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(54) Title: SEATING ARRANGEMENT

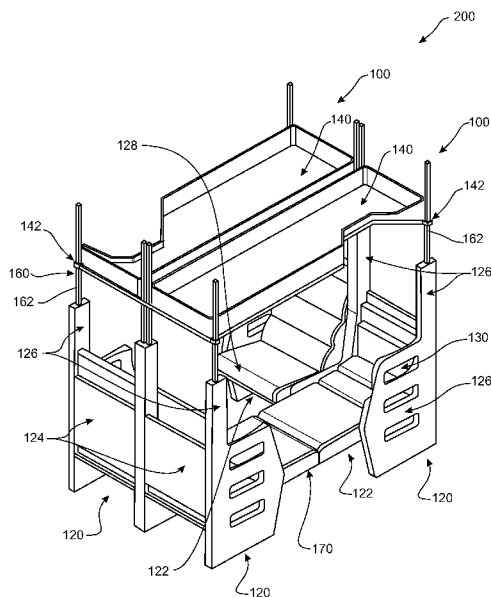


FIGURE 3

(57) **Abstract:** A seating arrangement suitable for a passenger vehicle cabin, the seating arrangement comprising a pair of seats aligned with each other, a movable (preferably horizontally aligned) upper bed assembly disposed vertically above at least part of both of the pair of seats; and a support frame extending upwardly from each of the seats, wherein the support frame is configured and adapted to facilitate guided movement of the upper bed assembly vertically between a retracted position in which the upper bed assembly is retracted towards the ceiling of the vehicle cabin for convenient storage, and a presented position in which the upper bed assembly is presented at a lower level above both of the seats, for supporting passengers in a substantially horizontal position.

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## SEATING ARRANGEMENT

### FIELD OF THE INVENTION

The present invention relates to a reconfigurable seating arrangement. More particularly but not exclusively it relates to a seating arrangement for an aircraft that is reconfigurable to provide a bunk-type sleeping arrangement.

### BACKGROUND OF THE INVENTION

Aircraft fly many passengers around the world every year. A significant proportion of these flights may be over time periods in excess of about 5 hours long. Some of these flights may be around 22 hours long. For some passengers, sitting in a seated position for such long times may be uncomfortable. Spending such long times in a seated position can be hazardous to passengers health, in the case where deep-vein thrombosis (DVT) may occur.

Airlines need to be able to comfortably fit in as many paying passengers into a single flight as they can, to make their business models more economically feasible. For this reason, passenger tickets that offer more space for sitting in or lying may be offered by airline operators at a premium.

It would be advantageous for passengers to be able to sleep in a horizontal laid flat position, instead of sitting up. However, there are a variety of reasons why passengers cannot merely be packed into small bed-shaped "cocoon". For instance, over long journeys, passengers will require food and drink to be served to them, and it may be uncomfortable for passengers to eat lying down. It also may not be convenient for some older or frailer passengers to climb up into a bunk arrangement. Further, technical problems and safety issues may exist with being able to securely strap passengers into a lying down position.

For this reason, it is desirable that a compromise be found which allows passengers to enter and exit an aircraft freely, to be strapped in securely for at least take off and landing of the aircraft, to be served food and/or drinks in a position in which it is convenient for them to consume the goods, and to allow them the space to lie horizontally in a comfortable position for long time periods, while at the same time, as many passengers are required to be transported as possible in order to provide or at least tend towards an economically feasible service.

In this specification, where reference has been made to external sources of information, including patent specifications and other documents, this is generally for the purpose of providing a context for discussing the features of the present invention. Unless stated otherwise, reference to such sources of information is not to be construed, in any jurisdiction, as an admission that such sources of information are prior art or form part of the common general knowledge in the art.

It is an object of the present invention to provide a reconfigurable seating arrangement which overcomes or at least ameliorates some of the abovementioned disadvantages or which at least provides the public with a useful choice.

### **BRIEF DESCRIPTION OF THE INVENTION**

In a first aspect the present invention may be said to be a seating arrangement suitable for a passenger vehicle cabin, said seating arrangement comprising:

a pair of seats aligned with each other,

a movable (preferably horizontally aligned) upper bed assembly disposed vertically above at least part of both of the pair of seats; and

a support frame extending upwardly from each of the seats, wherein the support frame is configured and adapted to facilitate guided movement of the upper bed assembly vertically between

a retracted position in which the upper bed assembly is retracted towards the ceiling of the vehicle cabin for convenient storage, and

a presented position in which the upper bed assembly is presented at a lower level above both of the seats, for supporting passengers in a substantially horizontal position.

Preferably the vehicle is an aircraft.

Preferably each seat comprises:

a seat cushion support assembly,

a backrest support assembly, and

a pair of side support assemblies.

Preferably the support frame extends from the side support assemblies of each of the seats.

Preferably the upper bed assembly is supported in its presented position by one or more selected from,

the backrest support assembly, and  
the side support assemblies.

Preferably each seat has,

a front side and

5 a back side, and

the seats are aligned in one selected from

a position in which the front side of one seat is facing the back side of the  
other seat, and

10 a position in which the front side of one seat is facing the front side of the  
other seat.

Preferably one or more selected from the seat cushion support assembly and the  
backrest support assembly are moveable to be configured to extend between the pair of  
seats to, at least in part, provide a lower bunk for supporting a passenger in a horizontal  
position.

15 Preferably the backrest support assembly is pivotable to move from a vertically  
extending position to a horizontally extending position to form part of the lower bunk.

Preferably the seating arrangement includes a seat extension member that is  
configured and adapted for spanning between the pair of seats to provide a horizontal  
support plane therewith for supporting a passenger in a horizontal position.

20 Preferably the seat extension member is moveable to be folded away when not in  
use.

Preferably the seat extension member is foldable into a variety of configurations, at  
least one of them including a table configuration for providing a table between the pair of  
seats.

25 Preferably the seats are similarly aligned from front to back in a straight line.

Preferably the seats are facing each other in a straight line.

Preferably the side support assemblies are adapted and configured for supporting  
the weight of a bed (and passenger).

30 Preferably the side support assemblies include climbing formations suitable for a  
facilitating the climbing onto the upper bed assembly by a passenger.

Preferably the climbing formations are apertures in the side support members or  
the seat backrest support member.

Preferably the seating arrangement comprises a plurality of pairs of seats, and a similar number of bed assemblies.

Preferably the seating arrangement comprises two pairs of seats disposed alongside each other, with each pair facing each other, and having an associated upper bed assembly  
5 disposed above them.

Preferably the upper bed assembly is light enough to be moved between its retracted position and its presented position manually by at least one person.

Preferably the seating arrangement further comprises a moving device for moving the upper bed assembly at least vertically at least in one direction between its retracted  
10 position and its presented position.

Preferably the moving device operates mechanically to move the upper bed assembly.

Preferably the moving device includes at least one selected from  
a tensioned cable to move the upper bed assembly,  
15 a rack and pinion gear set to move the upper bed assembly,  
a worm gear arrangement to move the upper bed assembly,  
a pneumatic actuator  
a hydraulic actuator,  
electric actuator, and  
20 electric motor.

Preferably the support frame comprises a plurality of poles extending between the seat backrest support member and a ceiling of the cabin.

Preferably a pole is provided at each corner of the upper bed assembly.

Preferably the upper bed assembly includes one or more selected from a recess and  
25 an aperture for receiving at least one pole therethrough.

Preferably the pair of seats include a fold away table assembly between them.

Preferably the fold away table is configured to fold from a first position in which it acts as a table top, to a second position in which it extends between the pair of seats to provide a horizontal support plane therewith for supporting a passenger.

30 Preferably one or more selected from the seat cushion support member and backrest support member, are moveable between a seated position in which a passenger can be supported in a seated position, and a lying position in which a passenger can be

supported in horizontal position by extending between the seats to form a horizontal plane therewith

Preferably the upper bed assembly is integrally formed.

5 Preferably the seating arrangement includes securing formations for securing the upper bed assembly in any position between the retracted position and the presented position.

Preferably the seating arrangement as described herein is on a passenger vehicle.

In an alternative aspect the present invention may be said to be an aircraft having a seating arrangement as herein previously described.

10 In another aspect the present invention may be said to be a passenger vehicle seating arrangement convertible to two beds comprising:

a first seat that includes a seat pan and a backrest and having a first facing direction,

15 a second seat that includes a seat pan and a backrest and having a second facing direction that is parallel to and opposite the first facing direction,

the first and second seats spaced apart from each other,

20 said first and second seat being configurable to a first bed wherein a support is positioned to span between said first and second seats and together with the seat pan of said first and second seat define a sleeping platform of said first bed, the elongate direction of said bed being parallel to the first and second facing directions,

25 a second bed located above the first and second seats presented in a horizontal condition and moveable between an lowered and elevated condition relative said first and second seats, wherein in said elevated condition, the second bed is at height above the seat pans to allow a person to be sedentary on each seat.

Preferably the second bed is oriented to extend parallel to the first and second facing directions.

30 Other aspects of the invention may become apparent from the following description which is given by way of example only and with reference to the accompanying drawings.

As used herein the term “and/or” means “and” or “or”, or both.

As used herein “(s)” following a noun means the plural and/or singular forms of the noun.

The term “comprising” as used in this specification [and claims] means “consisting at least in part of”. When interpreting statements in this specification [and claims] which include that term, the features, prefaced by that term in each statement, all need to be present but other features can also be present. Related terms such as “comprise” and  
5 “comprised” are to be interpreted in the same manner.

This invention may also be said broadly to consist in the parts, elements and features referred to or indicated in the specification of the application, individually or collectively, and any or all combinations of any two or more of said parts, elements or features, and where specific integers are mentioned herein which have known equivalents  
10 in the art to which this invention relates, such known equivalents are deemed to be incorporated herein as if individually set forth.)

### **BRIEF DESCRIPTION OF THE DRAWINGS**

The invention will now be described by way of example only and with reference to  
15 the drawings in which:

**Figure 1** shows a cutaway cross section view of a passenger aircraft cabin showing a seating arrangement,

**Figure 2** shows a cutaway perspective view of a passenger aircraft cabin showing a plurality of seating arrangements,

20 **Figure 3** shows a perspective view of one embodiment of a seating arrangement,

**Figure 4** shows a front view of one embodiment of a seating arrangement,

**Figure 5** shows a side view of one embodiment of a seating arrangement,

**Figure 6** shows a plan view of a plurality of seating arrangements,

**Figure 7** shows a side view of another embodiment of the a seating arrangement  
25 with the bed assembly in a presented condition,

**Figure 8** shows a side view of another embodiment of the a seating arrangement with the bed assembly in a retracted condition, and

**Figure 9** shows a perspective view of an aircraft.

### 30 **DETAILED DESCRIPTION OF THE INVENTION**

With reference to the above drawings, in which similar features are generally indicated by similar numerals, a seating arrangement according to a first aspect of the



invention is generally indicated by the numeral 100 and a plurality of seating arrangements by the numeral 200.

In one embodiment now described there is provided a seating arrangement 100 suitable for installation in a passenger aircraft cabin 300 of a passenger aircraft 999. A  
5 suitable aircraft cabin is envisaged as having a floor 310, ceiling 320 and side walls 330. The seating arrangement 100 comprises a pair of seats 120 aligned with each other, and a horizontally aligned upper bed assembly 140 that is disposed vertically above both of the pair of seats 120.

The seats 120 each include a seat cushion support assembly 122, a backrest support  
10 assembly 124, and a pair of side support assembly 126 to either side of the backrest support assembly 124.

The seating arrangement 100 further comprises a support frame 160 in the form of a pole 162 that extends from the top of the side support assemblies 126 of each of the seats 120, to provide four poles 162 for each pair of aligned seats 120.

The upper bed assembly 140 is movable (shown by arrow A in figure 5) vertically  
15 along the poles 162 between a retracted position (shown in figure 8) in which the upper bed assembly 140 is retracted towards the ceiling 320 of an aircraft cabin 300 for convenient storage, and a lower presented position (shown in figure 7) in which the upper bed assembly 140 is resting on the top of the side support assemblies 126, for supporting  
20 passengers (not shown) in a substantially horizontal position. The poles 162 of the support frame 160 are received into apertures 142 in the upper bed assembly 140 in order to guide the upper bed assembly 140 in its vertical movement.

In its presented position, the upper bed assembly 140 is supported by the top  
25 extent of the side support assemblies 126. It is envisaged that in another embodiment, the upper bed assembly 140 could be supported in its presented position by at least one of the side support assemblies 126, the backrest support assembly 124, or both. In yet another embodiment, it is envisaged that the upper bed assembly 140 could be supported on other support formations above the side support assemblies 126, such as on pins (nots shown) extending though holes (not shown) in the poles 162.

30 As shown in figure 3, each seat 120 has a front side 128 and a back side 129. In the embodiment of the invention shown in figures 3, the seating arrangement 100 comprises a two pairs of seats 120 disposed alongside each other, with each pair of seats 120 facing each other. Each pair of seats 120 has an associated upper bed assembly

disposed directly above the pair of seats 120. Further, the associated pairs of seats 120 face each other (with the front side 128 of one seat 120 facing the front side 128 of the other seat 120), and can be disposed alongside similar pairs of seats 120 to form an enclave-type seating arrangement. However, it envisaged that the associated pairs of seats could be facing in the same direction (i.e. with a front side 128 of one seat 120 facing the back side 129 of the other seat 120).

As shown in figure 3, the seat cushion support assembly 122 and the backrest support assembly 124 are coupled to each other, and are movable to extend forwards towards the other seat 120 to provide a horizontal support plane as a lower bed assembly 170 for supporting a passenger in a horizontal position.

In another embodiment, the seating arrangement 100 can include a seat extension member (not shown) that is configured and adapted for extending between the pair of seats 120 to provide a horizontal support plane therewith for supporting a passenger in a horizontal position. The seat extension member can be stored away when not in use. Where the seats 120 are disposed in a position in which the front side 128 of one seat 120 faces the back side 129 of another seat 120, it is envisaged that the lower bed assembly 170 can still be provided by providing at least one of the seats 120 with a folding backrest support assembly 124 which is foldable to lie flat in a horizontal position on substantially the same plane that the lower bed assembly 170 is to be provided on.

In another embodiment, the seating arrangement can include a fold away table assembly (not shown) between the seats 120. It is envisaged that such a table assembly will comprise at least one planar body member (not shown), and will be configured and adapted to move from a first position in which it acts as a table top, to a second position in which it extends between the pair of seats 120 to provide a horizontal support plane in conjunction with the seats 120 for supporting a passenger in a lying down position.

In this way, two passengers can either sit in a seated position on the seats 120, or can recline in a horizontal position on the upper bed assembly 140. Further, the seating arrangement allows the flexibility of one passenger remaining seated in their seat 120, while another reclines on the upper bed assembly 140 in its presented position.

The seating arrangement 100 further includes securing formations 180 for securing the upper bed assembly 140 any position when it is in the retracted position. It is envisaged that the securing formations could be a spigot in socket formation, or any other similar formation. Further, the securing formations can be mounted on the bed assembly

for use in securing the bed assembly in position anywhere between its retracted position and its presented position on the poles 162, or the securing formations can be mounted on, or part of, the support frame 160 to secure the bed assembly 140 in a single position.

5 Climbing apertures 130 are provided in selected side support assemblies 126, for facilitating the climbing onto the upper bed assembly 140 by a passenger.

It is envisaged that in a preferred embodiment, the upper bed assembly 140 will be moulded from lightweight materials such as resins, plastics, polymers or the like. Alternately, the upper bed assembly 140 could be assembled from lightweight aluminium, carbon fibre, Kevlar or other such lightweight materials.

10 If the upper bed assembly 140 is lightweight enough, it can be manually moved between its retracted position and its presented position. However, it is envisaged that in alternative embodiments, a moving device (not shown) may be provided for moving the upper bed assembly 140.

Some examples of moving devices include mechanically operated ones using cables (not shown) in tension, rack and pinion gears(not shown), worm gear arrangements (not shown), pneumatic arrangements (not shown), hydraulic arrangements (not shown), or electric motors to move the upper bed assembly 140. However, these embodiments are not preferred as they require additional parts which will means that the seating arrangement is heavier. In the context of an aircraft 999, additional weight is to be avoided.

20 The seating arrangement 100 shown in figure 3 may be duplicated throughout the cabin 300 of an aircraft 999 (as shown in figure 2) to provide a plurality of seating arrangements 200 that is compact and that allows versatility and convenience required by passengers.

25 Where in the foregoing description reference has been made to elements or integers having known equivalents, then such equivalents are included as if they were individually set forth.

Although the invention has been described by way of example and with reference to particular embodiments, it is to be understood that modifications and/or improvements may be made without departing from the scope or spirit of the invention.

30 In addition, where features or aspects of the invention are described in terms of Markush groups, those skilled in the art will recognise that the invention is also thereby described in terms of any individual member or subgroup of members of the Markush group.

**CLAIMS**

1. A seating arrangement suitable for a passenger vehicle cabin, said seating arrangement comprising
  - a pair of seats aligned with each other,
  - 5 a movable (preferably horizontally aligned) upper bed assembly disposed vertically above at least part of both of the pair of seats; and
  - a support frame extending upwardly from each of the seats, wherein the support frame is configured and adapted to facilitate guided movement of the upper bed assembly vertically between
    - 10 a retracted position in which the upper bed assembly is retracted towards the ceiling of the vehicle cabin for convenient storage, and
    - a presented position in which the upper bed assembly is presented at a lower level above both of the seats, for supporting passengers in a substantially horizontal position.
- 15 2. A seating arrangement as claimed in claim 1 wherein the vehicle is an aircraft.
3. A seating arrangement as claimed in claim 1 or 2 wherein each seat comprises
  - a seat cushion support assembly,
  - a backrest support assembly, and
  - a pair of side support assemblies.
- 20 4. A seating arrangement as claimed in claim 3 wherein the support frame extends from the side support assemblies of each of the seats.
5. A seating arrangement as claimed in claim 3 or 4 wherein the upper bed assembly is supported in its presented position by one or more selected from
  - the backrest support assembly, and
  - 25 the side support assemblies.
6. A seating arrangement as claimed in any one of claims 1 to 5 wherein each seat has
  - a front side and
  - a back side, and
  - the seats are aligned in one selected from
    - 30 a position in which the front side of one seat is facing the back side of the other seat, and
    - a position in which the front side of one seat is facing the front side of the other seat.

7. A seating arrangement as claimed in any of claims 3 to 6 wherein one or more selected from the seat cushion support assembly and the backrest support assembly are moveable to be configured to extend between the pair of seats to, at least in part, provide a lower bunk for supporting a passenger in a horizontal position.
- 5 8. A seating arrangement as claimed in claim 7 wherein the backrest support assembly is pivotable to move from a vertically extending position to a horizontally extending position to form part of the lower bunk.
9. A seating arrangement as claimed in any one of claims 1 to 7 wherein the seating arrangement includes a seat extension member that is configured and adapted for spanning  
10 between the pair of seats to provide a horizontal support plane therewith for supporting a passenger in a horizontal position.
10. A seating arrangement as claimed in claim 9 wherein the seat extension member is moveable to be folded away when not in use.
11. A seating arrangement as claimed in claims 9 or 10 wherein the seat extension  
15 member is foldable into a variety of configurations, at least one of them including a table configuration for providing a table between the pair of seats.
12. A seating arrangement as claimed in any one of claims 1 to 11 wherein the seats are similarly aligned from front to back in a straight line.
13. A seating arrangement as claimed in any one of claims 1 to 11 wherein the seats are  
20 facing each other in a straight line.
14. A seating arrangement as claimed in any one of claims 3 to 13 wherein the side support assemblies are adapted and configured for supporting the weight of a bed (and passenger).
15. A seating arrangement as claimed in any one of claims 3 to 14 wherein the side  
25 support assemblies include climbing formations suitable for a facilitating the climbing onto the upper bed assembly by a passenger.
16. A seating arrangement as claimed in claim 15 wherein the climbing formations are apertures in the side support members or the seat backrest support member.
17. A seating arrangement as claimed in any one of claims 1 to 16 wherein the seating  
30 arrangement comprises a plurality of pairs of seats, and a similar number of bed assemblies.
18. A seating arrangement as claimed in claim 17 wherein the seating arrangement comprises two pairs of seats disposed alongside each other, with each pair facing each other, and having an associated upper bed assembly disposed above them.

19. A seating arrangement as claimed in any one of claims 1 to 18 wherein the upper bed assembly is light enough to be moved between its retracted position and its presented position manually by at least one person.
20. A seating arrangement as claimed in any one of claims 1 to 19 wherein the seating arrangement further comprises a moving device for moving the upper bed assembly at least vertically at least in one direction between its retracted position and its presented position.
21. A seating arrangement as claimed in claim 20 wherein the moving device operates mechanically to move the upper bed assembly.
22. A seating arrangement as claimed in claim 20 wherein the moving device includes at least one selected from
- a. a tensioned cable to move the upper bed assembly,
  - b. a rack and pinion gear set to move the upper bed assembly,
  - c. a worm gear arrangement to move the upper bed assembly,
  - d. a pneumatic actuator
  - e. a hydraulic actuator,
  - f. electric actuator, and
  - g. electric motor.
23. A seating arrangement as claimed in any one of claims 3 to 22 wherein the support frame comprises a plurality of poles extending between the seat backrest support member and a ceiling of the cabin.
24. A seating arrangement as claimed in claim 23 wherein a pole is provided at each corner of the upper bed assembly.
25. A seating arrangement as claimed claim 23 or 24 wherein the upper bed assembly includes one or more selected from a recess and an aperture for receiving at least one pole therethrough.
26. A seating arrangement as claimed in any one of claims 1 to 25 wherein the pair of seats include a fold away table assembly between them.
27. A seating arrangement as claimed in claim 26 wherein the fold away table is configured to fold from a first position in which it acts as a table top, to a second position in which it extends between the pair of seats to provide a horizontal support plane therewith for supporting a passenger.
28. A seating arrangement as claimed in any one of claims 3 to 27 wherein one or more selected from the seat cushion support member and backrest support member, are

moveable between a seated position in which a passenger can be supported in a seated position, and a lying position in which a passenger can be supported in horizontal position by extending between the seats to form a horizontal plane therewith

29. A seating arrangement as claimed in any one of claims 1 to 28 wherein the upper  
5 bed assembly is integrally formed.

30. A seating arrangement as claimed in any one of claims 1 to 29 wherein the seating arrangement includes securing formations for securing the upper bed assembly in any position between the retracted position and the presented position.

31. A seating arrangement as claimed in anyone of claims 1 to 30 wherein the seating  
10 arrangement is for use on a passenger vehicle.

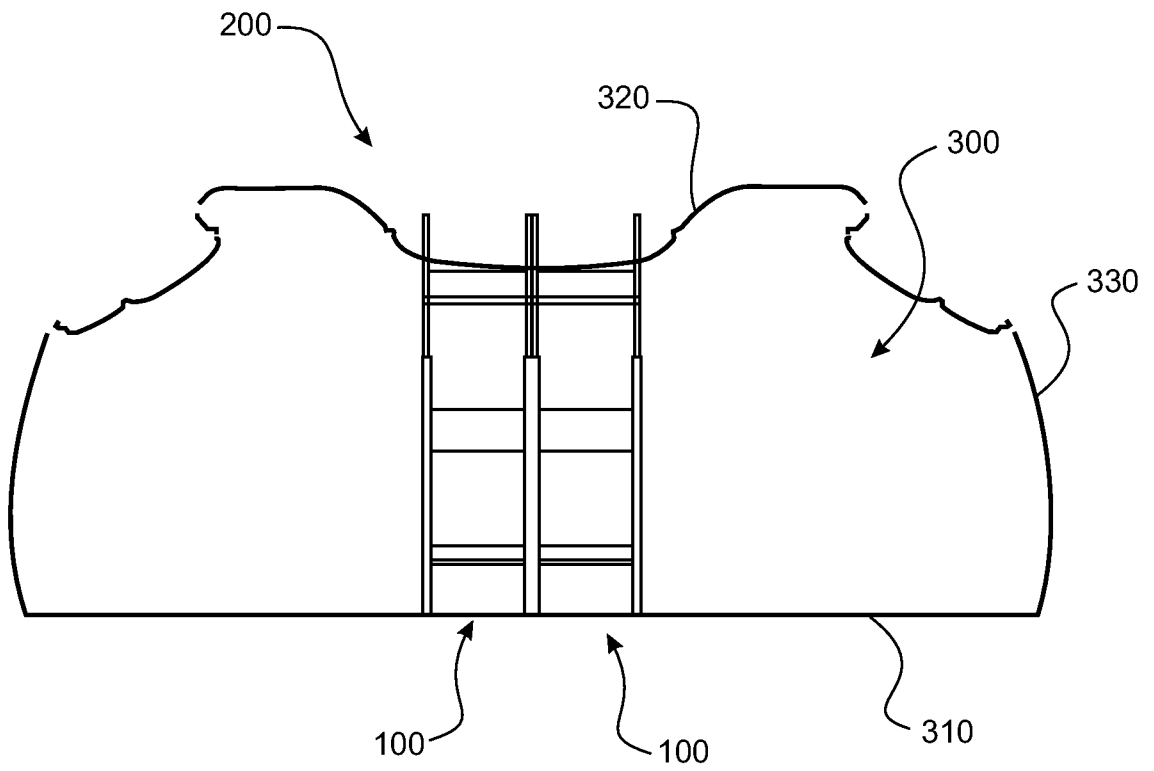
32. An aircraft having a seating arrangement as claimed in anyone of claims 1 to 30.

33. A passenger vehicle seating arrangement convertible to two beds comprising:  
a first seat that includes a seat pan and a backrest and having a first facing direction,  
a second seat that includes a seat pan and a backrest and having a second facing  
15 direction that is parallel to and opposite the first facing direction,  
the first and second seats spaced apart from each other,

said first and second seat being configurable to a first bed wherein a support is positioned to span between said first and second seats and together with the seat pan of said first and second seat define a sleeping platform of said first bed, the elongate direction  
20 of said bed being parallel to the first and second facing directions,

a second bed located above the first and second seats presented in a horizontal condition and moveable between an lowered and elevated condition relative said first and second seats, wherein in said elevated condition, the second bed is at height above the seat pans to allow a person to be sedentary on each seat.

25 34. A seating arrangement as claimed in claim 33 wherein the said second bed is oriented to extend parallel to the first and second facing directions.



**FIGURE 1**



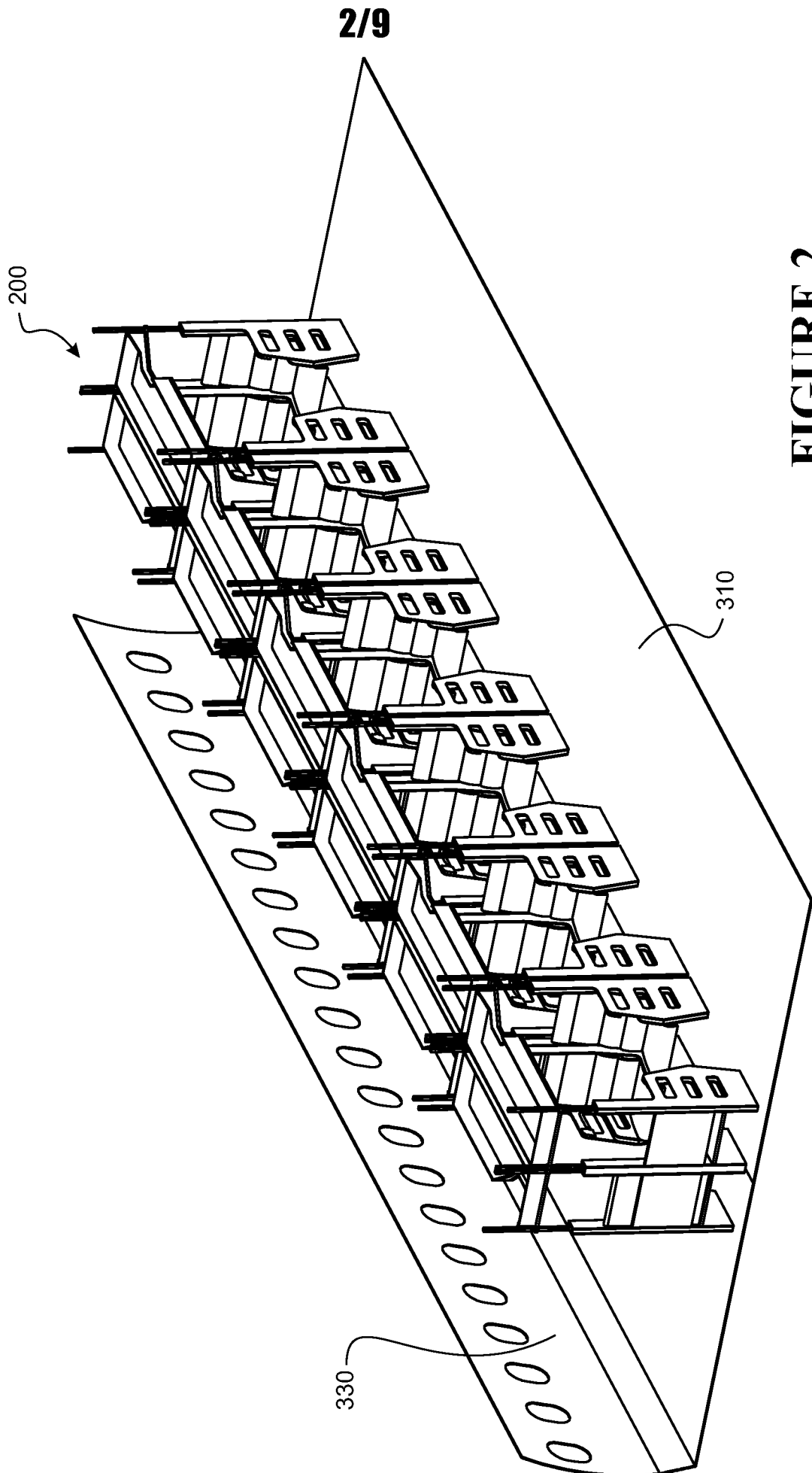


FIGURE 2

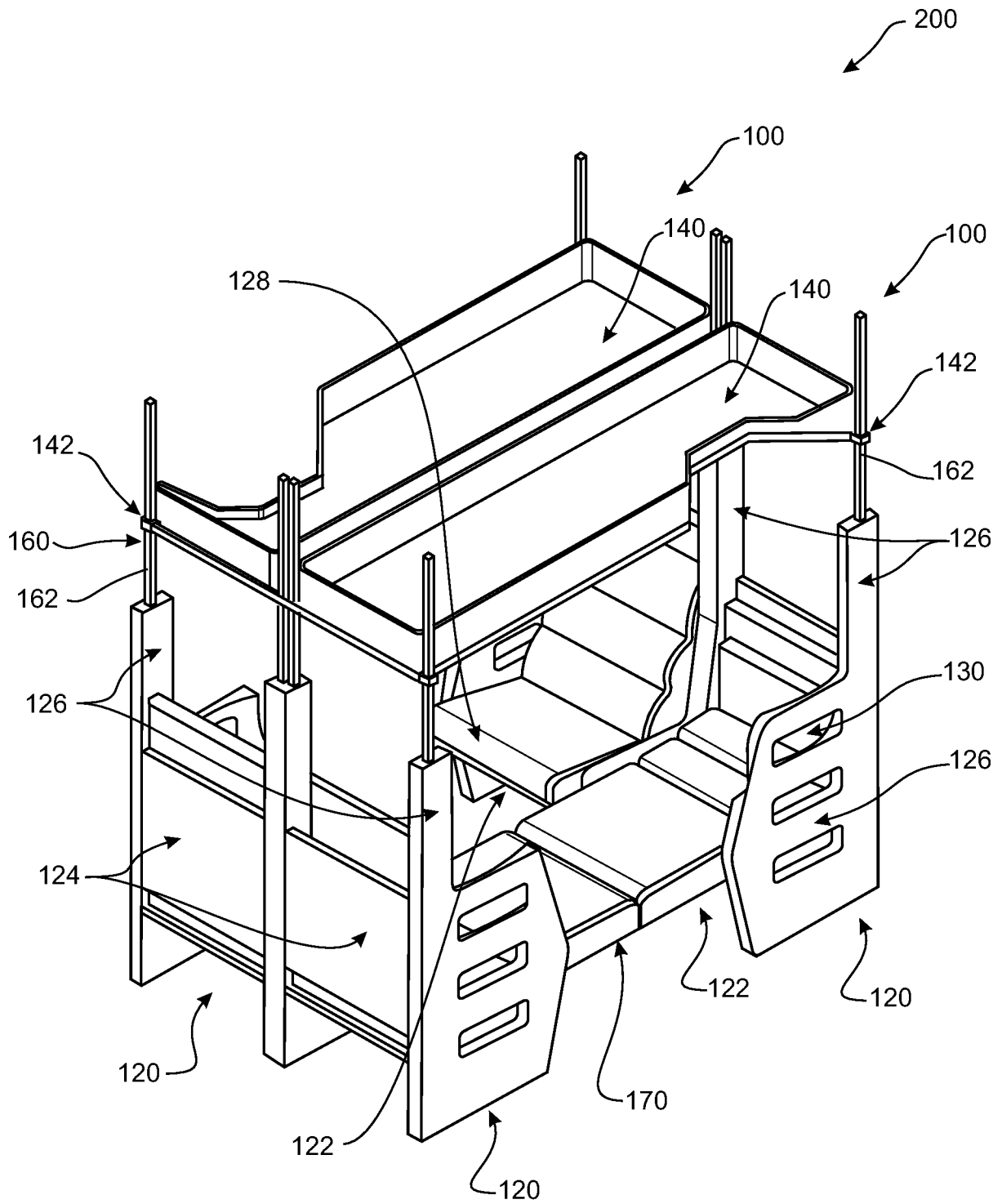


FIGURE 3

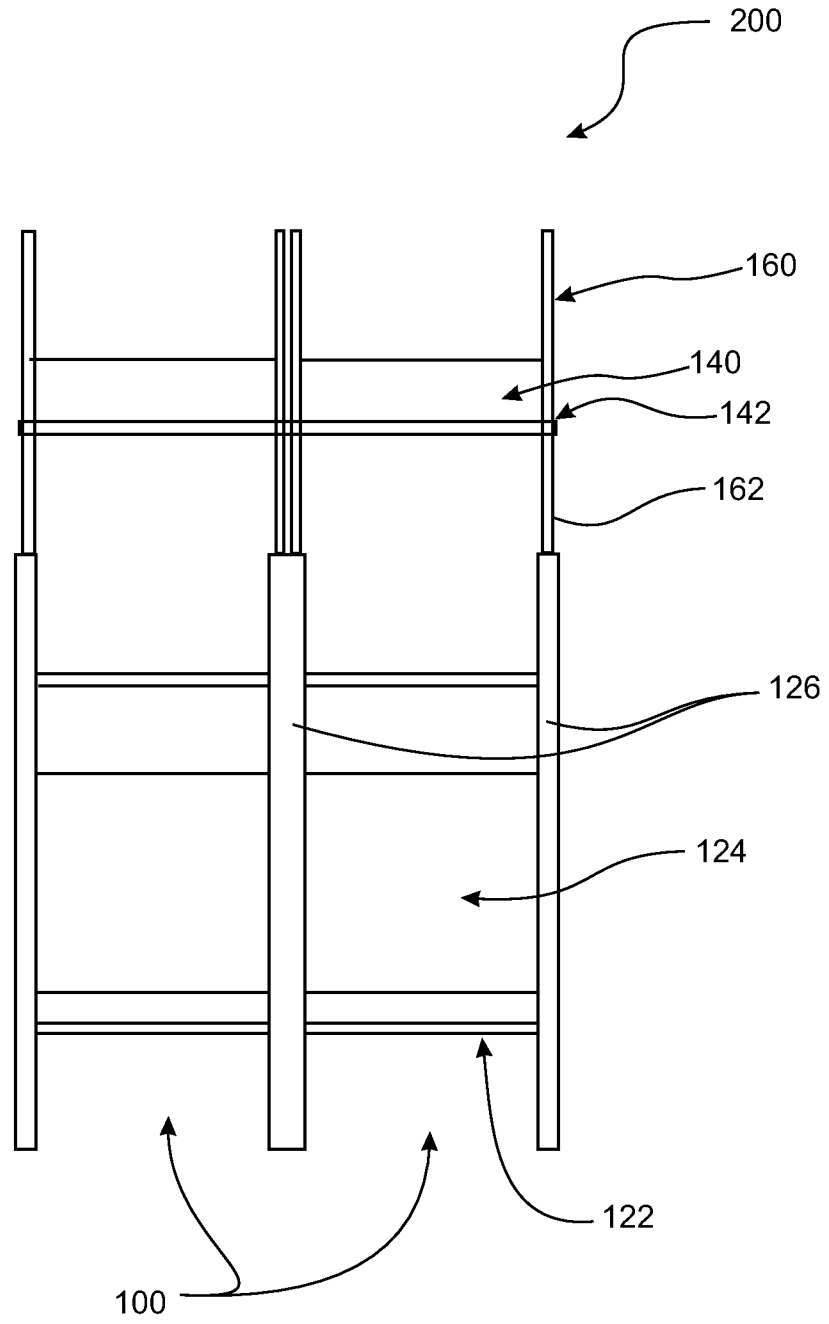
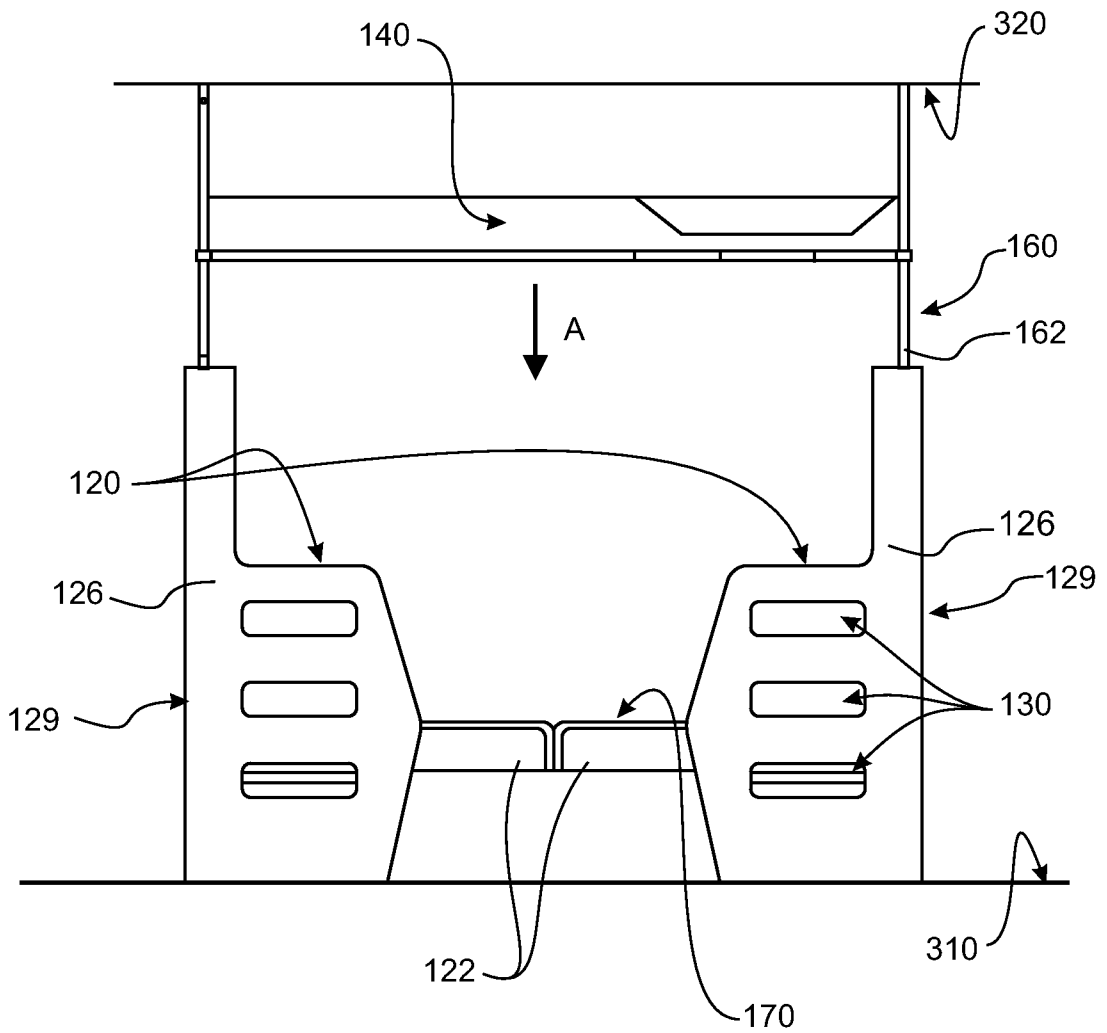


FIGURE 4



**FIGURE 5**

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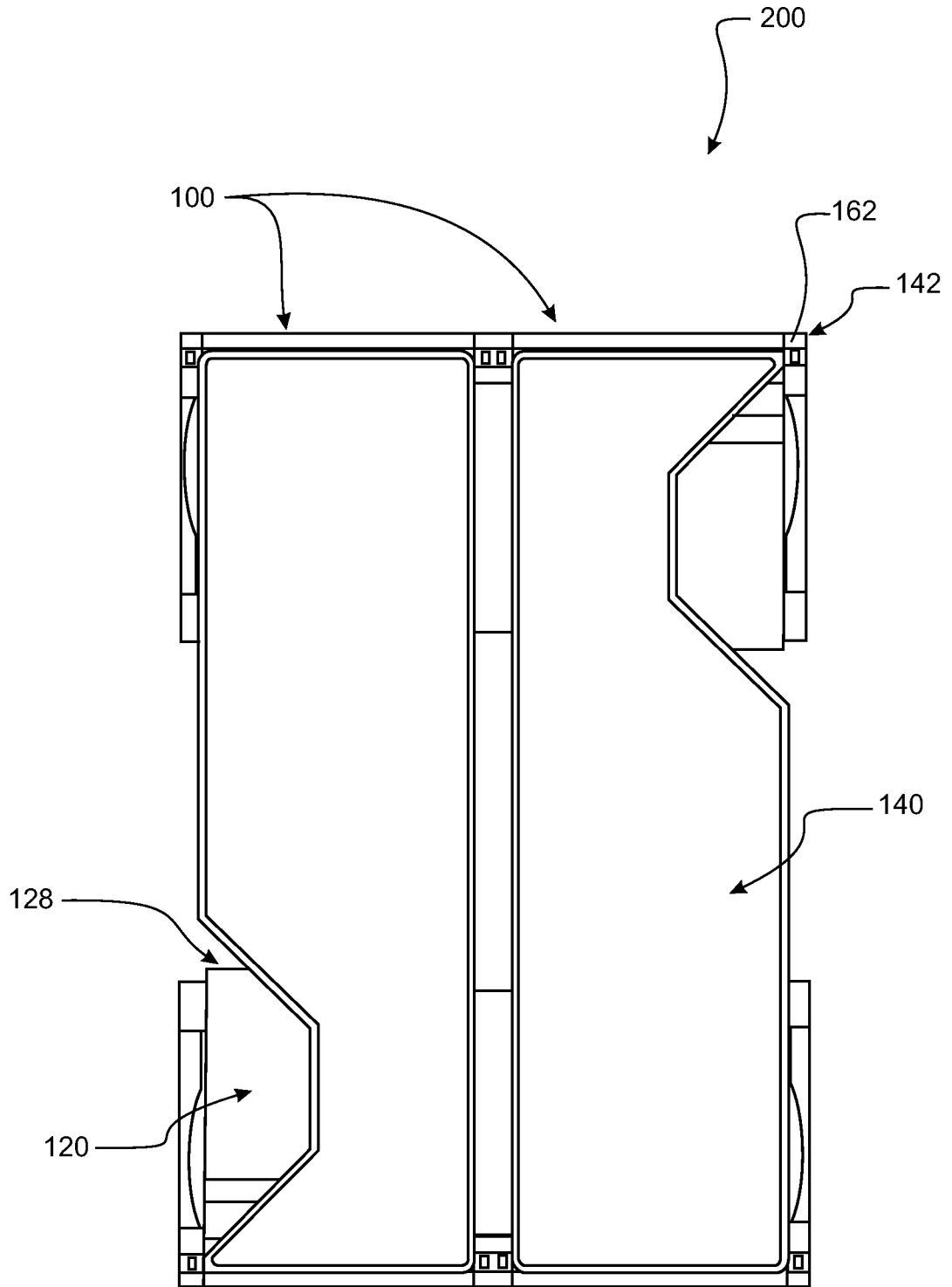
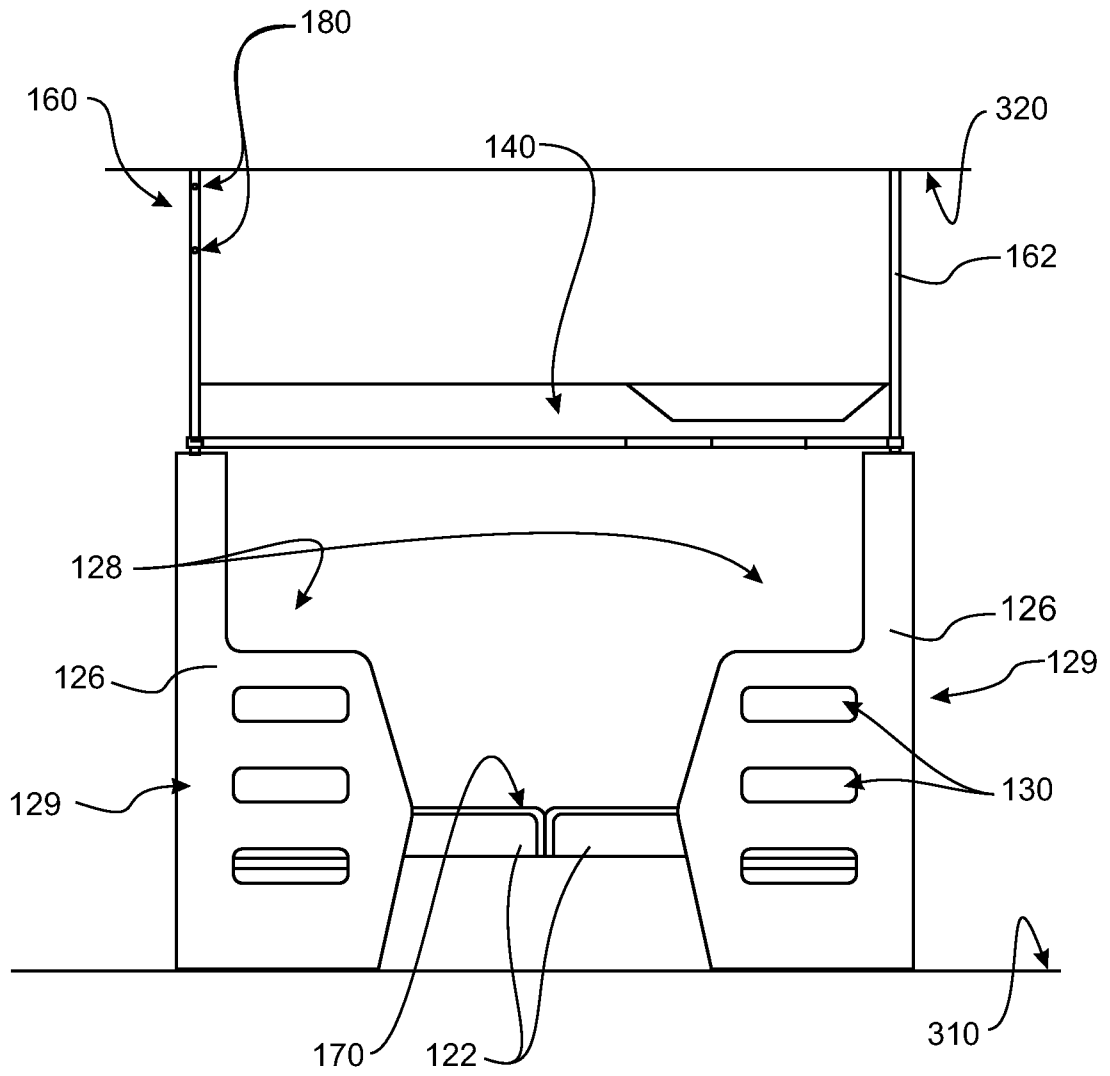


FIGURE 6



**FIGURE 7**

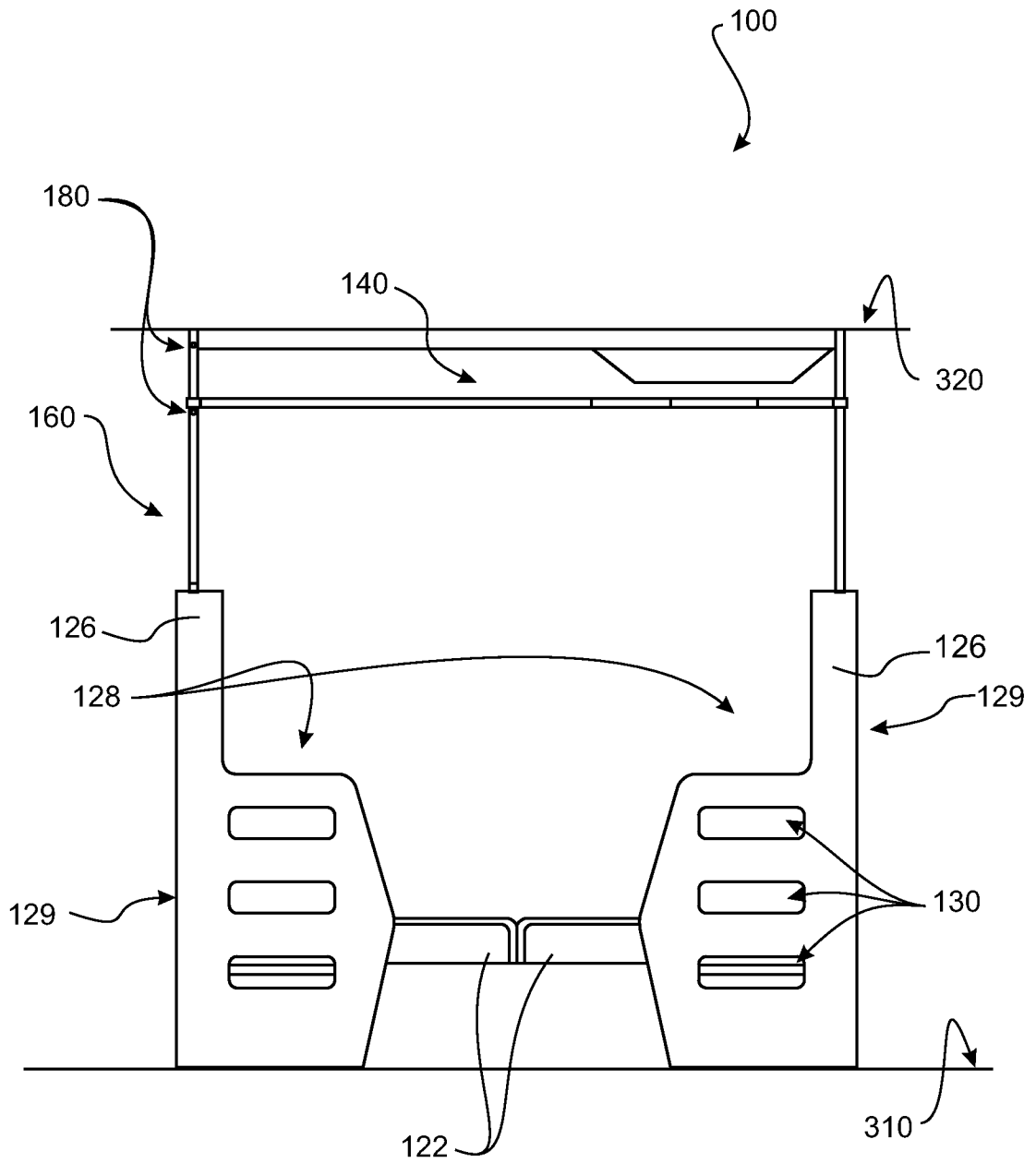


FIGURE 8

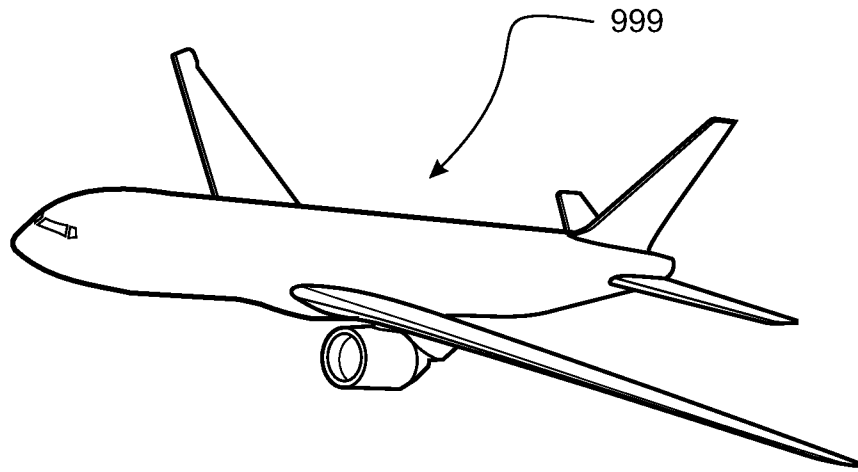


FIGURE 9



## INTERNATIONAL SEARCH REPORT

International application No.

PCT/IB2010/055969

## A. CLASSIFICATION OF SUBJECT MATTER

Int. Cl.

*B64D 11/06* (2006.01)*B60N 2/34* (2006.01)*A47B 85/00* (2006.01)*B61D 33/00* (2006.01)

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)

IPC: B64D11/00, B60N/LOW, A47B/LOW, B61D33/00, B62D47/02, B60R/LOW, E04H/LOW, B25H/LOW, A47C17/84. Key words: seat, chair, recliner, couch, bed, bunk, sleeper, above, over, convert, adapt, alter, change and like terms.

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	GB1041128 A (GEN PATENT COMPANY SA) 1 September 1966	1-34
A	WO2006/032280 A1 (PEDERSEN) 30 March 2006	1-34
A	EP0291894 B1 (WELTER et al.) 6 November 1991	1-34
A	WO1995/032873 A1 (BOLDISZAR) 7 December 1995	1-34



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	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"E" earlier application or patent but published on or after the international filing date	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"O" document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family
"P" document published prior to the international filing date but later than the priority date claimed	

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29 March 2011

Date of mailing of the international search report

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**INTERNATIONAL SEARCH REPORT**

Information on patent family members

International application No.

**PCT/IB2010/055969**

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			
GB	1041128	NONE			
WO	2006032280	DK	200401431	EP	1794024
EP	0291894	DE	3716626		
WO	9532873	AU	26811/95	HU	70818

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

**END OF ANNEX**