May 7, 1957 W. W. GLEASON 2,790,979

SPRING ASSEMBLY FOR UPHOLSTERY

Filed Nov. 8, 1954

FIG. 1

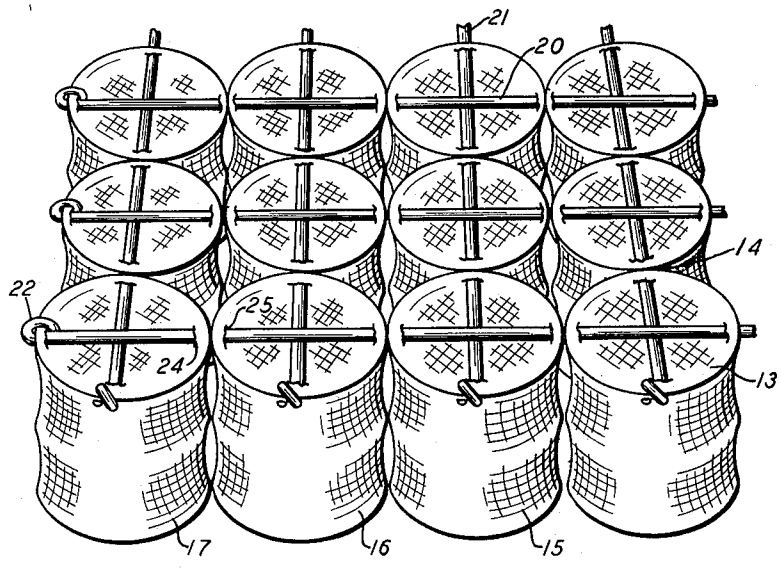
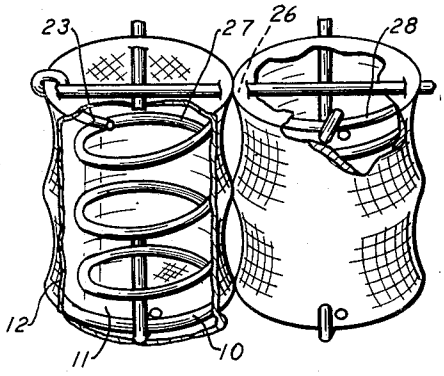


FIG. 2



INVENTOR.
WILLIAM W. GLEASON
BY
Toms, McDougall, Williams & Hersh
ATTORNEYS

United States Patent Office 2,790,979 Patented May 7, 1957

2,790,979

SPRING ASSEMBLY FOR UPHOLSTERY

William W. Gleason, Chicago, Ill., assignor to Nachman Corporation, Chicago, Ill., a corporation of Illinois

Application November 8, 1954, Serial No. 467,513

4 Claims. (Cl. 5—353)

This invention relates to a spring assembly for upholstered furniture, generally referred to as spring assemblies of the Marshall type, in which a plurality of spring coils are confined in a compressed state within individual cells or socks formed of fabric material joined one to another in a desired arrangement for use in the manufacture of a cushion unit or other upholstered furniture. By the use of precompressed spring coil members confined within cells in an assembly of the type described, the cushion unit that is formed is adapted usually to return substantially immediately to its original shape unless the spring elements within the cells or socks become displaced or distorted or unless the fabric deteriorates to the extent that one or more of these spring coil members is released to project outwardly beyond the surface.

In constructions of the type described which have heretofore been produced, it has been convenient to form a length of such cells by stitching together the walls of fabric between separated spring coils to form individual aligned cells in which the springs are contained. The lengths of the cells are dimensioned to be considerably less than the length of the coil springs in their extended or relaxed condition with the result that the spring coils are retained under tension in their confining cells constantly to urge the ends of the fabric towards their original extended position by forces corresponding to the amount of contraction of the spring coils in use. The string of interconnected cells is usually arranged to form one row of a unit and means are provided for securing the rows one to another to form an integrated assembly of prestressed spring coils for use in the manufacture of upholstered furniture.

The problems inherent in the construction of Marshall units of the type described reside chiefly in the means for economically and efficiently joining the cells containing the spring coils into a composite assembly in which the cells are interconnected in a manner which produces a sturdy unit capable of maintaining a relatively flat surface under the conditions of use and without excessive wear on the fabric and without permanent distortion or displacement of spring coils. To the present, use has been made of cords or helical tie wires for interconnecting adjacent coils at their edge portions by threading the wire or cord over and above the edge portions of the terminal coils and the fabric adjacent thereto. While such assemblies have served successfully to join the elements one to another, it has been found that the elements in one section function wholly independent of the elements in other sections of the spring assembly with the result that considerable unevenness may exist in the surfaces of the unit, especially after a short period of use where one section receives more use than the other. Such tie-in means as have heretofore been employed do not successfully prevent relative movements between the coils whereby one spring coil may shift laterally relative to the other or overlap the other. This not only results in unevenness in the surface but such relative

movements and overlap causes excessive wear of the fabric with the result that replacement or repair is often required to keep the assembly in serviceable condition.

It is an object of this invention to produce Marshall units of the type described in which spring coils entrapped within fabric cells in a pre-tension relation are interconnected one with the other adjacent thereto in a manner to minimize distortion or non-uniformity in the surface of the assembled springs, which does not interfere with the cushioning action or the efficiency of the spring unit in operation in cushions, which minimizes the amount of wear on the fabric in which the individual spring coils are housed, thereby to avoid inadvertent displacement or release, and which prevents overlapping of the coils of the spring units in their assembled relation, and it is a related object to produce a spring assembly of the type described in which such means for interconnecting the spring coils within their cells is easily and quickly embodied in the structure and which constitutes means simple in construction and operation thereby to cause little, if any, increase in the cost of the unit.

These and other objects and advantages of this invention will hereinafter appear and for purposes of illustration, but not of limitation, an embodiment of the invention is shown in the accompanying drawing in which—

Figure 1 is a perspective view of a portion of a spring assembly embodying features of this invention, and

Figure 2 is a perspective elevational view of a fragment of the spring assembly shown in Figure 1, with portions broken away for better illustration of the interior thereof.

As illustrated in the drawing, **10** indicates the individual coil springs confined within individual cells or socks **11** formed of textile material **12**, such as burlap or other open-meshed fabric of soft and pliable material. In the construction of a unit of the Marshall type, a plurality of such individual coil springs **10** may be arranged in an elongate row **13** and wrapped with the textile fabric **12** which is then stitched lengthwise, as at **14**, between the separated springs to provide a series of interconnected cells in a row **13**, after which the ends of the fabric are secured together as by stitching after the spring coils have been compressed to form cells of uniform lengths dimensioned to be considerably less than the lengths of the spring coils when in their extended or relaxed condition. Thus, an elongate row **13** of spring coils individually housed in interconnected cells in side-by-side relation are provided, the length of the row of cells corresponding preferably to the length of the spring unit desired for the cushion assembly. Instead, separate cells containing compressed coil springs confined therein may be formed and arranged in side-by-side relation in the rows as desired.

Additional rows **15**, **16** and **17** of the type described are positioned crosswise in contacting relation with each other to build up the width of spring assembly desired. In the past, such separated cells in adjacent rows have been interconnected by tie wires or by intertying with strings or cords passed about adjacent terminal portions of the spring coils, but as previously described, such means have been found to be insufficient because of their inability to restrain one spring unit from displacement relative to others, and because of their inability to prevent overlap between spring units, with the result that excessive wear takes place which causes deterioration of the fabric and release of the spring coils, or else the spring coils become permanently displaced whereby the spring assembly loses its shape to which it would otherwise normally return. As a result, such spring units embodying tie-in means previously employed have required frequent replacement and repair and have produced struc-

tures subject to rapid deterioration from the standpoint of appearance and utility in upholstered furniture.

In accordance with the practice of this invention, such relative movements and displacements as accelerate deterioration of the textile material or which cause distortion of the spring assembly or projection of one spring beyond the other in the assembly, are substantially completely eliminated by a construction wherein the terminal coils of adjacent spring members and the fabrics in which they are confined become interconnected one to another over substantial lengths in a manner which inter-relates one section of coil springs with another to make them more dependent one on the other in the assembly. As a result, a spring assembly embodying the improvements which will hereinafter be described remains substantially flat in use because the terminal coils of adjacent springs hold up throughout at a uniform level and they are enabled to shift in overlapping relation. This arrangement also minimizes displacement and reduces the wear on the fabric between and about the coil springs in use.

These improvements in construction and operation have been found to result from the use of elongate, relatively rigid members of resilient material, such as steel wires or bands **20** and **21**. The wires or bands are dimensioned to extend over the length or width of the unit to the outer edge portions of the terminal coils of the outermost coil springs for attachment thereto as by twisting the ends of the wires or bands about the outermost portion of the terminal coils **23** to form loops **22**. The intermediate portions of the wires or bands extend crosswise diametrically over the centers of the terminal coils of the coil springs therebetween in each row with the wire or band extending over the outside of the fabric of each cell through the major portion between the coils and through the fabric as at **24** and **25** in the outer periphery of the cells and beneath the terminal portions **26** of adjacent coil springs illustrated by the numerals **27** and **28**. Such interconnecting wires or bands **20** and **21** are preferably provided to extend both across the aligned lengthwise and crosswise rows of cells and spring coils respectively when the units are formed of unconnected cells. When rows of interconnected cells are employed, it is possible to make use only of one series of wires or bands arranged to extend across adjacent rows of cells for interconnecting the cells and coils of one row with aligned cells and coils of adjacent rows.

When constructed in this manner, the wires or bands which extend crosswise diametrically over the outside of the fabric across the central portions of the cells function to engage the underside of the terminal portions of all of the spring coils in one row to the end that the spring coils will be supported as a unit at a uniform level with one group of coils in one section assisting to support the groups of coil springs in distant sections and vice versa. Similarly, the fabric forming the top and bottom walls of the cells located beneath the wires or bands contributes to the support of the spring coils at a desirable uniform level. The close association between the fabric and the terminal coils of the coil springs and the limited space available at the fabric portion cut off by the band extending therethrough beneath the terminal coils limits the extent of relative movement of the coil springs sufficiently to prevent overlapping or extensive amounts of relative movement.

It will be apparent that the limited space available between the fabric and the band passing therethrough in which the terminal portions of adjacent coil springs are confined serves to maintain the relative position between the fabric and the coil springs to minimize the amount of relative movement or abrasion and the amount of wear that can take place which would otherwise cause the rapid and excessive deterioration of the fabric. The limited space available in the portion of the fabric cut off by the wires or bands and in which the terminal portions of the coil springs are located prevents permanent

displacement of the spring coils such as might result in permanent distortion of the spring assembly. The cooperative relationship which exists between the wires or bands which resiliently engage the terminal portions of the coils on the underside and the fabric of the cells which engage the terminal portions of the coils on the top side as well as at the sides and the limited space available for movement of the terminal portions of the coil springs has been found substantially to prevent one coil from climbing over the other to a different level thereby to provide a spring assembly characterized by a permanent flat surface and in which wear is kept to a minimum.

In addition to the function of the wires or bands in supporting the coil springs at a uniform level in fixed relation in their upper and lower portions of their cells of fabric material with the consequent advantages described, the crosswise and lengthwise wires or bands which extend diametrically across the terminal coils of the coil springs plug the space therebetween which might otherwise become filled with packing or the like upholstery material which would then be visible from the outside of the upholstered cushion unit and would cause unevenness and possible discomfort in the use thereof.

It will be understood that numerous other advantages result from the use of crossing wires and bands assembled in the manner described in a Marshall unit and that changes may be made in the details of construction and arrangement without departing from the spirit of the invention, especially as defined in the following claims.

I claim:

1. A spring assembly of the Marshall type comprising a plurality of coil springs, a cell for each coil spring formed of textile material and dimensioned to have a diameter corresponding generally to the diameter of the coil springs and a length less than the normal length of the coil springs, said coil springs being confined within said cells in a compressed state to form prefabricated units which are separate and apart from each other, and means interconnecting said spring containing cells aligned in rows to effect an assembled relation, said interconnecting means comprising elongate elements of rigid material dimensioned to have a length corresponding to the length of the row of aligned cells with the ends of the elements secured to the outer edges of the terminal coils of the outermost coil springs in the row and with the portion between the ends extending continuously in a straight line diametrically across the cells arranged in side by side relation in the row with the elements extending through the fabric in the edge portions of each cell adjacent the terminal coils of the coil springs confined therein for passage beneath the terminal coil portions of adjacent coil springs with the remainder of the elements extending outside of the fabric of the cells between the edge portions.

2. A spring assembly of the Marshall type comprising a plurality of coil springs, a cell for each coil spring formed of textile material and dimensioned to have a diameter corresponding generally to the diameter of the coil springs and a length less than the normal length of the coil springs, said coil springs being confined within said cells in a compressed state to provide prefabricated units which are unconnected one to the other by stitching between the fabric, and means interconnecting said spring containing cells aligned in rows to effect an assembled relation, said interconnecting means comprising elongate metal members dimensioned to have a length corresponding to the length of the row of aligned cells with the ends of the metal members secured to the outer edges of the terminal coils of the outermost coil springs in the row and with the portion between the ends extending diametrically across the cells arranged in side by side relation in the row with the metal members extending through the fabric in the edge portions of each cell adjacent the terminal coils of the coil springs confined therein for passage beneath the terminal coil portions of adjacent

coil springs with the remainder of the metal members extending outside of the fabric of the cells between the edge portions.

3. A spring assembly as claimed in claim 1 in which the cells are interconnected by stitching lengths of fabric together between aligned spring coils and in which the tie-in elements extend crosswise between cells aligned crosswise in each row to effect an interconnected relation.

4. A spring assembly as claimed in claim 1 in which the cells are formed individually and aligned in lengthwise and crosswise rows and in which the tie-in elements

extend crosswise and lengthwise interconnecting the cells in the crosswise and lengthwise rows.

References Cited in the file of this patent

UNITED STATES PATENTS

1,140,973	Foill	May 25, 1915
1,875,521	Suekoff	Sept. 6, 1932
2,541,468	Ebert	Feb. 13, 1951

FOREIGN PATENTS

328,562	Great Britain	Apr. 28, 1930