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L. TROTTA ET AL.
SPRING CUSHION ASSEMBLY

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Fig. 1.

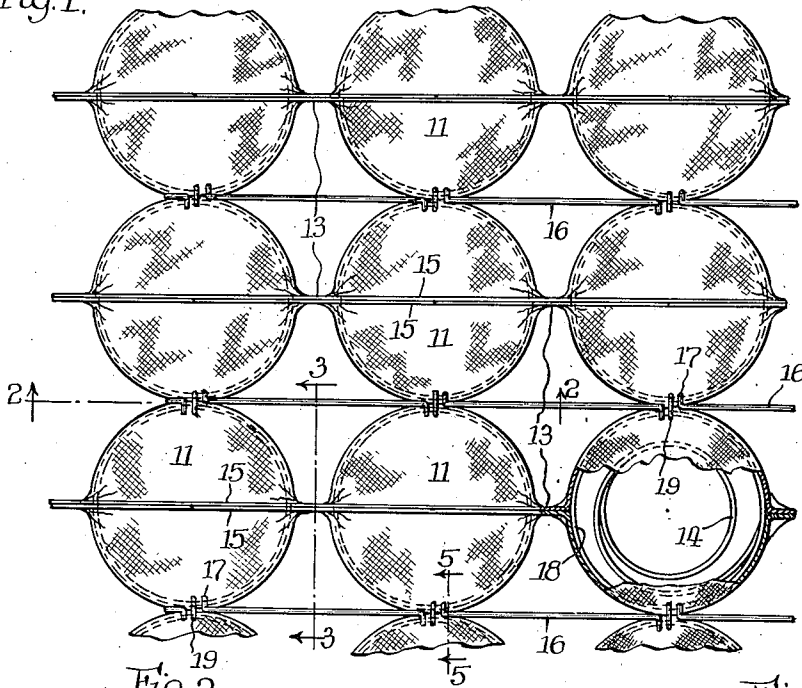


Fig. 2.

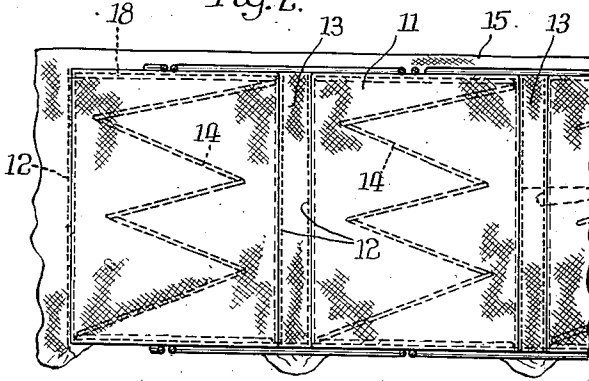


Fig. 3.

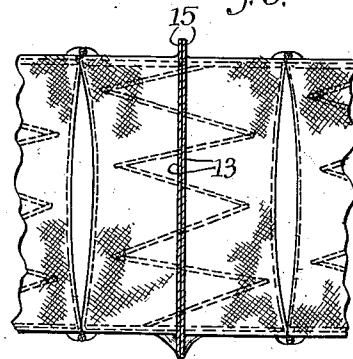


Fig. 4.

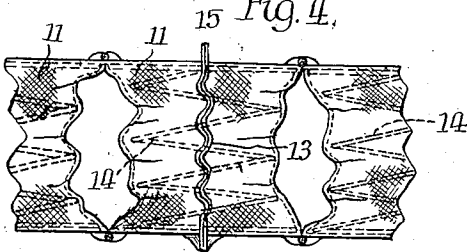
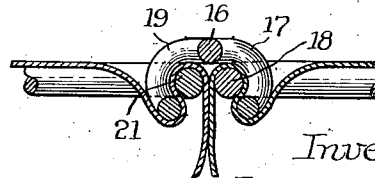


Fig. 5.



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SPRING CUSHION ASSEMBLY

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2 Claims. (Cl. 5—353)

The instant invention relates to spring-assemblies or spring-units involving the housing of the individual spiral-springs in fabric pockets or casings.

5 There is nothing new in merely providing a plurality of parallel series of cloth pockets, each of such series formed by suitably stitching a relatively-long fabric member, folded upon itself, at intervals to supply the row of pockets or cells, each of which houses an upright, helical or spiral 10 spring, crossing rows of strings attached to the terminal coils of such springs holding the parallel series or groups together to form a complete spring-assembly.

15 Stated somewhat differently, in the type of spring-assembly just referred to a number of rows of articulate fabric casings divided into individual pockets each receiving a single, coiled spring and each closed at its top and bottom ends are arranged side by side in parallelism in appropriate 20 number for the desired purpose, such casing pockets being distended by their enclosed springs both circumferentially and lengthwise, the stated longitudinal tautness of the pockets being due to the fact that they are somewhat shorter than the 25 normal uncompressed length of the springs.

Such rows of spring-filled casings are then joined or connected together by hand stitching with the tie strings to maintain them in their 30 predetermined positions or relations, thereby completing the assembly which is thereupon embodied in a cushion in any appropriate manner.

Constructions so made, while they possess certain well-known advantages are nevertheless subject to as well recognized objections, in that their 35 springs are readily crowded together into overlapping relation and not infrequently they become permanently displaced with relation to one another, and, furthermore, the fabric forming the 40 pockets or cells is subjected to excessive strain and wear with the result that the fabric breaks and the springs previously encased in such cells are released and the life of the assembly is accordingly shortened.

45 In an attempt to avoid the defects of the structures referred to, it has been proposed to employ substantially-straight resilient wires between contiguous sets of the articulate spring-filled fabric-casings adjacent to their top and bottom 50 walls and with strings to tie such wires to the terminal or end coils of the springs.

While such a structure may have certain features of betterment and improvement, it is still 55 short of possessing several desirable structural and functional characteristics.

In both of such instances, the fabric tends to wear out unnecessarily early with resulting serious damage to the spring-assembly as a whole and both of the styles of assemblies have the disadvantage that they do not adequately keep their 5 shape to facilitate their incorporation in cushions or mattresses.

Owing to the more or less loose manner in which their parts are tied or associated together, they have an undue capacity for swaying, wab- 10 bling, teetering, etc., whereby they do not sufficiently maintain their proper shape and form to render their incorporation in a mattress or similar cushion a matter of ease and convenience, but, on the contrary, the indicated characteristics 15 hinder and retard the completion of the final structures of which they constitute internal parts or elements.

It has also been suggested to employ helical cross wires between the pockets of the springs in- 20 wardly of the terminal convolutions of the spiral-springs to which they are fastened by additional wire loops.

Such type of construction is subject to similar criticisms. 25

One of the leading aims and prime purposes of the invention is to supply a new kind of analogous spring-assembly which avoids the defects and disadvantages of the earlier constructions referred to. 30

A further object of the invention is to provide a spring-unit having its springs encased in cloth or similar pockets or compartments which is relatively economical to manufacture resulting in comparatively low price of sale, which in- 35 volves but few parts easily assembled, which holds its shape thereby facilitating its incorporation in the cushion or mattress, which will not wear the pockets unduly, which holds the springs reliably in proper positions and which is unlikely 40 to become injured or damaged in ordinary service.

In order that those acquainted with and skilled in this art may understand the invention and the structural and functional advantages flow- 45 ing therefrom, a present preferred embodiment of the invention has been presented in detail in the accompanying drawing forming a part of this specification, and, for simplicity, like reference numerals have been employed to denote 50 the same parts in the several views, but it is to be understood, of course, that the invention as defined by the appended claims is susceptible of a variety of incorporations in physical form differing more or less in structural features but all 55

embracing or containing the fundamental principles on which the invention is based.

In this drawing:—

Figure 1 is a fragmentary, top or bottom plan view of the spring-assembly with the end wall of one of the fabric pockets or receptacles broken away to show its contained spring;

Figure 2 is a vertical section on line 2—2 of Figure 1;

Figure 3 is a vertical section on line 3—3 of Figure 1;

Figure 4 shows the structure presented in Figure 3 somewhat compressed, illustrating the manner in which the cloth pockets separate under such conditions; and

Figure 5 is an enlarged, fragmentary, vertical section on line 5—5 of Figure 1 showing the manner in which the securing or fastening wires are connected to the terminal coils of the fabric-encased springs.

Referring to this drawing, it will be perceived that each row of fabric-pockets 11, 11 is formed by folding a strip of cloth longitudinally on its middle line and then stitching the two thicknesses of such fabric crosswise its length to divide it into a series of pockets or cells.

In this instance to separate or space these compartments from one another properly, between each pair of the pockets, two parallel rows of stitching 12, 12 are used, thereby leaving or providing a narrow, blank, upright, double-thickness, fabric spacing section 13, the one row of such stitching forming a portion of one such pocket and the companion or correlated row of stitching constituting a part of the next pocket.

As to its length, each pocket is slightly less than the longitudinal dimension of the spring 14 which it is adapted to house, whereby to normally maintain the spring under a moderate or desired degree of compression.

All of the springs of any row having been inserted or introduced into their pockets, the previously open ends of the pockets, which may be either at the top of the assembly or at the bottom, are closed by stitching together the margins 15 of the two thicknesses of the fabric across the center of the end coils of the contained springs.

Thus each row of fabric-encased springs comprises an articulate, jointed or hinged, fabric member so stitched as to provide spaced closed cells each housing its own individual or separate spiral-spring.

In order to hold or maintain these fabric elements and their pocketed springs in proper longitudinal stretched relation and to fasten these several strips and their enclosed springs together crosswise thereof, suitable securing or latch spring wires 16 are used at both the top and bottom surfaces of the structure outside of the fabric ends of the pockets.

Each such wire is located approximately in register with the adjacent parts of the terminal coils of the encased springs of two proximate rows, as shown in Figure 1, such latch or fastening wires being parallel to the rows of fabric pockets.

At each point where the end coils of the springs come almost into contact with one another, each such wire is bent laterally and then back again to provide a projection 17 which is bent around the terminal coil 18 of the spring of one row, the wire being also bent laterally in the opposite direction, close to the first bending, and then back again to form a complementary projection 19

which in similar manner is bent around the end coil 21 of the adjacent spring 14.

As is indicated, each such transverse extension 17 or 19 is of double wire form comprising an outwardly-directed and an inwardly-extended short wire section joined together at their outer ends by a short wire portion.

Each such narrow projection or ear, therefore, is in the form of an unclosed loop, open at its inner end in alignment or register with the longitudinal dimension of the wire, whereby such loop may automatically open or contract in a minor measure when strain is imposed tending to produce such result.

As presented in Figure 5, each pair of these projections may act as a sort of hinge connection for the two springs which they join together, or if preferred, they may so firmly bind the coils together as to practically preclude such hinge function.

The fabric of the pockets may be interposed between these projections and the terminal coils of the pocketed springs, or, in some cases, the fastening projections may pierce through the fabric and be in direct contact with the wires of the end coils.

These lateral projections are so located on their securing wires that the fabric strips are maintained lengthwise more or less taut between the spring pockets, thus assuring that the springs will not rub the pockets together with resulting wear, and, of course, such securing of the springs insures the maintenance of their proper spacing.

Along the other dimension of the spring-assembly the pockets are in contact with one another only at their tops and bottoms, as indicated in Figure 3, this being due to the fact that the encased springs instead of being of cylindrical shape are longitudinally externally concave or of slight hour-glass form, all as is clearly shown.

As has been explained, these housed springs are kept under minor lengthwise or axial compression by reason of the corresponding dimension of the pockets and their tendency to expand longitudinally in the pockets makes the latter take the somewhat concave shape depicted in Figure 3, whereby the pockets, for all practical purposes, are out of rubbing contact with one another.

One might naturally surmise that as the springs are still further compressed in use, the fabric pockets would bulge outwardly into engagement with one another, but this is not the fact, because as the springs are shortened by their imposed load, the adjacent parts of the pockets separate from one another still more, as shown in Figure 4.

When the spring-assembly is in use, the spring latch or connecting wires 16 do not become kinked or deformed between their fastening connections with the coiled springs due to the slight yield or give permitted by the open-loop structure of their lateral extensions or projections, which perform the dual or double function of securing the springs together and affording automatic, yielding, take-up means lengthwise the wires.

From what precedes, it will be apparent that the entire spring-assembly is built up of only three types of parts: the rows of spaced fabric pockets, the springs, and the spacing securing wires.

It will be noted that in the new and improved structure, specially-treated, non-kinking wires take the place of the usual twine ties to avoid broken connections and to permanently latch or fasten adjoining springs together on both sides of the unit.

Furthermore, the springs of modified hour-glass shape, because of the new wire securing means, are definitely spaced apart sufficiently to eliminate rub-wear on the encasing cloth pockets.

Due to the incorporation of the present invention in the construction, the life and effectiveness of the cloth compartments are greatly prolonged with resulting preservation of the springs under proper compression.

Even if some of the fabric pockets become torn, the springs are still held securely in place and continue to function reasonably satisfactorily.

The latching or fastening wires act also to distribute the weight of the load over the entire unit, the springs not functioning solely independently of one another to resist the imposed pressure, but, by reason of the presence of the connecting wires functioning unitedly or conjointly to provide a more positive support without sacrifice of satisfactory resiliency or elasticity.

Due to the manner in which the parts of the spring-assembly are joined together, there is no substantial danger of crushing or distorting the unit while it is being incorporated in a cushion of which it is to comprise the principal and most important part.

We claim:

1. In a spring-assembly, the combination of a plurality of substantially-parallel fabric-members each formed to provide a row of individual upright pockets with the pockets spaced apart from one another lengthwise the member and closed at both ends, an upstanding spiral-spring in each of said pockets, and tie-wires at both surfaces of the assembly substantially parallel to said rows of pockets with their major portions outside of said pockets and holding said fabric-members of said rows stretched lengthwise to keep the pockets and the springs of each row spaced apart and fastening the terminal coils of the springs of adjacent rows together with at least the top and bottom portions of the pockets of proximate rows substantially in contact with one another, said tie-wires thus uniting all of said springs and also bridging the spaces between the pockets, each of said tie-wires for each such connection being bent to form only a pair of double-wire projections directly adjacent to one another and extended laterally in opposite directions from the main body of the wire, said projections extending over and being bent downwardly around the wires forming the terminal coils of adjacent springs of proximate rows, said tie-wires and their projections having spring characteristics, each pair of such projections being narrow enough and capable of expansion and contraction, whereby, upon depression of the spiral-springs by a load imposed thereon, said tie-wires by reason of expansion of their projections elongate in minor degree and flex vertically without danger of kinking and said projections

constitute vertically-acting hinge connections between the terminal coils of the springs with which they are associated, all of said parts due to the spring properties of said tie-wires and their projections returning to their normal positions and conditions when the load is removed, said parallel tie-wires constituting the sole means for holding said fabric-members stretched lengthwise and for fastening said springs together.

2. In a spring-assembly, the combination of a plurality of substantially-parallel fabric-members each formed to provide a row of individual upright pockets with the pockets spaced apart from one another lengthwise the member and closed at both ends, an upstanding spiral-spring in each of said pockets, and tie-wires at both surfaces of the assembly substantially parallel to said rows of pockets with their major portions outside of said pockets and holding said fabric-members of said rows stretched lengthwise to keep the pockets and the springs of each row spaced apart and fastening the terminal coils of the springs of adjacent rows together with at least the top and bottom portions of the pockets of proximate rows substantially in contact with one another, said tie-wires thus uniting all of said springs and also bridging the spaces between the pockets, each of such tie-wires for each such connection being bent laterally and then back again to form a first double-wire projection bent over and inwardly around the wire of the terminal coil of a spring in one row, the tie-wire being also bent laterally in the opposite direction directly adjacent to said first projection and then back again to provide a second double-wire projection bent over and inwardly around the wire of the terminal coil of the adjacent spring in the next row, said oppositely-directed lateral projections being directly adjacent to one another and constituting the only spring-fastening projections of the wire for each such connection, said tie-wires and their projections having spring characteristics, each pair of such projections being narrow enough and capable of expansion and contraction, whereby, upon depression of the spiral-springs by a load imposed thereon, said tie-wires by reason of expansion of their projections elongate in minor degree and flex vertically without danger of kinking and said projections constitute vertically-acting hinge connections between the terminal coils of the springs with which they are associated, all of said parts due to the spring properties of said tie-wires and their projections returning to their normal positions and conditions when the load is removed, said parallel tie-wires constituting the sole means for holding said fabric-members stretched length-wise and for fastening said springs together.

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