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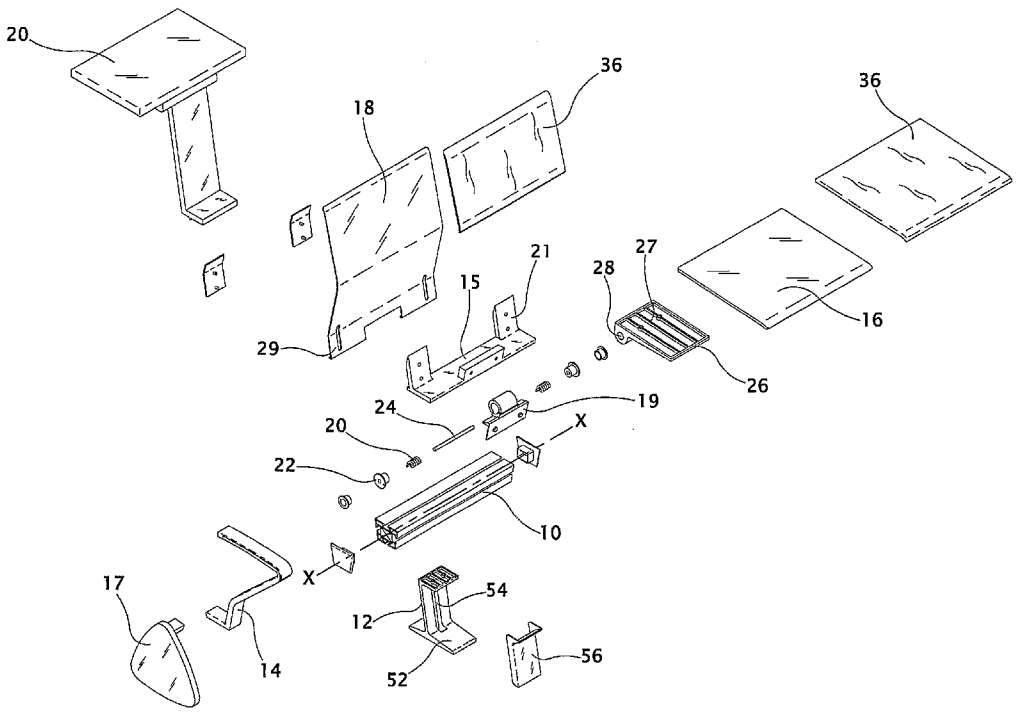
Declarations under Rule 4.17:

— *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))*

— *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))*

[Continued on next page]

(54) Title: FITTED MODULAR SET OF SEATS



(57) Abstract: A fitted modular set of seats comprises a plurality of furnishing elements which can form one or more seats. The furnishing elements comprise at least one seat (16) and a back (18), and each seat comprises a single supporting element (15) to which the furnishing elements (12, 14, 16, 18) are directly and selectively connected, in such a way that the type of one or more seats can be modified freely in use.

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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

FITTED MODULAR SET OF SEATS

The present invention relates to the field of furnishing elements and specifically to a fitted modular set of seats. To clarify the description, the term "seat", according to common usage in the field of furnishing, denotes any furnishing elements such as chairs, armchairs, small armchairs, and the like, whose principal function is to act as a structure supporting one or more persons in a sitting position.

The present invention was developed with particular regard to a unit equipped with seats comprising modular combinable elements which are particularly suitable for creating furnishing elements having different functional and structural characteristics.

There are widely known seats to which further furnishing components can be added to modify their appearance and, especially, their functional and structural characteristics. For example, there are known seats to which armrests, writing tablets and/or different types of supports can be added. There are also known sets of seats supported by a single common supporting bar which can be modified by the subsequent superimposition of furnishing components to achieve the desired configuration. Some of these solutions are known from patent documents in the name of the present applicant, in which sets of equipped seats comprise, as the main support for development, a supporting frame structure, or alternatively a common shaft.

The object of the present invention is to improve further the functional and structural characteristics of known seats, while also making it possible to provide a fitted set of seats comprising modular combinable elements in which one or more seats can be added, removed or modified structurally in

a simple and economical way, by non-specialized personnel if necessary. In order to achieve this objective, the present invention proposes a unit equipped with seats comprising modular combinable elements having the characteristics stated in the claims below.

A further object of the present invention is to provide a unit equipped with seats which can be easily and economically manufactured, and which allows fast and easy modification of its structural and functional characteristics.

One of the principal benefits of the present invention is the fact that the substantial reduction in the overall dimensions of the seat, without limiting the useful seating space, makes it possible to equip spaces such as meeting rooms, auditoriums, theatres and lecture halls with a greater number of seats without sacrificing the comfort of users. Furthermore, when the said spaces have been equipped, it is possible to modify their functional and structural characteristics at any time without the need to dismantle the whole set of seats, simply by operating on one or more individual seats.

A further benefit of the present invention is due to the fact that the unit equipped with seats comprises a supporting element which makes the addition of new seats or their removal and/or the structural modification of existing seats independent of the development of the structure of the system.

In a particularly advantageous embodiment of the present invention, the supporting structure also comprises conduit means for electrical wiring or a wired data network. Thus each seat of the set of seats can make use at any time of a connection to the said wiring, without the need to run temporary wires external to the set of seats from time to

time, which might cause inconvenient bulkiness and might be hazardous to users.

Finally, by means of the present invention it is also possible to benefit from all the known advantages of the design, production and marketing of generally combinable modular elements, these advantages including the reduction in the development time of new models of seats having different appearances but identical structural elements, and the reduction in stocks or procurement and delivery times of the various modules suitable for constructing different models of seats.

Further characteristics and advantages will be made clear by the following detailed description of two of the preferred embodiments, with reference to the attached figures, provided purely by way of example without restrictive intent, in which:

- Figure 1 is an exploded view of a seat of a fitted modular set of seats according to the present invention;
- Figure 2 is a side view of the seat of Figure 1;
- Figure 3 is a front view of the seat of Figure 1;
- Figure 4 is a front view of a seat of a fitted modular set of seats according to the present invention;
- Figure 5 is an enlarged side view of the supporting structure of the set of seats of Figure 4;
- Figure 6 is a schematic perspective view of another of the preferred embodiments of the present invention; and
- Figure 7 is a schematic side view of the embodiment of Figure 6.

With reference to the figures, a fitted set of seats according to the present invention comprises a plurality of seats positioned adjacent to each other and close together. Each seat comprises a single supporting element, for example, but not exclusively, a supporting plate or bracket 15 with

which are engaged all the necessary furnishing elements for forming a seat. The supporting bracket 15, of substantially elongate shape and preferably made from metallic material, for example aluminium, comprises a plurality of engagement means, including, for example, at least a pair of vertically projecting appendages 21 and a plurality of through holes.

Figure 1 shows an exploded view of one of the embodiments of the present invention, with particular reference to a single seat. As clearly shown, the supporting bracket 15 is engaged with a set of furnishing elements comprising for example, but not exclusively, one or more of the following elements: a leg 12, an armrest 14, a seat 16, a back 18, a writing tablet 17, and/or a rear support shelf 20. Preferably, but not necessarily, the said set also comprises a seat tipping mechanism 16, comprising an attachment 19, a pair of coil springs 20, a rotation bush 22, a shaft 24 and a plate 26. The attachment 19 comprises a surface for connection to the supporting bracket 15 and a bush into which are inserted the pair of coil springs 20 and the rotation bush 22. The plate 26, preferably made from metallic material, comprises a surface 27 having, for example, a square shape, with through holes formed in its corners. The plate 26 is fixed to the seat 16 by means of fixing elements, for example screws or the like, which pass through the said holes. The plate 26 also comprises two substantially cylindrical lateral appendages 28, each comprising a through hole, which can be joined, in use, to the tipping mechanism described above. In particular, the shaft 24 is inserted into the bush of the attachment, into the pair of coil springs 20, into the rotation bush 22 and into the through holes of the lateral appendages 28 of the plate 26. At its ends, the shaft 24 has locking means for keeping the aforesaid elements of the tipping mechanism engaged with each other. Figure 2 shows how the tipping mechanism enables the seat 16 to be moved from an

unused position, in which the seat is adjacent to the back 18, to a working position, shown in broken lines.

The back 18 comprises a panel, which is preferably thin, is curved in its intermediate portion, and comprises a pair of projecting appendages 29 in its lower portion. The back 18 is fixed to the two vertical appendages 21 formed on the supporting bracket 15, by means of its lower appendages 29 only, using known fixing means. This characteristic is particularly beneficial in that it increases the flexibility of the back 18 when it is subjected to the stresses caused by a user, thus making the seat more ergonomic and comfortable.

The back and the seat are preferably, but not necessarily, made from wood or metal or plastics material, and can be covered with covering elements 36, made from textile material or leather. Alternatively, a layer of padding can be inserted between the surfaces of the back and/or the seat and the covering elements, so as to make the seat more comfortable. The writing tablets and the rear support shelves 20 can be fixed or of the folding type or "anti-panic" type.

In one of the preferred embodiments of the present invention, the fitted set of seats comprises a supporting structure, preferably one or more elongate supporting elements. In the illustrated embodiment, the supporting structure consists of a support bar 10 which extends along a preferred axis indicated by X-X in the figures. The support bar 10 can be connected to one or more leg elements 12, and one or more supporting brackets 15, which together with the other furnishing elements can form one or more seats, are engaged with the support bar.

With particular reference to Figure 5, the substantially "bar"-shaped supporting element 10 comprises a peripheral wall on which is formed a plurality of lateral appendages or

ribs 30, and corner appendages or ribs 32, which, in combination, form peripheral walls of the supporting element, interrupted by a plurality of parallel longitudinal grooves 34. The supporting brackets 15 are engaged with the supporting bar 10 inside the peripheral wall and in particular through the said grooves 34. Inside the upper and lower grooves of the supporting element 10 there is positioned a plurality of fixing means, comprising, for example, blocks 40 which can be engaged selectively with two corresponding clamping screws 42. The outer surfaces of the blocks 40 have shapes complementary with the shape of the inner surface of the groove 34, in such a way that they are locked with respect to rotation, when in use, inside the said groove during the tightening of the corresponding screws 42. The means of engagement described above are positioned inside the peripheral surface in such a way that this peripheral surface of the supporting element is left free. This characteristic is highly beneficial not only in terms of the appearance, since it enables a "clean" profile of the modular set of seats to be obtained, but also in terms of function.

The fitted set of seats according to the present invention also comprises channel means for the passage of electrical wiring and/or a wired data network. In particular, the conduit means comprise a channel formed inside the bar-shaped supporting element and apertures, grooves and through holes formed in the components of the seats. As clearly shown in the figures, the support bar comprises a through channel 50 delimited by the peripheral walls, in which a plurality of apertures is formed at predetermined points. Electrical connectors and/or data connectors for the connection of electrical and/or electronic devices can be engaged in these apertures, on the outer surface of the peripheral walls of the supporting bar.

Each leg element 12 also comprises a through hole 52 in its base and a vertical groove 54 which can house one or more wires. A front cover element 56, formed for example, but not exclusively, from plastics material, can be fitted over the leg element so as to conceal the aforesaid wiring.

The fitted set of seats described above is installed by placing the supporting bar 10 in position and fixing it to the floor by means of the leg elements 12. The electrical and/or data wires are then passed through the conduit means, and the connectors are placed in predetermined positions. In a particularly advantageous embodiment of the present invention, fitted sets of seats having a curved extension can be produced. In the case of large environments, it is possible to position the support bar of the present invention in such a way that it has a sufficient radius of curvature to produce a set of seats with a curved extension, without modifying any furnishing or connecting element.

When the supporting structure and the wiring have been positioned, all the supporting elements, such as the supporting brackets 15, and the tipping mechanisms are added. Finally, the fitted set of seats is completed with the furnishing elements. Clearly, changes can be made according to the models of seats which are to be provided, which may equally well have tip-up or fixed seats, rear and/or front writing tablets, and seats of different materials such as wood, metal, or plastics, and which may be covered and/or padded, etc.

In another preferred embodiment of the present invention, shown in Figures 6 and 7, the plurality of supporting brackets 15 of the fitted set of seats is supported directly by leg elements 12 or by architectural elements, preferably sequential and staggered with respect to height, such as tiers, small walls, and the like. The supporting bracket 15

is engaged with a set of furnishing elements comprising for example, but not exclusively, one or more of the following elements: an armrest 14, a seat 16, a back 18, a writing tablet 17, and/or a rear support shelf 20. Preferably, but not necessarily, the said set also comprises a seat tipping mechanism 16, comprising an attachment 19, a pair of coil springs 20, a rotation bush 22, a shaft 24 and a plate 26.

This embodiment is particularly advantageous in the case in which the fitted set of seats is used in environments comprising sequential raised architectural spaces, such as the tiers of a stadium, a theatre or a lecture hall.

CLAIMS

1. Fitted modular set of seats, of the type comprising a plurality of furnishing elements capable of forming one or more seats, the said furnishing elements comprising at least one seat (16) and a back (18), characterized in that each seat comprises a single supporting element (15) to which the furnishing elements (12, 14, 16, 18) are directly and selectively connected, in such a way that the type of one or more seats can be freely modified in use.

2. Modular set according to Claim 1, characterized in that it also comprises one or more supporting elements (10) elongated in a preferred direction, all of the supporting elements (15) being engaged with the said one or more supporting elements (10).

3. Modular set according to Claim 2, characterized in that the supporting element (10) comprises conduit means (50) for the passage of electrical wires and/or data transmission wires.

4. Modular set according to Claim 3, characterized in that the supporting element (10) comprises a peripheral wall in which is formed a plurality of lateral appendages or ribs (30), and corner appendages or ribs (32) interrupted by a plurality of parallel longitudinal grooves (34).

5. Modular set according to Claim 4, characterized in that it also comprises leg elements (12) connected to the supporting element (10).

6. Modular set according to Claim 1, characterized in that the furnishing elements are selected from the following set of elements: a leg element (12), an armrest (14), a seat

(16), a back (18), a writing tablet (15), a support shelf (20), and a support bar (10).

7. Modular set according to Claim 6, characterized in that the supporting element comprises a supporting bracket (15) in which is formed a pair of vertically projecting appendages (21), the back (18) being fixed to the said vertical appendages (21) by means of its lower appendages (29) only.

8. Modular set according to Claim 6, characterized in that the back (18) and the seat (16) are covered with covering elements (36) of textile material and/or leather.

9. Modular set according to Claim 8, characterized in that a layer of padding is inserted between the surfaces of the back (18) and/or the seat (16) and the covering layers.

10. Modular set according to Claim 6, characterized in that it also comprises a tipping mechanism for a seat (16).

11. Modular set according to Claim 10, characterized in that the tipping mechanism comprises a pair of coil springs (20), a rotation bush (22), a shaft (24) and a connection plate (26).

12. Modular set according to Claim 11, characterized in that the connection plate comprises a surface (27) of substantially square shape.

13. Modular set according to Claim 1, characterized in that the supporting elements (15) of the fitted set of seats are supported directly by architectural elements.

14. Modular set according to Claim 13, characterized in that the furnishing elements are selected from the following set

of elements: an armrest (14), a seat (16), a back (18), a writing tablet (15), and a rear support shelf (20).

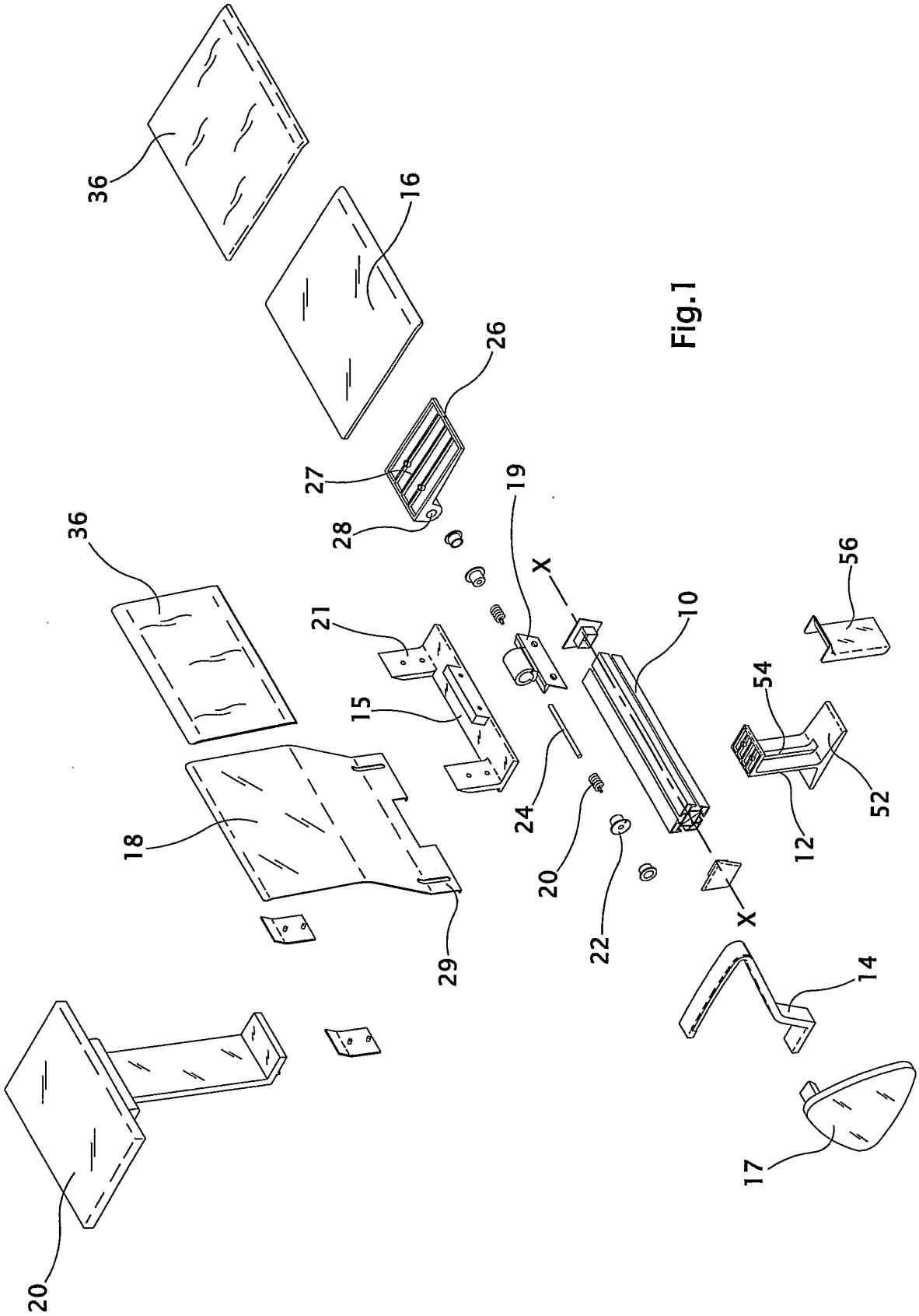


Fig.1

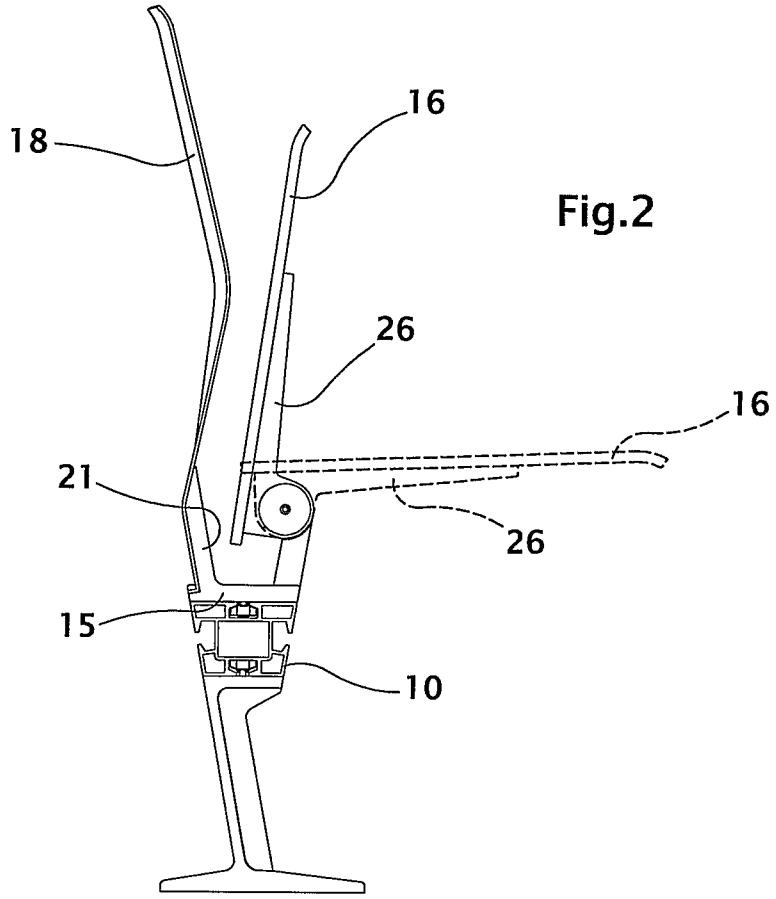


Fig.2

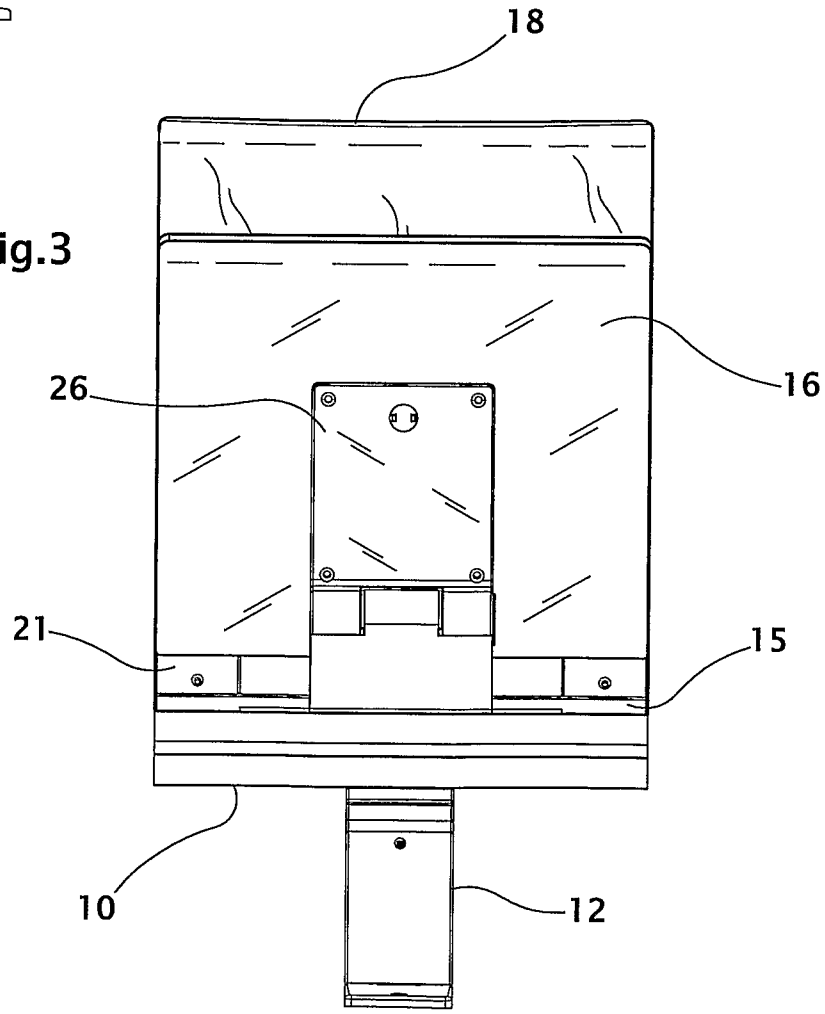


Fig.3

Fig.4

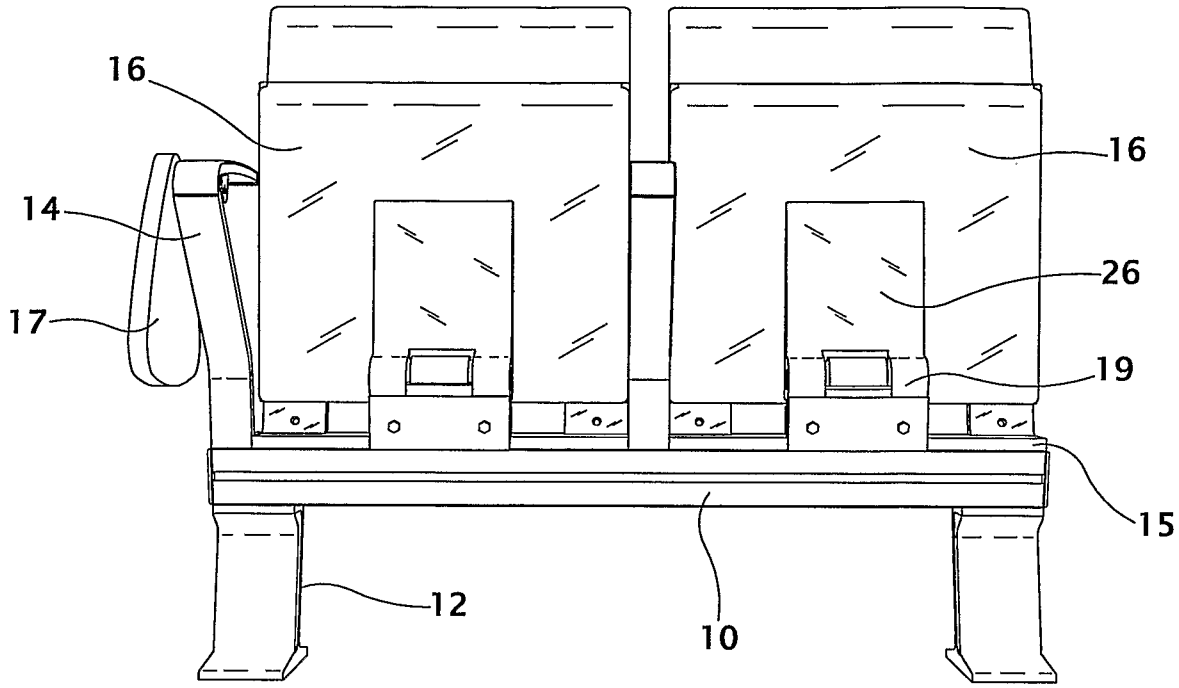


Fig.5

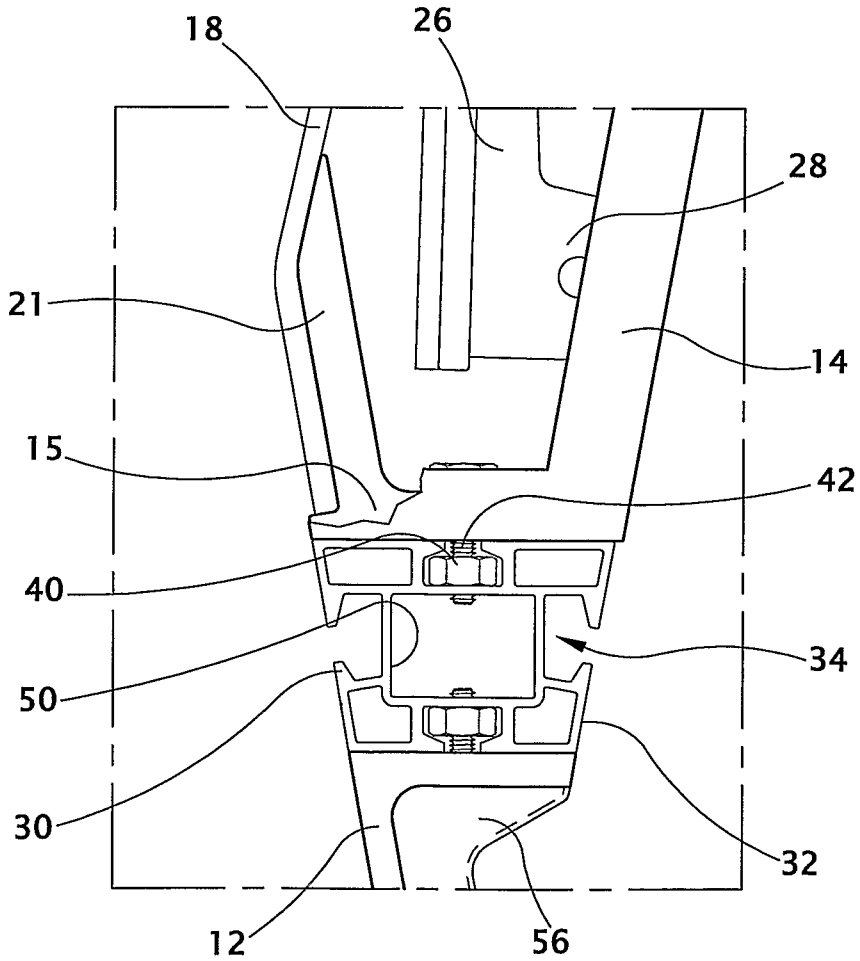


Fig.6

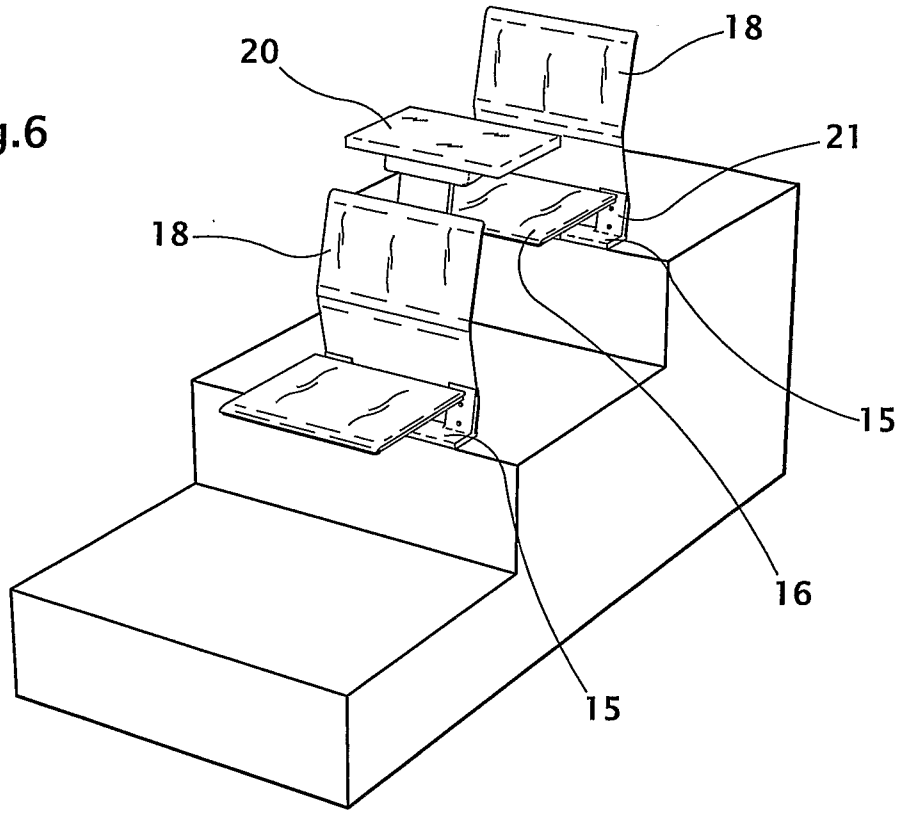
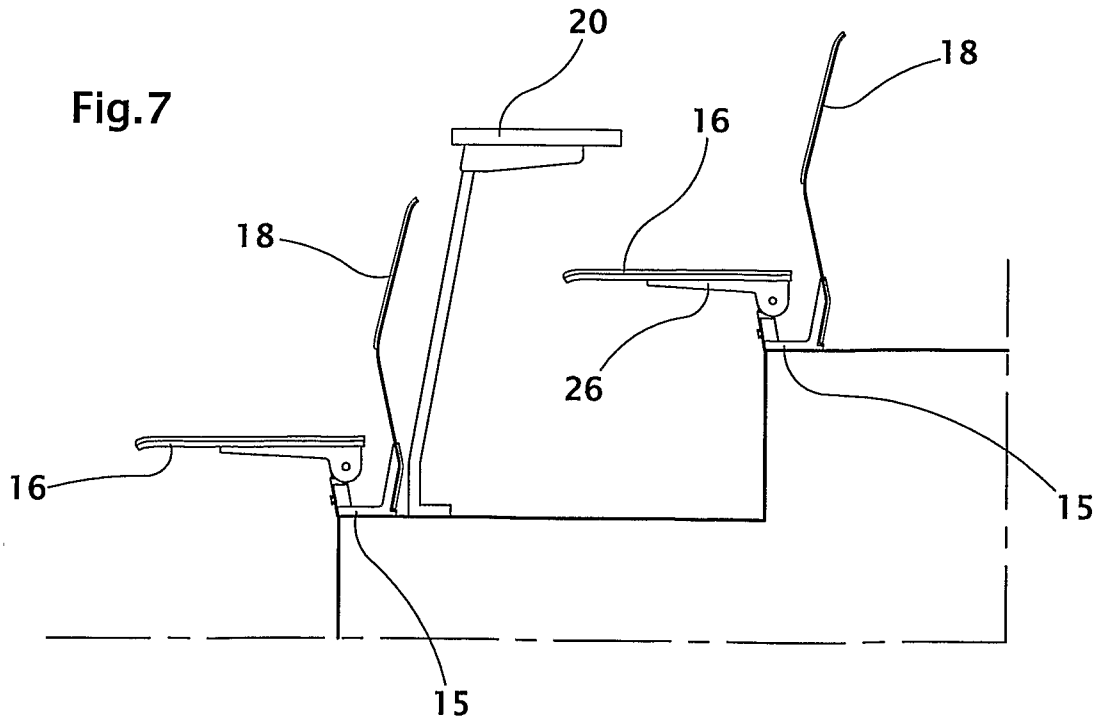


Fig.7



INTERNATIONAL SEARCH REPORT

International application No
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A. CLASSIFICATION OF SUBJECT MATTER
INV. A47C1/121 A47C7/56 A47C13/00

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)
A47C

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, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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Y	figures	11,12

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

[X] See patent family annex.

* Special categories of cited documents :

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Date of the actual completion of the international search	Date of mailing of the international search report
27 April 2007	08/05/2007

Name and mailing address of the ISA/	Authorized officer
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International application No
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C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

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