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M. D. STONE

2,874,390

MATTRESS AND CUSHION CONSTRUCTION

Filed Dec. 3, 1956

2 Sheets-Sheet 1

FIG. 1.

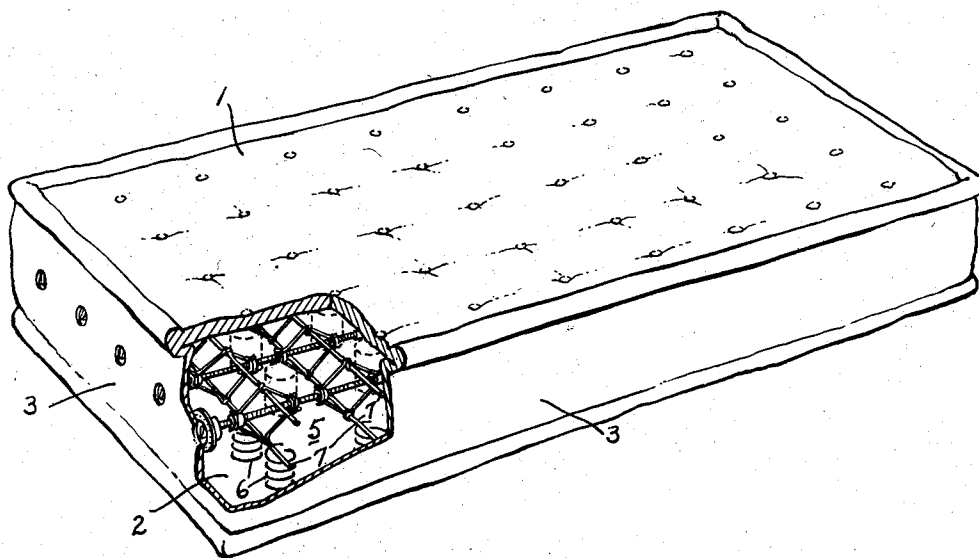
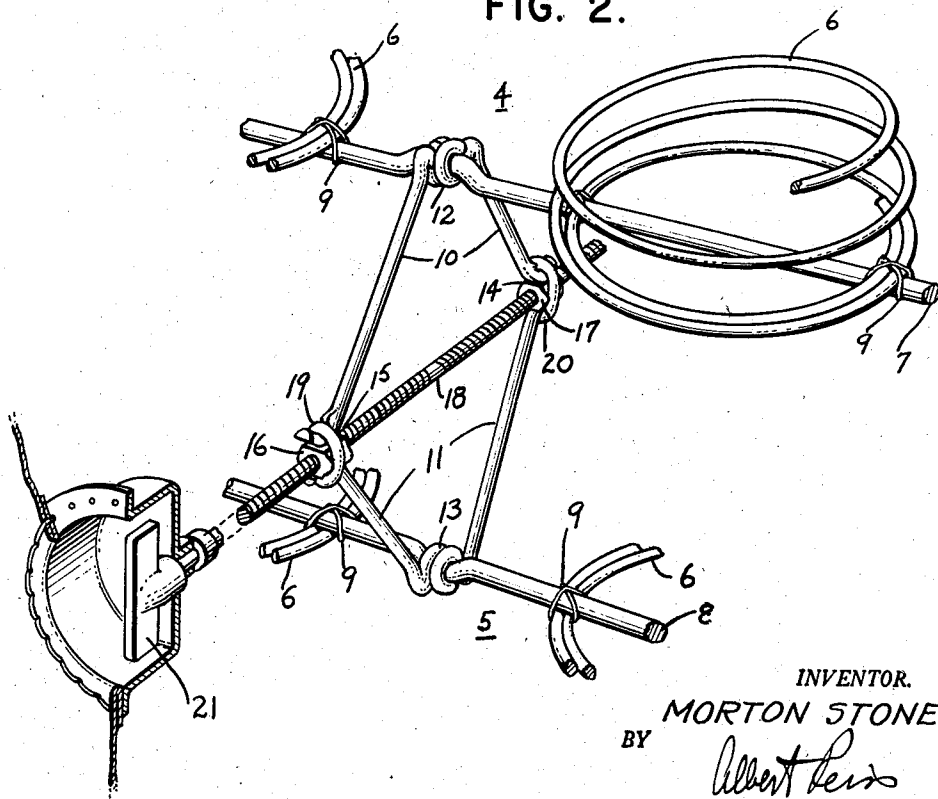


FIG. 2.



INVENTOR.
MORTON STONE
BY *Albert Lewis*
ATTORNEY

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M. D. STONE

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FIG. 3.

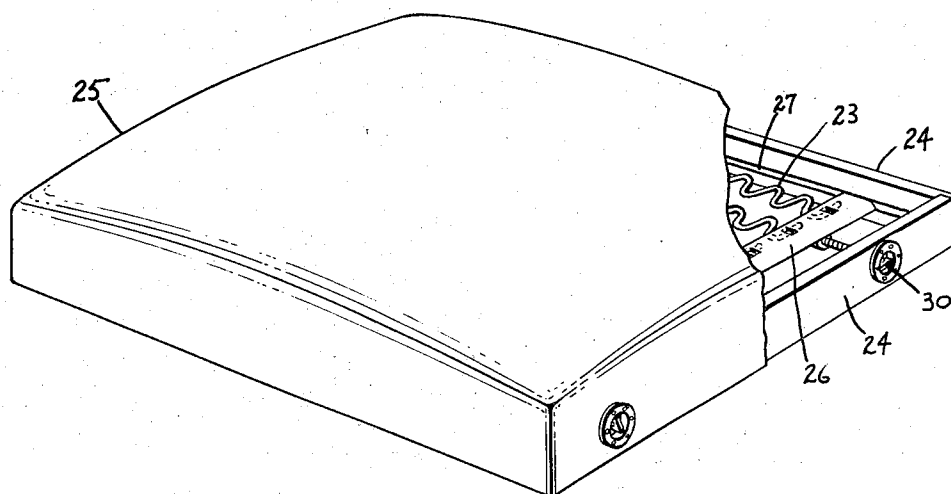
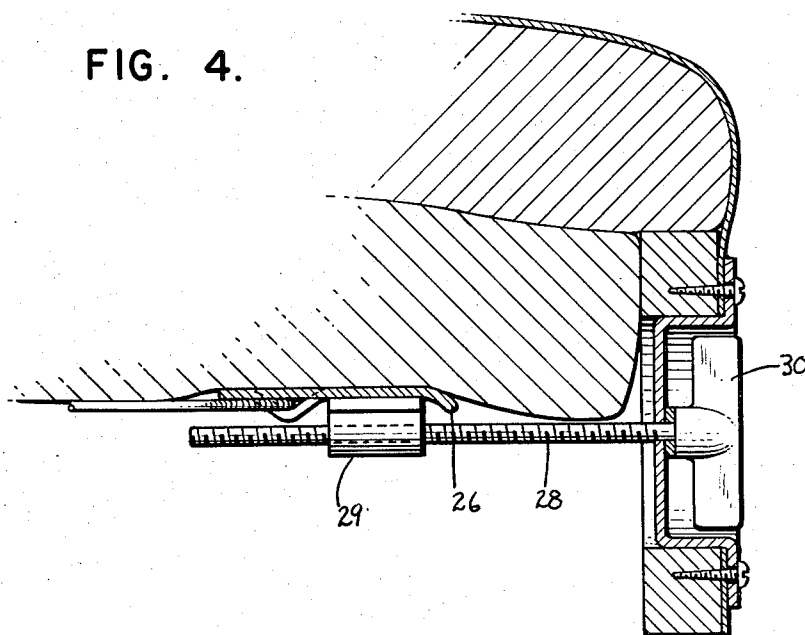


FIG. 4.



INVENTOR.
MORTON STONE
BY
Albert R. Perry
ATTORNEY

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2,874,390

MATTRESS AND CUSHION CONSTRUCTION

Morton D. Stone, Brooklyn, N. Y.

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This invention relates to mattresses, cushions or the like, and particularly to such articles having a resiliency capable of adjustment.

More specifically this invention relates to such articles having means for adjusting the resiliency thereof, at any time after the article is manufactured and while in use.

As will appear from the following description my invention is applicable to mattresses, cushions, and other similar articles for accommodating one's person. By "cushion" I mean most any type of seat which employs resilient means to enhance the comfort thereof. For example, the word cushion includes seats for all sorts of vehicles, upholstered furniture and box springs. However, for the sake of simplicity, I will describe the invention in connection with a mattress only. The applicability of the principles of the invention to other types of cushions will be obvious to those skilled in the art.

Mattresses as manufactured today are constructed to have a particular predetermined resiliency, and once the conventional mattress is manufactured there is no way of altering the resiliency to suit one's taste. Thus a prospective purchaser or user either finds just the right mattress or he must compromise. If his taste should change after he acquires the mattress, he must either suffer it, or he must acquire a new one.

Moreover, present day mattresses are usually constructed to have a given resiliency over its entire surface area. Considering a double mattress designed to accommodate two persons, both must have identical and unchanging tastes regarding resiliency or one must compromise his or her requirements from time to time.

Thus, it is an object of my invention to provide a mattress, cushion, or the like which may be adjusted as to resiliency after it is manufactured and while it is in use.

It is a further object of my invention to provide a mattress having means for variably adjusting portions of the mattress to exhibit respectively different resiliencies.

In accordance with a broad aspect of my invention there is provided a mattress or cushion comprising means for adjusting the resiliency thereof.

In accordance with another aspect of my invention there is provided a mattress divided horizontally into an upper and a lower portion, comprising resilient means in at least one of said portions, and characterized by means for varying the resiliency of such resilient means.

The above and further objects of this invention will become more apparent from the following detailed description taken in conjunction with the drawing, wherein:

Fig. 1 is a perspective view of a mattress with a corner thereof broken away to show one coil spring compression means in position;

Fig. 2 is an enlarged perspective view of the spring compression means shown in Fig. 1; and

Fig. 3 is a perspective view of a zig-zag type spring construction including the means for varying the resiliency thereof, and Fig. 4 is a side view of Fig. 3.

Referring first to Fig. 1, there is illustrated a mattress

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comprising the usual padding on the top surface 1, bottom surface 2 and sides 3. The mattress is divided horizontally, preferably in two parts 4 and 5. Resilient supporting means, preferably in the form of coil springs 6, are mounted in vertical and horizontal alignment in the two parts 4 and 5. In Fig. 2, several turns of one coil spring 6 and segments of three adjacent springs are shown. The springs 6 are initially mounted so as to provide maximum resiliency; i. e., the springs are mounted so that initially only a minimum compressive force is exerted thereupon by the padding and other ensemble. The mattress as described so far, except for the division thereof horizontally, is conventional and forms no part of my invention.

My invention is characterized by means for varying the resiliency of the mattress by compressing the means which provides the resiliency. For example, if the resiliency is provided by coil springs, then the coil springs are compressed to vary the resiliency of the mattress. If the resiliency is provided by foam rubber, or by a combination of springs and foam rubber, or other similar means then the resiliency may be varied by compressing the springs or the foam rubber.

Referring now to Fig. 2, the upper part of the mattress is designated at 4 and the lower part at 5. The resiliency of the coil springs is controlled by an arrangement comprising upper and lower groups of rods 7 and 8, extending laterally of the mattress and fastened to the springs by lashing 9, or by any other suitable fastening means. Movement of rods 7, 8 is adjusted by a plurality of linkage means, one of which is shown. The linkage means comprises two pairs of arms 10 and 11. The pairs of arms form a quadrilateral and are pivotally connected at the opposite corners 12 and 13 of one diagonal thereof to the upper and lower rods 7 and 8. The pivotal connection is effected by simply forming a loop at the appropriate ends of the arms 10 and 11 to surround loosely the rods 7 and 8. The corners 14, 15 of the opposite diagonal are adapted to move linearly and simultaneously in opposite directions, thereby causing the corners 12 and 13 to move vertically and either further separate or bring together rods 7, 8 thereby compressing or expanding the springs 6. The simultaneous linear and opposite movement of the corners 14 and 15 is effected by coupling two ends of the respective arms to traveling nuts 16, 17 which are suitably threaded to engage threaded rod 18. The ends of the respective arms are coupled to the traveling nuts preferably by means of links 19 and 20. Each portion of the rod 18 is associated with a linkage arrangement, is divided into two portions, one portion bearing a right-hand thread and the other a left hand thread. Thus rotation of the rod 18 produces simultaneous movement of the traveling nuts 16 and 17 in opposite directions.

The overall desired resiliency of the mattress is thus attained by rotation of the several rods 18. Each of the rods is conveniently rotated by means of a knob 21 rigidly connected to one end thereof.

The knobs 21 are preferably recessed as shown in Figs. 1 and 2 so that the bed may be covered without distracting protuberances from one end thereof. Each of the knobs 21 is positioned in a cup 22 which may be directly sewn to the cover of the mattress as shown. Since comparatively little force is applied to the cups, no special reinforcing means is required to retain them in position.

The illustrated embodiment has the advantage that most of the force which is applied to the rods 18 as a result of one's weight being placed on the mattress, is absorbed by those portions of the rods 18 between the corners 14 and 15. Therefore, no special reinforcing means is required to retain the rods 18 in position.

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Although this embodiment of the invention has been described in connection with a specific type of linkage means, it is to be understood that other means for effecting the compression may be utilized with equal facility.

Further, instead of a plurality of rods 18, it should be obvious that one rod centrally located laterally of the mattress may be employed. The advantage in utilizing several rods 18 is that by dividing the group of upper and lower rods 7, 8 into two sections, one for each lateral half of the mattress, the resiliency of the two sides of the mattress may be adjusted independently to suit the tastes of the user.

Still further, it is to be realized that instead of coil springs, foam rubber or similar resilient material, or a combination of coil springs and foam rubber may be employed with equal facility. If such resilient material is used, a flat surface such as a board may be used to bear against and compress the resilient material uniformly throughout the mattress. In such an arrangement the rods 7 and 8 would bear against and move the flat surface.

By reason of the double linkage, with the corners of a diagonal thereof being diametrically disposed at the top and bottom of the mattress, the mattress may be turned at periodic intervals, as is the custom, and yet retain the facility of adjustability.

Referring now to Fig. 3 and Fig. 4, there is shown another embodiment of my invention which has more application in seat type cushions than in mattresses. There is presently a trend towards zig-zag springs in seat cushions, particularly where such cushions are covered with foam rubber padding. In such cushions the zig-zag portions of the several springs lie in a single plane substantially parallel to the cushion. To illustrate more clearly the spring construction and tensioning means in Fig. 3, the padding and other associated structure has been omitted. The zig-zag springs 23 are located within a rectangular framework 24 forming, for example, the cushioned insert portion of a chair. The springs 23 are attached at one end thereof to a side 25 of the framework 24 by any suitable means. The opposite ends of the springs are attached to a movable rod 26. The movement of the rod is guided by channel grooves 27 formed in the opposite sides of the framework as shown. When the rod 26 is moved to one extreme position, closest to the opposite side 25, the springs are at their free length and accordingly most resilient. When it is desired to stiffen the springs the rod 26 is moved to stretch the springs. Thus, as the springs are stretched the resiliency thereof is decreased.

The movement of the rod 26 is effected by a threaded bolt 28 engaging a nut 29 fixed to the under side of the frame 30. The end of the bolt 28 is rotatably coupled to the rod so that only an axial force is imparted to the rod as the bolt 28 is rotated.

The advantages of my invention should now be apparent. In hotels and other public sleeping places where there are many transient users with different tastes it would be highly desirable to have mattresses of adjustable resiliency. Further my invention permits any mattress to be converted into an orthopedic mattress very simply.

While there is described herein the principles of operation of the invention together with embodiments thereof, it will be understood that the apparatus disclosed is only illustrative and that other means and apparatus may be employed to vary the resiliency of the mattress without departing from the spirit and scope of the invention as defined by the appended claims.

What is claimed is:

1. A mattress, cushion box spring, upholstered seat or like article, divided horizontally into an upper and a lower part, comprising two groups of like springs within said article positioned to exert tension against said parts,

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respectively, said springs arranged in parallel rows, a plurality of mounting elements, each element extending transversely of a different one of said rows with the springs of each row mounted thereon, a plurality of separate, adjustable compressing means intermediate the mounting means associated with both said spring groups and extending transversely of said mounting means, said compressing means operable to simultaneously move in opposite directions the mounting means with which it is coordinate, whereby to selectively alter the resiliency of corresponding springs of the rows in each group and their resultant tension against said parts.

2. The article according to claim 1, wherein corresponding coil springs in said groups are mounted in vertical alignment on their associated mounting elements.

3. The article according to claim 1, wherein the compressing means comprises a linkage mechanism in the form of a quadrilateral, the corners of one diagonal being disposed towards the top and bottom of the mattress respectively, the corners of the other diagonal lying in the horizontal plane of the mattress between said parts, a plurality of laterally disposed rods coupled to said top and bottom corners, the top and bottom corners being pivotally connected therearound, and means coupled to the corners in the horizontal plane for moving said corners either closer towards, or further away from, each other, whereby said top and bottom corners are moved similarly, either closer towards, or further away from each other.

4. The article according to claim 3, wherein said means for moving said corners in the horizontal plane comprises a rod having left-hand and right-hand threads respectively over a given portion thereof, a pair of traveling nuts coupled to said corners respectively, and means for rotating said rod, whereby rotation thereof causes said corners to move simultaneously in opposite directions.

5. The article according to claim 1, wherein said adjustable compressing means is manually operable and comprises a linkage mechanism in the form of a quadrilateral, the corners of one diagonal being disposed towards the top and bottom of the mattress respectively, the corners of the other diagonal lying in the horizontal plane of the mattress between said parts, corresponding mounting elements of each group being coupled to said top and bottom corners, respectively, the top and bottom corners being pivotally connected therearound, and means coupled to the corners in the horizontal plane for moving said corners either closer towards, or further away from, each other, whereby said top and bottom corners are moved similarly, either or further away from, or closer towards each other.

6. The article according to claim 5, wherein said means for moving said corners in the horizontal plane comprises a rod having left-hand threads and right-hand threads respectively over a given portion thereof, a pair of traveling nuts coupled to said corners respectively, and means for rotating said rod, whereby rotation thereof causes said corners to move simultaneously in opposite directions.

7. The article according to claim 6, and further comprising a plurality of rods extending longitudinally of the mattress, each of said rods controlling the movement of a plurality of linkage means.

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