July 28, 1942. A. KRAKAUER 2,291,389

SILENCER FOR SPRING STRUCTURES

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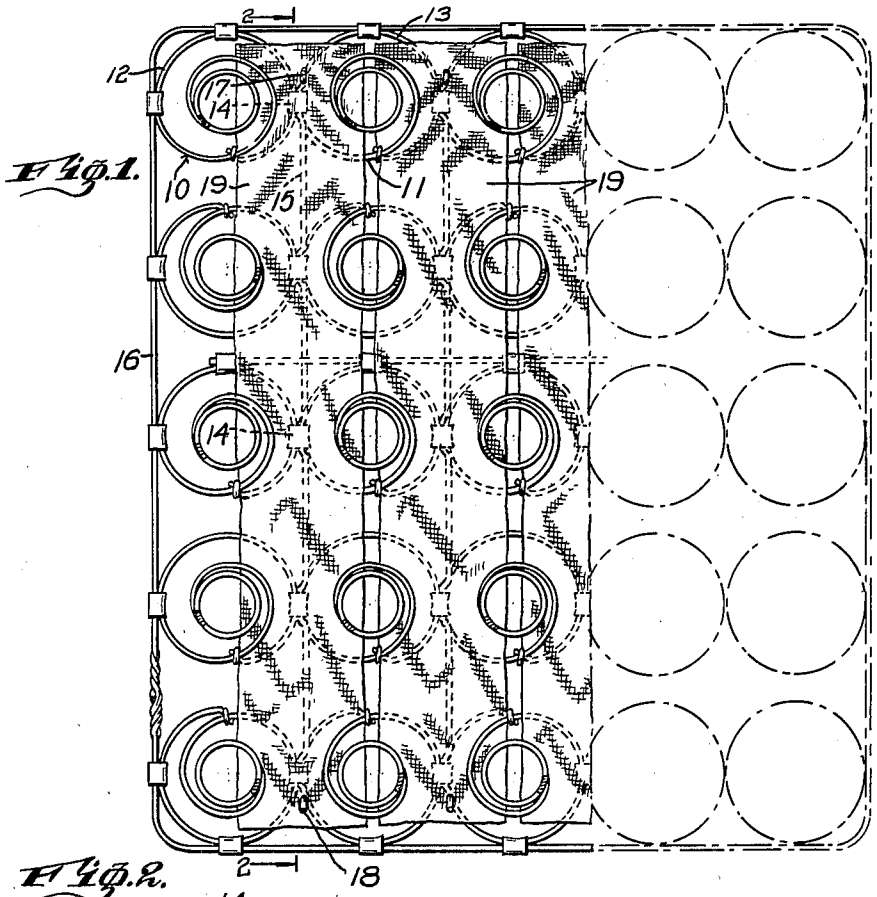


Fig. 1.

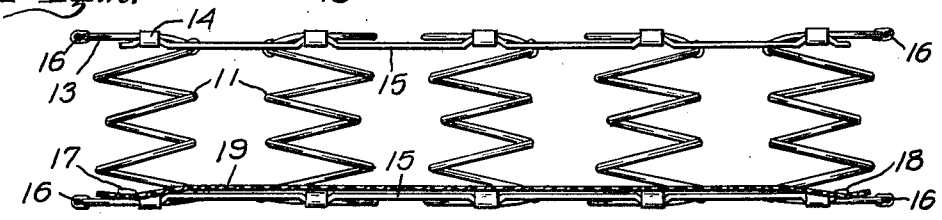


Fig. 2.

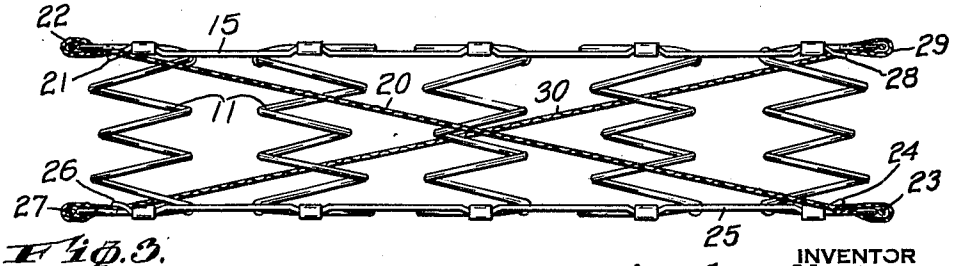


Fig. 3.

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SILENCER FOR SPRING STRUCTURES

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7 Claims. (Cl. 5—309)

This invention relates to spring cushions and mattresses and particularly to the type in which a number of coil springs are held together by means of suitable clips or other securing means in rows braced by tie wires, the border springs being held to a suitable border wire at the top and bottom end coils thereof.

Heretofore, it has been customary to use sisal or the like strips laid loosely in the interior of the cushion to eliminate objectionable noises which occur when the springs are compressed and released owing to the coils of the springs snapping past or more or less violently engaging each other. Such sisal strips when first inserted in place serve to dull or silence the clicking noises resulting from use of the cushion, but there is no practical way to hold the strips in place with the result that they shift out of position and permit the objectionable noises to be heard and often interfere with the operation of the springs.

My invention therefrom contemplates the provision of a simple and comparatively inexpensive fabric silencing means for the cushions, which means is easily and quickly attached and adequately maintained in place to form part of the cushion and is preferably composed of inexpensive comparatively narrow strips of burlap or the like fabric.

My invention further contemplates the provision of silencing means in a spring structure, which means does not require sewing or other relatively expensive means of attachment but which may be quickly secured to the tie wires of the structure and adequately deadens the noises resulting from compression of the springs and consequent violent contact of parts of the springs, said means taking the form of burlap strips of the same length as that of the cushion or of greater length and arranged in closely adjacent relation, and of a width about that of the diameter of the end coils of the springs.

The various objects of the invention will be clear from the description which follows and from the drawing, in which:

Fig. 1 is a horizontal section of a spring cushion embodying my invention, such section being taken about midway between the top and bottom of the cushion shown in Fig. 2.

Fig. 2 is a vertical section of the same taken on the line 2—2 of Fig. 1.

Fig. 3 is a similar view of a modified form of the invention.

In the practical embodiment which I have shown by way of example, the adjacent springs 10 and 11 of each row have the end coils as 12 and 13 thereof connected as by means of suitable clips 14. Said clips also serve to hold the longitudinally extending tie wires 15 which brace the cushion from front to back. The edge springs are similarly secured to the border wire 16 by similar clips.

I prefer to leave the free end portions 17 and 18 of the tie wire 15 projecting somewhat beyond the end clips 14 to provide means for securing thereto the silencing strips 19. Said strips are preferably made of suitable inexpensive fabric such as burlap or the like, and the width of each of the strips is substantially that of the diameter of the end coils of the springs, so that each of said strips, when secured in place, extends approximately from the axis of one row of springs to the axis of the other row, the strips being thereby arranged substantially symmetrically about the tie wires.

To secure the strips 19 in place, the end portion 17 of the tie wire 15 is merely forced through the strip to pierce it, and the strip is then stretched and hooked over the opposite end portion 18 of the tie wire, said end portion readily piercing the strip and holding it in place in stretched position just above the lower end coils of the springs and above the lower tie wire 15. The strip thereby becomes arranged in substantially flat position, with one of its faces uppermost.

The remaining strips are similarly secured in place by pulling them over the projecting free end portions of the remaining tie wires, which pierce the strips and holds them stretched. The edges of the strips thereby are arranged in closely adjacent relation so that when the cushion is used, the spring coils strike the burlap strips rather than the other end coils of the springs, thereby either preventing clicking noises, or deadening such noises if they should occur.

As shown in Fig. 3, the stripes as 20 may be made of sufficient length so that they extend past the border wire. In said Fig. 3, I have shown a further modified form of the invention wherein one end 22 of the strip 20 is hooked over and pierced by the projecting part 21 of the upper longitudinal tie wire 15 while the other end 23 of the strip is hooked over and pierced by the projecting end 24 of the lower tie wire 25 which is parallel to the tie wire 15 and directly thereunder. As has been indicated, the strip 20 is stretched after being hooked over the free end part 21 so that when hooked over the projecting free end part 24, it is self-retained in position. By this inclined or diagonal arrangement of the

strips 20 relative motion between the upper border wire 16 and the lower border wire 27 is largely prevented in the direction of the tie wires 15 and 25 since the strips 20 act as braces to maintain said upper and lower border wires in relatively vertical position, and eliminates possible side sway in the cushion.

The strip 30 next adjacent the strip 20 is hooked over and pierced by the projecting left end 26 (as viewed in Fig. 3) of the next lower tie wire and over the projecting right-hand free end 28 of the next upper tie wire so that the bracing effect of the diagonal arrangement of said strips is enhanced. Similarly, the remaining strips are arranged alternately like the strips 20 and 30 in relatively crossed diagonal relation. It will be understood that, if desired, the ends of the strips may be wrapped around the border wires and stapled or otherwise held together against accidental displacement as shown at 22, 23, and 29.

In any case, whether the shorter or longer strips are used, it will be seen that I have provided a simple means for deadening or eliminating the objectionable noises produced when a cushion is compressed during the use thereof, and that I have provided a structure well designed to meet the requirement of practical use.

While I have shown and described certain specific embodiments of my invention, I do not wish to be understood as limiting myself thereto, but intend to claim the invention as broadly as may be permitted by the state of the prior art and the scope of the appended claims.

I claim:

1. In a spring structure having a plurality of coil springs therein, tie wires for the upper and lower end coils of the springs, a projecting free end portion on each wire, and diagonally arranged fabric strips extending from the free end of an upper tie wire to the opposite free end of a lower tie wire and being arranged alternately in relatively crossing relation, each of the strips being stretched between and pierced by said free ends.

2. In a spring structure, a plurality of rows of coil springs of the hour glass type, each having a pair of end coils of substantially the same diameter, a tie wire arranged at the corresponding end coils of the springs of adjacent rows at the top and bottom of the structure, clips securing the tie wire to corresponding pairs of the end coils of adjacent springs, a border wire at the top and bottom of the structure, means securing the top and bottom end coils of the marginal springs of the structure to the border wires, each of the tie wires terminating in a free end portion in inwardly spaced relation to the border wire, and a series of imperforate fabric strips each of a single thickness of material and each arranged in a plane between the top and bottom tie wires with the edges of the strips lying in vertical planes parallel to the vertical planes of the tie wires, each of the strips having free end parts arranged in the spaces between the ends of the tie wire and the adjacent border wire and each having a width approximately that of the end coils, the free end portion of a tie wire piercing the otherwise imperforate free end part of a strip inwardly of the end edge of the strip, the other free end part of the strip being similarly pierced by the free end portion of a tie wire, said strip being tensioned between the pierced end parts thereof and covering approximately half of each of the end coils of the springs in a pair of adjacent rows.

3. In a spring structure, a plurality of coil springs arranged in rows, a plurality of parallel tie wires connecting the end coils of the springs of adjacent rows, each of said wires terminating in a free end portion in inward spaced relation to the adjacent edge of the structure, and a series of limp imperforate fabric strips each of a single thickness of material and of greater length than the tie wires and having a width approximately that of the end coils of the springs, each of said strips being arranged inside of the corresponding end coils of a pair of adjacent rows of springs and covering approximately half of each of said corresponding coils, the free end portion of a tie wire being passed through each end part of each strip inwardly of its edge to hold said strip against displacement, and said strip being tensioned between the points thereof held by the tie wires and being thereby maintained substantially flat.

4. In a spring structure, a plurality of rows of coil springs, tie wires connecting the end coils of the springs, a clip securing each pair of adjacent springs and a tie wire together at said end coils, each of the wires having free end portions each projecting beyond the clip securing said wire to the adjacent border spring and terminating inwardly of the adjacent edge of the structure, and fabric silencing strips each of a single thickness of limp imperforate material and each of a width substantially equal to the diameter of the end coils of the springs, said strips being stretched symmetrically on the wires inside of said end coils and each pierced adjacent its ends by the free end portion of a wire, the clips for the border springs preventing the ends of said strips from moving inwardly past said clips.

5. In a spring structure, a plurality of coil springs arranged in rows, tie wires connected to the end coils of the springs of adjacent rows, a free end portion at each end of each wire terminating inwardly of the adjacent edge of the structure, border wires for the end coils of the marginal springs of the structure, and fabric strips each of a single thickness of limp material approximately the length of said structure and of approximately the width of the end coils stretched between an opposed pair of said free end portions and pierced and held thereby in position to prevent direct contact of the opposite end coils of a spring when the springs are depressed, each of said strips being arranged inside of the end coils and extending between the center lines of a pair of adjacent rows of springs and inside of the end coils.

6. In a spring structure having a plurality of coil springs therein arranged in rows, tie wires for the upper and lower end coils of the springs, clips securing adjacent springs and a tie wire together, a free end portion on each wire projecting past the clip joining said wire to the marginal spring and terminating inwardly of the adjacent edge of the structure, border wires for the upper and lower end coils of the marginal springs of the structure, said border wires being arranged outwardly of the end portions of the tie wires, and a series of fabric strips each stretched between the ends of a lower tie wire and pierced and held thereby above the lower end coils of a pair of adjacent rows of springs in a plane substantially parallel to the plane of said lower end coils and covering approximately half of the circumference of each of the corresponding end coils of said pair of rows.

7. In a spring structure in which a plurality of coil springs are secured together in rows, tie wires arranged longitudinally of the structure and crossing said rows and between adjacent pairs of springs of said rows, clips holding the tie wires to adjacent pairs of springs, said tie wires terminating in free end portions spaced inwardly of the peripheral edges of the structure, border wires secured to the end coils of the marginal springs of the structure and constituting said peripheral edges, and means for silencing the noises occasioned by use of the structure comprising a plurality of comparatively narrow elongated strips of a single imperforate thickness of burlap, each pierced at each end by the free end of a tire wire and tensioned between said free ends, each of said strips being substantially flat when tensioned as aforesaid and arranged with one of its faces uppermost and inside of the end coils of the springs of a pair of adjacent rows, and covering approximately half of the end coils of said pair of springs, the clips nearest said end portions of the tie wires obstructing inward longitudinal movement of the strip along the wire.

ABRAHAM KRAKAUER.