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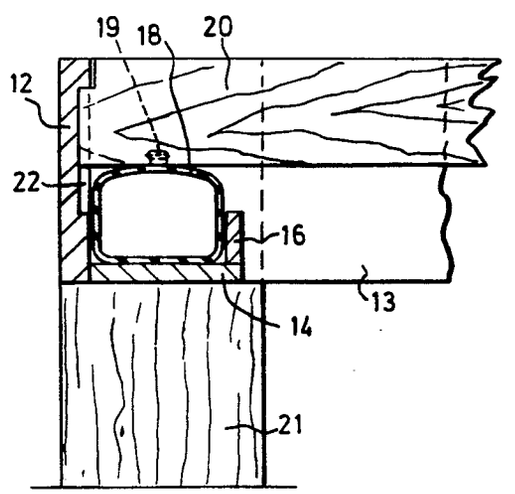
(54) An improved bed or the like.

(57) A bed, chair, or couch providing a high standard of comfort for all types of user including sufferers from back complaints. The invention as applied to a bed comprises a frame having spaced side members (12) and a body support surface formed by a plurality of slats (20) extending transversely of the frame and guided for vertical movement in slots (22) formed in the side members. The end portions of each slat (20) engage, respectively, an elongate resilient tube (18) housed in a channel sphaped member (14, 16) such that, in use, the support surface formed by the slats (20) conforms to the profile of a user's body in contact therewith.



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AN IMPROVED BED OR THE LIKE

The present invention relates to support appliances such as beds, chairs or couches designed to provide a high standard of comfort for all types of user, large or small, heavy or light in weight, or to sufferers from back complaints. For the purpose of this specification the term "bed" will be used generally to describe all such appliances.

Normally, persons suffering from back trouble require beds that furnish a large amount of lumbar support, which the ordinary resilient mattress does not provide. A known remedy is either to provide a special, hard mattress or to insert a rigid board between the mattress and the sprung bed. It will be readily appreciated that, although this treatment is effective, it is also somewhat uncomfortable as the increased support is also applied to other parts of the body where no such support is required, and where the additional support may even be undesirable.

It is an object of the present invention to provide a bed which provides adjustable increased lumbar support without sacrificing resilience of the bed in the region of the shoulders and the pelvis of the user.

Furthermore, present practice is for users to purchase beds having soft, medium or hard mattresses

and once purchased, there is no adjustment possible. Guests and casual users may therefore experience some discomfort and even detrimental after effects e.g. back complaints, for some time after use. Therefore, it is also an object of this invention to provide a means whereby users of such beds, whether having back troubles or not, have the ability to rapidly adjust the bed to the exact desired hardness or softness required by the user. For example, in the case of a so-called double bed, the user of one side might be light in weight and require a more resilient (softer) surface to lie on, whereas the other user may be of heavier build and require a firmer surface in order to compensate for the increased weight. The present invention enables both parties to have equal comfort by setting the resilience of the surface beforehand to their respective requirements, notwithstanding that each adjacent support surface was identically produced. Previously the mattress used was a compromise hardness or softness which was often not suitable for either user. Single or double beds manufactured in a like, exact manner with final adjustment easily effected by the purchaser thus substantially reduces manufacturing costs by standardisation of all the main components.

Accordingly, the present invention consists in

a bed (as hereinbefore defined) comprising a frame and a body support surface formed by a plurality of members extending transversely of the frame and movable normal to the plane thereof with spaced portions of each member positioned respectively on opposite sides of its centre and engaging resilient support means such that, in use, the support surface formed by the transversely extending members conforms substantially to the profile of a user's body in contact therewith.

Preferably, said resilient support means comprises one or more pressurised, flexible, elongate tubes extending, respectively, along spaced members forming the sides of said frame.

In the accompanying drawings in which like reference numerals have been used throughout the various Figures to designate similar or corresponding members:-

Fig. 1 is a plan view of a bed according to the present invention,

Fig. 2 is a cross-section, on an enlarged scale, taken along the line 2-2 of Fig. 1,

Fig. 3 is a view, similar to Fig. 2, but showing a slightly modified construction,

Fig. 4 is a cross-section of a second embodiment of a single bed according to the present invention,

Fig. 5 is a cross-section, similar to Fig. 4, but showing a double bed arrangement,

Fig. 6 is a plan view showing a portion of the body support surface, and

Fig. 7 is a cross-section, similar to Fig. 4, but showing a modified construction.

In carrying the invention into effect according to one convenient mode, by way of example, there is provided a rectangular bed frame 10 having longitudinally extending side members 12 and transverse end members 13. As shown in Fig. 2, each side member 12 has its lower portion of channel-shaped cross-section which is formed by an inwardly directed flange 14 provided at its inner end with an upwardly directed flange 16, spaced from, but parallel to the side member 12 with an elongate flexible tube 18 accommodated in the channel-shaped portion, the tube 18 having a filling valve 19 and containing air or liquid under pressure e.g. 1 to 5 lbs/sq. inch depending on the weight and configuration of the users.

A plurality of independent, transversely extending body support members or slats 20 extend between the side members 12 and are guided for vertical movement in guideways 22, conveniently formed by slots in the side members 12 which engage the respective extremities of each slat 20. A downwardly depending support foot 21 is fixedly mounted at each corner of the bed frame 10.

As shown in Fig. 3, the end portions of each slat

20 may be formed with a downwardly extending portion 20a which engages with the respective pressurised tube 18 positioned along each side member 12 as described above. To avoid chafing, the lower surface 20b of each downwardly projecting portion 20a may be arcuate, or part-spherical, whilst the upper surface 20c of each slat 20 is preferably profiled to suit the user. In general, the upper surfaces of all the slats 20 may be flat as shown in Fig. 2, or concave as shown in Fig. 3 to form a longitudinally extending, concave, body support surface, so that the user is directed towards the centre of the bed, but if necessary, the upper surfaces of the slats 20 may collectively be formed to provide humps or ridges (not shown) in order to provide varying degrees of lumbar support so that a wide variety of users of different physique can receive the benefits of the bed construction in a simple and economical manner.

It will be seen that when a user lies on the bed, the slats 20 enable the support surface to conform accurately to the profile of the user's body in contact with the support surface so that all parts are adequately supported i.e. the end portions of the slats 20 subjected to the greatest pressure are thrust downwardly onto the pressurised tubes 18 to urge any non-pressurised slats upwardly into contact with the user's body. It will be appreciated that, although not so convenient,

other forms of pressurisation may be applied to the end portions of the slats 20 i.e., the end of each slat 20 may have a downwardly depending piston (not shown) slidably mounted in a cylinder which communicates with a common fluid reservoir, but clearly, this is more expensive than the preferred arrangement described above. Alternatively, the ends of each slat 20 may engage coil springs (not shown).

If desired, a thin foam mattress 23 may be provided to overlie the slats 20 and the bed may be provided with covers which are tailored to fit and provided with zips to allow easy removal thereof for laundering.

In the embodiment of the invention shown in Figure 4, there is provided a rectangular bed frame having longitudinally extending side members 12 and transverse end members (not shown) as described with reference to the previous embodiment. Each side member 12 has at its lower portion an inwardly directed flange 14 provided at its inner end with an upwardly directed member 16 having a plurality of aligned, vertical bores 24 extending therethrough. The member 16 is spaced from and parallel to the side member 12 with an elongate flexible tube 18 seated on the flange 14.

In this embodiment, the plurality of independent, transversely extending body support members or slats 20 are positioned with their larger dimension horizontall

disposed and forming the body support surface. Each member 20 is guided for vertical movement by means of spaced downwardly depending dowels 26 fixedly mounted on the underside of the member 20 and slidable in the bores 24 in the respective upwardly directed members 16. Thus, in this embodiment, it is not necessary to have the extremities of the members 20 guided for vertical movement in the respective side members 12, a similar guiding effect being provided by the dowels 26 sliding in their respective bores 24 in the members 20, the respective end portions of which are supported by the tubes 18. The side members 12 are mounted on longitudinally extending support feet 28 positioned inwardly of the side members 12. A mattress or cover 23 may overlie the body support surface formed by the members or slats 20.

As shown in Figures 5 and 6, the construction described with reference to Figure 4 is particularly advantageous for double or king size beds. Thus, in a double bed construction, a central, longitudinally extending member 30 is positioned at a level lower than the side members 12 and provides a common support for the adjacent flanges 14 and the associated upwardly extending flanges 16. It will be appreciated that this arrangement obviates a central ridge extending longitudinally of the bed as would be caused by the arrangement shown in Figs. 1 to 3 and as shown in Figure 6, enables

the respective adjacent inner portions 20d, 20f of the members 20 to be in juxtaposed relationship and thus provide a "merging" of the two independent body support surfaces.

In Fig. 7 which shows a modification of the arrangement shown in Figure 4, the downwardly depending dowels 26 are slidable in bearing bushes 32 fixedly mounted in a panel 34 interconnecting the respective inwardly directed flanges 14. In this construction, the lower end of each downwardly depending dowel 26 is provided with a part-spherical member 36 engaging the resilient tube 18 which, in this modified arrangement, is accommodated in a base member 38. Abutment members 40 may be provided to limit the vertical movement of the transversely extending members 20.

The slats 20 may be of wood or moulded from a synthetic resinous material.

A bed according to the present invention has the advantage that it is of normal shape, as opposed to a number of previous designs of orthopaedic, or other types of bed which tend to be of unusual shape, thus requiring special bed clothes and other covers.

Also, the basic frame and assembly may be utilised in place of a deep spring or other mattress, on top of the existing base in order to conveniently convert existing beds into the improved construction described

above.

A further advantage is that beds made according to the present invention may conveniently be supplied in kit form which facilitates transit. Such beds are provided with connector members which simplifies re-assembly.

CLAIMS

1. A bed (as hereinbefore defined) comprising a frame (10) and a body support surface formed by a plurality of members (20) extending transversely of the frame (10), characterised in that said members (20) are movable normal to the plane of the body support surface with spaced portions of each member (20) positioned, respectively, on opposite sides of its centre and engaging resilient support means (18) such that, in use, the support surface formed by the transversely extending members (20) conforms substantially to the profile of a user's body in contact therewith.

2. A bed as claimed in claim 1, characterised in that said resilient support means (18) comprises one or more pressurised, flexible, elongate tubes extending, respectively, along spaced members (12, 14, 16) forming the sides of said frame.

3. A bed as claimed in claim 2, characterised in that the lower portion of each side member (12, 14, 16) is of channel-shaped configuration and said resilient support means (18) is accommodated therein.

4. A bed as claimed in claim 2 or 3, characterised in that the ends of each of said transversely extending members (20) are, respectively, guided for movement in a slot (22) formed in the adjacent side member (12).

5. A bed as claimed in any of the preceding claims, characterised in that the end portions of each transversely extending member (20) are provided, respectively, with a downwardly extending portion (20a) which engages the resilient support means (18).

6. A bed as claimed in claim 2, characterised in that each transversely extending member (20) has spaced, downwardly depending guide members (26) slidably mounted in bores (24) formed, respectively, in said side members (16).

7. A bed as claimed in claim 6, characterised in that two independent body support surfaces are provided, the adjacent inner portions (20d, 20f) of the transversely extending members (20) forming each support surface being in juxtaposed relationship.

8. A bed as claimed in claim 1, characterised in that each transversely extending member (20) has spaced downwardly depending guide members (26) slidably mounted in bearing bushes (32) fixedly mounted in a panel (34) interconnecting spaced members (14) forming the sides of said frame (10).

9. A bed as claimed in claim 8, characterised in that the lower extremities of the guide members (26) engage said resilient support means (18).

10. A bed as claimed in any of the preceding claims, characterised in that the upper surface (20c) of each of the transversely extending members (20) is profiled.

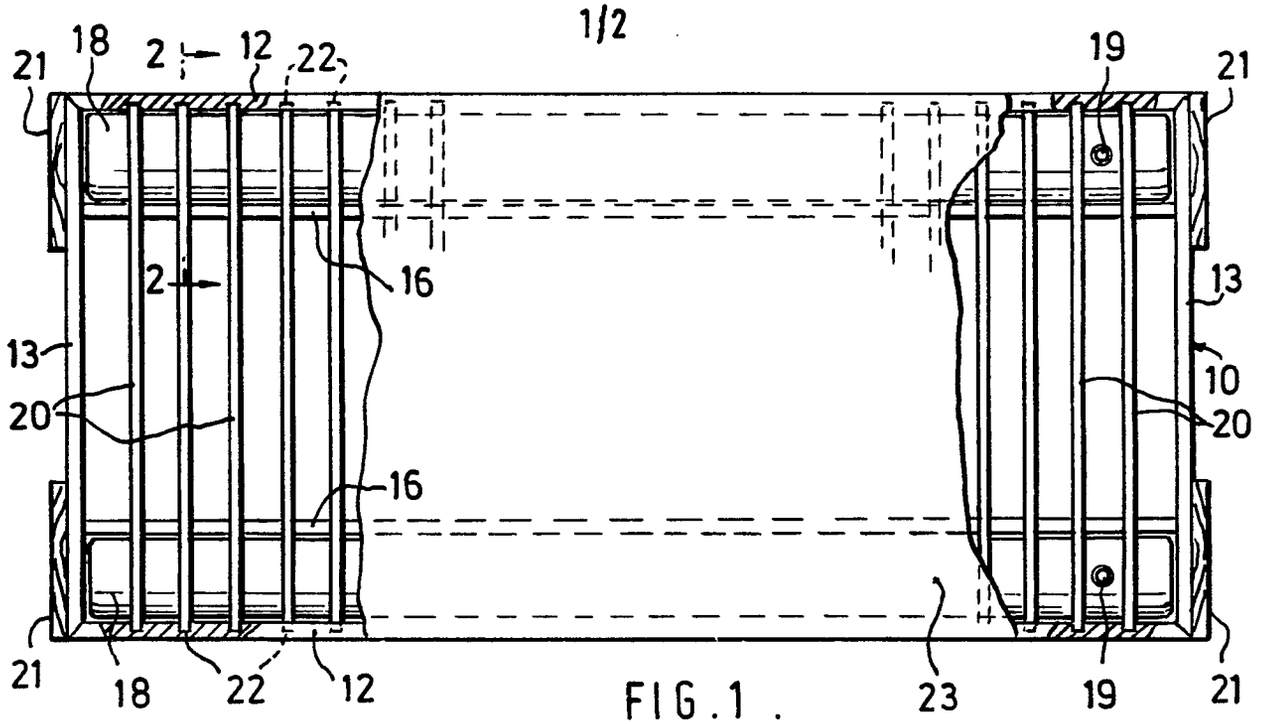

FIG.1.

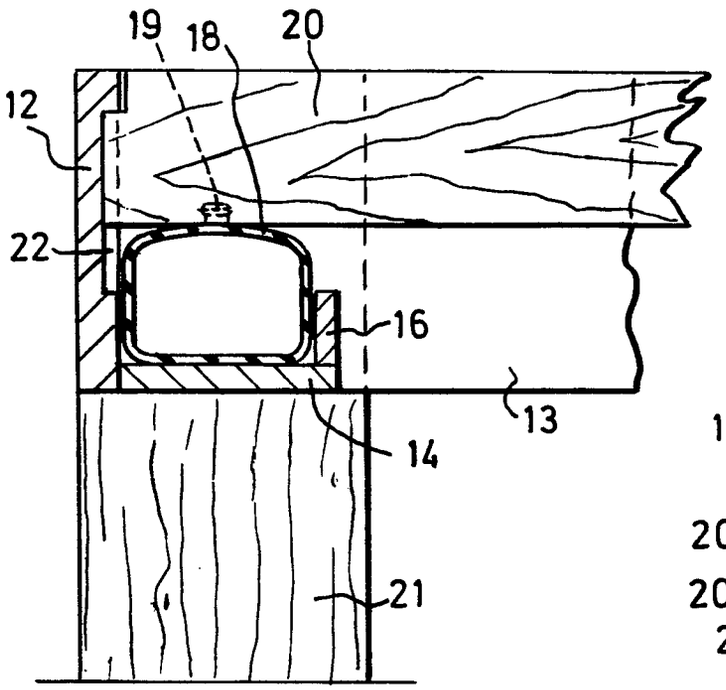

FIG.2.

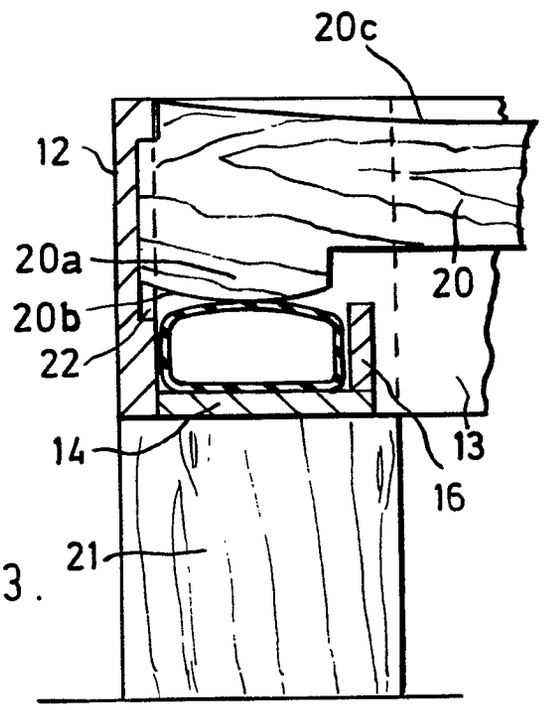

FIG.3.

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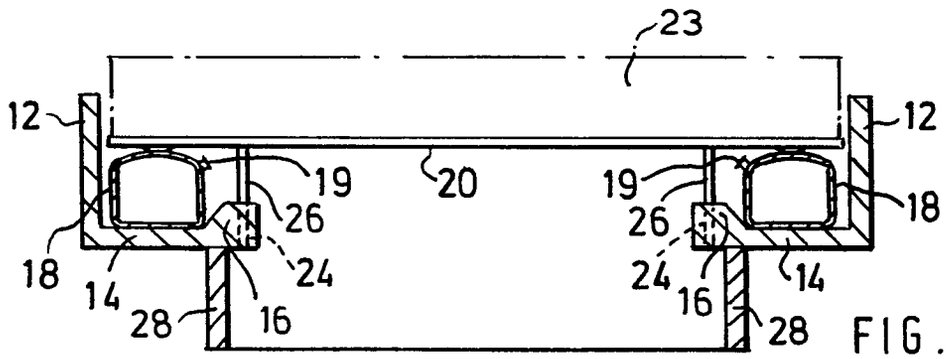

FIG.4.

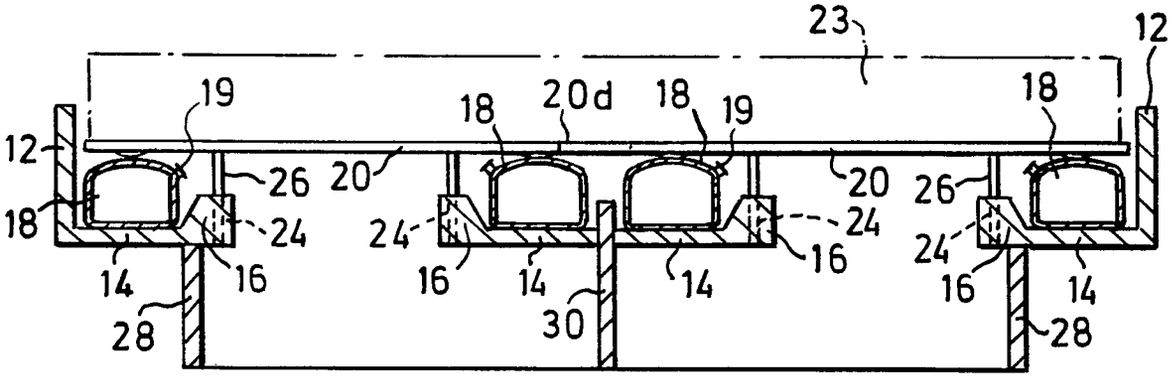

FIG.5.

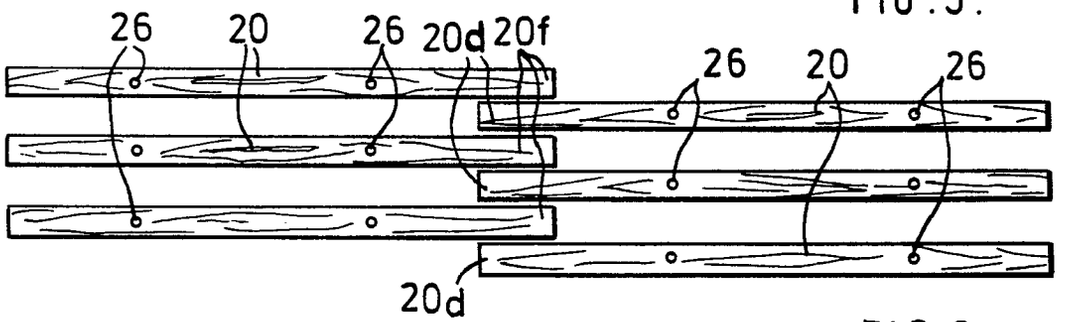

FIG.6.

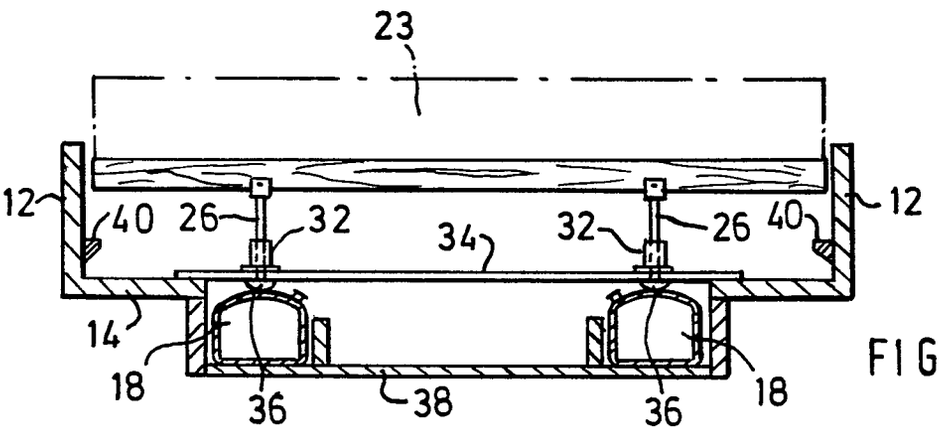

FIG.7.

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EUROPEAN SEARCH REPORT

Application number
0038155
EP 81 30 1481

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim
X	DE - B - 2 621 803 (EGGENWEILER) * Column 1, line 56 - column 2, line 58; figures *	1,2,3
X	FR - A - 2 407 692 (INDUSTRIE) * Page 2, line 6 - page 4, line 15; figures *	1,2,4
X	DE - B - 1 260 092 (ZWEHL) * Column 4, line 46 - column 5, line 52; figures 1-3 *	1-3,5, 6,8,9, 10
	GB - A - 327 192 (FORSYTHE) * Page 1, lines 92-106; figures 3,4 *	7

CLASSIFICATION OF THE APPLICATION (Int. Cl.³)

A 47 C 23/06
23/30

TECHNICAL FIELDS SEARCHED (Int. Cl.³)

A 47 C

CATEGORY OF CITED DOCUMENTS

X: particularly relevant
A: technological background
O: non-written disclosure
P: intermediate document
T: theory or principle underlying the invention
E: conflicting application
D: document cited in the application
L: citation for other reasons

&: member of the same patent family, corresponding document

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	21-07-1981	VANDEVONDELE

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