July 9, 1968 E. L. BRONSTIEN, JR., ET AL 3,391,412

SPRING ASSEMBLY AND ELEMENT EMPLOYED IN SAME

Filed Nov. 14, 1966

FIG. 1

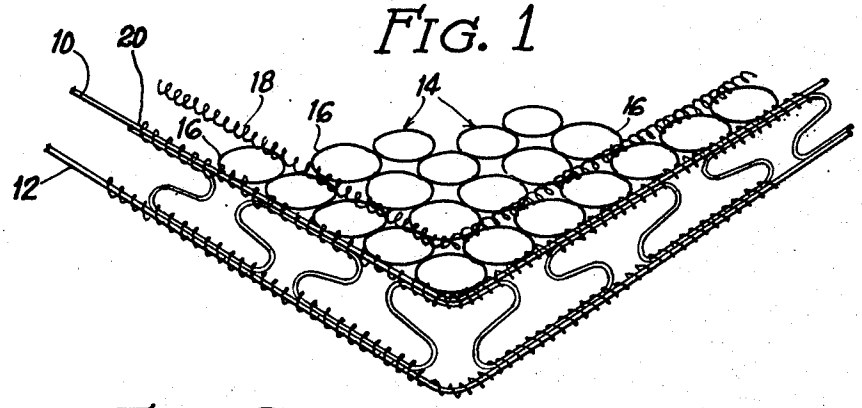


FIG. 2

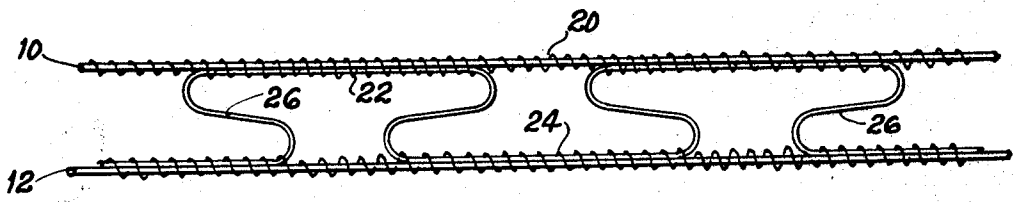


FIG. 3

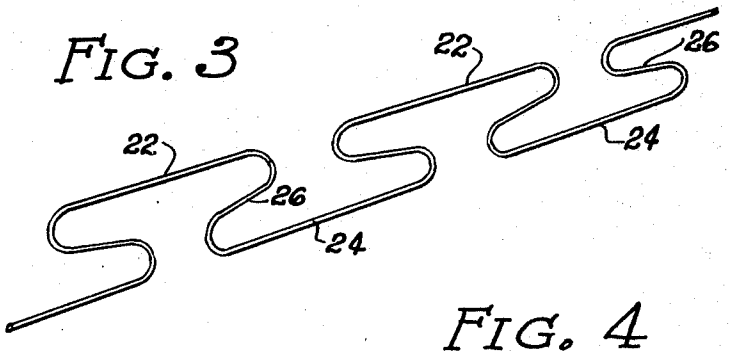
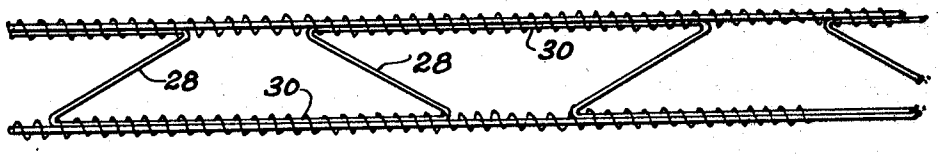


FIG. 4



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SPRING ASSEMBLY AND ELEMENT EMPLOYED IN SAME

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6 Claims. (Cl. 5—260)

ABSTRACT OF THE DISCLOSURE

The invention is addressed to a multiple spring assembly which embodies a plurality of coil springs aligned in lengthwise and crosswise rows between upper and lower border wires and interconnected to provide a spring assembly and to an edge support formed of a continuous length of spring wire interrupted in longitudinally spaced apart relationship in the form of a plurality of alternating Z-shaped sections with the upper and lower arms of the Z-sections parallel with the upper and lower border wires and having a corresponding spaced relationship whereby said upper and lower arms can be interconnected to the respective upper and lower border wires substantially throughout their length to position the support in the edge of the spring assembly in a stable manner to militate against inadvertent displacement.

This invention relates to a spring assembly and to an element employed in the manufacture of same and it relates more particularly to a spring assembly for use in box springs, mattresses, cushions, seats, and the like.

For the most part, spring assemblies for use in box springs and mattresses are formed of a plurality of interconnected coil springs arranged in side by side relation in crosswise and lengthwise rows between upper and lower border wires which are interconnected to the upper and lower terminal coils of the outermost coil springs in each of the rows, as by means of helicals, hog rings, clips and the like, to provide a coil spring assembly. While the invention will be described with reference to a spring assembly of the type described, it will be understood that spring elements other than coil springs may be employed as the resilient members forming the body portion of the spring assembly, such as zig-zag spring members and the like.

Spring assemblies of the type described can be modified to increase or decrease the concentration of coil springs in the body portion to make coil springs available of sufficient gauge and number to carry the load and to resist excessive deformation in use thereby to permit the desired degree of stiffness and load carrying ability to be embodied in the body portion of the spring assembly.

However, excessive concentration of load is often applied to the edge portion of the spring assembly, as when sitting on the bed or mattress or when lying adjacent the edge. The number of coil springs capable of disposition in the edge portion of the assembly is limited such that the edge portion is often subject to excessive deformation and insufficient load carrying ability. This results in edge sag or deformation which reduces the useful life of the spring or mattress and which detracts from its appearance and comfort in use.

It has been the practice to reinforce and stiffen the edge construction with inserts in the form of longitudinally

spaced apart spring members which are arranged to extend along the edges of the spring assembly between the upper and lower border wires, as described in U.S. Patent Nos. 2,703,414 and 2,826,768. Such edge reinforcement and stiffening members for adding strength and support to the edge construction of the spring assembly have found widespread use in the bedding field but they have been employed as individual elements arranged in longitudinally spaced apart relation in the edge construction. As a result, their cost is relatively high and their assembly in the desired arrangement in the edge construction is difficult to achieved. It is difficult to fix the separate elements in the desired position of use in the assembly whereby the edge supporting member will remain in the desired relationship during the entire life of the spring assembly or mattress.

It is an object of this invention to produce a new and improved spring assembly and it is a related object to produce a new and improved element for use in the manufacture of same.

More specifically, it is an object of this invention to produce a reinforcing and stiffening element adapted to be employed in the edge construction of a spring assembly to reinforce and stiffen the edge portion of the assembly, to increase the load carrying ability of the edge portion of the spring assembly to conform more with the supports available from the body portion thereof; which is capable of easy fabrication into a continuous elongate unit capable of spanning a substantial portion and preferably the entire edge construction of the spring assembly; which is capable of incorporation in a simple and efficient manner into the spring assembly to form a component thereof; which is capable of accurate location in position of use in the edge construction of the spring assembly, which is capable of assembly for permanent retention in the desired position of use in the spring assembly, and which offers maximum stiffness and support without interfering with the resiliency in the edge portion of the spring assembly.

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

FIG. 1 is a perspective elevational view of a corner portion of a spring assembly embodying the features of this invention;

FIG. 2 is a side elevational view of a fragmentary portion of the spring assembly shown in FIG. 1;

FIG. 3 is a perspective view of a spring edge supporting member embodying the features of this invention; and

FIG. 4 is a side elevational view, similar to that of FIG. 2, showing a modification in the construction of the supporting member.

In the drawing, illustration is made of a spring assembly embodying an upper border wire **10** and a lower border wire **12** with a plurality of coil springs **14** arranged in the area within the border wires with the upper terminal coils **16** of the outermost coil springs **14** adjacent the upper border wire **10** and the lower terminal coils of the outermost coil springs **14** along side the lower border wire **12**.

The coil springs **14** can be in the form of hourglass springs or straight coil springs arranged in various patterns in the area between the border wires. For example, the coil springs **14** can be arranged in lengthwise and

crosswise rows with the terminal coils of adjacent coil springs in each of the rows in side by side relationship or they can be arranged in rows which are spaced one from the other, or combinations thereof. The terminal coils of the coil springs are usually interconnected one to another by hog rings, by clips, or preferably by helical tie wires **18** which are spun about the aligned terminal coils of adjacent coil springs.

The assembly of interconnected coil springs are joined to the border wires by tying the border wires to adjacent terminal coils of the outermost coil springs, as by clips and preferably by the use of helical tie wires **20** spun along the border wires to encompass the overlapping of adjacent terminal portions of the adjacent coil springs. The border wires **10** and **12** are usually formed of round or flat spring wires of heavier gauge than the spring wires of which the coil springs are formed.

To the present, the description is that of a conventional coil spring assembly of the type described in numerous patents and of the type which has been used in box springs and mattresses for a number of years.

The edge supporting element of this invention comprises a continuous length of spring wire formed with a number of longitudinally spaced apart spring sections, each of which comprises a pair of vertically spaced apart parallel arms **22** and **24** with an integral portion in between interconnecting the end of one arm with the other end of the other arm whereby the arms **22** and **24** are resiliently retained in their vertically spaced apart parallel relationship. The intermediate connecting portion **26** may be of curvilinear shape, such as to define a spring section of S-shape with the S-shaped spring sections alternating between regular and reversed S sections for integral connection one with the other to provide a continuous support or variable length.

Instead, the intermediate portion **26** can extend angularly, or in zig-zag fashion from the end of one arm to the other end of the other arm, as in FIG. 4, to define alternating regular and reversed Z-shaped sections **28** in the continuous supporting member.

The upper and lower arm portions **22** and **24** of each spring section are vertically spaced apart by an amount corresponding to the spaced relationship between the upper and lower border frame members **10** and **12** so that the arm portions will be disposed alongside the border frame members when the support member is positioned to extend vertically beyond the border frame members in position of use. The spring sections in the continuous support are spaced one from another, in the integral unit, by an amount corresponding to about one-half to three times the spaced relationship between the parallel arms and preferably one to two times the spaced relationship between the arms.

The attachments between the arms of the spring sections including the connecting portions **30** between adjacent spring sections and the adjacent portions of the border frame members **10** and **12** can be effected by the helical tie wires **20** spun about the border frame members to engage the arm sections as well as the adjacent portions of the terminal coils of the coil springs to intertie the units. Instead, the desired interconnection can be effected by the use of tie wires, hog rings, clips and the like to secure the support member to extend vertically between the border frame members along the edge of the spring assembly to reinforce, stiffen and support the edge construction.

In the preferred embodiment of this invention, the preformed supporting elements are cut to lengths whereby a single continuous length of the supporting member is used to extend continuously about the entire spring assembly for incorporation therewith. Instead, the supporting member may be used in shorter lengths if desired, but to lengths to at least span one side or end or both.

Because of the unitary construction of the supporting member, its arrangement to extend continuously about

the edges of the spring assembly, and the plurality of points of attachment between the horizontally disposed upper and lower portions of the supporting member with the adjacent border frame members, the supporting member is capable of proper location between the border frame members with the number of attachments sufficient substantially permanently to retain the support in position of use for maximum utilization of the supporting member. There is no tendency for lateral or lengthwise displacement by reason of the stabilizing reaction of the continuous length about all four sides of the assembly.

The configured arrangement in each spring section offers resiliency while still enabling the section to react throughout its length to enhance resistance to the squeezing deformation thereby to increase the amount of resiliency and support made available from the supporting member without increase in the gauge of the wires, the cost of the elements or the number and spacing of units required to be employed. The spring sections support one another throughout the continuous length of the supporting member for the transmission of load whereby more effective use can be made of the entire unit to resist load even when concentrated on a small section thereof.

The support member can be retained in vertical alignment between the border wires for more effective use in support of load and for stiffening the edge construction without loss of position and without protruding into or out of the spring assembly.

It will be apparent from the foregoing that we have provided a new, novel, simple and relatively inexpensive supporting member which is capable of more efficient use and easier assembly into the edge construction of a spring assembly whereby a more stable unit is capable of being produced having greater stiffness and resiliency in the edge construction.

It will be understood that changes may be made in the details of construction, arrangement and operation without departing from the spirit of the invention, especially as defined in the following claims.

We claim:

1. An edge support for multiple spring assemblies in which the edge support is located between vertically spaced apart parallel border wires forming a part of the edge construction of the spring assembly comprising a continuous length of spring wire interrupted in longitudinally spaced apart portions to provide a plurality of longitudinally spaced apart spring sections in the form of a Z-shaped portion with the Z-shaped portions alternating between regular and reversed Z shaped sections, with the upper and lower arms of the Z-shaped portions spaced apart by an amount corresponding to the spacing between the vertically spaced apart border wires of the spring assembly.

2. An edge support as claimed in claim **1** in which the spring sections are longitudinally spaced one from the other by an amount corresponding to one-half to three times the spaced relationship between the vertically spaced arms.

3. An edge support as claimed in claim **1** in which the spring sections are longitudinally spaced one from the other by an amount corresponding to one to two times the spaced relationship between the vertically spaced arms.

4. In a spring assembly having a plurality of interconnected spring members forming a body portion of the spring assembly and a pair of vertically spaced apart parallel border wires surrounding the body portion and means for attachment of the border wires to the body portion to form a part of the edge construction, continuous edge supports as claimed in claim **1** disposed between the vertically spaced apart border wires and means for securing the upper arms to the upper border wires and the lower arms to the lower border wires to incorporate the edge support into the edge construction of the spring assembly.

5. A spring assembly as claimed in claim 4 in which the means for attachment of the arms to the respective portions of the border wires comprises helical tie wires encircling the border wires and the adjacent arms of the spring members.

6. A spring assembly as claimed in claim 5 in which the edge support is of a unitary construction which extends substantially throughout the length of the spring assembly between the border wires.

References Cited

UNITED STATES PATENTS

2,703,414	3/1955	Bank	5—253
2,826,768	3/1958	Drews	5—351
2,978,714	4/1961	Bechik	5—351

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