Dec. 8, 1942. A. PUDLO 2,304,651

SPRING STRUCTURE

Filed July 21, 1941 2 Sheets-Sheet 1

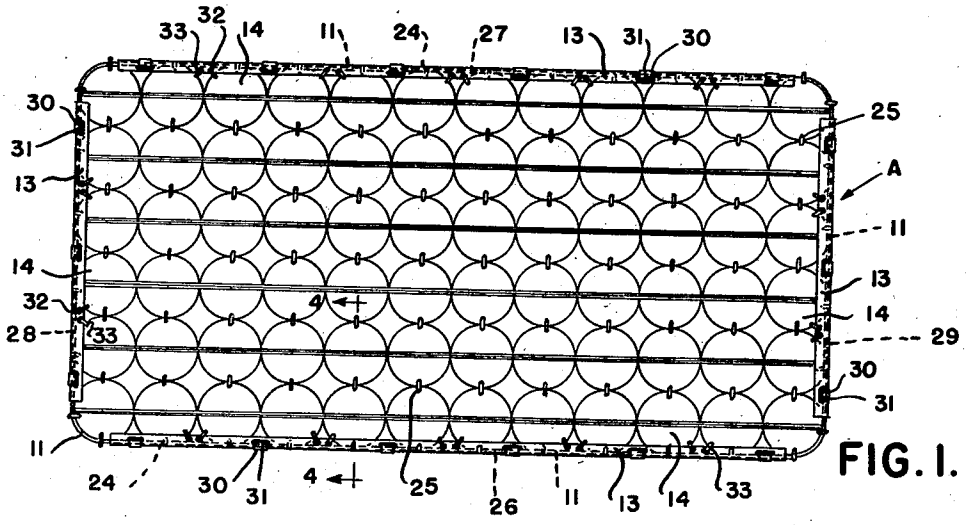


FIG. 1.

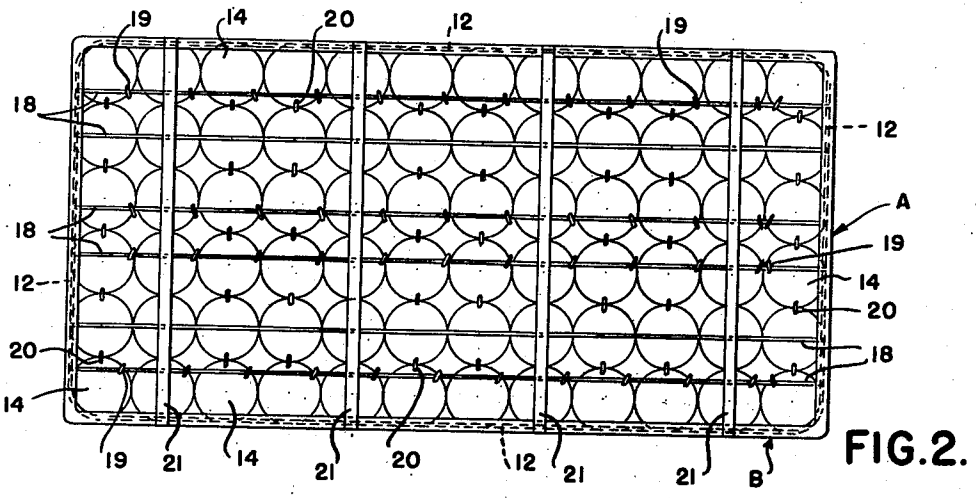


FIG. 2.

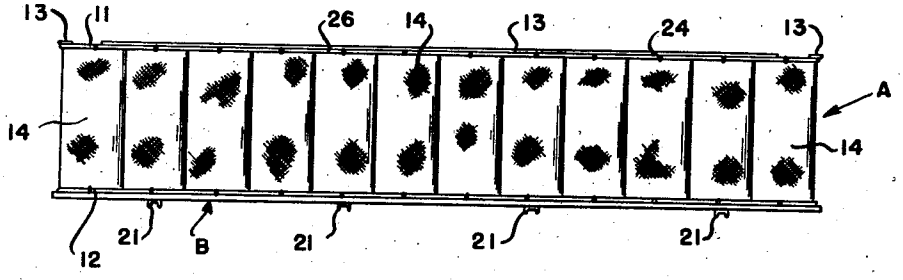


FIG. 3.

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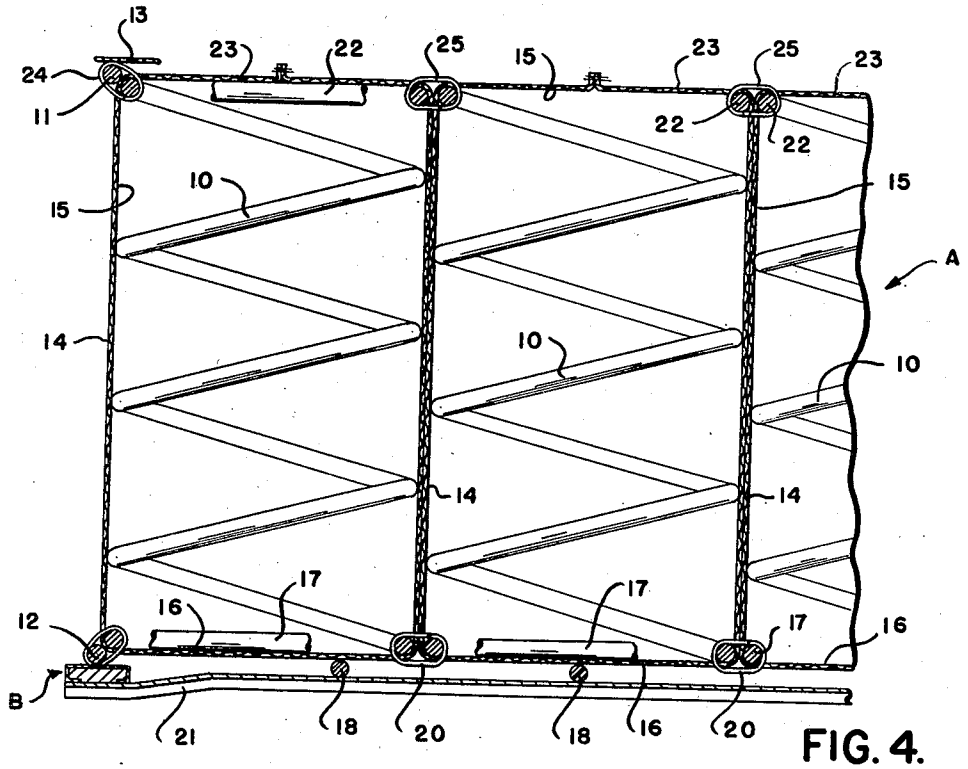


FIG. 4.

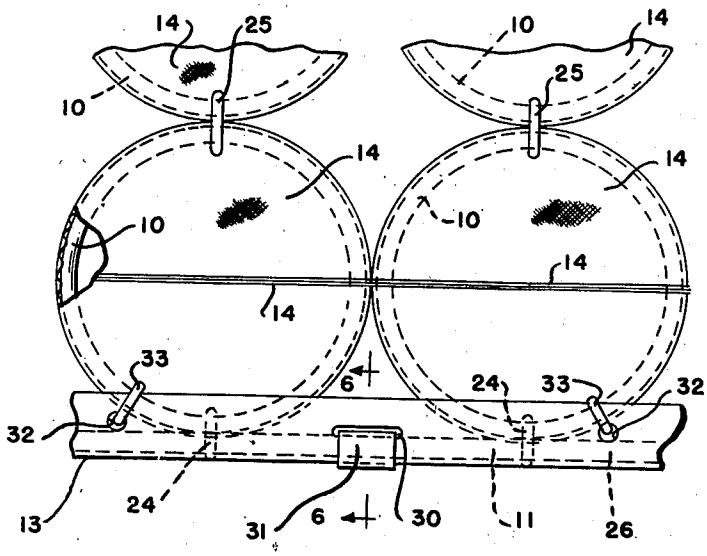


FIG. 5.

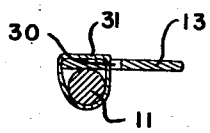


FIG. 6.

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UNITED STATES PATENT OFFICE

2,304,651

SPRING STRUCTURE

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Application July 21, 1941, Serial No. 403,432

4 Claims. (Cl. 155—179)

This invention relates generally to spring structures and refers more particularly to those designed for use in vehicle seat cushions and the like.

Heretofore it has been customary to rely upon the upper border wires of spring structures to provide seat cushions with straight edge formations at the upper margins thereof. It also has been customary to brace the seat cushions by wires that extended diagonally through the spring structures from the upper border wires mentioned to the lower border wires or other suitable parts of the spring structures. However, when the spring structures or cushions are handled by workmen in the factory or elsewhere during the manufacture thereof, and while the cushions are in use, the upper border wires are sometimes bent out of shape, especially when they are subjected to a sudden load or sharp blow, and thereby cause the trim fabric or upholstering material applied thereto as a covering to be correspondingly out of shape. Frequently the braces mentioned are different lengths and require separate forming operations. Moreover, when used in a group of upright coil springs, the braces often times extended through or between convolutions of some of the springs and thereby interfered with or hampered the action of the springs. Actually the braces constituted a drag on the upper border wires and thus caused the coil springs connected to said border wires adjacent the braces to function differently than the other coil springs connected to such wires. This produced uneven contours and otherwise failed to provide the desired straight edge formations at the upper margins of the seat cushion.

In the present instance I have eliminated the braces mentioned and have provided the upper border wires of the spring structures with spring metal reinforcing strips or bands that normally provide straight edge formations for the seat cushion and are sufficiently flexible to spring back and restore such straight edge formations after being subjected to loads or blows. Moreover, my improvement affords freedom of movement of the upright coil springs in a vertical direction unhampered by braces or other impediments. Such strips are also utilized to keep upright the pockets for the coil springs adjacent the upper border wire. In fact, the strips are connected to the pockets, coil springs therein, and upper border wire in such a manner that complete cooperation between the respective parts is obtained for maintaining the maximum efficiency in the operation of the spring structure and for maintaining uniformity in the trim or upholstery material of the seat cushion. When used at the rear of the spring structure, the strips will eliminate bowed or irregular edge formations and resulting holes heretofore present between the seat cushion and the seat back.

In the accompanying drawings:

Figure 1 is a top plan view of a spring structure embodying my invention;

Figure 2 is an even bottom plan view thereof;

Figure 3 is a front elevation thereof;

Figure 4 is an enlarged vertical sectional view taken substantially on the plane indicated by the line 4—4 of Figure 1;

Figure 5 is an enlarged fragmentary plan view of a portion of Figure 1;

Figure 6 is an enlarged cross section taken substantially on the plane indicated by the line 6—6 of Figure 5.

Referring now to the drawings, A is a spring structure embodying my invention having a group of upright coil springs 10, upper and lower border wires 11 and 12, and spring metal reinforcing strips 13.

As shown, the upright coil springs 10 are arranged in substantially parallel, longitudinally extending rows and are spaced slightly apart in the respective rows. Preferably each row of springs has a covering 14 of some coarse material such as burlap, and the springs of each row are individually enclosed in pockets 15 of such covering. The bottoms 16 of these pockets form seats for the lowermost convolutions 17 of the coil springs and rest upon suitable longitudinally extending wires 18 terminally connected to opposite ends of the lower border wire 12. Any suitable means such as the hog rings 19 may be employed to anchor the bottoms 16 of the pockets and the lowermost convolutions 17 of the springs to the supporting wires 18. If desired, the lowermost convolutions 17 of adjacent springs and the bottoms 16 of the pockets 15 therefor may be interconnected by hog rings 20. The lower border wire 12 rests upon and is secured to a base frame B having a number of transversely extending bars 21 at spaced points longitudinally thereof that form seats for and support the longitudinally extending wires 18 of the spring structure.

At the margins of the spring structure, the uppermost convolutions 22 of the coil springs 10 and the tops 23 of the pockets for said springs are connected by hog rings 24 to the upper border wire 11, while throughout the spring structure, the uppermost convolutions 22 of adjacent coil springs and the tops 23 of the pockets for said springs are preferably interconnected by hog rings 25. Thus, an interconnected group of individually enclosed springs is provided between the upper and lower border wires 11 and 12, and since the individual springs are in pockets that are anchored as aforesaid, the springs are held partially compressed. This insures the proper depth of spring structure while at the

same time permitting the individual springs to flex freely within the limits of the pockets.

The spring metal strips 13 extend along and terminate just short the ends of the front, rear and end portions 26, 27, 28 and 29, respectively, of the upper border wire 11. Preferably these strips are of sufficient width to overhang slightly the outer sides of the border wire 11 to provide straight edges of the upholstery material (not shown) of the seat cushion, and to overlie the coil springs 10 at the margins of the spring structure. At spaced points longitudinally of the strips are slots 30 that receive suitable clips 31 for securing the strips to the upper border wire 11, while also at spaced points longitudinally of the strips are openings 32 for receiving hog rings 33 for securing the strips to the tops 23 of the pockets 15 and to the upper convolutions 22 of the coil springs at the margins of the spring structure. Thus, the strips 13 not only provide straight edges for the upholstery material of the seat cushion but also constitute a flexible coupling between the upper border wire 11 and adjacent coil springs 10 and pockets 15 therefor. Consequently, the pockets 15 and springs therein will be held in the proper upright position and the strips 13 will be held flat on the upper border wire.

In use, the strips 13 serve as flexible protectors for the portions of the upper border wire 11 covered thereby and will automatically spring back and restore the straight edge formation after being subjected to loads or blows. In this connection, the underlying coil springs 10 will serve as flexible backers and will cooperate with the strips to accomplish the desired results.

When an upright back cushion (not shown) of a seat is assembled with a seat cushion having the spring structure described herein, the strip at the rear of the seat cushion will insure a straight joint between the parts and, accordingly, will eliminate bowed or irregular edge formations and resulting holes heretofore present between the seat cushion and seat back.

In the present instance, I have shown and described a spring structure for vehicle seat cushions as one embodiment of my invention, however it is to be clearly understood that the inventive principle set forth may be incorporated in a cushion of any desired character regardless of whether or not it is to be used in a vehicle seat or in any other type of construction where a spring structure is desired.

What I claim as my invention is:

1. A seat cushion spring structure having a group of interconnected upright coil springs, an upper border wire enclosure for said group, the springs adjacent said wire enclosure being connected directly thereto, and means reinforcing the wire enclosure and providing laterally outward beyond said enclosure a straight edge formation for upholstering material of the seat cushion, comprising one or more substantially flat spring metal strips entirely above and overlying the wire enclosure and coil springs adjacent thereto and covering the connections aforesaid therebetween, said strips extending lengthwise of the wire forming the enclosure and overhanging and projecting laterally outward beyond the same for engagement with the upholstery material mentioned, the outer longitudinal edges of said strips being straight and substantially parallel to the adjacent portions of the wire enclosure so as to provide the straight edge formation aforesaid for said upholstering material, and means connecting the strips to the wire enclosure and adjacent springs whereby said strips also provide a flexible coupling therebetween.

2. A seat cushion spring structure having a group of interconnected upright coil springs, an upper border enclosure for said group, the springs adjacent said enclosure being connected directly thereto, and means reinforcing the enclosure and providing laterally outward beyond said enclosure a nonyielding straight edge formation for upholstery material of the seat cushion, comprising one or more substantially flat spring metal strips entirely above and overlying the enclosure and coil springs adjacent thereto and covering the connections aforesaid therebetween, said strips extending lengthwise of the margins of the enclosure and overhanging and projecting laterally outward beyond the same for engagement with the upholstery material mentioned, the outer longitudinal edges of said strips being straight and substantially parallel to the adjacent portions of the enclosure so as to provide the straight edge formation aforesaid for said upholstering material, and means connecting the strips to the enclosure and adjacent springs whereby said strips also provide a flexible coupling therebetween.

3. A seat cushion spring structure having a group of interconnected upright coil springs, an upper border wire enclosure for said group, the springs adjacent said wire enclosure being connected directly thereto, and means reinforcing the wire enclosure and providing laterally outward beyond said enclosure a straight edge formation for upholstery material of the seat cushion, comprising one or more substantially flat spring metal strips entirely above and overlying the wire enclosure and coil springs adjacent thereto and covering the connections aforesaid therebetwen, said strips extending lengthwise of the wire forming the enclosure and overhanging and projecting laterally outward beyond the same for engagement with the upholstering material mentioned, the outer longitudinal edges of said strips being straight and substantially parallel to the adjacent portions of the wire enclosure so as to provide the straight edge formation aforesaid for said upholstery material, means connecting the strips to the wire enclosure, and means connecting the strips to the adjacent springs.

4. A seat cushion spring structure having a group of interconnected upright coil springs, an upper border enclosure for said group, the springs adjacent said enclosure being connected directly thereto, and means reinforcing the enclosure and providing laterally outward beyond said enclosure a nonyielding straight edge formation for upholstery material of the seat cushion, comprising one or more substantially flat spring metal strips entirely above and overlying the enclosure and coil springs adjacent thereto and covering the connections aforesaid therebetween, said strips extending lengthwise of the margins of the enclosure and overhanging and projecting laterally outward beyond the same for engagement with the upholstery material mentioned, the outer longitudinal edges of said strips being straight and substantially parallel to the adjacent portions of the enclosure so as to provide the straight edge formation aforesaid for said upholstery material, said strips being connected to the enclosure and adjacent springs whereby they also provide a flexible coupling therebetween.

ANTHONY PUDLO.