BODY CONTOUR CONFORMING AND SUPPORTING DEVICE

Modesto P. Young, Fresno, Calif.

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The present invention pertains to a body supporting device and more particularly to such a supporting device adapted to conform to the contour of a body overlaying the device so as to provide positive support for concavities of the body.

The present application is a continuation-in-part of my prior pending application Serial No. 569,366 filed March 5, 1956, for Mattress Support, now abandoned.

It is important that all parts of the body receive adequate support when sleeping, resting, or otherwise reclining. This is especially true for the natural concavities or arches of the back. Stuffed and inner spring mattresses frequently fail to provide sufficiently uniform support throughout although possessing limited resilient compressibility. More recently, advances have been made in solving the described problem by the provision of foam rubber mattresses. However, even when lying on one of these mattresses, on one's back for example, the mattress does not fill in or positively arch up into the cavity of the back to provide support therefor. On the other hand those portions of the body which protrude, such as the posterior, depress the mattress and cause the latter to exert an upward reactive force in support of the protruding portion. Probably the back more than any other part of the body needs this positive support. The subject invention is designed to aid a mattress in providing the desired support by forcing the mattress to conform or arch up into hollows of the body.

Accordingly, it is an object of the present invention to provide a body supporting device.

Another object is to provide a body supporting device which conforms to body contours.

Another object is to provide positive support for concave portions of the body when reclining.

Another object is to minimize back aches.

Another object is to provide a mattress insert adapted to provide body support auxiliary to the mattress.

Another object is to provide an undulating device adapted to arch into body concavities incident to pressure of body protrusions on the device.

Another object is to provide a body supporting device which conforms to surfaces on which it is supported without impairment of function.

Another object is to provide a device of the nature described which can be made in different sizes in accordance with various body sizes and further to accommodate one or more persons independently of each other.

Another object is to provide a body supporting device adapted for use under a variety of mattresses.

Another object is to provide a body supporting device adapted for releasable insertion between a mattress and a mattress support which does not impair ventilation through the mattress. Other objects are to provide a body supporting and contour conforming device which is economical, lightweight, durable, dependable in operation, and simple to construct and use.

These together with other objects will become more fully apparent upon reference to the following description and accompanying drawing.

In the drawing:

Fig. 1 is a side elevation, partially in cross section, of a bed including a mattress and a mattress support, a person reclining on the mattress, and a body contour conforming and supporting device of the present invention interposed the mattress and the mattress support and illustrating the action of the device in use.

Fig. 2 is a somewhat enlarged, perspective of the body contour conforming and supporting device.

Fig. 3 is a somewhat enlarged cross-section taken on line 3—3 of Fig. 2.

Referring more particularly to the drawing, a conventional bed is generally indicated by numeral 10. The bed is shown as including spaced parallel head and foot posts 11 and rigidly interconnected by a horizontal frame 13. A substantially rectangular mattress supporting box 14 of springs, not specifically shown but well known in the art, is rested on the bed frame and provides a firm but resiliently deformable support surface 15.

A substantially rectangular resiliently flexible and compressible mattress 20 of innersprings, foam rubber, or other type having resilient flexibility and compressibility, is supported on the box 14 of springs in the usual manner. The mattress has a lower surface 21 contacting the upper surface 15 of the box and an upper body supporting surface 22.

For purposes of understanding the invention more clearly, a human body 23 is shown in Fig. 1 resting on the upper surface 22 of the mattress 20 longitudinally thereof. So as to provide convenient basis for later reference, it is to be noted that the head 29, the shoulders 30, the inwardly concave back 31, the outwardly convex posterior 32, and the legs 33 of the body are shown.

A body contour conforming and supporting device as constructed in accordance with the principles of the present invention is designated generally by the numeral 40. The device includes a flexible, elongated, substantially rectangular, latticed backing frame 41. The frame provides spaced parallel transversely extended flat end frame members 42 of equal length and of resiliently flexible material, and a plurality of transversely spaced, parallel, longitudinally extended inner and outer flat frame members 43 of resiliently flexible material and having opposite ends 44 and 45 underlying and rigidly connected by rivets 46 to the end frame members 42. In addition, the frame includes a plurality of intermediate, longitudinally spaced, parallel, transversely extended, flat frame members 48 of resiliently flexible material having opposite ends 49 and 50 and rigidly connected to the outermost longitudinal frame members between and parallel to the end members. The intermediate and end frame members are also of substantially equal length. It is to be noted that the intermediate transverse frame members extend under the intermediate longitudinal frame members and are not connected thereto. The longitudinal frame members define the length of the frame, and the transverse frame members define the width of the frame, as will be evident.

A plurality of flat, elongated, resiliently flexible, body contouring leaves 55 of fixed, substantially equal length greater than the length of the frame 41, and thus the longitudinal frame members 43, are individually positioned over the longitudinal frame members. The leaves have smoothly polished upper surfaces and opposite ends 56 and 57 overlapping and rigidly connected to the end frame members 42 by the same rivets 46 that secure the longitudinal frame members to the end members. The ends of the longitudinal frame members and the leaves are coincident so that the rigid connection causes the leaves to bow upwardly in the middle away from the frame members. This rigid connection further insures that the
ends of the leaves are held against movement longitudi
nally of the frame.

The leaves 55 have very little longitudinal rigidity or, stated otherwise, have considerable longitudinal flexibility. This flexibility is sufficient to permit longitudinal undulating movement of the leaves, toward and away from the ends of the leaves, perpendicularly to the length of the bed 10. The leaves are shown to have varying numbers of leaves. The leaves 55, when held laterally, are capable of moving longitudinally, to bow outwardly against the mattress and to undulate upwardly throughout the length of the leaves 55 and converted to upwardly directed arches at positions spaced longitudinally in the mattress. As such, the leaves conform to the contour of the body. The leaves are principally intended to be body contour conforming members.

The characteristics of the material of which the leaves 55 are constructed are important in achieving the undulating, body contour conforming action described. The material must be capable of the described flexibility but also must have sufficient rigidity to be capable of body support in the upwardly arched positions of the leaves 55. The material is not elastic, and it must not crease or crack incident to the undulating movement.

The frame members 42, 43 and 48, and the leaves 55 can be cut from sheets of a laminated plastic consisting of a phenolic resin and paper, and of slightly less than one-sixteenth of an inch thick. It is to be understood that the dimensions and material of the leaves are not limiting but merely in aid of obtaining a fuller understanding of the invention.

Operation

The operation of the described embodiment of the present invention is believed to be readily apparent and is briefly summarized at this point. The body contour conforming and supporting device 40 is adapted to be releasably inserted between the boxed springs 14 and the mattress 20 with the frame 41 resting against and conforming to the upper surface 15 of the mattress.

The device is positioned longitudinally along the bed 10. Preferably, the length of the body 28 or mattress is slightly greater than the width of the sleeping or reclining area of the body 28. The length, on the other hand, is less than the length of the body and thus the length of the reclining area. For example, a commercial embodiment of the invention has a frame length of approximately forty-five inches and a frame width of approximately twenty-nine inches. Parenthetically, this commercial embodiment has leaves 55 which are approximately forty-five and one-half inches long. In relation to the human body, the frame length is approximately equal to the distance from the shoulders 30 to the calf area of the legs 33. Naturally, these dimensions may be varied depending on the size of the person using the device.

After the device 40 is positioned between the mattress 20 and the boxed springs 14 in generally the upper portion of the sleeping or reclining area, as shown in Fig. 1, a person 28 may recline on the upper surface 22 of the mattress in the usual manner. The downwardly convexed posterior 32 depresses the mattress downwardly against the leaves 55. Since the posterior is generally above the lower portion of the device, with respect to the length of the bed 10, the lower portions of the leaves, again with respect to the bed length, contact their respective longitudinal frame members 43. However, the leaves are undulate upwardly into engagement with the mattress, and specifically causes the upper portions, with respect to the length of the bed 10, of the leaves to bow upwardly against the mattress to cause it to flex upwardly into the arch of the back 31 to provide support thereafter. Because of the provision of the frame members 43 beneath the leaves 55, the leaves are compelled to bow upwardly into areas of the least downward force or resisting device. Any combination of downwardly directed force are distributed throughout the length of the leaves and converted to upwardly directed arches at positions spaced longitudinally in the mattress. As such, the leaves conform to the contour of the bed 10. It could be employed under other body supporting members, as on a chaise lounge, sofa or the like, or even used directly to support a body 25 in contact therewith. Not only does the frame 41 enable the undulating action of the leaves 55, but further, it is sufficiently flexible to conform to the surface, as 15, on which it is supported. In addition its open construction does not inhibit ventilation usually important in environments of this nature.

From the foregoing, it will be evident that a highly effective body contour conforming and supporting device has been provided. The undulating leaves provide support especially for inwardly concave portions of the body which so frequently fail to achieve proper support from conventional mattresses and other body supporting members. Accordingly, mattresses, and the like, with which it is used are able more effectively to perform their intended function.

Although the invention has been herein shown, and described in what is conceived to be the most practical and preferred embodiment, it is recognized that departures may be made therefrom within the scope of the invention, which is not to be limited to the details disclosed herein, but is to be accorded the full scope of the claims so as to embrace any and all equivalent devices and apparatus.

Having described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In a body contour conforming and supporting device, an elongated resiliently flexible flat backing member of predetermined length having opposite ends, and an elongated flat highly flexible body contouring member of sheet material having a fixed length greater than the length of and positioned over the backing member and having opposite ends rigidly connected to the opposite ends of the backing member so as to be curved upwardly from the backing member, the ends of the contouring member being rigidly held against movement longitudinally of the backing member, the contouring member having appreciable longitudinal flexibility facilitating longitudinal undulating movement thereof toward and away from the backing member incident to application of force on the contouring member moving it toward the backing member, there being sufficient flexibility in the contouring member such that the contouring member exerts negligible reactive force in opposition to said force moving the contouring member toward the backing member. The body contour conforming and supporting device of claim 1 wherein the contouring member is made of thin plastic sheet material.

2. The body contour forming and supporting device of claim 1 wherein the contouring member is made of plastic sheet material of approximately one-sixteenth of an inch thick and has a length extended over approximately one-half the length of a body lying on the device.

3. The body contour conforming and supporting device of claim 1 wherein the contouring member is made of a laminated plastic sheet including lamina of phenolic resin and paper and is approximately one-sixteenth of an inch in thickness.

4. A body contour conforming and supporting device comprising an elongated resiliently flexible backing means of predetermined length having opposite ends, and a plurality of spaced substantially parallel elongated flat sub-
stantially flexible body contouring members of thin sheet material and of fixed lengths greater than the length of the backing means positioned over the backing means and having opposite ends rigidly connected to the opposite ends of the backing means so as to be upwardly arched from the lengths of the ends of the contouring members being rigidly held against movement longitudinally of the backing means, each of the contouring members having a longitudinal flexibility equivalent to the longitudinal flexibility of an elongated laminate plastic sheet including lamina of phenolic resin and paper having a thickness of one-sixteenth of an inch and a length of forty-five inches so as to be upwardly arched from the lengths of the ends of the contouring members being rigidly held against movement longitudinally of the contouring members toward and away from the backing means incident to movement of the respective contouring member toward the backing means at longitudinally spaced positions therealong.

6. A body contour conforming and supporting device comprising a pair of spaced end members, a plurality of laterally spaced parallel elongated resiliently flexible flat backing members of predetermined lengths having opposite ends respectively rigidly connected to the end members, and a plurality of laterally spaced substantially parallel, thin elongated flatly flexible body contouring members of fixed lengths greater than the lengths of the backing members individually positioned over the backing members and having opposite ends rigidly connected to the opposite ends of the backing members so as to be upwardly bowed from their respective backing members, the ends of the contouring members being rigidly held against movement longitudinally of their respective backing member, each of the contouring members having a longitudinal flexibility approximately the same as the longitudinal flexibility of an elongated strip of laminated plastic including lamina of phenolic resin and paper and having a thickness of approximately one-sixteenth of an inch and a length of approximately forty-five and one-half inches so as to enable free longitudinal undulating movement of the contouring members toward and away from their respective backing member incident to movement of the respective contouring member toward its backing member at longitudinally spaced positions therealong, said longitudinal flexibility being such that each contouring member offers negligible resistance to a force tending to move the contouring member toward its respective backing member.

7. In combination with a mattress support having an upper surface and an underlying body supporting surface, a mattress having a lower surface rested on the upper surface of the mattress support and an upper surface adapted to support the human body longitudinally thereof and in a predetermined area of predetermined length and width, a body contouring and supporting device releasely inserted between the mattress and the mattress support comprising an elongated substantially rectangular laminate frame disposed longitudinally on the mattress support, longitudinally spaced parallel flat end frame members of resiliently flexible material, a plurality of transversely spaced parallel longitudinally extended flat frame members of resiliently flexible material rigidly connected at opposite ends to the end members, and a plurality of intermediate longitudinally spaced parallel transversely extended flat frame members of resiliently flexible material rigidly connected at opposite ends to the outermost longitudinal frame members between the end members, the intermediate transverse frame members underlaying and being unconnected to the intermediate longitudinal frame members; and a plurality of flat elongated highly flexible body contouring leaves of fixed substantially equal length greater than the length of the frame and of thin plastic sheet material individually positioned over the longitudinal frame members having opposite ends rigidly connected to the end frame members so that the leaves are upwardly bowed from the frame into depressing slidable engagement with the lower surface of the mattress and the ends of the leaves are rigidly held against movement longitudinally of the frame, the leaves having little longitudinal rigidity and appreciable longitudinal flexibility so that longitudinally spaced portions thereof are alternately upwardly bowed incident to depression of other portions longitudinally spaced from the bowed portions whereby when a portion of a leaf is depressed into flat engagement with its associated longitudinal frame member by a convex part of a body rested on the mattress, another portion of said leaf longitudinally spaced from the depressed portion rises into engagement with the mattress to force its upper surface into a concavity in said body so that the upper surface of the mattress conforms to contour of the body.

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