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(54) **Slatted bedstead and slat used in the said bedstead**

(57) Disclosed is a bedstead, particularly for orthopaedic beds, comprising a plurality of slats 2 resting on longitudinal members 4 of a supporting frame, each of which slats 2 comprises a curved tensioning element 10

and at least one elastic element 11 pre-tensioned between the ends of tensioning element 10, and rests with its ends 3 on elastically compliant supports 20, 120, 220 and 320.

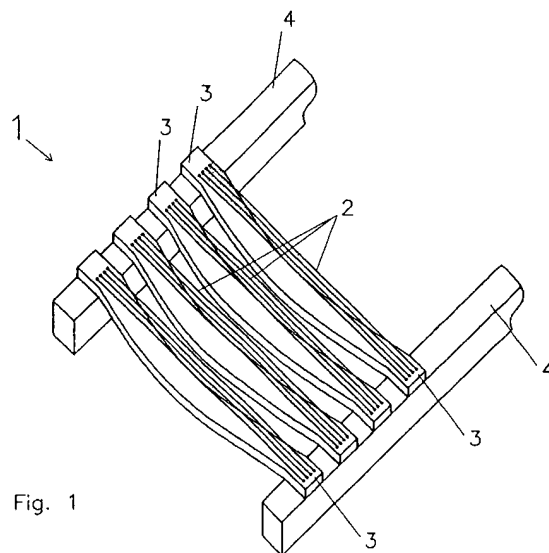


Fig. 1

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Description

[0001] This invention relates to a slatted bedstead, particularly for orthopaedic beds, and a slat used in the said bedstead.

[0002] A slatted bedstead consists of a plurality of slats or bars, usually made of strips of wood, the ends of which rest on a rigid frame.

[0003] The slats are made of flexible wood and normally have a bowed shape, with the concavity facing downwards, so that under the user's weight they tend to bend and curve in the opposite direction.

[0004] In these structures, the compliance of the bedstead is provided by the deformation of the slats loaded with the user's weight; this deformation is always limited and not very adaptable to the shape of the body, either lengthways or transversely.

[0005] The results obtainable with these bedsteads are therefore unsatisfactory.

[0006] Bedsteads have also been proposed in which the slats or bars are substantially rigid or inflexible, and rest at the ends or elastically compliant supports.

[0007] These supports may, for example, be made of moulded rubber and constrain the ends of each slat to the fixed structure of the bedstead.

[0008] In other cases, the said compliant supports are constituted by tubes of elastic material filled with a fluid of appropriate density, so that the weight of the person lying on the bedstead crushes the tubes most in correspondence with the slats subjected to most stress, and crushes them far less, if at all, or even leaves a "swelling", in correspondence with the slats not under load.

[0009] In other cases, the said compliant supports at the ends of the slats are constituted by structural sections made of elastically deformable plastic or a combination of deformable plastic structural sections and fluid-filled tubes in order to increase the response time to the stresses which are generated by a body lying on the bedstead or caused by relatively abrupt movements, and therefore reduce the "oscillation" phenomenon caused by movements of the liquid in the tubes in the both directions, of decreasing extent.

[0010] These bedsteads provide good longitudinal but poor transverse adaptability.

[0011] Thus, for example, the fact that the slats are substantially rigid or inelastic prevents the bedstead from adapting to the user's body in the transverse direction because the deformation has a bowed shape, and very thick mattresses are consequently required to make the bed comfortable.

[0012] The very thick mattresses used in these structures prevent the bedstead from breathing sufficiently.

[0013] Other bedsteads, different from the slatted type described above to which the invention relates, have a rigid frame and a plurality of flexible bands or cables constrained at the ends to the said frame.

[0014] This bedstead is substantially different from the slatted type, and presents the same drawbacks as

slatted bedsteads with a rigid frame, although its transverse adaptability is improved.

[0015] The purpose of the invention is to eliminate the drawbacks of the bedsteads described above, especially for orthopaedic beds, by combining the advantages of one with those of the others to obtain good longitudinal and transverse adaptability while using mattresses of lesser thickness.

[0016] In particular, one purpose of the invention is to provide a highly ergonomic slatted bedstead that adapts perfectly to the user's body in the different positions adopted during rest.

[0017] Another purpose of the invention is to provide such a slatted bedstead which is simple and cheap to manufacture, and in particular obtainable from bedsteads with conventional supports merely by changing the conformation of the slats.

[0018] These purposes are achieved by the bedstead in accordance with the invention, which presents the characteristics described in the annexed independent claim 1.

[0019] The invention also relates to a slat usable in such a bedstead which presents the characteristics described in the annexed independent claim 13, and an orthopaedic bed made with such a bedstead in accordance with independent claim 16.

[0020] Substantially, the bedstead in accordance with the invention, particularly for orthopaedic beds, comprises a plurality of slats resting at the ends on elastically compliant supports, wherein each slat comprises at least one substantially rigid tensioning element 10 and at least one flexible elastic element with fixed tension, the ends of which are constrained to the ends of the said tensioning element.

[0021] Conveniently, the tensioning element will have a curved shape, with the concavity facing upwards, namely towards the said at least one flexible element which is pre-tensioned by the tensioning element.

[0022] The tensioning element can be made of wood, curved plywood, moulded thermoplastic material, one or more steel rods, sheet steel or the like, while the flexible element consists of a belt or cable which has some degree of elasticity but is very tough, being made, for example of nylon, kevlar, teflon, rayon or the like.

[0023] The elastically compliant supports may be moulded rubber supports which constrain the ends of each slat to a rigid frame, or elastically compliant longitudinal members on which the ends of the slats rest.

[0024] The said elastically compliant longitudinal members may in turn consist of (i) tubes filled with a fluid of appropriate density (gel), (ii) elastically deformable plastic (polyurethane/latex foam), or (iii) a tubular combination filled with fluid and compliant plastic.

[0025] A bedstead thus designed produces the desired results; in particular, as each slat in accordance with the invention is highly flexible and its ends rest on the elastically compliant supports, it adapts ergonomically to the positions adopted by the user in the bed.

[0026] Further characteristics of the invention will appear more clearly from the detailed description that follows, which relates to purely non-limiting examples of embodiment illustrated in the annexed drawings, wherein:

figure 1 schematically represents a slatted orthopaedic bedstead in accordance with the invention in a partial axonometric view

figure 2 is a schematic view in front elevation of a single slat of the bedstead shown in figure 1

figures 3 to 7 are schematic perspective views of various embodiments of slats adaptable to the bedstead in accordance with the invention

figures 8 to 11 are schematic perspective views of various embodiments of compliant supports to which the ends of the slats of the bedstead in accordance with the invention are attached.

[0027] Figure 1 illustrates, highly schematically and in partial view, a slatted orthopaedic bedstead in accordance with the invention, globally indicated as no. 1.

[0028] Bedstead 1 comprises a plurality of slats 2, the structure of which will be described in greater detail by reference to figures 3 to 7, the ends 3 of which slats rest on the longitudinal members 4 of a supporting frame. The supports of slats 2 will also be more particularly described hereafter by reference to figures 8 to 11.

[0029] The structure of each slat 2 is more clearly visible in figure 2; it comprises a curved tensioning element 10 with the concave side facing upwards, the ends of which are connected on the concave side to at least one pre-tensioned elastic element 11.

[0030] In the embodiment shown in figure 3, tensioning element 10 consists of a curved bar made of wood, in particular plywood, or a moulded thermoplastic panel, and there are a plurality of elements 11 consisting of cables made of an elastic but very tough material such as nylon, kevlar, teflon or the like.

[0031] In the example shown in figure 4, tensioning element 10 includes two steel rods that bear ends 3 of the slat to which elastic cables 11 are fixed.

[0032] In accordance with the embodiment shown in figure 5, the tensioning element consists of a steel sheet which is also fitted below elastic cables 11.

[0033] The embodiment shown in figure 6 includes two elastic belts 11, conveniently made of the same materials as the above-mentioned cables, with tensioning element 10, made of plywood or moulded plastic as shown in figure 3, fitted below them.

[0034] The embodiment shown in figure 7 includes a single elastic belt 11, held taut by the tensioning element 10 shown in figures 6 and 3.

[0035] Belts 11 of the embodiments illustrated in figures 6 and 7 could obviously also be secured to the tensioning elements shown in figure 4 (steel rods) or figure 5 (steel sheets).

[0036] Slats 2 are attached to longitudinal members

4 via elastically compliant supports.

[0037] As shown in figure 8, elastically compliant supports 20 made of moulded rubber are fitted at ends 3 of each slat 2, and the said supports are attached in turn to longitudinal members 4.

[0038] In particular, support 20 is a block of rubber with large through apertures 21, which enables them to yield elastically at the point where a force is exerted, and two cavities 22 destined to house a corresponding end 3 of slat 2, which has a central slot 13 for this purpose. Support 20 can be attached to a corresponding longitudinal member 4 via rods 23.

[0039] In accordance with the embodiment shown in figure 9, the elastically compliant support on which ends 3 of slats 2 rest consists of a structural section 120 made of elastically deformable plastic such as polyurethane or latex foam, which said structural section is housed in longitudinal members 4 and projects above them.

[0040] In accordance with the embodiment shown in figure 10, the elastically compliant support consists of a tube of elastic material 220 containing a gel, which extends along the whole length of longitudinal members 4.

[0041] Finally, as shown in figure 11, elastically compliant support 320 is a combination of plastic structural section 120 illustrated in figure 9 and gel-filled tube 220 illustrated in figure 10.

[0042] The advantages of the orthopaedic bedstead in accordance with the invention clearly emerge from the above description.

[0043] In particular, the structure of slat 2, ends 3 of which rest on elastically compliant supports 20, 120, 220 and 320, which said slat consists of a tensioning element 10 and elastic elements 11, adapts perfectly to the user's positions.

[0044] The orthopaedic bedstead in accordance with the invention therefore presents considerable advantages over the slatted bedsteads described above.

[0045] The invention is obviously not limited to the precise forms of embodiment described herein and illustrated in the annexed drawings; various changes and modifications could be effected therein by one of ordinary skill in the art without departing from the scope or spirit of the invention as defined by the annexed claims.

Claims

1. Bedstead, particularly for orthopaedic beds, comprising a plurality of slats 2 resting on longitudinal members 4 of a supporting frame, **characterised in that** each of the said slats 2 comprises at least one substantially rigid tensioning element 10 and at least one elastic element 11 pre-tensioned by the said tensioning element, and that the ends 3 of each slat 2 rest on elastically compliant supports 20, 120, 220 and 320.
2. Orthopaedic bedstead as claimed in claim 1, **char-**

acterised in that the said at least one tensioning element is a curved element with the concavity facing upwards, and the said at least one elastic element is stretched taut between the ends of the tensioning element on the concave side thereof.

3. Slatted bedstead as claimed in claim 2, **characterised in that** the said tensioning element 10 is a curved plywood bar. 5
4. Slatted bedstead as claimed in claim 2, **characterised in that** the said tensioning element 10 is a moulded thermoplastic panel. 10
5. Slatted bedstead as claimed in claim 2, **characterised in that** the said tensioning element 10 is a steel rod. 15
6. Slatted bedstead as claimed in claim 2, **characterised in that** the said tensioning element 10 is a steel sheet. 20
7. Slatted bedstead as claimed in any of the preceding claims, **characterised in that** the said elastic element 11 is a cable or strand made of nylon, kevlar, teflon or similar tough material. 25
8. Slatted bedstead as claimed in any of claims 1 to 6, **characterised in that** the said elastic element 11 is a belt made of nylon, kevlar, teflon or similar tough material. 30
9. Slatted bedstead as claimed in any of the preceding claims, **characterised in that** the said elastically compliant supports are moulded rubber supports 20 which can be fitted to each end of each slat 2. 35
10. Slatted bedstead as claimed in any of claims 1 to 8, **characterised in that** the said elastically compliant supports are made of elastically deformable plastic such as polyurethane or latex foam. 40
11. Slatted bedstead as claimed in any of claims 1 to 8, **characterised in that** the said elastically compliant supports are tubes made of elastic material 220 filled with a fluid of suitably density (gel). 45
12. Slatted bedstead as claimed in any of claims 1 to 8, **characterised in that** the said elastically compliant supports 320 comprise a structural section made of elastically deformable plastic 120 and a gel-filled tube of elastic material 220. 50
13. Slat for orthopaedic bedstead comprising at least one substantially rigid tensioning element 10, having a curved shape with the concavity facing upwards, and at least one elastic element 11 pre-tensioned by the ends 3 of the said tensioning element 55

10 and joined to it on the concave side thereof.

14. Slat for orthopaedic bed as claimed in claim 13, wherein the said tensioning element 10 is a curved plywood bar, a moulded thermoplastic panel, a steel rod, a steel sheet or the like.
15. Slat for orthopaedic bed as claimed in claim 13 or 14, wherein the said elastic element 11 is a cable, strand or belt made of a tough elastic material such as nylon, kevlar, teflon or the like.
16. Orthopaedic bed comprising a slatted bedstead as claimed in any of claims 1 to 12.

