or electronic component system in a housing assembly that provides little clearance for airflow.

Thus there is no suggestion in Losinski that the piezoelectric fan may be used in a structure such as that of Applicant's invention.

The Examiner's attention is drawn, in particular, to MPEP 706.02(j) and MPEP 2143 and the three basic criteria that must be set out to establish a prima facie case of obviousness.

The first criteria is that there must be some suggestion of motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings.

Second, there must be a reasonable expectation of success.

Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art and not based on applicant's disclosure. MPEP 2143 quoting *In re Tack*

MPEP 706.02(j) quotes *Ex Parte Clapp*: "To support the conclusion that the claimed invention is directed to obvious subject matter, either the references must expressly or impliedly suggest the claimed invention, or the Examiner must present a convincing line of reasoning as to why the artisan would have found the claimed invention to be obvious in light of the teachings of the references."

Serial No. 10/430,696

MPEP 2143.01 clearly points out that the "level of skill in the art cannot be relied upon to provide the suggestion to combine references" *Al-Site Corp. v. ISI Int'l Inc.*

MPEP 2143.01 further provides the clear guidance that: "A statement that modifications of the prior art to meet the claimed invention would have been 'well within the ordinary skill of the art at the time the claimed invention was made' because the references relied upon teach that all aspects of the claimed invention were individually known in the art is not sufficient to establish a *prima facie* case of obviousness without some objective reason to combine the teachings of the references." Citing *Ex parte Levengood*

MPEP 2143.01 further clearly provides the guidance that the proposed modification of the prior art cannot change the principle of operation of the prior art reference.

The '819 patent fails to even suggest using any device for enhancing heat removal from the LEDs. The additional references cited by the Examiner fail to suggest use with a light source or removal of heat from LEDs. The Examiner has failed to provide any convincing line of reasoning as to why the Arndt reference would be modified as the Examiner suggests. One skilled in the art would, in the absence of a specific teaching to the contrary not associate the use of a fan or a Peltier device in conjunction with an emergency vehicle rotating light. At best, one skilled in the art would assume rotation of the device itself could provide fluid movement, or alternatively convective movement of air. Accordingly, Applicant has traversed the basis for the Examiner's "common knowledge" argument and if the Examiner does not withdraw the argument and its basis, Applicant requests that the Examiner provide adequate evidence to support his position.

It is clearly evident that the Examiner is relying on Applicant's disclosure to make the suggestion of utilizing a fluid movement device in fluid communication with said elongate thermally conductive member to enhance movement of said fluid over at least some of said heat surface discontinuities, as called for in claim 1 and similar recitations in the remaining claims.

There is no suggestion in any of the references to combine them as the Examiner suggests. Even the selection of references made by the Examiner is being made with hindsight.

Applicant does not acquiesce in any of the Examiner's positions taken in sections 8 through 12. It is believed that the foregoing comments reaffirm Applicant's positions and show the failings in the logic employed by the Examiner. In addition, with respect to the '849 reference, the Examiner's attention is further drawn to Col. 20, lines 15-20 where it is clearly stated that the substrate K comprising layer 1 is a "glue-epoxy" substrate- a well known heat insulator.

It is therefore respectfully submitted that none of the references taken singly or in combination show, teach or make obvious Applicant's novel structures.

It is believed that all the claims in the application are now in condition for allowance. Reexamination and reconsideration are requested. It is also requested that the claims be allowed and this application be passed to issue.

Serial No. 10/430,696

It is further requested that claim 25 be reinstated and that claim 25 also be allowed.

An early notice of allowance would be appreciated.

Respectfully submitted,

/Donald J. Lenkszus/

Donald J. Lenkszus, Reg No 28,096

Page 31 of 31

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APR 09 2007

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<b>PETITION FOR EXTENSION OF TIME UNDER 37 CFR 1.136(a)</b> FY 2008 (Fees pursuant to the Consolidated Appropriations Act, 2008 (H.R. 4518).)		Docket Number (Optional) <b>OPTO LUM-003</b>	
Application Number <b>10/430,696</b>		Filed <b>5/5/2003</b>	
For <b>LIGHT EMITTING DIODE LIGHT SOURCE</b>			
Art Unit <b>2818</b>		Examiner <b>TU TU V HO</b>	

This is a request under the provisions of 37 CFR 1.136(a) to extend the period for filing a reply in the above identified application.

The requested extension and fee are as follows (check time period desired and enter the appropriate fee below):

	Fee	Small Entity Fee	
<input type="checkbox"/> One month (37 CFR 1.17(a)(1))	\$120	\$60	\$ _____
<input checked="" type="checkbox"/> Two months (37 CFR 1.17(a)(2))	\$450	\$225	\$ <b>225</b>
<input type="checkbox"/> Three months (37 CFR 1.17(a)(3))	\$1020	\$510	\$ _____
<input type="checkbox"/> Four months (37 CFR 1.17(a)(4))	\$1590	\$795	\$ _____
<input type="checkbox"/> Five months (37 CFR 1.17(a)(5))	\$2160	\$1080	\$ _____

☒ Applicant claims small entity status. See 37 CFR 1.27.

☐ A check in the amount of the fee is enclosed.

☒ Payment by credit card. Form PTO-2038 is attached.

☐ The Director has already been authorized to charge fees in this application to a Deposit Account.

☐ The Director is hereby authorized to charge any fees which may be required, or credit any overpayment, to Deposit Account Number \_\_\_\_\_. I have enclosed a duplicate copy of this sheet.

**WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-3028.**

I am the ☐ applicant/inventor.

☐ assignee of record of the entire interest. See 37 CFR 3.71.  
Statement under 37 CFR 3.73(b) is enclosed (Form PTO/SB/98).

☒ attorney or agent of record. Registration Number **28096**

☐ attorney or agent under 37 CFR 1.34.  
Registration number if acting under 37 CFR 1.34 \_\_\_\_\_

*Donald J. Lenkszus* *04/09/2007*  
Signature Date

*Donald J. Lenkszus* *602-463-2010*  
Typed or printed name Telephone Number

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below.

☐ Total of \_\_\_\_\_ forms are submitted.

This collection of information is required by 37 CFR 1.136(a). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 5 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1460, Alexandria, VA 22313-1460.

If you need assistance in completing the form, call 1-800-PTO-0199 and select option 2.

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1. 2019-2020-2021-2022-2023-2024-2025-2026-2027-2028-2029-2030-2031-2032-2033-2034-2035-2036-2037-2038-2039-2040-2041-2042-2043-2044-2045-2046-2047-2048-2049-2050-2051-2052-2053-2054-2055-2056-2057-2058-2059-2060-2061-2062-2063-2064-2065-2066-2067-2068-2069-2070-2071-2072-2073-2074-2075-2076-2077-2078-2079-2080-2081-2082-2083-2084-2085-2086-2087-2088-2089-2090-2091-2092-2093-2094-2095-2096-2097-2098-2099-2100-2101-2102-2103-2104-2105-2106-2107-2108-2109-2110-2111-2112-2113-2114-2115-2116-2117-2118-2119-2120-2121-2122-2123-2124-2125-2126-2127-2128-2129-2130-2131-2132-2133-2134-2135-2136-2137-2138-2139-2140-2141-2142-2143-2144-2145-2146-2147-2148-2149-2150-2151-2152-2153-2154-2155-2156-2157-2158-2159-2160-2161-2162-2163-2164-2165-2166-2167-2168-2169-2170-2171-2172-2173-2174-2175-2176-2177-2178-2179-2180-2181-2182-2183-2184-2185-2186-2187-2188-2189-2190-2191-2192-2193-2194-2195-2196-2197-2198-2199-2200-2201-2202-2203-2204-2205-2206-2207-2208-2209-2210-2211-2212-2213-2214-2215-2216-2217-2218-2219-2220-2221-2222-2223-2224-2225-2226-2227-2228-2229-2230-2231-2232-2233-2234-2235-2236-2237-2238-2239-2240-2241-2242-2243-2244-2245-2246-2247-2248-2249-2250-2251-2252-2253-2254-2255-2256-2257-2258-2259-2260-2261-2262-2263-2264-2265-2266-2267-2268-2269-2270-2271-2272-2273-2274-2275-2276-2277-2278-2279-2280-2281-2282-2283-2284-2285-2286-2287-2288-2289-2290-2291-2292-2293-2294-2295-2296-2297-2298-2299-2300-2301-2302-2303-2304-2305-2306-2307-2308-2309-2310-2311-2312-2313-2314-2315-2316-2317-2318-2319-2320-2321-2322-2323-2324-2325-2326-2327-2328-2329-2330-2331-2332-2333-2334-2335-2336-2337-2338-2339-2340-2341-2342-2343-2344-2345-2346-2347-2348-2349-2350-2351-2352-2353-2354-2355-2356-2357-2358-2359-2360-2361-2362-2363-2364-2365-2366-2367-2368-2369-2370-2371-2372-2373-2374-2375-2376-2377-2378-2379-2380-2381-2382-2383-2384-2385-2386-2387-2388-2389-2390-2391-2392-2393-2394-2395-2396-2397-2398-2399-2400-2401-2402-2403-2404-2405-2406-2407-2408-2409-2410-2411-2412-2413-2414-2415-2416-2417-2418-2419-2420-2421-2422-2423-2424-2425-2426-2427-2428-2429-2430-2431-2432-2433-2434-2435-2436-2437-2438-2439-2440-2441-2442-2443-2444-2445-2446-2447-2448-2449-2450-2451-2452-2453-2454-2455-2456-2457-2458-2459-2460-2461-2462-2463-2464-2465-2466-2467-2468-2469-2470-2471-2472-2473-2474-2475-2476-2477-2478-2479-2480-2481-2482-2483-2484-2485-2486-2487-2488-2489-2490-2491-2492-2493-2494-2495-2496-2497-2498-2499-2500-2501-2502-2503-2504-2505-2506-2507-2508-2509-2510-2511-2512-2513-2514-2515-2516-2517-2518-2519-2520-2521-2522-2523-2524-2525-2526-2527-2528-2529-2530-2531-2532-2533-2534-2535-2536-2537-2538-2539-2540-2541-2542-2543-2544-2545-2546-2547-2548-2549-2550-2551-2552-2553-2554-2555-2556-2557-2558-2559-2560-2561-2562-2563-2564-2565-2566-2567-2568-2569-2570-2571-2572-2573-2574-2575-2576-2577-2578-2579-2580-2581-2582-2583-2584-2585-2586-2587-2588-2589-2590-2591-2592-2593-2594-2595-2596-2597-2598-2599-2600-2601-2602-2603-2604-2605-2606-2607-2608-2609-2610-2611-2612-2613-2614-2615-2616-2617-2618-2619-2620-2621-2622-2623-2624-2625-2626-2627-2628-2629-2630-2631-2632-2633-2634-2635-2636-2637-2638-2639-2640-2641-2642-2643-2644-2645-2646-2647-2648-2649-2650-2651-2652-2653-2654-2655-2656-2657-2658-2659-2660-2661-2662-2663-2664-2665-2666-2667-2668-2669-2670-2671-2672-2673-2674-2675-2676-2677-2678-2679-2680-2681-2682-2683-2684-2685-2686-2687-2688-2689-2690-2691-2692-2693-2694-2695-2696-2697-2698-2699-2700-2701-2702-2703-2704-2705-2706-2707-2708-2709-2710-2711-2712-2713-2714-2715-2716-2717-2718-2719-2720-2721-2722-2723-2724-2725-2726-2727-2728-2729-2730-2731-2732-2733-2734-2735-2736-2737-2738-2739-2740-2741-2742-2743-2744-2745-2746-2747-2748-2749-2750-2751-2752-2753-2754-2755-2756-2757-2758-2759-2760-2761-2762-2763-2764-2765-2766-2767-2768-2769-2770-2771-2772-2773-2774-2775-2776-2777-2778-2779-2780-2781-2782-2783-2784-2785-2786-2787-2788-2789-2790-2791-2792-2793-2794-2795-2796-2797-2798-2799-2800-2801-2802-2803-2804-2805-2806-2807-2808-2809-2810-2811-2812-2813-2814-2815-2816-2817-2818-2819-2820-2821-2822-2823-2824-2825-2826-2827-2828-2829-2830-2831-2832-2833-2834-2835-283

**PATENT APPLICATION FEE DETERMINATION RECORD**  
Effective December 8, 2004

10/430696

**CLAIMS AS FILED - PART I**

	(Column 1)	(Column 2)
TOTAL CLAIMS		4-9-07
FOR	NUMBER FILED	NUMBER EXTRA
TOTAL CHARGEABLE CLAIMS	minus 20 =	
INDEPENDENT CLAIMS	minus 3 =	
MULTIPLE DEPENDENT CLAIM PRESENT		<input checked="" type="checkbox"/>

SMALL ENTITY  
TYPE ☐

OR OTHER THAN  
SMALL ENTITY

RATE	FEE
BASIC FEE	150.00
X\$ 25=	395
X100=	
+180=	
TOTAL	395

RATE	FEE
BASIC FEE	300.00
X\$50=	
X200=	
+360=	
TOTAL	

\* If the difference in column 1 is less than zero, enter "0" in column 2

**CLAIMS AS AMENDED - PART II**

	(Column 1)	(Column 2)	(Column 3)
AMENDMENT A	4/9/07	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR
Total	* 30	Minus	** 33 =
Independent	* 5	Minus	*** 5 =
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM <input type="checkbox"/>			

PAID  
SMALL ENTITY

OR OTHER THAN  
SMALL ENTITY

RATE	ADDITIONAL FEE
X\$ 25=	
X100=	
+180=	
TOTAL ADDIT. FEE	

RATE	ADDITIONAL FEE
X\$50=	
X200=	
+360=	
TOTAL ADDIT. FEE	

	(Column 1)	(Column 2)	(Column 3)
AMENDMENT B		CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR
Total	*	Minus	** =
Independent	*	Minus	*** =
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM <input type="checkbox"/>			

RATE	ADDITIONAL FEE
X\$ 25=	
X100=	
+180=	
TOTAL ADDIT. FEE	

RATE	ADDITIONAL FEE
X\$50=	
X200=	
+360=	
TOTAL ADDIT. FEE	

	(Column 1)	(Column 2)	(Column 3)
AMENDMENT C		CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR
Total	*	Minus	** =
Independent	*	Minus	*** =
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM <input type="checkbox"/>			

RATE	ADDITIONAL FEE
X\$ 25=	
X100=	
+180=	

RATE	ADDITIONAL FEE
X\$50=	
X200=	
+360=	



## EAST Search History

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	157	(light adj source lumi\$6) with heat adj pip\$3	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/06/12 10:17
L2	78735	(362/\$8).CCLS.	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2007/06/12 06:52
L3	82464	(313/\$8).CCLS.	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2007/06/12 06:52
L4	451956	((257/\$8) or (438/\$8)).CCLS.	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2007/06/12 06:52
L5	152	2 and 3 and 4	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/06/12 06:52
L6	661	(light adj source lumi\$6) with (heat thermal\$3) near2 (pip\$3 tub\$6 elongat\$3)	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/06/12 18:46
L7	157	1 and 6	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/06/12 06:59
L8	111856	surface adj mount\$3	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/06/12 06:59

## EAST Search History

L9	1	6 same 8	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/06/12 06:59
L10	83	6 and 8	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/06/12 07:00
L12	53	(@ad @pd) < "20020529" and 10	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/06/12 07:05
L13	3	10/430696 10/631027	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/06/12 07:45
L14	52	"5278432"	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/06/12 07:45
L15	2	"5278432".pn.	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/06/12 07:45
L22	3	"20040085779"	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/06/12 09:05
L23	12	10/156810	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/06/12 09:19

## EAST Search History

L24	35	09/727726 "6517218"	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/06/12 09:28
L25	44	10/299870 10/308177 10/137094 l24	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/06/12 09:30
L26	52	10/299870 10/308177 10/137094 09/727726 "6517218" "6832849"	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/06/12 09:46
L27	12	23 and (outer adj surface)	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/06/12 09:56
L28	275542	(piezoelectric piezo) (peltier seebeck ) solid adj state near2 ( heatsink ((heat thermal\$2) near (sink\$4 spread\$3 dissipat\$3 conducting conductive radiat\$4)) (cool\$3 near2 (device apparatus) ) )	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/06/12 18:50
L29	117	12 23 26	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/06/12 10:00
L30	15	29 and 28	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/06/12 10:16
L31	48	(light adj source lumi\$6) with ( (metal\$6 copper aluminum) near2 (core\$3 clad\$4 laminat\$4 substrate base\$3) near2 ( (printed adj circuit PC wiring ) adj (board card module) ) pcb PWB motherboard mother adj board carrier) mcpb mpcb mc adj pcb m?pcb )	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/06/12 10:38

## EAST Search History

L32	536	(light adj source lumi\$6) and ( (metal\$6 copper aluminum) near2 (core\$3 clad\$4 laminat\$4 substrate base\$3) near2 ( (printed adj circuit PC wiring ) adj (board card module) ) pcb PWB motherboard mother adj board carrier) mcpcb mpcb mc adj pcb m?pcb )	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/06/12 10:39
L33	6896	( (metal\$6 copper aluminum) near2 (core\$3 clad\$4 laminat\$4 substrate base\$3) near2 ( (printed adj circuit PC wiring ) adj (board card module) ) pcb PWB motherboard mother adj board carrier) mcpcb mpcb mc adj pcb m?pcb )	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/06/12 16:47
L34	191008	(heat thermal\$3) near2 (pip\$3 tub\$6 elongat\$3)	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/06/12 10:41
L35	36	32 and 33 and 34	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/06/12 12:47
L36	0	13 near4 (microchip micro adj chip chip integrated adj circuit die dice ic semiconductor adj (device element structure component module) CPU central adj process\$4 adj unit chipset chip adj set )	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/06/12 12:49
L37	2164	34 near4 (microchip micro adj chip chip integrated adj circuit die dice ic semiconductor adj (device element structure component module) CPU central adj process\$4 adj unit chipset chip adj set )	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/06/12 12:51
L38	9740	(light adj source lumi\$6) near4 (microchip micro adj chip chip integrated adj circuit die dice ic semiconductor adj (device element structure component module) CPU central adj process\$4 adj unit chipset chip adj set )	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/06/12 12:53
L39	295	(light adj source lumi\$6) near4 34	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/06/12 17:06

## EAST Search History

L40	2442	37 39	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/06/12 12:53
L42	34	28 same 40	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/06/12 14:52
L43	605987	2 3 4	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/06/12 12:56
L44	152	2 and 3 and 4	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/06/12 12:56
L45	0	40 and 44	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/06/12 12:56
L46	673	40 and 43	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/06/12 12:57
L47	36894	28.clm.	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/06/12 12:57
L48	269	40.clm.	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/06/12 12:58

## EAST Search History

L49	97	28 and 40	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/06/12 12:58
L50	12	49 and 47 and 48	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/06/12 12:58
L51	51	49 and (47 48)	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/06/12 12:58
L52	1	11/035592	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/06/12 14:52
L53	1	52 and amorphous	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/06/12 16:00
L54	12	10/398660 "6874910"	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/06/12 16:00
L55	5	("4935665"   "5813753"   "5985696"   "6517218"   "6531328").PN.	US-PGPUB; USPAT; USOCR	OR	ON	2007/06/12 16:03
L56	13	26 and (28 fan)	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/06/12 18:20
L57	19	10/073822	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/06/12 17:05

## EAST Search History

L58	50	"6799864" "6874910" "6517218"	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/06/12 17:05
L59	11	58 and (28 fan)	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/06/12 17:19
L60	0	("7176502").URPN.	USPAT	OR	ON	2007/06/12 18:17
L61	53	("20010032985"   "20020004251"   "20020034834"   "20020163006"   "20020175621"   "20020176250"   "20030010993"   "20030025465"   "20030057421"   "20040026706"   "20040150995"   "20040222433"   "20040233672"   "20050029535"   "20050189557"   "20050225222"   "20060006405"   "3711789"   "4886709"   "4935655"   "5117281"   "5122781"   "5140220"   "5482898"   "5485037"   "5581876"   "5660481"   "5725808"   "5745624"   "5841244"   "5847935"   "5857767"   "5953203"   "5977567"   "6016038"   "6045240"   "6220722"   "6259846"   "6318886"   "6325524"   "6376268"   "6428189"   "6455930"   "6480389"   "6483623"   "6518502"   "6634750"   "6634770"   "6670751"   "6692252"   "6793374"   "6799864"   "6828170").PN.	US-PGPUB; USPAT; USOCR	OR	ON	2007/06/12 18:18
L62	17	61 and (28 fan)	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/06/12 18:24
L63	0	"6799864".pn. and (28 fan)	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/06/12 18:24

## EAST Search History

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L64	174163	( (led ((light radiation radiating) near (emitting emissive)) (optoelectronic opto adj electronic) (EL luminescen\$2 electroluminescen\$2 electr\$4 near (luminescen\$2. optic\$3)) ) near (device diode structure element package) OLED laser) .clm.	US-PGPUB; USPAT	OR	ON	2007/06/12 18:51
L65	44384	(heat thermal\$3 al cu aluminum copper metal\$6) near2 (pip\$3 tub\$6 elongat\$3).clm.	US-PGPUB; USPAT	OR	ON	2007/06/12 18:47
L66	83740	((piezoelectric piezo) (peltier seebeck ) fan solid adj state near2 ( heatsink ((heat thermal\$2) near (sink\$4 spread\$3 dissipat\$3 conducting conductive radiat\$4)) (cool\$3 near2 (device apparatus) ) ) ).clm.	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/06/12 18:50
L67	14	64 same 65 same 66	US-PGPUB; USPAT	OR	ON	2007/06/12 19:07
L68	6	67 and 28	US-PGPUB; USPAT	OR	ON	2007/06/12 19:08





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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/430,696	05/05/2003	Joel M. Dry	OPTOLUM-003	3639
<div>7590      06/20/2007</div> <div>DONALD J LENKSZUS PO BOX 3064 CAREFREE, AZ 85377-3064</div>				
			EXAMINER	
			HO, TU TU V	
			ART UNIT	PAPER NUMBER
			2818	
			MAIL DATE	DELIVERY MODE
			06/20/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

Application No.

10/430,696

Applicant(s)

DRY, JOEL M.

Examiner

Tu-Tu Ho

Art Unit

2818

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 09 April 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-27 and 31-33 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-26 and 31-33 is/are allowed.
- 6) ☒ Claim(s) 27 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 August 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |                                                                                      |                                                                   |
|--------------------------------------------------------------------------------------|-------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____                                                          | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### *Continued Examination Under 37 CFR 1.114*

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 04/09/2007 has been entered.

### *Response to Arguments*

2. Applicant's arguments, see "Applicant Arguments/Remarks Made in an Amendment" and "Specification", filed 04/09/2007, with respect to the rejection(s) of claims 1-24, 26, and 31-33 have been fully considered and are persuasive. The rejection of these claims has been withdrawn.

3. Applicant's arguments, see "Applicant Arguments/Remarks Made in an Amendment" and "Specification", filed 04/09/2007, with respect to the rejection(s) of claim(s) 27 under 35 U.S.C. 102(e) as being anticipated by Jones et al. U.S. Patent Application Publication 20050055070 and under 35 U.S.C. 102(e) as being anticipated by Yoneda et al. U.S. Patent 6,832,849 have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Nagamatsu U.S. Patent 6,876,681.

### *Election/ Restriction*

4. Claims 1-24, 26, and 31-33 are allowable. Claim(s) 25, previously withdrawn from consideration as a result of a restriction requirement, include all the limitations of an allowable claim. Pursuant to the procedures set forth in MPEP § 821.04(a), **the restriction requirement between Species, as set forth in the Office action mailed on 10/28/2005, is hereby withdrawn** and claim 25 is hereby rejoined and fully examined for patentability under 37 CFR 1.104. In view of the withdrawal of the restriction requirement, applicant(s) are advised that if any claim

Art Unit: 2818

presented in a continuation or divisional application is anticipated by, or includes all the limitations of, a claim that is allowable in the present application, such claim may be subject to provisional statutory and/or nonstatutory double patenting rejections over the claims of the instant application. Once the restriction requirement is withdrawn, the provisions of 35 U.S.C. 121 are no longer applicable. See *In re Ziegler*, 443 F.2d 1211, 1215, 170 USPQ 129, 131-32 (CCPA 1971). See also MPEP § 804.01.

### ***Claim Rejections - 35 USC § 102***

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

**5. Claim 27** is rejected under 35 U.S.C. 102(e) as being anticipated by Nagamatsu U.S. Patent 6,876,681 (the '681 reference).

The '681 reference discloses a light source comprising:

an elongate thermally conductive member (31, Figs. 2's, col. 4, line 57 through col. 5, line 67, wherein "elongate thermally conductive member" is interpreted per *Applicant Arguments/Remarks Made in an Amendment and Specification*, filed 04/09/2007) having an outer surface (no number);

at least one light emitting diode (generally defined by laser diode module 10, Figs. 1-2, col. 4, lines 39+, or defined by semiconductor laser 11/chip carrier 22, col. 3, lines 55-67, and wherein "diode", "module", and "semiconductor laser/chip carrier" are broadly and relatively interpreted) carried on said elongate member outer surface (best seen in Figs. 2's);

said elongate thermally conductive member being configured to conduct heat away from said at least one light emitting diode (col. 4, line 57 through col. 5, line 67); and

a Peltier cooling device (23, cols. 3-5, particularly col. 3, lines 64+) in thermal communication with said elongate thermally conductive member to enhance cooling of said at least one light emitting diode.

### ***Conclusion***

Art Unit: 2818

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tu-Tu Ho whose telephone number is (571) 272-1778. The examiner can normally be reached on 6:30 am - 3:00 pm, Monday through Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven H. Loke can be reached on (571) 272-1657. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

06-13-2007

/Tu-Tu V. Ho/

Primary Examiner, A.U. 2818

<b>Notice of References Cited</b>	Application/Control No. 10/430,696		Applicant(s)/Patent Under Reexamination DRY, JOEL M.	
	Examiner Tu-Tu Ho		Art Unit 2818	Page 1 of 1

**U.S. PATENT DOCUMENTS**

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-6,876,681	04-2005	Nagamatsu, Shinya	372/34
	B	US-			
	C	US-			
	D	US-			
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			


**FOREIGN PATENT DOCUMENTS**

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

**NON-PATENT DOCUMENTS**


*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

\*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)  
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

<b>Index of Claims</b> 	<b>Application/Control No.</b> 10430696	<b>Applicant(s)/Patent Under Reexamination</b> DRY, JOEL M.
	<b>Examiner</b> Ho, Tu-Tu	<b>Art Unit</b> 2818

✓	<b>Rejected</b>	-	<b>Cancelled</b>	N	<b>Non-Elected</b>	A	<b>Appeal</b>
=	<b>Allowed</b>	÷	<b>Restricted</b>	I	<b>Interference</b>	O	<b>Objected</b>

<input type="checkbox"/> Claims renumbered in the same order as presented by applicant				<input type="checkbox"/> CPA				<input type="checkbox"/> T.D.				<input type="checkbox"/> R.1.47			
CLAIM		DATE													
Final	Original	06/13/2007													
	1	=													
	2	=													
	3	=													
	4	=													
	5	=													
	6	=													
	7	=													
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	20	=													
	21	=													
	22	=													
	23	=													
	24	=													
	25	=													
	26	=													
	27	✓													
	28	-													
	29	-													
	30	-													
	31	=													
	32	=													
	33	=													

<b>Search Notes</b>  	<b>Application/Control No.</b>  10430696	<b>Applicant(s)/Patent Under Reexamination</b>  DRY, JOEL M.
	<b>Examiner</b>  Ho, Tu-Tu	<b>Art Unit</b>  2818

<b>SEARCHED</b>			
<b>Class</b>	<b>Subclass</b>	<b>Date</b>	<b>Examiner</b>
257	88	06/13/2007	TH

<b>SEARCH NOTES</b>		
<b>Search Notes</b>	<b>Date</b>	<b>Examiner</b>
257/99,675,708,712,724,E33.057,E33.075,E23.099; 362/555,580,582,217,218 (text search only - see search history printout)	06/13/2007	TH

<b>INTERFERENCE SEARCH</b>			
<b>Class</b>	<b>Subclass</b>	<b>Date</b>	<b>Examiner</b>



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OCT 22 2007

Serial No. 10/430,696

*Attorney Docket OPTOLUA1-003*

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

JOEL DRY

:

Group Art No.: 2818

Serial No. 10/430,696

:

Examiner: Tu Tu V Ho

Filed: 05/05/2003

:

Title: LIGHT EMITTING DIODE LIGHT SOURCE

Commissioner of Patents

PO Box 1450

Alexandria, VA 22313-1450

RESPONSE

This is responsive to the Office Action dated 06/20/2007. A petition for extension is filed herewith.

Remarks are at page 2.

Serial No. 10/430,696

#### REMARKS

Claims 1-27 and 31-33 are in the application.

Claims 1-26 and 31-33 are allowed.

Claim 27 stands rejected under 35 U.S.C. 102(e) as anticipated by Nagamatsu U.S. Patent 6,876,681.

At the outset, the Examiner is thanked for the allowance of claims 1-26 and 31-33. It is believed that claim 27 is also allowable.

The Examiner has withdrawn the prior 35 U.S.C. 102(e) rejection of claim 27 based on the Jones et al patent. It is respectfully submitted that for the same reasons that claim 27 is allowable over Jones et al, it is likewise not anticipated by the '681 patent.

The structure shown and described in the '681 patent is substantially the same as that in the Jones et al patent

#### 35 U.S.C. 102(E) REJECTIONS

##### Standard for anticipation

The standard for anticipation under 35 U.S.C. 102 is set forth in M.P.E.P. 2131:

'A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described in a single prior art reference.' *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631... 'The identical invention must be shown in as complete detail as is contained in the claim.' *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989)....

For anticipation under 35 USC 102, the reference must teach every aspect of the claimed invention either explicitly or implicitly. Any feature not directly taught must be inherently present.

##### The Examiner has not met the standards for anticipation under 35 USC 102 of:

'A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described in a single prior art reference.' or 'The identical invention must be shown in as complete detail as is contained in the claim.'

The Examiner is not permitted to change the teachings of a reference in order to meet the structure claimed by an applicant.

As will be specifically pointed out below, the Examiner has failed to follow this clear directive for determining anticipation.

Serial No. 10/430,696

Claim 27 recites:

A light source comprising:

an elongate thermally conductive member having an outer surface;

at least one light emitting diode carried on said elongate member outer surface;

said elongate thermally conductive member being configured to conduct heat away from said at least one light emitting diode; and

cooling apparatus in thermal communication with said elongate thermally conductive member to enhance cooling of said at least one light emitting diode, said cooling apparatus being selected from one of a solid state cooling device, a Peltier cooling device, and a Piezoelectric device.

The Examiner, in stating the basis for the rejection states that

"an elongate thermally conductive member (31, Figs. 2's, col. 4, line 57 through col. 5, line 67, ... ) having an outer surface (no number):

at least one light emitting diode (generally defined by laser diode module 10, Figs 1-2, col. 4, lines 39+, or defined by semiconductor laser 11/chip carrier 22, col. 3, lines 55-67, and wherein "diode", "module", and "semiconductor laser/chip carrier" are broadly and relatively interpreted) carried on said elongate member outer surface (best seen in Figs. 2's):

said elongate thermally conductive member being configured to conduct heat away from said at least one light emitting diode (col. 4, line 57 through col. 5, line 67); and

a Peltier cooling device (23, cols. 3-5, particularly col. 3, lines 64+) in thermal communication with said elongate thermally conductive member to enhance cooling of said at least one light emitting diode.

It is respectfully submitted that the Examiner's "broadly and relatively" interpretation of laser diode module 10 is not warranted nor is it supported by the plain language teachings of the '681 patent. The Examiner's attention is drawn to the following portions of the '681 patent:

In general, a laser diode module is used as a signal light source for an optical fiber communication, particularly a trunk line system--CATV or an excitation light source for a fiber amplifier. In order to achieve a high power and a stable operation, the laser diode module includes a built-in Peltier device, and in addition, optical parts such as a laser diode chip, a photodiode chip, lens or the like as well as electric parts such as a thermistor component, inductor, resistor or the like are arranged on a metal substrate mounted on the upper part of the Peltier device. (Col. 1, lines 15-20)

A light source comprising a plurality of laser diode modules, wherein a plurality of high optical power laser diode modules are arranged in high density, each of said plurality of high optical power laser diode modules includes a metal substrate mounting a laser diode chip and an optical instrument thereon; a Peltier device thermally connected to said metal substrate; a heat pipe having a heat absorbing portion and a heat dissipating portion in which said heat absorbing portion is thermally connected to

Serial No. 10/430,696

said Peltier device and a heat dissipating fin is provided on said heat dissipating portion; and a heat pipe reinforcing member to hold said heat dissipating fin and reinforce a strength of said heat pipe. (Col. 1, lines 53-65)

More specifically, it is found that a light source comprising a plurality of highly reliable and high optical power laser diode modules can be obtained by thermally connecting the heat absorbing portion of the heat pipe to the respective Peltier devices in laser diode modules each of which includes a metal substrate mounting a laser diode chip and optical equipment thereon, and a Peltier device thermally connected to the metal substrate, even when a plurality of laser diode modules respectively having a high optical power are arranged highly densely, because the respective laser diode module can be cooled by the scale incomparable to the prior art. (Col. 3, lines 1-12)

One of the embodiment of the light source of the invention comprises a light source comprising a plurality of laser diode modules, wherein a plurality of high optical power laser diode modules are arranged in high density, each of said plurality of high optical power laser diode modules includes a metal substrate mounting a laser diode chip and an optical instrument thereon; a Peltier device thermally connected to said metal substrate; a heat pipe having a heat absorbing portion and a heat dissipating portion in which said heat absorbing portion is thermally connected to said Peltier device and a heat dissipating fin is provided on said heat dissipating portion; and a heat pipe reinforcing member to hold said heat dissipating fin and reinforce a strength of said heat pipe. (Col. 3, lines 43-56)

FIG. 1 is a schematic view showing an example of a laser diode module constructing a light source of the present invention. As shown in FIG. 1, a laser diode module 10 includes a semiconductor laser 11, a first lens 12, a second lens 13, a core enlarged fiber 14 and a hermetic case 20. The semiconductor laser 11 is installed on a base 21 through a chip carrier 22 with a predetermined distance apart from the first lens 12. The base 21 is arranged on a Peltier device 23 for effecting temperature control which is disposed in the hermetic case 20. The base 21 comprises a composite material made of copper for an essential part thereof, and of stainless steel for a portion where the first lens 12 is installed. A carrier 24 is fixed on the base member 21 in one side which is positioned opposite to the first lens 12 with the chip carrier 22 positioned therebetween, and a photo diode 24a for monitoring is installed on the side portion of the carrier 24, facing toward the semiconductor laser 11. (Col. 3, line 57- col. 4, line 6)

The heat pipe 31 may comprise a round type heat pipe. The respective laser diode module comprises, as shown in FIG. 1, a metal substrate 21 mounting a laser diode chip 11 and an optical instrument 12, and a Peltier device 23 thermally connected to the metal substrate 21. Furthermore, the Peltier device 23 is thermally connected to a heat absorbing portion of a heat pipe 31. In the light source comprising laser diode modules of the present invention, the heat pipe 31 is thermally connected to the respective laser diode module 10, as shown in FIG. 2(a). (Col. 5, lines 12-21)

Serial No. 10/430,696

Accordingly, the Peltier device arranged in the laser diode module is prevented from being destroyed, and the laser diode chip 11 can be maintained within a predetermined temperature range to continue to efficiently function, thus a high performance of the light source can be maintained. (Col. 6, lines 17-21)

In addition, a Raman amplifier of the invention comprises a light source including: at least one laser diode module including a metal substrate mounting a laser diode chip and an optical component, and a Peltier device thermally connected with the metal substrate; a heat pipe having a heat absorbing portion and a heat dissipating portion, the heat absorbing portion of the heat pipe being thermally connected with the peltier device; a heat dissipating fin provided on the heat dissipating portion; and a heat pipe reinforcing member to hold the heat dissipating fin and reinforce a strength of the heat pipe. (Col. 7, lines 32-42)

Furthermore, a light source of the invention comprises: a laser diode module including a laser diode chip, an optical component, and a peltier device, the laser diode chip and the optical component being supported by the peltier device; a mounting portion having the peltier device mounted thereon such that the peltier device is thermally connected with the mounting portion; at least one heat pipe having a first portion extending within the mounting portion and a second portion extending from a side of the mounting portion, the heat pipe having an interior with a heat transfer fluid therein; a heat dissipating fin provided on the second portion; and a heat pipe reinforcing member to hold the heat dissipating fin and reinforce a strength of the heat pipe. (Col. 7, lines 43- 55)

Claim 1. A light source comprising:

a plurality of laser diode modules, wherein a plurality of high optical power laser diode modules are arranged in high density, each of said plurality of high optical power laser diode modules includes a metal substrate mounting a laser diode chip and an optical instrument thereon; a Peltier device thermally connected to said metal substrate; a heat pipe having a heat absorbing portion and a heat dissipating portion in which said heat absorbing portion is thermally connected to said Peltier device and a heat dissipating fin is provided on said heat dissipating portion; and  
a heat pipe reinforcing member configured to contact and pinch-hold said heat dissipating fin against said heat pipe, so as to reinforce a strength of said heat pipe, said reinforcing member having a ring-shape.

Claim 13. A light source comprising:

a laser diode module including a laser diode chip, an optical component, and a peltier device, said laser diode chip and said optical component being supported by said peltier device;  
a mounting portion having said peltier device mounted thereon such that said peltier device is thermally connected with said mounting portion;

Serial No. 10/430,696

at least one heat pipe having a first portion extending within said mounting portion and a second portion extending from a side of said mounting portion, said heat pipe having an interior with a heat transfer fluid therein;  
a heat dissipating fin provided on said second portion; and  
a heat pipe reinforcing member configured to pinch-hold said heat dissipating fin against said heat pipe and reinforce a strength of said heat pipe, said reinforcing member having a ring-shape.

It is clear from a reading of the above-quoted portions of the '681 patent that the "module" includes not just a laser diode, but specifically the "module" includes a laser diode chip, an optical component, and a Peltier device, the laser diode chip and the optical component are supported by the Peltier device

Thus the Examiner has mischaracterized the disclosure of the '681 patent.

The '681 patent specifically shows the Peltier device is carried on the heat pipe. The laser diode is carried by a Peltier device via an intermediate metal layer.

The laser diode of the '681 patent is not carried on an outer surface of the heat pipe. Accordingly, the '681 patent teaches away from carrying an LED or laser diode on the outer surface of a heat pipe. Therefore, the '681 patent fails to show, disclose or teach that: "at least one light emitting diode carried on said elongate member outer surface" as recited in claim 27.

Claim 27 recites, inter alia:

said elongate thermally conductive member being configured to conduct heat away from said at least one light emitting diode

In contrast, the '681 patent clearly shows and describes that heat pipe is configured to conduct heat away from the Peltier device and not from the laser diode.

The '681 patent does not show or describe or suggest or anticipate the structure set out in claim 27.

Reexamination and reconsideration are requested. It is further requested that claim 27 also be allowed and that this application be passed to issue.

An early notice of allowance would be appreciated.

Respectfully submitted,

/Donald J. Lenkszus/

Donald J. Lenkszus, Reg. No. 28,096

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**OCT 22 2007**

PTO/SB/22 (10-07)

Approved for use through 10/31/2007. OMB 0551-0031  
U.S. Patent and Trademark Office, U.S. DEPARTMENT OF COMMERCE

Under the paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

<b>PETITION FOR EXTENSION OF TIME UNDER 37 CFR 1.136(a)</b> <b>FY 2006</b> (Fees pursuant to the Consolidated Appropriations Act, 2006 (H.R. 4318).)		Docket Number (Optional) <b>OPTOLYM-003</b>	
Application Number <b>10/430696</b>		Filed <b>5/5/2003</b>	
For <b>LIGHT EMITTING DIODE LIGHT SOURCE</b>			
Art Unit <b>2819</b>		Examiner <b>TU TU V HO</b>	

This is a request under the provisions of 37 CFR 1.136(a) to extend the period for filing a reply in the above identified application.

The requested extension and fee are as follows (check time period desired and enter the appropriate fee below):

	Fee	Small Entity Fee	
<input checked="" type="checkbox"/> One month (37 CFR 1.17(a)(1))	\$120	\$80	\$ <b>60</b>
<input type="checkbox"/> Two months (37 CFR 1.17(a)(2))	\$480	\$230	\$ _____
<input type="checkbox"/> Three months (37 CFR 1.17(a)(3))	\$1050	\$525	\$ _____
<input type="checkbox"/> Four months (37 CFR 1.17(a)(4))	\$1640	\$820	\$ _____
<input type="checkbox"/> Five months (37 CFR 1.17(a)(5))	\$2230	\$1115	\$ _____

☒ Applicant claims small entity status. See 37 CFR 1.27.

☐ A check in the amount of the fee is enclosed.

☒ Payment by credit card. Form PTO-2038 is attached.

☐ The Director has already been authorized to charge fees in this application to a Deposit Account.

☐ The Director is hereby authorized to charge any fees which may be required, or credit any overpayment, to Deposit Account Number \_\_\_\_\_. I have enclosed a duplicate copy of this sheet.

**WARNING:** Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

I am the ☐ applicant/inventor.

☐ assignee of record of the entire interest. See 37 CFR 3.71.  
Statement under 37 CFR 3.73(b) is enclosed (Form PTO/SB/98).

☒ attorney or agent of record. Registration Number **28,096**

☐ attorney or agent under 37 CFR 1.34.  
Registration number if acting under 37 CFR 1.34 \_\_\_\_\_

Signature *Donald J. Lenkszus* Date **10/22/2007**

Typed or printed name **DONALD J. LENKSZUS** Telephone Number **602-463-2010**

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below.

☐ Total of \_\_\_\_\_ forms are submitted.

This collection of information is required by 37 CFR 1.136(a). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 5 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1480, Alexandria, VA 22313-1480. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1480, Alexandria, VA 22313-1480.

If you need assistance in completing the form, call 1-800-PTO-6199 and select option 2.

10/23/2007 VBUI11 00000058 10430696

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**OCT 22 2007**

PTO/SB/21 (10-07)

Approved for use through 10/31/2007. OMB 0651-0031

U.S. Patent and Trademark Office, U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

<b>TRANSMITTAL FORM</b>	Application Number	10/430,696
	Filing Date	05/05/2006
	First Named Inventor	JOEL DRY
	Art Unit	2815
	Examiner Name	TU TU V HO
(to be used for all correspondence after initial filing)		
Total Number of Pages in This Submission	8	Attorney Docket Number OPTOLUM 003

ENCLOSURES (Check all that apply)		
<input type="checkbox"/> Fee Transmittal Form <input type="checkbox"/> Fee Attached <input checked="" type="checkbox"/> Amendment/Reply <input type="checkbox"/> After Final <input type="checkbox"/> Affidavits/declaration(s) <input checked="" type="checkbox"/> Extension of Time Request <input type="checkbox"/> Express Abandonment Request <input type="checkbox"/> Information Disclosure Statement  <input type="checkbox"/> Certified Copy of Priority Document(s) <input type="checkbox"/> Reply to Missing Parts/ Incomplete Application <input type="checkbox"/> Reply to Missing Parts under 37 CFR 1.52 or 1.53	<input type="checkbox"/> Drawing(s) <input type="checkbox"/> Licensing-related Papers  <input type="checkbox"/> Petition <input type="checkbox"/> Petition to Convert to a Provisional Application <input type="checkbox"/> Power of Attorney, Revocation Change of Correspondence Address <input type="checkbox"/> Terminal Disclaimer <input type="checkbox"/> Request for Refund <input type="checkbox"/> CD. Number of CD(s) _____ <input type="checkbox"/> Landscape Table on CD	<input type="checkbox"/> After Allowance Communication to TC <input type="checkbox"/> Appeal Communication to Board of Appeals and Interferences <input type="checkbox"/> Appeal Communication to TC (Appeal Notice, Brief, Reply Brief) <input type="checkbox"/> Proprietary Information <input type="checkbox"/> Status Letter <input checked="" type="checkbox"/> Other Enclosure(s) (please identify below): PTOL-2038
<div style="border: 1px solid black; padding: 2px;">Remarks</div>		

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT			
Firm Name	DONALD J LENKSZUS, PC		
Signature	/Donald J Lenkszus/		
Printed name	DONALD J LENKSZUS		
Date	10/22/2007	Reg. No.	28,006

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# EAST Search History

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S13 9	163	S138 S130	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/01/04 08:50
S13 8	85	S137 and S126	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/01/04 08:50
S13 7	188	S136 and S123	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/01/04 08:50
S13 6	223	S133 and S135	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/01/04 08:50
S13 5	26791	S134 S116	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/01/04 08:50
S13 4	11707	S110 S131	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/01/04 08:50
S13 3	1770	( (semiconduct\$4 semi adj conduct\$4 silicon si ge germanium solid adj state) near2 (light near emitting optoelectronic opto adj electronic oled emitting adj (device diode) (EL luminescen\$2 electroluminescen\$2 electro adj luminescen\$2) ) (led light near emitting near diode) (hp led hbled (hp hb high adj (power brightness) ) adj (led light near emitting)) ( (led "l.e.d." "l.e.d" ((light radiation radiating) near (emitting emissive)) (optoelectronic opto adj electronic) (EL luminescen\$2 electroluminescen\$2 electr\$4 near (luminescen\$2 optic\$3)) ) near (device diode structure element package) OLED laser) ) same S132	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/01/04 08:50

## EAST Search History

S13 2	49170	(tub\$6 cylind\$6 elongat\$3 pip\$4 annul\$4) near5 ( heatsink ((heat thermal\$2) near (sink\$4 spread\$3 dissipat\$3 conducting conductive radiat\$4)) (cool\$3 near2 (device apparatus) ) )	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/01/04 08:50
S13 1	8022	(362/294,249,346,373,800,235,252,249).CCLS.	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2008/01/04 08:50
S13 0	97	S127 S129	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/01/04 08:50
S12 9	56	S128 SAME S125	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/01/04 08:50
S12 8	1710	(( (semiconduct\$4 semi adj conduct\$4 silicon si ge germanium solid adj state) near2 (light near emitting optoelectronic opto adj electronic oled emitting adj (device diode) (EL luminescen\$2 electroluminescen\$2 electro adj luminescen\$2) ) (led light near emitting near diode) (hp led hbled (hp hb high adj (power brightness) ) adj (led light near emitting)) ( (led "l.e.d." "l.e.d" ((light radiation radiating) near (emitting emissive)) (optoelectronic opto adj electronic) (EL luminescen\$2 electroluminescen\$2 electr\$4 near (luminescen\$2 optic\$3)) ) near (device diode structure element package) OLED laser) ) same S117	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/01/04 08:50
S12 7	45	S122 and (wire wiring conduct\$5)	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/01/04 08:50
S12 6	317	(( (semiconduct\$4 semi adj conduct\$4 silicon si ge germanium solid adj state) near2 (light near emitting optoelectronic opto adj electronic oled emitting adj (device diode) (EL luminescen\$2 electroluminescen\$2 electro adj luminescen\$2) ) (led light near emitting near diode) (hp led hbled (hp hb high adj (power brightness) ) adj (led light near emitting)) ) S105) same S124	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/01/04 08:50

## EAST Search History

S12 4	1443	S117 same S123	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/01/04 08:50
S12 3	1088767	(luminaire illuminan\$4 light adj source lamp)	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/01/04 08:50
S12 2	46	S121	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/01/04 08:50
S12 1	46	S120 and S117	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/01/04 08:50
S12 0	1961	S118 and S119	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/01/04 08:50
S11 9	21381	S110 S116	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/01/04 08:50
S11 8	96862	S109 and S115	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/01/04 08:50
S11 7	47498	(tub\$6 cylind\$6 elongat\$3 pip\$4) near5 ( heatsink ((heat thermal\$2) near (sink\$4 spread\$3 dissipat\$3 conducting conductive radiat\$4)) (cool\$3 near2 (device apparatus) ) )	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/01/04 08:50

## EAST Search History

S11 6	15227	(257/13,79-103).CCLS.	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2008/01/04 08:50
S11 5	408310	S112 S113 S114	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/01/04 08:50
S11 4	108306	S111.clm.	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/01/04 08:50
S11 3	331939	S111.ab.	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/01/04 08:50
S11 2	74651	S111.ti.	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/01/04 08:50
S11 1	622961	light adj2 source	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/01/04 08:50
S11 0	6277	(362/600,611,612,613,551,555,580,582,217,218,800). CCLS.	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2008/01/04 08:50
S10 9	876320	S106 S107 S108	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/01/04 08:50

## EAST Search History

S10 8	186496	S105.clm.	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/01/04 08:50
S10 7	701552	S105.ab.	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/01/04 08:50
S10 6	399220	S105.ti.	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/01/04 08:50
S10 5	1358762	( (led ((light radiation radiating) near (emitting emissive)) (optoelectronic opto adj electronic) (EL luminescen\$2 electroluminescen\$2 electr\$4 near (luminescen\$2 optic\$3)) ) near (device diode structure element package) OLED laser)	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/01/04 08:50
S10 2	66	S101 not S88	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/01/04 08:50
S14 3	15	S141 and S142	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/01/04 08:56
S14 2	57	S140 and fan	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/01/04 08:56
S14 1	64	S140 and S125	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/01/04 09:05

## EAST Search History

S14 0	163	S139	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/01/04 11:33
S14 4	76	S140 and base	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/01/04 11:42
S14 5	1	(US-6936855-\$).did.	USPAT	OR	ON	2008/01/04 12:51
S14 6	0	S145 and S125	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/01/04 12:52
S12 5	289190	solid adj state near3 ( heatsink ((heat thermal\$2) near (sink\$4 spread\$3 dissipat\$3 conducting conductive radiat\$4)) (cool\$3 near2 (device apparatus) ) ) peltier (piezoelectric piezo adj electric piezo\$5)	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/01/05 07:32
S14 8	1	S147 near3 (mechanical adj2 fan)	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/01/05 07:36
S14 9	4	S147 same (mechanical adj2 fan)	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/01/05 07:42
S14 7	289190	solid adj state near3 ( heatsink ((heat thermal\$2) near (sink\$4 spread\$3 dissipat\$3 conducting conductive radiat\$4)) (cool\$3 near2 (device apparatus) ) ) peltier (piezoelectric piezo adj electric piezo\$5)	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/01/05 07:43
S15 0	36	("20020056804" "20050055070" "5861703" "5890794" "5949347" "6274924" "6293753" "6428189" "6573536" "6582100" "6712486" "6715900" "6787999" "6799864" "6832849" "6848819" "6876681").PN.	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/01/06 11:37

## EAST Search History

S15 4	6	S153 and peltier	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/01/06 11:47
S15 3	31	10/380189 "4727554"	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/01/06 11:47
S15 2	36	("20020056804" "20050055070" "5861703" "5890794" "5949347" "6274924" "6293753" "6428189" "6573536" "6582100" "6712486" "6715900" "6787999" "6799864" "6832849" "6848819" "6876681").PN.	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/01/06 11:47
S15 1	9	S150 and (peltier piezoelectric piezo adj electric piezo\$5)	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/01/06 12:18
S15 6	321	( piezoelectric piezo adj electric piezo\$5) adj2 (fan cooling)	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/01/06 12:19
S15 5	220	( piezoelectric piezo adj electric piezo\$5) adj fan	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/01/06 12:19
S15 7	4	S156 near6 solid adj state	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/01/06 13:07
S15 8	2	10/732105 and (metal\$4 al aluminum)	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/01/06 15:44

## EAST Search History

S16 0	14	S159 same (semiconductor chip ic electronic)	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/01/06 15:49
S16 3	4	S152 and (gas)	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/01/06 15:50
S16 2	0	S152 and (other adj gas)	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/01/06 15:50
S16 1	0	S152 and (helium)	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/01/06 15:50
S15 9	188	air near6 (helium) near6 cooling	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/01/06 15:56
S16 4	8	S159 with (enhance enhancing improve improving increase increasing benefit advantage better protect protecting)	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/01/06 15:57





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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/430,696	05/05/2003	Joel M. Dry	OPTOLUM-003	3639
<div>7590      01/10/2008</div> <div>DONALD J LENKSZUS PO BOX 3064 CAREFREE, AZ 85377-3064</div>				
			EXAMINER	
			HO, TU TU V	
			ART UNIT	PAPER NUMBER
			2818	
			MAIL DATE	DELIVERY MODE
			01/10/2008	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

Application No.

10/430,696

Applicant(s)

DRY, JOEL M.

Examiner

Tu-Tu Ho

Art Unit

2818

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 22 October 2007.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-27 and 31-33 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-24, 26, 27 and 31-33 is/are rejected.
- 7) ☒ Claim(s) 20 and 25 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 August 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Allowable Subject Matter*

1. The indicated allowability of claims 1-24, 26, and 31-33 is withdrawn in view of the newly discovered reference(s) to Bolta et al. U.S. Patent Application Publication 20040120152.

Rejections based on the newly cited reference(s) follow.

### *Claim Objections*

2. **Claim 20** is objected to because of the following informalities: Claim 20 derives and antecedent basis for "said extrusion" from claim 19, not from claim 18 as claimed.

Appropriate correction is required.

### *Claim Rejections - 35 USC § 102*

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

3. **Claims 1-4, 7-11, 15, 17-19, 21,23, 31, and 32** are rejected under 35 U.S.C. 102(e) as being anticipated by Bolta et al. U.S. Patent Application Publication 20040120152 (the '152 reference).

The '152 reference discloses in Fig. 15 and respective portions of the specification a light source as claimed.

Referring to **claim 1**, the reference discloses a light source comprising:

an elongate thermally conductive member (no number, described generally as: "the tube implementation of the lighting fixture 10", Fig. 15, paragraph(s) [0097]) having an outer surface (no number);

a plurality of light emitting diodes ("L.E.D." 12) carried on said elongate member outer surface at least some of said light emitting diodes being disposed in a first plane and others of

Art Unit: 2818

said light emitting diodes being disposed in a second plane not coextensive with said first plane (as clearly depicted in Fig. 15);

said elongate thermally conductive member being configured to conduct heat away from said light emitting diodes to fluid ("air") contained by said elongate thermally conductive member;

said elongate thermally conductive member comprises one or more surface discontinuities ("fins" 16) to enhance heat dissipation; and

a fluid movement device ("fan" 20) in fluid communication with said elongate thermally conductive member to enhance movement of said fluid over at least some of said heat surface discontinuities (paragraph(s) [0097]).

Referring to **claim(s) 2 and 3**, the reference further discloses that said fluid movement device comprises an electromechanical device and said electromechanical device comprises a fan (fan 20).

Referring to **claim(s) 4**, the reference further discloses that said fluid movement device comprises an electronic device (fan 20).

Referring to **claim(s) 7 and 8**, the reference further discloses that said elongate thermally conductive member is configured to conduct heat away from said light emitting diodes to fluid proximate said elongate member outer surface and that said fluid proximate said elongate member outer surface comprises air ("fan 20 can be added to the hollow center area to move air through the unit to cool the L.E.D.'s 12", paragraph(s) [0097]).

Referring to **claim(s) 9 and 10**, the reference further discloses that said fluid movement device comprises an electromechanical device and said electromechanical device comprises a fan (fan 20).

Referring to **claim(s) 11**, the reference further discloses that said fluid movement device comprises an electronic device (fan 20).

Referring to **claim(s) 15**, the reference further discloses that said elongate thermally conductive member comprises a tube ("the tube implementation of the lighting fixture 10", Fig. 15, paragraph(s) [0097]).

Referring to **claim(s) 17**, the reference further discloses that said tube has a cross-section having flat portions (as clearly depicted in Fig. 15).

Referring to **claim(s) 18**, the reference further discloses that said elongate thermally conductive member comprises a channel (generally defined by fins).

Referring to **claim(s) 19**, the reference further discloses that said elongate thermally conductive member comprises an extrusion (such as a fin 16).

Referring to **claim(s) 21**, the reference further discloses that each of said light emitting diodes emits white light (paragraph(s) [0046]).

Referring to **claim(s) 22**, the reference further discloses that at least some of said light emitting diodes emit colored light (paragraph(s) [0046]).

Referring to **claim 23**, the reference discloses a light source comprising:

an elongate thermally conductive member (no number, described generally as: “the tube implementation of the lighting fixture 10”, Fig. 15, paragraph(s) [0097]) having an outer surface (no number);

a plurality of light emitting diodes (“L.E.D.” 12) carried on said elongate member outer surface at least some of said light emitting diodes being disposed in a first plane and others of said light emitting diodes being disposed in a second plane not coextensive with said first plane;

said elongate thermally conductive member being configured to conduct heat away from said light emitting diodes to fluid (“air”) contained by said elongate thermally conductive member (paragraph(s) [0097]); and

a cooling apparatus (“fan” 20) coupled to said elongate thermally conductive member to enhance cooling of said plurality of light emitting diodes (paragraph(s) [0097]).

Referring to **claim 31**, the reference discloses a light source comprising:

an elongate thermally conductive member (no number, described generally as: “the tube implementation of the lighting fixture 10”, Fig. 15, paragraph(s) [0097]) having an outer surface (no number);

at least one light emitting diodes (“L.E.D.” 12) carried on said elongate member outer surface;

one or more electrical conductors (not shown, “The tube provides mechanical support, heat sinking, utility (power) delivery mechanism”, paragraph(s) [0097]) carried by said elongate thermally conductive member and connected to said at least one light emitting diodes to supply electrical power thereto;

Art Unit: 2818

said elongate thermally conductive member being configured to conduct heat away from said at least one light emitting diode to fluid contained by said elongate thermally conductive member (paragraph(s) [0097]); and

a fluid moving device (fan 20) in fluid communication with said elongate thermally conductive member to move said fluid (paragraph(s) [0097]).

Referring to **claim 32**, the reference discloses a light source comprising:

an elongate thermally conductive member (no number, described generally as: “the tube implementation of the lighting fixture 10”, Fig. 15, paragraph(s) [0097]) having an outer surface (no number);

a plurality of light emitting diodes (“L.E.D.” 12) carried on said elongate member outer surface at least some of said light emitting diodes being disposed in a first plane and others of said light emitting diodes being disposed in a second plane not coextensive with said first plane;

electrical conductors (not shown, “The tube provides mechanical support, heat sinking, utility (power) delivery mechanism”, paragraph(s) [0097]) carried by said elongate thermally conductive member and connected to said plurality of light emitting diodes to supply electrical power thereto; and

said elongate thermally conductive member being configured to conduct heat away from said light emitting diodes to fluid contained by said elongate thermally conductive member (paragraph(s) [0097]); and

a coating (not shown, paragraph(s) [0073]) carried on said elongate thermally conductive member.

4. **Claim 27** is rejected under 35 U.S.C. 102(e) as being anticipated by Nagamatsu U.S. Patent 6,876,681 (the ‘681 reference, cited in a previous office action).

The ‘681 reference discloses a light source comprising:

an elongate thermally conductive member (31, Figs. 2’s, col. 4, line 57 through col. 5, line 67) having an outer surface (no number);

at least one light emitting diode (generally defined by laser diode module 10, Figs. 1-2, col. 4, lines 39+, or defined by semiconductor laser 11/chip carrier 22, col. 3, lines 55-67, and wherein “diode”, “module”, and “semiconductor laser/chip carrier” are broadly and relatively

Art Unit: 2818

interpreted) carried on said elongate member outer surface (best seen in Figs. 2's; because the claim does not require that the diode is carried directly on said elongate member outer surface, it is proper to say that laser diode 11 is carried, via other layers, on said elongate member outer surface);

said elongate thermally conductive member being configured to conduct heat away from said at least one light emitting diode (cols. 1 through 5, particularly col. 1, lines 35-40, col. 3, lines 5-12, col. 4, lines 55+, col. 5, lines 1-15; specifically, because the patent teaches that the heat pipe is configured to conduct heat away from the Peltier device (col. 4, lines 55+) and the Peltier device is configured to conduct heat away from the laser diode (col. 1, lines 35-40: "keeping the temperature of the laser diode chip constant"; col. 3, lines 5-12: "the respective laser diode module can be cooled by the scale incomparable to the prior art"), the patent teaches, in effect, that said elongate thermally conductive member (said heat pipe) being configured to conduct heat away from said at least one light emitting diode (said laser diode chip) ); and

a Peltier cooling device (23, cols. 3-5, particularly col. 3, lines 64+) in thermal communication with said elongate thermally conductive member to enhance cooling of said at least one light emitting diode.

### ***Claim Rejections - 35 USC § 103***

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

**5. Claims 16 and 20** are rejected under 35 U.S.C. §103(a) as being unpatentable over Bolta et al. U.S. Patent Application Publication 20040120152 (the '152 reference).

Referring to **claim 16**, the '152 reference discloses as detailed above that said elongate thermally conductive member comprises a tube. The reference further discloses that said elongate thermally conductive member has a cross-section in the shape of a circle (Fig. 15).

Although the reference does not disclose that the shape could be a polygon, the shape differences

Art Unit: 2818

are considered obvious and are not patentable unless unobvious or unexpected results are obtained from these changes.

Referring to **claim 20**, the reference discloses as detailed above for claim 19 an extrusion (fin 20) that is a part of the metal tube (paragraph(s) [0050] and [0097]). Although the reference does not disclose aluminum material as claimed for said metallic elongate thermally conductive member including said extrusion, aluminum was available as a known thermally conductive material at the time the invention was made, therefore selection of aluminum would have been obvious to one of ordinary skill in the art at the time the invention was made.

6. **Claims 5, 6, 12, 13, 24, and 26** are rejected under 35 U.S.C. §103(a) as being unpatentable over Bolta et al. U.S. Patent Application Publication 20040120152 (the '152 reference) in view of Losinski U.S. Patent 5,861,703 (cited in a previous office action).

Referring to **claims 5, 6, 12, 13, 24, and 26**, the '152 reference discloses a light source substantially as claimed and as detailed above for claims 1, 7, and 23 including a fluid (air) movement device which is a (rotary) fan (20, Fig. 15). The reference fails to teach that the fluid (air) movement device could be a solid state piezoelectric device as claimed.

Losinski, at the time the invention was made, teaches that a solid state piezoelectric device ("piezoelectric fan") is better than a (mechanical rotary) fan in that the solid state piezoelectric device does not have drawbacks that the mechanical rotary fan possesses such as moving parts, periodic lubricating, a large size, and short life (col. 1, lines 15-25).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to form the reference's device using a solid state piezoelectric device instead of fan 20. One would have been motivated to make such a change in view of the teachings in Losinski so as to prolong the life, among other advantages, of the device.

7. **Claim 14** is rejected under 35 U.S.C. §103(a) as being unpatentable over Bolta et al. U.S. Patent Application Publication 20040120152 (the '152 reference) in view of Hirano U.S. Patent 6,560,064.



The '152 reference discloses a light source substantially as claimed and as detailed above for claim 1 including said cooling medium which is air. The reference fails to teach that the cooling medium is something other than air.

Hirano, in disclosing an electronic device, teaches that helium provides better cooling than air (column 3, lines 50-55). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize helium as a cooling medium. One would have been motivated to make such a change in view of the teachings in Hirano because helium provides better cooling than air.

8. **Claim 33** is rejected under 35 U.S.C. §103(a) as being unpatentable over Bolta et al. U.S. Patent Application Publication 20040120152 (the '152 reference) in view of Wu U.S. Patent 5,949,347 (cited in a previous office action).

The '152 reference discloses a light source substantially as claimed and as detailed above for claim 32 including said coating. The reference fails to teach that the coating is infused with optically reflective material.

Wu, in disclosing a light source, teaches that an LED carrier coated with a reflective material results in a light source with an even illumination (column 4, lines 15-21). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to form the reference's coating such that it would be infused with optically reflective material. One would have been motivated to make such a change in view of the teachings in Wu so as to result in a light source with an even illumination.

#### ***Response to Arguments***

9. Applicant's arguments with respect to claim 7, filed 10/22/2007, have been fully considered but they are not persuasive.

Art Unit: 2818

With respect to Applicant's arguments on page 6 that the laser diode (11) of the '681 patent is not carried on an outer surface of the heat pipe, it is respectfully that, because the claim does not require that the diode is carried directly on said elongate member outer surface, or requires that a surface of the diode is in direct contact with a surface of the elongate member, it is proper to say that laser diode 11 is carried (, via other layers,) on said elongate member outer surface, see Figs. 1-2).

Applicant argued on page 6 that the '681 patent does not disclose "said elongate thermally conductive member being configured to conduct heat away from said at least one light emitting diode"; instead, the patent discloses that the heat pipe is configured to conduct heat away from the Peltier device and not from the diode, as argued by Applicant. However, because the patent teaches that the heat pipe is configured to conduct heat away from the Peltier device (col. 4, lines 55+) and the Peltier device is configured to conduct heat away from the laser diode (col. 1, lines 35-40: "keeping the temperature of the laser diode chip constant"; col. 3, lines 5-12: "the respective laser diode module can be cooled by the scale incomparable to the prior art"), the patent teaches, in effect, that said elongate thermally conductive member (said heat pipe) being configured to conduct heat away from said at least one light emitting diode (said laser diode chip).

#### ***Allowable Subject Matter***

10. Claim 25 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is an examiner's statement of reasons for the indication of allowable subject matter: The cited art, whether taken singularly or in combination, especially when all limitations are considered within the claimed specific combination, fails to teach or render obvious a light source with all limitations as recited in claim 25.

#### ***Conclusion***

Art Unit: 2818

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tu-Tu Ho whose telephone number is (571) 272-1778. The examiner can normally be reached on 6:30 am - 3:00 pm, Monday through Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven H. Loke can be reached on (571) 272-1657. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

01-06-2008

/Tu-Tu V. Ho/

Primary Examiner, A.U. 2818

<b>Notice of References Cited</b>	Application/Control No. 10/430,696	Applicant(s)/Patent Under Reexamination DRY, JOEL M.	
	Examiner Tu-Tu Ho	Art Unit 2818	Page 1 of 1

**U.S. PATENT DOCUMENTS**

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-6,560,064	05-2003	Hirano, Toshiki	360/97.02
*	B	US-2004/0120152	06-2004	Bolta et al.	362/294
	C	US-			
	D	US-			
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			


**FOREIGN PATENT DOCUMENTS**

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

**NON-PATENT DOCUMENTS**


*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

\*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)  
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

<b>Index of Claims</b> 	<b>Application/Control No.</b> 10430696	<b>Applicant(s)/Patent Under Reexamination</b> DRY, JOEL M.
	<b>Examiner</b> Ho, Tu-Tu	<b>Art Unit</b> 2818

✓	<b>Rejected</b>	-	<b>Cancelled</b>	N	<b>Non-Elected</b>	A	<b>Appeal</b>
=	<b>Allowed</b>	÷	<b>Restricted</b>	I	<b>Interference</b>	O	<b>Objected</b>

<input type="checkbox"/> Claims renumbered in the same order as presented by applicant					<input type="checkbox"/> CPA					<input type="checkbox"/> T.D.					<input type="checkbox"/> R.1.47				
CLAIM		DATE																	
Final	Original		06/13/2007	01/06/2008															
	1		=	✓															
	2		=	✓															
	3		=	✓															
	4		=	✓															
	5		=	✓															
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	25		=	O															
	26		=	✓															
	27		✓	✓															
	28		-	-															
	29		-	-															
	30		-	-															
	31		=	✓															
	32		=	✓															
	33		=	✓															

<b>Search Notes</b> 	<b>Application/Control No.</b> 10430696	<b>Applicant(s)/Patent Under Reexamination</b> DRY, JOEL M.
	<b>Examiner</b> Ho, Tu-Tu	<b>Art Unit</b> 2818

SEARCHED			
Class	Subclass	Date	Examiner
257	88	06/13/2007	TH
	(Updated)	01/06/2008	TH

SEARCH NOTES		
Search Notes	Date	Examiner
257/99,675,708,712,724,E33.057,E33.075,E23.099; 362/555,580,582,217,218 (text search only - see search history prinout)	06/13/2007	TH
(Updated)	01/06/2008	TH

INTERFERENCE SEARCH			
Class	Subclass	Date	Examiner

MAR 19 2008

PTO/SB/21 (01-08)

Approved for use through 03/31/2008. OMB 0651-0031

U.S. Patent and Trademark Office, U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

<b>TRANSMITTAL FORM</b>  (to be used for all correspondence after initial filing)	Application Number	10430,596
	Filing Date	05/05/2008
	First Named Inventor	JOEL DRY
	Art Unit	2818
	Examiner Name	TU TU V HO
	Attorney Docket Number	OPTOLUM-003
Total Number of Pages in This Submission		2

ENCLOSURES (Check all that apply)		
<input type="checkbox"/> Fee Transmittal Form <input type="checkbox"/> Fee Attached <input type="checkbox"/> Amendment/Reply <input type="checkbox"/> After Final <input type="checkbox"/> Affidavits/declaration(s) <input type="checkbox"/> Extension of Time Request <input type="checkbox"/> Express Abandonment Request <input type="checkbox"/> Information Disclosure Statement <input type="checkbox"/> Certified Copy of Priority Document(s) <input type="checkbox"/> Reply to Missing Parts/Incomplete Application <input type="checkbox"/> Reply to Missing Parts under 37 CFR 1.52 or 1.53	<input type="checkbox"/> Drawing(s) <input type="checkbox"/> Licensing-related Papers <input type="checkbox"/> Petition <input type="checkbox"/> Petition to Convert to a Provisional Application <input type="checkbox"/> Power of Attorney, Revocation <input type="checkbox"/> Change of Correspondence Address <input type="checkbox"/> Terminal Disclaimer <input type="checkbox"/> Request for Refund <input type="checkbox"/> CD, Number of CD(s) _____ <input type="checkbox"/> Landscape Table on CD	<input type="checkbox"/> After Allowance Communication to TC <input type="checkbox"/> Appeal Communication to Board of Appeals and Interferences <input type="checkbox"/> Appeal Communication to TC (Appeal Notice, Brief, Reply Brief) <input type="checkbox"/> Proprietary Information <input type="checkbox"/> Status Letter <input checked="" type="checkbox"/> Other Enclosure(s) (please identify below): PYQ/SB/83 REQUEST FOR WITHDRAWAL AS ATTORNEY OR AGENT AND CHANGE OF CORRESPONDENCE ADDRESS
Remarks		
SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT		
Firm Name	DONALD J LENKSZUS, PC	
Signature	/Donald J Lenkszus/	
Printed name	DONALD J LENKSZUS	
Date	03/19/2008	Reg. No. 28,096

CERTIFICATE OF TRANSMISSION/MAILING	
I hereby certify that this correspondence is being facsimile transmitted to the USPTO or deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on the date shown below:	
Signature	/Donald J Lenkszus/
Typed or printed name	DONALD J LENKSZUS
Date	03/19/2008

This collection of information is required by 37 CFR 1.5. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

MAR 19 2008

PTO/SB/83 (01-06)

Approved for use through 12/31/2008. OMB 0651-0036

U.S. Patent and Trademark Office, U.S. DEPARTMENT OF COMMERCE

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**REQUEST FOR WITHDRAWAL  
AS ATTORNEY OR AGENT  
AND CHANGE OF  
CORRESPONDENCE ADDRESS**

Application Number	10/430,886
Filing Date	05/05/2003
First Named Inventor	JOEL DRY
Art Unit	2818
Examiner Name	TU TU V HO
Attorney Docket Number	OPTOLUM-003

**To: Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450**

Please withdraw me as attorney or agent for the above identified patent application, and

- ☒ all the attorneys/agents of record.  
☐ the attorneys/agents (with registration numbers) listed on the attached paper(s), or  
☐ the attorneys/agents associated with Customer Number

**NOTE:** This box can only be checked when the power of attorney of record in the application is to all the practitioners associated with a customer number.

The reasons for this request are: OPTOLUM, INC HAS EXPRESSLY TERMINATED THE REPRESENTATION.

**CORRESPONDENCE ADDRESS**

1. ☐ The correspondence address is NOT affected by this withdrawal.  
2. ☒ Change the correspondence address and direct all future correspondence to:  
☐ The address associated with Customer Number:

**OR**

<input checked="" type="checkbox"/> Firm or Individual Name	OPTOLUM, INC.		
Address	1515 W University Dr Ste 102		
City	TEMPE	State	AZ
Country	USA		
Telephone	480-968-2500	Email	karen@optolum.com
Signature	/Donald J Lenkszus/		
Name	DONALD J LENKSZUS	Registration No.	28,096
Date	03/19/2008	Telephone No.	602-463-2010

**NOTE:** Withdrawal is effective when approved rather than when received. Unless there are at least 30 days between approval of withdrawal and the expiration date of a time period for response or possible extension period, the request to withdraw is normally disapproved.

This collection of information is required by 37 CFR 1.36. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.





**DONALD J. LENKSZUS**  
**PO BOX 3064**  
**CAREFREE, AZ 85377**

**COPY MAILED**

**APR 14 2008**

**OFFICE OF PETITIONS**

In re Application of

**DRY, Joel M.**

Application No. 10/430,696

Filed: May 05, 2003

Attorney Docket No. **OPTOLUM-003**

**DECISION ON PETITION  
TO WITHDRAW  
FROM RECORD**

This is a decision on the Request to Withdraw as attorney or agent of record under 37 C.F.R. § 1.36(b), filed March 19, 2008.

The request is **NOT APPROVED**.

A grantable request to withdraw as attorney/agent of record must be signed by every attorney/agent seeking to withdraw or contain a clear indication that one attorney is signing on behalf of another/others. A request to withdraw will not be approved unless at least 30 (thirty) days would remain between the date of approval and the later of the expiration date of a time to file a response or the expiration date of the maximum time period which can be extended under 37 C.F.R. § 1.136(a).

In order to request or take action in a patent matter, the assignee must establish its ownership of the patent to the satisfaction of the Director. In this regard, a Statement under 37 CFR 3.73(b) must have either: (i) documentary evidence of a chain of title from the original owner to the assignee (*e.g.*, copy of an executed assignment), and a statement affirming that the documentary evidence of the chain of title from the original owner to the assignee was or concurrently is being submitted for recordation pursuant to § 3.11; or (ii) a statement specifying where documentary evidence of a chain of title from the original owner to the assignee is recorded in the assignment records of the Office (*e.g.*, reel and frame number).

The Office cannot approve the request at this time since the reasons provided do not meet any of the conditions under the mandatory or permissive categories enumerated in 37 CFR 10.40. Section 10.40 of Title 37 of the Code of Federal Regulation states, "[a] practitioner shall not withdraw from employment in a proceeding before the Office without permission from the Office[.]" More specifically, 37 CFR 10.40 states, "[i]f paragraph (b) of this section is not applicable, a practitioner may not request permission to withdraw in matter pending before the Office unless such request or such withdrawal is" for one the permissive reasons listed in 37 CFR 10.40(c). The reasons set forth in the request, (Optolum, Inc. has expressly terminated the representation), does not meet any the conditions set forth in 37 CFR 10.40.

All future communications from the Office will continue to be directed to the above-listed address until otherwise notified by applicant.

Telephone inquiries concerning this decision should be directed to the undersigned at 571-272-4231.



Michelle R. Eason  
Paralegal Specialist  
Office of Petitions

cc: **OPTOLUM, INC.**  
**1515 W. UNIVERSITY DR.**  
**SUITE 102**  
**TEMPE, AZ 85281**



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
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Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/430,696	05/05/2003	Joel M. Dry	OPTOLUM-003	3639

7590 09/10/2008  
DONALD J LENKSZUS  
PO BOX 3064  
CAREFREE, AZ 85377-3064

EXAMINER
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HO, TU TU V

ART UNIT	PAPER NUMBER
----------	--------------

2818

MAIL DATE	DELIVERY MODE
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09/10/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Notice of Abandonment</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/430,696	DRY, JOEL M.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Tu-Tu V. Ho	2818	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--**

This application is abandoned in view of:

1. ☒ Applicant's failure to timely file a proper reply to the Office letter mailed on 10 January 2008.
  - (a) ☐ A reply was received on \_\_\_\_\_ (with a Certificate of Mailing or Transmission dated \_\_\_\_\_), which is after the expiration of the period for reply (including a total extension of time of \_\_\_\_\_ month(s)) which expired on \_\_\_\_\_.
  - (b) ☐ A proposed reply was received on \_\_\_\_\_, but it does not constitute a proper reply under 37 CFR 1.113 (a) to the final rejection.  
(A proper reply under 37 CFR 1.113 to a final rejection consists only of: (1) a timely filed amendment which places the application in condition for allowance; (2) a timely filed Notice of Appeal (with appeal fee); or (3) a timely filed Request for Continued Examination (RCE) in compliance with 37 CFR 1.114).
  - (c) ☐ A reply was received on \_\_\_\_\_ but it does not constitute a proper reply, or a bona fide attempt at a proper reply, to the non-final rejection. See 37 CFR 1.85(a) and 1.111. (See explanation in box 7 below).
  - (d) ☒ No reply has been received.
  
2. ☐ Applicant's failure to timely pay the required issue fee and publication fee, if applicable, within the statutory period of three months from the mailing date of the Notice of Allowance (PTOL-85).
  - (a) ☐ The issue fee and publication fee, if applicable, was received on \_\_\_\_\_ (with a Certificate of Mailing or Transmission dated \_\_\_\_\_), which is after the expiration of the statutory period for payment of the issue fee (and publication fee) set in the Notice of Allowance (PTOL-85).
  - (b) ☐ The submitted fee of \$\_\_\_\_\_ is insufficient. A balance of \$\_\_\_\_\_ is due.  
The issue fee required by 37 CFR 1.18 is \$\_\_\_\_\_. The publication fee, if required by 37 CFR 1.18(d), is \$\_\_\_\_\_.
  - (c) ☐ The issue fee and publication fee, if applicable, has not been received.
  
3. ☐ Applicant's failure to timely file corrected drawings as required by, and within the three-month period set in, the Notice of Allowability (PTO-37).
  - (a) ☐ Proposed corrected drawings were received on \_\_\_\_\_ (with a Certificate of Mailing or Transmission dated \_\_\_\_\_), which is after the expiration of the period for reply.
  - (b) ☐ No corrected drawings have been received.
  
4. ☐ The letter of express abandonment which is signed by the attorney or agent of record, the assignee of the entire interest, or all of the applicants.
  
5. ☐ The letter of express abandonment which is signed by an attorney or agent (acting in a representative capacity under 37 CFR 1.34(a)) upon the filing of a continuing application.
  
6. ☐ The decision by the Board of Patent Appeals and Interference rendered on \_\_\_\_\_ and because the period for seeking court review of the decision has expired and there are no allowed claims.
  
7. ☐ The reason(s) below:

/Tu-Tu V. Ho/ 09-08-2008  
Primary Examiner, Art Unit 2818

Petitions to revive under 37 CFR 1.137(a) or (b), or requests to withdraw the holding of abandonment under 37 CFR 1.181, should be promptly filed to minimize any negative effects on patent term.