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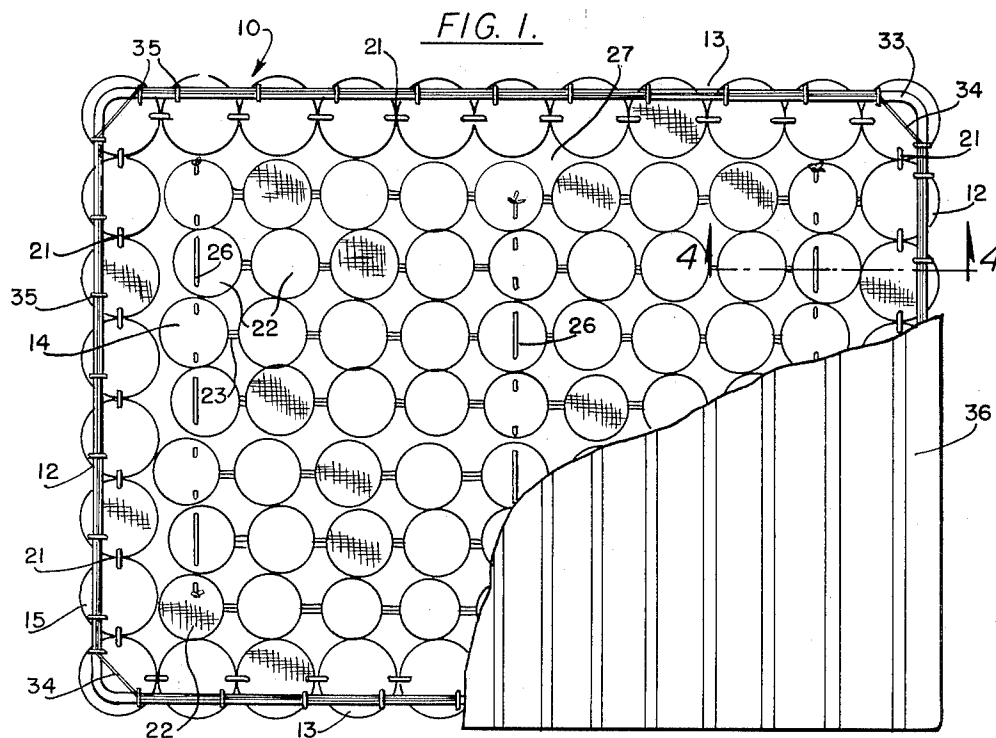
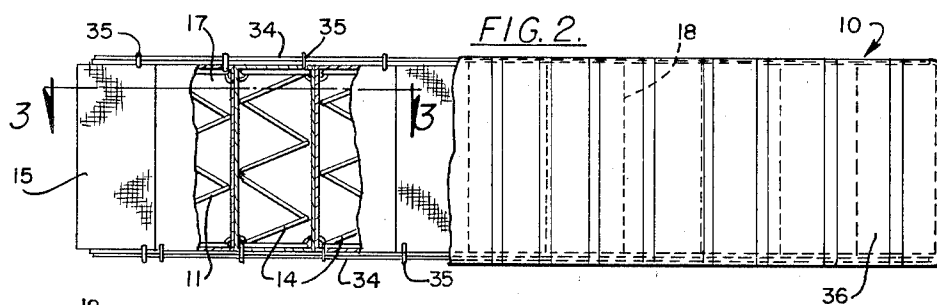
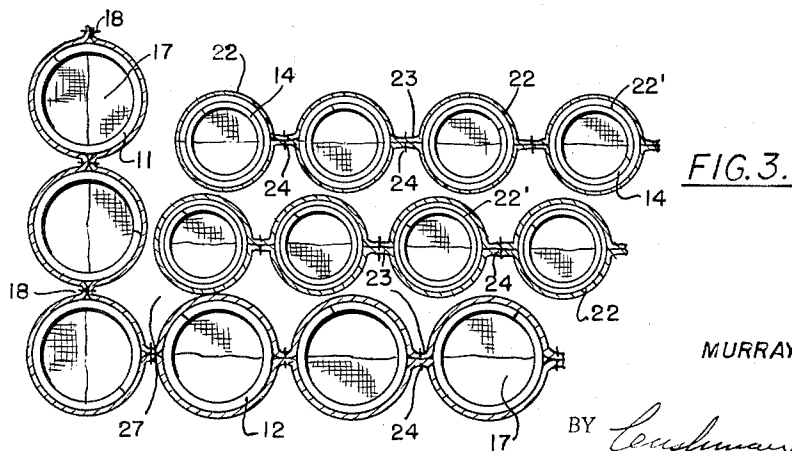
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2,715,435

SPRING CUSHION ASSEMBLY FOR UPHOLSTERY

Filed April 12, 1954

2 Sheets-Sheet 1



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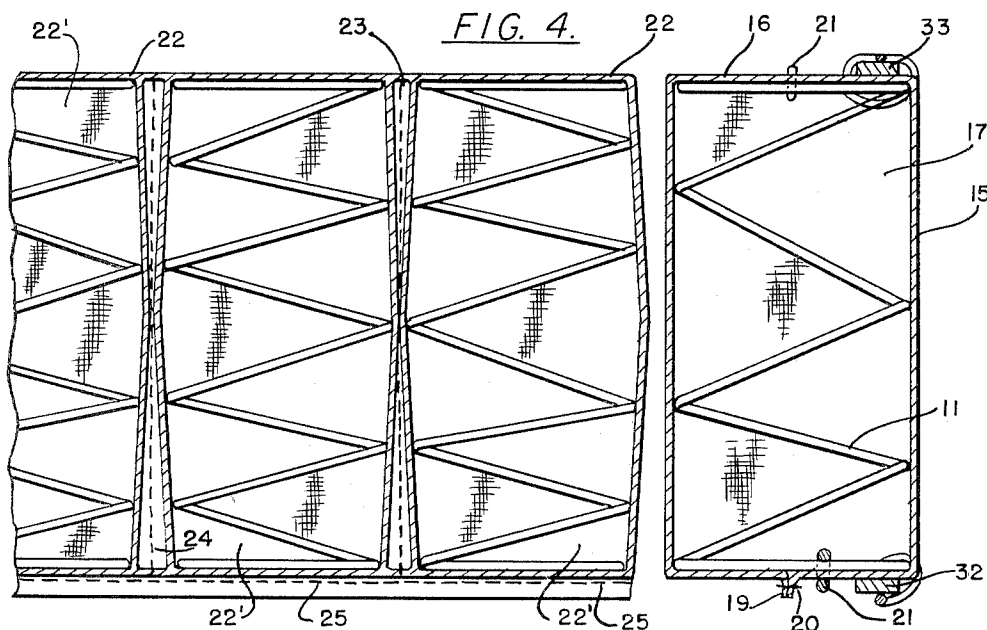
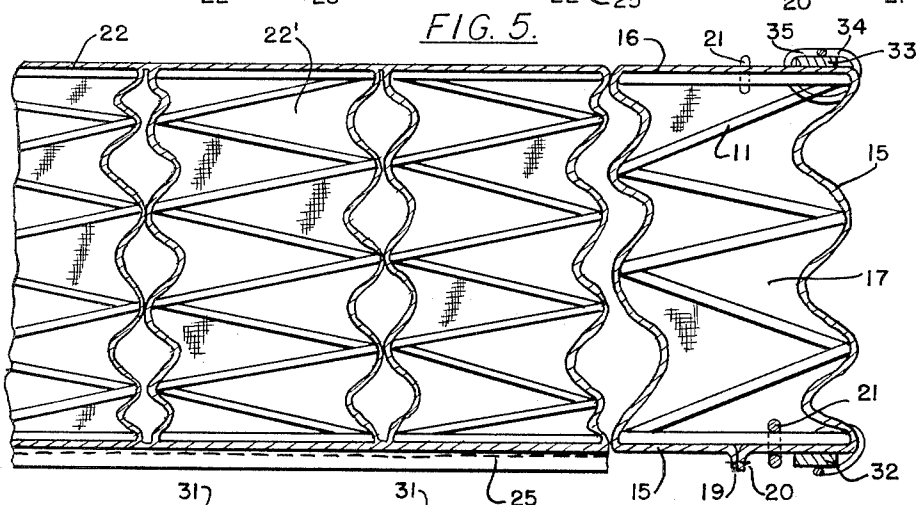
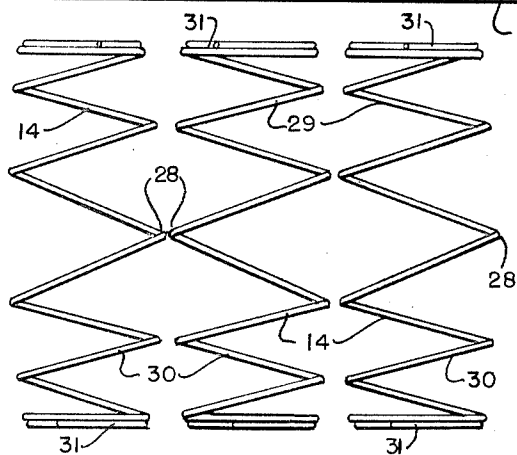
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SPRING CUSHION ASSEMBLY FOR UPHOLSTERY

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2 Sheets-Sheet 2



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## SPRING CUSHION ASSEMBLY FOR UPHOLSTERY

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1 Claim. (Cl. 155—179)

The present invention relates to an improved spring assembly for upholstery and the like.

An important object is to provide a coil spring cushion assembly including an outer continuous border of coil springs of any suitable configuration and within which are confined a plurality of rows of inner springs shaped and positioned to coact with one another so that when the spring cushion is compressed, it produces substantially the same desirable soft and comfortable feeling or effect that is obtained by compressing a rubber cushion.

A further object is to provide a spring cushion including an outer border of helical springs within which is loosely enclosed a plurality of substantially barrel-shaped springs lighter and of smaller diameters than the outer springs so as to provide means for producing a two-way compression of the coil of each inner spring when the same is depressed. In other words, the particular configuration of the inner helical springs instead of producing a straight top to bottom compression after a certain point of the springs is compressed, produces not only a top to bottom compression of the inner springs, but also a bottom to top compression which is caused by the barrel shape of the coils and the engagement at the midway point of each contiguous inner spring. Thus, spring cushioning means are provided which produces substantially the effect and softness as a rubber cushion.

Another object consists in associating with the outer or border springs, upper and lower flat border wires, each of which crosses the springs at points offset from their diameters so as to enable these springs to withstand the wear and pressure to which they are normally subjected. Additionally, the inner barrel springs are insertable or positioned within the outer border springs without any anchoring. In other words, the arrangement is such that the inner barrel-shaped springs may be casually introduced into the space formed by the outer border springs without the necessity of precision in placing or arranging the inner springs in this open area. Once the inner springs are inserted, the only tying means required are a few pieces of cord or twine that extends laterally in order to give some semblance of order and position to the springs.

Other objects and advantages of the invention will become apparent from the following description when taken in conjunction with the accompanying claim and drawings.

Referring to the drawings in which is shown one form the invention may assume:

Figure 1 is a plan view of a spring cushion assembly constructed in accordance with the invention and with parts cut away for clearness of illustration;

Figure 2 is a side elevational view of Figure 1;

Figure 3 is a detailed sectional view taken substantially along the line 3—3 of Figure 2;

Figure 4 is an enlarged detail sectional view taken substantially along the line 4—4 of Figure 1 showing the springs confined in their fabric housings;

Figure 5 is a view similar to Figure 4 but showing the inner and outer coil springs compressed; and

Figure 6 is a detail side view of a row of the barrel shaped inner coiled springs when removed from the housing and showing the engagement of the adjacent central convolutions or ribs and the reduced tapered end portions spaced from each other.

Referring to the drawings, the spring cushion assembly which is primarily intended to be used with an upholstery unit, is indicated generally by the numeral 10. The cushion 10 includes an outer border of helical springs 11 comprising spaced transverse or end rows 12 (Fig. 1) having eight springs to each row and side rows 13 composed of eleven springs in each row. For the purpose of illustration, the outer border of coil springs 11 is shown in the form of a rectangular frame, however, the size and shape of the frame as well as the number of outer coil springs may be varied as necessitated by the particular use to which the upholstery cushion is to be used. The closed space 27 within the outer border springs 11 is filled with longitudinally and transverse rows of inner coil springs 14 which are of lighter gauge than the outer border springs 11 and are of substantially barrel shape.

Each of the outer transverse rows or ends 12 and the side rows 13 of the border springs 11 is encased in a fabric housing 15 preferably formed of a piece of suitable flexible durable material of the desired length, and which is folded medially so as to provide a closed top 16 (Fig. 4) and is provided with longitudinally disposed spaced pockets 17 by the vertical spaced lines of stitching 18 (Fig. 2). The length of each pocket 17 is such that when a coil spring 11 is inserted, the abutting lower ends 19 of the folded fabric are stitched together as at 20 (Fig. 4). Metal tie wires or rings 21 extend through each pocket 17 at the upper and lower ends of the springs 11 so as to peripherally connect adjacent springs.

Each of the longitudinal rows of inner springs 14 is similarly enclosed in a fabric housing 22 (Fig. 3). The adjacent housings of each row of springs 14 are connected by webs 23 secured together by a vertical line of stitching 24 so that the barrel shaped springs 14 are independently positioned within the pockets 22' formed in each of the housings 22. The top of each of the pockets 22' may be closed and the bottom opened so as to receive a spring 14 and cover the same when closed by the longitudinal line of stitching 25 (Fig. 4).

Thus, it will be seen that the outer rows of coiled springs 11 are suitably encased in the fabric pockets 17 and that the inner rows of springs 14 are similarly enclosed in pockets 22' but have their ends free and unattached. The adjacent longitudinal rows of inner springs 14 including the housings 22 may be loosely connected to each other by transversely disposed spaced pieces of string or cord 26 (Fig. 1) extending at right angles to the webs 23. The inner coil springs 14 when loosely connected together by the spaced strings or flexible members 26 can be casually introduced into the space 27 (Fig. 1) formed by the outer border springs 12 so as to properly align themselves and without requiring any pre-determination of their placing in the space 27 relative to the outer border springs 11. The springs 14 in each longitudinal row are slightly offset or staggered relative to its adjacent row in order to snugly fit within the spaces 27. In other words, when the inner springs 14 and their housings are positioned within the outer springs, there is no necessity to connect the ends of the inner springs to one another or to adjacent outer springs, and the loose flexible connection afforded by the spaced strings 26 extending laterally of the rows, is sufficient to yieldably maintain the inner springs in proper compact position relative to each other and the outer springs.

Each of the inner barrel springs 14 has a convolution

or rib 28 (Fig. 6) positioned halfway or centrally between the length of the spring so as to provide an upper coil portion 29 and a lower coil portion 30 that extend in a reduced taper outwardly from the central rib 28 and terminate in the straight curved terminal portions 31, which engage adjacent convolutions so as to provide smooth ends. When the inner barrel-shaped springs 14 are positioned in the pockets 22', they are subjected to slight compression and are slightly contracted as shown in Figure 4. The adjacent barrel springs 14 each has its large central convolution or rib 28 engaging or abutting the central convolution 28 of an adjacent spring to provide a certain degree of tightness, while the taper portions 29 and 30 that extend in opposite directions from the central portion 28 are laterally spaced from the convolutions of adjacent springs in order that the end portions may act freely and independently. By reason of the slight engagement of the central convolutions 28 of the barrel springs 14 when the parts are assembled, means are provided for causing the adherence of the central coil of barrel spring 14 with the central coil of an adjacent spring so as to prevent lateral displacement. Due to the barrel-shape arrangement of the inner springs 14 as contrasted to straight coil springs of uniform diameter, not only a compression from top and bottom is provided but also a bottom to top compression is obtained, thus eliminating the necessity of tying the rows of inner springs together such as heretofore has been the practice. Further, the action of each of the barrel-shaped springs 14 when subjected to compression is from both an up and a down direction towards the center of the spring, in order to produce the desired soft rubber cushion effect.

The half spring portions 29 and 30 of the inner springs 14 (Fig. 6) are gradually reduced by the narrowing down of the convolutions to their outer ends 31, with the result that the spring cushion thus formed by the coaction of the inner barrel-shaped springs 21 with each other and with the outer border springs 11, imparts to the cushion 10 the same desirable soft and comfortable effects as produced by a rubber cushion. Further, the rows of inner springs are sufficiently close as to prevent cupping or canting of the springs and insure a uniform distribution of the load or weight thereon.

By reason of the barrel-shaped construction of the inner springs 14, the adjacent springs will only engage or abut at their midway points so as to impart a certain degree of tightness to the springs in order to maintain them in proper position when the parts are assembled. In other words, the opposite ends of each of the barrel springs are of reduced taper and prevent the end coils from leaning or rubbing against each other. Further this novel arrangement causes the ends of the inner springs to act independently and freely of each other, so as to impart to the assembled springs, a soft rubber cushion-like action without requiring the use of additional anchoring means.

The outer rows or border springs 12 and 13 may be anchored or connected together by a bottom flat metal strap or wire rectangular frame 32 and a similar shaped upper flat border frame 33 (Fig. 4). Each of the flat frames 32 and 33 is connected to the housings of the outer springs by a flexible member or cord 34 (Fig. 1) that extends through each of the housings and is tied by spaced knots 35 thereto. The straps 32 and 33 extend transversely of the top and bottom of the outer rows of springs so as to extend continuously around the same and cross the springs at points offset from the center or diameters of the springs 11 in order to provide means

for uniformly distributing the weight or load when the outer springs are subjected to pressure. The spring cushion 10 when the parts are assembled as shown in Fig. 1, may readily be connected to any suitable piece of upholstery or the like 36, so as to provide a soft and comfortable spring cushion assembly that in operation reproduces substantially the same desirable effects produced by a rubber cushion. The opposed flat ends 31 of the springs 14 flatly engage the adjacent inner walls of the housing and the entire assembly is covered by the upholstery 36 in order to provide a spring cushion having all the soft and comfortable attributes of a rubber cushion.

By reason of the novel arrangement of the barrel-shaped springs 14 and the coaction with the cylindrical springs 11, a rubber-like feel is imparted to the spring assembly, since instead of being a one-way compression from the top only of the springs when pressure or weight is applied to the cushion, there is provided a two-way compression after the springs are compressed to a certain amount and the bottom portions 30 of the springs 14 begin to depress themselves with the results that the cushion produces the same feel as is obtained when compressing slab or foam rubber.

It will be understood that the form of the invention shown is merely illustrative and that such changes may be made as come within the scope of the following claim.

I claim:

A spring cushion assembly for upholstery including an outer continuous border row of fabric-encased helical springs, the space within said border springs being filled with a plurality of rows of coil springs casually introduced bodily into said space so as to properly align themselves without requiring predetermination of their placement relative to the outer border springs, fabric casings having spaced pockets in which said coil springs are separately enclosed, said coil springs being of substantially barrel shape and free from connection with the border springs, said barrel springs having central convolutions engaging one another and their ends spaced apart so as to produce a rubber cushion effect when compressed, the engagement of the central convolutions of adjacent barrel springs serving to prevent lateral displacement, upper and lower flexible flat metal frames connected to the border springs, said frames extending longitudinally of the top and bottom of the border springs and offset relative to the diameters thereof so as to anchor the border springs and enable them to withstand the wear and pressure to which they are normally subjected, a flexible member connected to each of the metal frames and to the outer housings and the border springs to maintain the border springs in a fixed position relative to the frames, transversely extending longitudinally spaced flexible means connected to the row of barrel springs and to the barrel spring housings for loosely connecting the row of barrel springs together, and said barrel springs being positioned sufficiently close to each other to prevent cupping or canting of the barrel springs and insure a uniform distribution of the weight thereon.

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