June 30, 1970 T. N. PATTON 3,517,398

INNERSPRING UNIT CONSTRUCTION

Filed May 20, 1968

Fig. 1

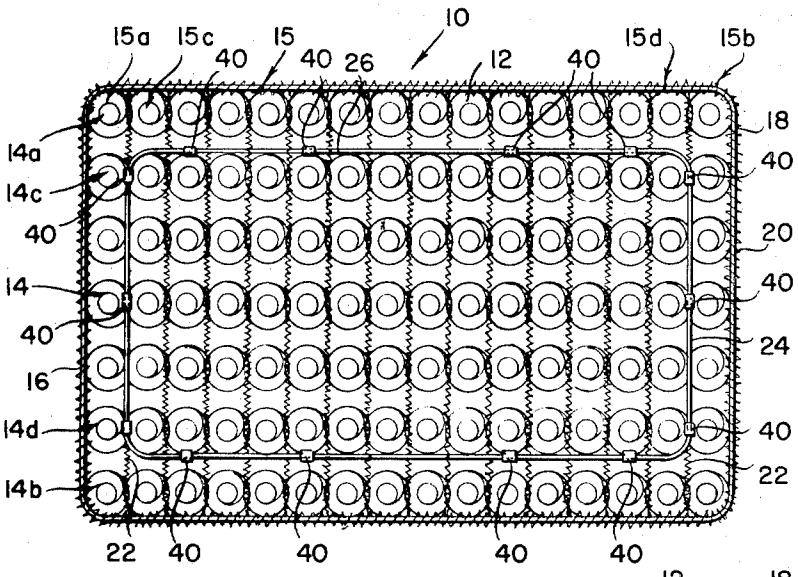
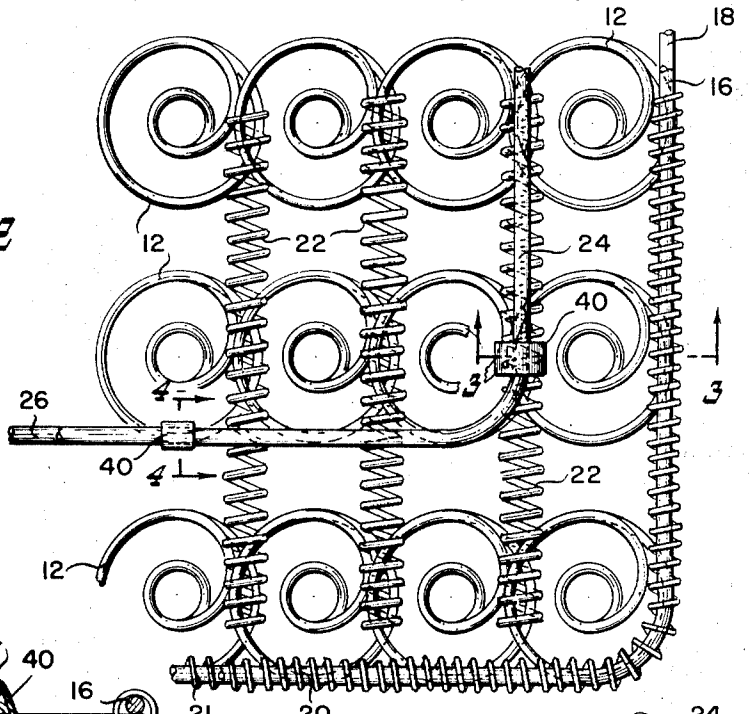


Fig. 2



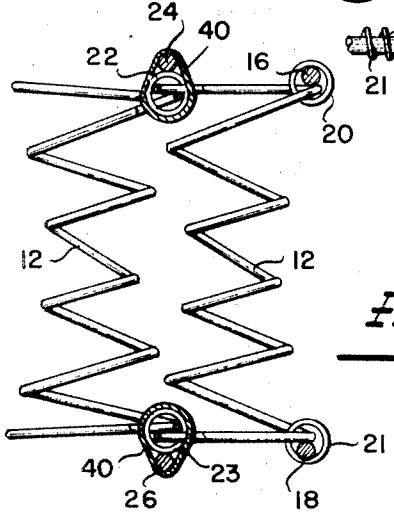


Fig. 3

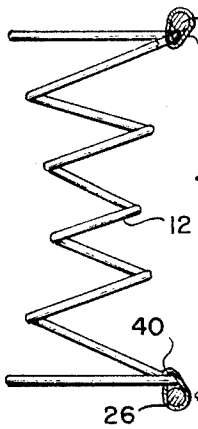


Fig. 4

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INNERSPRING UNIT CONSTRUCTION

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U.S. Cl. 5—351 5 Claims

ABSTRACT OF THE DISCLOSURE

In an innerspring unit of the Bonnell type, the improvement which essentially consists of top and bottom inner border members disposed inwardly of the outer border members, with each inner border member having side edge portions extending along and connected to the outer edges of coil springs in each of two penultimate columns which are laterally separated by a plurality of columns and each inner border member having end edge portions extending along and connected both to the inner edges of coil springs in each of two terminal rows and to the outer edges of coil springs in each of two penultimate rows, which penultimate rows are longitudinally separated by a plurality of rows.

BACKGROUND OF THE INVENTION

Field of the invention

The present invention relates to an improved innerspring unit and, more particularly, the invention relates to an improved innerspring unit of the Bonnell type.

By way of background, about 75 percent of all innerspring units today on the market are of the Bonnell type. The fundamental Bonnell type unit is more fully described in U.S. Pat. No. 405,821 to Bonnell et al., the disclosure of which is hereby expressly incorporated by reference. It is to be noted, moreover, that while the spring unit of U.S. Pat. No. 405,821 is a bed spring assembly, as opposed to an innerspring unit, the aforesaid innerspring unit of the Bonnell type which accounts for about 75 percent of the market consists of the bed spring of such patent provided with edge reinforcing outer border wires which extend around the perimeters of both the upper and lower edges of the basic unit, thus effecting the transformation from bed spring to innerspring.

Such innerspring units of the Bonnell type are characterized by ease of assembly and economy of manufacture. They also generally provide very comfortable weight distribution and support for a person resting thereupon, and are quite stable due to the cross-helicals comprising the same. Further, no specialized machinery is required for their manufacture and clips or like means are not even required in or for their assembly.

Furthermore, the resiliency of these innerspring units of the Bonnell type can be conveniently altered simply by changing the gauge of the wire defining the coil elements thereof, or the number of coils themselves can be varied up to a commercial maximum of about 405 per unit.

Nevertheless, and in spite of the attractiveness of the conventional innerspring unit of the Bonnell type, there still exists a need for an innerspring unit exhibiting all of the advantages of the conventional, while at the same time providing an improved edge construction and further serving to distribute load considerably more evenly over the entire unit, both lengthwise and crosswise. A further desideratum is the elimination of contraction and/or expansion of the unit during use and upon passage of time.

Description of the prior art

Therefore, it logically follows that a recognized problem in this art is that of providing an innerspring unit having an improved edge construction, a more uniformly reinforced resilient supporting surface and which will afford a higher degree of resilient load distributing support over the entire assembly.

Steps toward the solution of this problem have been taken. U.S. Pat. No. 3,242,505 to Tyhanic suggests a spring unit having improved characteristics of weight distribution and edge stabilization by providing the standard Bonnell innerspring unit with top and bottom inner border members, preferably in the form of relatively flat bands, these being disposed inwardly of the outer border members. According to Tyhanic each inner border member has side edge portions extending along and connected to coil springs in each of two columns only which are laterally separated by a plurality of columns. It is a sine qua non according to Tyhanic, however, that the end portions of each inner border member *not* be connected to the coil springs; but rather that these end portions be free to move longitudinally relative to the coil springs or be permitted to "float" longitudinally thereupon. The patentee also requires, between the side edge portions of his inner border members, a plurality of suitably affixed intermediate connecting elements which interconnect the end portions of the inner border members; and standard helicals are set forth as suitable connectors for the side edges of each inner border member to the inner edges of the coil springs in the preferably terminal longitudinal columns.

Thus, again according to Tyhanic, it is the plurality of preferably flat connecting bands that tend to distribute any applied force over the top of the coil springs and longitudinally along the column or columns of coil springs, while, at the same time, it is the free longitudinal floating action of the ends of the inner border members which permits the distribution of weight to be effected over the surface of the spring unit without tending to pull the outer border members inwardly to distort the same.

Also representative of the state of the art is U.S. Pat. No. 3,327,331 to Simon which follows in like vein and with the same avowed purposes. This patentee likewise provides the standard Bonnell innerspring unit with top and bottom flat band reinforcing members, but in this instance such reinforcing members assume the form and position of polygonal reinforcing members disposed exteriorly adjacent the border frames in top and bottom support planes respectively. Each polygon has a pair of longitudinally extending rectilinear side portions, a pair of integral transversely extending end portions and four integral rectilinear connecting portions which extend diagonally and interconnect the side portions and end portions of the reinforcing member. Interconnection throughout the entire assembly is preferably by means of helical tie wires. According to Simon, it is the direct coaction, load-wise, of the border frames with the polygonal reinforcing bands, together with the effect upon the coil springs spanned by the diagonal parts of said polygonal reinforcing bands, which serves to give rise to more uniform load distribution.

SUMMARY OF THE INVENTION

Accordingly, a principal object of this invention is that of providing an improved innerspring unit of the Bonnell type having improved characteristics of weight distribution and edge stabilization, without concomitant disadvantages hitherto known in the art as complexity of structure and geometry, extraneous interconnecting elements, relatively exotic connections or lack of connections, and diverse working principles.

Another object is that of providing just such an improved innerspring unit exhibiting all of the advantages of the conventional, while at the same time providing an improved edge construction, insofar as stiffness and resiliency are concerned.

Still another object is that of providing an improved innerspring unit which serves to distribute load more evenly over, or give substantial support for the entire assembly.

Yet another object is that of providing an improved innerspring unit less susceptible to contraction and/or expansion over its service life.

Additional objects will appear hereinafter.

In accordance with this invention, the innerspring unit of the Bonnell type comprises a plurality of coil springs arranged in parallel longitudinal columns and transversely aligned parallel rows. Top and bottom outer border members extend along and are connected to the outer edges of the coil springs in the terminal columns thereof and to the outer edges of the coil springs at the ends of the intermediate columns thereof. Thus, these outer border members extend peripherally about the coil springs at the top and bottom of the construction. Top and bottom inner border members are also provided, these being disposed inwardly of the outer border members. Each inner order member has side edge portions extending along and connected to the outer edges of coil springs in each of two penultimate columns which are laterally separated by a plurality of columns. Each inner border member also has end edge portions extending along and connected both to the inner edges of coil springs in each of two terminal rows and to the outer edges of coil springs in each of two penultimate rows, which penultimate rows are longitudinally separated by a plurality of rows.

The present invention thus features an improved innerspring unit of the Bonnell type, the inner border members of which themselves provide an improved edge construction, insofar as resiliency and stiffness are concerned, and such construction renders it unnecessary to make use of adjunctive means for resiliency and support.

The hereinbefore mentioned and other features and objects of the present invention and the manner of attaining the same will become more apparent and the invention itself will be best understood by reference to the following description of several embodiments of the invention taken in conjunction with the accompanying several figures of the drawing, which figures illustrate the best mode presently contemplated for carrying out the objects of the invention and its principles, and are not to be construed as restrictions or limitations on its scope or as in any way precluding the substitution of one non-critical equivalent member for another, and further wherein like reference numerals are used to indicate like or equivalent parts.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a top plan view of an innerspring unit of the Bonnell type embodying the features of this invention;

FIG. 2 is a fragmentary top plan view of an innerpring unit of the Bonnell type embodying the features of this invention, illustrating in enlarged detail the structure of FIG. 1;

FIG. 3 is a sectional view taken substantially along the line 3—3 of FIG. 2; and

FIG. 4 is a sectional view taken substantially along line 4—4 of FIG. 2.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

In FIG. 1, the innerspring unit **10** which is the Bonnell type comprises a plurality of coil springs **12**. Each coil is preferably hourglass shaped, 5¼ to 5½ inches high and has five or six convolutions to the coil. These coil springs are arranged in standard Bonnell construction in a plurality of longitudinally extending columns **14** which are laterally spaced apart, and are preferably constructed of 14, 13½ or 13 gauge high carbon steel. The coil springs are also aligned in lateral or transverse rows **15**. While it is preferred that the longitudinal columns of coils be laterally spaced as illustrated, it will be appreciated that the invention will also have application to a standard Bonnell construction wherein the coil springs are not laterally spaced but are laterally juxtaposed.

Top and bottom outer border members **16** and **18**, respectively, extend along and are connected to the outer edges of the coil springs in the terminal or outermost columns **14***a* and **14***b* and to the outer edges of the coil springs in the terminal or outermost rows **15***a* and **15***b*.

The outer border members **16** and **18** are preferably constructed of round wire that is of substantially heavier gauge than the wire of the coil spring **12**, for example, the outer border members **16** and **18** are preferably constructed of 9 gauge tempered spring steel, high carbon wire. The outer border members are connected to the outer edges of the coil springs in the terminal columns and rows by means of standard helical or pig-tail wire connections or ties **20** and **21** (see FIG. 3), the wire used in these connections or ties being generally of lighter gauge than the wire of the coil springs **12**, preferably 17 or 17½ gauge premier steel wire. These helical connections or ties **20** and **21** run at right angles to the axis of the unit to prevent slippage.

A plurality of helical or pig-tail wire connections or ties **22** and **23** (see FIG. 3) also extend transversely across the unit at the top and bottom thereof, respectively, and connect the adjacent transverse rows **15** of coil springs together, as well as tying the longitudinal columns **14** together. These laterally extending helicals **22** and **23** thus tie the unit together both longitudinally and transversely (see FIG. 2) and likewise are preferably constructed of 17 or 17½ gauge premier steel wire.

Stated differently, the innerspring unit 10—minus the outer border members **16** and **18**, the inner border member members **24** and **26** (discussed infra) and clips **40** (also discussed infra)—would be tantamount to the bed spring assembly of U.S. Pat. No. 405,821 to Bonnell et al.

The top and bottom inner border members **24** and **26** according to the invention are about two coil spring diameters shorter in length and two coil spring diameters narrower in width than the outer border members **16** and **18**. The side edges of each inner border member extend along and are connected to the outer edges of the coil springs in the penultimate longitudinal columns **14***c* and **14***d*, the connection being by standard wraparound or encircling clips **40**, such as Paslode #91399–SX–1 clips (illustrated, for example, in U.S. Pat. No. 3,324,485) or equivalents thereof (see FIG. 4). The end portions of these inner border members extend along the inner edges of the coil springs in the terminal rows **15***a* and **15***b* and the outer edges of the coil springs in the penultimate rows **15***c* and **15***d* thereof, with connection thereto, as well as to helical ties **22** and **23**, likewise being by standard wraparound or encircling clips **40**, such as Paslode #91399–SX–1 clips or equivalents thereof (see FIGS. 2 and 3).

Thus, the inner border members are conveniently exteriorly adjacent attached with clips according to the invention both atop the uper surface of the basic Bonnell unit, as well as beneath the under surface thereof.

The inner border members, like the outer border members, are preferably constructed of round wire that is of substantially heavier gauge than the wire of the coil springs **12**, for example, said inner border members are preferably constructed of 9 gauge tempered spring steel, high carbon wire. Moreover, such inner border members are preferably secured to the basic Bonnell unit with clips, as aforesaid, with 5 clips per each longitudinal side edge and 3 clips per each transverse side edge.

Hence, it is apparent that the subject invention provides an improved innerspring unit of the Bonnell type which is characterized by ease and economy of manufacture and which is further characterized by an improved edge construction simpler by far than those hitherto known in the art, while at the same time serving at least equally as well, insofar as load distribution and elimination of contraction and/or expansion are concerned.

It is to be understood that the form of the invention herewith shown and described is to be taken as a preferred example of the same, and that various changes in the shape, size and arrangement of parts may be resorted to, without departing from the spirit of the invention or scope of the subjoined claims.

What is claimed is:

1. In an innerspring unit of the Bonnell type, having a plurality of spaced parallel columns of coil springs and top and bottom outer border members each extending along and connected to the outer edges of the coil springs in the terminal columns thereof and to the outer edges of the coil springs at the ends of the intermediate columns thereof, the improvement consisting essentially of top and bottom inner border members disposed inwardly of the outer border members, with each inner border member having side edge portions extending along and connected to the outer edges of coil springs in each of two penultimate columns which are laterally separated by a plurality of columns and each inner border member having end edge portions extending along and connected both to the inner edges of coil springs in each of two terminal rows and to the outer edges of coil springs in each of two penultimate rows, which penultimate rows are longitudinally separated by a plurality of rows and which end edge connections are such that the said end edge portions are unable to move longitudinally relative to the coil springs.

2. The innerspring unit of the Bonnell type as defined by claim 1, wherein each inner border member is constructed of round wire.

3. The innerspring unit of the Bonnell type as defined by claim 2, wherein the round wire is of substantially higher gauge than the wire of the coil springs.

4. The innerspring unit of the Bonnell type as defined by claim 3, wherein the connections of the inner border wires to the assembly are by wraparound clips.

5. In an innerspring unit of the Bonnell type, having a plurality of spaced parallel columns of coil springs and top and bottom outer border members each extending along and connected to the outer edges of the coil springs in the terminal columns thereof and to the outer edges of the coil springs at the ends of the intermediate columns thereof, the improvement consisting of top and bottom round wire inner border members disposed inwardly of the outer border members, with each inner border member having side edge portions extending along and connected to the outer edges of coil springs in each of two penultimate columns which are laterally separated by a plurality of columns and each inner border member having end edge portions extending along and connected both to the inner edges of coil springs in each of two penultimate rows, which penultimate rows are longitudinally separated by a plurality of rows and which end edge connections are such that the said end edge portions are unable to move longitudinally relative to the coil springs.

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CASMIR A. NUNBERG, Primary Examiner

U.S. Cl. X.R.

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