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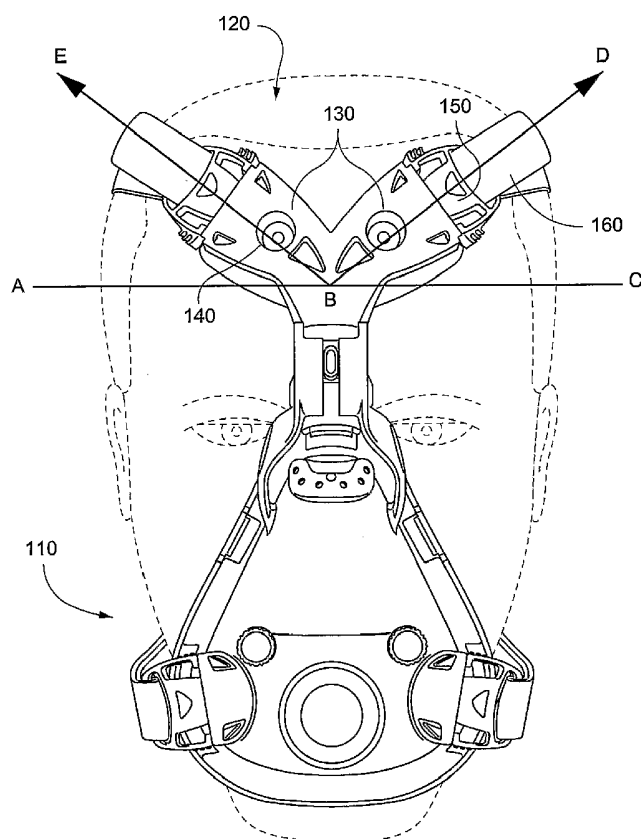
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[Continued on next page]

(54) Title: FOREHEAD SUPPORT FOR A PATIENT INTERFACE



(57) Abstract: Mask assembly (110, 300, 400, 500) includes a forehead support (120, 220, 316, 416, 520) having a base provided to a frame and two upwardly extending support arms (130, 230, 318, 418, 518). The arms define a fixed or adjustable included angle that is less than 180 degrees and in the range of about 100-150 degrees. The arms can be attached either directly to headgear straps, or the arms can be connected to headgear straps via clips (150, 506). Also claimed is an embodiment with one arm.

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FOREHEAD SUPPORT FOR A PATIENT INTERFACE

CROSS-REFERENCE TO APPLICATIONS

[0001] This application claims the benefit of U.S. Provisional Application No. 60/582,538, filed June 25, 2004, which is incorporated herein by reference in its entirety.

FIELD OF THE INVENTION

[0002] The invention relates to a patient interface used for treating sleep disordered breathing. In particular, the invention relates to a forehead support for a patient interface.

BACKGROUND OF THE INVENTION

[0003] In the treatment of sleep disordered breathing, a patient receives a supply of air or breathable gas at positive pressure to "splint" open their airway. The supply of air or gas is delivered to the patient via a patient interface, such as a facial mask. The patient interface is typically held in position by headgear. Headgear typically includes a number of straps that in use are attached to the patient interface at an anchor point. In use, the various straps are tightened to secure the mask in position and to prevent it from lifting off the face under pressure. Generally, the higher the treatment pressure, the tighter the mask strap needs to be. When poorly fitting masks are used, patients sometimes over tighten the straps to try to get a seal. This can lead to pressure sores on their face. It is a continuing challenge for designers and manufacturers to provide a patient interface with comfortable seal against leak.

[0004] The addition of a forehead support to a facial mask can assist in stabilising the mask and provide a convenient means to adjust the mask to suit each patient. Improving the fit of the mask can lead to improved comfort, reduced noise and a more effective therapy.

[0005] Other known arrangements are found in U.S. Patent Nos. 6,422,238 and 6,536,435 and Australian Patent Application AU 200071882 A1.

SUMMARY OF THE INVENTION

[0006] In accordance with a first aspect of the invention there is provided a patient interface comprising a cushion adapted to be positioned in use against a patient's face at an

angle and an adjustable support wherein adjustment of the support adjusts the angle which the cushion makes with the patient's face.

[0007] In accordance with a second aspect of the invention there is provided a patient interface comprising a cushion adapted to be positioned in use against a patient's face at an angle and an adjustable forehead support wherein adjustment of the support adjusts the angle which the cushion makes with the patient's face.

[0008] In accordance with yet a further aspect of the invention there is provided a patient interface assembly comprising (i) a mask interface including a forehead support with an adjustment mechanism and (ii) headgear including at least one head strap attached to the forehead support wherein adjustment of the adjustment mechanism of the forehead support relocates said at least one strap to a different position on the head.

[0009] In accordance with another aspect of the invention, there is provided a generally "Y"-shaped forehead support for a facial mask.

[0010] Other aspects, features, and advantages of this invention will become apparent from the following detailed description when taken in conjunction with the accompanying drawings, which are a part of this disclosure and which illustrate, by way of example, principles of this invention.

BRIEF DESCRIPTION OF THE FIGURES

[0011] The accompanying drawings facilitate an understanding of the various embodiments of this invention. In such drawings:

[0012] Fig. 1 shows a front view of a prior art frame for an ULTRA MIRAGE® mask;

[0013] Fig. 2 shows a front view of a mask and forehead support assembly in accordance with a first embodiment of the invention on a glass head;

[0014] Fig. 3 shows a detail of the assembly of Fig. 2;

[0015] Fig. 4 shows an adjustable "Y"-shaped forehead support according to another embodiment of the invention;

[0016] Figs. 5A-5C show an alternative embodiment according to the present invention;

[0017] Figs. 6A-6C show still another embodiment according to the present invention;

[0018] Fig. 7 shows yet another embodiment according to the present invention;

[0019] Fig. 8 is a side perspective view of a mask assembly according to yet another embodiment of the present invention on a patient's head;

[0020] Fig. 9 is a rear view of the mask assembly shown in Fig. 8 on a patient's head;

[0021] Fig. 10 is a top view of a headgear of the mask assembly shown in Fig. 8 removed from the mask and the patient's head;

[0022] Fig. 11 is a plan view of a side portion of the headgear shown in Fig. 10; and

[0023] Fig. 12 is a plan view of the side portion shown in Fig. 11 and showing dimensions of an embodiment.

DETAILED DESCRIPTION OF ILLUSTRATED EMBODIMENTS

[0024] A prior art mask assembly 10 such as ResMed's ULTRA MIRAGE® mask as shown in Fig. 1 includes a forehead support 20 having a pair of arms 30, each having a slot 40 adapted to receive a strap (not shown). Each arm 30 includes a pair of forehead pad receiving lugs 50. The forehead support has a general "T"-shape, with the arms arranged along the upper cross portion of the "T":

[0025] As shown in Fig. 2, a mask assembly 110 in accordance with a first aspect of the invention provides a forehead support 120 including a pair of arms 130 defining an included angle EBD of less than 180°, for example 100°-150°, preferably 120°. Thus the forehead support is generally "Y"-shaped. In the embodiment shown in Fig. 2, each arm includes a slot arrangement 140 adapted to receive a forehead support clip 150. Each forehead support clip 150 is in turn adapted to engage with a forehead support strap 160. There is a line of force BE and BD for the respective arms 130.

[0026] Each arm 130 is disposed at an angle (ABE or CBD) with respect to horizontal line ABC, that is, e.g., about 15°-40°, preferably 30°. However, the angle (ABE or CBD) may have any other suitable size, e.g., about 20°-80°, preferably about 40°-50°, or more preferably about 45°. The lines of force have a component in a vertical direction (with respect to the orientation depicted in Fig. 2, i.e., with the patient sitting upright), as opposed to being purely in a horizontal direction (as in the prior art). A feature of this arrangement is that when the straps are tightened they will pull the mask up the face, not just pulling the forehead support more tightly onto the face. Fig. 3 is an enlarged view of a portion of mask 120 shown in Fig. 3.

[0027] In accordance with another aspect of the invention, the angle between the arms may be adjustable over a range of about 240°, e.g., where a first arm is positioned at about -30° and the second arm is positioned at about 210°. However, the preferable range of angles between the arms is as described above, the difference being that in the embodiment of Figs. 2-3, angle is fixed while the angle of Fig. 4 is adjustable over the range. The arms can be positioned above or below horizontal, but are preferably above horizontal. In one form, this is achieved by an adjustable forehead support 220 in which each arm 230 has a hole 235 at one end. In use, a bolt 240 passes through both holes and a corresponding hole in a support post 241. The arms 230 are free to rotate with respect to the support post. A wing nut 245 on the end of the bolt 240 can be used to secure the arms when they have been adjusted to the desired angle. Each arm 230 is adapted to support a forehead pad 250.

[0028] Figs. 5A-5C illustrate another mask assembly 300 according to the present invention. Mask assembly 300 includes a pair of lower headgear straps 302 and a pair of upper headgear straps 304. The lower straps 302 are connected to a frame 308 via a pair of clips 306, which operate in a manner which is similar to that of clips 150 (described above). Frame 308 is adapted to support a cushion 310, which in this case is a full face cushion, although support frame 308 could be adapted to support a nasal cushion instead. Frame 308 includes a front plate 312 including an aperture 314 adapted to receive pressurized gas from an air delivery tube, e.g., via a swivel elbow.

[0029] Frame 308 is provided with a substantially Y-shaped extension including a base 317 and two upwardly extending arms 318. The arms 318 are disposed such that an angle between the arms is in the range of 30°-120°, and preferably about 70°-90°. The arms

318 may be connected to upper strap portion 304 via stitching, adhesives or other suitable fasteners.

[0030] The Y-shaped forehead support 316 is shown in this embodiment as being an integral part of frame 308. However, the base 317 of the support 316 could be structured such that it snap-fits or is otherwise detachably connectable to frame 308.

[0031] Figs. 5B and 5C show, respectively, front and side views of the mask assembly 300 shown in Fig. 5A. As shown in Fig. 5C, the headgear includes a pair of rear headgear straps 307 which connect the lower and upper strap portions 302, 304 on each side of the patient's head in use.

[0032] Figs. 6A-6C illustrate still another embodiment of the present invention which is similar to the embodiment shown in Figs. 5A-5C. However, Figs. 6A-6C include a frame which supports a cushion 310' having a gusseted portion (as best seen in Fig. 6C). Operation of the gusseted portion is more fully described in U.S. Patent Application No. 09/885,445, filed June 21, 2001, incorporated herein by reference in its entirety.

[0033] Fig. 7 is a perspective view of a mask assembly 400 according to still another embodiment of the present invention. Mask assembly 400 is like the assembly shown in Figs. 5A-5C and/or 6A-6C, wherein like reference numbers indicate like parts. As shown in Fig. 7, an air delivery hose is provided to plate 412.

[0034] Forehead support 416 includes a flexible joint 421 which allows the forehead support 416 to angle the upwardly extending arm portions 418 in accordance with the slope of the patient's forehead.

[0035] Figs. 8-12 illustrate a mask assembly 500 according to yet another embodiment of the present invention. As best shown in Fig. 8, the mask assembly 500 includes a mask 505 and headgear 515 to support the mask 505 on the patient's face. In the illustrated embodiment, the mask 505 is a full-face mask similar to the mask shown in Fig. 2 including a Y-shaped forehead support 520. Each arm 518 of the forehead support 520 is disposed at an angle with respect to horizontal, e.g., about 45°. However, each arm 518 may be disposed at other suitable angles as described above. Also, the mask 505 includes a frame 508 adapted to support a cushion 510, which in this case is a full face cushion, although the frame 508 may be adapted to support other suitable cushions, e.g., a nasal cushion. Also, the cushion 510 may include a gusseted portion as described above.

[0036] As best shown in Figs. 9 and 10, the headgear 515 includes a first side portion 560 and a second side portion 570 that is attached to the first side portion 560. The first and second side portions 560, 570 are substantially symmetrical to one another. This arrangement may achieve better or more efficient material use in manufacture. Each side portion 560, 570 includes an upper side strap 504 that is removably connected to a respective arm 518 of the Y-shaped forehead support 520, and a lower side strap 502 that is removably connected to a lower portion of the mask frame 508. Also, each side portion 560, 570 includes an upper connecting strap 580 and a lower connecting strap 582.

[0037] The first and second side portions 560, 570 are attached to one another by attaching the upper connecting straps 580 of respective side portions 560, 570 to one another and attaching the lower connecting straps 582 of respective side portions 560, 570 to one another. In the illustrated embodiment, the upper connecting straps 580 are attached to one another via an upper ladder lock buckle 590, and the lower connecting straps 582 are attached to one another via a lower ladder lock buckle 592. In an embodiment, the ladder lock buckles 590, 592 may have a similar form to those disclosed in U.S. Patent Application No. 10/781,929, filed February 20, 2004, the contents of which are hereby incorporated by reference in its entirety. However, the first and second side portions 560, 570 may be attached to one another in other suitable manners, e.g., stitched, welded, glued or otherwise formed, to form the headgear 515.

[0038] In the illustrated embodiment, the upper side straps 504 are removably connected to respective arms 518 of the Y-shaped forehead support 520 via clips 506, which operate in a manner similar to the clips described above. Also, the lower side straps 502 are removably connected to a lower portion of the mask frame 508 via clips 506. The free end of each of the upper and lower side straps 504, 502 includes a strip of Velcro® material 503 for use in securing each of the straps 504, 502 to a respective clip 506. Figs. 8 and 9 illustrate the headgear 515 attached to the mask 505 and secured on the patient's head, and Fig. 10 illustrates the headgear 515 removed from the mask 505 and the patient's head. However, the upper and lower side straps 504, 502 may be attached to mask 505 in other suitable manners.

[0039] When the headgear 515 is secured on the patient's head, the two upper side straps 504 are angled about 45° with respect to horizontal to achieve desired force vectors similar to Fig. 2. As described above, this arrangement generates both horizontal and vertical

force vectors such that when the straps 504 are tightened they will pull the mask up the face, not just pulling the forehead support 520 more tightly onto the face. This assists with better positioning of the mask 505 on the patient's face and stops the mask 505 from falling down the patient's face, especially with increased weight of full face gusseted cushion. Also, as shown in Fig. 9, the lower connecting straps 582 are configured such that they provide an increased cutaway 596 at the lower rear of the patient's head. This arrangement prevents the headgear 515 from sitting on soft tissue at the back of the patient's head or neck. This arrangement also prevents the headgear 515 from "digging" into the lower edge of the patient's occipital bone.

[0040] In the illustrated embodiment, the upper ladder lock buckle 590 provides adjustment across the ball of the patient's head, i.e., around the base of the patient's parietal bone. The lower ladder lock buckle 592 is not intended to be adjusted, but only functions to assemble the two side portions 560, 570. However, the upper and lower ladder lock buckles 590, 592 may have other arrangements, e.g., both adjustable, both non-adjustable.

[0041] Fig. 11 illustrates an embodiment of a side portion 560, 570, and Fig. 12 illustrates dimensions of an embodiment of a side portion 560, 570. Although specific dimensions of a side portion 560, 570 are shown in Fig. 12, it is to be understood that these dimensions are merely exemplary and other dimensions are possible depending on application.

[0042] While the invention has been described in connection with what are presently considered to be the most practical and preferred embodiments, it is to be understood that the invention is not to be limited to the disclosed embodiments, but on the contrary, is intended to cover various modifications and equivalent arrangements included within the spirit and scope of the invention. Also, the various embodiments described above may be implemented in conjunction with other embodiments, e.g., aspects of one embodiment may be combined with aspects of another embodiment to realize yet other embodiments. In addition, while the invention has particular application to patients who suffer from OSA, it is to be appreciated that patients who suffer from other illnesses (e.g., congestive heart failure, diabetes, morbid obesity, stroke, barriatric surgery, etc.) can derive benefit from the above teachings. Moreover, the above teachings have applicability with patients and non-patients alike in non-medical applications.

WHAT IS CLAIMED IS:

1. A generally "Y" shaped forehead support (120, 220, 316, 416, 520) for a patient interface used in the treatment of sleep disordered breathing.
2. A forehead support as claimed in claim 1, further comprising a pair of arms (130, 230, 318, 418, 518) and a support post (241).
3. A forehead support as claimed in claim 2, wherein at least one arm (230) is adapted to rotate relative to the support post (241).
4. A forehead support as claimed in claim 2, wherein at least one arm (230) is adapted to move via at least one of a sliding or pivoting motion.
5. A forehead support (120, 220, 316, 416, 520) for a patient interface used in the treatment of sleep disordered breathing, the forehead support (120, 220, 316, 416, 520) comprising a pair of arms (130, 230, 318, 418, 518) and a support post (241) wherein an angle between arms (130, 230, 318, 418, 518), as seen in front view, is less than 180°.
6. A forehead support as claimed in claim 5, wherein at least one arm (130, 230, 318, 418, 518) is adapted to receive a strap (160, 302, 304, 402, 404, 502, 504) of a headgear.
7. A forehead support as claimed in any one of claims 5-6, wherein at least one arm (130, 230, 318, 418, 518) is adapted to receive a forehead pad (250).
8. A forehead support (120, 220, 316, 416, 520) for a patient interface, the forehead support (120, 220, 316, 416, 520) comprising at least one arm (130, 230, 318, 418, 518), an end of which is adapted to be connected to a headgear strap (160, 302, 304, 402, 404, 502, 504), the arm (130, 230, 318, 418, 518) being structured to transmit a force from the headgear, the force having a component in a vertical direction, as measured when the patient's head, in use, is upright.

9. A forehead support (120, 220, 316, 416, 520) for a facial mask including a joining member supporting a pair of arms (130, 230, 318, 418, 518) defining an angle therebetween, the angle being adjustable over a range of about 30°-90°.

10. A mask assembly (110, 300, 400, 500) comprising:
a frame (308, 508) to support a mask cushion (310, 310', 510);
headgear including a pair of lower straps (302, 402, 502) and at least one upper strap (160, 304, 404, 504); and
a Y-shaped forehead support (120, 220, 316, 416, 520) fixedly attached to the at least one upper strap (160, 304, 404, 504).

11. The mask assembly as claimed in claim 10, wherein the Y-shaped forehead support (120, 220, 316, 416, 520) includes a pair of upwardly extending arms (130, 230, 318, 418, 518) defining an included angle of about 40°-160°.

12. The mask assembly as claimed in any one of claims 10-11, wherein the frame (308) and Y-shaped forehead support (316) are formed as an integral one piece unit.

13. The mask assembly as claimed in any one of claims 10-12, wherein the Y-shaped forehead support (416) includes a proximal portion provided to the frame (408) and a flexible joint (421) positioned between the proximal portion and the at least one upper strap (404).

14. A mask assembly (110, 300, 400, 500) comprising:
a frame (308, 508);
a cushion (310, 310', 510) provided to the frame (308, 508);
a Y-shaped forehead support (120, 220, 316, 416, 520) provided to the frame (308, 508) and adapted to engage a patient's forehead, the Y-shaped forehead support (120, 220, 316, 416, 520) including a pair of arms (130, 230, 318, 418, 518) that define an included angle therebetween less than 180°; and
headgear including a pair of lower straps (302, 402, 502) attached to the frame (308, 508) and a pair of upper straps (160, 304, 404, 504) attached to respective arms (130,

230, 318, 418, 518) of the forehead support (120, 220, 316, 416, 520), wherein the upper straps (160, 304, 404, 504) are adapted to generate horizontal and vertical force vectors when a force is applied thereto.

15. The mask assembly according to claim 14, wherein the included angle is in the range of 100°-150°.

16. The mask assembly according to claim 15, wherein the included angle is about 120°.

17. The mask assembly according to claim 14, wherein the included angle is in the range of 30°-120°.

18. The mask assembly according to claim 17, wherein the included angle is in the range of 70°-90°.

19. The mask assembly according to any one of claims 14-18, wherein the lower straps (302, 402, 502) are attached to the frame (308, 508) via clips (150, 306, 406, 506).

20. The mask assembly according to any one of claims 14-19, wherein the upper straps (160, 304, 404, 504) are attached to respective arms (130, 230, 318, 418, 518) of the forehead support (120, 220, 316, 416, 520) via clips (150, 506).

21. The mask assembly according to any one of claims 14-20, wherein at least one of the arms (230) of the forehead support (220) is adjustable.

22. The mask assembly according to any one of claims 14-21, wherein the Y-shaped forehead support (316) is an integral part of the frame (308).

23. The mask assembly according to any one of claims 14-22, wherein the cushion (310) includes a gusseted portion.

24. The mask assembly according to any one of claims 14-23, wherein the headgear includes a first side portion (560) and a second side portion (570) attached to the first side portion (560), each of the first and second side portions (560, 570) including an upper side strap (504) attached to a respective one of the arms (518) of the forehead support (520) and a lower side strap (502) attached to the frame (508).

25. The mask assembly according to claim 24, wherein each of the first and second side portions (560, 570) includes an upper connecting strap (580) and a lower connecting strap (582), the first and second side portions (560, 570) being attached to one another by attaching the upper connecting straps (580) of respective side portions (560, 570) to one another and attaching the lower connecting straps (582) of respective side portions (560, 570) to one another.

26. The mask assembly according to claim 25, wherein the upper connecting straps (580) are attached to one another via an upper ladder lock buckle (590), and the lower connecting straps (582) are attached to one another via a lower ladder lock buckle (592).

27. The mask assembly according to claim 26, wherein the upper ladder lock buckle (590) is adjustable.

28. The mask assembly according to any one of claims 25-27, wherein the lower connecting straps (582) are configured such that they provide an increased cutaway (596) at the lower rear of the patient's head.

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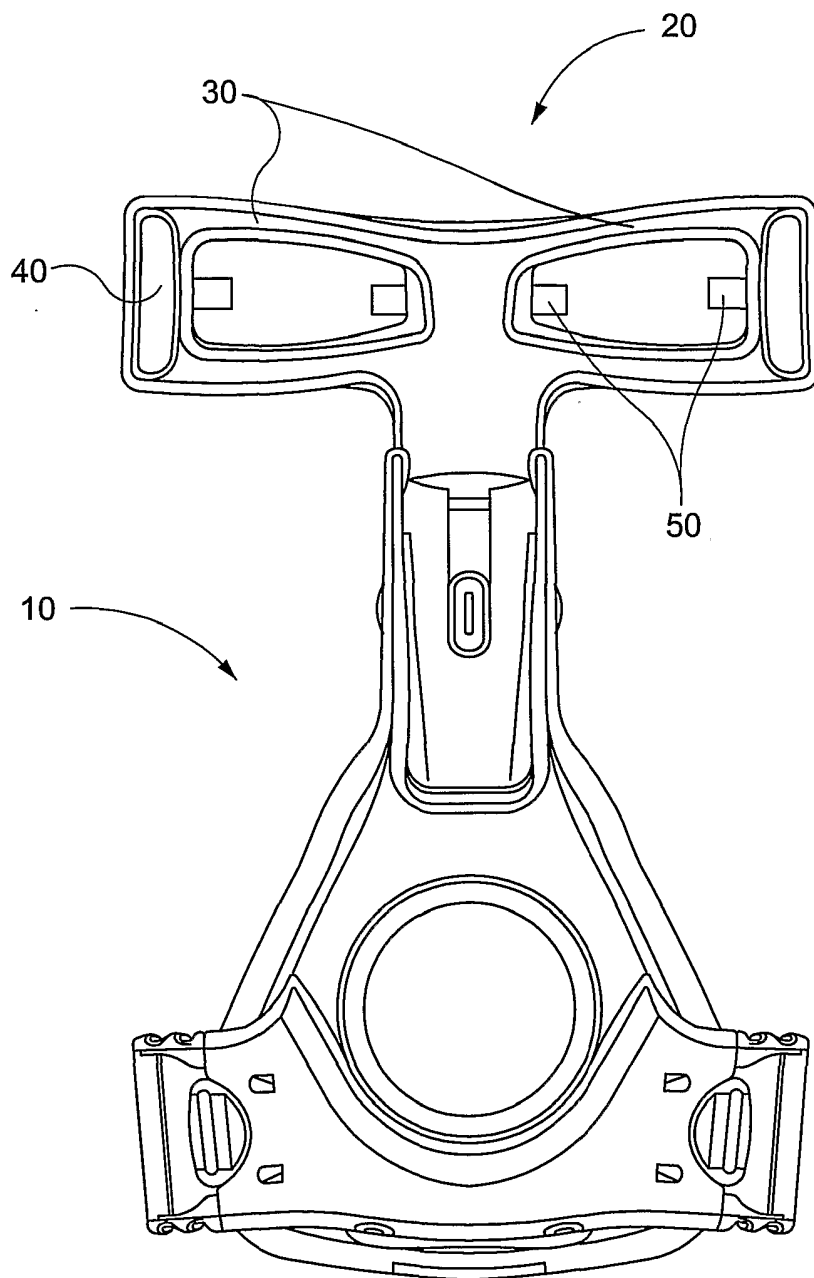


Fig. 1
Prior Art

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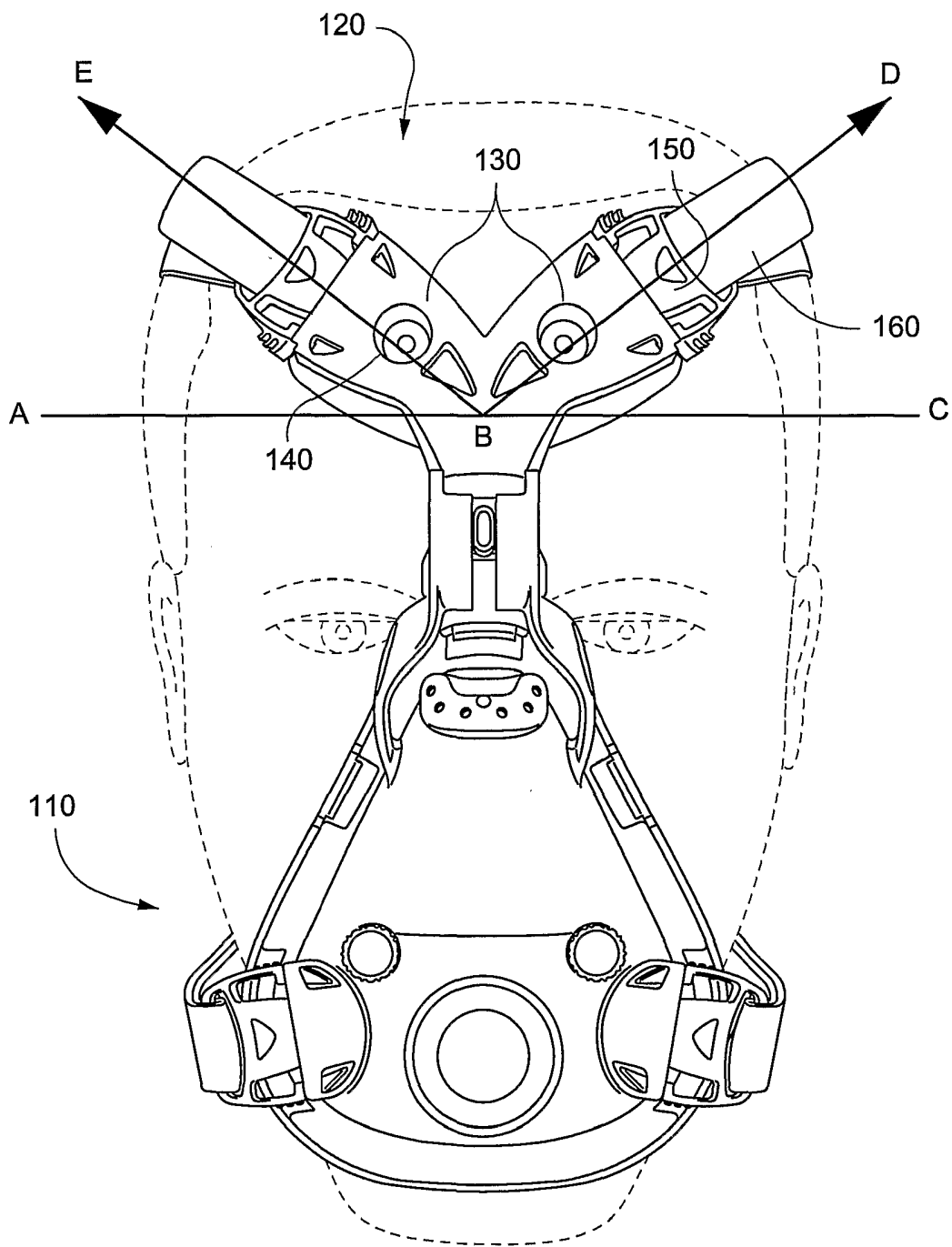


Fig. 2

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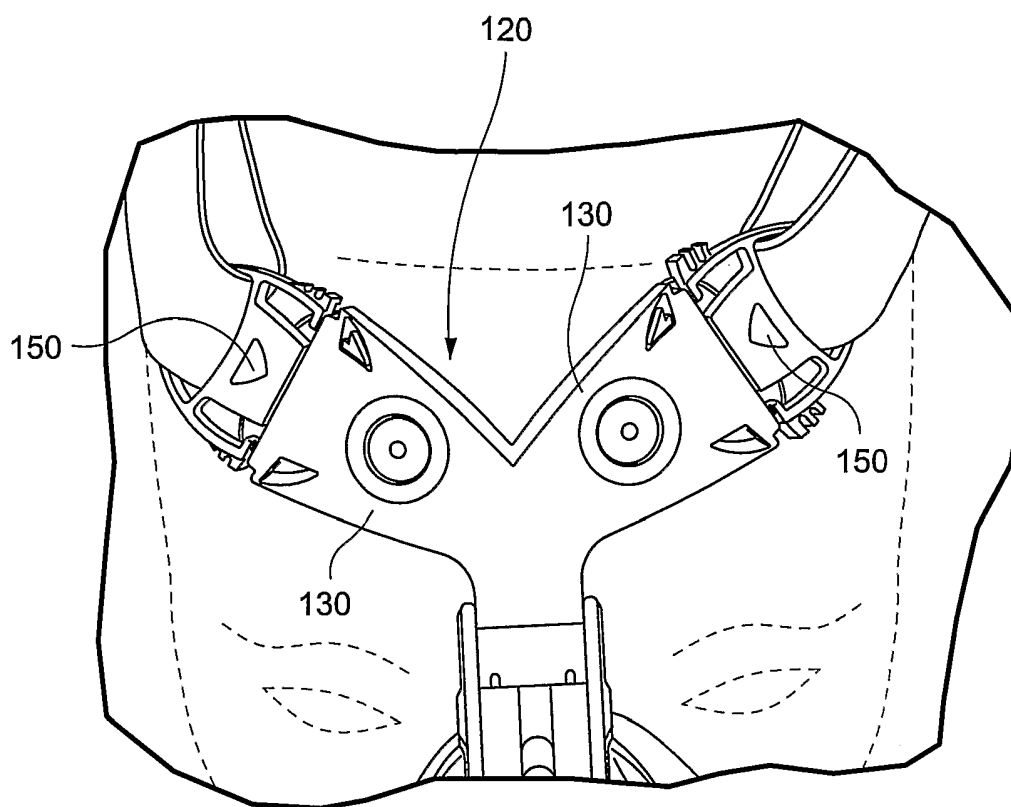


Fig. 3

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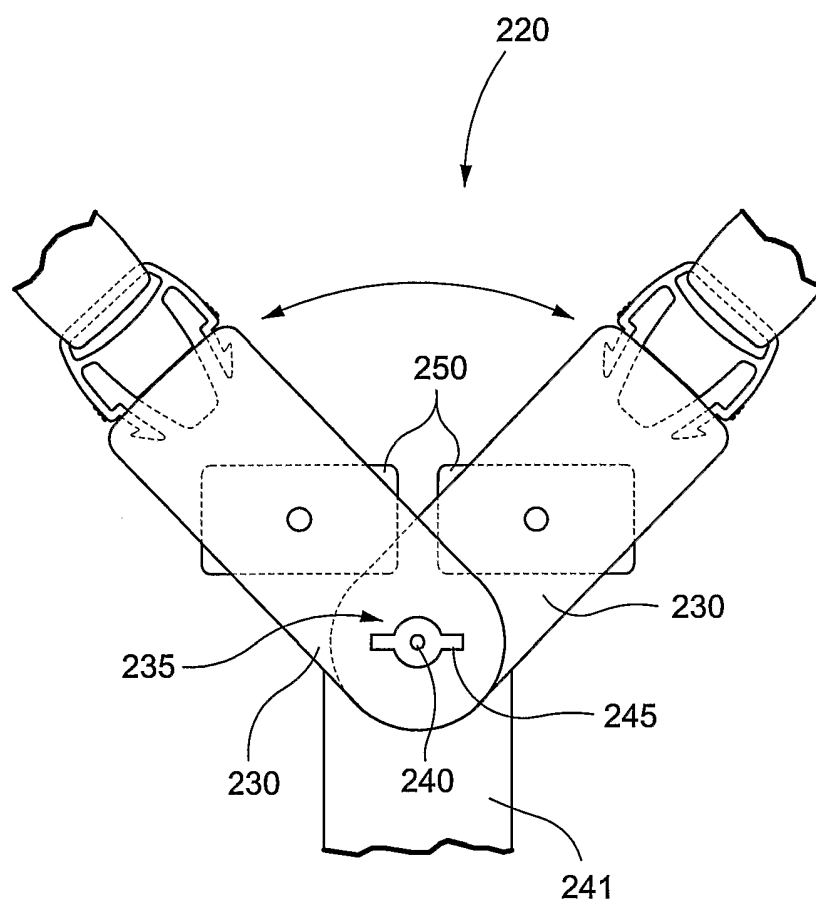


Fig. 4

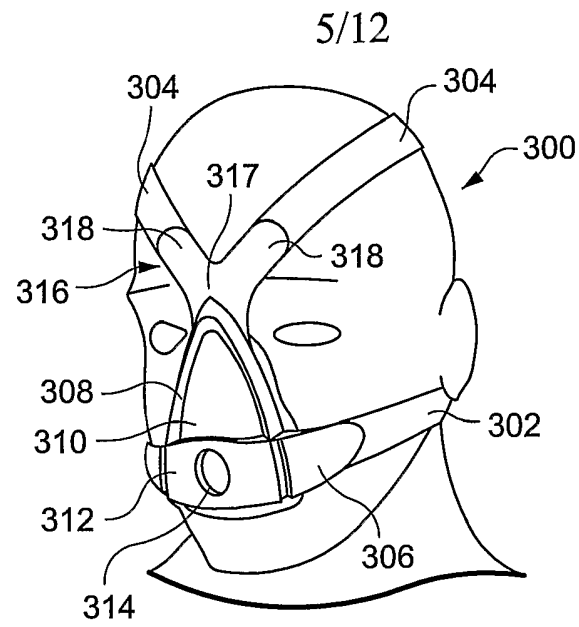


Fig. 5A

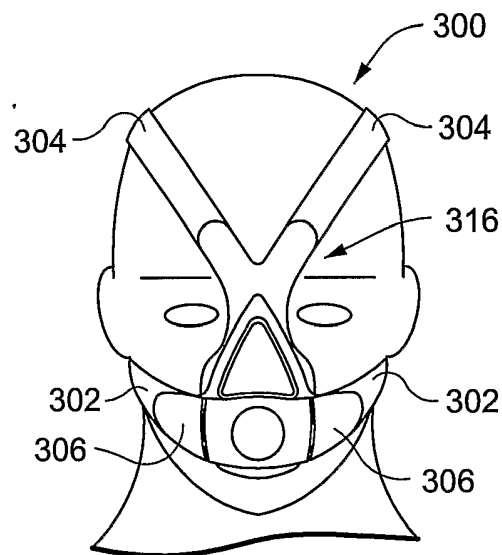


Fig. 5B

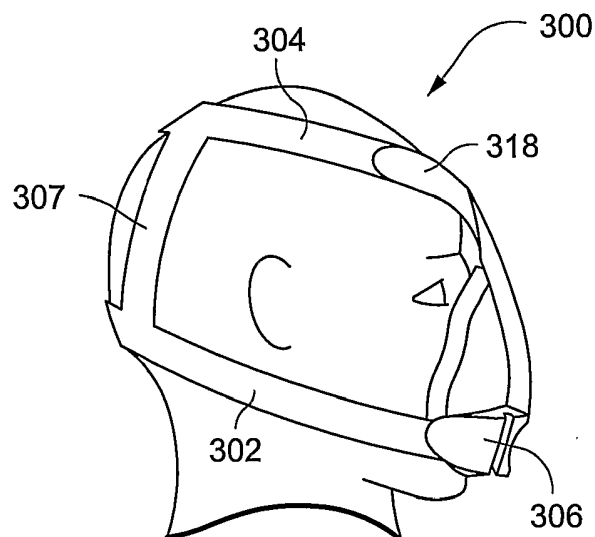


Fig. 5C

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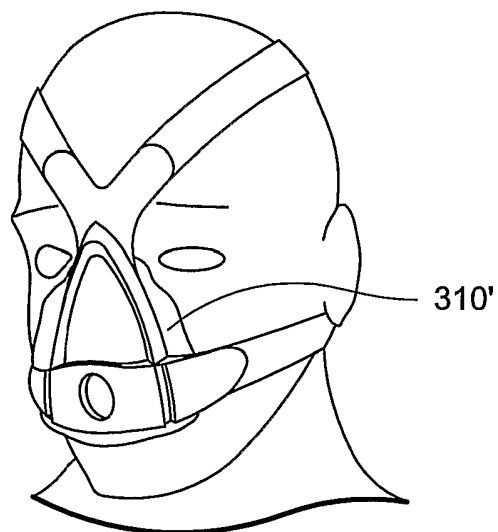


Fig. 6A

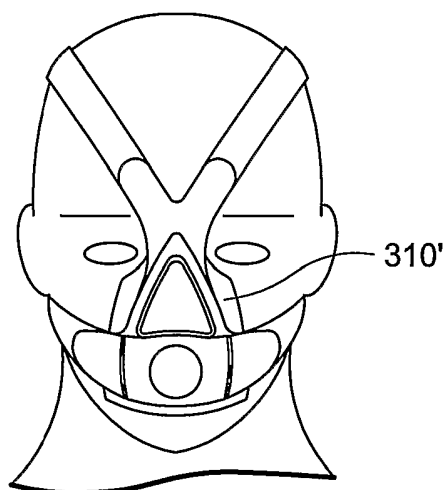


Fig. 6B

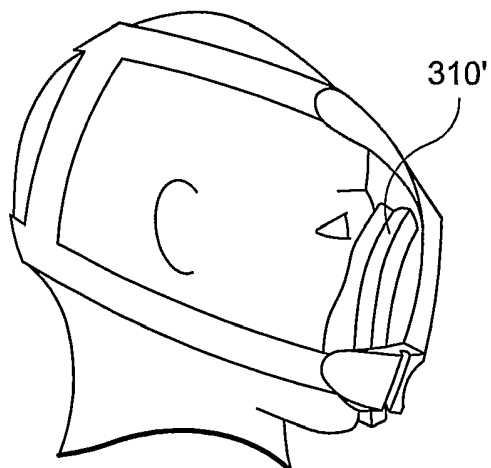


Fig. 6C

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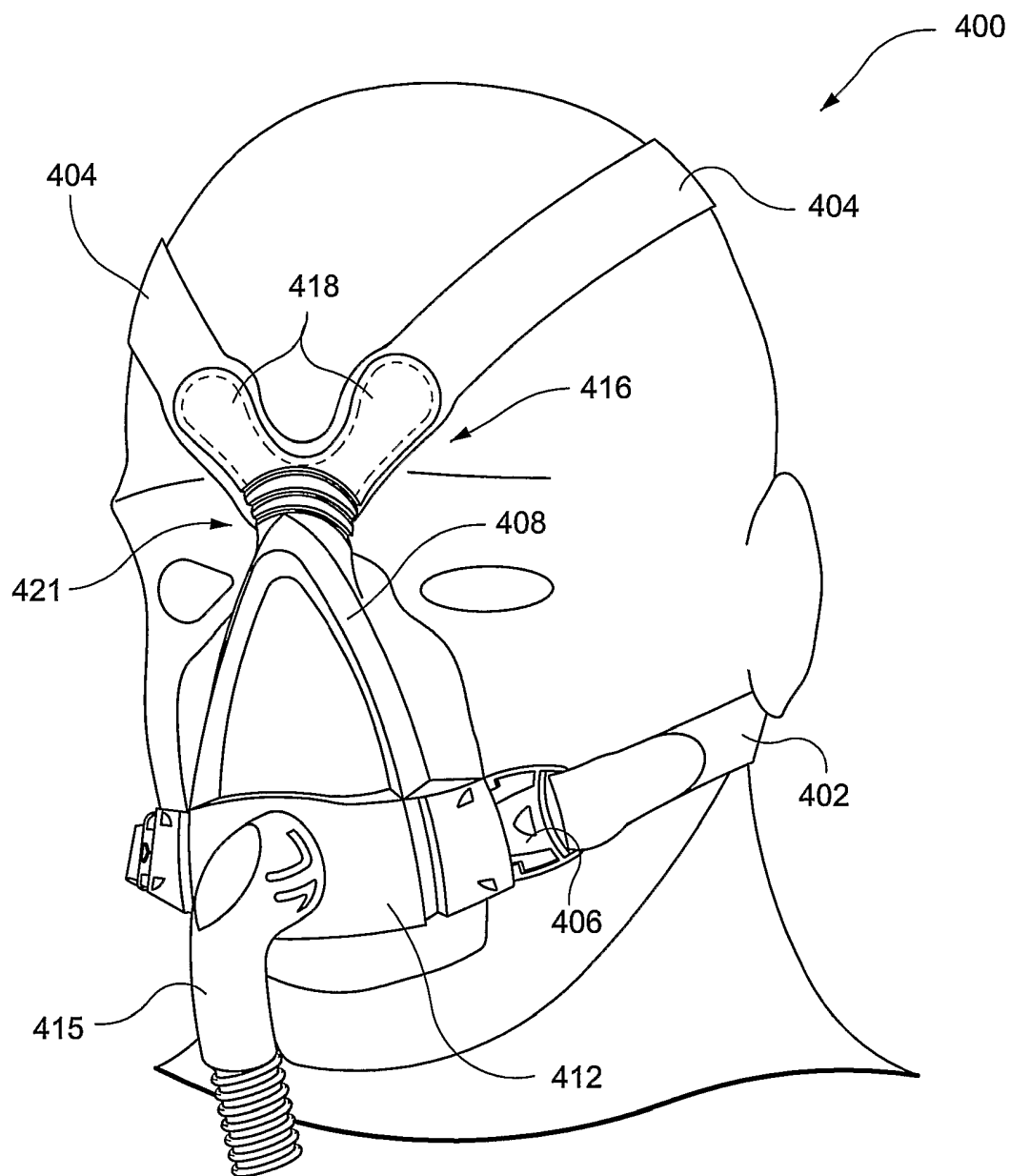


Fig. 7

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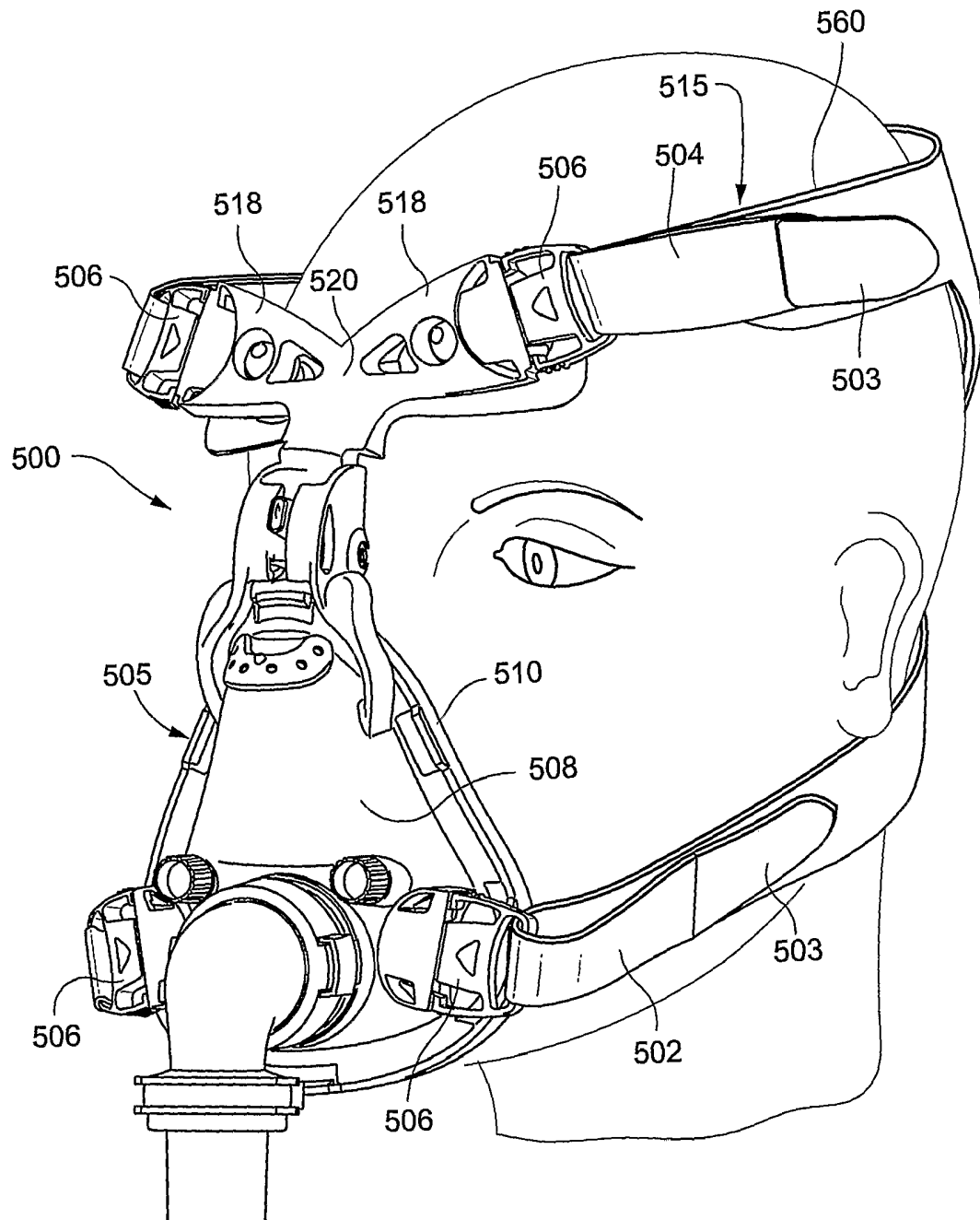


Fig. 8

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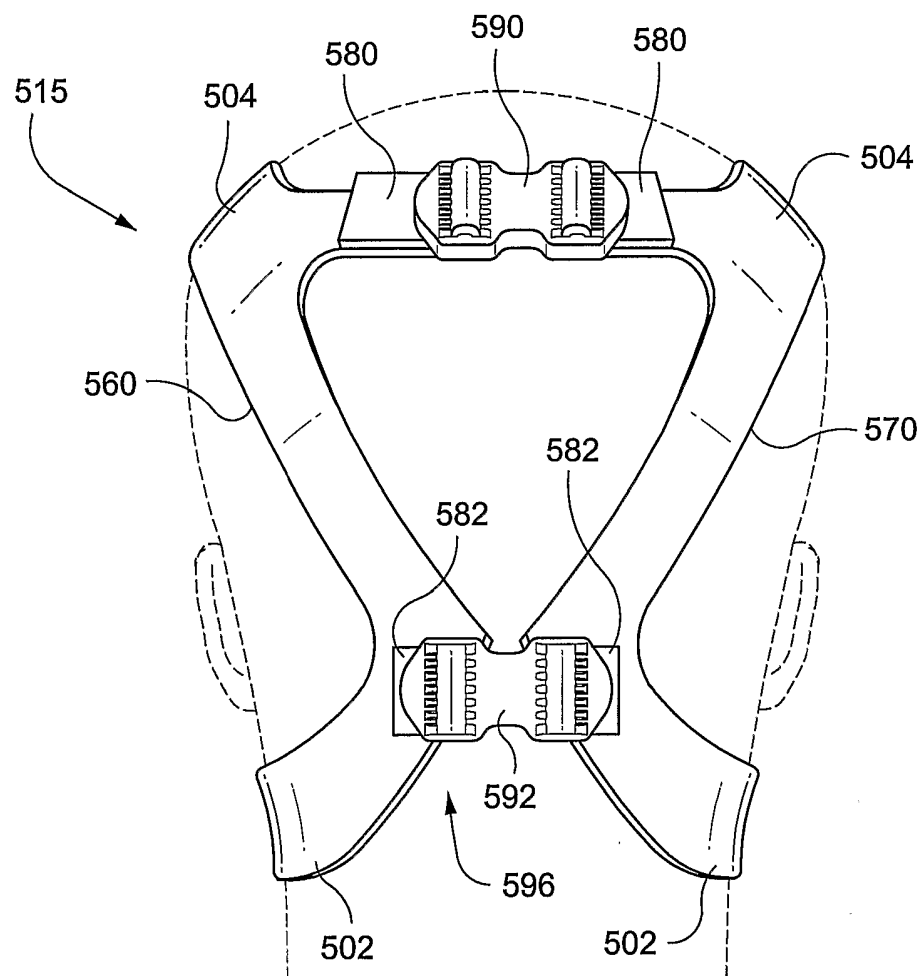
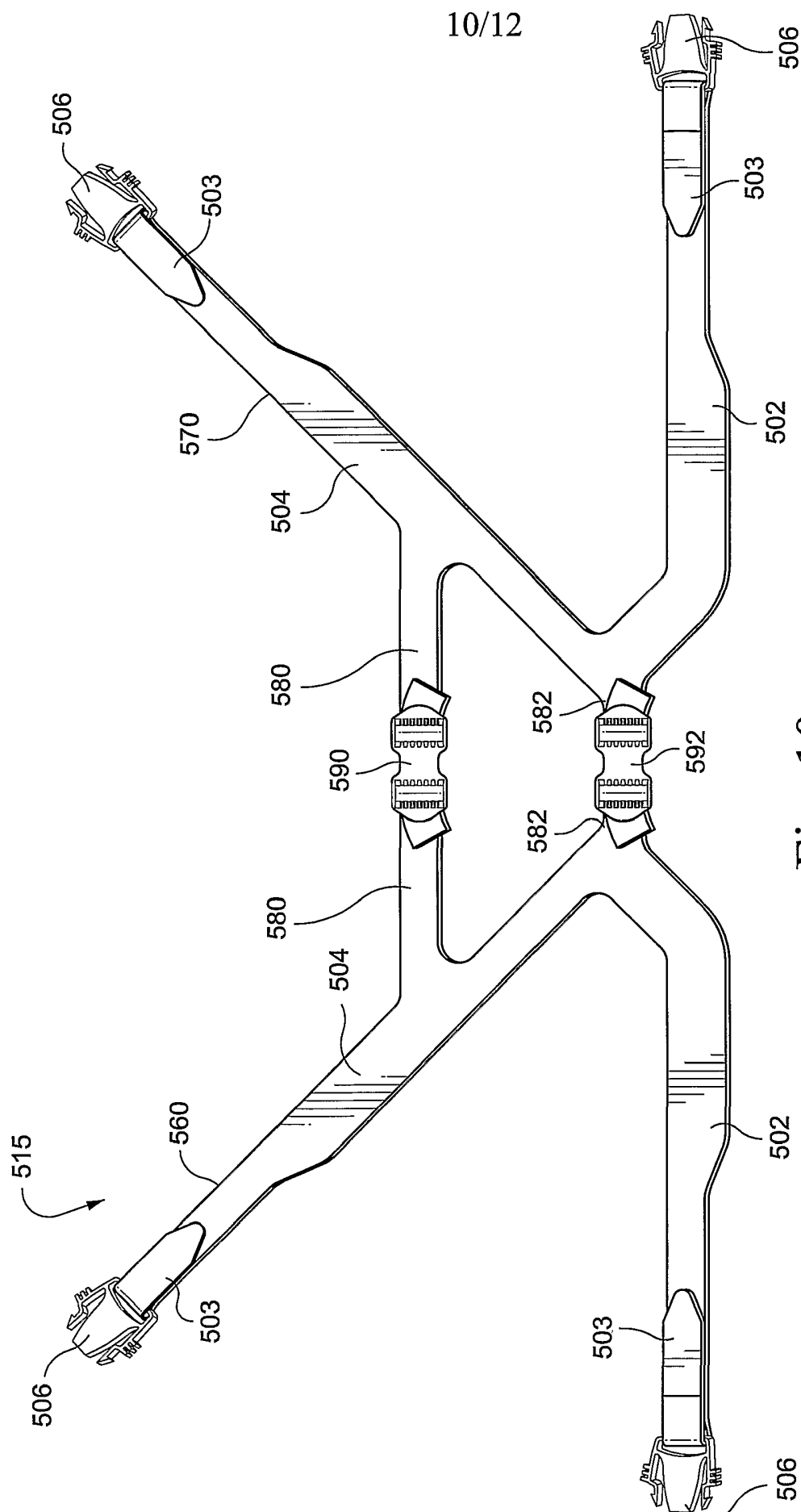


Fig. 9



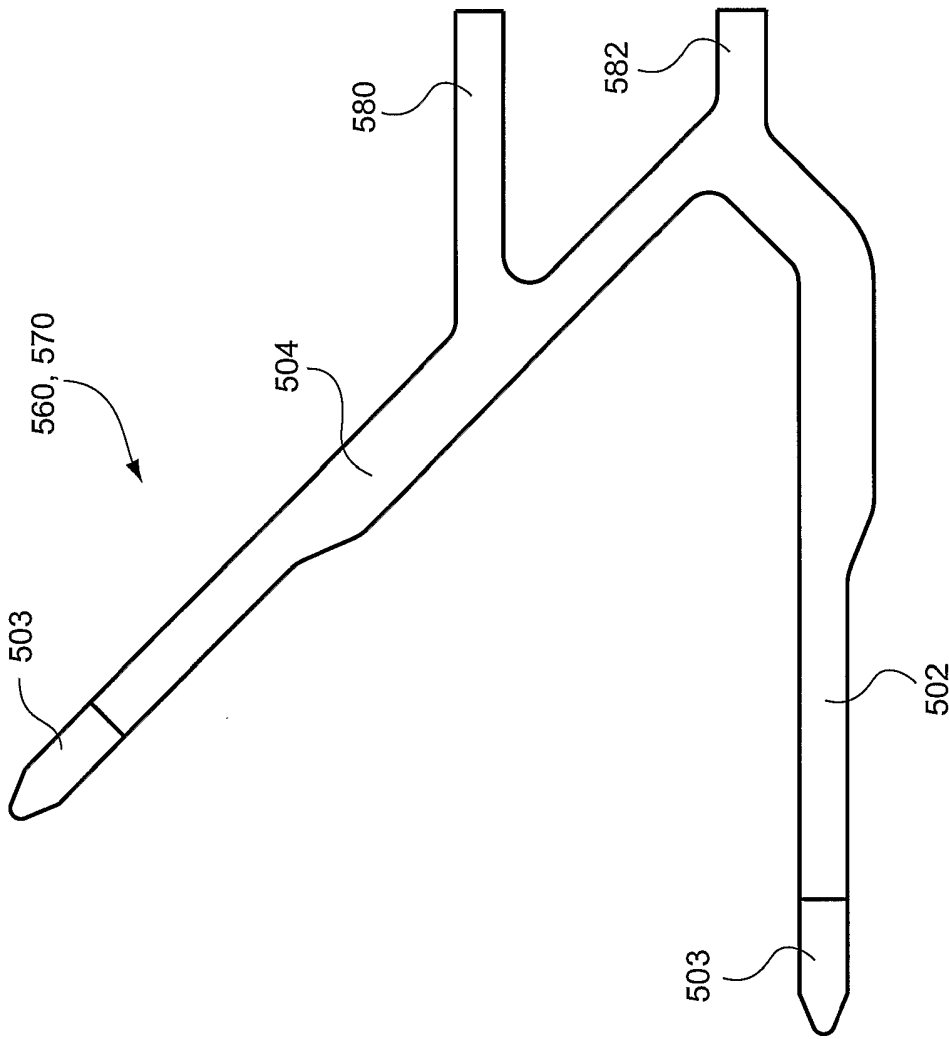
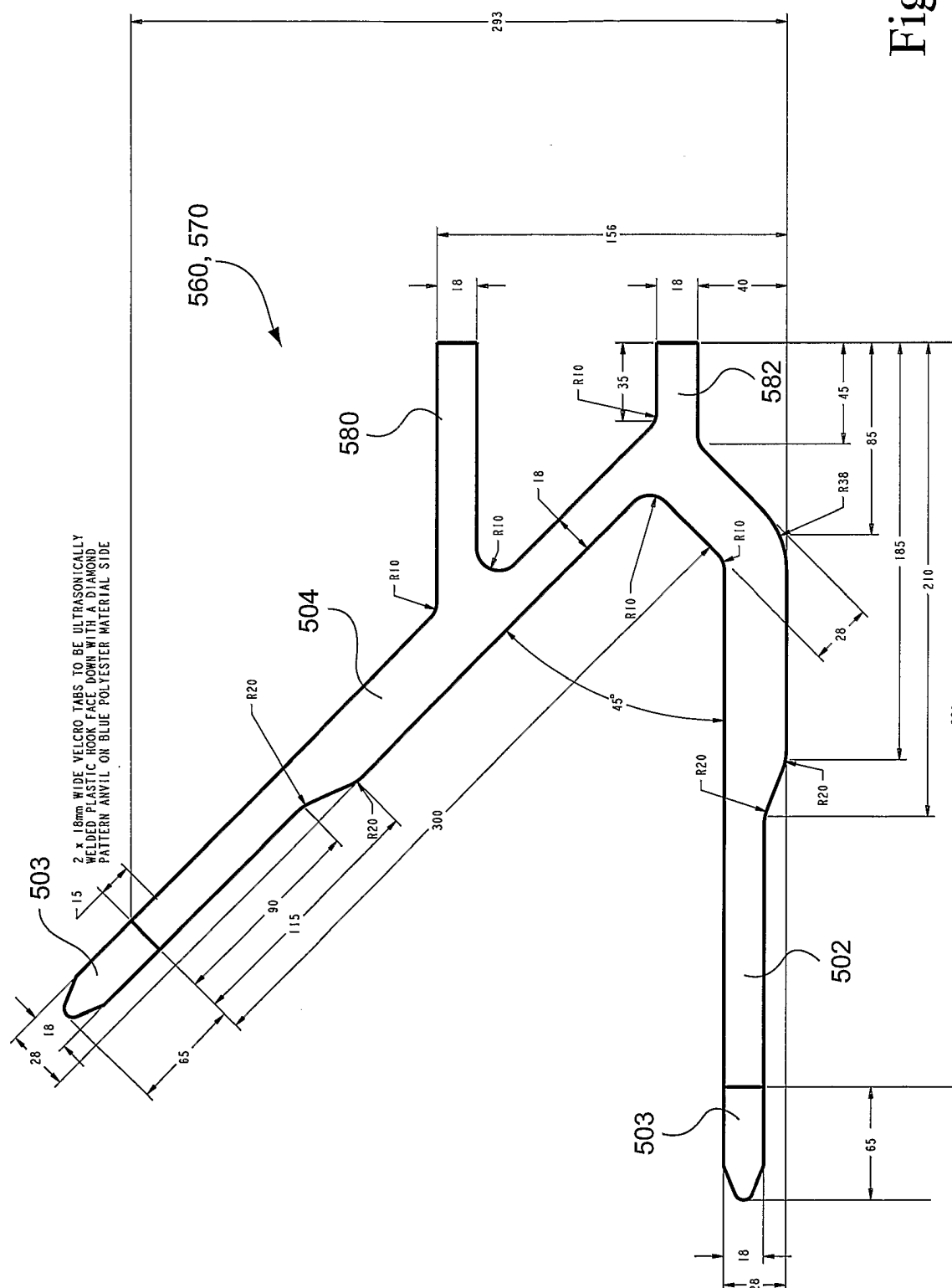


Fig. 11

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Fig. 12



INTERNATIONAL SEARCH REPORT

International application No.

PCT/AU2005/000931

A. CLASSIFICATION OF SUBJECT MATTER														
Int. Cl. ⁷ : A61M 16/06, A62B 18/08														
According to International Patent Classification (IPC) or to both national classification and IPC														
B. FIELDS SEARCHED														
Minimum documentation searched (classification system followed by classification symbols)														
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched														
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) DWPI: IPC A61M 16/IC, A62B/IC and keywords (mask, forehead, brow, Y, V, arm, strap, harness, headgear and similar terms)														
C. DOCUMENTS CONSIDERED TO BE RELEVANT														
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.												
X	US 6463931 B1 (KWOK et al) 15 October 2002 Whole document	1, 2, 5, 6, 7, 10, 11												
X	WO 2000/078384 A1 (RESMED LTD) 28 December 2000 Whole document	1, 2, 5, 6, 7, 10												
X	US 2004/0079375 A1 (LITHGOW et al) 29 April 2004 Whole document	1, 2, 5, 6, 7, 10, 11												
A	AU 200071882 A1 (McCudden) 7 June 2001 Pages 2-5													
<input type="checkbox"/> Further documents are listed in the continuation of Box C <input checked="" type="checkbox"/> See patent family annex														
<table border="0"> <tr> <td>* Special categories of cited documents:</td> <td></td> </tr> <tr> <td>"A" document defining the general state of the art which is not considered to be of particular relevance</td> <td>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</td> </tr> <tr> <td>"E" earlier application or patent but published on or after the international filing date</td> <td>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone</td> </tr> <tr> <td>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</td> <td>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art</td> </tr> <tr> <td>"O" document referring to an oral disclosure, use, exhibition or other means</td> <td>"&" document member of the same patent family</td> </tr> <tr> <td>"P" document published prior to the international filing date but later than the priority date claimed</td> <td></td> </tr> </table>			* Special categories of cited documents:		"A" document defining the general state of the art which is not considered to be of particular relevance	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention	"E" earlier application or patent but published on or after the international filing date	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone	"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art	"O" document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family	"P" document published prior to the international filing date but later than the priority date claimed	
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"O" document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family													
"P" document published prior to the international filing date but later than the priority date claimed														
Date of the actual completion of the international search 13 July 2005		Date of mailing of the international search report 19 JUL 2005												
Name and mailing address of the ISA/AU AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA E-mail address: pct@ipaustalia.gov.au Facsimile No. (02) 6285 3929		Authorized officer Sue Thomas Telephone No : (02) 6283 2454												

INTERNATIONAL SEARCH REPORT

International application No.

PCT/AU2005/000931

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☒ Claims Nos.: 8
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
The claim does not define the invention which includes a Y-shaped forehead support or a forehead support having a joining member from which two arms define an angle of less than 180 degrees.
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a)

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/AU2005/000931

This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent Document Cited in Search Report		Patent Family Member	
US	6463931	US	6119693
		US	2004060561
US	2004079375	US	2002026934
WO	0078384	AU	61522/01
		EP	0956069
		NZ	513052
		US	2002148473
		US	2003005935
		AU	2004205283
		CA	2470671
		EP	1187650
		JP	2000279520
		US	6112746
		WO	0078381

Due to data integration issues this family listing may not include 10 digit Australian applications filed since May 2001.

END OF ANNEX