(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) Publication number: **0 369 956 A1**

(12) EUROPEAN PATENT APPLICATION

(21) Application number: **89850331.3**

(51) Int. Cl.[5]: **A47C 27/08, A47C 27/18**

(22) Date of filing: **04.10.89**

(30) Priority: **17.10.88 NO 884608**

(43) Date of publication of application:
23.05.90 Bulletin 90/21

(84) Designated Contracting States:
DE IT NL SE

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(54) A supporting mattress for conventional mattresses.

(57) A supporting mattress for and with a smaller height than conventional mattresses, e.g. spring mattresses or resilient mattresses of foamed plastic or foamed rubber, for use in beds having a firm bottom, or on another firm foundation, to permit increased compression, shaping of the mattress in a loaded state with simultaneous compression of the supporting mattress. This is achieved with a supporting mattress comprising a mattress base (1) with a flat underside (2) and an upper side (3) with a recess (4) extending over a substantial portion of the length and width of mattress base (1) and being defined by resiliently compressible rims (5). In recess (4) a water bag (6) of a flexible and waterproof material with tensile strength, the top face of which when filled with water and in an unloaded state is flush with or lower than the top faces (5a) of said resiliently compressible rims (5) in order to form a support face for a conventional mattress with said faces (5a).

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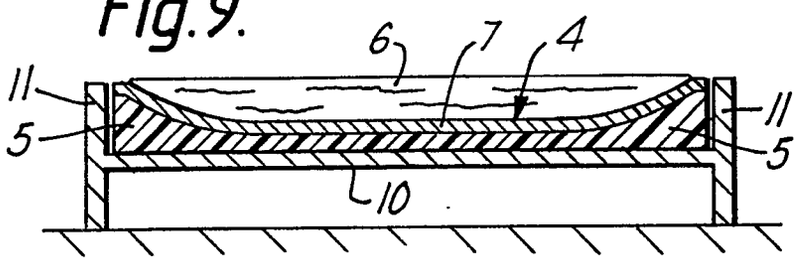
Fig.9.



The present invention relates to a supporting mattress for conventional mattresses of a kind as stated in the preamble of the following independent claim 1.

The above mentioned supporting mattress is intended to be underlaying a common spring mattress or a foamed plastic mattress so as to enhance the springiness of the latter, when subjected to a load.

Springiness of spring mattresses and other mattresses is limited by stationary bed boards. In order to enhance the possibility of springiness, i.e. the possibility of depressing the mattress when subjected to a load, resilient bed board means, e.g. lattice means were designed. Such a bed lattice system may, e.g. in a case of a known commercially available means comprise thin, often laminated list members or ribs of a slightly curved shape which provides a bias, such list members being placed with their convex face upwards in a bed frame to form a support which is convex upwards across the longitudinal direction of the bed. Such list members may also be mounted to be resilient/springy towards the sides of the bed frame. In this manner a springy bed support is achieved which permits the underside of the mattress to be shaped in accordance with varying loads exerted on the mattress by different parts of the body of a lying person.

In such a system some of the ribs will be subjected to a load, whereas other ribs stay unloaded and, thus, passive, the load on the ribs subjected to a load not being transferred to the non-loaded ribs. This means that pressing down a list member does not result in a corresponding upward directed force on an adjacent list means.

It is an object of the present invention to provide a supporting mattress of the kind mentioned above, where the whole surface of the supporting mattress is involved in supporting the conventional mattress lying on top of it, and where a lumped load on the mattress and, thus, the supporting mattress, will cause a corresponding active force in the opposite direction on the remaining portions of the mattress.

A supporting mattress showing the desirable, above mentioned properties is achieved according to the present invention by the aid of the characterizing features stated in the characterizing part of the following claim 1, as well as in the following dependent claims.

By the aid of the present invention the lumped load on a conventional mattress which is supported by said supporting mattress will automatically be transferred to other portions of the mattress to increase the counter pressure there correspndingly. In this manner, not only a more pronounced support is achieved, but also a more active mattress which will displace the counter pressure or support at the slightest movement by the person lying on it. By the aid of the supporting mattress according to the present invention it was possible to utilize the advantages of water beds, becoming more and more acknowledged, for conventional mattresses. Quality of sleep is experienced differently, some people prefer a water bed, others find a traditional mattress to be the best alternative. By the aid of the supporting mattress according to the present invention, the advantages of a water bed and a traditional mattress may be combined.

The invention is disclosed in more detail below with reference to embodiments diagrammatically shown in the drawing, where

Figure 1 is a perspective view of a supporting mattress the components of which are shown in a spaced arrangement,

Figure 2 and 3 show longitudinal sections through two alternative embodiments of the supporting mattress,

Figure 4 shows the mattress base as seen in perspective from above,

Figure 5 shows the mattress base folded into a tubular shape for storage/transport,

Figure 6 is a perspective view of an open mattress cover,

Figure 7 is a view corresponding to Figure 6, but showing a closed mattress cover,

Figure 8 shows a cross sectional view of an alternative embodiment of the mattress base, and

Figure 9 shows the same, provided on a bed board arrangement in a bed frame, and with a water bag provided on top.

The support mattres as shown in the drawings, and especially in Figure 1, comprises a mattress base 1 having a flat underside 2, and an upper side 3 with a recess 4 which extends over a substantial portion of the length and width of mattress base 1, and is defined by resiliently compressible rims 5. A water bag 6 of a flexible and waterproof material with tensile strength, and provided with a valve (not shown) for filling up and discharging water, is provided in said recess. When water bag 6 is filled with water and is not subjected to a load, the top surface 6a of water bag 6 is flush with upper surfaces 5a of the resiliently compressible edges 5 and will, combined with the latter, form a supporting surface for a conventional mattress, when the supporting mattress is placed in a bed frame with a rigid bed board arrangement, or on another rigid foundation. The height of the supporting mattress is less than that of a conventional mattress, preferably, it is substantially less, so that the volume of water in water bag 6 is in the order of 40-60 litres. A supporting mattress of this kind will, thus, be so lightweight that it may be used in any bed having a rigid bottom which serves as a foundation of all

kinds of tradi tional mattresses. A supporting mattress of the above mentioned kind may be sold at a reasonable price, since it does not need electrical heating, the user being kept isolated from the water bag 6 by the aid of the conventional mattress placed on top of the supporting mattress.

The supporting mattress, naturally, may be provided with an electric heater, as shown in Figure 4, where the heating element is designated 9. The insignificant water content of the supporting mattress represents a minimum hazard in case of a leakage. Furthermore, the supporting mattress is not very heavy, and it may readily and inexpensively be stored and transported, as it is possible to roll/fold it up and pack it in a handy packing.

As shown in the drawing, mattress base 1 comprises a sheet 2a of a rigid or soft foamed plastic material or a thin fibreboard which is preferably divided into a number of sections 2c, 2d, 2e, 2f, 2g, as shown in Figures 1, 4, and 5, said sections being hinged together, e.g. by the aid of folding lines 2b, so that the total size of the sections corresponds to that of a conventional mattress size. About the peripheral edge of sheet 2a a rim 5 of a resiliently compressible material, e.g. foamed plastic material, is secured. Rims 5 and bottom plate 2a define the recess 4 in which water bag 6 is placed.

Water bag 6 may be of a conventional design, but it is substantially slimmer (more shallow) with a water depth of only approximately 4-7 cm.

As will clearly appear from Figure 1, the resiliently compressible rims 5, e.g. consisting of foamed plastic, may be attached to bottom plate 2a of mattress base 1, e.g. by the aid of an adhesive. Said rims 5 may have an oblique wall 5b extending from top face 5a of rim 5 and inwards into recess 4 in order to provide a smooth transition for the water bag 6 from bottom plate 2a of the mattress base to top face 5a of the lateral edges.

As shown in Figure 1, mattress base 1 with water bag 6 of the supporting mattress is enveloped by a tensioned mattress cover 8 contributing to hold together the components of the supporting mattress in use, and during folding operations for storage or transport.

As shown in Figures 6 and 7, mattress cover 8 may be produced from a preferably waterproof, flexible material forming a container which comprises a bottom 8a with upward side walls 8b, c, d, e, and extended flaps 8b′, c′, d′, and e′. In a folded down state said extended flaps will form the top of mattress cover 8, as shown in Figure 7. The extended flaps are preferably provided with fastening means to be joined in a closed state, e.g. of the hook and loop cloth type.

Figures 8 and 9 show an alternative embodiment of mattress base 1. Here, the mattress base comprises a foamed plastic sheet 2a with compressed material on one face forming a substantially tight skin 7 on the opposite side of the face with flexibly compressible rims 5. Plate 2a with said rims 5 in its position for use is provided with said rims 5 facing down, and with water bag 6 placed against skin 7 of the foamed plastic sheet facing upwards. In a filled state, water bag 6 will then force the face of the foamed plastic sheet with skin 7 down between said compressible rims 5 and provide a recess 4 for water bag 6, as shown in Figure 9, when mattress base 1 is placed upside down in a bed frame with a bed boards arrangement 10. Skin 7 may, if it is not waterproof, be treated in a suitable manner to achieve a waterproof condition, so that any leakage from water bag 7 will be caught inside recess 4 in mattress base 1. The advantage of the above disclosed alternative embodiment of mattress base 1 is that it may be manufactured from a foamed plastic web, which is in production automatically provided with a compressed exterior layer on its top and bottom, respectively, as it is passing through a fashioning tunnel, where said skin is formed.

The foamed plastic web with a skin on both sides is split into two equal halves and is cut into lengths corresponding to desired lengths of mattresses. Then the manufactured foamed plastic members may be subjected to a cutting operation for cutting a recess 4′ into the split faces, i.e. opposite to their faces which are provided with a skin 7. In this manner the resiliently compressible lateral rims 5 will be automatically formed and will define recess 4′ of mattress base 1, which recess corresponds to recess 4 in Figures 1 and 4.

As mentioned above, the alternative embodiment of mattress base 1 is turned upside down for use, as shown in Figure 9, so that said recess 4′ is flattened when water bag 6 is placed on top of mattress base skin 7 and forces the central portion of mattress base 1 down, so that a recess 4 is formed on top of skin 7, which recess 4 corresponds to the recess shown in Figures 1 and 4.

By the aid of a mattress base 1 which is manufactured in this manner, it is possible to achieve a mattress base recess 4 which is made waterproof by the aid of skin 7 at the production stage, or may be made waterproof by a further waterproof film which is glued to the surface or by the aid of a waterproof coating material which cures on the face.

Claims

1. A supporting mattress for and having less height than conventional mattresses, e.g. of the spring mattress kind or resilient mattresses of

foamed plastic or foamed rubber, for use in beds having a firm bottom or on another firm foundation, e.g. a floor, in order to permit more extensive depression - shaping - of the mattress when it is loaded with simultaneous depression of the supporting mattress, **characterized in** that the supporting mattress comprises a mattress base (1) having a flat underside (2), and an upper side (3) with a recess (4) extending over a substantial portion of the length and width of the mattress base (1), and being defined by resiliently compressible rims (5), and a water bag (6) which is provided in recess (4), consists of a flexible and waterproof material having tensile strength, and the top face (6a) of which, when it is filled-up with water and is in an unloaded state, is flush with or lower than the top faces (5a) of said resiliently compressible rims (5), with the latter to form a support surface for a conventional mattress.

2. A supporting mattress as stated in claim 1, **characterzed in** that the flat underside (2) of mattress base (1) consists of a sheet (2a) onto which the resiliently compressible rims (5) are attached.

3. A supporting mattress as stated in claim 2, **characterized in** that sheet (2a) consists of a rigid material.

4. A supporting mattress as stated in claim 2, **charact erized in** that sheet (2a) consists of a soft foamed plastic material.

5. A supporting mattress as stated in claim 4, **characterized in** that sheet (2a) consists of a foamed plastic sheet with skin (7) which is at least substantially waterproof, opposite to its lateral face with resiliently compressible rims (5), and that sheet (2a) with said rims (5) in a position for use is provided with said rims (5) facing down, and with water bag (6) provided on skin (7) of the foamed plastic sheet, so that water bag (6) in a filled state will urge the face of foamed plastic sheet which is provided with a skin (7) down between said rims (5) and provide a recess (4) for water bag (6).

6. A supporting mattress according to claim 1, 2, or 3, **characterized in** that sheet (2a) is provided with folding lines (2b) for folding rolling up mattress base (1) for storage or transport.

7.A supporting mattress according to claim 6, **characterized in** that folding lines (2b) extend across the mattress base (1).

8. A supporting mattress according to claim 6 or 7, **characterized in** that sheet (2a) is divided into five sections (2c, 2d, 2e, 2f, 2g) by the aid of folding lines (2b) for folding sheet (2a) into a square tube shape (2h).

9. A supporting mattress according to any of the preceding claims, **characterized in** that at least one of the resiliently compressible rims (5) have a wall (5b) which is inclined inwards into recess (4).

10. A supporting mattress according to any of the preceding claims, **characterized in** that the bottom (6b) of water bag (6) has its shape adapted to recess (4) of the mattress base (1), as known per se.

11. A supporting mattress according to any of the preceding claims 1-10, **characterized in** that mattress base (1) and water bag (6) are surrounded by a tensioned mattress cover (8), as known per se.

12. A supporting mattress according to claim 11, **characterized in** that mattress cover (8) comprises a bottom (8a) with side walls (8b,c,d,e) extending upwards, and with extended flaps (8b′,c′,d′,e′), if desired, provided with fastening means, and which form the top of mattress cover (8) in a folded down state.

Fig.1.

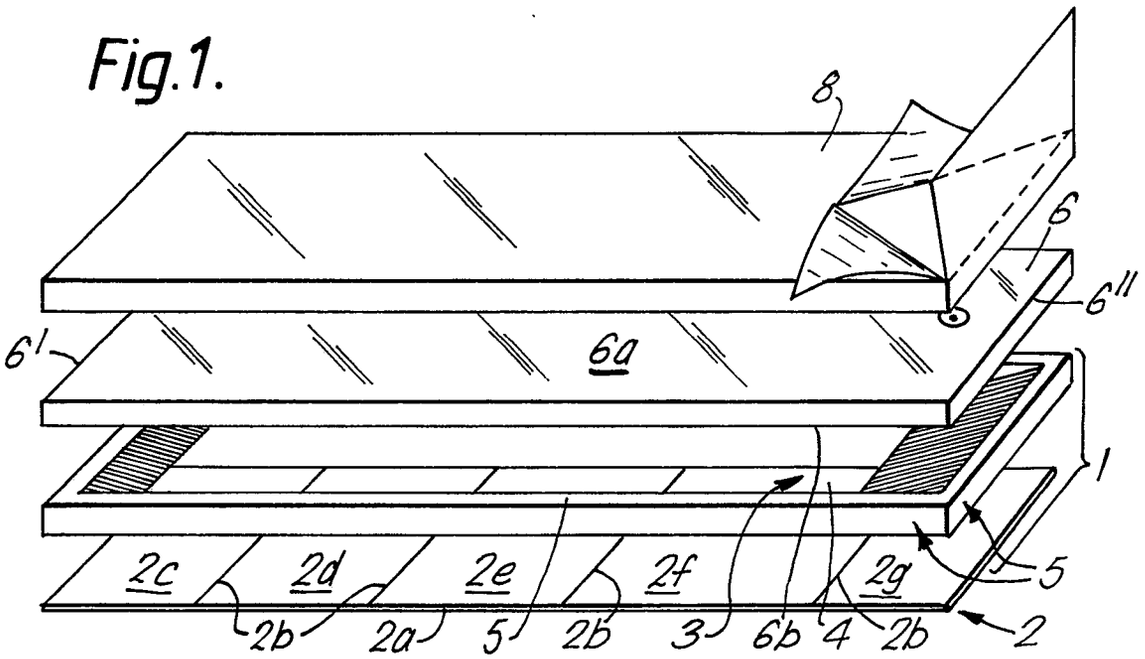


Fig.2.

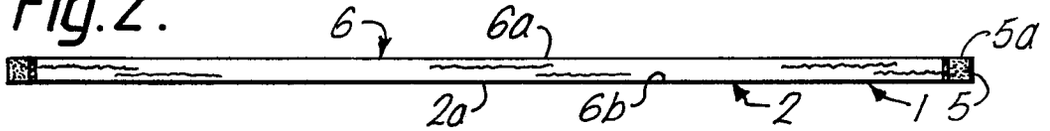


Fig.3.

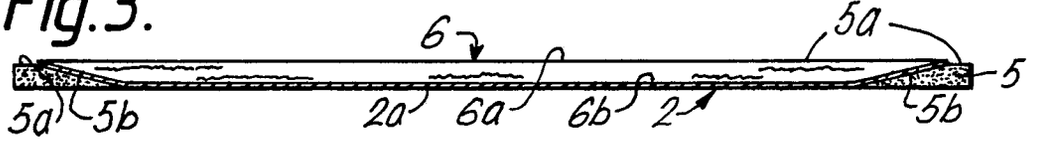


Fig.5.

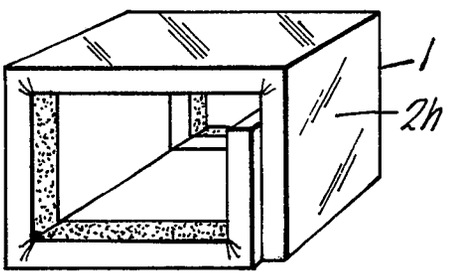


Fig.4.

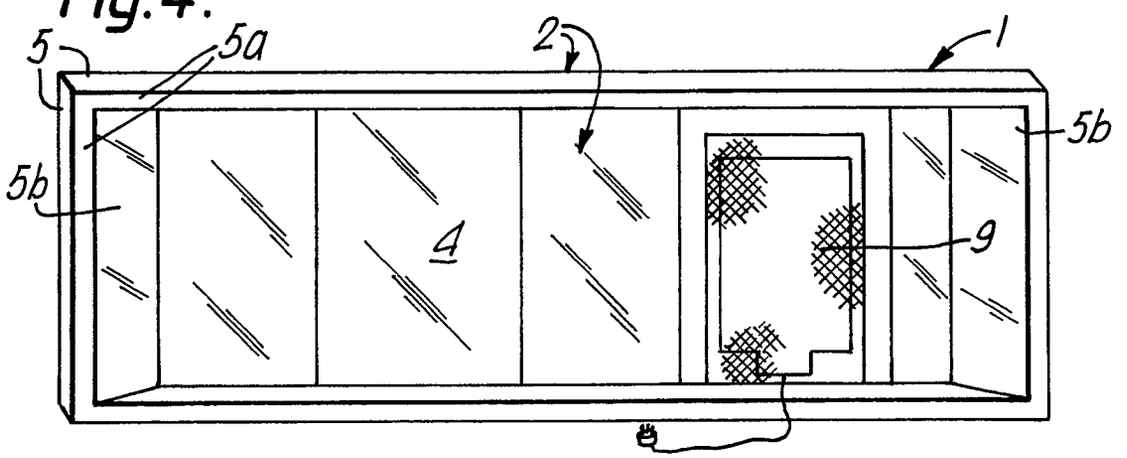


Fig.6.

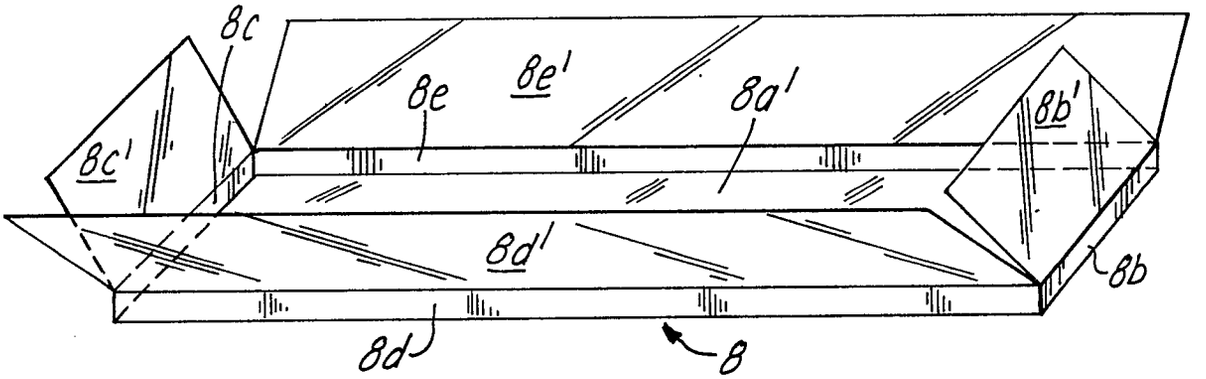


Fig.7.

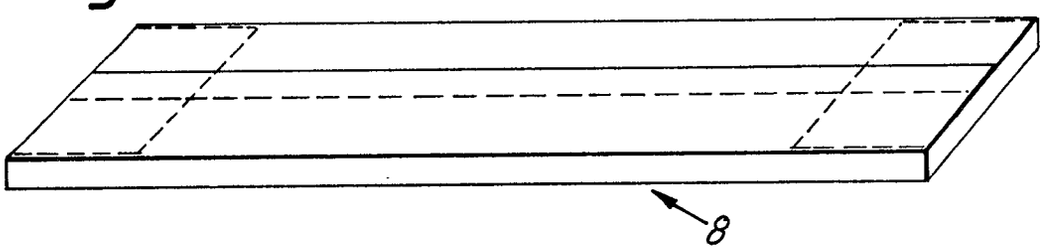


Fig.8.

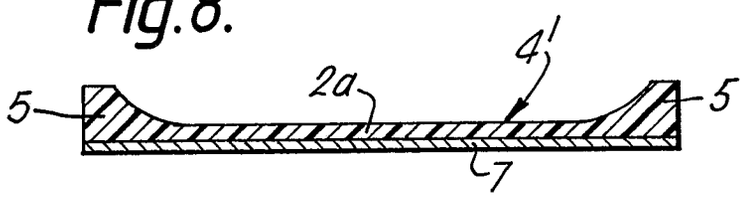
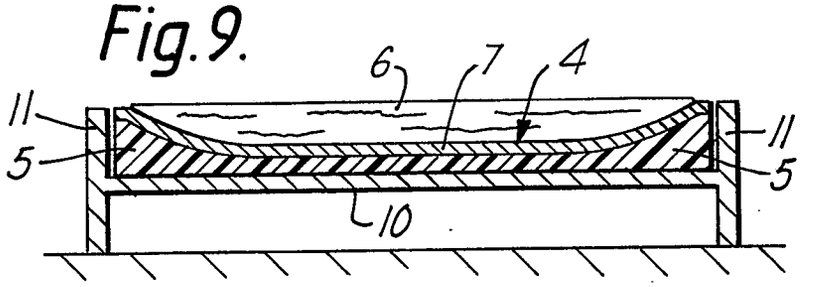


Fig.9.



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EUROPEAN SEARCH REPORT

Application Number

EP 89 85 0331

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
X	EP-A-0 267 495 (HUGHES) * Column 4, lines 7-26; figure 1 *	1,2	A 47 C 27/08 A 47 C 27/18
A		4,5,9, 10,11	
X	EP-A-0 190 084 (MOLINA) * Page 3, line 10 - page 4, line 7; figures *	1,2	
A		5,9,10, 11	
X	US-A-4 107 799 (LAMBERT) * Column 2, line 61 - column 4, line 16; figures *	1	
A		2,3,6,7 ,9,10, 11	
P,X	GB-A-2 205 740 (MENTOR) * Page 2, line 19 - page 3, line 21; page 3, lines 33-36; figures *	1,2	

TECHNICAL FIELDS SEARCHED (Int. Cl.5)

A 47 C

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	16-01-1990	VANDEVONDELE J.P.H.

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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