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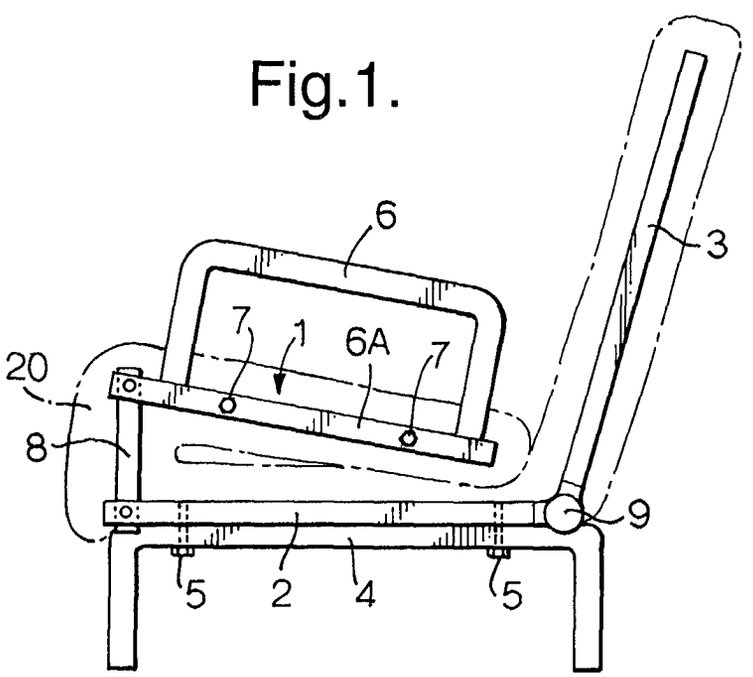
(54) Sofa-bed

(57) A sofa-bed which comprises a frame entirely enclosed in a filling material (20), the frame including an upper seat section (1), a lower seat section (2) and a back section (3). The frame has a first seat position, in which the upper seat section (1) overlies the lower seat section (2) and arms (6) on the upper seat section (1) define arms of the seat, and a second recliner position in which the upper seat section (1) is folded over onto a floor, the arms (6) of the upper seat section (1) becoming the legs of the recliner and resting on the floor.

Fig.1.



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Description

[0001] This invention relates to a piece of furniture that converts from either a sofa to a bed or a chair into a bed, these pieces of furniture are known as sofa-beds.

[0002] Sofa-beds are well known pieces of furniture that

(1) comprise a frame with cushions and a concealed mattress,
(2) comprise a frame with a single cushion that also doubles up as a mattress,
(3) comprise a frame with more than one cushion that double up as a mattress, or
(4) comprise cushions consisting of just filling materials that stack up on top of each other to form the seating and then lay out flat to form the mattress.

[0003] There have been very many proposals for designs of sofa-bed, but there is still a need for a design that is able to provide a comfortable seat, a comfortable bed at an appropriate height and an attractive design, all at an economical cost.

[0004] According to the first aspect of the invention there is provided a sofa-bed comprising:

a frame entirely enclosed in a filling material, the frame including an upper seat section, a lower seat section and a back section,
the frame having a first seat position in which the upper seat section overlies the lower seat section and arms on the upper seat section define arms of the seat,
the frame having a second recliner position in which the upper seat section is folded over onto a floor, the arms of the upper seat section becoming the legs of the recliner and resting on the floor.

[0005] By providing the combination of arms on the upper seat section that are also able to serve as legs when the sofa-bed is in its second recliner position and of entirely enclosing the frame in the filling material, it becomes possible to provide a comfortable seat, a comfortable bed and an attractive design. The product can be converted from chair/sofa to bed and back to chair/sofa without the necessity of lifting off or re-arranging cushions or mattress. Because the frame is entirely enclosed in the filling material, the body of a user of the sofa-bed never comes into contact with the frame, but is always cushioned by the filling material, whether the sofa-bed is in the seat position or the recliner position. The use of the arms to serve as legs enables the sofa-bed to be maintained at an appropriate height when in the recliner position. The enclosure of the frame in the filling material enables the sofa-bed to have a stylish appearance without unsightly pieces of frame being visible. As will be clear from the particular embodiment described below, all of the above features can be provided in a simple and economical way.

[0006] The arms on the upper seat section are preferably bolted on through the filling material. In a typical case where upholstery encloses the filling material, the arms are preferably bolted on through the upholstery and filling material. Of course where reference is made to "bolting", it will be understood that any appropriate fastening method that provides the required fastening effect may be employed. It should also be understood that in the precise region of the fastening there may be little or no filling material interposed between the frame of the upper seat section and the arms that are bolted to it; that does not, however, affect a user's comfort since the user does not place any weight in that region of the sofa-bed when using it. Thus it will be understood that the reference to the frame of the sofa-bed being entirely enclosed in filling material is not to be taken to imply that there is total enclosing by filling material of all parts of the frame. That is certainly possible, but it is also possible for example that the frame is not enclosed in some small region where the lack of enclosing does not adversely affect the performance of the sofa-bed.

[0007] Preferably, the sofa-bed further includes legs on the lower seat section. As in the case of the arms on the upper seat section, the legs on the lower seat section are preferably "bolted" on through the filling material and, in a case where upholstery encloses the filling material, through the upholstery and filling material.

[0008] Preferably the upper seat section is attached to the lower seat section by means of a link allowing folding of the frame inside the filling material. In the case of a frame entirely enclosed in filling material it is difficult to provide satisfactorily for pivoting movement of the upper seat section into a position overlying the lower seat section if the upper seat section is directly connected to the lower seat section. By providing a link in the connection it becomes much simpler to provide a satisfactory arrangement. Preferably a first end of the link is pivotably connected to the upper seat section and a second, opposite, end of the link is pivotably connected to the lower seat section.

[0009] Preferably the link pivots through about a right angle relative to the lower seat section and the upper seat section also pivots through about a right angle relative to the link, when the frame is moved from the first seat position to the second recliner position. It will be understood that the angle need not be exactly a right angle and may, for example, be as little as 70 degrees or as much as 110 degrees in each case. If the angle of pivoting at one end of the link is relatively high, then the angle of pivoting at the other end of the link is preferably relatively low. In an embodiment of the invention described with reference to the drawings the total angle of pivoting of the upper seat section relative to the lower seat section is a little over 180°.

[0010] It is also preferred that the range of pivoting movement of the link relative to the lower seat section is restricted to about a right angle and it is preferred that

the range of pivoting movement of the upper seat section relative to the link is restricted to about a right angle. Such restriction facilitates the movement by a user of the upper seat section when converting the sofa-bed. Furthermore, the restriction of pivoting of the upper seat section relative to the link is of additional advantage when the frame is in the first seat position because it precludes undesirable forward sliding movement of the upper seat section over the lower seat section. As indicated above, the angle to which pivoting is restricted need not be exactly a right angle and may, for example, be as little as 70 degrees or as much as 110 degrees in each case.

[0011] Preferably, the first and second ends of the link are juxtaposed to frame members of the upper seat section and the lower seat section respectively, and transversely extending members fixed to respective ends of the link and projecting into the path of pivoting of the frame members limit the range of pivoting movement. It will be appreciated that the link may comprise a pair of members on opposite sides of the sofa-bed, each member being juxtaposed to a respective frame member of each of the upper seat section and the lower seat section. An arrangement of this kind provides a very simple method of pivotably connecting together the upper and lower seat sections with the desired limits to pivotal movement.

[0012] Preferably the frame is adjustable to several positions. Advantageously the back section of the frame is pivotably connected to the lower seat section by a connection that allows the back section to be held at a variety of inclinations to the lower seat section and also allows the back section to adopt a horizontal orientation. Such connection means are known *per se*.

[0013] According to a second aspect of the present invention there is provided a sofa-bed that comprises a frame that is adjustable to several positions but which is entirely enclosed in filling material, enabling the product to be converted from chair/sofa to bed and back to chair/sofa, without the necessity of lifting off or re-arranging cushions or mattress.

[0014] According to a third aspect of the invention there is provided a sofa-bed where the frame is entirely enclosed in the filling material.

[0015] An embodiment of the invention will now be described by way of example with reference to the accompanying drawings in which:

Fig. 1 shows in side view a sofa-bed in a chair/sofa position;

Fig. 2 show in side view the action of lifting a seat part up to lay down on the floor to form a recliner position;

Fig. 3 shows in side view the sofa-bed in a recliner position;

Fig. 4 shows in side view the sofa-bed in a bed position;

Fig. 5 shows in perspective view the sofa-bed of Fig. 1 in the chair/sofa position;

Fig. 6A shows in side view frame parts of the sofa-bed; and

Fig. 6B shows the frame parts of Fig. 6A when viewed in the direction of the arrow B in Fig. 6A.

[0016] The dotted lines in various drawings show the bounds of filling material 20 around the frame of the sofa-bed, the filling material being bounded by upholstery.

[0017] Referring to the drawings, the sofa-bed has a frame comprising three main sections: an upper seat section 1, a lower seat section 2 and a back section 3.

[0018] The lower seat section 2 is supported off the ground by means of a pair of bolt-on legs 4 secured by bolts 5. The bolts go through the upholstery and the filling material. As shown they extend upwardly through the legs 4 into the lower seat section 2.

[0019] The upper seat section 1 has arms 6 which become the legs when the upper seat section is lifted up and laid out as a recliner or bed. The arms 6 are bolted on through the upholstery and the filling material 20 by means of bolts 7 which pass horizontally through a part 6A of each arm and into the upper seat section 1.

[0020] The upper seat section 1 and the lower seat section 2 are connected by means of a link 8.

[0021] The back section 3 is attached to the lower seat section 2 by means of a ratchet coupling 9 of a kind known *per se.* The coupling allows the back section 3 to be supported at any of a variety of inclinations to the horizontal, and also in a horizontal orientation. When the back section is lowered to form the bed it may additionally be supported by means of legs 10 which may themselves be pivotable as indicated by an arrow in Fig. 3, so as to be movable between a stowed position and the position shown in Fig. 3.

[0022] Figs. 6A and 6B show in more detail the connection of frame members of the upper seat section 1, the link 8 and the lower seat section 2. Each frame member is formed of tube, in this particular example square tube. A first end 8A of the link 8 is pivotably connected by a pin 11 to the end of the upper seat section 1 and similarly a second, opposite, end 8B of the link 8 is pivotably connected by a pin 12 to the end of the lower seat section 2. As can be seen in Fig. 6B, the ends 8A, 8B of the link 8 are juxtaposed to the frame members of the upper and lower seat sections 1, 2 to which they are pivotably connected by the pins 11, 12. Stop bar 13 is welded to the link 8 in the region of its first end 8A and, as shown in Fig. 6B, projects into the path of the frame member of the upper seat section 1, thereby limiting its angle of pivoting to about a right angle. Similarly stop bar 14 is welded to the link 8 in the region of its second end 8B and, as shown in Fig. 6B, projects into the path of the frame member of the lower seat section 2, thereby limiting its angle of pivoting to about a right angle.

[0023] In the description above and all the drawings except Fig. 5, only one side of the sofa-bed is seen and thus only the frame arrangement on one side is de-

scribed. It will be understood, however, that substantially the same frame arrangement is provided along the opposite side of the sofa-bed and that cross-frame members are provided where appropriate interconnecting the frame arrangements on each side to thereby form the frame sections 1, 2 and 3. Similarly, the link arrangement is provided on both sides of the frame.

[0024] As will now be understood, a user can simply convert the sofa-bed of Fig. 1 shown in its first seat position to the sofa-bed of Fig. 3 shown in a recliner position. The user simply lifts the upper seat section 2 by one or both of the arms 6 and flips the upper seat section over onto the ground. That action is illustrated in Fig. 2 where both positions of the seat section 1 are shown. The limited range of pivoting of the link 8 relative to the seat sections 1 and 2 facilitates this movement. Also it may be noted that the limited range of movement prevents the upper seat section 1 sliding forwards (to the left as seen in Fig. 1) when the seat is in the position shown in Fig.1.

[0025] After the movement just referred to and illustrated in Fig. 2, the sofa-bed is in the position shown in Fig. 3, namely a recliner position. The amount of the recline can be adjusted as desired by virtue of the ratchet coupling 9 between the back section 3 and the lower seat section 2 and for use as a bed a particular recliner position is adopted in which the back section 3 is horizontal. In this case the legs 10 may be swung out to provide additional support for the back section 3.

[0026] In Fig. 5 it can be seen that the particular embodiment illustrated is a chair. It will be understood, however, that substantially the same design can be applied to a wider seat which would then commonly be referred to as a sofa.

[0027] As can be seen from Fig. 5 the filling material entirely encloses the frame. In Figs. 1 to 4, the filling material boundary is shown in dotted outline as substantially coincident with the bottom of the frame section 2, but it should be understood that this only applies where the legs 4 are immediately adjacent to the lower seat section 2. Away from that region the filling 5 material extends below the bottom of the frame section 2.

[0028] Whilst one particular embodiment of the invention has been described, it will be understood that many variations may be made to the embodiment within the scope of the invention. For example, the legs 4 may take a wide variety of forms including that of a swivel base. Similarly the arms 6 may be of any desired shape or size consistent with their use as supports for the upper seat section when the upper seat section is in the recliner position; for example, they may be upholstered and may be much bulkier than the arms shown in the drawings.

Claims

1. A sofa-bed comprising:

a frame entirely enclosed in a filling material, the frame including an upper seat section, a lower seat section and a back section,
the frame having a first seat position in which the upper seat section overlies the lower seat section and arms on the upper seat section define arms of the seat,
the frame having a second recliner position in which the upper seat section is folded over onto a floor, the arms of the upper seat section becoming the legs of the recliner and resting on the floor.

2. A sofa-bed according to claim 1, wherein the arms on the upper seat section are bolted on through the filling material.

3. A sofa-bed according to claim 1, wherein upholstery encloses the filling material and the arms on the upper seat section are bolted on through the upholstery and filling material.

4. A sofa-bed according to any preceding claim, further including legs on the lower seat section.

5. A sofa-bed according to claim 4, wherein the legs on the lower seat section are bolted on through the filling material.

6. A sofa-bed according to claim 4, wherein upholstery encloses the filling material and the legs on the lower seat section are bolted on through the upholstery and filling material.

7. A sofa-bed according to any preceding claim, wherein the upper seat section is attached to the lower seat section by means of a link allowing folding of the frame inside the filling material.

8. A sofa-bed according to claim 7, wherein a first end of the link is pivotably connected to the upper seat section and a second, opposite, end of the link is pivotably connected to the lower seat section.

9. A sofa-bed according to claim 8, wherein the link pivots through about a right angle relative to the lower seat section and the upper seat section also pivots through about a right angle relative to the link, when the frame is moved from the first seat position to the second recliner position.

10. A sofa-bed according to claim 8 or 9, wherein the range of pivoting movement of the link relative to the lower seat section is restricted to about a right angle.

11. A sofa-bed according to any of claims 8 to 10, wherein the range of pivoting movement of the up-

per seat section relative to the link is restricted to about a right angle.

12. A sofa-bed according to claim 10 or 11, wherein the first and second ends of the link are juxtaposed to frame members of the upper seat section and the lower seat section respectively, and transversely extending members fixed to respective ends of the link and projecting into the path of pivoting of the frame members limit the range of pivoting movement.

13. A sofa-bed according to any preceding claim, wherein the frame is adjustable to several positions.

14. A sofa-bed wherein the frame is entirely enclosed in the filling material.

15. A sofa-bed as claimed in claim 14, wherein the arms on the upper seat section become the legs of the bed when the upper seat section is folded over onto the floor forming the recliner position.

16. A sofa-bed as claimed in claim 14 or 15, wherein the arms on the upper seat section are bolted on through the upholstery and fillings.

17. A sofa-bed as claimed in any of claims 14 to 16, wherein the upper seat section is attached to the lower seat section by means of a link allowing the folding of the frame inside the filling material.

18. A sofa-bed as claimed in any of claims 14 to 17, wherein the lower seat section is supported by means of legs that are bolted on through the upholstery and fillings.

19. A sofa-bed as claimed in any of claims 14 to 18, wherein the back section has legs that swing down through the upholstery and fillings to support the back section when it is in the bed position.

Fig.1.

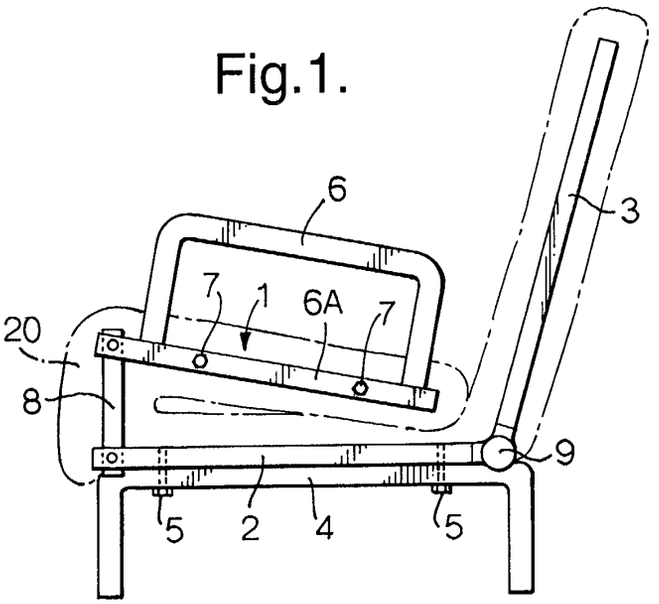

Fig.5.

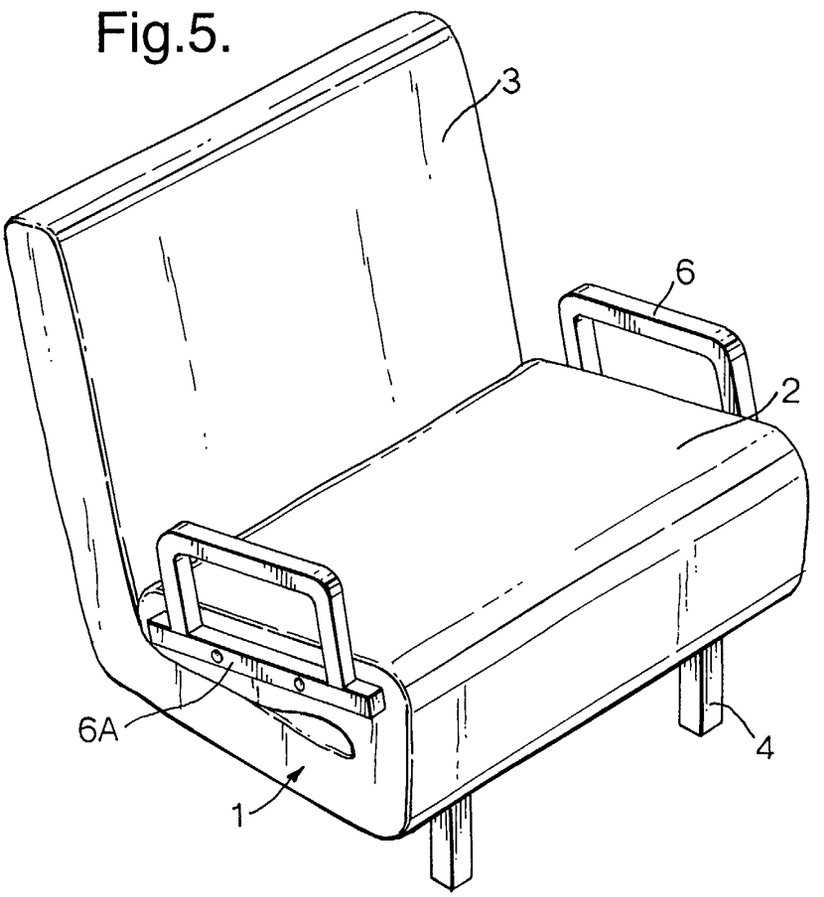

Fig.2.

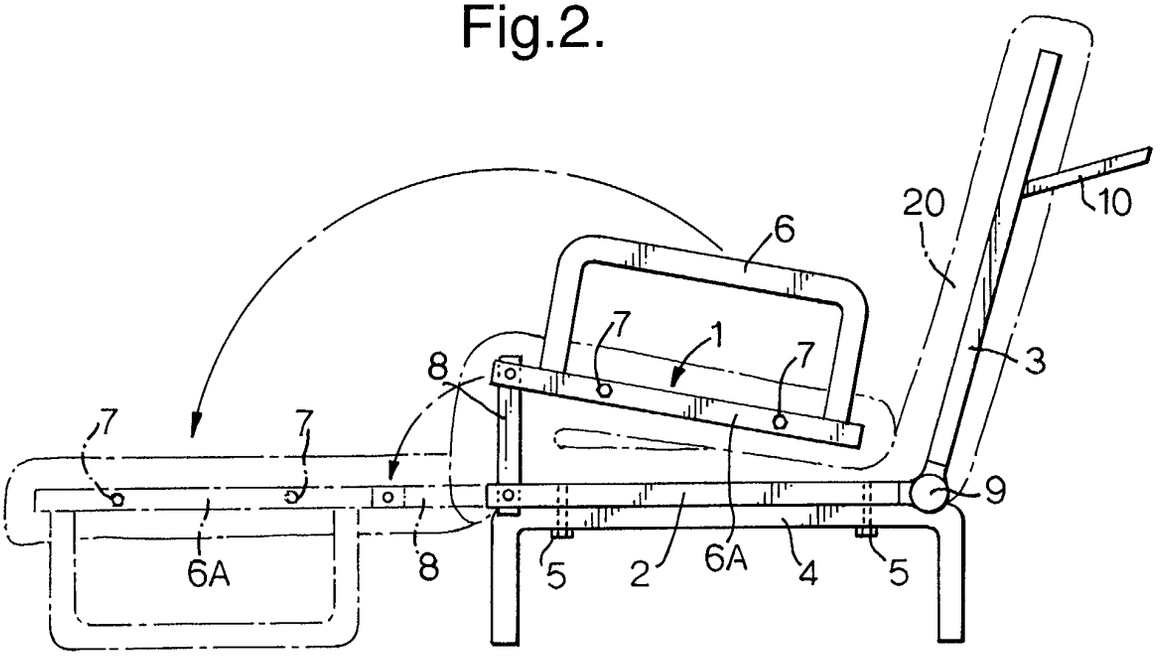

Fig.3.

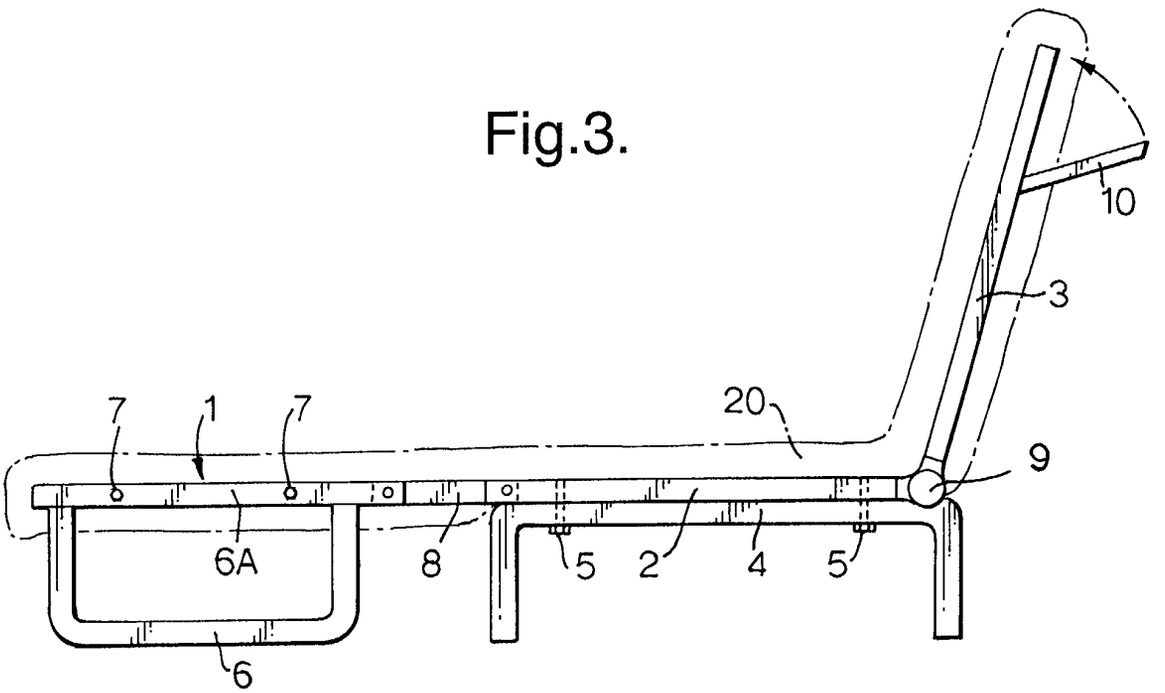

Fig.4.

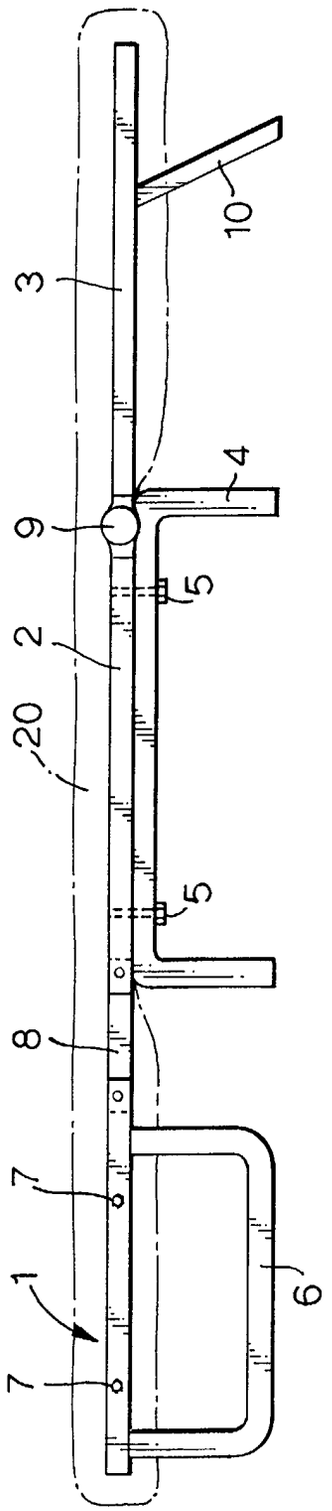

Fig.6B.

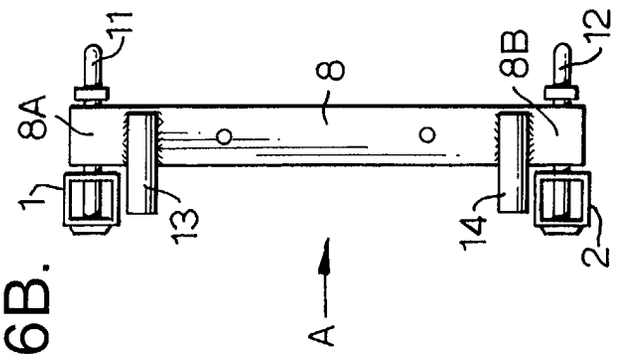

Fig.6A.