(12) PATENT
(19) AUSTRALIAN PATENT OFFICE

(11) Application No. AU 199880423 B2
(10) Patent No. 730239

(54) Title
Spring mattress

(51)[6] International Patent Classification(s)
A47C 023/32 A47C 027/06
A47C 023/043 A47C 027/07

(21) Application No: 199880423 (22) Application Date: 1998 .05 .08

(87) WIPO No: WO98/53724

(30) Priority Data

(31) Number	(32) Date	(33) Country
9702045	1997 .05 .30	SE

(43) Publication Date : 1998 .12 .30
(43) Publication Journal Date : 1999 .02 .11
(44) Accepted Journal Date : 2001 .03 .01

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(56) Related Art
GB 430564
US 1418469

OPI DATE 30/12/98 APPLN. ID 80423/98
AOJP DATE 11/02/99 PCT NUMBER PCT/SE98/00844
AU9880423

(51) International Patent Classification 6 : A47C 23/32

A1

(11) International Publication Number: WO 98/53724

(43) International Publication Date: 3 December 1998 (03.12.98)

(21) International Application Number: PCT/SE98/00844

(22) International Filing Date: 8 May 1998 (08.05.98)

(30) Priority Data:
9702045-7 30 May 1997 (30.05.97) SE

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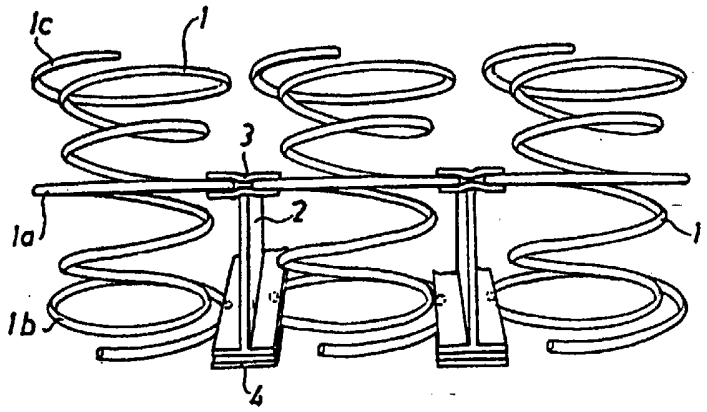
(81) Designated States: AL, AM, AT, AT (Utility model), AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, CZ (Utility model), DE, DE (Utility model), DK, DK (Utility model), EE, EE (Utility model), ES, FI, FI (Utility model), GB, GE, GH, GM, GW, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SK (Utility model), SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG).

Published

With international search report.

In English translation (filed in Swedish).

(54) Title: SPRING MATTRESS



(57) Abstract

The invention relates to a spring mattress comprising a plurality of interconnected coil-spring elements (1), said mattress having at least two layers extending in parallel with the plane of the mattress and each exhibiting different properties of resilience. The features characterising the mattress in accordance with the invention are that the same coil springs extend across both said layers and that these coil springs exhibit a higher degree of bias only along part of their extension, thus forming said layers exhibiting different properties of resilience.

SPRING MATTRESS

Technical Field

The present invention relates to a spring mattress comprising a plurality of interconnected coil-spring elements, said mattress having at least two layers extending in parallel with the plane of the mattress and each exhibiting different properties of resilience.

Background

Quality spring mattresses today normally comprise two superposed layers of coil springs disposed between the bed frame and the surface of the mattress. In some cases the springs in one of the spring layers are enclosed in an external cover, usually made from a textile material. As a result of the provision of these outer covers the springs assume a partly biased position in the normal, unloaded condition of the mattress.

However, these mattresses are comparatively complicated to manufacture, since they comprise a large number of different components and since they are relatively cumbersome to assemble, considering that each spring in the biased layer must be sewn into a separate cover, in addition to which the springs thereafter must be tied to one another in order to form a layer, which layer then must be anchored to a lower, non-biased layer and to frame parts and the like.

Object of the Invention

It is an object of the present invention to overcome or ameliorate some of the disadvantages of the prior art, or at least to provide a useful alternative.

Summary of the Invention

There is firstly disclosed herein a spring mattress comprising a plurality of interconnected coil-spring elements, said mattress having at least two layers extending in parallel with the plane of the mattress and each exhibiting different properties of resilience, and in which mattress the same coil springs extend across both said layers and in which mattress these coil springs exhibit a higher degree of bias only along part of their extension, thus forming said layers exhibiting different properties of resilience, characterised in that the coil springs are biased by biasing elements of a textile material, a plastics material, non-rigid and pliable metal wire or the like, said biasing elements being disposed at and extending between two different turns in each coil spring.

There is further disclosed herein a method of producing a spring mattress as claimed in the preceding claims, comprising the step of interconnecting a plurality of coil springs in such a manner that they are joined together in one layer, characterised by the further step of biasing parts of said springs by attaching thereto biasing elements of a textile or plastics material, non-rigid and pliable metal wire or the like, at and between different turns of each individual spring.

The present invention, at least in a preferred embodiment, provides a spring mattress and a method of manufacturing the same, said mattress being of a kind that comprises layers exhibiting different qualities of resilience but that contains fewer components, while at the same time the mattress is more convenient and less expensive to manufacture than hitherto known mattresses of this kind.

The invention preferably provides a mattress which improves the user's comfort because the layer having the lesser bias is turned towards the surface of the mattress and/or because the springs occupying this layer are individually resilient.

Brief Description of the Drawings

A preferred embodiment of the invention will now be described, by way of example only, with reference to the accompanying drawings.

Fig. 1 is a view of a part of a spring mattress in accordance with one embodiment of the invention, as seen from the side,

Fig. 2 is a view from below of the spring mattress of Fig. 1.

Fig. 3 is a view of a larger part of the spring mattress of Fig. 1 as seen from below, and

Fig. 4 is an exploded view of the interconnecting tie strips in accordance with one embodiment of the invention.

Description of Preferred Embodiments

Fig. 1 illustrates in a lateral view one layer of springs in accordance with an embodiment of the invention, and Fig. 2 illustrates the same layer of springs in a view from below. The mattress in accordance with the invention comprises only one single layer of coil springs 1, extending resiliently between the bed frame and the surface of the mattress. Parts of these springs, for instance the lower half or a central part of the springs, are biased, as will be described in more detail in the

following, resulting in the formation of at least two layers exhibiting different properties of resilience but wherein the same springs extend through both layers.

The biased condition is achieved in accordance with the teachings of the invention by strip pieces 2 attached in such a manner as to extend between two turns 1a and 1b in the springs. Preferably, strip pieces 2 having an I-shaped configuration are used, allowing the strip pieces to be anchored to two neighbouring springs as shown in the appended drawing figures. Strips 3 and 4, which may be flat, are attached on the top and on the lower faces, respectively, of the I-shaped strip pieces by means of spot welding or the like. Preferably, one point of attachment 5a, 5b is located internally of a turn of each spring and a further point of attachment 5c intermediate the springs in each pair of adjoining springs.

It is likewise advantageous to arrange for the planes of extension of both turns 1a, 1b of each spring secured as indicated above to be essentially perpendicularly to the longitudinal axis of the spring, in order to thus prevent the strip attachments from sliding on the spring wire. This arrangement is not, however, necessary, if the strips are anchored directly to the spring wire.

By adjusting the length of the strip pieces and the number of turns of two adjoining, interconnected springs, the biasing force of the springs is easily adapted to the desired strength.

The biasing means, consisting of the strip pieces arranged as described above, are advantageously positioned in succession along lines 6, 7, 8 extending in parallel with one another and in parallel with the plane of the mattress, as appears from Fig. 3. Each biasing means thus preferably joins together several pairs of neighbouring springs, for instance two or three such pairs. In this manner, the springs of the mattress are interconnected and cooperate to absorb pressure exerted

on the mattress while at the same time each spring may be compressed comparatively individually. The latter property is desirable both for reasons of comfort and for preventing displacement of the mattress sides when a load is exerted on the middle region of the mattress.

The feature of dividing the biasing elements in the manner indicated above such that each individual spring is connected only to a small number of other springs is important above all in the part of the layer that is turned towards the top of the mattress, i.e. in the turn 1a of the springs of Fig. 1. At the opposite end, on the other hand, such division is uncalled for, since the springs are not to be compressed from this direction. On the contrary, it might even be desirable to refrain from such division of the biasing elements at this end, as this contributes to the integrity of the mattress and to its firmness and stability. Preferably, the flat strips 3 therefore are divided in the above-mentioned manner whereas the flat strips 4 are not. The strip pieces 2 having an I-shaped cross-section could either be completely divided or partly divided in such a manner as to be slit from the part facing the strip 3 and across part of its extension towards the strips 4.

In addition, the biasing elements could be disposed in staggered relationship in the different lines 6, 7 8 in the direction of extension of the individual lines. Thus, as shown in the illustrated embodiment, the biasing elements 6' in line 6 may be positioned in alignment with element 8' in line 8, elements 6" in alignment with elements 8" and so on, whereas elements 7' and 7" and so on, positioned in line 7 intermediate lines 6 and 8, may be displaced relative to the elements in lines 6 and 8 by a distance corresponding to one pair of springs. This staggered arrangement improves the stability and the integrity of the springs in the mattress.

In the mattress in accordance with the shown embodiment the less biased layer is turned towards the surface

of the mattress whereas the higher-bias layer is positioned underneath. In the less biased layer the springs are also individually resilient. This feature provides excellent qualities of comfort, since it means that the upper layer adapts to the geometry of the user's body with resulting even distribution of the carrying force. The lower layer has a higher bias and consequently the springs in this layer will not be compressed, unless the force exceeds a predetermined threshold value which depends on the magnitude of the bias. This means that this layer will be compressed and be active in places where the user-induced depression is the highest, as is the case underneath the user's buttocks and shoulders, and consequently the user's spine will be straightened.

The biasing elements may be manufactured in the manner appearing from Fig. 4. Initially, a piece of strip 2a is bent into U-shape and further strip pieces 2b and 2c, respectively, are attached to the external faces of the flanges of the U-shaped element, as illustrated by arrows 10 and 11. The pieces are joined together in attachment points 9, by welding, gluing, clamping by means of clamps, clips or the like. In this manner the above-mentioned strip having an I-shaped configuration is produced. Further strips 3, 4 are attached along their middle as seen in the transverse extension, to strips 2b and 2c, respectively, in attachment points 5c.

Up to this point, the biasing elements may be prefabricated. Thereafter they are put in position on the springs, whereupon the strips 3 and 2b, and 4 and 2c, respectively, are joined together at the additional attachment points 5a and 5b as illustrated in Fig. 2.

The biasing elements may be manufactured from textile materials, preferably of a kind that lends itself to welding. Other materials, such as e.g. plastics materials, non-rigid and pliable metal wire or the like, are of course also possible.

A mattress in accordance with the invention is a spring mattress of a kind comprising at least two layers exhibiting different properties of resilience but the springs of which extend across both layers, a feature which makes the manufacture and the assembly of the mattress both more convenient and less expensive than is the case with conventional mattresses.

The invention has been described herein with reference to one embodiment. Other varieties of the invention are, however, possible. For instance, other types of biasing elements are possible and the biasing elements may be used to bias only one spring at a time, the springs subsequently being joined together in the conventional manner. The biased layers could also be disposed in the middle of or at the upper part of the mattress instead of, as desribed herein, at the lower part thereof. In addition, the springs could have different degrees of bias along their extension, resulting in a mattress having several layers exhibiting different degrees of bias. Such varieties and modifications of the invention must be regarded as obvious and to be within the scope of protection of the invention as the latter is defined by the appended claims.

The claims defining the invention are as follows:

1. A spring mattress comprising a plurality of interconnected coil-spring elements, said mattress having at least two layers extending in parallel with the plane of the mattress and each exhibiting different properties of resilience, and in which mattress the same coil springs extend across both said layers and in which mattress these coil springs exhibit a higher degree of bias only along part of their extension, thus forming said layers exhibiting different properties of resilience, characterised in that the coil springs are biased by biasing elements of a textile material, a plastics material, non-rigid and pliable metal wire or the like, said biasing elements being disposed at and extending between two different turns in each coil spring.

2. A spring mattress as claimed in claim 1, characterised in that those turns of the coil springs to which the biasing elements are attached have a larger radial extension than the rest of the turns, and in that these turns extend essentially in parallel with the plane of the mattress.

3. A spring mattress as claimed in any one of claims 1-3, characterised in that at least some of the biasing elements at are also secured to turns of neighbouring coil springs.

4. A spring mattress as claimed in any one of the preceding claims, characterised in that the biasing elements are in the form of strip pieces preferably made from a textile material.

5. A spring mattress as claimed in any one of claims 1-4, characterised in that the biasing elements comprise strips having an I-shaped cross-sectional shape and being disposed between coil springs, said strips being attached to said springs by means of additional, flat strip pieces, one point of attachment being arranged intermediate the springs and one point of attachment being arranged internally of the associated spring.

6. A spring mattress as claimed in any one of claims 3-5, characterised in that the biasing elements extend between several pairs of coil springs.

7. A spring mattress as claimed in claim 6, characterised in that several biasing elements are arranged in succession along lines extending in parallel with the plane of the mattress, and in that several such lines run in parallel with one another, the biasing elements of the various lines being disposed in staggered relationship in the direction of extension of the lines.

8. A spring mattress as claimed in any one of the preceding claims, characterised in that the springs are biased in such a manner that a layer having a smaller bias is turned towards the surface of the mattress and a layer having a higher bias is turned towards the bottom of the mattress.

9. A spring mattress as claimed in any one of the preceding claims, characterised in that the springs in the layer closest to the surface of the mattress are individually resilient.

10. A method of producing a spring mattress as claimed in the preceding claims, comprising the step of interconnecting a plurality of coil springs in such a manner that they are joined together in one layer, characterised by the further step of biasing parts of said springs by attaching thereto biasing elements of a textile or plastics material, non-rigid and pliable metal wire or the like, at and between different turns of each individual spring.

11. A method as claimed in claim 10, characterised by interconnecting and biasing said springs simultaneously by attachment of each individual element to several springs.

12. A method as claimed in claim 11, characterised in that the biasing elements preferably are made from a textile material and comprise strip pieces having an I-shaped cross-sectional configuration, said strip pieces being attached by means of additional, flat strip pieces, said additional strips being attached in a point of attachment between adjoining springs and in a point of attachment internally of the turns of the respective spring, with respect to each pair of adjoining springs.

13. A method as claimed in claim 11 or 12, characterised by attaching the biasing elements to several pairs of neighbouring springs, the spring elements extending

in longitudinal alignment along parallel lines and in staggered relationship from one neighbouring line to the next in the direction of extension of said lines.

14. A method as claimed in any one of claims 10-13, characterised in that the biasing elements are disposed in such a manner that one layer of the mattress will have one layer having a higher bias that is turned towards the bottom of the mattress and one layer having a lesser bias that is turned towards the surface of the mattress.

15. A spring mattress, substantially as herein described with reference to any one of the embodiments of the invention shown in the accompanying drawings.

16. A method of producing a spring mattress, substantially as herein described with reference to any one of the embodiments of the invention shown in the accompanying drawings.

Dated 19 December, 2000
Stjernfjadrar AB
Patent Attorneys for the Applicant/Nominated Person
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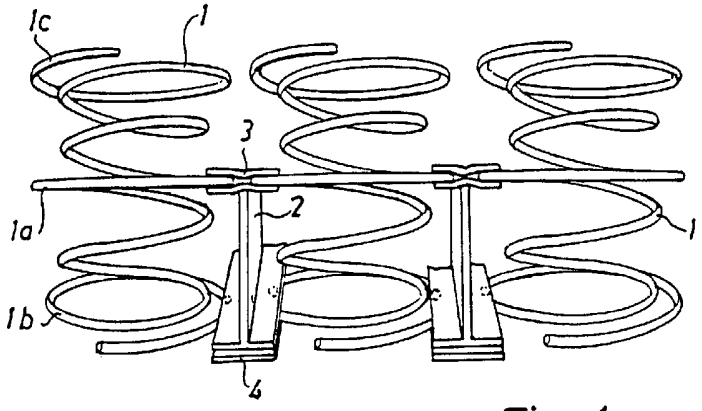

Fig. 1

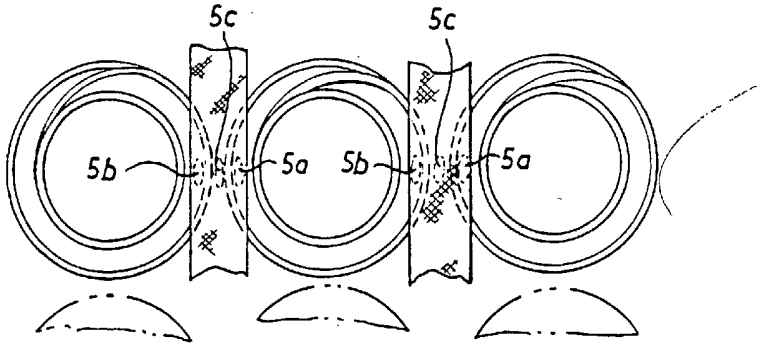

Fig. 2

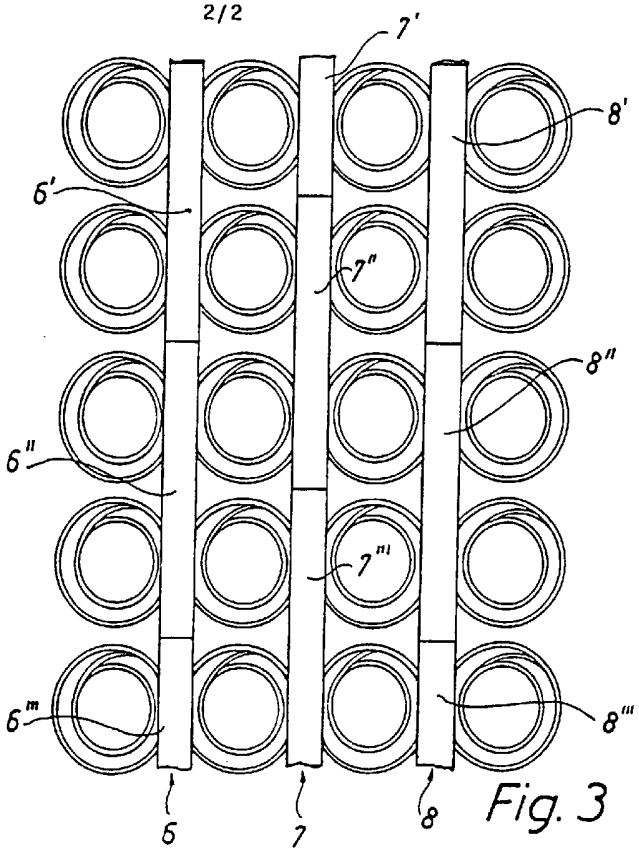

Fig. 3

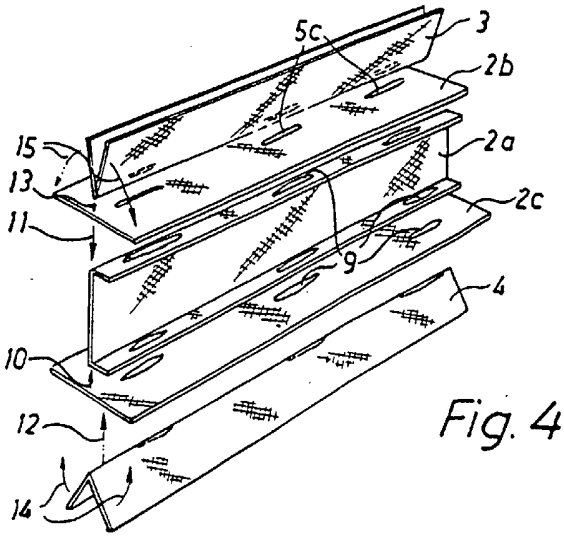

Fig. 4