involves sliding a cover member 61 over the stored table assembly 25 to provide a flat working surface.

In the configuration shown in Figure 33 the compartment is multi-functional. By way of example, the single passenger occupant may be seated in the chair 23 or on the seat 27 and relax or work, as required. When seated on the chair 23 the passenger may conveniently view the visual display screen 45.

Figure 34 illustrates an intermediate position of the bed 29 in a first step to transform the configuration shown in Figure 33 to a "sleeping" configuration.

This step comprises lowering the bed 29 from the raised position shown in Figure 14 to the lowered position shown in Figure 35.

Figure 35 illustrates the bed 29 supported by the work desk 23 in the lowered position of the bed.

Figure 36 illustrates the compartment in the sleeping configuration with a person on the bed 29 and the visual display screen 45 pivoted to a position in which the person on the bed can view the screen while in a reclining position.

Figure 37 illustrates a first step to transform the compartment from the "sleeping" configuration shown in Figure 17 to a "working" configuration.

The first step involves swiveling the chair 23 from the forward position shown in Figure 36 to a working position shown in Figure 37 in which a person seated in the chair is facing towards the aircraft side wall 15.

Figure 38 illustrates a subsequent step of

raising the bed 29 from the lowered position to the raised position shown in the figure. This step enables access to the work desk 23.

The work desk 23 is vertically adjustable so that a person seated in the chair 23 can adjust the height as required to suit personal preferences.

Figure 38 illustrates the work desk in one raised position and Figure 39 illustrates the work desk in a lowered position.

Many modifications may be made to the embodiments of the cabin and the private passenger compartment described above with departing from the spirit and scope of the invention.

By way of example, whilst the embodiments of the cabin comprise 3 rows 11a, 11b, 11c of private passenger compartments separated by aisles 51, the invention is not so limited and extends to any suitable arrangement of the compartments 5.

AN AIRCRAFT CABIN

CLAIMS:

1. An aircraft cabin that comprises a plurality of "private" passenger compartments for passengers during an aircraft flight, with each compartment comprising walls that define a compartment space and being accessible via a doorway in one of the walls, and with each compartment at least comprising a chair for a passenger.

2. The cabin defined in claim 1 wherein the compartment walls are at least 1.5 m high.

3. The cabin defined in claim 2 wherein the compartment walls are at least 1.6 m high.

4. The cabin defined in any one of the preceding claims comprises at least 3 rows of the compartments extending in a length-wise extending direction of the aircraft, with adjacent rows being separated by length-wise extending aisles, and with: (a) two outer rows being positioned along opposite sides of the aircraft with the aircraft side walls forming compartment walls, and (b) at least one internal row being positioned between the outer rows and separated from at least one outer row by a said length-wise extending aisle.

5. The cabin defined in claim 4 wherein the doorway walls define the aisles and the compartments are accessible from the aisles via the doorways.

6. The cabin defined in claim 4 or claim 5 wherein the doorways divide the doorway walls into two sections, with one section on each side of each doorway.

7. The cabin defined in claim 6 wherein the doorways

are positioned centrally in the doorway walls.

8. The cabin defined in any one of claims 4 to 7 wherein the aisles are curved along the length thereof.

9. The cabin defined in claim 8 wherein the curved aisles are formed by forming the doorway walls as curved walls and by positioning the compartments so that the doorways of the compartments on opposite sides of the aisles are not aligned.

10. The cabin defined in claim 9 wherein the compartments are positioned so that the doorways of the compartments on one side of the aisles face the doorway walls on the other side of the aisles, and vice versa.

11. The cabin defined in any one of claims 4 to 10 wherein the walls that form the two outer rows of the compartments comprise (a) the aircraft side walls, (b) walls that extend inwardly from the aircraft side walls, and (c) the doorway walls.

12. The cabin defined in any one of claims 4 to 11 wherein the or each interior row of the compartments comprises a plurality of pairs of length-wise extending compartments, with the doorways of the compartments of each pair providing access to the compartments from aisles on opposite sides of the interior row.

13. The cabin defined in claim 12 wherein the compartments of at least one pair of compartments is separated by a length-wise extending wall that is a removable wall, whereby the pair of compartments may be converted into a double compartment by removing the removable wall.

14. The cabin defined in claim 13 wherein each

compartment of the at least one of the pair of compartments comprises single beds that can be moved from storage positions to sleep positions that are in side-by-side relationship when the compartment is converted into the double compartment so as to form a double bed.

15. The cabin defined in any one of claims to 4 to 14 comprises a plurality of wardrobes in walls of the compartments that separate adjacent compartments in the rows of compartments.

16. The cabin defined in claim 15 wherein the wardrobes include wardrobes that are mounted for sliding movement between storage positions in the walls and operative positions in which the wardrobes extend into the aisles and are accessible from the aisles.

17. The cabin defined in any one of the preceding claims wherein each compartment includes doors for the doorways so that the compartments can be completely enclosed spaced when the doors are closed.

18. A private passenger compartment for a passenger during an aircraft flight that comprises walls that define a compartment space, a doorway in one of the walls that enables access to the compartment from an aisle, and a chair and other basic furniture located in the compartment space in an interactive way so that the furniture can be selectively arranged in a number of different configurations.

19. The compartment defined in claim 18 wherein the compartment walls are at least 1.5 m high.

20. The compartment defined in claim 19 wherein the compartment walls are at least 1.6 m high.

21. The compartment defined in any one of claims 18 to 20 wherein the doorway divides the doorway wall into two sections, with one section on each side of the doorway.

22. The compartment defined in claim 21 wherein the doorway is positioned centrally in the doorway wall.

23. The compartment defined in claim 21 or claim 22 wherein the sections of the doorway wall are curved, for example by being convex as viewed from the aisle, so that the compartment is wider in these sections of the compartment than in the region of the doorway.

24. The compartment defined in claim 23 wherein the doorway wall includes at least one window.

25. The compartment defined in claim 24 wherein the doorway wall includes at least two windows, with at least one window in each section of the doorway wall.

26. The compartment defined in claim 25 wherein the windows include retractable blinds that can be closed.

27. The compartment defined in any one of claims 18 to 26 includes a door assembly for closing the doorway.

28. The compartment defined in claim 27 wherein the door assembly comprises a door mounted for sliding movement from a retracted position within the doorway wall to a closed position in which the door extends across the doorway and closes the compartment.

29. The compartment defined in claim 28 wherein the door assembly comprises a pair of doors mounted for sliding movement inwardly towards each other from retracted positions within the sections of the doorway

walls that are on opposite sides of the doorway.

30. The compartment defined in any one of claim 29 wherein the doors include transparent windows that are positioned so that the view through the windows in the doorway walls is not obscured by the doors when the doors are in the retracted positions.

31. The compartment defined in claim 30 wherein the doors include retractable blinds that can be closed when the doors are in the closed positions.

32. The compartment defined in claim 27 wherein the door assembly comprises an upper rail and a curtain supported by the rail.

33. The compartment defined in claim 32 wherein the rail is mounted for sliding movement between a retracted position within the doorway wall and an operative, ie closed, position in which the rail extends across the doorway.

34. The compartment defined in claim 33 wherein the curtain is adapted to fold in a concertina fashion so that (a) the curtain folds against the doorway wall when the rail is slid into the retracted position and (b) the curtain expands and closes the doorway when the rail is in the operative position.

35. The compartment defined in any one of claims 18 to 34 wherein the configurations of the compartment comprise relaxation, work, and sleep configurations.

36. The compartment defined in any one of claims 18 to 35 wherein, in addition to the chair, the other basic furniture of the compartment comprises any one or more of a table assembly, a cadenza that houses the table assembly

when the table assembly is in a folded position, a seat, and a bed.

37. The compartment defined in claim 36 wherein the bed is foldable from a storage position in one of the compartment walls to a sleep position within the compartment.

38. The compartment defined in claim 37 wherein the chair is foldable from an operative position in which a person can sit upright in the chair to an inoperative position in which the folded chair defines a support for the bed when the bed is in the sleep position.

39. The compartment defined in claim 38 wherein the chair defines a bedside table when the chair is in the inoperative position.

40. The compartment defined in any one of claims 37 to 39 wherein the seat is adapted to define a support for the bed when the bed is in the sleep position.

41. The compartment defined in any one of claims 37 to 40 wherein the cadenza is adapted to define a support for the bed when the bed is in the sleep position.

42. The compartment defined in claim 41 wherein the cadenza is movable from a raised operative position in which the cadenza can be accessed conveniently by a passenger seated in the chair to a lowered bed support position.

43. The compartment defined in any one of claims 36 to 42 wherein the table assembly is housed in the cadenza so that it can be moved, for example by being swivelled, from a stored position within the cadenza to an operative position with a table of the table assembly extending

horizontally into the compartment proximate the chair.

44. The compartment defined in any one of claims 36 to 42 wherein an interactive combination of the furniture in the compartment space comprises: (a) the chair to one side of the doorway, (b) the seat to the other side of the doorway, (c) the cadenza against the wall opposite the doorway, and (d) the table assembly housed in the cadenza and movable between a stored position within the cadenza and an operative position with a table of the table assembly extending horizontally into a space between the chair and the seat.

45. The compartment defined in any one of claims 18 to 35 wherein, in addition to the chair, the other basic furniture of the compartment comprises any one or more of a work desk, a table assembly, a seat, a bed and a visual display system of an entertainment system.

46. The compartment defined in claim 45 wherein an interactive combination of the basic furniture in the compartment space comprises: (a) the chair in one corner of the compartment space, (b) the work desk along at least a part of one wall of the compartment and proximate the chair, (c) the table assembly movable between a stored position adjacent one wall of the compartment and an operative position with a table of the table assembly extending horizontally proximate the chair.

47. The compartment defined in claim 46 comprises the bed movable between a raised storage position and a lowered sleep position on the work desk.

48. The compartment defined in claim 46 or 47 comprises the seat adjacent at least a part of one wall of the compartment.

49. The compartment defined in any one of claims 46 to 48 wherein the work desk and the seat are positioned adjacent different walls of the compartment.

50. The compartment defined in claim 45 wherein an interactive combination of the basic furniture in the compartment space comprises: (a) the chair in one corner of the compartment space, (b) the seat adjacent one wall of the compartment, (c) the table assembly movable between a stored position adjacent one wall of the compartment and an operative position with a table of the table assembly extending horizontally proximate the chair.

51. The compartment defined in claim 45 wherein an interactive combination of the basic furniture in the compartment space comprises: (a) the chair in one corner of the compartment space, (b) the bed movable between a raised storage position and a lowered sleep position, (c) the table assembly movable between a stored position adjacent one wall of the compartment and an operative position with a table of the table assembly extending horizontally proximate the chair.

52. The compartment defined in claim 45 wherein an interactive combination of the basic furniture in the compartment space comprises: (a) the chair in one corner of the compartment space, (b) the seat adjacent a an wall opposite the chair when the chair is in a take-off position, (c) the work desk adjacent a wall that is in a lengthwise-extending direction of the aircraft, (d) the table assembly movable between a stored position adjacent the same wall as the work desk and an operative position with a table of the table assembly extending horizontally in a space between the chair and the seat, and (e) the bed movable between a raised storage position and a lowered sleep position on the work desk.

53. The compartment defined in claim 52 wherein the work desk and the table assembly are located adjacent the wall that is opposite the wall that defines the doorway.

54. The compartment defined in claim 53 wherein the work desk defines a support platform for the bed and supports the bed when the bed is in the sleep position.

55. The compartment defined in claims 54 wherein the bed is stored in the raised position in the compartment space and is moveable down to the lowered sleep position on the platform and is supported by the platform in the lowered position.

56. The compartment defined in any one of claims 52 to 55 wherein the work desk and the table assembly are positioned in relation to the chair when the table assembly is in the operative position so that the chair can be swiveled between positions facing the work desk and the table assembly.

57. The compartment defined in any one of claims 52 to 56 wherein a work platform of the work desk is vertically adjustable to accommodate different requirements of different passengers.

58. The compartment defined in claim 57 wherein the stored position of the table assembly is adjacent the work desk.

59. The compartment defined in claim 57 wherein the stored position of the table assembly is within the space occupied by the work desk.

60. The compartment defined in any one of claims 52 to 59 wherein the table assembly comprises: (a) a base member that can slide between the stored position adjacent

the side wall and the operative position between the chair and the seat, (b) a support arm pivotally mounted to the base member and foldable between the storage position and the operative position, and (c) a table pivotally mounted to the support arm.

61. The compartment defined in claim 60 wherein the table assembly can be moved from the stored position to the operative position by sliding or otherwise moving the base member outwardly from the stored position, lifting the table upwardly and inwardly into the compartment space and thereby pivoting the support arm upwardly and inwardly into the compartment space until the table is in the horizontal operative position.

62. The compartment defined in claim 61 wherein the support arm comprises a table support element that is positioned to support an underside of the table when the table assembly is the operative position with the table in the horizontal position.

63. The compartment defined in claim 62 wherein the table comprises side wings that can be folded between an inward storage position and an outward operative position.

64. The compartment defined in claim 63 wherein the base member defines a storage compartment.

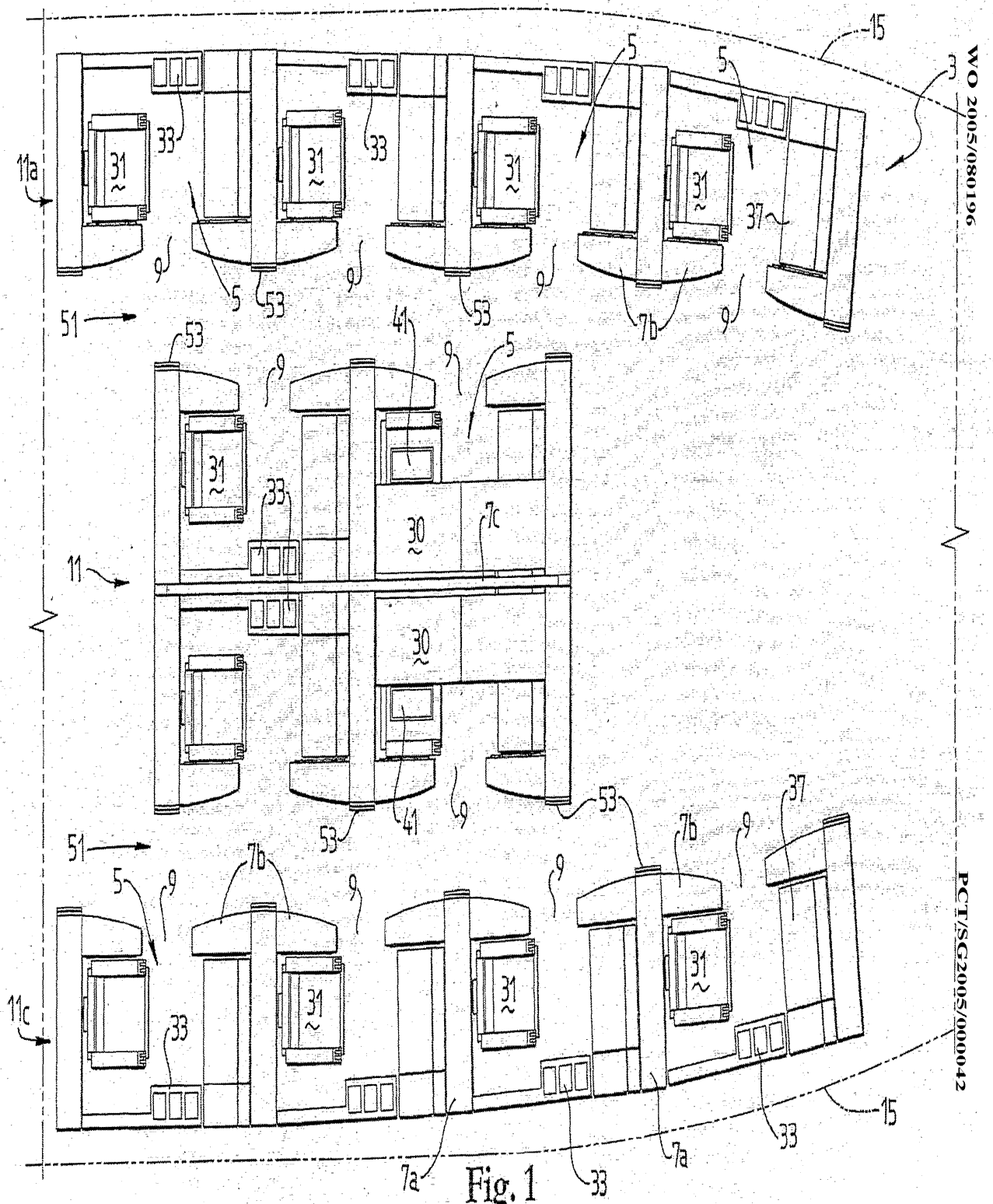

Fig. 1

Fig. 2

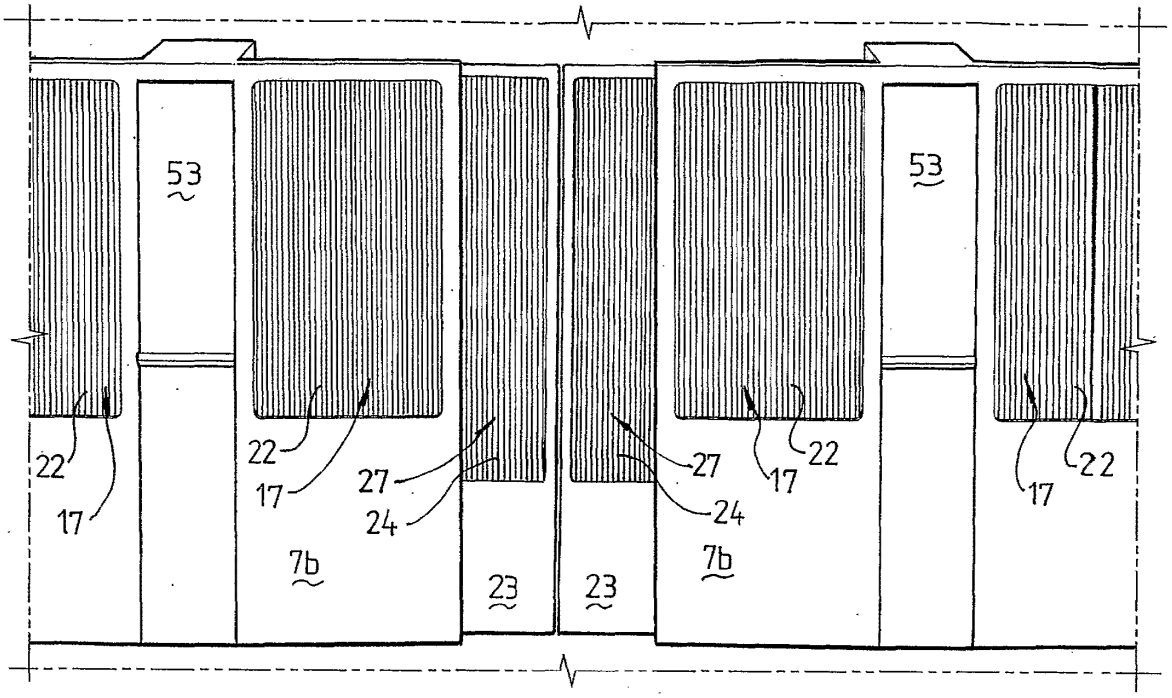
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Fig. 3

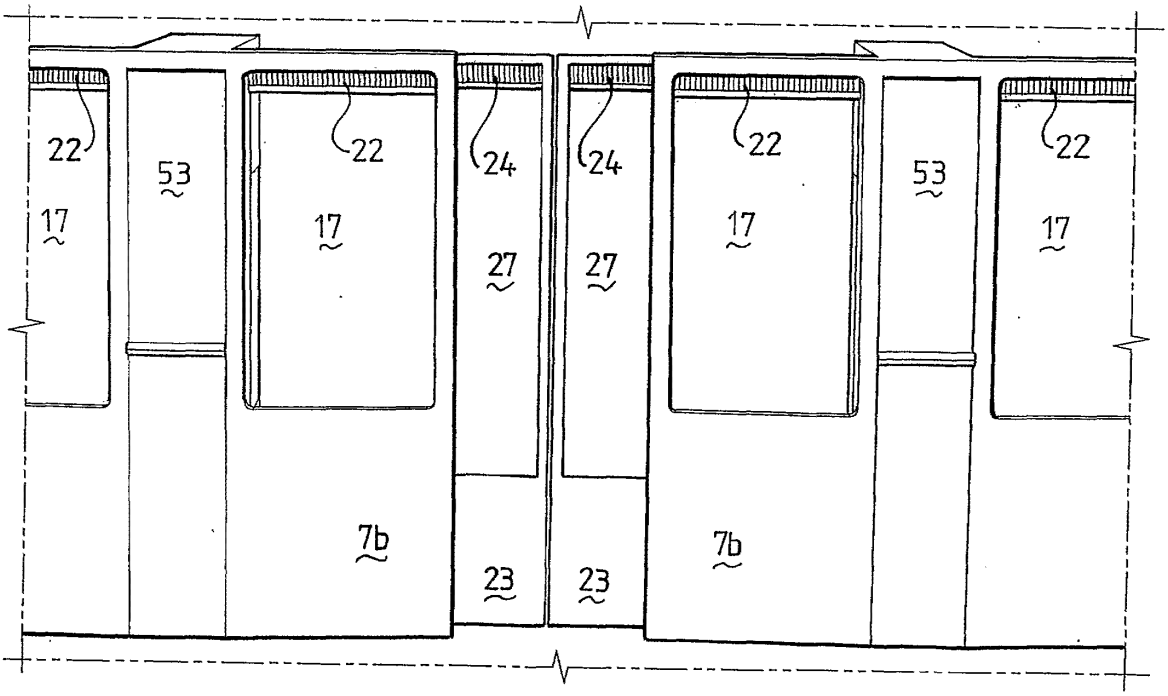
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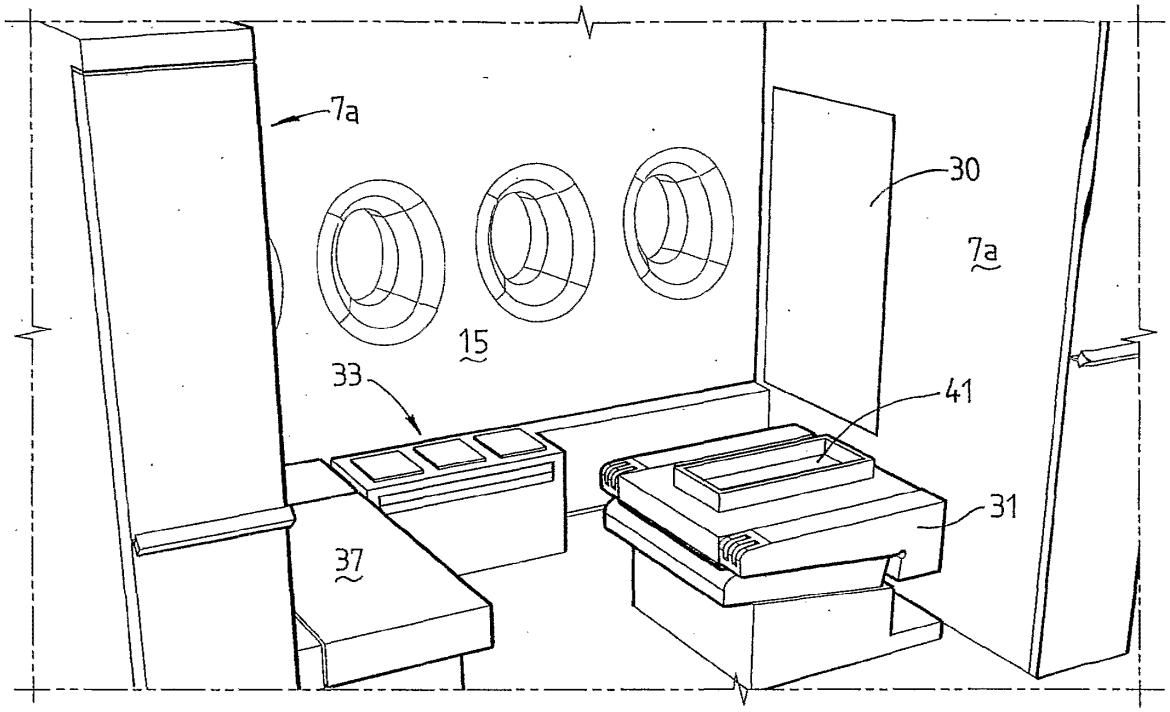
Fig. 4

Fig. 5

Fig. 6



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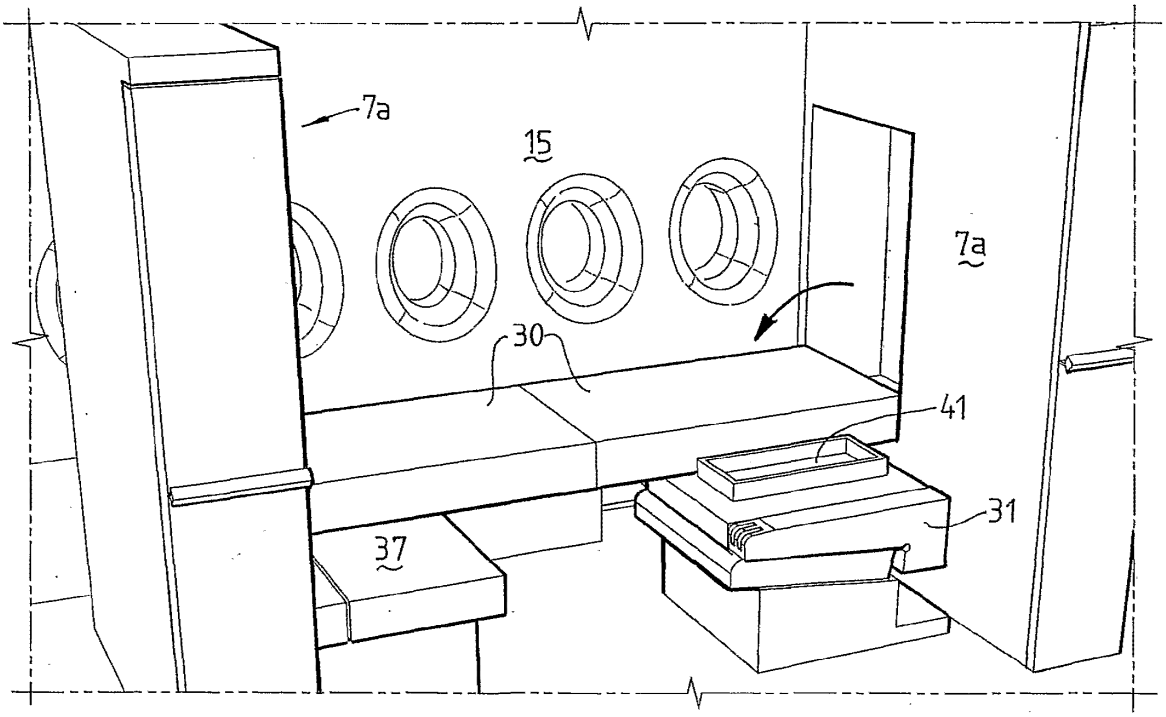
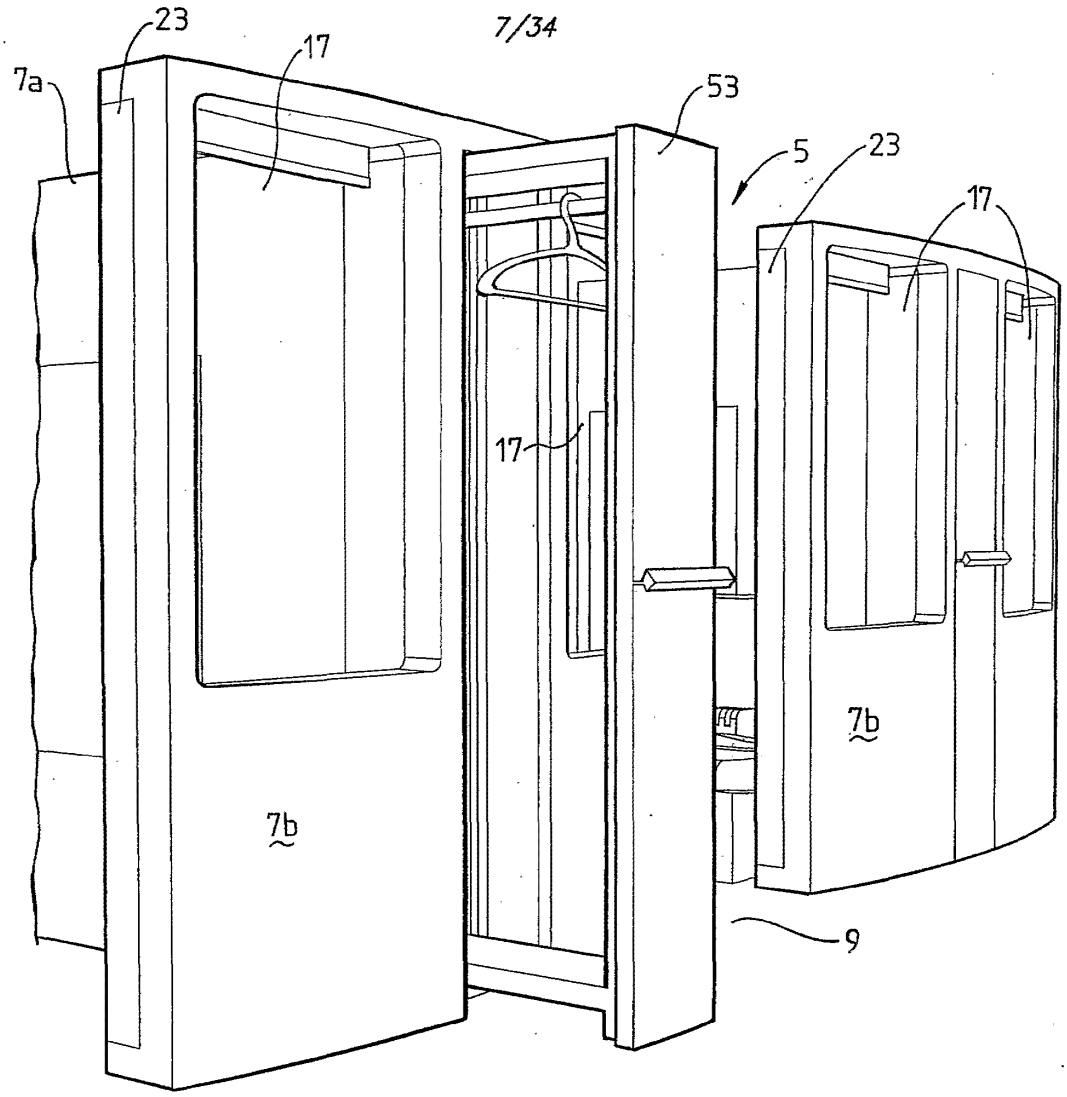


Fig. 8



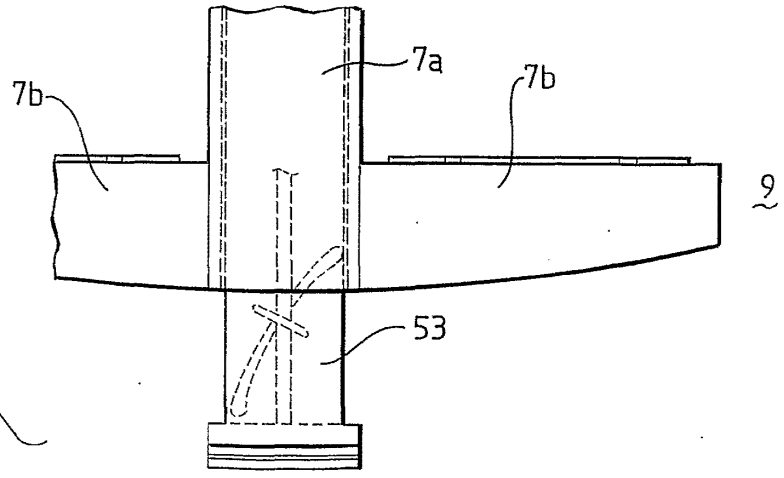
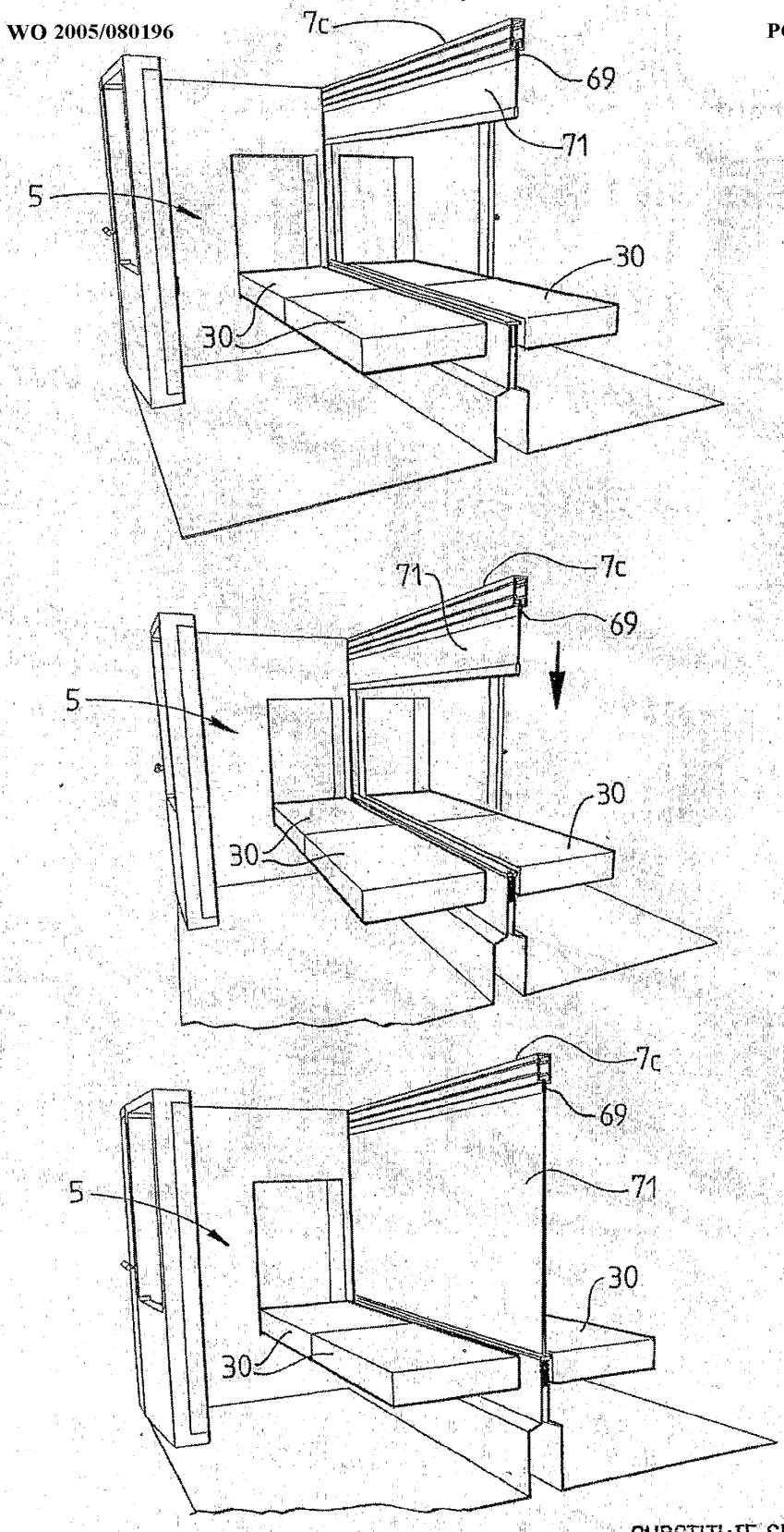


Fig. 9

Fig. 10



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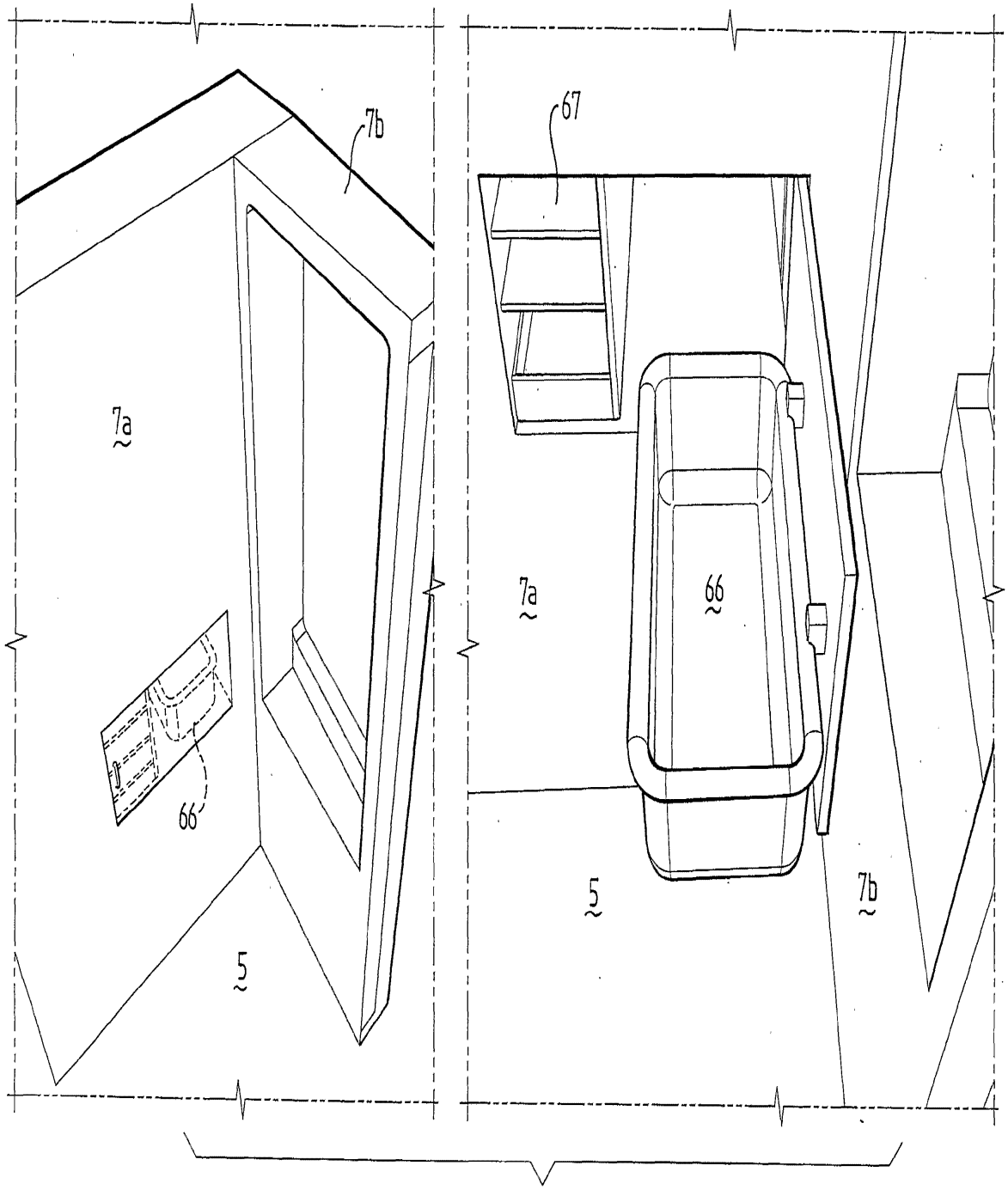

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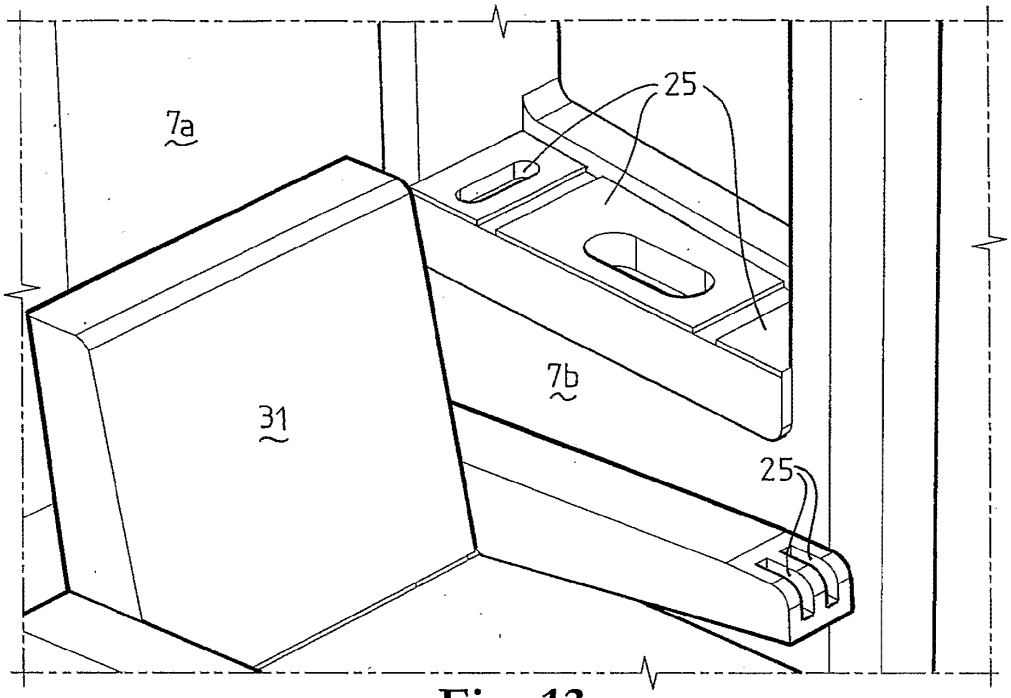

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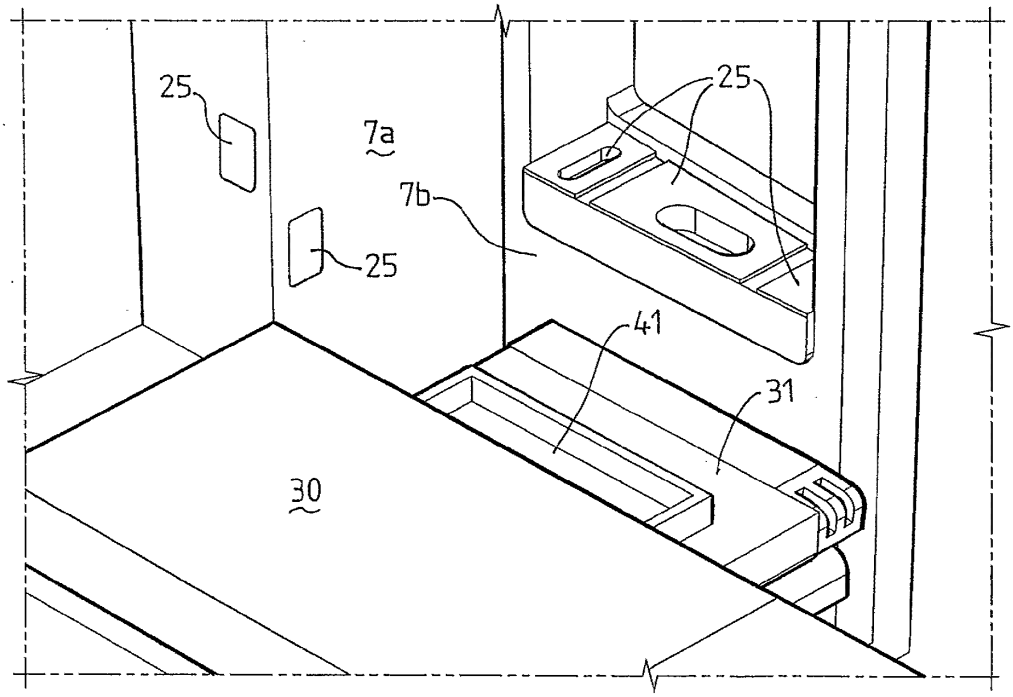


Fig. 14

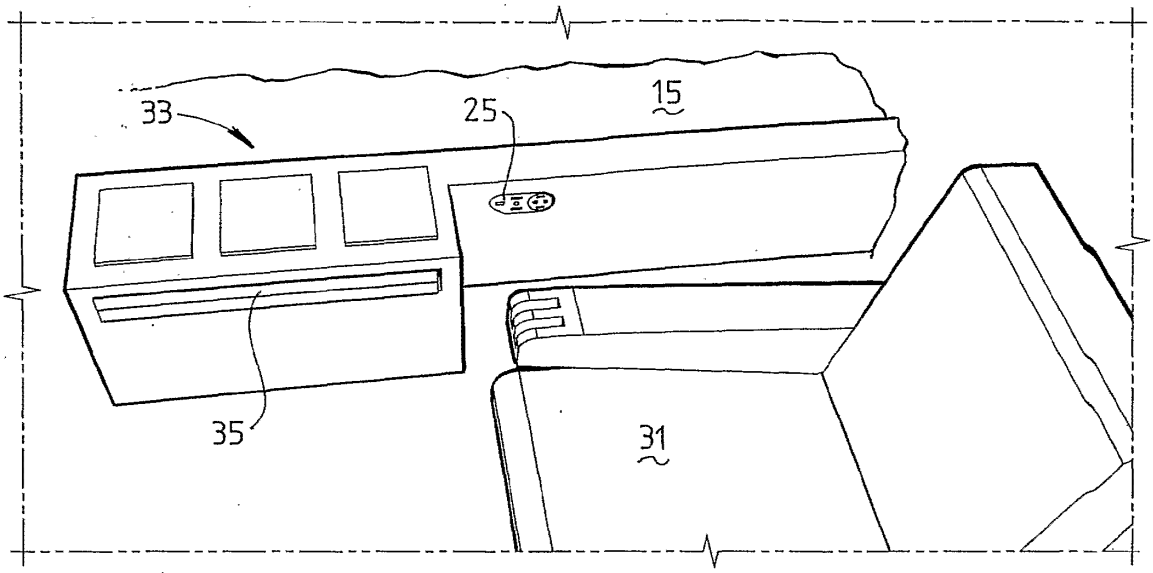
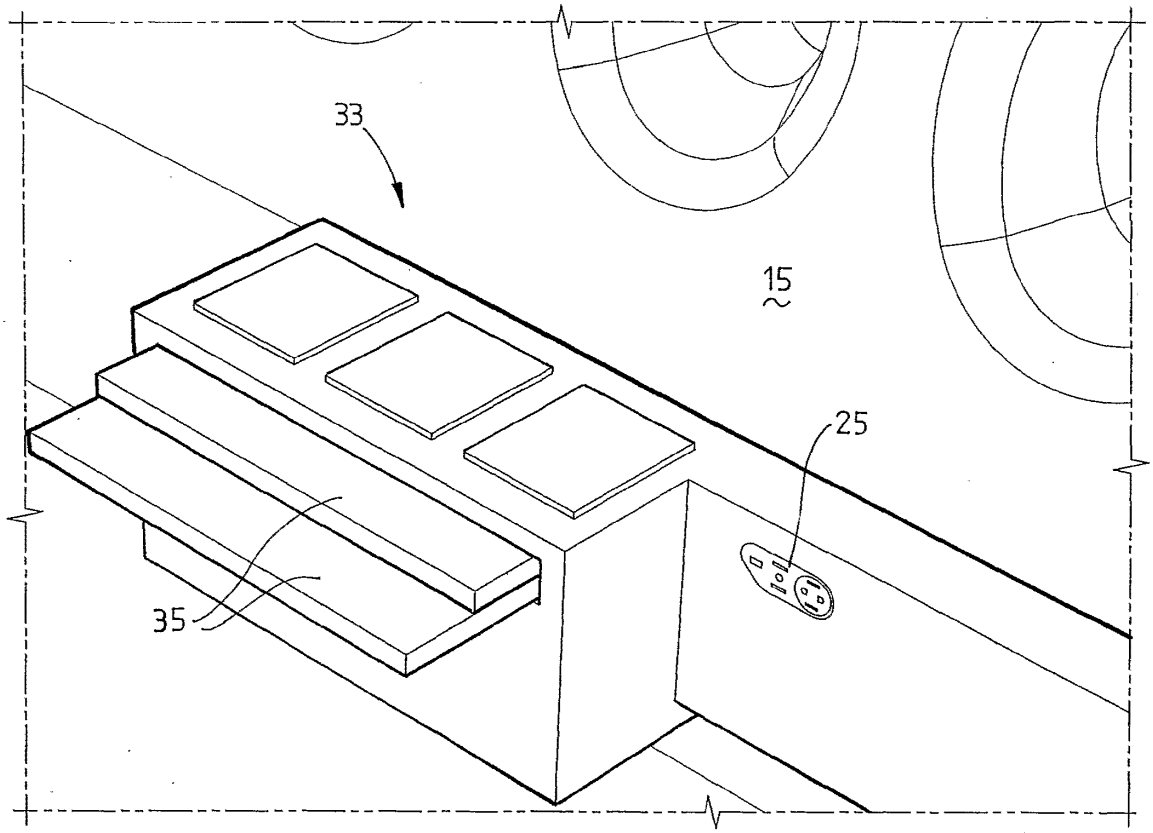


Fig. 15



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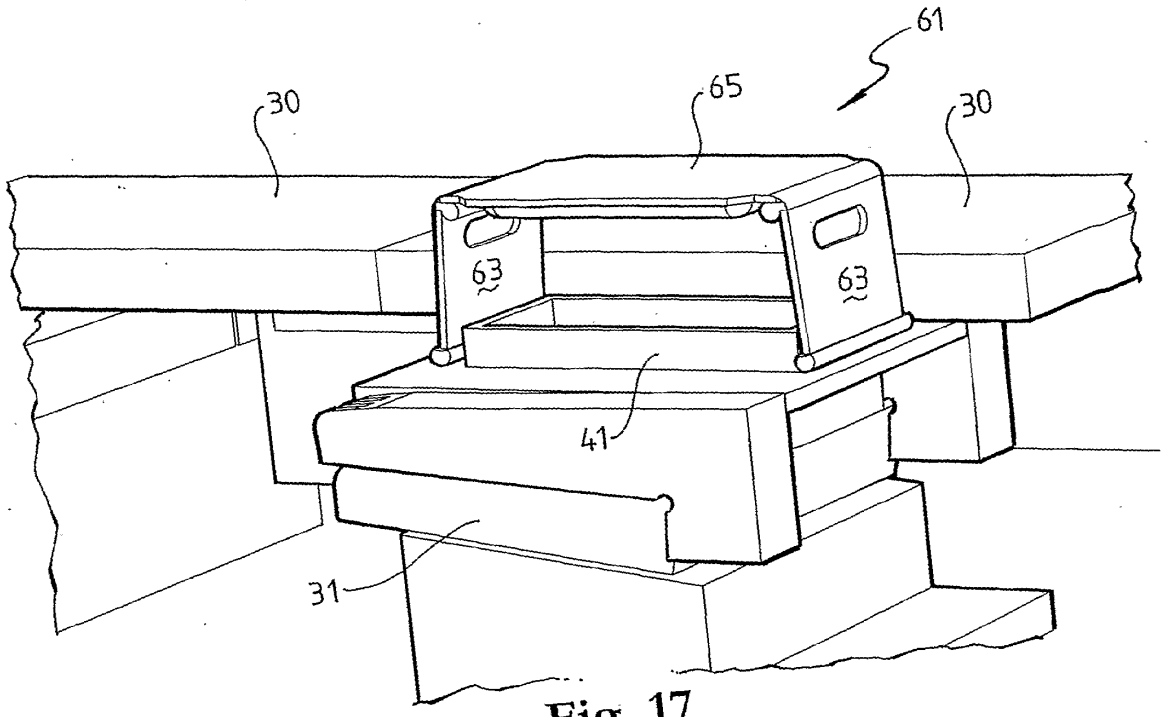

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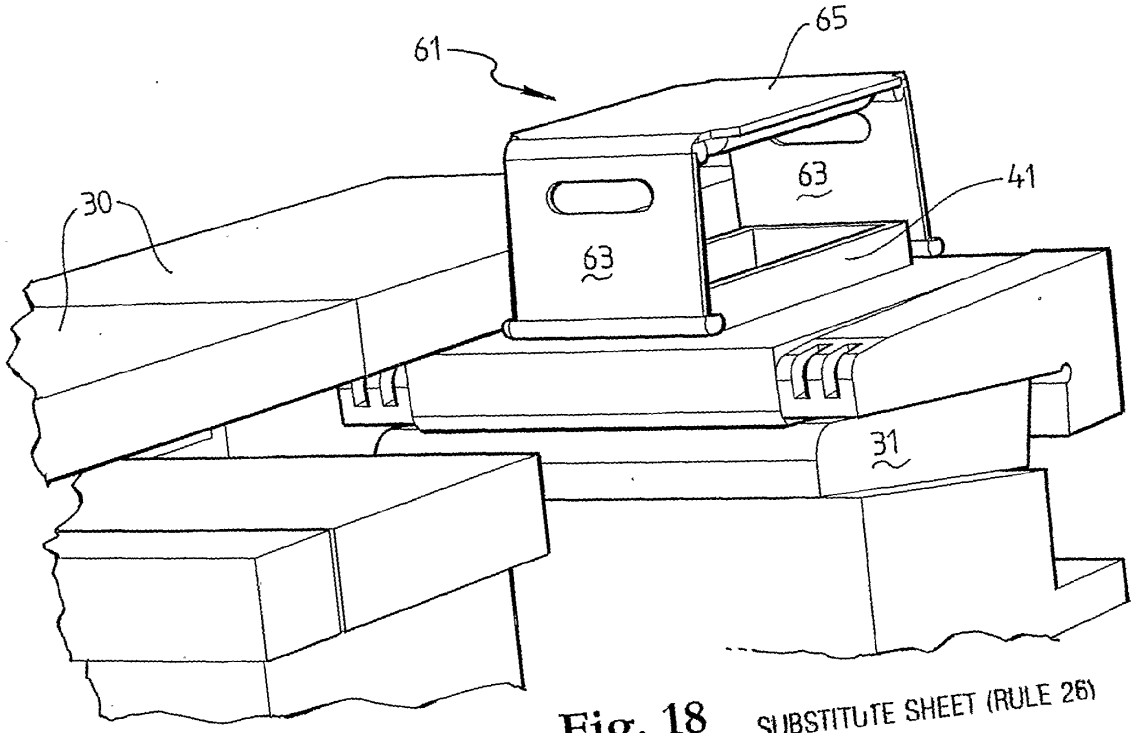

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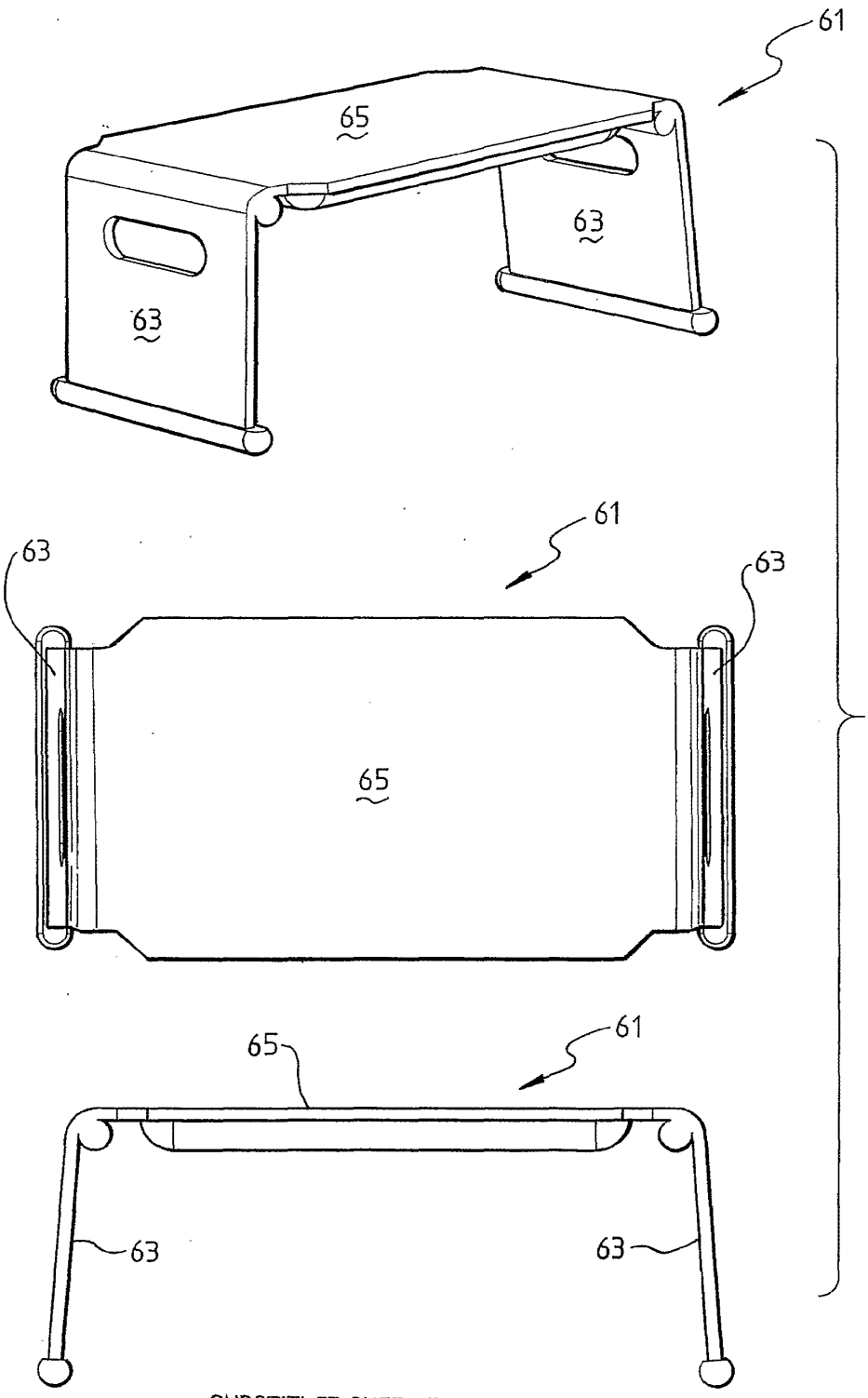

Fig. 19

Fig. 20

Fig. 21

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Fig. 22

Fig. 23

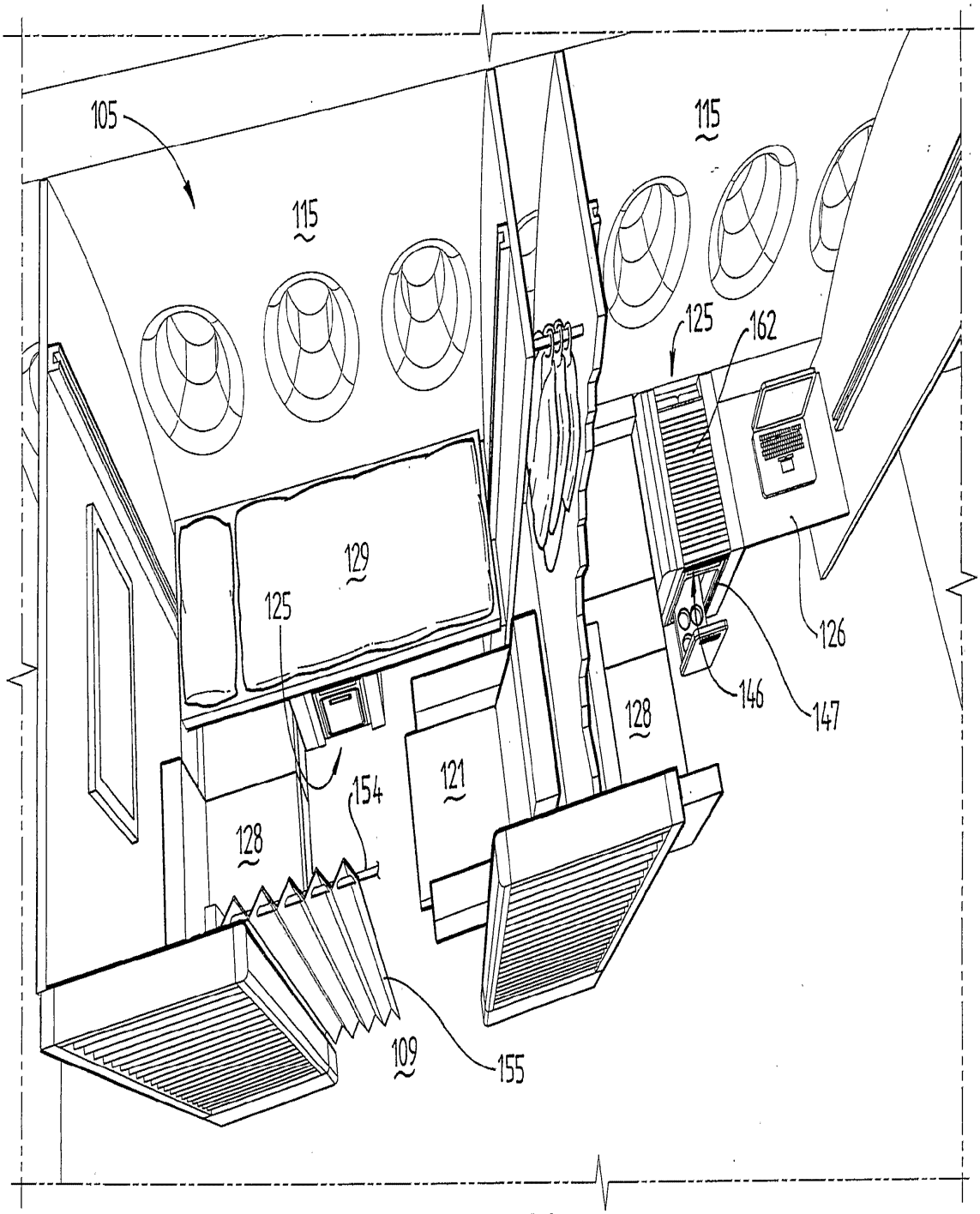


Fig. 24

Fig. 25

Fig. 26

Fig. 27

Fig. 28

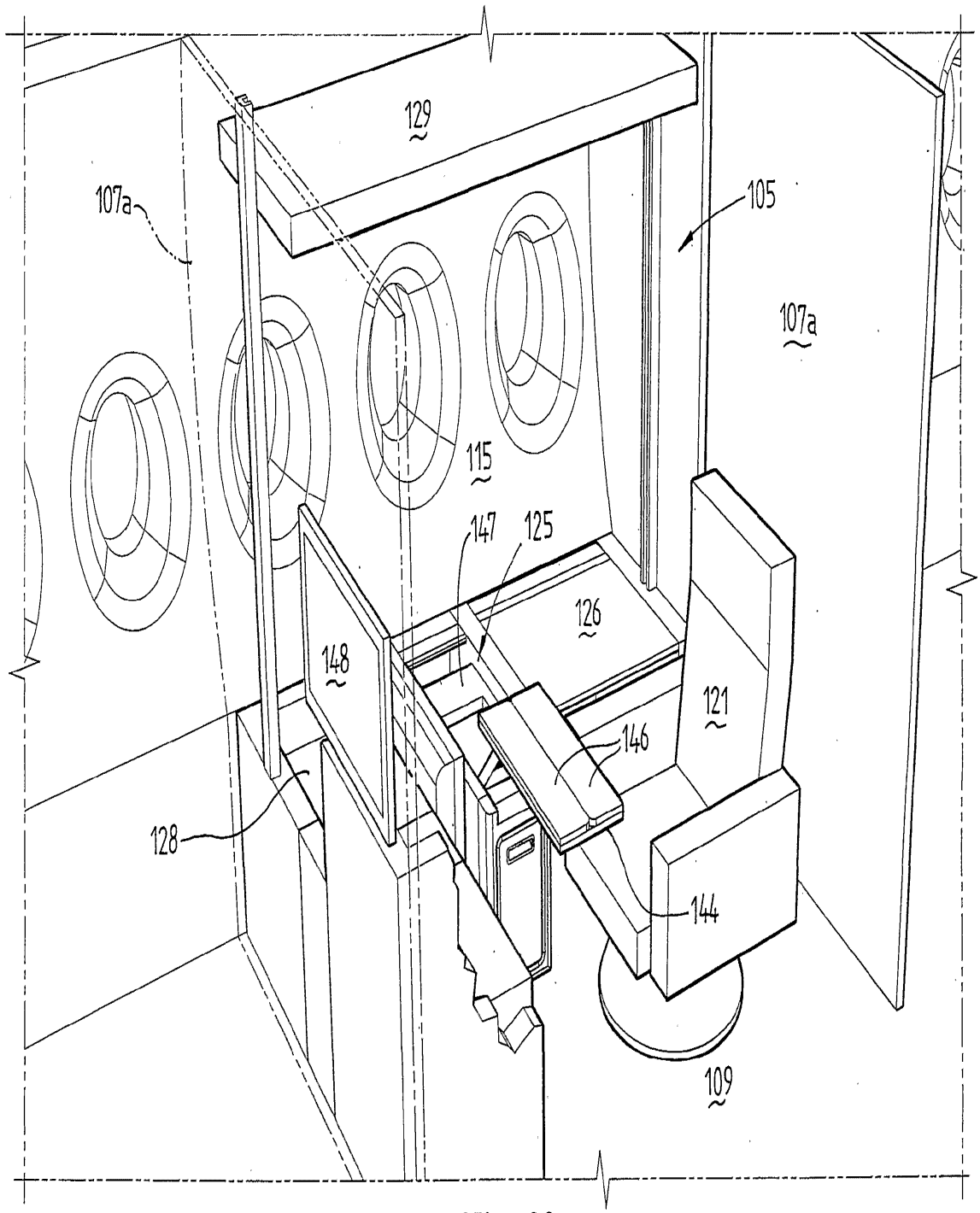


Fig. 29

Fig. 30

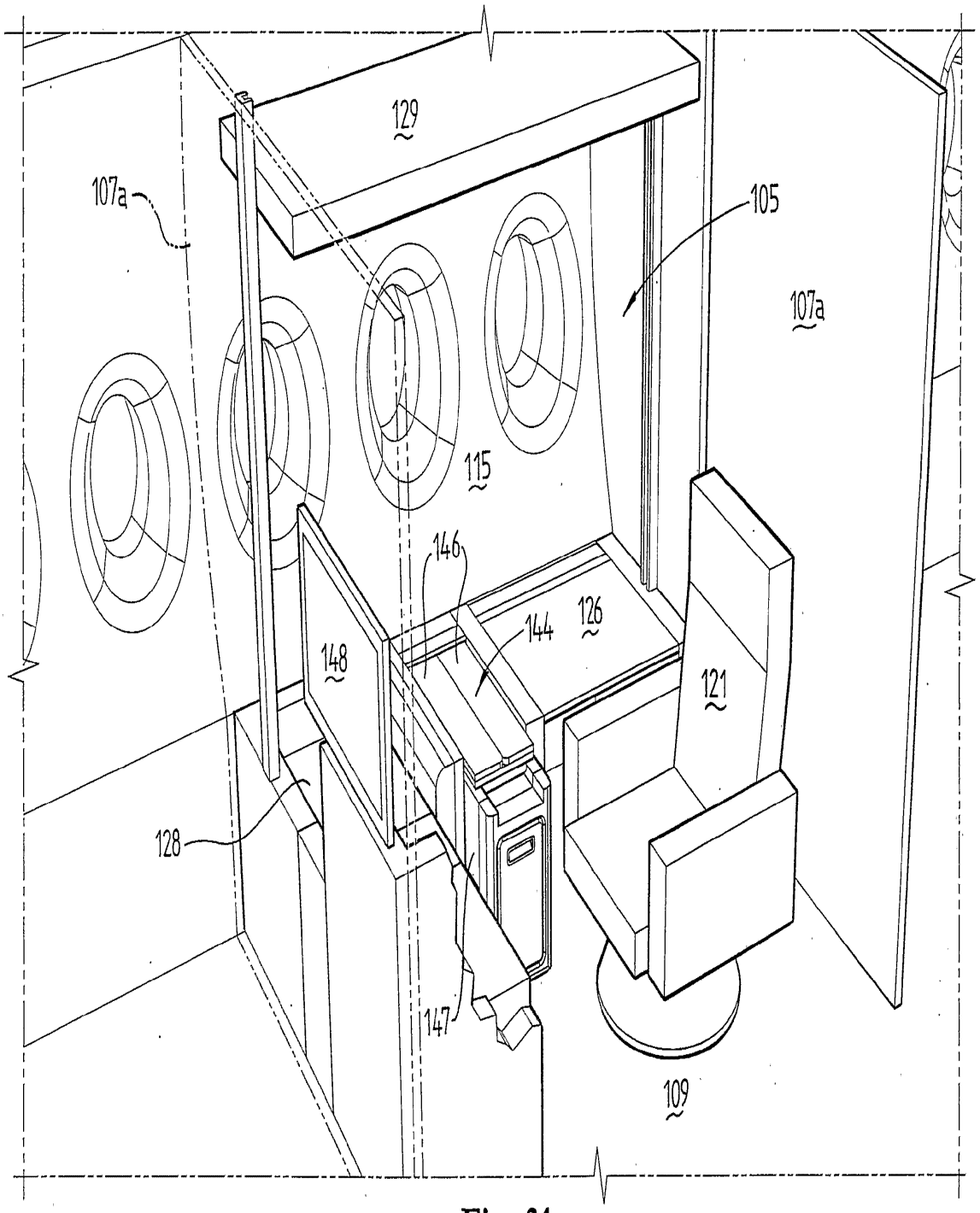


Fig. 31

Fig. 32

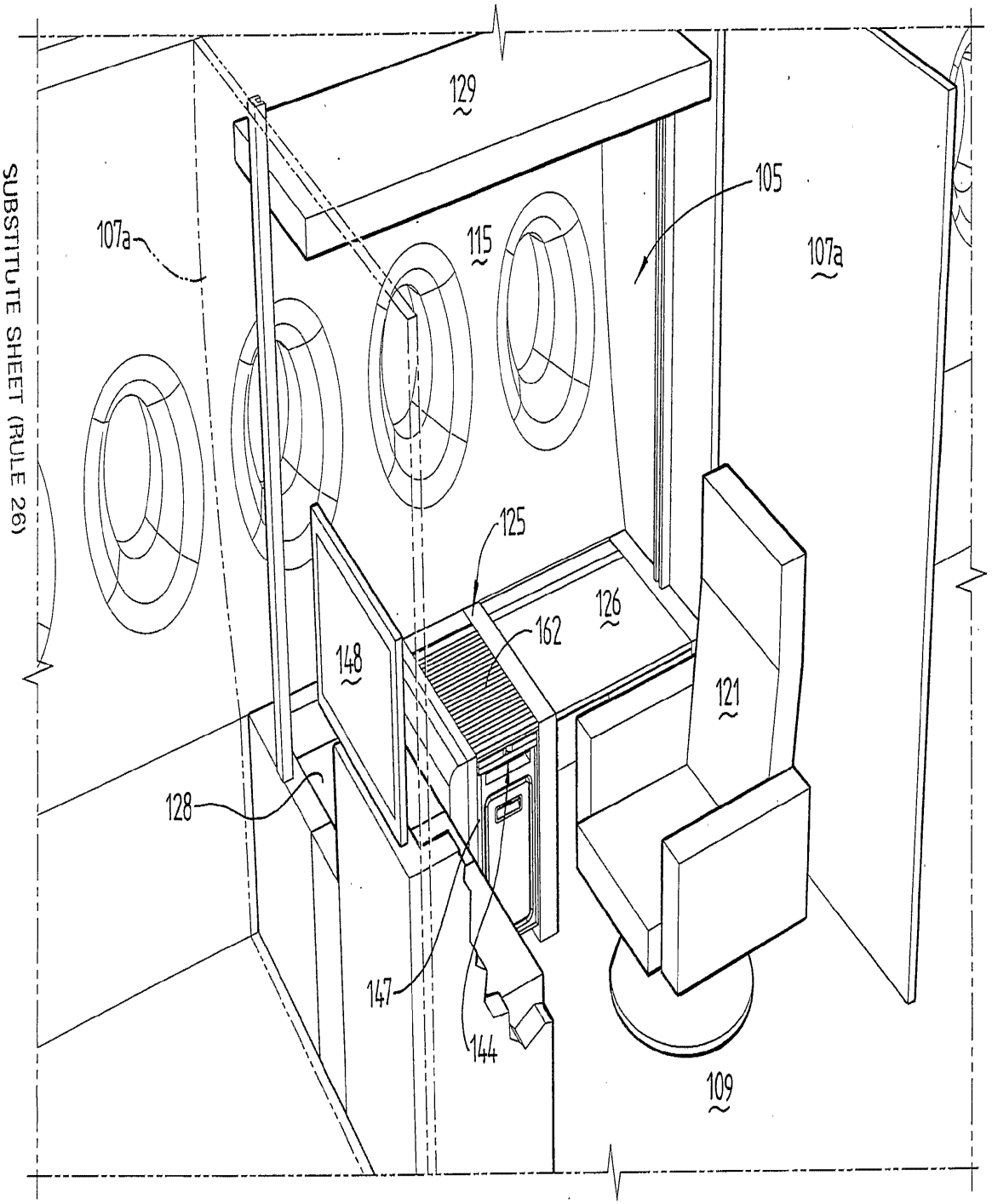


Fig. 33

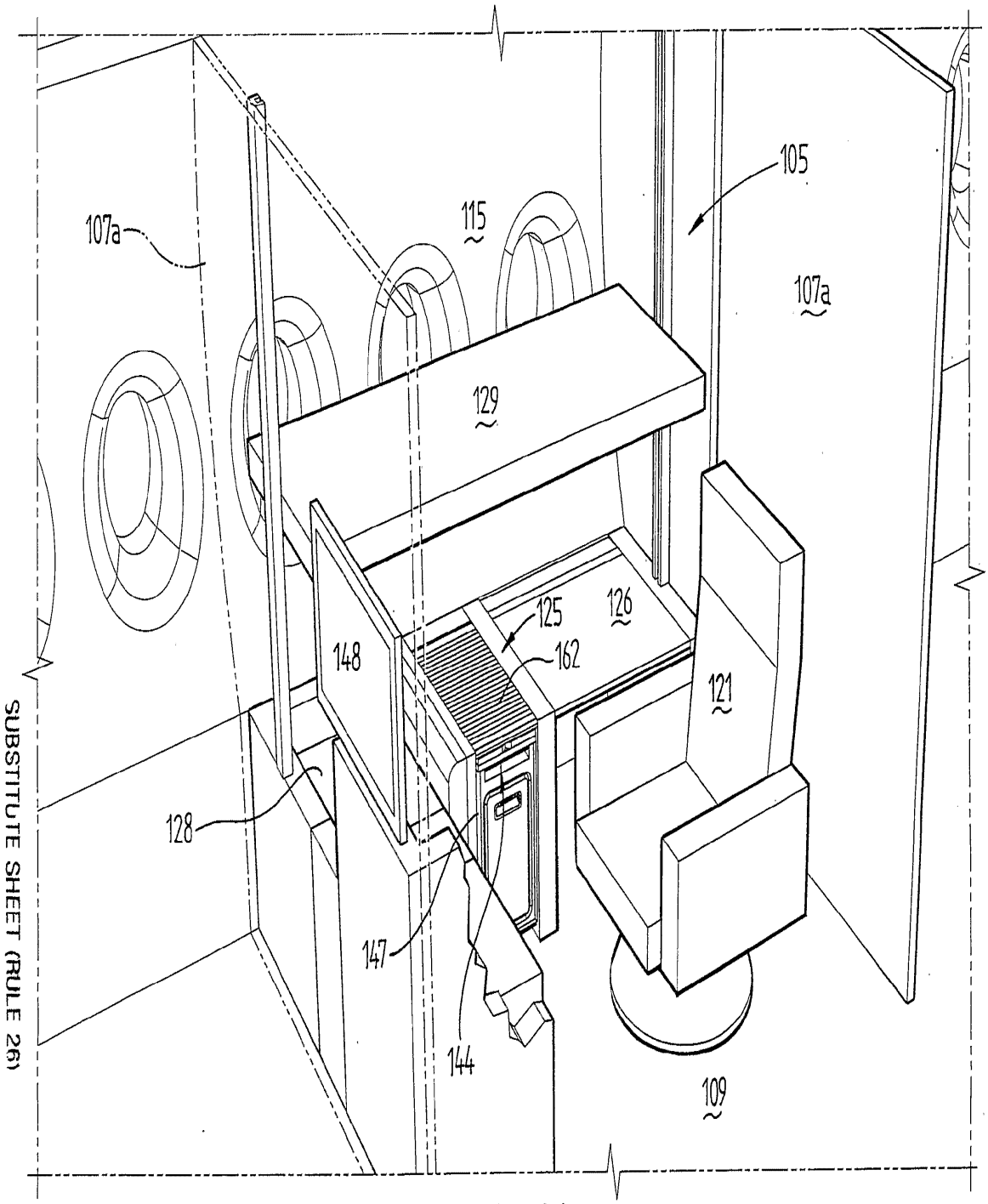


Fig. 34

Fig. 35

Fig. 36

Fig. 37

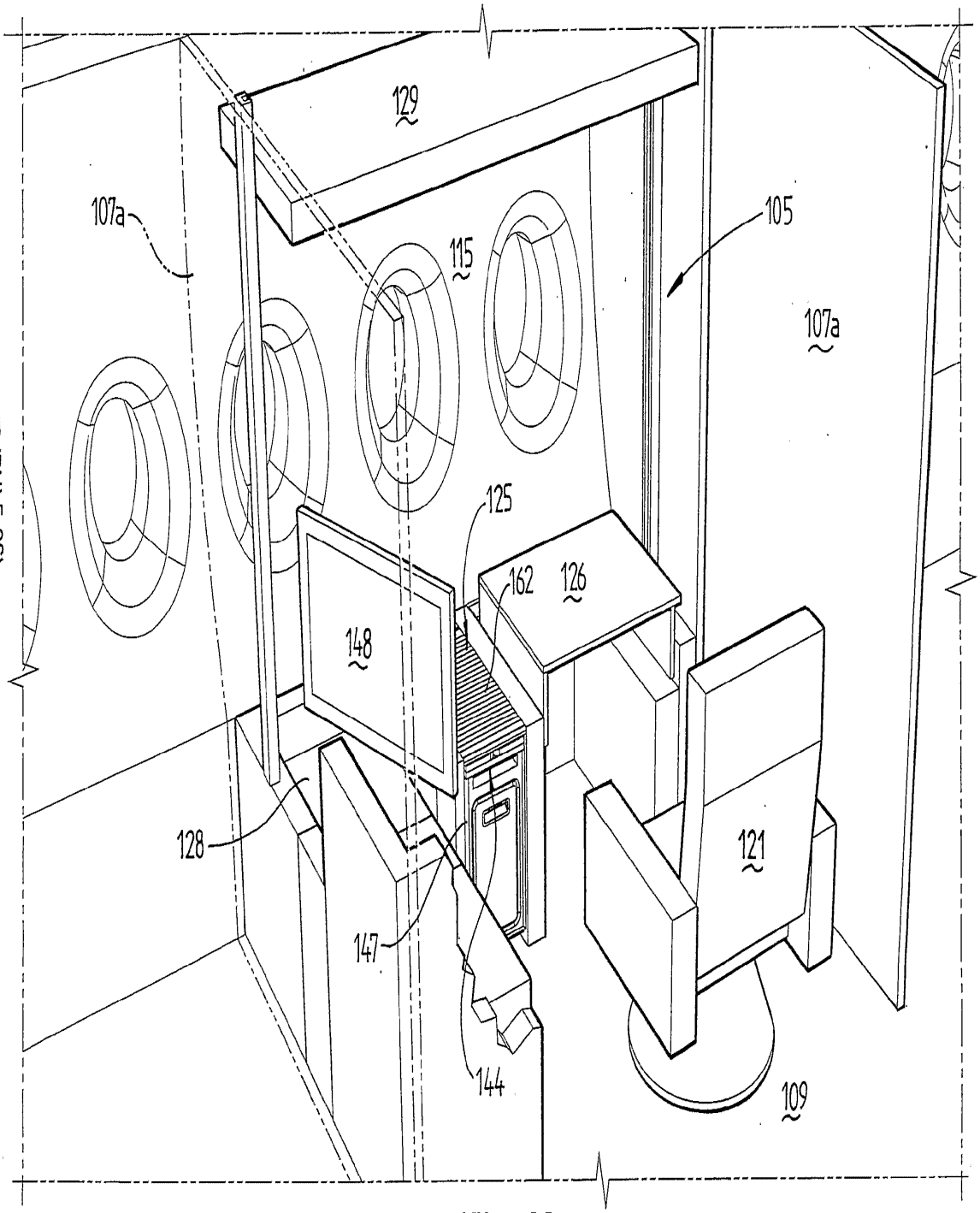


Fig. 38

Fig. 39

INTERNATIONAL SEARCH REPORT

International application No.
PCT/SG2005/000042

A. CLASSIFICATION OF SUBJECT MATTER

Int. Cl. [7]: B64D 11/00, 11/06

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 B60N 3/00, B60P 3/3-, B61D 1/-, 31/-, 33/-, 37/-, B62D 47/-, B63B 29/-, B64D 11/00, 11/06 and keywords: table, desk, chair, seat, office
esp@ce and USPTO

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 6152400 A (SANKRITHI et al) 28 November 2000 Whole document, but in particular compartments C1-C4 of Fig 16, lines 20-26 of column 9 and Figs 21-27.	1-15, 17-64
X	US 5024398 A (RIEDINGER et al) 18 June 1991 Whole document.	1-15, 17-64
X	US 2092655 A (PAGE) 7 September 1937 See whole document.	1-15, 17-64
X	GB 2362095 A (AMERICAN AIRLINES INC) 14 November 2001 Whole document	1-15, 17-64

[X] Further documents are listed in the continuation of Box C [X] See patent family annex

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"E" earlier application or patent but published on or after the international filing date
"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)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
"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
"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
"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
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
3 May 2005	12 MAY 2005
Name and mailing address of the ISA/AU AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA E-mail address: pct@ipaustralia.gov.au Facsimile No. (02) 6285 3929	Authorized officer **ZBIGNIEW BIELAWSKI** Telephone No : (02) 6283 2218

Form PCT/ISA/210 (second sheet) (January 2004)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/SG2005/000042

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	JP 09202232 A (FUKUYA) 5 August 1997 (& Derwent Abstract Accession No. 97-443615/41, Class Q21, JP 09202232 A (FUKUYA) 5 August 1997) Whole document	1-15, 17-64

Form PCT/ISA/210 (continuation of second sheet) (January 2004)

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/SG2005/000042

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	6152400	EP	0901963
US	5024398		
US	2092655		
GB	2362095		
JP	9202232		

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

END OF ANNEX

Espacenet

Bibliographic data: WO2007006938 (A1) — 2007-01-18

AIRCRAFT CABIN PARTITION

Inventor(s): BOCK THOMAS-MATHIAS [FR] ± (BOCK, THOMAS-MATHIAS)

Applicant(s): AIRBUS [FR]; BOCK THOMAS-MATHIAS [FR] ± (AIRBUS, ; BOCK, THOMAS-MATHIAS)

Classification: **- international:** ***B64D11/00***
- cooperative: **B64D11/0023**

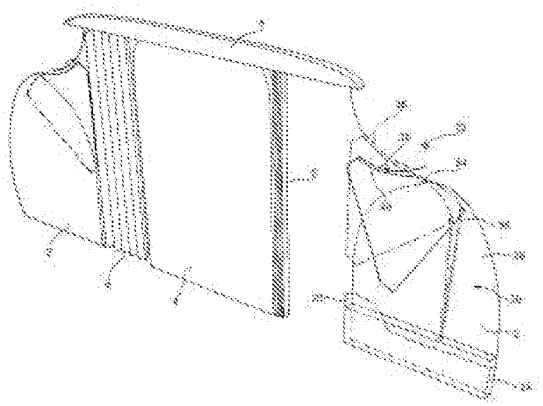
Application number: WO2006FR01634 20060707

Priority number (s): FR20050007442 20050712

Also published as: FR2888561 (A1) FR2888561 (B1) RU2008105036 (A) RU2403186 (C2) JP2009501108 (A) more

Abstract of WO2007006938 (A1)

The invention relates to a partition (2) for an aircraft cabin, comprising a rigid, fixed vertical panel (24, 26, 28); and an element (32) which can move between a deployed position, in which the element (32) projects out beyond the edges of the fixed, rigid panel (24, 26, 28), and a retracted position, in which the projecting part of the element (32) is retracted at least partially in relation to the edges of the fixed, rigid panel (24, 26, 28).



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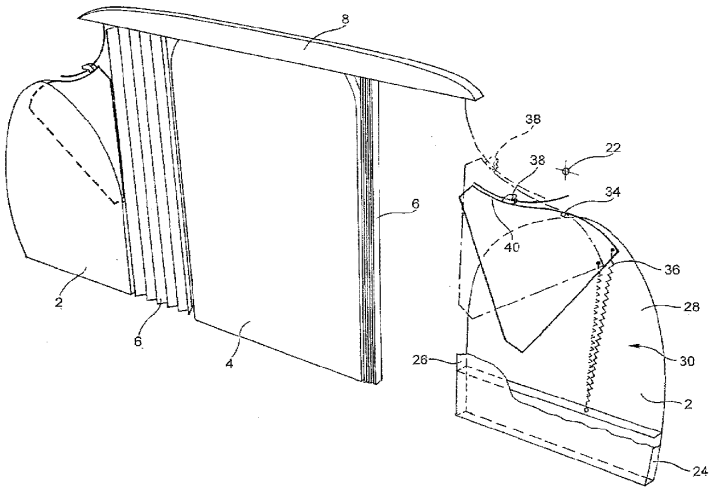
[Suite sur la page suivante]

(54) **Title:** AIRCRAFT CABIN PARTITION

(54) **Titre :** CLOISON DE SEPARATION DANS UNE CABINE D'AERONEF



(57) **Abstract:** The invention relates to a partition (2) for an aircraft cabin, comprising a rigid, fixed vertical panel (24, 26, 28); and an element (32) which can move between a deployed position, in which the element (32) projects out beyond the edges of the fixed, rigid panel (24, 26, 28), and a retracted position, in which the projecting part of the element (32) is retracted at least partially in relation to the edges of the fixed, rigid panel (24, 26, 28).

[Suite sur la page suivante]

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— *avant l'expiration du délai prévu pour la modification des revendications, sera republiée si des modifications sont reçues*

En ce qui concerne les codes à deux lettres et autres abréviations, se référer aux "Notes explicatives relatives aux codes et abréviations" figurant au début de chaque numéro ordinaire de la Gazette du PCT.

(57) Abrégé : Cette paroi de séparation (2) pour cabine d'aéronef comporte : un panneau vertical (24, 26, 28) rigide et fixe, un élément mobile (32) entre une position déployée dans laquelle l'élément mobile (32) fait saillie au-delà des contours du panneau (24, 26, 28) rigide et fixe et une position rétractée dans laquelle la partie en saillie de l'élément mobile (32) est escamotée au moins partiellement par rapport aux contours du panneau (24, 26, 28) rigide et fixe.

Cloison de séparation dans une cabine d'aéronef

La présente invention concerne une paroi de séparation dans une cabine d'aéronef.

Dans une cabine d'aéronef, on trouve parfois des sièges de types différents. Ces sièges différents permettent d'offrir aux passagers divers niveaux de confort dans la cabine de l'aéronef. Dans de telles cabines, on trouve alors généralement trois niveaux de confort définissant trois classes de confort croissant : la classe économique, la classe affaires et la première classe. Les sièges d'une même classe sont généralement regroupés au sein d'un compartiment.

De manière connue, les compartiments dans une cabine d'aéronef sont séparés les uns des autres par une cloison de séparation transversale. Ces cloisons doivent être réalisées en respectant les différentes règles de sécurité. Ainsi, il convient notamment de pouvoir évacuer rapidement l'aéronef en cas de danger. Les couloirs de la cabine de l'aéronef ne doivent donc pas comporter d'obstacles. Les cloisons de séparation de l'art antérieur comportent ainsi généralement des parois rigides présentant la largeur de deux ou trois sièges et disposées derrière une rangée transversale de sièges. Entre ces parois, au niveau du (ou des) couloir(s), un rideau, généralement textile, réalise la séparation entre les compartiments.

Avec une telle cloison de séparation, l'isolement entre les compartiments est imparfait. Ceci est dû en partie à l'utilisation de rideaux souples pour réaliser la séparation au niveau des couloirs mais également à la forme des parois rigides. En effet, pour permettre l'ouverture des coffres à bagages, placés en hauteur, la partie supérieure des parois rigides est découpée. Ainsi au cours d'un vol, lorsque les coffres à bagages sont fermés, une découpe apparaît dans la paroi de séparation au niveau de chaque coffre à bagages.

La présente invention a alors pour but de fournir une paroi (et une cloison) de séparation permettant de réaliser un bon isolement entre des compartiments de cabine d'aéronef, même au niveau de coffres à bagages.

A cet effet, elle propose une paroi de séparation pour cabine d'aéronef comportant un panneau vertical rigide et fixe.

Selon l'invention, cette paroi comporte en outre un élément mobile entre

une position déployée dans laquelle l'élément mobile fait saillie au-delà des contours du panneau rigide et fixe et une position rétractée dans laquelle la partie en saillie de l'élément mobile est escamotée au moins partiellement par rapport aux contours du panneau rigide et fixe.

Une telle paroi de séparation peut s'adapter à des contours "variables" tels ceux définis par un coffre à bagages qui peut être ouvert ou fermé. Ainsi, la position déployée de l'élément mobile correspond par exemple à la position fermée d'un coffre à bagages sous lequel se trouve la paroi de séparation et la position rétractée correspond à la position ouverte de ce coffre à bagages.

Dans une première forme de réalisation, l'élément mobile est monté pivotant autour d'un axe horizontal. Il s'agit ici d'un mouvement simple qui permet généralement de bien suivre le mouvement d'ouverture d'un coffre à bagages.

Une forme de réalisation préférée prévoit que l'élément mobile est une lame qui, dans sa position rétractée, est logée au moins partiellement dans une réservation prévue à cet effet dans le panneau rigide et fixe. Ainsi, esthétiquement, on ne voit apparaître que la partie en saillie de l'élément mobile. Dans cette forme préférée, le panneau rigide et fixe comporte par exemple deux faces latérales entre lesquelles vient prendre place la lame mobile, et le guidage de la lame mobile entre sa position déployée et sa position rétractée, et inversement, est assuré par les faces latérales du panneau rigide et fixe. Dans cette variante, la lame mobile est guidée comme une vitre de portière de véhicule automobile.

Pour commander le mouvement de l'élément mobile, il est proposé par exemple que des moyens de rappel précontraignent l'élément mobile vers sa position déployée. De cette manière, cet élément peut suivre le contour "variable". Dans le cas d'une paroi située sous un coffre à bagages, l'élément mobile peut suivre les ouvertures et fermetures de ce coffre.

Pour une meilleure liaison entre l'élément mobile et un coffre à bagages, l'élément mobile présente un bord supérieur sur lequel coulisse par exemple un butoir destiné à venir au contact d'une porte de coffre à bagages et fixé sur celle-ci.

La présente invention concerne également une cloison de séparation pour cabine d'aéronef comportant au moins une paroi de séparation et un rideau, dans laquelle au moins une paroi de séparation est une paroi telle que décrite ci-

dessus. Elle concerne également une cabine d'aéronef et un aéronef, caractérisés en ce qu'ils comportent chacun au moins une telle paroi de séparation.

Des détails et avantages de la présente invention ressortiront mieux de la description qui suit, faite en référence aux dessins schématiques annexés sur lesquels :

La figure 1 représente en perspective une cloison de séparation selon l'invention, et

La figure 2 est une vue partielle de face d'une cabine d'aéronef équipée d'une cloison de séparation selon l'invention.

La figure 1 représente une cloison de séparation destinée à prendre place dans une cabine d'aéronef. Cette cloison est destinée à être disposée transversalement dans cette cabine. Cette cloison de séparation comporte notamment deux parois de séparation latérale 2, une paroi de séparation centrale 4, deux rideaux 6 et un bandeau 8 supérieur. Tous ces éléments sont placés sensiblement dans un même plan que l'on supposera dans la suite de la description comme étant vertical.

Comme le montre la figure 2, cette cloison de séparation est destinée à isoler l'un de l'autre deux compartiments de la cabine d'aéronef. Dans l'exemple de la figure 2, la cloison de séparation est disposée entre un compartiment de classe affaires équipé de sièges convertibles 10 et un compartiment de classe économique équipé de sièges à dossier inclinable 12. La cloison de séparation s'étend depuis le sol 14 de la cabine d'aéronef jusqu'à son plafond et d'une paroi latérale 16 de cette cabine jusqu'à la paroi latérale opposée.

La paroi de séparation centrale 4 est une paroi fixe rigide. Elle correspond à une paroi de séparation telle celles que l'on connaît de l'art antérieur. Elle est disposée entre deux rangées de sièges successives. Dans la cabine d'aéronef considérée ici à titre d'exemple, deux couloirs 18 (dont seul un est représenté sur la figure 2) s'étendent longitudinalement dans la cabine de l'aéronef pour permettre l'accès aux sièges de cette cabine. La paroi de séparation centrale 4 est délimitée par ces deux couloirs 18. L'isolement entre les deux compartiments de la cabine d'aéronef séparés par la cloison de séparation représentée se fait au niveau des couloirs par les rideaux 6. On trouve ainsi un tel rideau 6 de part et d'autre de la paroi de séparation centrale 4. Sur la figure 1, un premier rideau 6 est montré dans sa position tirée dans laquelle il forme une

séparation entre les deux compartiments et un autre rideau est montré dans sa position pliée dans laquelle le rideau 6 laisse libre le passage entre les deux compartiments.

Le bandeau 8 est disposé au-dessus de la paroi de séparation centrale 4 et des rideaux 6. Ces derniers peuvent être par exemple portés par le bandeau 8. Une glissière peut ainsi être prévue aux extrémités de ce bandeau 8 sur la face inférieure de celui-ci.

Ce bandeau est par exemple un bandeau lumineux sur lequel peuvent apparaître des pictogrammes (non représentés). Ces pictogrammes peuvent par exemple indiquer aux passagers l'état libre ou occupé d'une toilette, rappeler éventuellement une interdiction de fumer, demander aux passagers d'attacher leur ceinture, etc....

La présente invention concerne plus particulièrement les parois de séparation latérales pour la configuration de cabine représentée aux dessins. Ces parois de séparation latérales 2 se trouvent disposées contre les parois latérales 16 de la cabine d'aéronef. Du côté opposé à cette paroi latérale 16 de cabine, elles sont délimitées par un couloir 18. Les parois de séparation latérales 2 représentées reposent sur le sol 14 de la cabine d'aéronef. En partie supérieure, ces parois de séparation latérales 2 s'étendent non pas jusqu'au plafond de la cabine d'aéronef mais jusqu'à un coffre à bagages 20. Dans l'exemple représenté, ce dernier est monté pivotant autour d'un axe horizontal longitudinal. Sur les figures, cet axe est symbolisé par un premier point de pivotement 22. Ce point correspond à l'intersection entre l'axe de pivotement horizontal et le plan vertical recevant la cloison de séparation.

Les deux parois de séparation latérales 2 de la figure 1 sont symétriques par rapport à un plan médian vertical de la cabine d'aéronef. Seule l'une de ces parois de séparation latérale 2 sera donc décrite ci-après.

Une paroi de séparation latérale 2, dans sa forme de réalisation préférée, comporte une base 24, une face avant 26 et une face arrière 28. La base 24 repose sur le sol 14 de la cabine d'aéronef. Les faces avant 26 et arrière 28 sont symétriques l'une par rapport à l'autre et définissent entre elles un logement 30. Ce dernier reçoit une lame mobile 32 (alors que la base 24 et les faces avant 26 et arrière 28 sont considérées comme étant fixes).

La forme des faces avant 26 et arrière 28 est telle que lorsque le coffre

à bagages 20 est en position ouverte un espace subsiste entre la partie supérieure des faces avant 26 et arrière 28 et le coffre à bagages 20 dans sa position ouverte. La lame mobile 32 vient combler l'ouverture restant entre les faces avant 26 et arrière 28 de la paroi de séparation latérale 2 et le coffre à bagages 20, que celui-ci soit en position fermée ou ouverte.

Dans la forme de réalisation préférée représentée aux dessins, la lame mobile 32 est montée pivotante autour d'un second axe horizontal, parallèle à l'axe de pivotement du coffre à bagages 20. On a représenté sur les figures 1 et 2 un second point de pivotement 34 qui correspond à l'intersection de l'axe de pivotement de la lame mobile 32 avec le plan contenant la cloison de séparation. Dans son mouvement de pivotement, la lame mobile 32 est guidée par les faces avant 26 et arrière 28.

Des moyens sont prévus pour précontraindre la lame mobile 32 dans sa position relevée, en contact avec le coffre à bagages 20. Dans la forme de réalisation représentée, ces moyens comportent un ressort 36 accroché d'une part à la lame mobile 32 et d'autre part à un point fixe, par exemple la base 24 de la paroi de séparation latérale 2, comme représenté sur la figure 1.

Dans la forme de réalisation préférée représentée au dessin, la lame mobile 32 ne vient pas directement au contact du coffre à bagages 20. Un butoir 38 fixé sous le coffre à bagages assure la liaison entre celui-ci et la lame mobile 32. On remarque sur les dessins que la lame mobile présente une arête supérieure 40 reprenant le contour de la face inférieure du coffre à bagages 20. Lorsque le coffre à bagages 20 s'ouvre, le butoir 38 vient glisser sur l'arête supérieure 40 de la lame mobile 32.

Sur la figure 2, la lame mobile 32 est représentée dans sa position déployée correspondant à la position fermée du coffre à bagages. Cette position déployée est représentée en pointillés sur la figure 1. Sur cette dernière figure, la lame mobile 32 est représentée dans sa position rétractée à l'intérieur du logement 30 en traits pleins. On remarque que la lame mobile 32 n'est que partiellement rétractée dans son logement 30. Dans une autre forme de réalisation, on pourrait prévoir que les faces avant 26 et arrière 28 de la paroi de séparation latérale 2 viennent sensiblement épouser la face inférieure du coffre à bagages 20 lorsque celui-ci est en position ouverte. Dans un tel cas de figure, la lame mobile, dans sa position rétractée, serait entièrement logée dans son

logement 30.

Comme on peut le voir sur les dessins, la lame mobile 32 permet de parfaire l'isolation entre deux compartiments d'une cabine d'aéronef. Une cloison de séparation telle que décrite ci-dessus permet de réaliser un bon isolement entre deux compartiments. Elle permet notamment d'avoir une isolation visuelle et phonétique des compartiments. On peut également prévoir des éclairages différents dans deux compartiments voisins séparés par la cloison de séparation selon l'invention.

La cloison de séparation selon l'invention permet de réaliser cet isolement aussi bien lorsque les coffres à bagages sont dans leur position ouverte que fermée.

En outre, la cloison de séparation selon l'invention permet de respecter les règles de sécurité et ne gêne pas notamment l'évacuation des passagers en cas d'urgence.

La présente invention ne se limite pas à la forme de réalisation préférée décrite ci-dessus à titre d'exemple non limitatif. Elle concerne également toutes les variantes de réalisation à la portée de l'homme du métier dans le cadre des revendications ci-après.

Une cloison de séparation selon l'invention peut s'adapter à tous types d'aéronefs. Elle concerne aussi bien des aéronefs monocouloir que des aéronefs comportant plusieurs couloirs. La description faite concerne l'isolement de deux compartiments de classes de confort différentes. Bien entendu, une telle cloison de séparation peut être utilisée pour réaliser deux compartiments d'une seule et même classe de confort ou par exemple pour isoler un compartiment destiné à recevoir des passagers et un autre compartiment destiné par exemple au personnel navigant (cuisine, etc...) ou tout autre type d'espace (espace médicalisé pour rapatriement sanitaire, etc...).

La description ci-dessus décrit un mode de réalisation préféré dans lequel la lame est montée pivotante. Dans cet exemple de réalisation, le mouvement de la lame mobile est adapté au mouvement que l'on rencontre le plus souvent au niveau de coffre à bagages. Il est clair que le mouvement de la lame mobile peut être différent de celui décrit. On peut par exemple prévoir une translation de cette lame dans le cas notamment où le coffre à bagages s'ouvre en se translatant. De même, la lame mobile décrite est guidée entre les faces avant

et faces arrière d'une paroi de séparation latérale. On pourrait prévoir une structure dans laquelle la lame mobile ne viendrait pas se loger entre deux faces d'une paroi mais viendrait simplement coulisser ou pivoter (ou tout autre mouvement) le long d'une paroi.

REVENDICATIONS

1. Paroi de séparation (2) pour cabine d'aéronef comportant :

- un panneau vertical (24, 26, 28) rigide et fixe, et

- un élément mobile (32) entre une position déployée dans laquelle l'élément mobile (32) fait saillie au-delà des contours du panneau (24, 26, 28) rigide et fixe et une position rétractée dans laquelle la partie en saillie de l'élément mobile (32) est escamotée au moins partiellement par rapport aux contours du panneau (24, 26, 28) rigide et fixe,

caractérisée en ce que l'élément mobile (32) présente un bord supérieur (40) sur lequel coulisse un butoir (38) destiné à assurer la liaison entre une porte de coffre à bagages (20) et l'élément mobile (32).

2. Paroi de séparation selon la revendication 1, caractérisée en ce que l'élément mobile (32) est monté pivotant autour d'un axe horizontal (34).

3. Paroi de séparation selon l'une des revendications 1 ou 2, caractérisée en ce que l'élément mobile (32) est une lame qui, dans sa position rétractée, est logée au moins partiellement dans une réservation (30) prévue à cet effet dans le panneau (24, 26, 28) rigide et fixe.

4. Paroi de séparation selon la revendication 3, caractérisée en ce que le panneau rigide et fixe comporte deux faces latérales (26, 28) entre lesquelles vient prendre place la lame mobile (32), et en ce que le guidage de la lame mobile (32) entre sa position déployée et sa position rétractée, et inversement, est assuré par les faces latérales (26, 28) du panneau rigide et fixe.

5. Paroi de séparation selon l'une des revendications 1 à 4, caractérisée en ce que des moyens de rappel (36) précontraignent l'élément mobile (32) vers sa position déployée.

6. Ensemble comportant d'une part un coffre à bagages avec une porte de coffre à bagages et d'autre part une paroi de séparation selon l'une des revendications 1 à 5, caractérisée en ce que le butoir (38) est fixé sur la porte du coffre à bagages (20).

7. Cloison de séparation pour cabine d'aéronef comportant au moins une paroi de séparation (2, 4) et un rideau (6), caractérisée en ce qu'au moins une paroi de séparation (2) est une paroi selon l'une des revendications 1 à 5.

8. Cabine d'aéronef, caractérisée en ce qu'elle comporte au moins une paroi de séparation (2) selon l'une des revendications 1 à 5.

9. Aéronef, caractérisé en ce qu'il comporte au moins une paroi de séparation (2) selon l'une des revendications 1 à 5.

10. Aéronef, caractérisé en ce qu'il comporte au moins un ensemble selon la revendication 6.

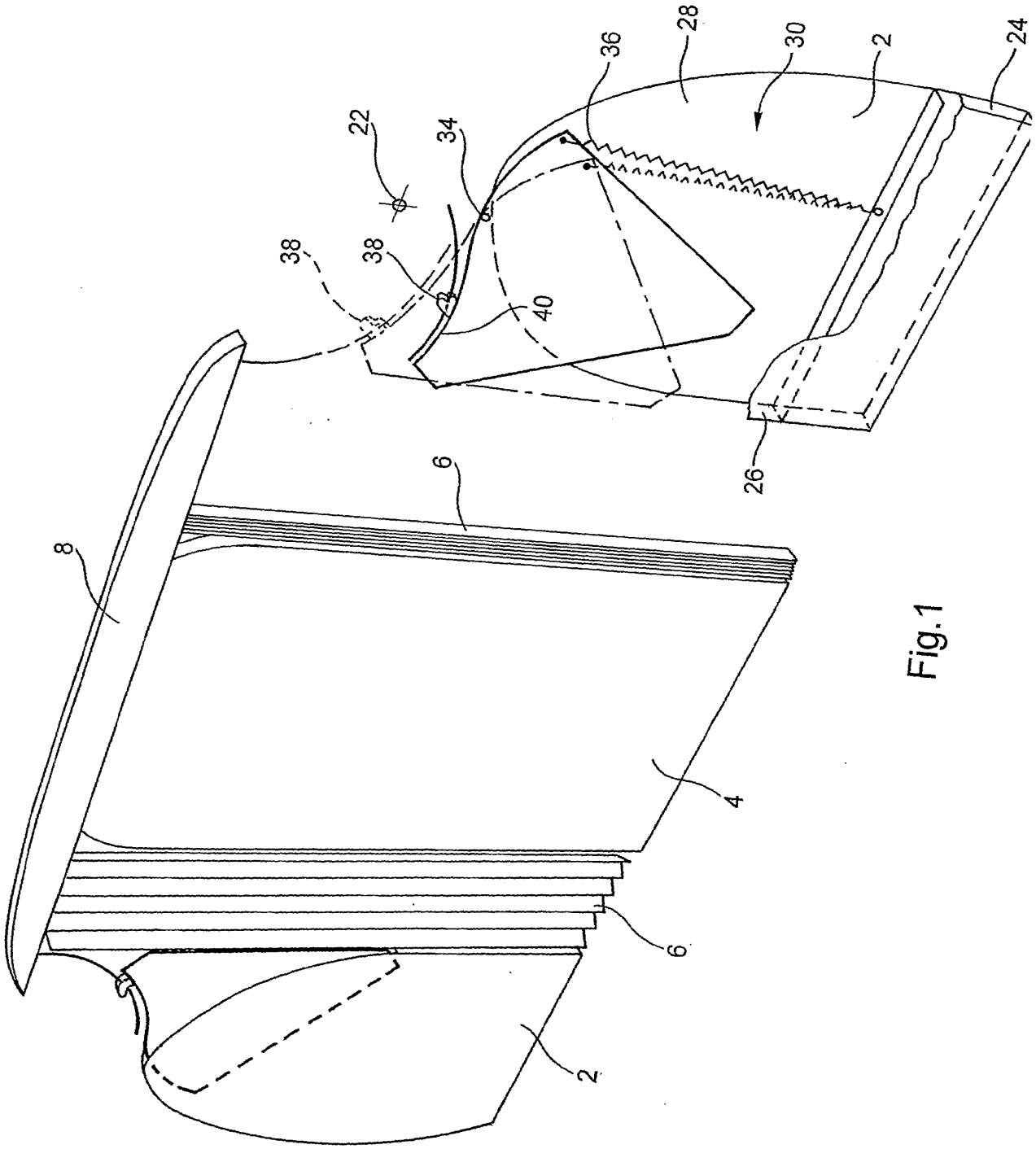
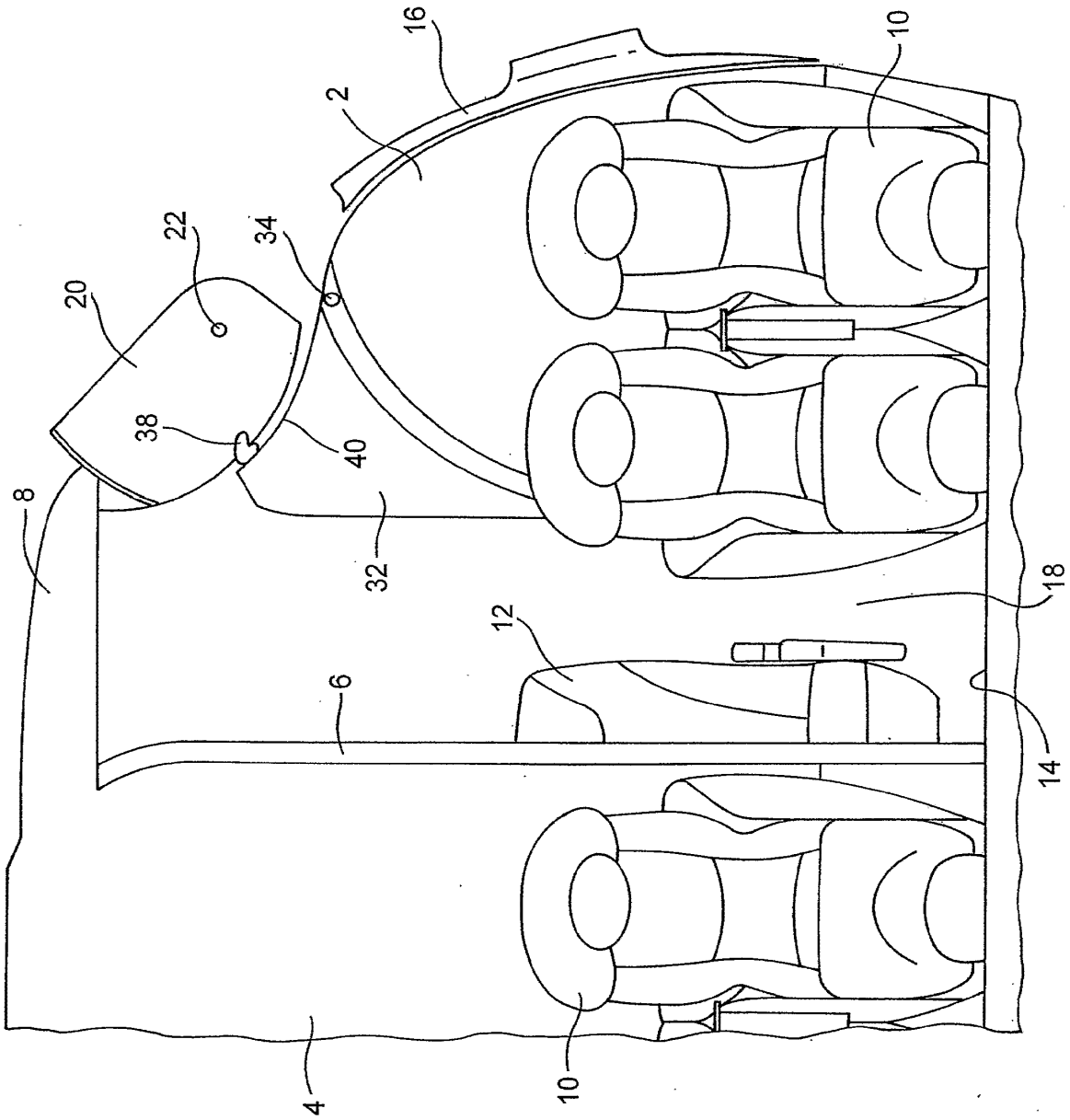


Fig.1

Fig.2



INTERNATIONAL SEARCH REPORT

International application No
PCT/FR2006/001634

A. CLASSIFICATION OF SUBJECT MATTER
INV. B64D11/00

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)
B64D B64C

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 practical, search terms used)
EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 4 911 219 A (DALRYMPLE ET AL) 27 March 1990 (1990-03-27) column 1, lines 6-25 column 4, line 24 - column 6, line 5 figures 2-4	1-10
A	US 6 523 779 B1 (MICHEL DOMINIQUE) 25 February 2003 (2003-02-25) column 4, lines 17-25 column 5, lines 4-65 figure 2	1-10

☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance
"E" earlier document but published on or after the international filing date
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"P" document published prior to the international filing date but later than the priority date claimed
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"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.
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
21 November 2006	28/11/2006

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL – 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Weber, Carlos

Form PCT/ISA/210 (second sheet) (April 2005)

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/FR2006/001634

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Form PCT/ISA/210 (patent family annex) (April 2005)

RAPPORT DE RECHERCHE INTERNATIONALE

Demande internationale n°
PCT/FR2006/001634

A. CLASSEMENT DE L'OBJET DE LA DEMANDE
INV. B64D11/00

Selon la classification internationale des brevets (CIB) ou à la fois selon la classification nationale et la CIB

B. DOMAINES SUR LESQUELS LA RECHERCHE A PORTE

Documentation minimale consultée (système de classification suivi des symboles de classement)
B64D B64C

Documentation consultée autre que la documentation minimale dans la mesure où ces documents relèvent des domaines sur lesquels a porté la recherche

Base de données électronique consultée au cours de la recherche internationale (nom de la base de données, et si cela estréalisable, termes de recherche utilisés)
EPO-Internal

C. DOCUMENTS CONSIDERES COMME PERTINENTS

Catégorie*	Identification des documents cités, avec, le cas échéant, l'indication des passages pertinents	no. des revendications visées
A	US 4 911 219 A (DALRYMPLE ET AL) 27 mars 1990 (1990-03-27) colonne 1, ligne 6-25 colonne 4, ligne 24 - colonne 6, ligne 5 figures 2-4	1-10
A	US 6 523 779 B1 (MICHEL DOMINIQUE) 25 février 2003 (2003-02-25) colonne 4, ligne 17-25 colonne 5, ligne 4-65 figure 2	1-10

[ ] Voir la suite du cadre C pour la fin de la liste des documents

[X] Les documents de familles de brevets sont indiqués en annexe

* Catégories spéciales de documents cités:

"A" document définissant l'état général de la technique, non considéré comme particulièrement pertinent

"E" document antérieur, mais publié à la date de dépôt international ou après cette date

"L" document pouvant jeter un doute sur une revendication de priorité ou cité pour déterminer la date de publication d'une autre citation ou pour une raison spéciale (telle qu'indiquée)

"O" document se référant à une divulgation orale, à un usage, à une exposition ou tous autres moyens

"P" document publié avant la date de dépôt international, mais postérieurement à la date de priorité revendiquée

"T" document ultérieur publié après la date de dépôt international ou la date de priorité et n'appartenenant pas à l'état de la technique pertinent, mais cité pour comprendre le principe ou la théorie constituant la base de l'invention

"X" document particulièrement pertinent; l'inven tion revendiquée ne peut être considérée comme nouvelle ou comme impliquant une activité inventive par rapport au document considéré isolément

"Y" document particulièrement pertinent; l'inven tion revendiquée ne peut être considérée comme impliquant une activité inventive lorsque le document est associé à un ou plusieurs autres documents de même nature, cette combinaison étant évidente pour une personne du métier

"&" document qui fait partie de la même famille de brevets

Date à laquelle la recherche internationale a été effectivement achevée	Date d'expédition du présent rapport de recherche internationale
21 novembre 2006	28/11/2006

Nom et adresse postale de l'administration chargée de la recherche internationale	Fonctionnaire autorisé
Office Européen des Brevets, P.B. 5818 Patentlaan 2 NL – 2280 HV Rijswijk Tel. (+31–70) 340–2040, Tx. 31 651 epo nl, Fax: (+31–70) 340–3016	Weber, Carlos

Formulaire PCT/ISA/210 (deuxième feuille) (avril 2005)

RAPPORT DE RECHERCHE INTERNATIONALE

Renseignements relatifs aux membres de familles de brevets

Demande internationale n°
PCT/FR2006/001634

Document brevet cité au rapport de recherche	Date de publication	Membre(s) de la famille de brevet(s)	Date de publication
US 4911219 A	27-03-1990	AUCUN	
US 6523779 B1	25-02-2003	DE 10080841 B4	06-05-2004
		DE 10080841 T0	13-06-2001
		WO 0056601 A1	28-09-2000
		FR 2791031 A1	22-09-2000
		GB 2353512 A	28-02-2001

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference	**FOR FURTHER ACTION**	see Form PCT/ISA/220 as well as, where applicable, item 5 below.
BEAFS-86253		
International application No.	International filing date *(day/month/year)*	(Earliest) Priority Date *(day/month/year)*
PCT/US2011/033090	19/04/2011	20/04/2010
Applicant		
BE INTELLECTUAL PROPERTY, INC.		

This International search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 3 sheets.

[X] It is also accompanied by a copy of each prior art document cited in this report.

1. **Basis of the report**
   a. With regard to the **language,** the international search was carried out on the basis of:
      [X] the international application in the language in which it was filed
      [ ] a translation of the international application into _____, which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b))
   b. [ ] This international search report has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43.6*bis*(a)).
   c. [ ] With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, see Box No. I.

2. [ ] **Certain claims were found unsearchable** (See Box No. II)

3. [ ] **Unity of invention is lacking** (see Box No III)

4. With regard to the **title,**
   [X] the text is approved as submitted by the applicant
   [ ] the text has been established by this Authority to read as follows:

5. With regard to the **abstract,**
   [X] the text is approved as submitted by the applicant
   [ ] the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority

6. With regard to the **drawings,**
   a. the figure of the **drawings** to be published with the abstract is Figure No. 2
      [X] as suggested by the applicant
      [ ] as selected by this Authority, because the applicant failed to suggest a figure
      [ ] as selected by this Authority, because this figure better characterizes the invention
   b. [ ] none of the figures is to be published with the abstract

Form PCT/ISA/210 (first sheet) (July 2009)

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2011/033090

A. CLASSIFICATION OF SUBJECT MATTER
INV. B64D11/02
ADD.

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)
B64D B60N B63B

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 practical, search terms used)
EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 2005/014395 A1 (THOMPSON JAMES [GB]) 17 February 2005 (2005-02-17) abstract page 15, line 1 - line 18 figures 10-12	1-22
A	DE 10 2007 009863 A1 (AIRBUS GMBH [DE]) 4 September 2008 (2008-09-04) abstract figure 5	1-22
A	WO 2005/080196 A1 (LEADERN INVEST LTD; BOCK THOMAS [FR]; COSTE JEAN-JAQUES [FR]) 1 September 2005 (2005-09-01) abstract figures 7,8	1-22

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"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)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"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

"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

"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.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
5 September 2011	15/09/2011

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Vachey, Clément

Form PCT/ISA/210 (second sheet) (April 2005)

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/US2011/033090

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2005014395 A1	17-02-2005	AT 509830 T	15-06-2011
		EP 1648767 A1	26-04-2006
		EP 2289798 A2	02-03-2011
		JP 4604030 B2	22-12-2010
		JP 2009513419 A	02-04-2009
		US 2007241232 A1	18-10-2007
		US 2011169306 A1	14-07-2011
DE 102007009863 A1	04-09-2008	US 2009050738 A1	26-02-2009
WO 2005080196 A1	01-09-2005	AU 2005214298 A1	01-09-2005
		AU 2009245829 A1	24-12-2009
		CN 1950256 A	18-04-2007
		EP 1720766 A1	15-11-2006
		HK 1102073 A1	28-05-2010
		JP 2007523002 A	16-08-2007
		US 2007170310 A1	26-07-2007
		US 2011210205 A1	01-09-2011
		ZA 200606862 A	30-04-2008

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:

see form PCT/ISA/220

PCT

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis*.1)

Date of mailing
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION
See paragraph 2 below

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/US2011/033090	19.04.2011	20.04.2010

International Patent Classification (IPC) or both national classification and IPC
INV. B64D11/02

Applicant
BE INTELLECTUAL PROPERTY, INC.

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step and industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notifed the International Bureau under Rule 66.1*bis*(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA:	Date of completion of this opinion	Authorized Officer
European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Fax: +49 89 2399 - 4465	see form PCT/ISA/210	Vachey, Clément Telephone No. +49 89 2399-3356

Form PCT/ISA/237 (Cover Sheet) (July 2009)

Box No. I Basis of the opinion

1. With regard to the **language**, this opinion has been established on the basis of:

   ☒ the international application in the language in which it was filed

   ☐ a translation of the international application into , which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1 (b)).

2. ☐ This opinion has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43bis.1(a))

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, this opinion has been established on the basis of a sequence listing filed or furnished:

   a. (means)

      ☐ on paper

      ☐ in electronic form

   b. (time)

      ☐ in the international application as filed

      ☐ together with the international application in electronic form

      ☐ subsequently to this Authority for the purposes of search

4. ☐ In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

5. Additional comments:

Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	
	No:	Claims	1-22
Inventive step (IS)	Yes:	Claims	
	No:	Claims	1-22
Industrial applicability (IA)	Yes:	Claims	1-22
	No:	Claims	

2. Citations and explanations

see separate sheet

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

Reference is made to the following document:

D1 WO 2005/014395 A1 (THOMPSON JAMES [GB]) 17 February 2005 (2005-02-17)

The present application does not meet the criteria of Article 33(2) PCT, because the subject-matter of claim 1 is not new.

D1 discloses (fig.10):

A lavatory (86) for a cabin of an aircraft, the cabin including a structure (88) having an aft portion that is substantially not flat in a vertical plane, the lavatory comprising:

a lavatory stall unit having at least one wall having a forward wall portion, said at least one wall defining an interior lavatory space, and said forward wall portion being configured to be disposed immediately aft of and adjacent to an aircraft cabin structure (20) having an exterior aft surface having a shape that is substantially not flat in a vertical plane; and wherein said forward wall portion is shaped to substantially conform to the shape of the exterior aft surface of the aircraft cabin structure (90).

The same reasoning applies, mutatis mutandis, to the subject-matter of the corresponding independent claims 5, 13,19 which therefore are also considered not new.

Dependent claims 2-4, 6-12, 14-18 and 20-22 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of novelty , see D1 (fig.10).

Independent claim 1, 5, 13 and 19 is not in the two-part form in accordance with Rule 6.3(b) PCT, which in the present case would be appropriate, with those features known in combination from the prior art D1 being placed in the preamble (Rule 6.3(b)(i) PCT) and the remaining features being included in the characterising part (Rule 6.3(b)(ii) PCT).

The features of claims 1-22 are not provided with reference signs placed in parentheses (Rule 6.2(b) PCT).

Possible steps after receipt of the international search report (ISR) and written opinion of the International Searching Authority (WO-ISA)

General information	For all international applications filed on or after 01/01/2004 the competent ISA will establish an ISR. It is accompanied by the WO-ISA. Unlike the former written opinion of the IPEA (Rule 66.2 PCT), the WO-ISA is not meant to be responded to, but to be taken into consideration for further procedural steps. This document explains about the possibilities.
Amending claims under Art. 19 PCT	Within 2 months after the date of mailing of the ISR and the WO-ISA the applicant may file amended claims under Art. 19 PCT directly with the International Bureau of WIPO. The PCT reform of 2004 did not change this procedure. For further information please see Rule 46 PCT as well as form PCT/ISA/220 and the corresponding Notes to form PCT/ISA/220.
Filing a demand for international preliminary examination	In principle, the WO-ISA will be considered as the written opinion of the IPEA. This should, in many cases, make it unnecessary to file a demand for international preliminary examination. If the applicant nevertheless wishes to file a demand this must be done before expiry of 3 months after the date of mailing of the ISR/WO-ISA or 22 months after priority date, whichever expires later (Rule 54bis PCT). Amendments under Art. 34 PCT can be filed with the IPEA as before, normally at the same time as filing the demand (Rule 66.1 (b) PCT). If a demand for international preliminary examination is filed and no comments/amendments have been received the WO-ISA will be transformed by the IPEA into an IPRP (International Preliminary Report on Patentability) which would merely reflect the content of the WO-ISA. The demand can still be withdrawn (Art. 37 PCT).
Filing informal comments	After receipt of the ISR/WO-ISA the applicant may file informal comments on the WO-ISA directly with the International Bureau of WIPO. These will be communicated to the designated Offices together with the IPRP (International Preliminary Report on Patentability) at 30 months from the priority date. Please also refer to the next box.
End of the international phase	At the end of the international phase the International Bureau of WIPO will transform the WO-ISA or, if a demand was filed, the written opinion of the IPEA into the IPRP, which will then be transmitted together with possible informal comments to the designated Offices. The IPRP replaces the former IPER (international preliminary examination report).
Relevant PCT Rules and more information	Rule 43 PCT, Rule 43bis PCT, Rule 44 PCT, Rule 44bis PCT, PCT Newsletter 12/2003, OJ 11/2003, OJ 12/2003

Electronic Acknowledgement Receipt	
EFS ID:	22588373
Application Number:	14709409
International Application Number:	
Confirmation Number:	1803
Title of Invention:	AIRCRAFT INTERIOR LAVATORY
First Named Inventor/Applicant Name:	Donald F. Cook
Customer Number:	119984
Filer:	James Warren Paul/Adam Stocks
Filer Authorized By:	James Warren Paul
Attorney Docket Number:	BEALCI-94515
Receipt Date:	10-JUN-2015
Filing Date:	11-MAY-2015
Time Stamp:	13:41:02
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Information Disclosure Statement (IDS) Form (SB08)	IDS.pdf	614462 83a108d3843c9c6a759146ccffe3639c0b499a20	no	9
Warnings:					
Information:					

2	Foreign Reference	EP1281614A1.pdf	645983 d99d2e3e3b89967d334e4080b7489276d0822f9b	no	14
Warnings:					
Information:					
3	Foreign Reference	WO03026495A2.pdf	1349567 c4971c12f33fc896351cf1f85ca8332fefe37e00	no	26
Warnings:					
Information:					
4	Foreign Reference	WO2005014395A1.pdf	2309825 0237164ee4197fefe33e4079dd6e4492f50d0a5f	no	48
Warnings:					
Information:					
5	Foreign Reference	WO2005080196A1.pdf	3595378 8a11c00f3d59f82e07d1dd1e9727ba3e12dfad99	no	76
Warnings:					
Information:					
6	Foreign Reference	WO2007006938A1.pdf	812627 a9bdd7d5912d7f14f4d2cc4a8b4a929e7e9aba1a	no	18
Warnings:					
Information:					
7	Non Patent Literature	NPL-1.pdf	291505 857959c814faab3bb22e050550ac2e3d68320b05	no	8
Warnings:					
Information:					
8	Non Patent Literature	NPL-2.pdf	19736226 5c1b67327ae0ed5b52718ec1f8700298ab356ac0	no	177
Warnings:					
Information:					
9	Non Patent Literature	NPL-3.pdf	410510 d91285ca3cd3e0d20c7033e03736ac4fa18b8eca	no	17
Warnings:					
Information:					
10	Non Patent Literature	NPL-4.pdf	963374 f2312d820da8e5ed4df39cb78cd9aa22765ffee4	no	27
Warnings:					
Information:					

11	Non Patent Literature	NPL-5.pdf	914262 93399cfd99b953b65444c74899aec954f99ddd9e	no	5
Warnings:					
Information:					
12	Non Patent Literature	NPL-6_Part_1_of_6.pdf	15691651 e88412f2f243d2c62ea309fa6b771e5fb1ff2c61	no	171
Warnings:					
Information:					
13	Non Patent Literature	NPL-6_Part_2_of_6.pdf	15077908 7b54542f56ac3da5772a04de1a9015463e26b5bb	no	171
Warnings:					
Information:					
14	Non Patent Literature	NPL-6_Part_3_of_6.pdf	17554216 f0fd6a0acca8cd0dac4ca2d8821793d97a602079	no	171
Warnings:					
Information:					
15	Non Patent Literature	NPL-6_Part_4_of_6.pdf	14092245 63c72cc027d777a63a42a334a05a6c142d5ecbff	no	171
Warnings:					
Information:					
16	Non Patent Literature	NPL-6_Part_5_of_6.pdf	6526151 39385e7fe84626f86be9fdc192553e09d041e211	no	171
Warnings:					
Information:					
17	Non Patent Literature	NPL-6_Part_6_of_6.pdf	48961 6d1605d6cf6dac18cf5cd1906ab6c8308391780e	no	1
Warnings:					
Information:					
18	Non Patent Literature	NPL-7.pdf	403411 0a739feaa1ee6e4e163d1625820ca9237f8c4ccc	no	10
Warnings:					
Information:					
19	Non Patent Literature	NPL-8.pdf	845390 086ba5e966c402ee37d82fb18dac9fa883044fd12	no	3
Warnings:					
Information:					

20	Non Patent Literature	NPL-9.pdf	355370 c5f0520593e87ca7578011678c35e98be584120e	no	25

Warnings:	
Information:	
Total Files Size (in bytes):	102239022

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2013/050342

A. CLASSIFICATION OF SUBJECT MATTER
INV. B64D11/02
ADD.

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)
B64D

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)
EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 2005/014395 A1 (THOMPSON JAMES [GB]) 17 February 2005 (2005-02-17) figures 9-12	1-27
X	US 5 340 059 A (KANIGOWSKI ANDREW S [US]) 23 August 1994 (1994-08-23) figures 3-5	1-5, 7-11, 13-18, 20-24
X	WO 2009/073244 A1 (BE AEROSPACE INC [US]) 11 June 2009 (2009-06-11) figures 2,5	7-12, 14-19
X	US 5 482 230 A (BIRD MICHAEL S [US] ET AL) 9 January 1996 (1996-01-09) figures 10-14	7,8,14, 15

-/--

[X] Further documents are listed in the continuation of Box C.

[X] See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"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)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"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

"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

"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

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
15 January 2015	27/01/2015

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Wojski, Guadalupe

Form PCT/ISA/210 (second sheet) (April 2005)

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2013/050342

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
E	WO 2014/024046 A2 (ZODIAC SEATS FRANCE [FR]) 13 February 2014 (2014-02-13) figures 3,4	1,2,6-8, 12-15, 19-21, 23,27
A	US 2011/253835 A1 (COOK DON [US] ET AL) 20 October 2011 (2011-10-20) the whole document	1-27

Form PCT/ISA/210 (continuation of second sheet) (April 2005)

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/US2013/050342

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2005014395 A1	17-02-2005	AT 509830 T	15-06-2011
		EP 1648767 A1	26-04-2006
		EP 2289798 A2	02-03-2011
		JP 4604030 B2	22-12-2010
		JP 2009513419 A	02-04-2009
		US 2007241232 A1	18-10-2007
		US 2011169306 A1	14-07-2011
		US 2012228902 A1	13-09-2012
		WO 2005014395 A1	17-02-2005
US 5340059 A	23-08-1994	NONE	
WO 2009073244 A1	11-06-2009	EP 2217496 A1	18-08-2010
		JP 5520229 B2	11-06-2014
		JP 2011506165 A	03-03-2011
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Electronic Acknowledgement Receipt	
EFS ID:	22588462
Application Number:	14709409
International Application Number:	
Confirmation Number:	1803
Title of Invention:	AIRCRAFT INTERIOR LAVATORY
First Named Inventor/Applicant Name:	Donald F. Cook
Customer Number:	119984
Filer:	James Warren Paul/Adam Stocks
Filer Authorized By:	James Warren Paul
Attorney Docket Number:	BEALCI-94515
Receipt Date:	10-JUN-2015
Filing Date:	11-MAY-2015
Time Stamp:	13:45:04
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Non Patent Literature	NPL-10.pdf	1992699 d645e44b5cfe941c47eacc3dad8d32728a261191	no	39
Warnings:					
Information:					

2	Non Patent Literature	NPL-11.pdf	305645 8d16a2f840af9285b98363ef282ca1a21a0bf510	no	3

Warnings:	
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Total Files Size (in bytes):	2298344

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New Applications Under 35 U.S.C. 111
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New International Application Filed with the USPTO as a Receiving Office
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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
14/709,409	05/11/2015	Donald F. Cook	BEALCI-94515

CONFIRMATION NO. 1803

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PUBLICATION NOTICE

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Title:AIRCRAFT INTERIOR LAVATORY

Publication No.US-2015-0239564-A1
Publication Date:08/27/2015

NOTICE OF PUBLICATION OF APPLICATION

The above-identified application will be electronically published as a patent application publication pursuant to 37 CFR 1.211, et seq. The patent application publication number and publication date are set forth above.

The publication may be accessed through the USPTO's publically available Searchable Databases via the Internet at www.uspto.gov. The direct link to access the publication is currently http://www.uspto.gov/patft/.

The publication process established by the Office does not provide for mailing a copy of the publication to applicant. A copy of the publication may be obtained from the Office upon payment of the appropriate fee set forth in 37 CFR 1.19(a)(1). Orders for copies of patent application publications are handled by the USPTO's Office of Public Records. The Office of Public Records can be reached by telephone at (703) 308-9726 or (800) 972-6382, by facsimile at (703) 305-8759, by mail addressed to the United States Patent and Trademark Office, Office of Public Records, Alexandria, VA 22313-1450 or via the Internet.

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Further assistance in electronically accessing the publication, or about PAIR, is available by calling the Patent Electronic Business Center at 1-866-217-9197.

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Appl. No.	:	14/709,409	Confirmation No.:	1803
Inventor	:	Donald F. Cook		
Filed	:	May 11, 2015		
Title	:	AIRCRAFT INTERIOR LAVATORY		
Art Unit	:	3641		
Examiner	:	Benjamin P. Lee		
Docket No.:	:	BEALCI-94515		
Customer No.	:	24201		
Date:	:	September 21, 2015		

AMENDMENT

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

This is in reply to the Office Action dated June 10, 2015, setting a shortened statutory term for a response of three months. Applicant herewith petitions the Director of the United States Patent and Trademark Office to extend the time for reply to the Office Action dated June 10, 2015, for 1 month from September 10, 2015, to October 10, 2015. The extension fees will be paid by credit card with this Electronic Transmission. Please enter the following amendments.

Amendments to the Claims begin on page 2.

Remarks begin on page 4.

AMENDMENTS TO THE CLAIMS:

The listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

Claim 1 (Currently amended) A method of retrofitting an aircraft to provide additional passenger seating in the cabin of said aircraft, the cabin including a passenger seat having an exterior aft surface that is substantially not flat, comprising the steps of:

installing an aircraft enclosure unit comprising:

a forward wall, said forward wall being part of an outer boundary defining a single enclosed space that includes a toilet, said forward wall being substantially not flat and configured to receive a portion of the exterior aft surface of the passenger seat when the seat is in an unreclined seat position;

wherein said forward wall is adapted to provide more space forward of the enclosure unit such that the passenger seat in the unreclined seat position can be positioned further aft in the cabin than if the cabin included another enclosure unit having a substantially flat front wall located in substantially the same position in the cabin as the forward wall; and

wherein said enclosed space is taller than the passenger seat; and

positioning said aircraft passenger seat further aft in said aircraft cabin than an initial position of said aircraft passenger seat prior to retrofitting said aircraft, whereby a portion of the exterior aft surface of said passenger seat in the unreclined seat position is received by said forward wall.

Claim 2 (Currently amended) A method of providing an aircraft with more passenger seats in the aircraft's cabin, the method comprising the steps of:

installing a combination of an enclosure unit and a passenger seat in the aircraft, the combination comprising:

[[a]] the passenger seat being configured to be located forward of and proximate to the enclosure unit ~~and having an exterior aft surface that is substantially not flat~~;

[[an]] the enclosure unit being located aft of the passenger seat, the enclosure unit having a forward wall, said forward wall being part of an outer boundary defining a single enclosed

space that includes a toilet, said forward wall being substantially not flat and configured to receive a portion of the exterior aft surface of the passenger seat in an unreclined seat position;

wherein said forward wall is adapted to provide more space forward of the enclosure unit such that the passenger seat in the unreclined seat position can be positioned further aft in the ~~aircraft~~ cabin than if the cabin included another enclosure unit having a front wall that is substantially flat and is located in substantially the same position in the aircraft cabin as the forward wall; and

wherein said enclosed space is taller than the passenger seat; and

whereby said aircraft passenger seat in the unreclined seat position [[can be]] is installed further aft in said ~~aircraft~~ cabin than would be possible if the substantially flat front wall of the other enclosure unit was located in substantially the same position in the aircraft cabin as the forward wall; and

whereby a portion of the exterior aft surface of said passenger seat in the unreclined seat position is received by said forward wall.

Claim 3 (New) The method of claim 1 wherein said exterior aft surface of the passenger seat has a contoured shape, and wherein said forward wall is shaped to substantially conform to the contoured shape of the exterior aft surface of the passenger seat when the exterior aft surface of said passenger seat in the unreclined position is received by said forward wall.

Claim 4 (New) The method of claim 2 wherein said exterior aft surface of the passenger seat has a contoured shape, and wherein said forward wall is shaped to substantially conform to the contoured shape of the exterior aft surface of the passenger seat when the exterior aft surface of said passenger seat in the unreclined position is received by said forward wall.

REMARKS

By the foregoing amendment, Claims 1 and 2 have been amended, and dependent claims 3 and 4 have been added. It is respectfully submitted that the amendments introduce no new matter. Claims 1-4 are pending. Favorable reconsideration of the application is respectfully requested.

Claims 1 and 2 were rejected under 35 U.S.C. §112(b) or pre-AIA 35 U.S.C. §112, second paragraph, on the grounds of indefiniteness. The Examiner indicated that Applicant requires "said passenger seat configured to be located forward of and proximate to the aircraft enclosure unit and having an exterior aft surface that is substantially not flat." This language appeared to the Examiner to indicate that the seat includes an exterior aft surface that is substantially not flat, and the Examiner assumed that the enclosure, not the seat, includes the substantially not flat surface.

Claim 1 and Claim 2 have been amended and presently recite a “forward wall being substantially not flat." Support for these amendments can be found in paragraph 0019 of the specification, which explains that the “forward wall portion has a shape that is substantially not flat,” as is clearly illustrated in Fig. 2, for example. It is therefore respectfully submitted that the rejection of Claims 1 and 2 on the grounds of indefiniteness should be withdrawn.

Claim 1 was rejected under 35 U.S.C. §103(a) on the grounds of obviousness from Betts et al. (U.S. Patent 3,738,497) in view of Bar-Levav et al. (U.S. Patent 6,237,872) and further in view of Breuer et al. (US Patent 8,109,469). The Examiner acknowledged that Betts et al. does not teach retrofitting an aircraft to provide the seats, and Bar-Levav et al. was cited as disclosing this feature. The Examiner acknowledged that Betts et al. does not teach a space that includes a toilet, and Breuer et al. was cited as disclosing this feature.

The Examiner indicated that Fig. 1 of Betts et al. discloses a method of providing additional passenger seating in the cabin of an aircraft. To the contrary, the abstract of Betts et al. makes clear that the coat hanger rack of Betts et al. provides more passenger room, and therefore teaches away from providing additional passenger seating.

The Examiner further indicated that Bar-Levav et al. teaches redesigning or retrofitting an existing aircraft to accommodate a new seating arrangement (new seat designs for 747 aircraft), and that it would have been obvious to utilize the seat and cabin arrangement of Betts et al. for cost efficiency. However, at column 2, lines 54-61, Bar-Levav et al. explains that an object of the invention is to provide greater physical and emotional comfort to passengers during long intercontinental and transcontinental flights without reducing the number of seats in the aircraft, and that the single most important feature desired by passengers during long flights is the ability to stretch out for resting or sleeping. At column 3, lines 23-28, Bar-Levav et al. explains that in a first seating plan the pitch, the space between adjacent rows of seats, is markedly increased, and that seats are lost as a result of the increased pitch. At column 3, lines 36-38, Bar-Levav et al. explains that in a second seating plan increased comfort of passengers is achieved. At column 3, lines 45-48, Bar-Levav et al. explains that in a third seating plan includes a more spacious seating arrangement than the first seating plan. Accordingly, it is respectfully submitted that Bar-Levav et al. actually teaches away from providing additional passenger seating in an aircraft passenger cabin, and at least for this reason, the rejection of Claim 1 under 35 U.S.C. §103(a) should be withdrawn.

The Examiner indicated that the recess of Betts et al. allows a portion of the seat to be positioned further back in the aircraft cabin while still being able to recline the seat back. Claim 1 has been amended to require that a portion of the exterior aft surface of the passenger seat is

received by the forward wall when the seat is in an unreclined seat position. Neither Betts et al., Breuer et al. nor Bar-Levav et al. teach or suggest a forward wall configured to receive a portion of the aft surface of a passenger seat when the passenger seat is in an unreclined seat position. To the contrary, Betts et al. states that the "lower portion 30 of the coat compartment 18 slants rearwardly to provide a space for seatback 12 to be tilted rearwardly as desired by the occupant." (Col. 2, lines 19-22) Similarly, Fig. 11 of Breuer et al. shows that the forward wall of the module 100 is vertical and flat, and is not configured to receive any substantial portion of the aft surface of a passenger seat when the passenger seat is in an unreclined seat position. Bar-Levav et al. also fails to disclose an enclosure with a forward wall having the required recess. Accordingly, the cited references are completely silent regarding any structure with a forward wall that provides a space for a seatback in an unreclined seat position. Accordingly, the asserted combination of Betts et al., Bar-Levav et al. and Breuer et al. does not include every element or limitation required by Claim 1. At least for this reason, the rejection of Claim 1 under 35 U.S.C. §103(a) should be withdrawn.

The Examiner further indicated that Betts et al. discloses a single enclosed space that is taller than the passenger seat. As can be seen in Fig. 1 of Betts et al., the structure of Betts et al. clearly includes two entirely separate enclosed spaces 16, 18. In addition, the lower storage space 16 of Betts et al. is not taller than the passenger seat 10, and the coat compartment 18 is not a single enclosed space that is capable of or suitable for receiving a toilet. Therefore, Betts et al. does not describe, and actually teaches away from, an enclosure that defines a single enclosed space that is taller than a passenger seat. Accordingly, the asserted modification of Betts et al. in view of Bar-Levav et al. and further in view of Breuer at al. does not include every element or

limitation recited in Claim 1, and at least for this reason, the rejection of Claim 1 under 35 U.S.C. §103(a) should be withdrawn.

Furthermore, at column 4, lines 18-64, and in Fig. 1, Breuer et al. explains that the lavatory region 102 is separated from the storage space 113 by an upper landing or floor 112 that forms part of the divider element 103, or which can be provided separately as an additional component that is placed onto the divider element or that is affixed completely independently of the divider element, which *ensures privacy for users of the lavatory*. It is therefore respectfully submitted that Breuer et al. teaches directly away from including a lavatory or toilet within an enclosure unit such as within the upper coat compartment 18 or the lower storage space 16 of Betts et al. with an outer boundary defining a single enclosed space that includes a toilet such as the toilet of Breuer et al.

It is respectfully submitted that there is no evidence or suggestion in the combination of Betts et al., Bar-Levav et al. and Breuer et al. of a method of retrofitting an aircraft to provide additional passenger seating in the cabin of the aircraft, including the steps of installing an aircraft enclosure unit comprising a forward wall being part of an outer boundary defining a single enclosed space that includes a toilet, and wherein the enclosed space is taller than the passenger seat, as claimed. It is therefore respectfully submitted that Claim 1 patentably distinguishes the combination of Betts et al. in view of Bar-Levav et al. and further in view of Breuer et al., and that the rejection of Claim 1 on the grounds of obviousness should be withdrawn.

Claim 2 was rejected under 35 U.S.C. §103(a) on the grounds of obviousness from Betts et al. in view of Breuer et al. The Examiner acknowledged that Betts et al. does not teach a space that includes a toilet, and Breuer et al. was cited as disclosing this feature.

The Examiner indicated that Betts et al. discloses a method of providing an aircraft with more passenger seats in the aircraft's cabin. However, as discussed above, the abstract of Betts et al. explains that the coat hanger rack of Betts et al. is disclosed to provide more passenger room, and therefore actually teaches away from providing more passenger seats. Accordingly, the combination of Betts et al. and Breuer et al. does not include every element or limitation required by Claim 2, and the rejection of Claim 2 under 35 U.S.C. §103(a) should be withdrawn.

The Examiner indicated that Fig. 1 of Betts et al. discloses a forward wall that is part of an outer boundary defining a *single* enclosed space that is taller than a passenger seat. As discussed above regarding Claim 1, Betts et al. does not disclose a structure which defines a single enclosed space, and more particularly, does not disclose a single enclosed space that is taller than a passenger seat and capable of and suitable for receiving a toilet. Accordingly, the asserted modification of Betts et al. in view of Breuer at al. does not include every element or limitation recited in Claim 2, and at least for this reason, the rejection of Claim 2 under 35 U.S.C. §103(a) should be withdrawn.

Furthermore, at column 4, lines 18-64, and in Fig. 1, Breuer et al. explains that the lavatory region 102 is separated from the storage space 113 by an upper landing or floor 112 that forms part of the divider element 103, or which can be provided separately as an additional component that is placed onto the divider element or that is affixed completely independently of the divider element, which *ensures privacy for users of the lavatory*. It is therefore respectfully submitted that Breuer et al. teaches directly away from including a lavatory or toilet within an enclosure unit such as the upper coat compartment or lower storage space of Betts et al. with an outer boundary defining a single enclosed space that includes a toilet such as the toilet of Breuer et al.

It is respectfully submitted that there is no evidence or suggestion in the combination of Betts et al. and Breuer et al. of a method of providing an aircraft with more passenger seats in the aircraft's cabin, including the steps of installing a combination of an enclosure unit and a passenger seat in the aircraft, wherein the enclosure unit has a forward wall that is part of an outer boundary defining a single enclosed space that includes a toilet, and wherein the enclosed space is taller than the passenger seat, as claimed. It is therefore respectfully submitted that Claim 2 patentably distinguishes the combination of Betts et al. and Breuer et al., and that the rejection of Claim 2 on the grounds of obviousness from Betts et al., in view of Breuer et al., should be withdrawn.

In addition, Claim 2 has been amended to require that a portion of the exterior aft surface of the passenger seat is received by the forward wall when the seat is in an unreclined seat position. As discussed above regarding Claim 1, neither Betts et al. nor Breuer et al. teach or suggest a forward wall configured to receive a portion of the aft surface of a passenger seat when the passenger seat is in an unreclined seat position. Accordingly, the asserted combination of Betts et al. and Breuer et al. does not include every element or limitation required by Claim 2, and at least for this reason, the rejection of Claim 2 under 35 U.S.C. §103(a) should be withdrawn.

New dependent claims 3 and 4 have been added by this Amendment. Both dependent claims 3 and 4 require that the "exterior aft surface of the passenger seat has a contoured shape" and the "forward wall is shaped to substantially conform to the contoured shape of the exterior aft surface of the passenger seat when the exterior aft surface of said passenger seat in the unreclined position is received by said forward wall." Support for new dependent claims 3 and 4 is found in the specification in paragraph [0009] ("the forward wall portion is shaped to

substantially conform to the shape of the exterior aft surface of the aircraft cabin structure"), in paragraph [0019] ("the forward wall portion substantially conforms to the shape of the exterior aft surface of the aircraft cabin structure"), and as shown in Fig. 2. Because dependent claims 3 and 4 include every limitation recited in Claim 1 and Claim 2, respectively, claims 3 and 4 are allowable under 35 U.S.C. §103(a) for the same reasons presented above for Claim 1 and Claim 2.

In light of the foregoing amendments and remarks, it is respectfully submitted that the application is in condition for allowance, and an early favorable action in this regard is respectfully requested.

The Commissioner is authorized to charge any additional fees or credit any overpayment in this matter to our Deposit Account No. 06-2425.

Respectfully submitted,

FULWIDER PATTON LLP

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James W. Paul
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Electronic Patent Application Fee Transmittal					
Application Number:	14709409				
Filing Date:	11-May-2015				
Title of Invention:	AIRCRAFT INTERIOR LAVATORY				
First Named Inventor/Applicant Name:	Donald F. Cook				
Filer:	James Warren Paul/Laura Martinez				
Attorney Docket Number:	BEALCI-94515				
Filed as Large Entity					
Filing Fees for **Utility under 35 USC 111(a)**					
Description		**Fee Code**	**Quantity**	**Amount**	**Sub-Total in USD($)**
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Pages:					
Claims:					
Miscellaneous-Filing:					
Petition:					
Patent-Appeals-and-Interference:					
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Extension-of-Time:					

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension - 1 month with $0 paid	1251	1	200	200
Miscellaneous:				
		Total in USD ($)		**200**

Electronic Acknowledgement Receipt	
EFS ID:	23554045
Application Number:	14709409
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Title of Invention:	AIRCRAFT INTERIOR LAVATORY
First Named Inventor/Applicant Name:	Donald F. Cook
Customer Number:	119984
Filer:	James Warren Paul/Laura Martinez
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Attorney Docket Number:	BEALCI-94515
Receipt Date:	21-SEP-2015
Filing Date:	11-MAY-2015
Time Stamp:	15:46:32
Application Type:	Utility under 35 USC 111(a)

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Payment Type	Credit Card
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Deposit Account	062425
Authorized User	PAUL, JAMES W
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1		AMENDMENT.pdf	53871 d8a4dd90eaeefb02eaca8b7164313aba128b4dbf	yes	10

Multipart Description/PDF files in .zip description		
Document Description	**Start**	**End**
Amendment/Req. Reconsideration-After Non-Final Reject	1	1
Claims	2	3
Applicant Arguments/Remarks Made in an Amendment	4	10

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2	Fee Worksheet (SB06)	fee-info.pdf	30544 64fbd0dc162799aaabf08e052c39fc0fa4d51aa9	no	2

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PTO/SB/06 (09-11)
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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 14/709,409	Filing Date 05/11/2015	☒ To be Mailed

ENTITY: ☒ LARGE ☐ SMALL ☐ MICRO

APPLICATION AS FILED – PART I

	(Column 1)	(Column 2)		
FOR	NUMBER FILED	NUMBER EXTRA	RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 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).			
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT	09/21/2015	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 4	Minus	** 20	= 0	X $80 =	0
	Independent (37 CFR 1.16(h))	* 2	Minus	***3	= 0	X $420 =	0
	☐ Application Size Fee (37 CFR 1.16(s))						
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
						TOTAL ADD'L FEE	0

AMENDMENT		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =	
	☐ Application Size Fee (37 CFR 1.16(s))						
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
						TOTAL ADD'L FEE	

* 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".
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The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/709,409	05/11/2015	Donald F. Cook	BEALCI-94515	1803

119984 7590 12/30/2015

FULWIDER PATTON, LLP
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EXAMINER	
LEE, BENJAMIN P	

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NOTIFICATION DATE	DELIVERY MODE
12/30/2015	ELECTRONIC

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.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

docketla@fulpat.com
eOfficeAction@fulpat.com

Office Action Summary	Application No. 14/709,409	Applicant(s) COOK ET AL.	
	Examiner BENJAMIN P. LEE	Art Unit 3641	AIA (First Inventor to File) Status No

-- 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* MONTHS 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 *9/21/2015*.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ 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*

5)☒ Claim(s) *1-4* is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6)☐ Claim(s) _____ is/are allowed.

7)☒ Claim(s) *1-4* is/are rejected.

8)☐ Claim(s) _____ is/are objected to.

9)☐ Claim(s) _____ are subject to restriction and/or election requirement.

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☐ 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).

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).

Certified copies:

a)☐ All b)☐ Some** c)☐ None of the:

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) ☐ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date _____.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

4) ☐ Other: _____.

The present application is being examined under the pre-AIA first to invent provisions.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 9/22/2015 have been fully considered but they are not persuasive. Applicant argues that the Betts and Breuer references fail to teach or suggest a forward wall configured to receive a portion of the aft surface of a passenger seat when the passenger seat is in an unreclined seat position. Applicant indicates that the Betts reference states that "lower portion 30 of the coat compartment 18 slants rearwardly to provide a space for seatback 12 to be tilted rearwardly as desired by the occupant." In response, Examiner asserts that although Betts does in fact indicate that the space is provided to allow the seat to be reclined, figure 1 illustrates an aircraft seat in a unreclined position, but occupying at least a portion of the void created by the recess in the wall. Examiner points to the illustration in the instant application that shows a seat that is tilted back to some degree even while being “unreclined”.

Applicant also argues that since the lower portion (30) indicated as a luggage storage space in Betts is not included in the single enclosed space defined by an outer boundary of an enclosure unit, the lower portion forms no part of the enclosure. Examiner asserts that the angled wall portion of Betts constitutes a recess even without considering the luggage storage. Additionally, Examiner asserts that Betts teaches a wall that includes a recess that allows a seat back to recline and further provides a

portion of an enclosed space. Betts teaches that the enclosed space is a closet and a storage area, but does not teach away from providing the space for some different purpose, such as a lavatory as shown in the Breuer reference.

Claim Rejections - 35 USC § 103

The following is a quotation of pre-AIA 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 negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under pre-AIA 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 nonobviousness.

2. Claims 1 and 3 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Betts et al. (U.S. Patent 3,738,497) in view of Bar-Levav et al. (U.S. Patent 6,237,872) and in further view of Breuer et al. (U.S. Patent 8,109,469).

3. In regards to claim 1, Betts et al (henceforth referred to as Betts) disclose a method of providing additional passenger seating in the cabin of said aircraft;
Betts fails to explicitly teach retrofitting an aircraft to provide the seats. However, Bar-Levav et al (henceforth referred to as Bar-Levav) teaches redesigning or retrofitting an existing aircraft to accommodate a new seating arrangement (new seat designs for 747 aircraft). It would have been obvious to one of ordinary skill in the art at the time of Applicant's invention to utilize the seat and cabin arrangement of Betts in existing aircraft (retrofitting) as taught by Bar-Levav, for cost efficiency;
the cabin including a passenger seat having an exterior aft surface that is substantially not flat. Betts teaches an aircraft cabin with a seat and also an exterior aft surface that is not flat (see figure 1), comprising the steps of:

installing an aircraft enclosure unit (Betts teaches an enclosure that is installed) comprising:

a forward wall (items 30 and 40);

said forward wall being part of an outer boundary defining a single enclosed space (see figure 1);

Betts fails to teach that the space includes a toilet. However, Breuer et al (henceforth referred to as Breuer) teaches an enclosure that functions as a lavatory with a toilet. It would have been obvious to one of ordinary skill in the art at the time of Applicant's invention to provide the enclosure of Betts in various known capacities including a lavatory as taught by prior art Breuer et al

(henceforth referred to as Breuer), since lavatories on aircraft are commonly provided in compact enclosures;

said forward wall being substantially not flat and configured to receive a portion of the exterior aft surface of the passenger seat when the seat is in an unreclined seat position. As depicted in Betts, the forward wall is configured to receive a portion of the seat back and is substantially not flat and Examiner asserts that the illustration of the seat in figure 1 constitutes an "unreclined" position to the same degree that the representation of the seat in the instant application does (i.e. the upright position of a seat angles back to some degree);

wherein said forward wall is adapted to provide more space forward of the enclosure unit such that the passenger seat in the unreclined position can be positioned further aft in the cabin than if the cabin included another enclosure unit having a substantially flat front wall located in substantially the same position in the cabin as the forward wall. The recess in figure 5 of Betts allows the seat to be positioned further back in the aircraft cabin while still being able to recline the seat back; and

wherein said enclosed space is taller than the passenger seat (see figures of Betts); and

positioning said aircraft passenger seat further aft in said aircraft cabin than an initial position of said aircraft passenger seat prior to retrofitting said aircraft.

Betts as modified by Bar-Levav teaches implementing the arrangement of Betts

in an existing aircraft which includes movement of the seats (creating more space by seat position is the purpose and motivation of Betts);

whereby a portion of the exterior aft surface of said passenger seat in the unreclined seat position is received by said forward wall. As depicted, a portion of the seat, in the normal upright (albeit not orthogonal to the floor), occupies the recess.

4. In regards to claim 3, Betts discloses that the exterior aft surface of the passenger seat has a contoured shape, and wherein said forward wall is shaped to substantially conform to the contoured shape of the exterior aft surface of the passenger seat when the exterior aft surface of said passenger seat in the unreclined position is received by said forward wall. The slanted recess in the wall directly behind the seat in Betts conforms to the slant of a reclined passenger seat. Note that in as much as the illustration of the wall in the instant application is "contoured" to conform to the shape of the seat back, Betts provides an equal degree of conforming to the slanted shape of the wall.

5. Claims 2 and 4 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Betts et al. (U.S. Patent 3,738,497) in view Breuer et al. (U.S. Patent 8,109,469).

6. In regards to claim 2, Betts discloses a method of providing an aircraft with more passenger seats in the aircraft's cabin (note that Betts objective/purpose is to increase space and number of potential seats), the method comprising the steps of:

installing a combination of an enclosure unit and a passenger seat in the aircraft. Betts teaches installing a seat and an enclosure as depicted in figure 1, the combination comprising:

the passenger seat being configured to be located forward of and proximate to the enclosure unit. Betts teaches a seat that is located forward of an enclosure (see items 30 and 40 of figure 1);

the enclosure unit being located aft of the passenger seat. Betts teaches an enclosed area located aft of a seat as depicted;

the enclosure unit having a forward wall. Items 30 and 40;

said forward wall being part of an outer boundary defining a single enclosed space (see figure 1);

Betts fails to teach that the space includes a toilet. However, Breuer teaches an enclosure that functions as a lavatory with a toilet. It would have been obvious to one of ordinary skill in the art at the time of Applicant's invention to provide the enclosure of Betts in various known capacities including a lavatory as taught by prior art Breuer et al (henceforth referred to as Breuer), since lavatories on aircraft are commonly provided in compact enclosures;

said forward wall being substantially not flat and configured to receive a portion of the exterior aft surface of the passenger seat in an unreclined seat position.

The wall receives a portion of the seat back when reclined and as illustrated, is not flat and additionally, the seat of Betts is in a "normal" position that is not reclined, but occupies a portion of the recess;

wherein said forward wall is adapted to provide more space forward of the enclosure unit such that the passenger seat in the unreclined position can be positioned further aft in the aircraft cabin than if the cabin included another enclosure unit having a front wall that is substantially flat and is located in substantially the same position in the aircraft cabin as the forward wall. Betts inherently describes this, since the arrangement and construction of the seat and forward wall of the enclosure is to make more space; and

wherein said enclosed space is taller than the passenger seat (see figure 1); and whereby said aircraft passenger seat in the unreclined seat position is installed further aft in said aircraft cabin than would be possible if the substantially flat front wall of the other enclosure unit was located in substantially the same position in the aircraft cabin as the forward wall. This situation is inherently intended in the Betts design, since Betts teaches that the design of the front wall of the space allows the closest seat to be set back closer to the space;

whereby a portion of the exterior aft surface of said passenger seat in the unreclined seat position is received by said forward wall. As depicted, a portion of the seat, in the normal upright (albeit not orthogonal to the floor), occupies the recess.

7. In regards to claim 4, Betts discloses that the exterior aft surface of the passenger seat has a contoured shape, and wherein said forward wall is shaped to substantially conform to the contoured shape of the exterior aft surface of the passenger seat when the exterior aft surface of said passenger seat in the unreclined position is received by said forward wall. The slanted recess in the wall directly behind the seat in Betts conforms to the slant of a reclined passenger seat. Note that in as much as the illustration of the wall in the instant application is "contoured" to conform to the shape of the seat back, Betts provides an equal degree of conforming to the slanted shape of the wall.

Summary/Conclusion

8. Claims 1-4 are rejected.

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.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Benjamin P. Lee whose telephone number is 571-272-8968. The examiner can normally be reached between the hours of 8:30am and 5:00pm on Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Troy Chambers can be reached on 571-272-6874. 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).

/BENJAMIN P LEE/

Primary Examiner, Art Unit 3641

UNITED STATES PATENT AND TRADEMARK OFFICE

USPTO Automated Interview Request (AIR)

Feb 5 2016

This paper requesting to schedule and/or conduct an interview is appropriate because:

This submission is requested to be accepted as an authorization for this interview to communicate via the internet. Recognizing that Internet communications are not secure, I hereby authorize the USPTO to communicate with the undersigned concerning scheduling of the interview via video conference, instant messaging, or electronic mail, and to conduct the interview in accordance with office practice including video conferencing.

Name(s):
Greg H. Gardella

S-signature:
/Greg H Gardella/

Registration Number:
46045

U.S. Application Number:
14709409

Confirmation Number:
1803

E-mail Address:
ggardella@oblon.com

Phone Number:
7034126396

Proposed Time of Interview:
2-24-2016 10:00 AM ET

Prefered Interview Type:
In-person

I am the applicant or applicant's representative for this application.

uspto UNITED STATES PATENT AND TRADEMARK OFFICE
PALM-SILVER

Doc Code: IDS.3P
Document Description: Information Disclosure Statement Filed

PTO/SB/429 (03-13)
Approved for use through 07/31/2015. OMB 0651-0062
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THIRD-PARTY SUBMISSION UNDER 37 CFR 1.290

(Do not submit this form electronically via EFS-Web)

Application Number (required): 14/709,409

U.S. PATENTS AND U.S. PATENT APPLICATION PUBLICATIONS

Cite No.	Document Number	Issue Date or Publication Date	First Named Inventor
	Number-Kind Code[1]	MM/DD/YYYY	
	US-		
	US-		
	US-		
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FOREIGN PATENTS AND PUBLISHED FOREIGN PATENT APPLICATIONS

Cite No.	Country or Patent Office and Document Number	Publication Date	Applicant, Patentee or First Named Inventor	Translation Attached
	Country Code[2]-Number[3]-Kind Code[4]	MM/DD/YYYY		
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1. If known, enter kind of document by the appropriate symbols indicated on the document under WIPO Standard ST.16. See MPEP 901.04(a). 2. Enter the country or patent office that issued the document by two-letter country code under WIPO Standard ST.3. See MPEP 1851. 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. 4. If known, enter kind of document by the appropriate symbols indicated on the document under WIPO Standard ST.16. See MPEP 901.04(a).

This collection of information is required by 35 U.S.C. 122(e) and 37 CFR 1.290. The information is required to obtain or retain a benefit by the public, which is to update (and by the USPTO to process) the file of a patent or reexamination proceeding. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 10 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.**

Doc Code: IDS.3P
Document Description: Information Disclosure Statement Filed

PTO/SB/429 (03-13)
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THIRD-PARTY SUBMISSION UNDER 37 CFR 1.290

(Page 2 of 2)

Application Number (required): 14/709,409

NON-PATENT PUBLICATIONS (e.g., journal article, Office action)

Cite No.	Author (if any), title of the publication, page(s) being submitted, publication date, publisher (where available), and place of publication (where available)	Translation Attached	Evidence of Publication Attached
1	Final Written Decision, Case IPR2014-00727, Paper No. 65 (PTAB Oct. 26, 2015)	☐	☐
2	StartupBoeing, DC-10 presentation, copyright 2007	☐	☐
3	Letter from Flight Structures, Inc. to Air France, Aug. 3, 1994, re "B747-400M Door 4 Crew Rest", and enclosures	☐	☐
4	Flight Structures, Inc., 747 Door 4 Overhead Crew Rest rendering	☐	☐
		☐	☐
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		☐	☐

STATEMENTS

The party making the submission is not an individual who has a duty to disclose information with respect to the above-identified application under 37 CFR 1.56.

This submission complies with the requirements of 35 U.S.C. 122(e) and 37 CFR 1.290.

☑ The following fee set forth in 37 CFR 1.290(f) is submitted herewith: ☑ regular undiscounted ☐ small entity*

☐ The fee set forth in 37 CFR 1.290(f) is not required because this submission lists three or fewer total items and, to the knowledge of the person signing the statement after making reasonable inquiry, this submission is the first and only submission under 35 U.S.C. 122(e) filed in the above-identified application by the party making the submission or by a party in privity with the party.

Signature	/s/ John C. Alemanni		Date 2/26/2016
Name (Printed/Typed)	John C. Alemanni	Reg. No., if applicable	47,384

Examiner Signature**		Date Considered	

*SUBMITTER: By selecting the "small entity" box and paying the applicable small entity fee, the party making the submission asserts that the party qualifies as a small entity. A third party is not eligible for the micro entity discount.

**EXAMINER: Signature indicates all items listed have been considered, except for citations through which a line is drawn. Draw line through citation if not considered. Include a copy of this form with next communication to applicant.

Privacy Act Statement

The **Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	Donald F. Cook et al.	)	Confirmation No.: 1803
		)	
Application No.:	14/709,409	)	Art Unit: 3641
		)	
Filing Date:	May 11, 2015	)	Examiner: Benjamin P. Lee
		)	
For:	AIRCRAFT INTERIOR LAVATORY	)	

CONCISE DESCRIPTION OF RELEVANCE FOR THIRD PARTY SUBMISSION UNDER 37 C.F.R. § 1.290

Pursuant to 35 U.S.C. § 122(e) and 37 C.F.R. § 1.290, the undersigned respectfully submits this concise description of relevance in connection with its third party submission in U.S. Application Serial No. 14/709,409. This third party submission includes four references of relevance to the pending application:

1. **Final Written Decision in IPR2014-00727.**

On October 26, 2015, the Patent Trial and Appeal Board issued its Final Written Decision in *C&D Zodiac, Inc. v. B/E Aerospace, Inc.*, IPR2014-00727. That *inter partes* review addressed the validity of certain claims of U.S. Patent No. 8,590,838 ("the '838 Patent) to which this application claims priority. In its Final Written Decision, the Board held that "Petitioner has shown by a preponderance of the evidence that claims 1, 3-7, 9, 10, 12-14, 16-19, 21, 22, 24-29, 31, and 33-37 are unpatentable as obvious over Betts[1]." Decision, at 31.

Construing the challenged claims, the Board held that the "term 'enclosure unit' encompasses lavatories, aircraft closets, and aircraft galleys." Decision, at 9. The Board held that the term "substantially not flat in a vertical plane" "encompasses an aft portion (in the case of claim 1) and an aft portion with an exterior aft surface (in the case of claims 9, 21, and 31) that has a flat shape but which is not within a vertical plane." Decision, at 10. The Board construed the term "forward wall portion is shaped to substantially conform to the shape of the exterior aft surface of the aft portion of the . . . passenger seat" to "require that 'the forward wall portion is shaped to generally match or coincide with the shape of the exterior back surface of the back of the passenger seat" and rejected Patent Owner's proposed construction "that would exclude a wall that defines the forward side of two spaces instead of one." Decision, at 11-12.

The Board held that "Betts discloses all of the features of claims 1 [of the '838 Patent] except for the lavatory-specific limitations" Decision, at 14. The Board further held that "it

[1] U.S. Patent No. 3,738,497 to Betts et al. (issued June 12, 1973).

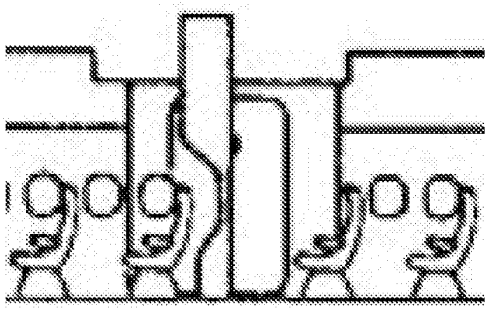
would have been obvious to apply the space-saving recessed forward wall design of Betts to other enclosure units, including lavatories." Decision, at 17. The Board further held that the "aft portion of the Betts seatback . . . is not flat in a vertical plane" and that "Betts depicts the seat immediately in front of the lowest portion of the forward wall" which "meets the ["immediately aft of and adjacent to"] limitation." Decision, at 16.

The Board further held Betts renders obvious "an enclosure unit that is taller than the passenger seat" and "'an aircraft cabin passenger seat' as part of the claimed apparatus." Decision, at 17. The Board also held that Betts teaches a "forward wall portion includes a forward projection configured to project over an aft portion of the seat back of the aircraft cabin passenger seat immediately forward of the lavatory stall unit." Decision, at 18.

The Board further held that Betts teaches the "forward wall portion defines a secondary space in said interior lavatory space in an area forward of an aft-most portion of the forward wall portion above the seat back of the aircraft cabin passenger seat." Decision, at 18-20. The Board held that Betts teaches "the forward wall portion includes a lower portion that extends under the aft portion of the aircraft cabin passenger seat." Decision, at 20. The Board held that Betts teaches the "aft-extending recess in said forward wall portion is disposed between a forward-extending upper wall portion and a forward-extending lower wall portion." Decision, at 20. Finally, the Board held that Betts teaches the "aft-extending recess in said forward wall portion extends along substantially a full width of said forward wall portion." Decision, at 21.

2. **DC-10 Series Lower Hold Compartments, StartupBoeing, 2007.**

The StartupBoeing presentation entitled "DC-10," having a copyright date of 2007, is located on Boeing's website at http://www.boeing.com/resources/boeingdotcom/company/about_bca/startup/pdf/historical/dc10-passenger.pdf. At page 12, the presentation depicts an enclosure unit that extends forward farther at the top than at the bottom (*i.e.*, is shorter at the bottom than at the top).



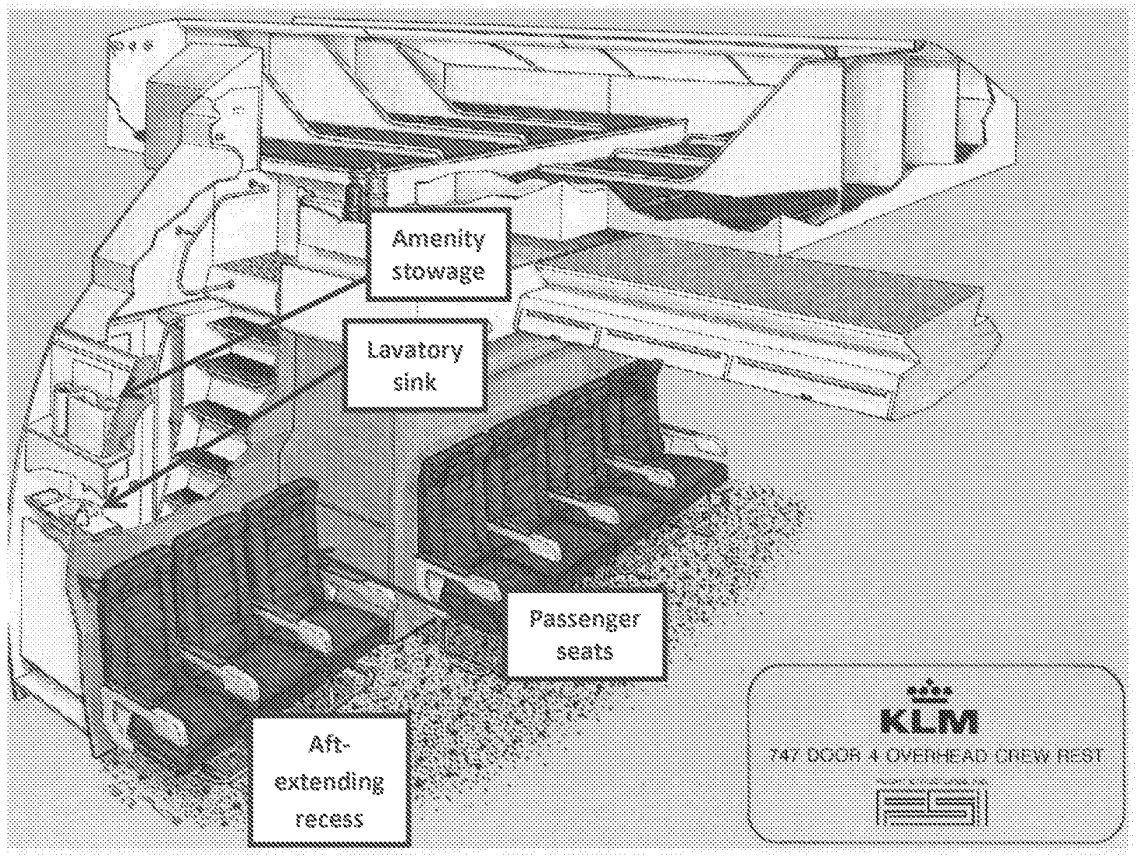
3. **Boeing 747 Crew Rest compartment and Proposals for Same, Offer for Sale from Flight Structures, Inc. to Air France, dated August 3, 1994.**

On August 3, 1994, Flight Structures, Inc., a company located in Arlington, Washington, sent a letter to Air France "present[ing] the following firm fixed price proposal for our 747 Door 4 Crew Rest." Letter, at 1. The Proposal attached to the letter depicts an overhead crew rest having an entry with a lavatory sink, amenity stowage, and a recessed forward wall portion shaped to substantially conform to the exterior aft surface of the aft portion of the passenger seats located forward of the enclosure.

Applicant submitted this offer for sale on March 18, 1999 during prosecution of Application No. 09/216,446 but did not submit this offer for sale during prosecution of the '838 Patent to which this application claims priority.

4. **Boeing 747 Crew Rest rendering, Flight Structures, Inc.**

Petitioner C&D Zodiac, Inc. submitted the following more legible version of the 747 Door 4 Crew Rest drawing as Exhibit 1012 during *C&D Zodiac, Inc. v. B/E Aerospace, Inc.*, IPR2014-00727. Annotations identify the aft-extending recess, lavatory sink, amenity stowage, and passenger seats.



The undersigned respectfully submits the above for consideration by the examiner and entry into the record of this application.

Respectfully submitted,

/s/ John C. Alemanni
John C. Alemanni
Reg. No. 47,384

Date: February 26, 2016

KILPATRICK TOWNSEND & STOCKTON LLP
1001 West Fourth Street
Winston-Salem, NC 27101-2400
Telephone: (336) 607-7311
Facsimile: (336) 734-2621
jalemanni@kilpatricktownsend.com

Electronic Patent Application Fee Transmittal	
Application Number:	14709409
Filing Date:	
Title of Invention:	
First Named Inventor/Applicant Name:	
Filer:	John Charles Alemanni/Lesley Andrew
Attorney Docket Number:	
Filed as Large Entity	
Filing Fees for	

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
DOCUMENT FEE FOR THIRD-PARTY SUBMISSIONS	1818	1	180	180
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension-of-Time:				
Miscellaneous:				
		Total in USD ($)		**180**

Electronic Acknowledgement Receipt	
EFS ID:	25038656
Application Number:	14709409
International Application Number:	
Confirmation Number:	1803
Title of Invention:	
First Named Inventor/Applicant Name:	
Correspondence Address:	- - - - - - - - - -
Filer:	John Charles Alemanni/Lesley Andrew
Filer Authorized By:	John Charles Alemanni
Attorney Docket Number:	
Receipt Date:	26-FEB-2016
Filing Date:	
Time Stamp:	17:23:12
Application Type:	

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	$180

RAM confirmation Number	4307
Deposit Account	
Authorized User	

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Concise Description of Relevance	Concise-description-generated.pdf	33088 85c76cdd5c7cfa8381c6cff8d1928c1ce49d4b85	no	5
Warnings:					
Information:					
2	Third-Party Submission Under 37 CFR 1.290	Third-party-preissuance-submission.pdf	44798 973f62597ae870da04247d73196e4a16fa1a6630	no	3
Warnings:					
Information:					
3	Request for Notification of Non-compliant Third-Party Submission	Third-party-notification-request.pdf	19717 3d06c9fa8ef4a2e3d073592fe687d585d152cabb	no	1
Warnings:					
Information:					
4	Information Disclosure Statement (IDS) Form (SB08)	Third-party_submission_14709409.pdf	812282 8ad5c8ed6b29d5c320d58c2c1c7732138ab443cb	no	3
Warnings:					
Information:					
This is not an USPTO supplied IDS fillable form					
5	Concise Description of Relevance	ConciseDescriptionOfRelevance_14709409.pdf	1749950 19cf4e7280dd89f5d0837c12e01c8b55b8f65373	no	4
Warnings:					
Information:					
6	Non Patent Literature	1_Final_Written_Decision_IPR2014-00727.pdf	9746038 ce0022aae6889b8a028d283dd0d12387ba0b26b0	no	33
Warnings:					
Information:					

7	Non Patent Literature	2_2007_Startup_Boeing_presentation.pdf	18890660 f3075c2c9d821fa76cd83d953ed32ea6166a0b9a	no	27
Warnings:					
Information:					
8	Non Patent Literature	3_AirFranceLetter.pdf	21093821 335530ac396b60752e8dea822ae43ff5ae143e68	no	28
Warnings:					
Information:					
9	Non Patent Literature	4_FSI_Crew_Rest_Rendering.pdf	1698683 b002006445802c0f1bab3f7f7db57139a4eae99f	no	1
Warnings:					
Information:					
10	Fee Worksheet (SB06)	fee-info.pdf	29384 2260cad1dec0ca7efb85a28378ae7fcca82b9595	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	54118421		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

THIRD-PARTY SUBMISSION UNDER 37 CFR 1.290
CONCISE DESCRIPTION OF RELEVANCE

Application Number	14709409

U.S. PATENTS

Cite No	Patent Number	Concise Description of Relevance

U.S. PATENT APPLICATION PUBLICATION

Cite No	Publication Number	Concise Description of Relevance

FOREIGN PATENT DOCUMENTS		
CiteNo	**Foreign Document Number**	**Concise Description of Relevance**

NON-PATENT PUBLICATIONS		
Cite No	**Reference**	**Concise Description of Relevance**
1	Final Written Decision IPR 2014-00727, October 26, 2015	See Attached

2	2007 Startup Boeing Presentation	See Attached

3	Air France Letter	See Attached

4	FSI Crew Rest Rendering	See Attached

PTO/SB/429(08-12)
Approved for use through 07/31/2015. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

THIRD-PARTY SUBMISSION UNDER 37 CFR 1.290	Application Number	14709409

U.S. PATENTS				
Cite No	Patent Number	Kind Code [1]	Issue Date (YYYY-MM-DD)	First Named Inventor

U.S. PATENT APPLICATION PUBLICATIONS				
Cite No	Publication Number	Kind Code [1]	Publication Date (YYYY-MM-DD)	First Named Inventor

FOREIGN PATENTS AND PUBLISHED FOREIGN PATENT APPLICATIONS						
Cite No	Foreign Document Number [3]	Country Code [2]	Kind Code [1]	Publication Date (YYYY-MM-DD)	Applicant, Patentee or First Named Inventor	T [5]
						☐

NON-PATENT PUBLICATIONS (e.g., journal article, Office action)			
Cite No	Author (if any), title of the publication, page(s) being submitted, publication date, publisher (where available), place of publication (where available).	T [5]	E [6]

THIRD-PARTY SUBMISSION UNDER 37 CFR 1.290	Application Number	14709409

1	FSI Crew Rest Rendering	☐	☒
2	Air France Letter	☐	☒
3	2007 Startup Boeing Presentation	☐	☒

THIRD-PARTY SUBMISSION UNDER 37 CFR 1.290	Application Number	14709409

4	Final Written Decision IPR 2014-00727, October 26, 2015	☐	☒

STATEMENTS

The party making the submission is not an individual who has a duty to disclose information with respect to the above-identified application under 37 CFR 1.56.

This submission complies with the requirements of 35 U.S.C. 122(e) and 37 CFR 1.290.

☒ The fee set forth in 37 CFR 1.290(f) has been submitted herewith.

☐ The fee set forth in 37 CFR 1.290(f) is not required because this submission lists three or fewer total items and, to the knowledge of the person signing the statement after making reasonable inquiry, this submission is the first and the only submission under 35 U.S.C 122(e) filed in the above-identified application by the party making the submission or by a party in privity with the party.

☐ This resubmission is being made responsive to a notification of non-compliance issued for an earlier filed third-party submission. The corrections in this resubmission are limited to addressing the non-compliance. As such, the party making this resubmission: (1) requests that the Office apply the previously-paid fee set forth in 37 CFR 1.290(f), or (2) states that no fee is required to accompany this resubmission as the undersigned is again making the fee exemption statement set forth in 37 CFR 1.290(g).

Signature	/John C. Alemanni/		
Name/Print	John C. Alemanni	Registration Number (if applicable)	47384

Examiner Signature		Date Considered	

*EXAMINER: Signature indicates all documents listed above have been considered,except for citations through which a line is drawn. Draw line through citation if not considered. Include a copy of this form with next communication to applicant. 1. If known, enter kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16. See MPEP 901.04(a). 2. Enter the country or patent office that issued the document, by two-letter code under WIPO standard ST.3. See MPEP 1851. 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. 4. If known, enter the kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 . See MPEP 901.04(a). 5. Check mark indicates translation attached. 6. Check mark indicates evidence of publication attached.

TRANSMITTAL FOR POWER OF ATTORNEY TO ONE OR MORE REGISTERED PRACTITIONERS

NOTE: This form is to be submitted with the Power of Attorney by Applicant form to identify the application to which the Power of Attorney is directed, in accordance with 37 CFR 1.5. If the Power of Attorney by Applicant form is not accompanied by this transmittal form or an equivalent, the Power of Attorney will not be recognized in the application.

Application Number	14/709,409
Patent Number	
Filing Date	May 11, 2015
Issue Date	
First Named Inventor	Donald F. COOK, et al.
Title	AIRCRAFT INTERIOR LAVATORY
Art Unit	3641
Examiner Name	LEE, BENJAMIN P
Attorney Docket Number	466860US110CONT

SIGNATURE of Applicant or Patent Practitioner

Signature	/Natalie J. Grace/	Date	03/03/2016
Name	Natalie J. Grace	Telephone	703-413-3000
Registration Number	65,803		

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4(d) for signature requirements and certifications.

■ *Total of 1 forms are submitted.

POWER OF ATTORNEY BY APPLICANT

(ASSIGNEE, LEGAL REPRESENTATIVE OR PERSON WHO OTHERWISE SHOWS SUFFICIENT PROPRIETARY INTEREST)

I hereby revoke all previous powers of attorney given in the application identified in the attached Transmittal for Power of Attorney form.

■ I hereby appoint Practitioner(s) associated with the following Customer Number as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the application referenced in the attached transmittal letter:

22850

Please recognize or change the correspondence address for the above-identified patent to:

■ The address associated with the above-mentioned Customer Number.

I am the Applicant:

■ Assignee or Person to Whom the Inventor is Under an Obligation to Assign and am authorized to act on behalf of all assignees

☐ Person Who Otherwise Shows Sufficient *Proprietary* Interest (*e.g.*, a petition under 37 CFR 1.46 (b)(2) was granted in the application or is concurrently being filed with this document)

SIGNATURE of Applicant for Patent

The undersigned (whose title is supplied below) is authorized to act on behalf of the applicant (e.g., where the applicant is a juristic entity).

Signature	Ryan M Patch	Date	2/2/2016
Name	Ryan M. Patch	Telephone	561 346 5343
Title	Vice President - Law, General Counsel & Secretary		
Company	B/E Aerospace, Inc.		

NOTE: Signature - This form must be signed by the applicant. See 37 CFR 1.4 for signature requirements and certifications. Submit multiple forms for more than one signature, see below*.

■ *Total of _____ forms are submitted.

Electronic Acknowledgement Receipt	
EFS ID:	25090123
Application Number:	14709409
International Application Number:	
Confirmation Number:	1803
Title of Invention:	AIRCRAFT INTERIOR LAVATORY
First Named Inventor/Applicant Name:	Donald F. Cook
Customer Number:	119984
Filer:	Bradley Davis Lytle/Kim Rouse
Filer Authorized By:	Bradley Davis Lytle
Attorney Docket Number:	BEALCI-94515
Receipt Date:	03-MAR-2016
Filing Date:	11-MAY-2015
Time Stamp:	12:58:35
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Power of Attorney	466860USpower.pdf	70844 413509a21c93e6773bf90c260f4fbb7ba94bf28a	no	2
Warnings:					
Information:					

Total Files Size (in bytes):	70844

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/709,409	05/11/2015	Donald F. Cook	BEALCI-94515	1803

119984 7590 03/11/2016

FULWIDER PATTON, LLP
Howard Hughes Center
6060 Center Drive
Tenth Floor
Los Angeles, CA 90045

EXAMINER	
LEE, BENJAMIN P	

ART UNIT	PAPER NUMBER
3641	

NOTIFICATION DATE	DELIVERY MODE
03/11/2016	ELECTRONIC

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.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

docketla@fulpat.com
eOfficeAction@fulpat.com

UNITED STATES DEPARTMENT OF COMMERCE
U.S. Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450

APPLICATION NO./ CONTROL NO.	FILING DATE	FIRST NAMED INVENTOR / PATENT IN REEXAMINATION	ATTORNEY DOCKET NO.
14/709,409	11 May, 2015	COOK ET AL.	BEALCI-94515

FULWIDER PATTON, LLP
Howard Hughes Center
6060 Center Drive
Tenth Floor
Los Angeles, CA 90045

EXAMINER	
ART UNIT	**PAPER**
3600	20160308

DATE MAILED:

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

Commissioner for Patents

NOTIFICATION REGARDING THIRD-PARTY PREISSUANCE SUBMISSION

The third-party submission under 37 CFR 1.290 filed on 2/26/16 for application 14/709409 has been determined to be compliant with 35 U.S.C. 122(e) and 37 CFR 1.290 and is being entered in the application. Please allow a few days for the submission to be visible in the Patent Application Information Retrieval (PAIR) system.

/ MIKADO BUIZ/
TC 3600 PQAS

PTO-90C (Rev.04-03)

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
14/709,409	05/11/2015	Donald F. Cook	466860US110CONT

CONFIRMATION NO. 1803

22850
OBLON, MCCLELLAND, MAIER & NEUSTADT, L.L.P.
1940 DUKE STREET
ALEXANDRIA, VA 22314

POA ACCEPTANCE LETTER

OC000000081424428

Date Mailed: 03/16/2016

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 03/03/2016.

The Power of Attorney in this application is accepted. Correspondence in this application will be mailed to the above address as provided by 37 CFR 1.33.

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at **(571) 272-4000** or **(571) 272-4200** or **1-888-786-0101**.

/vnguyen/

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
14/709,409	05/11/2015	Donald F. Cook	BEALCI-94515

CONFIRMATION NO. 1803

POWER OF ATTORNEY NOTICE

119984
FULWIDER PATTON, LLP
Howard Hughes Center
6060 Center Drive
Tenth Floor
Los Angeles, CA 90045

Date Mailed: 03/16/2016

NOTICE REGARDING CHANGE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 03/03/2016.

- The Power of Attorney to you in this application has been revoked by the applicant. Future correspondence will be mailed to the new address of record(37 CFR 1.33).

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at **(571) 272-4000** or **(571) 272-4200** or **1-888-786-0101**.

/vnguyen/

Docket No.: 466860US110CONT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

IN RE APPLICATION OF: Donald F. COOK, et al.

SERIAL NO:	14/709,409	GAU:	LEE, BENJAMIN P.
FILED:	May 11, 2015	EXAMINER:	3641
FOR:	AIRCRAFT INTERIOR LAVATORY		

REQUEST FOR CONTINUED EXAMINATION (RCE) TRANSMITTAL

COMMISSIONER FOR PATENTS
ALEXANDRIA, VIRGINIA 22313

Commissioner:

This is a Request for Continued Examination (RCE) under 37 C.F.R. §1.114 of the above-identified application.

Submission required under 37 C.F.R. §1.114

Previously Submitted:

- ☐ Consider the amendment(s)/reply under 37 C.F.R. §1.116 previously filed on
- ☐ Consider the arguments in the Appeal Brief or Reply Brief previously filed on

Enclosed:

- ■ Amendment/Reply
- ☐ Information Disclosure Statement (IDS)
- ☐ Track 1 Prioritized Examination
- ☐ Other:

FEES	RATE	CALCULATIONS
☐ Suspension of action on the above-identified application is requested under 37 C.F.R. §1.103(c) for a period of months.	$140.00	$0.00
■ RCE Fee required under 37 C.F.R. §1.17(e) - **1st request**	$1,200.00	$1,200.00
☐		$0.00
☐		$0.00
TOTAL OF ABOVE CALCULATIONS:		$1,200.00
☐ REDUCTION BY 50% FOR FILING AS SMALL ENTITY		$0.00
TOTAL:		$1,200.00

■ Credit card payment is being made online (if electronically filed), or is attached hereto (if paper filed), in the amount of **$1,200.00.**

■ Please charge any additional Fees for the papers being filed herewith and for which no payment is enclosed herewith, or credit any overpayment to Deposit Account No. **15-0030**.

■ If these papers are not considered timely filed by the Patent and Trademark Office, then a petition is hereby made under 37 CFR 1.136, and any additional fees required under 37 CFR 1.136 for any necessary extension of time may be charged to Deposit Account No. **15-0030**.

Respectfully Submitted,

OBLON, McCLELLAND,
MAIER & NEUSTADT, L.L.P.

/Greg H. Gardella/
Greg H. Gardella
Registration No. 46,045

Natalie J. Grace
Registration No. 65,803

Customer Number
22850

Tel. (703) 413-3000
Fax. (703) 413-2220
(OMMN 12/11)

466860US

IN THE UNITED STATES PATENT & TRADEMARK OFFICE

IN RE APPLICATION OF	:	
DONALD F. COOK ET AL.	:	EXAMINER: LEE, BENJAMIN P.
SERIAL NO: 14/709,409	:	
FILED: MAY 11, 2015	:	GROUP ART UNIT: 3641
FOR: AIRCRAFT INTERIOR LAVATORY	:	

RESPONSE AND AMENDMENT

COMMISSIONER FOR PATENTS
ALEXANDRIA, VIRGINIA 22313

Commissioner:

Applicants hereby submit the attached remarks and amendments in response to the Office Action dated December 30, 2015.

TABLE OF CONTENTS

AMENDMENT TO THE CLAIMS

Please amend the claims as follows.

Claim 1 (Currently Amended) A method of retrofitting an aircraft to provide additional passenger seating in the cabin of said aircraft, the cabin including a passenger seat having a seat back with an exterior aft surface that is substantially not flat, a seat bottom, and a seat support that interfaces with the floor of the aircraft cabin and holds the seat bottom in an elevated position above the floor of the aircraft cabin, the method comprising the steps of:

installing an aircraft enclosure unit comprising [[:]]

a forward wall, said forward wall being part of an outer boundary defining a single enclosed space that includes a toilet, said forward wall being substantially not flat and configured to receive a portion of the exterior aft surface of the ~~passenger~~ seat back when the seat back is in an unreclined seat position[[;]],

wherein said forward wall is adapted to provide more space forward of the enclosure unit such that the ~~passenger seat in the unreclined~~ seat ~~position~~ support can be positioned further aft in the cabin than if the cabin included another enclosure unit having a substantially flat front wall located in substantially the same position in the cabin as the forward wall[[;]], and

wherein said enclosed space is taller than the passenger seat; and

positioning said ~~aircraft passenger~~ seat support further aft in said aircraft cabin than ~~an initial position of~~ said ~~aircraft passenger~~ seat support could have been positioned prior to retrofitting said aircraft, whereby a portion of the exterior aft surface of said passenger seat back in the unreclined seat position is received by said forward wall.

Claim 2 (Currently Amended) A method of providing an aircraft with more passenger seats in the aircraft's cabin, the method comprising the steps of:

installing a combination of an enclosure unit and a passenger seat in the aircraft, said passenger seat having a seat back, a seat bottom, and a seat support that interfaces

with the floor of the aircraft cabin and holds the seat bottom in an elevated position above the floor of the aircraft cabin, the combination comprising [[:]]

the passenger seat being configured to be located forward of and proximate to the enclosure unit [[;]],

the enclosure unit being located aft of the passenger seat, the enclosure unit having

a forward wall, said forward wall being part of an outer boundary defining a single enclosed space that includes a toilet, said forward wall being substantially not flat and configured to receive a portion of the exterior aft surface of the passenger seat back in an unreclined seat position [[;]],

wherein said forward wall is adapted to provide more space forward of the enclosure unit such that the ~~passenger seat in the unreclined~~ seat ~~position~~ support can be positioned further aft in the cabin than if the cabin included another enclosure unit having a front wall that is substantially flat and is located in substantially the same position in the cabin as the forward wall [[; and]],

wherein said enclosed space is taller than the passenger seat [[; and]],

whereby said ~~aircraft passenger seat in the unreclined~~ seat ~~position~~ support is installed further aft in said cabin than would be possible if the substantially flat front wall of the other enclosure unit was located in substantially the same position in the aircraft cabin as the forward wall [[;]], and

whereby a portion of the exterior aft surface of said passenger seat back in the unreclined seat position is received by said forward wall.

Claim 3 (Currently Amended) The method of claim 1, wherein said exterior aft surface of the passenger seat back has a contoured shape, and wherein said forward wall is shaped to substantially conform to the contoured shape of the exterior aft surface of the passenger seat back when the exterior aft surface of said passenger seat back in the unreclined position is received by said forward wall.

Claim 4 (Currently Amended) The method of claim 2, wherein said exterior aft surface of the passenger seat back has a contoured shape, and wherein said forward wall is shaped to substantially conform to the contoured shape of the exterior aft surface of the passenger seat back when the exterior aft surface of said passenger seat back in the unreclined position is received by said forward wall.

Claim 5 (New) The method of claim 3, wherein said contoured shape includes a first section extending along a first axis and a second section extending along a second axis, said first section adapted to support a passenger's head and a second adapted to support a passenger's back, wherein said first axis is not parallel with said second axis.

Claim 6 (New) The method of claim 4, wherein said contoured shape includes a first section extending along a first axis and a second section extending along a second axis, said first section adapted to support a passenger's head and a second adapted to support a passenger's back, wherein said first axis is not parallel with said second axis.

REMARKS

This Response and Amendment (hereinafter "Response") addresses the Examiner's action dated December 30, 2015. That action rejected claims 1-4 as being obvious under pre-AIA 35 U.S.C. §103(a) over U.S. Patent No. 3,738,497 to Betts *et al.* ("Betts") in view of U.S. Patent No. 6,237,872 to Bar-Levav *et al.* ("Bar-Levav") and further in view of U.S. Patent No. 8,109,469 to Breuer *et al.* ("Breuer"). This Response amends claims 1-4 and adds claims 5-6. Accordingly, claims 1-6 are pending. No new matter has been added.

I. Examiner Interview Summary

Applicants thank the Examiner for the courtesies extended during the in-person interview on February 24, 2016. During the interview, the undersigned and co-inventor R. Klaus Brauer presented the slide deck entitled "B/E Aerospace Spacewall™ Technology, Examiner Interview, 14/709,409 and 14/709,378" and dated February 24, 2016. A copy of the slide deck is submitted herewith in an information disclosure statement.

As discussed during the interview, Mr. Brauer is submitting a declaration herewith. Mr. Brauer is a thirty-year veteran of Boeing (the Betts reference was originally assigned to McDonnel-Douglas, which was acquired by Boeing in 1997) and is widely recognized as a leading authority on aircraft cabin configuration. Brauer dec. ¶¶5, 8, citing Exs. A and B. Mr. Brauer is uniquely qualified to comment on the "the effects of demands known to the design community or present in the marketplace" and "the background knowledge possessed by a person having ordinary skill in the art." *KSR Int'l v. Teleflex Inc.*, 550 U.S. 398, 419 (Fed.Cir. 1983). Given further that Mr. Brauer has no pecuniary interest in the outcome of this proceeding, his declaration should be given substantial weight. *Ashland Oil, Inc. v. Delta Resins & Refractories, Inc.*, 776 F.2d 281 (Fed. Cir. 1985); *In re Oelrich,* 579 F.2d 86 (CCPA 1978); Brauer dec. ¶58.

II. Those Skilled in the Art Would not have Applied the Betts Wall to an Airplane Lavatory, which is Why they did not do so over the Course of the 35 Years Following the Publication of the Betts Reference

Those skilled in the art were strongly disinclined to use the Betts wall structure as a lavatory sidewall as proposed in the Office Action. Indeed, dozens of industry experts – including those employed by Boeing / McDonnell-Douglas, the owner of the Betts patent – reacted to the invention of the '838 patent with great skepticism. They and their companies had been working for decades to densify aircraft cabins and all uniformly believed that it was not possible to compress lavatory width while maintaining acceptable levels of passenger comfort in the interior enclosed space of the lavatory. It is precisely for this reason that neither Boeing nor McDonnell Douglas attempted to use the Betts wall structure as the side wall of an aircraft lavatory over the thirty-five years following its publication. After considering B/E Aerospace's Spacewall™ lavatory which embodies the invention, however, Boeing and the rest of the industry was surprised to find that the system was in fact feasible. So great was their surprise that a panel of industry experts awarded the Spacewall™ lavatory the highest honor in the industry, the Crystal Cabin Award for Industrial Design & Visionary Concepts. B/E Aerospace's competitors were caught by surprise, too, as evidenced by the fact that upon seeing the feasibility of the Spacewall™ design one competitor copied the Spacewall™ design rather than taking the time to develop its own solution. On this record, the Examiner cannot carry the burden of showing that a skilled artisan would have made the combination as proposed. *KSR*, 550 U.S. at 419 (Fed.Cir. 1983) (Requiring, in a case such as this, consideration of "the effects of demands known to the design community or present in the marketplace[] and the background knowledge possessed by a person having ordinary skill in the art, all in order to determine whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue.").

A. The Industry had been Working to Densify Cabins Since the Late 1970s

As explained in the declaration of Robert Klaus Brauer, submitted herewith, before the deregulation of airlines in 1978, the efficient use of airplane cabin space did not have a significant impact on airlines' profit. Brauer dec. ¶10. After deregulation, fares were determined by competition and market forces. *Id.* In other words, airlines could compete successfully by offering lower fares if they were able to fly passengers along a given route at a lower cost. *Id.* Because the incremental cost of carrying an additional passenger on a given route was minimal, a primary driver of profits was quickly recognized to be the number of seats in the passenger cabin of a plane. *Id.*

Accordingly, starting in the late 1970s airlines and aircraft manufacturers began to densify cabins. One of the best objective measures of this densification effort is aircraft seat pitch, the distance between like points on seats in adjacent rows. By the late 1980s the typical coach seat pitch had shrunk from 34-36 inches down to 31-32 inches. *Id.*, Ex. D.

As measured by seat pitch, more cabin densification occurred in the 1980s and 1990s than in the 2000s. Mr. Brauer explains that three of the four largest carriers implemented their largest decreases in seat pitch in the 1980s and 1990s. Brauer dec. ¶11. The fourth, Delta Airlines, implemented its greatest reduction between 2000 and 2002. *Id.*

Thus the evidence demonstrates that the aircraft industry was consistently working to densify aircraft cabins over the course of the three decades preceding the earliest effective filing date of the present application, May 20, 2010. In fact, the level of densification, as measured by reductions in seat pitch, peaked in the late 90's and early 2000's. This indicates that those most interested in the industry believed that they had made passenger seating in the aircraft cabin as dense as possible long before the earliest effective filing date. The industry believed that there was no more space available to add extra seats, so the industry essentially

stopped trying. That is, until B/E's Spacewall™ showed that there was actually space to be permanently harvested from a lavatory.

B. Prior Art Solutions Uniformly Reflect an Understanding that Lavatory Space Should Be Intruded Upon Only Temporarily, if at All, and that Any Intrusion Should Not Compress the Width of the Lavatory

The major players in the aircraft industry tried to make space-efficient lavatories, but those efforts all reflect a common design philosophy: the lateral dimensions of a lavatory[1] should not be intruded upon permanently. Brauer dec. ¶¶12-18. This derived from the understanding in the industry that lavatories were already fully compressed and therefore should not be compressed any further without sacrificing passenger comfort, which was considered unacceptable. *Id.*; see also U.S. 8,770,517, assigned to The Boeing Company ("[T]he dimensions of the lavatory enclosure often make it difficult for a user to move around in the enclosure, much less provide comfortable elbow room in the enclosure. Thus, passengers who are above median height and weight and are using conventional aircraft lavatories may feel uncomfortably confined in the lavatory enclosure.")

Boeing, for instance, tried to develop and patented at least two lavatory designs that adhered to this principle. *Id.* ¶¶12-13. The first was disclosed in a 1996 patent application which ultimately issued as U.S. Patent No. 6,007,025. As shown in Figure 1, below, the closet unit 25 temporarily collapsed into the lavatory space during takeoff and landing. Col. 3, ll. 5-12. After the aircraft leveled off at a cruising altitude, the attendant would extend the closet 25 and the lavatory space would not be impinged upon during use. This lavatory did not have a curved wall interacting with passenger seats to save floor space.

[1] Herein the term "lateral dimension" or "width" of the lavatory is used to refer to the dimension of the lavatory along the axis of the shoulders of a person seated on the toilet. That axis is generally parallel to the longitudinal, or lengthwise, axis of the aircraft because in most aircraft the rear of the lavatory is positioned against the fuselage to take advantage of the fact that less vertical clearance is needed when a person is seated on the toilet.

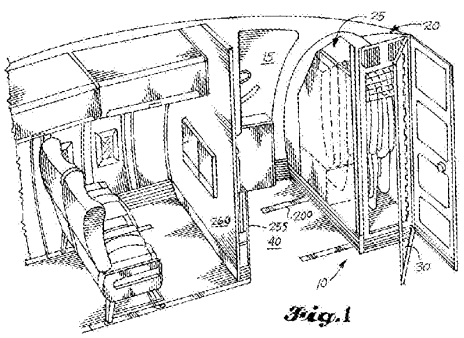


Fig. 1

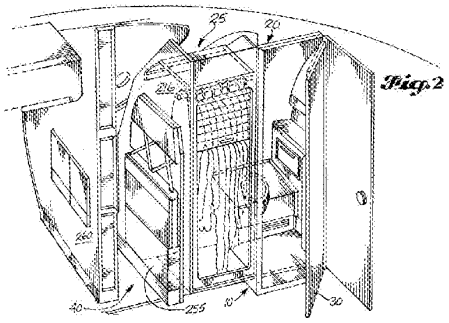


Fig. 2

Another of Boeing's lavatories is described in U.S. Patent No. 6,079,669 (filed 1997) and conforms to the same principle – intrude upon the lavatory space only temporarily. Col. 3, ll. 22-32; Brauer dec. ¶¶12-13. As shown in Figure 4, below, during take-off and landing the retractable sink unit 14 is collapsed into the lavatory space. When cruising (*i.e.*, when the lavatory can be used by passengers), the retractable unit 14 is extended into the aisle adjacent the aircraft door, which is unused except during takeoff and landing. Thus the lavatory dimensions are not permanently intruded upon; indeed, during use the lavatory footprint is actually expanded relative to a standard lavatory. Brauer dec. ¶13. Again, this lavatory did not have a curved wall interacting with passenger seats to save floor space.

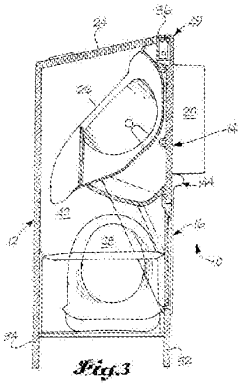


Fig. 3

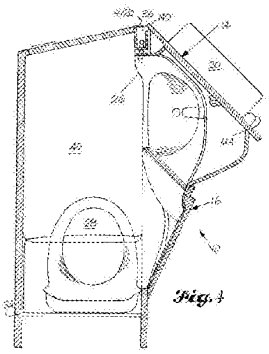
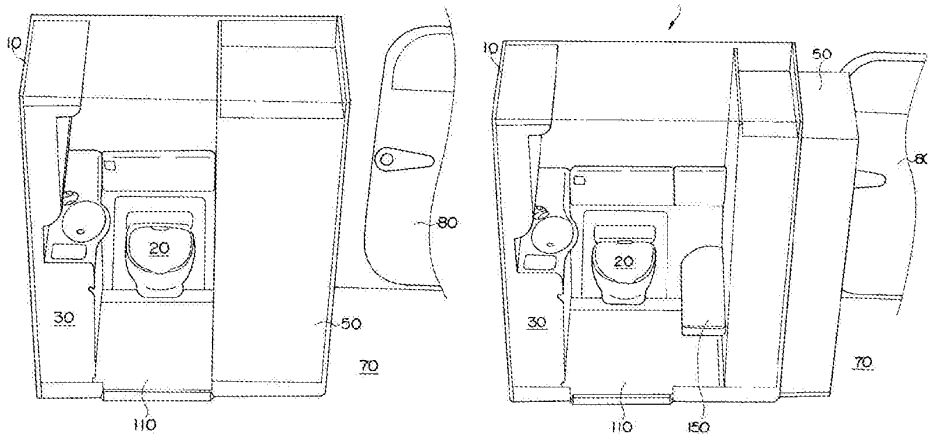


Fig. 4

Designs pursued by aircraft interior companies also conformed to the same design ethos (*i.e.*, do not invade the lavatory space, but if you do, do it only temporarily). Jamco, one of the world's largest suppliers of aircraft interior components, filed an application in

2002 which disclosed its improved lavatory. U.S. Patent No. 6,615,422 discloses a lavatory with a reciprocating unit 50. Like the Boeing lavatories, the Jamco lavatory invaded the lavatory space only during take-off and landing. Brauer dec. ¶14. Also like the Boeing designs, during use the lavatory interior volume is actually expanded relative to that of a standard lavatory. Col. 3, ll. 13-15. And also like the Boeing designs, this lavatory did not have a curved wall interacting with passenger seats to save floor space.



It is important to note that the Breuer patent relied upon by the Examiner is in no way inconsistent with these principles. Breuer's invention is a crew rest which is not intended to be used by passengers. U.S. 8,109,469 at col. 1, ll. 15-31; Brauer dec. ¶¶42-43. Indeed, the Breuer reference explains that a passenger cannot even stand up straight in it: "the distance between the first region of the floor of the module is less than 180 cm, for example even less than 150 cm or 130 cm, such that the use of a toilet seat in that region is possible but erect standing is not possible." Col. 1, ll. 63-66. Moreover, **even in the case of crew accommodations,**

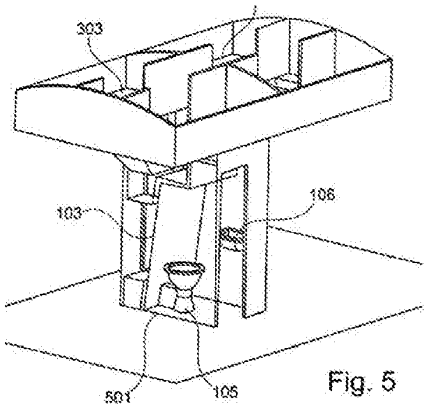


Fig. 5

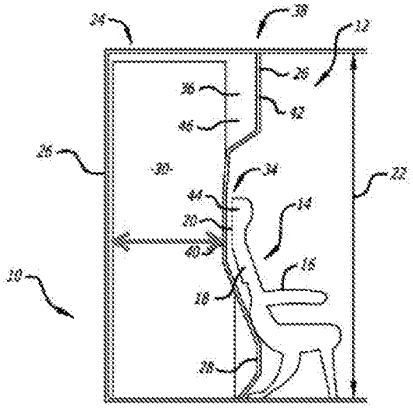
Breuer does not compress the lateral width of the lavatory. This punctuates the point that a skilled artisan simply would not have compressed the lateral dimensions of a lavatory unit. Brauer dec. ¶¶42-46.

Further still, skilled artisans believed that the worst possible location to compress lavatory width was at counter height, since this roughly corresponds to the shoulder height of a passenger seated on the toilet. As explained in Mr. Brauer's declaration, the traditional 737 lavatory was 25.5 inches wide at counter level, which is only about 3 inches wider than a typical clothed male. Id. ¶16, citing Ex. N, Ex. O. Accordingly, if one skilled in the art were to even consider compressing the lateral width of a lavatory, he or she would believe that one of the worst locations to compress that dimension was at counter height.

In summary, the conventional wisdom in aircraft lavatory design at the time of filing was that lavatory dimensions in the longitudinal axis of the airplane were already very tight. Brauer dec. ¶17. Those experienced in the art of lavatory design believed that one should not permanently invade the lateral dimensions of a lavatory, especially at counter height.

C. Industry Reaction to the Spacewall™ System

The lavatory enclosure described in the above-referenced patent applications is sold commercially under the tradename Spacewall™. Brauer dec. ¶19. The Spacewall™ lavatory cut directly against this conventional wisdom and was received with great skepticism in the industry. As shown in the illustration at right, the Spacewall™ design permanently compressed the lateral dimension or width of the lavatory. *Id.* Moreover, it did so at seated shoulder height, which as discussed above was considered to be one of the worst places to compress lateral lavatory



dimensions. Spacewall™ was the first design that included a curved wall that invaded the lavatory space to move seats back and gain floor space. *Id.*

Boeing initially received the Spacewall™ design with acute skepticism. The Boeing representatives challenged B/E Aerospace to prove that the Spacewall™ lavatory could be ergonomically comparable to existing lavatories (which was a design requirement) while still accommodating all of the required items (like plumbing fixtures, conduits, trash cans, tissues, paper towels, air-sickness bags, fire extinguishers, water filters, water heaters, valves, waste baskets, and the like). Brauer dec. ¶¶20-23; Freeman dec. ¶5. To convince the Boeing representatives that it was feasible, B/E Aerospace had to build detailed mock-ups of both the passenger environment and the systems and commodity arrangements. Brauer dec. ¶21.

After seeing the mock-ups, however, Boeing's skepticism turned to excitement. Boeing asked to see a copy of B/E Aerospace's pending patent application concerning the Spacewall™ lavatory (the benefit of which is claimed by the instant application). *Id.* ¶22. B/E provided Boeing a copy of the patent application and thereafter the final agreement between Boeing and B/E included pricing terms that provided B/E Aerospace an incentive to sell the Spacewall™ system exclusively to Boeing. *Id.;* Freeman dec. ¶5-6.

Ultimately, Boeing selected the Spacewall™ lavatory as the OEM fitment for 737 aircraft and, in so doing, dropped its long-standing OEM lavatory supplier, Yokohama. Brauer dec. ¶23. The cited facts demonstrate that the strength of the Spacewall™ technology and patent were principal factors. Yokohama had been Boeing's supplier for conventional 737 lavatories for over a decade, whereas B/E Aerospace was new to the OEM lavatory market. *Id.;* Freeman dec. ¶6. Notwithstanding this, Boeing awarded to B/E Aerospace the supply contract for 737 aircraft, which is **valued at almost $1 billion dollars**. Freeman dec. ¶6. Boeing's decision to drop a long-standing supplier and award such a large contract to B/E Aerospace, a new-comer to the OEM lavatory market, underscores the fact that Boeing,

which had successfully patented several different lavatory inventions, perceived B/E's then-patent-pending Spacewall™ lavatory to be nonobvious.

The reaction at Delta Air Lines, Inc. was similar to Boeing's – initial skepticism followed by surprise and acquiescence. Like Boeing, Delta's representatives insisted on seeing detailed functional mock-ups of the system. Brauer dec. ¶24. After examining those mockups Delta requested that the Spacewall™ lavatory be included in Delta's 737 aircraft. *Id.*

A similar story played out at United Air Lines, Inc. The United CEO was so skeptical that he insisted on seeing not only mock-ups but rather a full size prototype that he could sit in. *Id.* ¶25. B/E Aerospace provided one and he inspected it side-by-side with a full-size conventional 737 lavatory unit. *Id.* Thereafter United requested that the Spacewall™ lavatory be included in the 737 aircraft that United ordered from Boeing. *Id.* United also had their pre-existing 737 aircraft retrofitted with a copy-cat of the Spacewall™ design sold by Zodiac. *Id.*; see discussion *infra.*

Consistent with the skepticism (and later surprise and acquiescence) expressed by major customers such as Boeing, Delta, and United, the Spacewall™ lavatory received substantial acclaim in the industry. One publication noted that the design was "**taking the industry by storm**." Ex. E (emphasis added). The Wall Street Journal referred to the Spacewall™ lavatory as "a **ground-breaking coach-cabin lavatory. . .** that won over Boeing Co. and airlines because it packs a loo into a little space and allows for a few more coach seats on planes." Ex. F (emphasis added); see also Brauer dec. ¶26, citing Ex. G ("Asked why Boeing selected B/E Aerospace for the new lavatories, Boeing says: 'The B/E Aerospace modular lavatory system was selected for use in the Next Generation 737 to provide greater value to our airplane customers by freeing up floor space in the cabin.'").

Perhaps most significantly, the Spacewall™ lavatory won an award that is essentially the Oscar of the aircraft industry – the **Crystal Cabin Award for Industrial Design & Visionary Concepts**. Mr. Brauer was on the judging panel for the Crystal Cabin Awards since its inception[2] and the criteria included "patent-like considerations including a substantial inventive step over the prior art by the applicant for the award." *Id.* ¶27. The 2014 the Crystal Cabin award for Industrial Design & Visionary Concepts was given to B/E Aerospace for the Spacewall™ lavatory "**to recognize the novelty and groundbreaking nature of the design**." *Id.* ¶*28* (emphasis added).

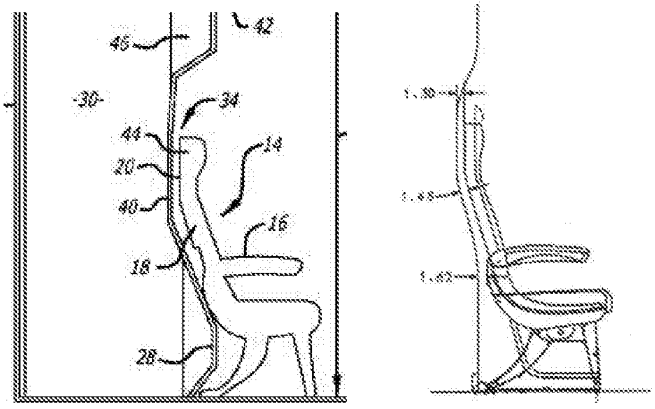
Many of the judges were likely well familiar with the aircraft closet design shown in the Betts reference applied by the Examiner. The Betts system was owned by McDonnell-Douglas and was deployed on DC-10s in the 1980s, 90s and 2000s. *Id.* ¶29. One of the Crystal Cabin Award judges who evaluated the Spacewall™ design was Rolf Sellge, who joined McDonnell-Douglas in about 1980 and stayed with the firm through its merger with McDonnell and then McDonnell-Douglas merger with Boeing. *Id.* ¶30. His tenure at McDonnell-Douglas would have covered the last eight years of DC-10 production, into which the Betts closet system was integrated. *Id.* Another one of the judges was Vern Alg, senior interiors engineer from Continental Airlines which had one of the world's largest fleets of DC-10s, which incorporated the Betts invention. *Id.* ¶31. Mr. Alg was with Continental from 1993 until 2008 as Senior Manager Interiors Engineering and Director of Project Management. *Id.* Indeed, there were over a dozen industry experts on the judging panel and most, or all, likely would have had some familiarity with the Betts coat stowage arrangement. *Id.* ¶32.

The Crystal Cabin Award for Industrial Design & Visionary Concepts was a manifestation of the uniformity with which those in the industry reacted with skepticism

[2] Mr. Brauer recused himself from voting on the Spacewall™ design. *Id.* ¶27.

which turned to surprise upon realizing that the Spacewall™ design maintained passenger comfort while compressing the lateral dimension of the lavatory. That was not thought possible in the industry prior to the Spacewall™ innovation.

The feasibility of the Spacewall™ design also took B/E Aerospace's competitors by surprise, as evidenced by the fact that one competitor copied key features of the Spacewall™ design. As can be seen in the side-by-side comparison below, the lavatory enclosure sold by Zodiac Aerospace, and its subsidiary C&D Zodiac, Inc., is a close copy of the patented Spacewall™ design. See Ex. L at 98:7-13, 99:17-100:1 (confirming that the Zodiac copy-cat design is covered by the claims); Ex. M (drawing of Zodiac copy-cat design referenced in cited testimony in Ex. L).



B/E Spacewall™ Zodiac Copy

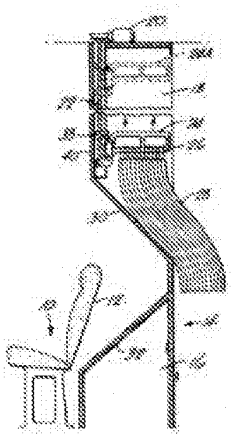
The most reasonable inference from this, when taken together with the fact that Zodiac was a major lavatory supplier for many years but failed to introduce an alternative solution prior to the introduction of the Spacewall™ lavatory, is that Zodiac copied the design of the Spacewall™ lavatory. *Dow Chem. Co. v. American Cyanamid Co.*, 816 F.2d 617 (Fed. Cir. 1987) (evidence of copying was persuasive of nonobviousness when an alleged infringer tried for a substantial length of time to design a product or process similar to the claimed

invention, but failed and then copied the claimed invention instead); *Intri–Plex Technologies, Inc. v. Saint–Gobain Performance*, IPR2014-00309, Paper 83 at 40 (March 23, 2014) ("A party may prove copying by showing that an accused copier had access to the patented product combined with substantial similarity to the patented product."), citing *Wyers v. Master Lock Co.*, 616 F.3d 1231, 1246 (Fed. Cir. 2010).

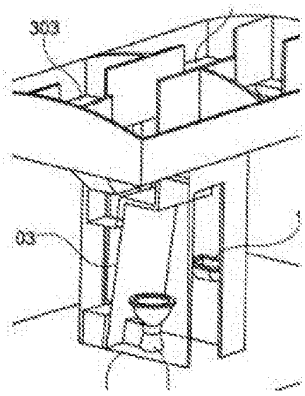
Every expert in the industry appears to have reacted to the Spacewall™ innovation in the same way: at first with disbelief and then with surprise and acquiescence after seeing mock-ups or prototypes. The Spacewall™ innovation was directly responsible for newcomer B/E Aerospace winning the Boeing 737 OEM lavatory contract, displacing a long-standing supplier. Those in industry associations recognized the innovativeness of the Spacewall™ design with awards. Those working for competitors quickly copied the design out of fear that, like Yokohama, their products would be replaced by the Spacewall™ system.

D. No One Skilled in the Art Would Have Attempted the Proposed Combination of Betts and Breuer, and No One in Fact Did

The Office Action rejected claims 1-4 based on the combination of Betts et al. (U.S. Patent 3,738,497) and Breuer (U.S. Patent No. 8,109,469). Office Action ¶¶2, 5. For claims 1 and 3 the Examiner further relies upon Bar-Levav (U.S. Patent No. 6,237,872) as teaching retrofitting an aircraft to accommodate a new seating arrangement. Office Action ¶3. For all claims, the Examiner has taken the position that one skilled in the art would have considered it obvious to incorporate the design of Betts into the lavatory side wall of Breuer, each of which is shown below. Office Action at ¶¶3, 6.



Betts (MD/Boeing)



Breuer (Airbus)

Before addressing the combination, it is first appropriate to clarify several aspects of the Betts reference. First, the Betts system was designed for and deployed on DC-10s such that the coats 28 would extend into a cross-aisle during take-off and landing. Brauer dec. ¶39. This is consistent with the other prior art addressed above, in which space was invaded only temporarily during take-off and landing. *Id.* Second, anyone in the industry would recognize that Figure 1 of is far out of scale. *Id.* ¶35-37. The DC-10 coat closet (into which the Betts system was deployed) was only about ten inches wide, whereas the drawing would suggest that it was several feet deep. *Id.* For these reasons one skilled in the art reading Betts would clearly understand that was not intended to be an accurate depiction of relative dimensions. *Id.*; see also *Hockerson-Halberstadt, Inc. v. Avia Grp. Int'l, Inc.*, 222 F.3d 951, 956 (Fed. Cir. 2000) ("Under our precedent, however, it is well established that patent drawings do not define the precise proportions of the elements and may not be relied on to show particular sizes if the specification is completely silent on the issue.") Third, the Betts specification says only that the recess in the wall receives the seatback ***when tilted***. Betts at 2:20-25 ("[t]he lower portion 30 of the coat compartment 18 slants rearwardly to provide a space for **seatback 12 to be tilted rearwardly** as desired by the occupant. The top 32 of storage space

16 also slants rearwardly **so as not to interfere with seatback 12 when tilted**.") (emphasis added). Nothing in Betts suggests that the wall can receive any portion of the seat in an unreclined position.

For these reasons, a skilled artisan would read Betts as disclosing a coat storage system which **temporarily intruded upon aisle space** (like prior art lavatories by Boeing and Jamco) and had separate and divided upper and lower enclosures **to permit the seat to recline**. Brauer dec. ¶39. A skilled artisan would **not** read Betts as disclosing that an unreclined seat is received by a contoured forward wall. *Id.* ¶38. Betts is silent about the relative position of the seatback when unreclined. *Id.*

Turning to the Breuer reference, as explained above this reference is consistent with the principle that one should not compress the lateral dimensions of a lavatory. As shown in Breuer's Figure 11, an annotated version of which appears below, the lavatory plainly includes a flat forward wall. Airbus (the owner of the Breuer patent and another major aircraft manufacturer) declined to contour the lavatory forward wall even in the context of a crew lavatory. Brauer dec. ¶42-44. Stated another way, **Airbus declined to compress lateral lavatory dimensions even in a crew lavatory, wherein sub-standard conditions were tolerated**.

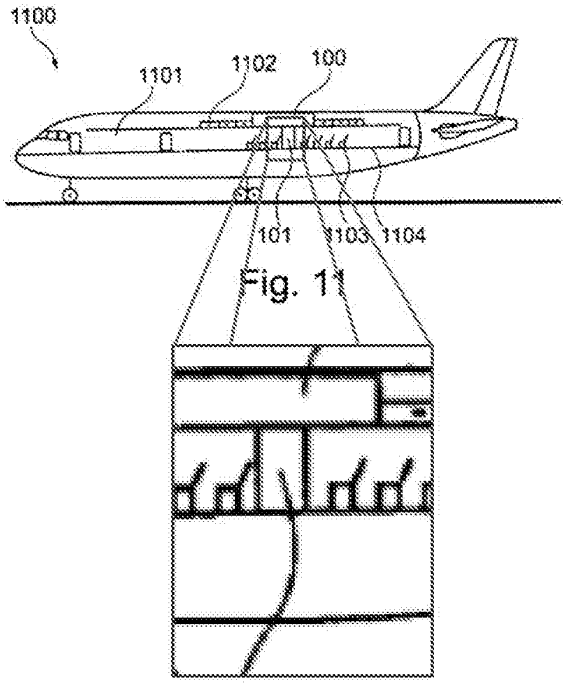


Fig. 11

The following premise thus cannot be overemphasized: **both Betts and Breuer are consistent with the conventional wisdom in the industry, namely, that one cannot permanently intrude on the lateral dimensions of a lavatory**.

As the Supreme Court noted in *KSR*, where the prior art teaches away from the recited combination, the claimed subject matter is likely nonobvious.

> The Court [in *United States v. Adams*] relied upon the corollary principle that when the prior art teaches away from combining certain known elements, discovery of a successful means of combining them is more likely to be nonobvious. When Adams designed his battery, the prior art warned that risks were involved in using the types of electrodes he employed. The fact that the elements worked together in an unexpected and fruitful manner supported the conclusion that Adams's design was not obvious to those skilled in the art.

KSR, 550 U.S. at 416 (citations omitted). In this connection the Supreme Court cautioned that where the proposed combination involves more than the simple substitution of one known element for another,

> [o]ften[] it will be necessary for a court to look to interrelated teachings of multiple patents; the effects of **demands known to the design community** or present in the marketplace; and the **background knowledge possessed by a person having ordinary skill in the art**, all in order to determine whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue.

KSR, 550 U.S. at 419 (emphasis added).

Here, the "demands known to the design community" and "the background knowledge possessed by a person having ordinary skill in the art" militate strongly against the proposed combination, *i.e.*, applying the Betts coat closet configuration to the forward wall of the Breuer lavatory. Put differently, there was no motivation to make the proposed combination. The strong and prevailing view was that lavatory dimensions should not be further compressed along the longitudinal axis of the airplane. Brauer dec. ¶¶16, 45. Moreover, the proposed combination would compress this lavatory dimension at counter-height, which is one of the most critical locations because it closely corresponds to the height of a passenger's shoulders while seated in the lavatory. *Id.* If a skilled artisan were to even consider compressing the lateral dimensions of the lavatory, he or she certainly would not have considered compressing the lateral lavatory dimensions at shoulder height. *Id.* That would be one of the last places a skilled artisan would want to compress the lateral dimensions of the Breuer lavatory. *Id.* This is especially true when one considers the fact that the Breuer lavatory is already a sub-sized crew lavatory in which one cannot even stand upright. Col. 1, ll. 63-66.

This explains why the owner of the Betts patent (McDonnel-Douglas, acquired by Boeing in 1997) never used the Betts coat closet configuration as the forward wall of a lavatory. If such a modification of Betts was obvious, clearly Boeing or McDonnell-Douglas or Airbus would have done so in the 1970s, 1980s, 1990s or 2000s, in response to the well document pressure to densify cabin space and increase seat count.

The foregoing also explains the acute skepticism expressed by Boeing and others in the industry when first exposed to the Spacewall™ design. No one in the industry believed it would work until they saw mock-ups or prototypes. Brauer dec. ¶¶21, 24-25. That speaks volumes. *Environmental Designs, Ltd. v. Union Oil Co. of Cal.*, 713 F.2d 693, 698 (Fed. Cir. 1983) ("Expressions of disbelief by experts constitute strong evidence of nonobviousness").

Consistent with all of this, a panel of industry judges who were well acquainted with the Betts closet system and prior art lavatories considered the Spacewall™ design to be innovative and visionary. Brauer dec. ¶¶27-33. B/E Aerospace received the Crystal Cabin award precisely because the Spacewall™ design cut directly against the conventional wisdom and disrupted the industry. *Id.*

There is no evidence in the cited references or anywhere else that one of skill in the art was motivated to put a curved wall on a lavatory as in the subject application; indeed, all the evidence is to the contrary. The evidence taken as a whole convincingly demonstrates that those skilled in the art would not (and in fact did not) consider it feasible to apply the Betts coat closet even to the crew lavatory of Breuer.

E. Substantial Evidence of Commercial Success Further Supports the Conclusion that the Proposed Combination of Betts and Breuer is Nonobvious

As explained above, Boeing awarded a contract worth almost $1,000,000,000 (one billion U.S. dollars) to B/E Aerospace in large part due to the perceived nonobviousness of the Spacewall™ innovation. B/E Aerospace's work under that contract is currently ramping up and will reach steady state in 2018. Freeman dec. ¶¶8-9.

At that time, it is projected that B/E Aerospace's market share will have climbed from 0% to about 20% in the OEM lavatory market. *Id.* ¶10. This market is relatively well-defined and measurable, as it consists essentially of sales by five leading aircraft interior equipment

suppliers (B/E Aerospace, Diehl, Jamco, Yokohama, and Zodiac) to the five leading manufacturers of commercial aircraft (Airbus, Boeing, Bombardier, Embraer, and Tupoloev). *Id.* ¶7. The total annual sales in 2018 in the OEM lavatory market is predicted to be $610 million U.S. dollars. *Id.* ¶9. B/E Aerospace's share of that market will be about 20%, up from 0% in 2014. *Id.* ¶10.

B/E Aerospace's gain of 20% of the market in OEM lavatories is directly attributable to the novel claimed features of the Spacewall™ design. *Joy Technologies Inc. v. Manbeck,* 751 F. Supp. 225, 229 (D.D.C. 1990), *aff'd*, 959 F.2d 226, 228 (Fed. Cir. 1992). The instant claims recite the contoured front wall that is directly responsible for enabling the aircraft manufacturer to include additional seats. Brauer dec. ¶19; Freeman dec. ¶11. Indeed, third party press outlets have reported that the B/E Aerospace won the Boeing contract **because** Spacewall™ provided an extra row of seats. Freeman dec. ¶11; Ex. K ("My colleague Susan Carey reports on a ground-breaking coach-cabin lavatory built by B/E Aerospace that won over Boeing Co. and airlines because it packs a loo into a little space and allows for a few more coach seats on planes."); Ex. G ("The B/E Aerospace modular lavatory system was selected for use in the Next Generation 737 to provide greater value to our airplane customers by freeing up floor space in the cabin.").

The commercial success did not arise from extraordinary marketing or other factors. Freeman dec. ¶¶12-13. The ability of the Spacewall™ enclosure to provide extra cabin space (and thus additional seats) appears to have been the principal reason that Boeing awarded the contract to B/E Aerospace, a new-comer to this market. *Id.*; Ex. G. Marketing was not a factor. Freeman dec. ¶¶12-13. Nor was brand; indeed, B/E was new to this particular market whereas Yokohama (the supplier displaced by the Spacewall™ design) had a decade-long relationship with Boeing. *Id.* ¶13.

The claimed subject matter thus is directly and primarily responsible for the gain of about 20% global market share, which equates to annualized sales of about $150,000,000. Freeman dec. ¶¶9-13. The Spacewall™ innovation thus presents a rare and compelling case of substantial commercial success which was created by the claimed features. For this reason the objective evidence should be given substantial weight. *Hybritech Inc. v. Monoclonal Antibodies, Inc.,* 802 F.2d 1367 (Fed. Cir. 1986) (Evidence of commercial success supported a conclusion of nonobviousness where the claimed features enabled the patent owner to quickly capture 25% of the market).

III. The Proposed Combination of Betts and Breuer Does Not Meet the Claim Language

Assuming arguendo that one was to make the combination proposed by the Examiner, the resulting combined system still would not meet the language of the claims. For instance, in the proposed combined system the seat is not adapted to be moved backwards as part of a retrofit with the contoured wall as required by the independent claims. The dependent claims further recite that the wall conform to the contour of the back of the passenger seat and the Betts closet does not meet this recitation. For these additional reasons the claims should be allowed.

A. "Seat Support Can Be Positioned Further Aft in the Cabin than if the Cabin Included another Enclosure Unit Having a Substantially Flat Front Wall" (Independent Claims 1 and 2)

Independent claims 1 and 2 recite that the seat support is positioned further aft relative to where the seat support would be if a flat lavatory wall was used. There is nothing in the cited references to suggest that the seat is or can be moved further aft. To the contrary, in the proposed combined system of Betts and Breuer, the seat support ***cannot*** be positioned any further aft. Brauer dec. ¶¶40-41. As shown in Betts' Fig. 1, the Betts wall prevents the seat support of Betts from being moved any further back relative to where the seat support would

be if a standard flat lavatory wall was used. *Id.* In contrast and for example, the contoured lower portion of the patented contoured wall (see application as-filed at Fig. 2) permits the seat support to nestle into the contour, which in turn allows the seat support to be positioned further back relative to where the seat support would be if a standard flat lavatory wall was used. *Id.*

Further, one skilled in the field would **not** read Betts as disclosing that the seat protrudes into the wall cavity when unreclined. Brauer dec. ¶38. Nor would such a person read Betts as disclosing a system in which seats could or should be moved further aft in the cabin; Betts is simply silent as to that issue. *Id.* As discussed above, there is nothing in Betts to suggest this, and indeed the specification expressly states that the recess is for **tilting** the seat back. Betts at 2:20-25 ("[t]he lower portion 30 of the coat compartment 18 slants rearwardly to provide a space for **seatback 12 to be tilted rearwardly** as desired by the occupant. The top 32 of storage space 16 also slants rearwardly **so as not to interfere with seatback 12 when tilted**.") (emphasis added). For this additional reason the Betts wall does not permit the seat support to be positioned any further aft than if the cabin included another enclosure unit having a substantially flat front wall.

Accordingly, the proposed combined system of Betts and Breuer, even in combination, cannot meet the recitation in independent claims 1 and 2 to the effect that the "seat support can be positioned further aft in the cabin than if the cabin included another enclosure unit having a substantially flat front wall."

B. "Positioning Said Seat Support Further Aft in Said Aircraft Cabin than Said Seat Support Could Have Been Positioned Prior to Retrofitting Said Aircraft" (Independent Claim 1) and "Installing . . . Whereby Said Aircraft Passenger Seat in the Unreclined Seat Position Seat Support is Installed Further Aft in Said Cabin than would be Possible if the Substantially Flat Front Wall of the Other Enclosure Unit was Located in Substantially the Same Position in the Aircraft Cabin as the Forward Wall." (Claim 2)

The installation of the proposed combined system also fails to meet the related recitation in claim 1 of "positioning said seat support further aft in said aircraft cabin than said seat support could have been positioned prior to retrofitting said aircraft" and the recitation in claim 2 of "installing . . . whereby said aircraft passenger seat in the unreclined seat position seat support is installed further aft in said cabin than would be possible if the substantially flat front wall of the other enclosure unit was located in substantially the same position in the aircraft cabin as the forward wall." Here again, the lower portion of the Betts wall prevents the seat support from being moved any further back relative to where the seat support would be if a standard flat lavatory wall was used. The combined system simply cannot meet the "positioning" limitation of claim 1 or the "installing" limitation of claim 2.

Moreover, the cited references do not disclose or even remotely suggest **positioning** or **installing** seats further aft in the cabin than where seats were positioned or could have been positioned prior to a retrofit. Betts says nothing about retrofitting, positioning or installing seats. Breuer is likewise entirely silent on this claimed step of position or installing a seat further aft in the airplane than would be possible prior to a retrofit. The Examiner cites Bar-Levav for the concept of rearranging seats (Office Action at 5), but this reference is likewise silent about positioning seats further aft in the cabin relative to where they would be positioned prior to a retrofit. Even when taken in combination, therefore, the references fail to meet the "positioning" and "installing" limitations of claims 1 and 2.

C. "Configured to Receive a Portion of the Exterior Aft Surface of the Passenger Seat Back [when the Seat Back is] in an Unreclined Seat Position" (Independent Claims 1-2)

Independent claim 1 recites that the wall is "configured to receive a portion of the exterior aft surface of the passenger seat back when the seat back is in an unreclined seat position." Independent claim 2 similarly recites forward wall is "configured to receive a portion of the exterior aft surface of the passenger seat back in an unreclined seat position."

Betts is simply silent as to whether an unreclined seat back extends into the recess formed by wall segments 30 and 32. Indeed, the Betts configuration is the precise opposite, with the recess designed to allow the seat to recline. Betts expressly states that

> [t]he lower portion 30 of the coat compartment 18 slants rearwardly to provide a space for **seatback 12 to be tilted rearwardly** as desired by the occupant. The top 32 of storage space 16 also slants rearwardly **so as not to interfere with seatback 12 when tilted**.

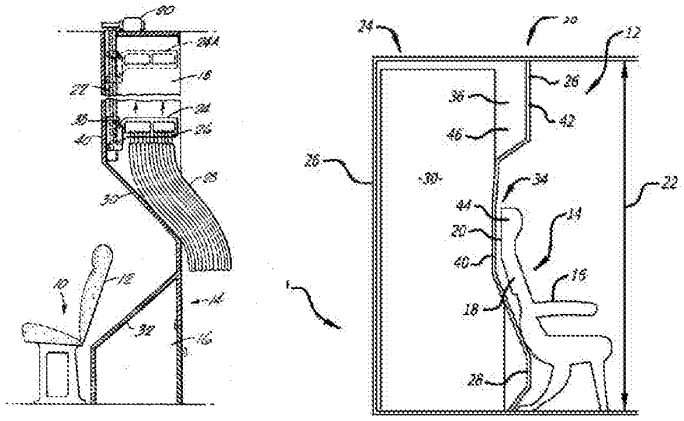
Betts at 2:20-25 (emphasis added). Nowhere does Betts suggest that the lower portion 30 provides space to receive a passenger seat when in **unreclined** position, as claimed.

Under Federal Circuit precedent, it would be error to infer this feature from Betts' drawings, at least because Betts does not indicate that the drawings are to scale. *Hockerson-Halberstadt*, 222 F.3d at 956 ("Under our precedent, however, it is well established that patent drawings do not define the precise proportions of the elements and may not be relied on to show particular sizes if the specification is completely silent on the issue."). To the contrary, the declaration evidence submitted herewith demonstrates that a skilled artisan would understand that the Betts drawings are not intended to be to scale. Brauer dec. ¶35. In any event, and as discussed above, the drawings in light of the specification do not indicate in any way that the wall receives any portion of the seat back in an unreclined position, as required by the claims, and to the contrary, expressly state that the recess is for a tilted seat back. *Panduit Corp. v. Dennison Mfg. Co.*, 810 F.2d 1561, 1568 (Fed. Cir. 1987) ("Among

legal standards for determining scope and content of the prior art, for example, are: a prior patent must be considered in its entirety, *i.e.*, as a whole, including portions that would lead away from the invention in suit.").

D. "Forward Wall is Shaped to Substantially Conform to the Contoured Shape of the Exterior Aft Surface of the Passenger Seat" (Dependent Claims 3-4)

The proposed combined system of Betts and Breuer also fails to meet the recitation in dependent claims 3 and 4 that the "wall is shaped to substantially conform to the contoured shape of the exterior aft surface of the passenger seat." The exterior aft portion of the Betts seat back, reference number 12 in the figure below left, is flat and not contoured. In Figure 2 of the pending application, by contrast, the exterior aft surface of the seat back has a contoured shape that is not flat (see the aft portion of the seat back indicated by reference number 20 and the portion of the seat back to which reference number 18 points). Brauer dec. ¶54. The Betts seat (which is the seat used in the combined system proposed in the Office Action) does not have such a contoured shape and thus the combined system cannot meet the claim language.

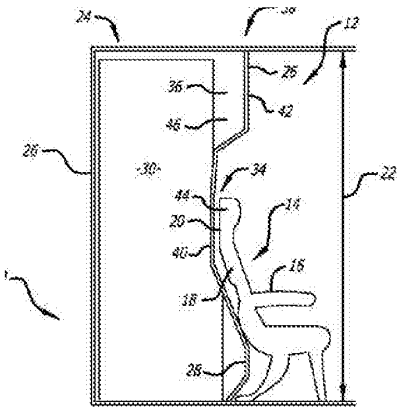


Moreover, a skilled artisan would see no reason to modify Betts wall 32 to include such a contoured shape even if the Betts seat back was contoured (which it is not). The space below wall 32 is designed for luggage storage. Betts at col. 2, line 12 ("luggage storage space

16"). If the wall 32 was curved into to luggage storage space the region at the top of space 16 would become narrower and less useful for storage. Brauer dec. ¶55. The same would be true if that space 16 was disposed in a lavatory, as in the proposed combined system.

E. "Contoured Shape Includes a First Section Extending along a First Axis and a Second Section Extending along a Second Axis, Said First Section Adapted to Support a Passenger's Head and a Second Adapted to Support a Passenger's Back, Wherein Said First Axis is not Parallel with Said Second Axis" (Dependent Claims 5-6)

Dependent claims 5 and 6 more specifically recite the contoured shape of a passenger seat. Nothing in the proposed combination suggests that the prior art seat would have such a shape. Brauer dec. ¶56. Claims 5 and 6 recite that the "contoured shape includes a first section extending along a first axis and a second section extending along a second axis, said first section adapted to support a passenger's head and a second adapted to support a passenger's back, wherein said first axis is not parallel with said second axis." This generally corresponds to the upper portion of the seat back (reference number 20 in the figure at right) and the lower portion of the seat back (to which reference number 18 points). As noted above, the Betts seat back and the Betts wall 32 lack any such contour and one skilled in the art would not have seen any apparent reason to contour the seat in that manner. Brauer dec. ¶¶54-56.



IV. Conclusion

On this record one need not speculate what those skilled in the art would or would not have done. The evidence shows that skilled artisans were working continuously since the 1970s to make more space efficient cabins and lavatories. Yet nobody made the claimed lavatory. To the contrary, skilled artisans plainly believed that lavatories should not be

further compressed, particularly at counter height. Given this, it is understandable that those in the industry reacted to the Spacewall™ design with acute skepticism. It is also understandable that their skepticism turned to surprise when they saw mock-ups and prototypes of the Spacewall™ design and they realized that the design was in fact feasible. The surprise led to widespread acclaim including the industry's most prestigious award, as well as to acquiescence and the capture of substantial market share. In light of the foregoing, it can confidently be stated that one skilled in the art would not have made the combination proposed by the Examiner. Even if the combination were contemplated, however, it still would fail to meet various recitations set forth in the claims. For these reasons the claims should be allowed.

Respectfully submitted,

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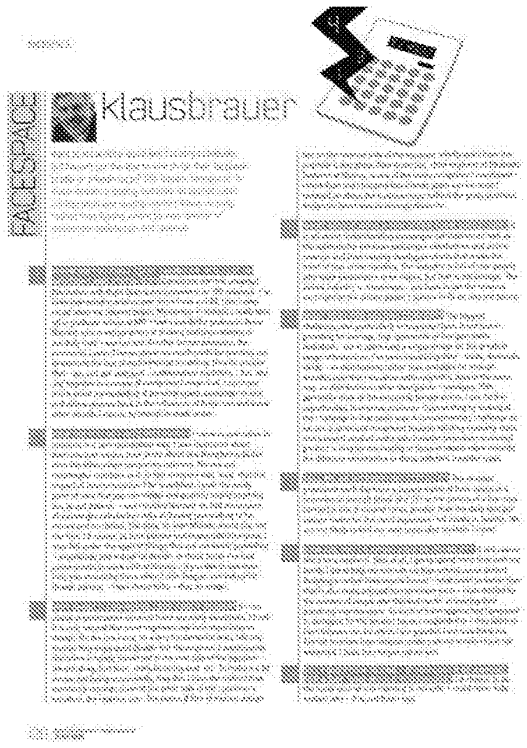
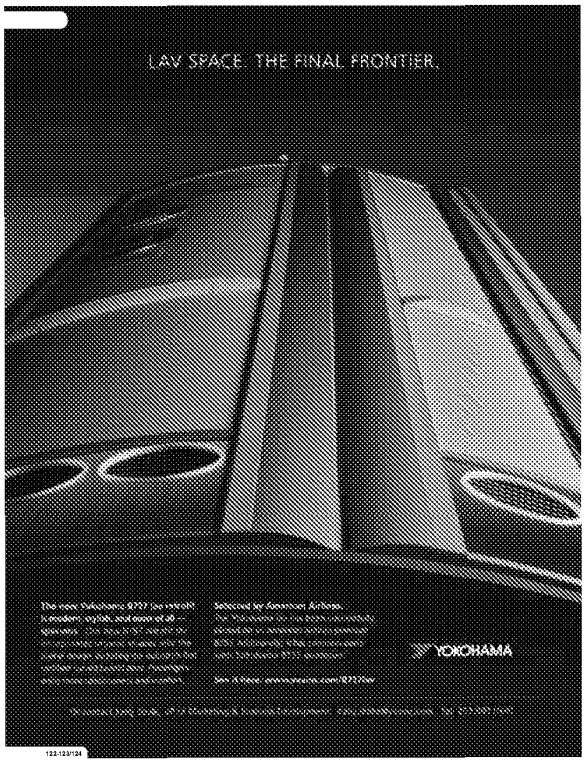
EXHIBIT A





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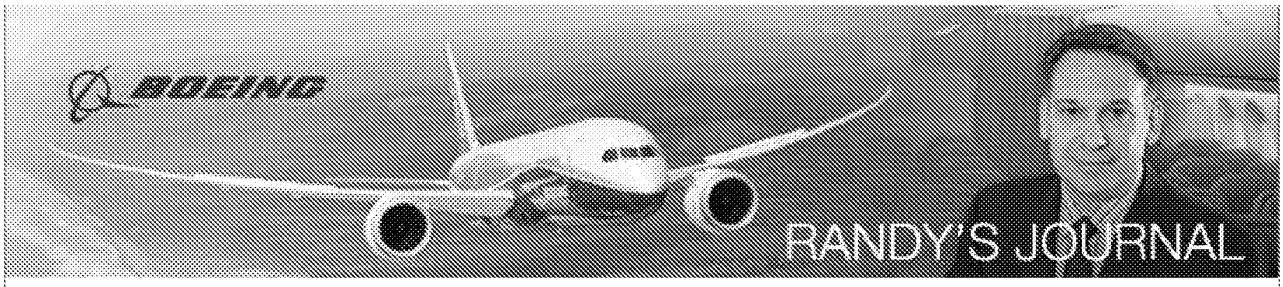
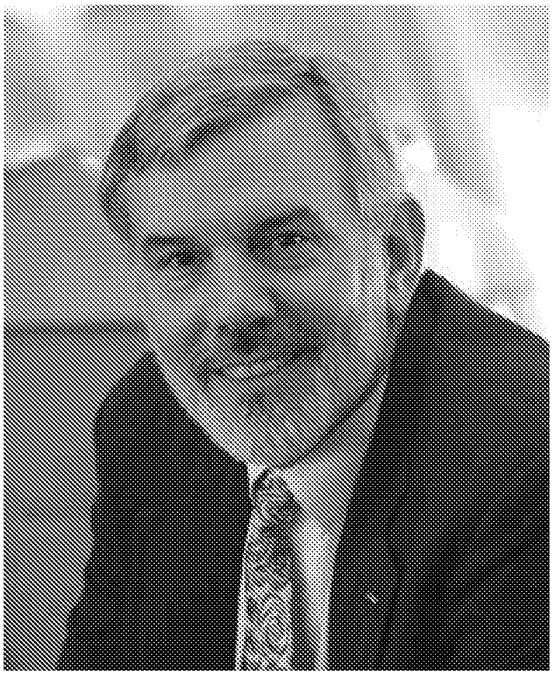


Dream weaver

In my 28 years at Boeing, I've met some truly remarkable people who have changed our industry. Some of them you know, such as Joe Sutter.

Others have spent their entire careers working behind the scenes or in very specialized areas. One of those people is my friend and colleague Klaus Brauer.



Boeing's Klaus Brauer.

In 2009, Klaus retired after 30 years at Boeing.

He is considered one of the world's leading authorities on airplane interiors and passenger comfort. His official title at Boeing was "Director – Passenger Satisfaction and Revenue."

But Klaus would always be glad to explain to you that what he did was develop concepts and tools to help airlines become profitable. Those tools also guided Boeing's product development efforts.

Before Klaus packed up his offices here at our Commercial Airplanes offices in Renton, we took some time to sit down and talk. Here's "part one" of our conversation:

Klaus, you brought science to something that maybe had been seen as an "art" before. Is that fair to say?

I think that's true. The origins go back to the 767 vs. A310 days.

I remember that well.

Archives

This page contains a single entry in Randy's Journal, a blog of thoughts and observations hosted by Randy Tinseth, vice president, marketing for Boeing Commercial Airplanes in Seattle.

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We were making these claims that the 767 is clearly superior because it has more window and aisle seats. Well, that makes intuitive sense. But as it happened I was going through some of our surveys and I said, "Wait a minute we've got all the data we need to model this." And we've been able to design airplanes using the resulting models.

Klaus - in earlier days - on the go in Beijing.

I thought of you because I was reading this book called *The Last Templar*. There was a line in it that went something like, "I got on the airplane, I could hear the door close, and how relieved I was because there was an empty seat next to me!"

Yeah, it's still the biggest discriminator in passenger satisfaction. And you know what the revelation for me was? It's not just that people like having empty seats next to them. It's that row arrangements dramatically influence *the probability of having an empty seat next to you*. Now, the response of the traditionalists to this discovery was, "Boeing thinks comfort is a matter of luck."

My point is, no, I want to *make* you lucky. And frankly by converting from 2-5-2 to 3-3-3 we made people lucky. As a result of the change to 3-3-3, millions more passengers have been seated next to an empty seat than would have in exactly the same load factor circumstances in a traditional arrangement.

Airbus embraced the traditional view, and its 2-4-2 arrangement is one of the worst in terms of seating passengers next to empty seats.

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A view of the "lucky" Boeing 3-3-3 cross section in the 787 Dreamliner.

And you know what's interesting, too, is that with the A350, Airbus has changed their design philosophy. They started to talk about width at seated eye level, and perception of interior space.

You look at the A350 cross section. Frankly, it's one of the ones that we considered for the 787. As I read the tea leaves looking at what they've done, they've basically gone far enough to get a kind of "inclusive-tour," a very tight tourist configuration into the airplane at 10-abreast.

But we decided we shouldn't go for that particular cross section for the 787 because it imposed significant added weight and drag on the airplane and as a result, higher fuel consumption, all that bad stuff. The inclusive-tour market was shrinking and people were growing. So we decided not to penalize the 98% of customers who wanted what we've offered, with a cross section optimized for the other 2%.

And I don't think they're getting any value with that cross section. I remember the conversation was, we were kind of plus or minus 3 inches. And of course they're what, six inches wider?

We had the mathematical models in place to really analyze it. It was the first time we'd had that capability in the development of a cross section. And I still feel really good about what we chose instead.

What do you think about the 737 Boeing Sky Interior?

It's my last new interior. It's outstanding, really incredible. You know it's funny, I think I've developed an eye for interiors and architecture and one of the things I've learned, one of the things I know about myself now, is I can't tell from drawings. I can't tell from a photograph.

The 737 Boeing Sky Interior.

It's interesting because we've used photographs with some of our executives and sometimes you'll get, "I can't see a difference."

It's true. You often can't "get it" just from a photograph. It's also true that you can be easily fooled by a photograph. I've worked with some of the best industrial designers on the planet and there's always a point where they say, "We've got to mock it up." So we've developed this capability to do very rapid mockups.

There were two really telling examples of this recently. When we did the 747-8 passenger interior, there was much I could extrapolate from the 787. But the door 2 area, I knew I couldn't tell if there was enough loft in the ceiling - from just the drawings. Because when we see something in real 3-D our eyes and brains are amazing at "decomposing" it and re-assembling it in the brain to make it all proportional. Our eyes and brains simply can't do that with a 2-D image.

747-8 Intercontinental: Seeing the door 2 mockup was a revelation.

I'll never forget when I first saw the loft of the door 2 ceiling for the 747-8. I knew what day the guys would be installing the ceiling panels over the door 2 area of the mockup, and I went over after they'd shut down for the night. Most of the lights were off. There were just a few safety lights on, like "ghost" lights in a theater. The front end of the mockup wasn't built yet so just I walked into the gaping end of the mockup and back to door 2.

There was no one there to see the big smile that came to my face. It was gorgeous. The ghost lights were all I needed to see that the designers from Teague had nailed it.

Made a couple of tweaks, but it's spectacular.

And the 737, it's the same way. I went into the half-finished mockup and could see how beautifully the Boeing Sky Interior works in the 737. Frankly, it really exceeded my expectations, which were pretty high to begin with.

Of all the projects you've worked on, which have you enjoyed the most? I know that's a hard question. And this is *not*, "This is Your Life, Klaus Brauer!"

Wow. Can I do two?

Yes, there are no rules. This is blogging!

I've had the "nerd's joy" of discovering some insights into making passengers more comfortable and airlines more profitable. And I had the great joy of working with and taking inspiration from many brilliant and dedicated people within Boeing and our partner, Teague.

I think there's no question that the whole 787 creative process was extraordinary. From the kinds of research that I'd never been involved in before, all of Blake Emery's psychological research, a discipline I'd had no familiarity with, to really being deeply involved with industrial design. Again, a discipline which is not something I was trained in.

So you actually got a chance to look at the back end, and the front end of the process?

And it was great because I'd been out in the front end for so long listening to customers and trying to understand their requirements. You've got everything they've been telling you for years and an understanding of their problems. But then we enhanced it with insights from the flying public.

Klaus (l) and colleague Blake Emery in the Dreamliner mockup in Renton.

You know, our airline customers, God love 'em, they're in a tough, rapidly evolving business. To survive, the bulk of their focus must be on the short and medium term. They can't afford to spend too much of their energies looking out 20 years. And I think it's our job to look out that far. We owe it to our customers to keep an eye out that far in the future. And so the kinds of methodologies we were using, you shouldn't expect an airline to do that for us, that's our job.

And I think we did an extraordinary job with the research. And the team itself was just so broad, between the interior industrial designers at Teague and our own interior engineers at our concept center.

It took a lot of guts. It took a helluva salesmanship job to get Boeing to spend money that way.

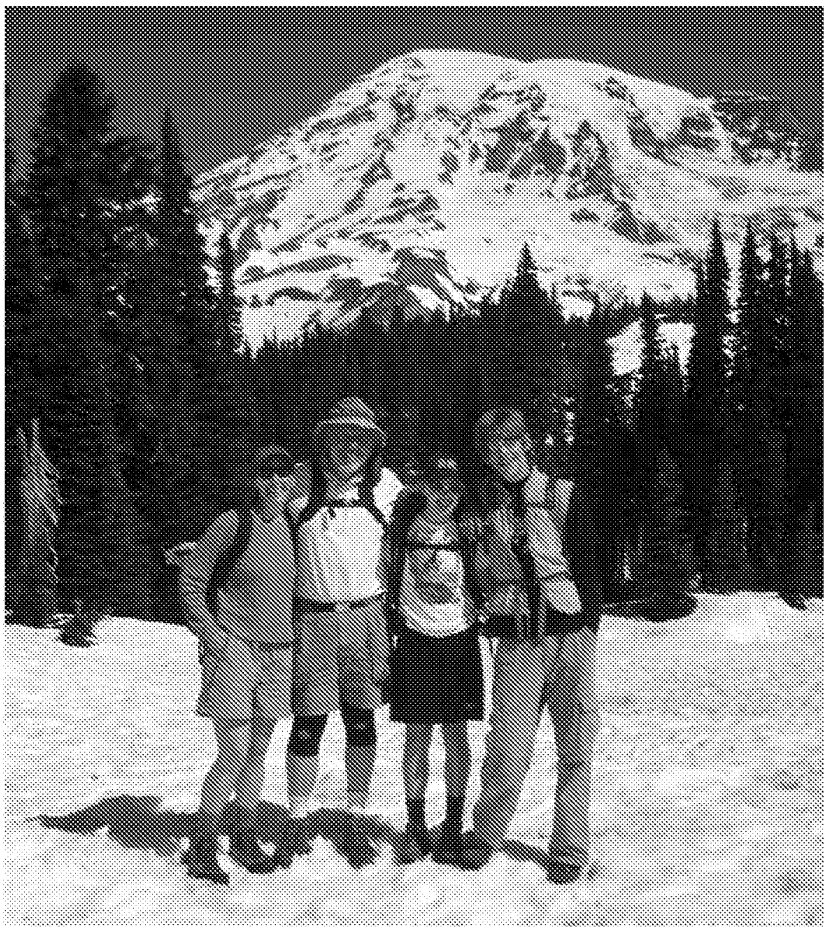
And it's a continuing process. And it's delivering for Boeing. You develop things and hand them off and they're matured somewhere else. It's easy to say, "Yeah, that's a product of the 787 program, or that's a product of the 777 program," when these things actually all had their genesis in the Boeing Concept Center. So all that, for anyone's career, is a super highlight.

The second highlight is, being still a nerd at heart, I'm really happy with the revenue model that I developed, which we call "Whitefish." The team wanted a fun name for it. Whitefish is ..

It's a nice town near Kalispell, Montana near where I grew up.

Ha-ha. Well the true story is, yes, I came up with this during a family ski vacation in Whitefish, Montana. I had wanted to do a model that quantified the change in revenue that's caused by a change in the passenger product.

The change could be, you increase the legroom, you decrease the legroom, you make the seats wider, you make them narrower, or maybe you change the class mix, have a few more business class seats and correspondingly fewer economy class seats. Any of those sorts of things.



Speaking of cabin altitude: Klaus and family at Mt. Rainier.

We can even factor in some things that we were seeing from research for the 787. For instance, some passengers get screaming headaches from cabin altitude. How can we reduce that and what's the impact of that? So I came up with an analytical model that represents a passenger decision process to the point where you get changes in demand. It represents the different fare buckets, as we call them. It replicates the configuration of an airplane and emulates the airline's revenue management system, and everything gets pulled in.

So I worked all this on my laptop watching the snow come down from a cabin in Whitefish. It works very well and it has proven far more adaptable than I'd imagined in those snowy days in Montana. As far as I know, no one had ever done this, to the same extent, from product change to revenue change. And Boeing uses it now in talking with customers, and in product development efforts.

I even use it when I'm talking about 747-8. I can look at two markets with similar airplane configurations and different demand and say, "Hey, you can make more money than an A380 can."

What's been fun is, I'm a real believer that things need to be transparent. Whitefish allows you to look at every equation and track the numbers right through. When you get a surprise, good or bad, you can see what's happening in the model, and ask yourself if you believe it.

> The surprises almost always come because so many things were interacting that your intuition just couldn't keep track of them all. When you can walk through the interactions in the equations you usually end up saying, "Oh, that does make sense."

At the time of his retirement, Klaus pointed out that he'd been with Boeing through good times *and* bad times. As he put it, "Keep the faith. We have extraordinary people and a magnificent product line."

Encouraging words.

I'll share a bit more of my conversation with Klaus later, including some thoughts on what makes Boeing stand out in terms of innovation in airplane interiors, and Klaus' view on what's coming next for our industry.

Posted on 08 March 2010 | Permalink

COMMENTS (13)

Chris C (South Africa):

> This is a truly excellent, and interesting, article indeed. I enjoyed the remark about the 767's interior being "clearly superior" to that of the A310s', as the 767 had more window and aisle seats.
>
> I remember writing about this in an article that was published online: In terms of passenger cabin comfort and flexibility, Boeing claimed that the 767's cabin width was ideally suited for the passenger market. "The 767 body was designed to cater to the people market, rather than the freighter market," said Boeing engineer Jack Steiner at the time, pointing to the 767's unique 7-abreast seating cross-section arrangement in economy.
>
> This new cross-section philosophy on the 767 meant that the airplane had to be more than 80% full before the middle-row centre seats had to be occupied. These seats are famous for being heavily un-popular with passengers due to the need to "push-past" passengers to get to and from the centre seat. Therefore, the 767 offered the preferred cabin arrangement over the A310 according to Boeing.
>
> And speaking of interior innovation on commercial jetliners, I remember reading an interesting article a few years back highlighting the need to address cabin "issues" for people of older ages and limited abilities. Engineers would wear "Third Age Suits" (developed by the Ford Motor Company) that allows them to experience the limitations felt by many older individuals, and helped Boeing identify the need for better colour contrasts in the cabin (particularly for personal in-flight cabin controls), over-head bin operations, etc. Teague was also involved in this study.
>
> These tests, conducted on local flights with Alaska Airlines and

Horizon Airlines, certainly helped Boeing design more user-friendly, market preferred airplane interiors.

Posted on March 8, 2010 11:38

James (Honolulu):

A very interesting post. A layman like myself would strictly be interested in legroom and (lack of) kneeroom. That there's more to interior design never came to mind. Thanks to the TSA I hate the airport experience, but hopefully I can one day fly aboard the 787 and see what interior design is really all about.

Posted on March 8, 2010 13:50

Ed (San Diego):

This was an incredible and enlightening article. I had no idea that designing airplane interiors had come down to a science.

Speaking of "tweaks" in the 747-8i interior, has the design been finalized for the side panels and windows? A lot of us in the blogosphere were wondering if the gentle giant will actually have the rounded windows and beautifully sculpted "frames" that are seen in the current virtual walk through video.

I think that design gives a much more open feeling than the old-style 747-400 windows and side walls which appear in the most current mock up.

Perhaps this was an engineering issue and it couldn't be done? Let's hope not.

Maybe Mr. Brauer has one more in him and can truly deliver a brand new kind of 747 experience before he retires.

Best wishes to him and his family.

Posted on March 8, 2010 19:25

Beck Nader (Belo Horizonte, Brazil):

Congratulations to your article and interview Randy. This is amazing. This is really a very nice and important subject that connects the flying public to the airplanes.

It is not difficult to perceive that the absence of a professional like Klaus with all his experience and "feelings for the science" will be highly missed.

Perhaps Boeing should keep him as a consultant :).

Posted on March 9, 2010 06:23

Barun Majumdar (Seattle, WA, USA) (Seattle, WA, USA):

An encouraging and upbeat story on innovation, indeed! Thanks Randy for bringing the great architect Klaus Bauer into the limelight after his retirement in 2009. I guess the revolutionary idea of passenger comfort and a high probability of having an empty passenger seat is confirmed by statistics and maybe Pauli's famous uncertainty principle as well.

We are embarked as pioneers upon a new science and industry in which are problems are so new and unusual that it behooves no one to dismiss any novel idea with the statement that 'it can't be done!'"
-- William E. Boeing, founder, The Boeing Company

Posted on March 9, 2010 07:49

Barun Majumdar (Seattle, WA, USA):

An increase in passenger load factor would lower the likelihood of having an empty passenger seat on board.

Still, the seasonal variation in passenger load factor (say, 0.6 to 0.9) would provide a seasonal variation in the statistical probability of having empty passenger seats. Apparently, the stat department may help to create a statistical model on likelihood of having empty seats based on data from airliners.

Ostensibly, the 3-3-3 passenger seat arrangement is a revolutionary idea built in the passenger aircraft. Hats off to Klaus Bauer! A true visionary, indeed!

Posted on March 9, 2010 08:22

Danny Yau (Renton, WA):

Thanks for sharing - we truly have amazing people working for The Boeing Company.

Posted on March 9, 2010 10:41

Norman (Long Beach, California, United States):

The 3x3x3 configuration works very good especially when sitting on the middle row of seats it looks less cluttered and cramped, if you have been on a on a DC-10, L-1011 or a 777 with 5 middle seats, this makes a world of difference.

I think Airbus got the idea after they saw the 787 interior and found out about the width in which soon their after they have widened the A350 to fit the 3x3x3 configuration as a standard economy configuration.

The 737's new interior and the 747-8's interior looks very good, the LED lights modernize the the inside decor of the aircraft, until now I have seen LED lights only on Airbus Aircraft.

Great interview and my best regards to Klaus for a great 30 years.

Posted on March 9, 2010 20:42

Fedor (Moscow, Russia):

Russian Il-96 has had 3x3x3 configuration since 1978. See please http://www.airliners.net/photo/Pulkovo-Airlines-(Rossiya/Ilyushin-Il-86/1299486/L/

Posted on March 10, 2010 14:29

Paulo M (Johannesburg, RSA):

Great read! Thanks!

Posted on March 11, 2010 12:10

Muhammad (Castelginest, France):

I guess it must be pretty tough for this guy to leave after 30 years, considering that at the time Boeing was "ruling" the industry, and now Airbus plays equal.
Who should be held responsible for this change?

Posted on March 12, 2010 09:12

Jun Leido (Manila, Philippines):

Congratulations on a new chapter in your life Klaus!!!

I have never met you in person - hope I will - but after reading this blog, I feel, that after flying so many times in different Boeing jets, and absolutely loving my time INSIDE these planes, I feel I have made a connection with you; that, as a passenger, I benefited from all your work.

I think you have a counterpart at Airbus, who would also work hard in delivering airplane solutions that made sense - and money - for its customers. I am sure this competition has resulted on both companies bringing to market different airplanes, which all together benefit the flying customers.

Airbus has a view of the world, as you guys too. Though you will most likely be different, the common denominator is the good airplanes that has come from both companies.

Posted on March 14, 2010 07:12

Richard Mahoney (Everett, Washington):

Great article on Klaus - Im sure he will appreciate it - however,

what you failed to mention is that had has 16 patents on aircraft interior and seat planning methods:

D606,923 Interior archway for an aircraft
7,516,919 Aircraft archway architecture
7,469,860 Aircraft archway architecture
7,448,574 Aircraft archway architecture
7,331,545 Aircraft archway
7,293,739 Aircraft archway
7,252,267 Aircraft archway architecture
7,156,345 Modular overhead stowage bin systems and associated methods
D533,129 Overhead storage bin for an airplane
D516,496 Ceiling panel for an airplane
D512,954 Ceiling panel for an airplane
D508,173 Corner table for an airplane
6,874,731 Modular overhead stowage bin systems and associated methods
6,822,812 Off-angle display systems and associated methods of manufacture and use
6,000,659 Fully reclinable, pivotable airplane passenger sleeper seat assemblies
5,611,503 Optimal airplane passenger seating configurations and methods therefor

Bon Voyage Klaus ..well see you back with your contractor badge when retirement becomes unbearable .. :)

Hi Richard,

Actually we plan to mention this in Part II! But thanks for the details.

-- Randy Tinseth

Posted on March 16, 2010 13:27

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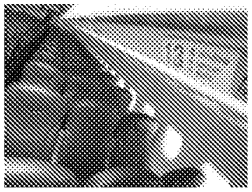
EXHIBIT C

Think airline seats have gotten smaller? They have

Bill McGee, Special for USA TODAY *7:56 a.m. EDT September 24, 2014*



(Photo: Andrew Itkoff for USA TODAY)

No, this isn't yet another examination of the Knee Defender, nor another rumination on the Right to Recline vs. the Right to Defend Against Recliners.

But in the hot debate over defending knees during the last month, I've noticed few have asked just why reclining seats are suddenly causing so much trouble aloft. Simply put, has legroom—and knee room—decreased in recent years? Have seats gotten smaller back in economy class where most of us fly? Have cabins gotten fuller?

The unequivocal answers are yes, yes and yes. And you'll have to deal with what appear to be irreversible trends.

Digging into the archives

In recent years I've sent many readers to the site SeatGuru.com (http://www.seatguru.com), which provides a wealth of information for air travelers about in-flight seating and entertainment options offered by airlines worldwide. But long before the Internet, *Consumer Reports* conducted in-depth examinations of airline seat size and comfort, carrier by carrier and aircraft by aircraft, starting way back in 1985. I was the editor of *Consumer Reports Travel Letter* when we completed the final analysis in 2002 (with painstaking research conducted by Linda Burbank, USA TODAY's Traveler's Aide (http://travel.usatoday.com/columnist/burbank/index)).

I dug out my old copies of CRTL to determine if it's myth that airline seats seem to have gotten smaller lately. I focused on the last four remaining "major" carriers in the United States, as defined by the U.S. Department of Transportation: American (AA), Delta (DL), United (UA) and Southwest (WN). Then I compared CRTL's findings to the latest data provided by SeatGuru for short-haul and long-haul coach/economy classes, eliminating extra-cost premium economy products.

What I found was quite surprising.

Seat pitch

Pitch—or the distance in inches from a given point on one seat to the same point on the seat in the next row—has indeed changed dramatically in economy class at the nation's four largest carriers over the last 30 years.

ECONOMY CLASS SEAT PITCH IN INCHES

	AA	DL	UA	WN
1985	31-33	31-33	32-36	31-35
1989	31-34	31-32	32-34	31-32
1991	31-37	31-33	31-34	31-33
1995	31-33	32-33	31-34	31-32
2000	31-34	31-35	31-33	N/A
2002	32-35	30-33	31-33	N/A
2014	30-32	30-33	30-31*	31-33

**32 inches on Boeing 787 only*

Sources: Consumers Union; SeatGuru

As indicated, all of the Big Three—American, Delta and United—now offer at least some aircraft with a seat pitch of only 30 inches in economy. In years past, 31 or 32 inches were the absolute minimums. What's more, the roomiest pitch offered by the Big Three and Southwest (31-33 inches) are now tighter than they were at all four carriers in recent years, by anywhere from 2 to 5 inches. The only good news is some U.S. airlines are worse: Spirit offers pitch of just 28 inches on some aircraft, though the silver lining is those seats don't recline.

One contributing factor to this trend has been the dramatic outsourcing of the Big Three's "mainline" flights to regional carriers flying smaller aircraft. A

government study recently found 61% of all advertised flights for American, Delta, United and US Airways (now merging with American) were operated by regionals in 2011, up from 40% in 2000.

Some airlines maintain design advances—such as slimline seats (/story/todayinthesky/2013/10/15/new-seats-let-airlines-squeeze-in-more-passengers/2986215)—only give the illusion of tighter quarters on paper even though pitch has indeed been reduced. But industry claims that passengers don't notice this have been refuted.

USA TODAY

New seats let airlines squeeze in more passengers

(http://www.usatoday.com/story/todayinthesky/2013/10/15/new-seats-let-airlines-squeeze-in-more-passengers/2986215/)

Seat width

Seat width has changed as well, and not for the better.

ECONOMY CLASS SEAT WIDTH IN INCHES

	AA	DL	UA	WN
1985	19-20	19-20	19.5-20	19
1989	19-20	19-20	19-20	19
1991	19-20	18.5-20	19-20	19-19.5
1995*				
2000	17.2-18.5	17-18	17-18	N/A
2002	17.2-18.4	17-18	17-18	N/A
2014	17.2-18.5	17.2-18.3	17-18.3	17

** All airlines ranged from 18.5-23 inches*

Sources: Consumers Union; SeatGuru

Simply put, the roomiest economy seats you can book on the nation's four largest airlines are narrower than the tightest economy seats offered in the 1990s. The worst seats today measure either 17 or 17.2 inches, when about 19 was as tight as it got through the 1990s. In fact, even the widest seats for sale in economy today—from 17 to 18.5 inches —would not have been offered several years ago. For comparison, up in the front of the cabin, premium class seating on the Big Three usually measures 21 inches.

The big squeeze has become a global problem. Last year the European aircraft maker Airbus suggested all airline seats be at least 18 inches wide, but the U.S. trade organization Airlines for America rejected the suggestion, stating, "We believe individual airlines should be able to determine fleet configurations that best meet their customers' needs, as they do today."

Meanwhile, demographics are moving in the wrong direction. In 2002, CRTL quoted a British ergonomics firm that provided data on human hip sizes worldwide. The result? Yep, the United States ranked first (20.6 inches), ahead of Germany (19.6), Britain (19.1), France (17.2), Japan (15.9) and China (15.6). It seems safe to say such averages have only increased over the last dozen years.

Load factors

As I've stated before, I believe the U.S. airline industry's conscious decision to dramatically increase load factors since the 1990s has been the single biggest contributor to passenger dissatisfaction with flying. Domestic cabins are fuller than at any time since airlines were troop carriers during World War II, and the misery index keeps rising.

U.S. AIRLINE PASSENGER LOAD FACTORS

1995	67%
1996	70%
1997	71%

1998	71%
1999	71%
2000	73%
2001	70%
2002	72%
2003	74%
2004	76%
2005	79%
2006	80%
2007	81%
2008	80%
2009	81%
2010	83%
2011	83%
2012	83%
2013	84%

Source: MIT

Among U.S. airlines, loads averaged in the 50s and 60s for most of the 20th century, and didn't break the 70% mark until the 1990s. But as this chart (http://web.mit.edu/airlinedata/www/2013%2012%20Month%20Documents/Traffic%20and%20Capacity/System%20Total/Total%20System%20Load%20Factor.htm) indicates, with the exception of slight reversals after the 9/11 attacks in 2001 and the Great Recession in 2008, loads on U.S. airlines have been soaring to new heights for 20 years now—with no leveling off in sight. The latest monthly report from the DOT shows U.S. carriers posted a load factor of 86.4% (http://www.rita.dot.gov/bts/press_releases/bts042_14) for June; such a high average, of course, means many flights are at 100%.

Fuller flights mean more than just rubbing shoulders and elbows with strangers. As I noted here last year with "Overloaded! Crowded airline cabins reach new heights (/story/travel/columnist/mcgee/2013/06/05/overloaded-crowded-airline-cabins-reach-new-heights/2389291)," there are far-reaching negative effects to these record loads, including boarding headaches, overhead bin shortages and increases in involuntary bumping.

Higher load factors also mean there are fewer empty seats, which directly affects your comfort. Consider a Boeing 737 with 144 seats, in a standard 3x3 configuration of 24 rows of six seats. A load factor of 80% means only 29 of 48 middle seats are unoccupied, and 90% means only 14 middles are empty.

The configuration of the aircraft is critical, because empty seats affect neighboring passengers on both sides. Thankfully, on wide-body aircraft with nine-across seating, the traditional 2x5x2 configuration has largely given way to a 3x3x3 model. A veteran Boeing engineer calculated (http://www.boeingblogs.com/randy/archives/2010/03/dream_weaver.html) this means "millions more passengers have been seated next to an empty seat." Years ago this same engineer told CRTL that an adjacent empty seat equals another 4.25 inches in width, roughly equivalent to an upgrade to business or first in some cases.

What can you do?

As the Knee Defender uproar made clear, tempers rise as cabins become tighter. In response, one airline official adopted a "let-them-eat-cake" pose and publicly suggested unhappy passengers should pay more to sit up front. Of course, that's not an option for many of us.

Consider the following when looking for more room:

• An upgrade may not be possible, but "extra legroom" seats are available on many carriers now for much less than sitting in business or first.

• Premium economy (http://www.seatguru.com/charts/premium_economy.php) options can work for many budgets as well.

• Confirm your seat assignment as soon as you can, even though some airlines may make this difficult, as I noted in 2012 with "Are airlines withholding seats so you'll pay a premium? (http://travel.usatoday.com/experts/mcgee/story/2012-03-28/Are-airlines-withholding-seats-so-youll-pay-a-premium

/53810316/1)"

• As many travelers know, seats in door rows, emergency exit rows and bulkhead rows offer additional legroom, and the hassles of a recliner in front are eliminated.

• On wide-body aircraft, which often operate long-haul flights, experts suggest you select an "inside aisle" seat, since middle seats in the middle section often are assigned last.

• On airlines with open seating policies, paying extra to board early could be money well spent.

Bill McGee, a contributing editor to Consumer Reports and the former editor of Consumer Reports Travel Letter, is an FAA-licensed aircraft dispatcher who worked in airline operations and management for several years. Tell him what you think of his latest column by sending him an e-mail at travel@usatoday.com (mailto:travel@usatoday.com?subject=McGee). Include your name, hometown and daytime phone number, and he may use your feedback in a future column.

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EXHIBIT D

Flying Across America

The Airline Passenger Experience

Daniel L. Rust

University of Oklahoma Press : Norman

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Seat Pitch

Seat pitch is commonly defined as the distance from any point on one seat to the exact same point on the seat in front of or behind it. While not synonymous with the amount of legroom available, seat pitch is a good indicator of the space available for seated passengers.

The first modern airliner, the Boeing 247, carried 10 passengers in seats with a 40-inch pitch in 1933. The Boeing's direct competitor, the Douglas DC-2, matched the Boeing in passenger seat pitch.

Douglas DC-3 airliner sported 21 passenger seats with 39-inch pitch. Lockheed Constellations had 42-inch seat pitch in the 1940s. Douglas announced in 1952 that passenger seats in its forthcoming DC-7 would have a typical 40-inch pitch. But airlines wished to crowd in more passengers aboard coach flights. American and TWA had both reduced seat pitch to 39 inches by the end of the decade.

Seat pitch continued to shrink for coach seating, especially after airline deregulation in the United States. In the mid-1970s, coach seats typically had a pitch between 34 and 36 inches. By the late 1980s, the typical coach-class seat pitch was 31 to 32 inches. The airlines' need for revenue from additional seats trumped legroom.

In the 1990s, TWA bucked the dominant trend, increasing legroom in coach class. The airline removed seats to accommodate an additional two to three inches of legroom for each coach seat and called it "Comfort Class." Popular with passengers, the extra legroom lasted fewer than two years, as TWA seat pitch shrank from 36 to 31 inches. American Airlines tried a similar feat in 2000 called "More Room in Coach." The airline removed more than 6000 seats to allow for greater coach seat pitches. Economic realities after the terrorist attacks of September 11, 2001, prompted American to reinstall thousands of seats. Each coach seat could generate more than $30,000 in revenue for American annually—not an inconsequential consideration in an era of skyrocketing fuel prices and strong competition.

As of 2007, passengers continue to squeeze into economy-class seats with a 30- to 32-inch pitch. However, domestic first-class passengers enjoy the legroom afforded in seats with 36- to 40-inch pitch—a world apart from the conditions of economy class.

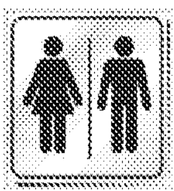
Sources: "Boeing's New Model 247 Transport," *Aviation* 32 (April 1933): 124; "Douglas Airliner for Transcontinental Service," *Aviation* 32 (October 1933): 331; "New DC-7 Details Revealed," *Aviation Week* 56 (June 16, 1952): 31; Solberg, *Conquest of the Skies*, 347; Betsy Wade, "Practical Traveler: Sizing Up Airline Seating," *New York Times* (November 6, 1994); Steve Huettel, "The Chair," *St. Petersburg Times* (July 23, 2001); David Grossman, "Getting a Good Airplane Seat," *USA Today* (November 4, 2006).

EXHIBIT E

apex editor's Blog

airline passenger experience association

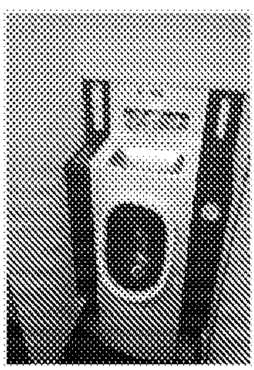
New aircraft lav sees B/E Aerospace flushed with success



If someone told me last week that a celebrity had encamped at the B/E Aerospace booth at the Aircraft Interiors Expo, I would not have been surprised, such was the hubbub and swarm of people surrounding the firm's cabin mock-up in Hamburg. But Lady Gaga was nowhere in sight. So what was the cause of all the commotion? Brace yourself. For the first time ever B/E showed off its modular lavatory for the Boeing 737.

That's right, a modular lavatory is currently taking the industry by storm, though, like any bare rise, pictures were verboten. Using patent-pending 'Spacewall' technology -- and, frankly, having perfected the art of scalloped walls -- B/E engineers have managed to shrink the lav and whilst ensuring that the seated knee width on the lav is actually wider. By freeing up precious floor space in the cabin, the lav allows 737 operators to add anywhere from two to eight seats, depending on their chosen configuration (such as galley space and whether to allow passengers to recline in the last row of seats) – which explains the huge draw. Antimicrobial coatings on the interior surfaces mean that the lav is cleaner and more hygienic, says B/E. And the toilet even uses less water when flushing, company executives told me when I visited the booth last week.

This lavs will debut on Delta Air Lines' new 737s, but they will also roll out on aircraft flown by Southwest Airlines, United Airlines, and eventually myriad others, as B/E holds the highly coveted exclusive contract to provide 737 lavs as standard to Boeing, after Japanese firm Yokohama Rubber Company -- which built lav modules for the narrowbody -- lost the contract last year.



An undisclosed airline customer of B/E also plans to retrofit its fleet of 737s with the modular lavs before the end of 2014. More retrofit customers are sure to follow. And while B/E has not yet developed a version of the lav for Airbus A320 family aircraft, the manufacturer says it certainly sees opportunities to do so. In short, B/E is flushed with success.

Not to be outdone, B/E's archrival Zodiac also unveiled a galley double lav concept that is PRM (persons with reduced mobility) accessible -- not unlike Airbus' Space-Flex concept for the A320 -- and ready for the retrofit market. Male passengers will no doubt welcome the new urinal-cum-sink portion of this unit, which gives them a far better shot of hitting the mark instead of the seat or the floor (can I hear an 'amen' ladies?).

Zodiac wasn't as precious about journalists snapping pictures, so here's a photo of the urinal for your viewing pleasure. And what about an in-and-out solution for women? A few of us tabled some suggestions at AIX!

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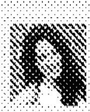
737, b/e aerospace, boeing, interiors, lav, prm, space flex, spacewall, toilet, zodiac



About Mary Kirby

Editor in Chief - APEX Media Platform | Previously Senior Editor at Flight International [illegible]

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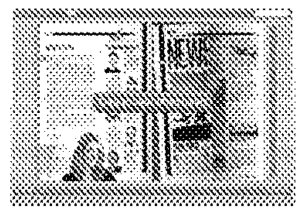

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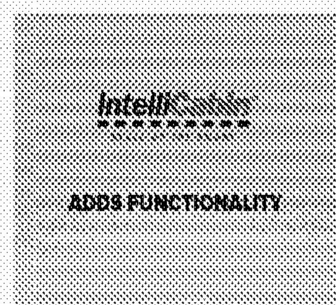
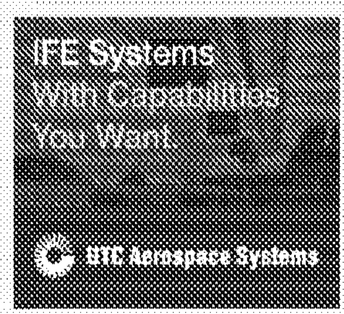




Upcoming Plans

EXHIBIT F

The Middle Seat Terminal

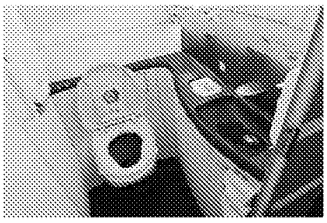
March 23, 2012, 11:58 AM ET

Airlines Lavs Shrink to Fit More Seats

By SCOTT MCCARTNEY

Airplane space-squeezers have been back in the lavatory – not a typo – shrinking the space that airplane bathrooms take up.

My colleague Susan Carey reports on a ground-breaking coach-cabin lavatory built by B/E Aerospace that won over Boeing Co. and airlines because it packs a loo into a little space and allows for a few more coach seats on planes.



Getty Images

Airplane lavatories are getting smaller.

Delta Air Lines Inc. will be among the first customers to get the petite potty, and those 737-900s will have four additional seats because of smaller lavs.

Delta says the new lavatories are only a wee bit smaller and won't be noticeably different. Space is squeezed from the wall behind the sink and one exterior wall is sculpted to allow seats in front of it to recline.

B/E, flush with pride, won the 737 contract at Boeing over incumbent Zodiac Aerospace. Planes with pared-down potties will come into service later this year. That's just one of several bathroom battles playing out in the little-seen world of airplane bathrooms. Susan reports on the standards airplane lavs have to meet, and the awful things passengers flush down them, including airline blankets.

Check out the story.

Airplanes, Lavatory, Seating

« Previous
Airline Passenger Rights: Few and Fleeting

Next »
Survey Says ... Airlines Do Pay Attention to All Those Questionnaires

THE MIDDLE SEAT TERMINAL HOME PAGE

About The Middle Seat Terminal

Scott McCartney writes The Middle Seat every Thursday. The Wall Street Journal's Travel Editor, Scott has been on the airline beat since 1995 — long enough to see it go from bust to boom and back to bust. He also writes a blog on travel at The Middle Seat Terminal.

Scott won the Online News Association award for online commentary in 2003 for "The Middle Seat," the George Polk Award for transportation reporting in 2000, and has been honored by the Deadline Club and New York's chapter of the Society of Professional Journalists. Before joining the Journal in 1993, he spent 11 years at The Associated Press.

Scott, a native of Boston and graduate of Duke University, is the author of four books, including The Wall Street Journal Guide to Power Travel: How to Arrive with Your Dignity, Sanity, and Wallet

Email Print

intact, which was published in 2009. He's also an instrument-rated private pilot.

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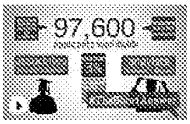

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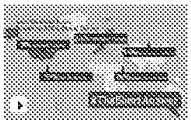

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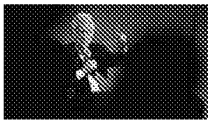
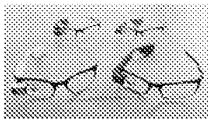
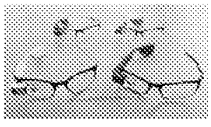


4 Google Glass Is on Sale for Anyone in the U.S. (Again)



5 Google Glass Goes on Sale for Anyone in the U.S.



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2:41 am June 30, 2013

In the Butt Bob wrote :

This is not funny … some of us just have rather large butts … you're not going to want to use that bathroom after one of us … trust me

1:37 pm May 23, 2013

Karen Brown wrote :

it's getting ridiculous when you can barely fit on the toilet but can't move anywhere to wipe yourself properly…I just spent 2 flights where I had problems going to the bathroom because it is

too small – there's hardly space to walk in let alone sit down…and don't get me started about the airlines seats during the flights….horrible….it's just a cattle car now with different airline names on the outside….flying isn't an enjoyable experience anymore.

9:43 am April 8, 2013

Greebiefester wrote :

What's next. Make all coach customers wear diapers and do away with the bathrooms completely?

4:38 pm April 3, 2013

Garrick wrote :

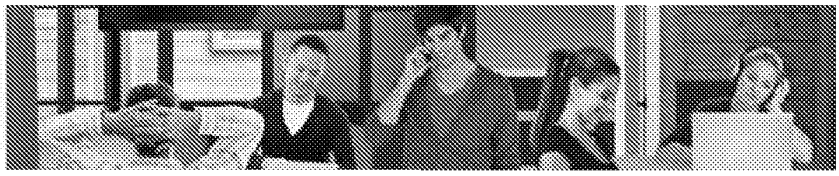
'Flush with pride.' Ha, ha.

6:50 pm March 29, 2013

James wrote :

I have been a flight attendant for 27 years. We have gone from having 2 seat belt extenders on each plane to 12 to 14 per plane. Passengers are getting fatter thus the coach sitting gets tighter as airlines uses every inch of the plane. I would recommend going to restroom prior to flight. That way you may not have to visit the Loo.

EXHIBIT G



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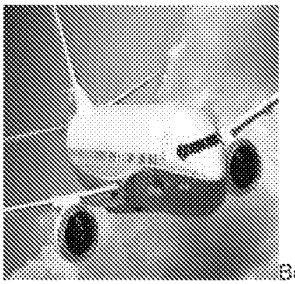
Japan's Yokohama "extremely disappointed" as Boeing picks B/E for 737 lavatories

January 19, 2012

Comfort

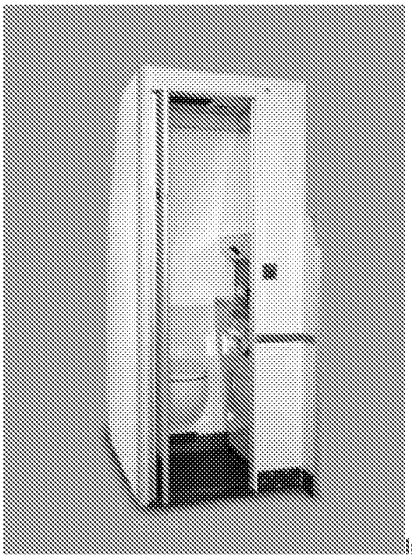


Boeing has selected B/E Aerospace as the exclusive manufacturer of modular lavatory systems for its 737 family and the forthcoming re-engined 737 Max, a move that displaces incumbent supplier Yokohama Rubber Company of Japan.

The $800 million-plus award to B/E came as "a complete surprise" to Yokohama Rubber, says Kelly Stolle, VP of marketing and business development for Yokohama's aerospace business in the United States.

"We are extremely disappointed," Stolle tells *the APEX editor's blog*. "We did not bid on this [new contract]."

According to its web site, Yokohama Rubber has been designing and manufacturing commercial aviation products for nearly 50 years.



In a May 2010 press release, the company announced that since winning an exclusive 737 lavatory modules contract in 2004, its cumulative deliveries of lavatory modules for the 737 had reached 5,000 units in February of that year (see photo of Yokohama lavatory to the right).

Asked why Boeing selected B/E Aerospace for the new lavatories, Boeing says: "The B/E Aerospace modular lavatory system was selected for use in the Next Generation 737 to provide greater value to our airplane customers by freeing up floor space in the cabin."

Boeing could not provide immediate comment on Yokohama's assertion that the award to an alternate supplier came as a surprise.

B/E Aerospace says its modular lavatory system uses patent-pending 'Spacewall' technology, which creates the opportunity to add up to six incremental passenger seats on each aircraft.

The system will integrate B/E's 'Aircraft Ecosystems' vacuum toilet, LED lighting and B/E Aerospace tamper proof, lavatory oxygen system.

Aircraft Ecosystem vacuum toilets "have 25 per cent greater reliability than existing systems and components can be replaced in a few minutes, as compared to up to an hour for existing systems", says the company, which expects to begin lavatory system deliveries for Delta Air Lines' new-buy 737s in the third quarter of 2013, and to ramp-up deliveries thereafter.

"We intend to substantially accelerate our investments in our modular lavatory program and on the related waste water system programs in order to be in a position to produce significant quantities of lavatory systems by the end of 2012," says B/E.

"In addition, the company is also stepping up its capital spending to support certain other SFE [supplier furnished equipment] programs. As a result of increased capital spending for plant, machinery, equipment, and tooling, as well as inventory build to support these programs, the company is adjusting its free cash flow conversion ratio guidance for 2012 to approximately 80 to 85 per cent of net earnings."

B/E Aerospace VP investor relations Greg Powell says today is the first time B/E has spoken publicly about the new lavatory system for the 737. Photos are not yet available.

737, b/e aerospace, interiors, system

About Mary Kirby

Editor in Chief - APEX Media Platform | Previously Senior Editor at Flight International where she led the magazine's coverage of in-flight entertainment and connectivity (IFEC) and aircraft interiors | Former proprietor of the highly-regarded Runway Girl blog, which focused on the passenger experience | Regularly speaks at industry conferences about airborne communications, ancillary revenue opportunities for airlines and social media | You can connect with Mary on Twitter, LinkedIn

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6 Responses to "Japan's Yokohama "extremely disappointed" as Boeing picks B/E for 737 lavatories"

1. *rcs* Says:
   January 19, 2012 at 2:49 am

   I must be confused. If Yokohama didn't bid on the contract, why would they be considered for it, let alone be disappointed they didn't win it? If you don't bid, you're not a player, right?

   Reply

   - 
     Mary Kirby Says:
     January 19, 2012 at 3:05 pm

Hi rcs, Yokohama expressed to me that this entire deal came out of left field for them (which would indicate that they were not given an opportunity to bid). Yokohama said it didn't want to speculate on Boeing's decision. Boeing, meanwhile, has not said whether or not it opened up the bid to Yokohama. I'm hoping to get more information, as there certainly seems to be more to this story.

Reply

2. 
Jonathan Norris Says:
January 19, 2012 at 10:52 am

I guess the question is whether they were invited to bid?

Reply

3. 
ereleases.com http://www.ereleases.com/submit.html www.ereleases.com/submit.html Says:
April 13, 2012 at 10:18 am

I'm always glad to share, Yvonne. I'm very glad you found this helpful!

Reply

4. 
Affiliate Trainer Sarah Says:
April 25, 2013 at 10:48 pm

Boeing makes some of the best aircraft ever manufactured.

Reply

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