United States Patent

[11] **3,577,574**

[72] Inventors **Fred A. Ciampa; Angelo Serafini; Louis Mazzarella, Boston, Mass.**

[21] Appl. No. **788,893**
[22] Filed **Jan. 3, 1969**
[45] Patented **May 4, 1971**
[73] Assignee **Standard Box Spring Co. East Boston, Mass.**

[54] **SPRING ASSEMBLY FOR FURNITURE AND METHOD OF MANUFACTURE**
6 Claims, 6 Drawing Figs.

[52] **U.S. Cl.** **5/267,** 5/276, 5/273, 140/3
[51] **Int. Cl.** **A61j 19/00**
[50] **Field of Search** ..... 5/265-—267, 248, 276, 273; 267/91, 100; 140/3, 1

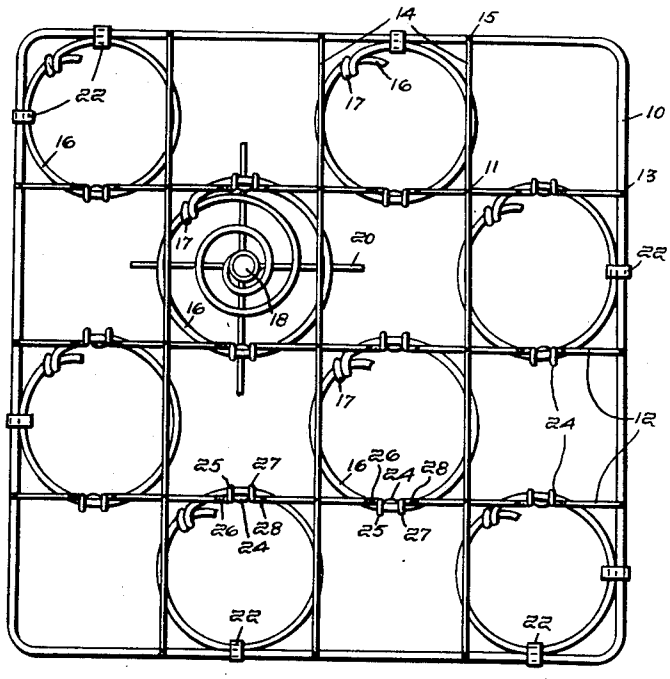
[56] **References Cited**

UNITED STATES PATENTS

1,854,503 4/1932 Dietrich 5/273
3,205,513 9/1965 Levine 5/267

Primary Examiner—Francis K. Zugel
Assistant Examiner—James C. Nutcielle
Attorney—Rich & Ericson

ABSTRACT: A spring assembly for bed springs or other furniture is prepared from wires having a series of longitudinally spaced return bends. Two groups of wires are welded in right angular relation to form a planar wire mesh. The return bends are located in at least one group of the wires, and form pairs of channels which are open in a direction normal to the plane of the mesh. The mesh is inverted with the channels open upwardly, and a number of coil springs are positioned on it, with the upper convolution of a coil spring inserted into each pair of channels. The return bends are then bent over the convolutions to lock them to the mesh. The free ends of the springs of the resulting spring assembly are then attached to a frame in a conventional manner.



PATENTED MAY 4 1971

3,577,574

SHEET 1 OF 2

Fig. 1.

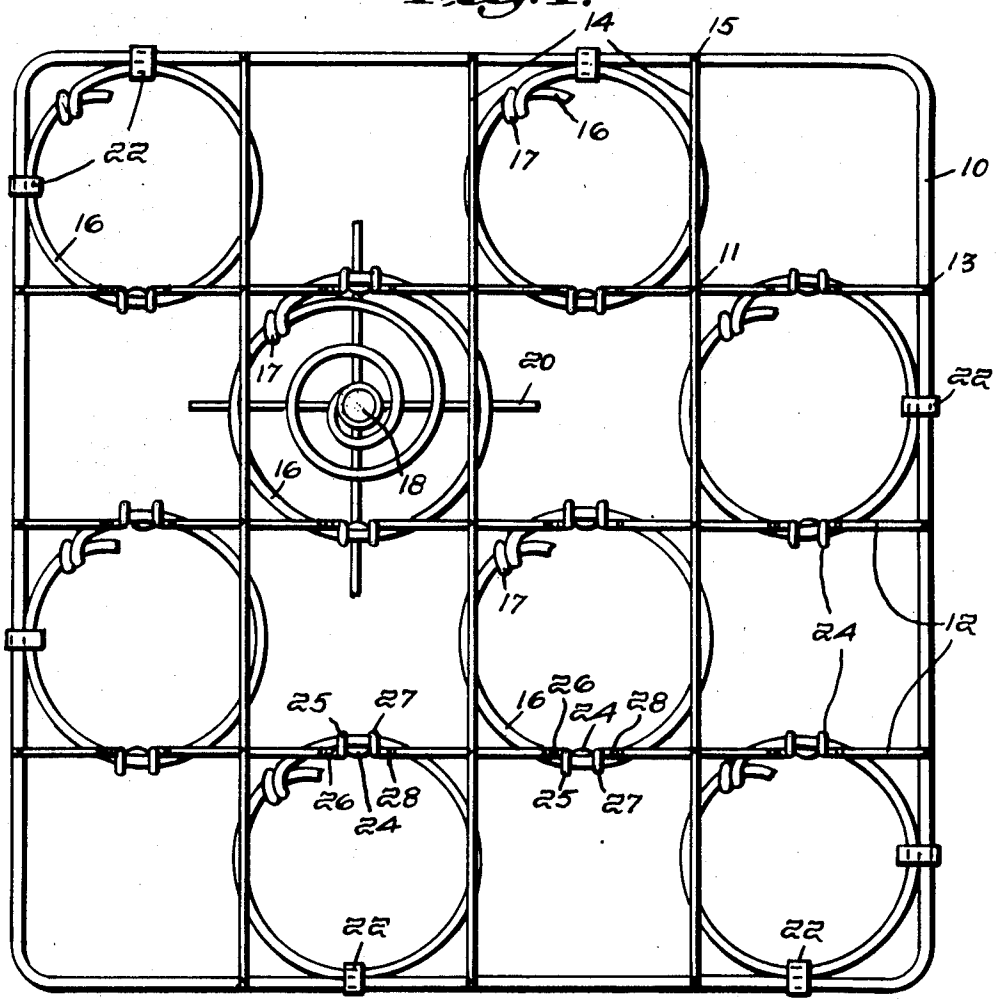
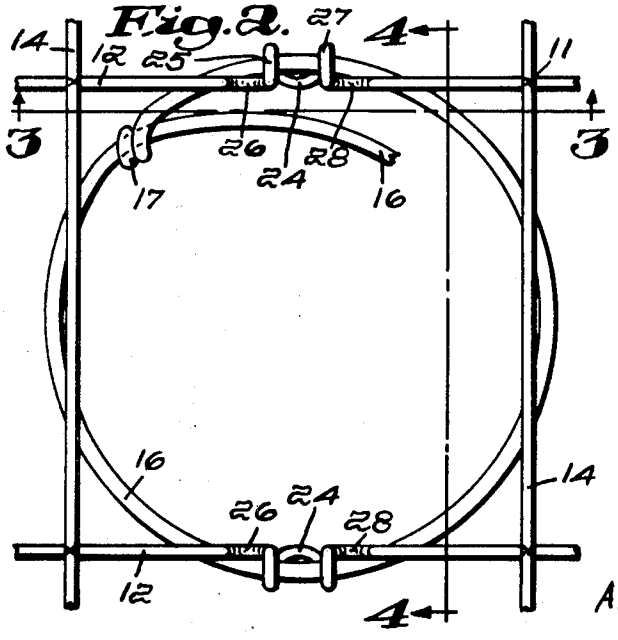


Fig. 2.



Inventors:
Fred A. Ciampa,
Angelo Serafini, Louis Mazzarella
by Thomson, Mroze & Ericson
Attorneys

Fig. 3.

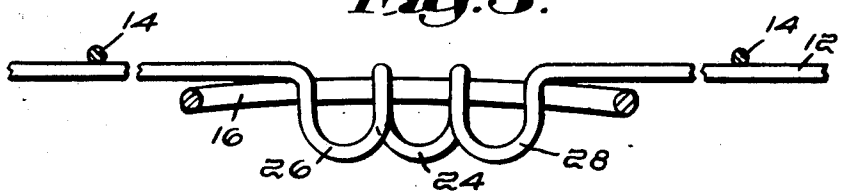


Fig. 4.

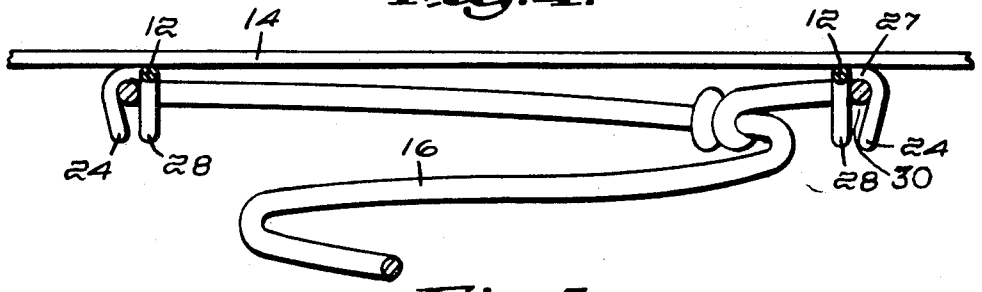


Fig. 5.

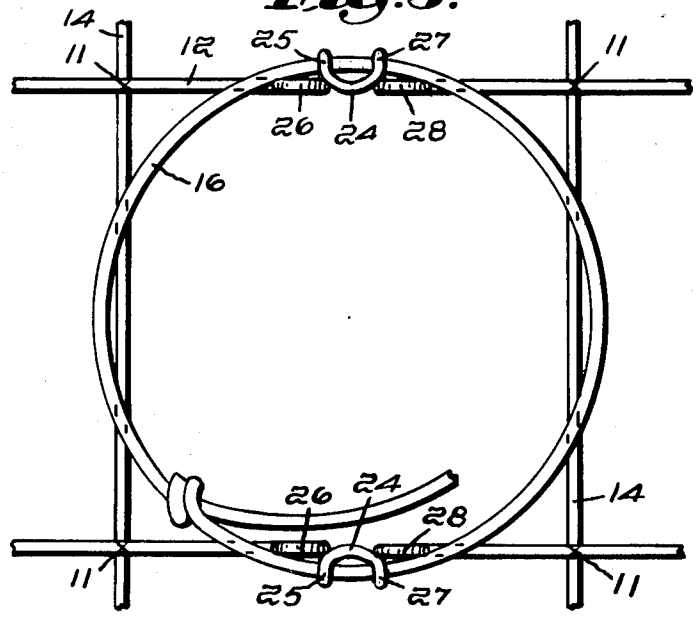
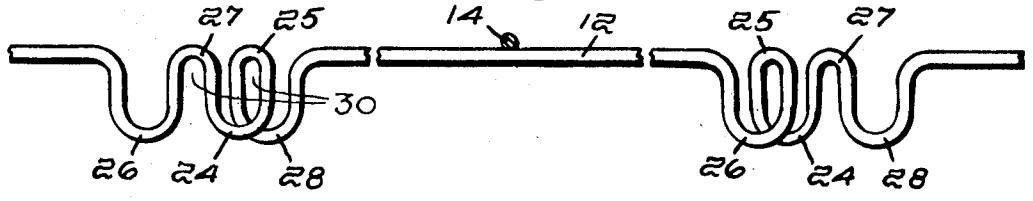


Fig. 6.



Inventors:
Fred A. Ciampa,
Angelo Serafini, Louis Mazzarella
by Thomson, Mrose & Ericson,
Attorneys

SPRING ASSEMBLY FOR FURNITURE AND METHOD OF MANUFACTURE

BACKGROUND AND BRIEF DESCRIPTION OF THE INVENTION

Conventional coil spring assemblies for furniture include interlocking wires formed with hooks or bends which must be individually attached to a series of coil springs. Their assembly requires skilled labor and a considerable amount of time.

It is the primary object of the present invention to provide an improved spring assembly and method of manufacture which substantially reduces the amount of labor required, and yet affords a secure structure in which the coil springs are firmly held against tipping or twisting. Further objects and advantages of the invention will appear as the following description proceeds.

Briefly stated, a preferred method of practice of my invention requires the formation of a series of return bends in longitudinally spaced relation in a group of wires which are later formed into a wire mesh. In a preferred form, each of these return bends consists of three separate bights which form an open channel for subsequent receipt of a convolution of a coil spring. The first and third bights of each return bend lie in a common plane, while the central bight is offset by transverse bends and lies substantially in a plane parallel to the common plane.

The wires having the return bends are arranged to form a parallel group which extends either transversely or longitudinally of the spring assembly. A second group of wires, which may also contain similar return bends or may be straight wires, are laid in parallel relation to one another at right angles to the first group. All of the return bends are oriented so that the channels which they form face in a common direction perpendicular to the plane in which the wires lie; that is, the planes of the bights are perpendicular to the common plane of the wires. The bends are spaced intermediate points of intersection of the two groups of wires. Additionally, a wire border frame which intersects the ends of all of the wires, and is normally rectangular in shape, is laid in the plane of the wires. The wires and frame are then joined into a unit, preferably by welding them together at all points of intersection.

In the completed wire mesh, pairs of return bends appear at opposite edges of at least some of the spaces defined within the intersecting wires. The spacing between each pair is made equal to the diameter of the uppermost convolution of a coil spring. The wire mesh is laid in an inverted position so that the channels are directed upwardly. The next step in the assembly is simply to place an appropriate number of coils in inverted position on the mesh, with an upper convolution received in a pair of the channels, or in two opposite pairs of channels in the event that both groups of wires are provided with return bends.

The central bight of each bend is then upset or bent over the received spring convolution to close the channel and firmly clip the convolution between the bights of that bend. The bights may be individually bent by means of pliers, or a jig may be used to bend a number of these bights at the same time. The furniture spring assembly is completed in a conventional manner by the attachment of a frame, which is usually made of wood, to the free ends of all of the coil springs.

DESCRIPTION OF THE DRAWINGS

While the specification concludes with claims particularly pointing out the subject matter which I regard as my invention, it is believed that a clearer understanding may be gained from the following description of a preferred embodiment and mode of operation, referring to the accompanying drawings, in which:

FIG. 1 is a fragmentary plan view showing a spring construction according to the invention;

FIG. 2 is a fragmentary plan view showing a single coil spring of the assembly on an enlarged scale;

FIG. 3 is a sectional view taken along line 3–3 in FIG. 2, looking in the direction of the arrows;

FIG. 4 is a sectional view taken along line 4–4 in FIG. 2, looking in the direction of the arrows;

FIG. 5 is a fragmentary bottom plan view of the coil of FIG. 2; and

FIG. 6 is a perspective view showing the construction and configuration of the wire mesh prior to the attachment of coil springs thereto.

FIGS. 1—5 illustrate a completed spring assembly made according to a preferred mode of practice of the invention. The spring assembly comprises a first group of parallel wires 14 extending longitudinally, a second group of parallel wires 12 extending laterally, a rectangular wire border frame 10, a series of coil springs 16, and a group of bottom crimps or straps 20 which are used to attach the spring assembly at the bottom to a frame of wood.

The first step in the improved method involves the formation in at least the wires 12, and also in the wires 14 if so desired, of a series of return bends spaced longitudinally of each wire, as shown in perspective in FIG. 6. The bends preferably consist each of first and third bights 26 and 28 which lie in a common plane, transverse bends 25 and 27 which project laterally from the common plane, and a central bight 24 which initially extends in a plane substantially parallel to the common plane of the first and third bights. This configuration provides a channel 30 between the bight 24 and the bights 26, 28 of each bend. This channel is initially open in one direction parallel to the planes of the bights, i.e., downwardly in the plane of the paper in FIG. 6. Preferably the central bights 24 of alternate bends project from the common plane in opposite directions, as shown in FIGS. 6 and 1, for a reason which will become apparent hereinafter.

The wires 14 are first laid on a plane surface in parallel relation, and these are followed by the wires 12. The wires 12 are laid in parallel rows with the channels 30 of all of the bends facing in a common direction roughly perpendicular to the common plane of the wires, that is, with the bights projecting upwardly from this plane. The frame 10 is then laid over the array of wires, intersecting the ends of each wire as shown in FIG. 1. A complete wire mesh is formed by welding all of the intersections 11 between the two groups of wires, the intersections 13 between the wires 12 and frame 10, and the intersections 15 between the wires 14 and frame 10. The unitary wire mesh so formed rests on the assembly surface in an inverted position from that shown in FIG. 1, and all of the channels 30 project vertically upwardly. A series of coil springs 16 are then placed on the mesh, with the upper convolution of each coil being received in a pair of channels 30 formed on opposite edges of alternating ones of the rectangular spaces formed by the mesh. In the case of those spaces adjacent to the wire border 10, the coils seat in only a single return bend channel, as shown in FIG. 1; the convolutions are secured to the wire border by means of conventional clips 22. It is feasible to provide additional return bends in the wire border for securing the adjacent coils, but I prefer not to do this because the wire borders are normally made of heavier gauge wire. Furthermore, the border would not have a completely smooth outline if bent in this manner.

With all of the coils in place, the central bight 24 of each return bend is upset or bent over the received spring convolution, as best shown in FIGS. 4 and 5, thus locking the convolution in the channel and gripping it firmly between the bight 24 and the bights 26, 28. The bending may be done by means of pliers, one bend at a time, but may also be performed by a suitable jig operating on one complete wire or on all of the wires at one time.

To complete the spring assembly, a series of crimps or straps 20 are attached to the smaller protruding ends of the coil springs. For this purpose, I prefer to use discs 18 as described and claimed in U.S. Pat. No. 3,414,915, issued Dec. 10, 1968 to Ciampa et al. and entitled "Bottom Construction For Box Springs"; however, conventional attachment methods may be used. The crimps 20 are used to fasten the spring assembly to a conventional wooden frame.

My improved method and product avoid the need for complicated hand assembly procedures such as are involved in prior art constructions of which I am aware. The improved assembly is very sturdy since the return bends securely grip the coil springs, and prevent tipping over and twisting quite satisfactorily.

While I have illustrated and described a preferred embodiment of my invention by way of illustration, it will be readily apparent to those skilled in the art that various changes and modifications may be made without departing from the true spirit and scope of the invention, which I therefore intend to define in the appended claims without limitation to the details of the foregoing embodiment.

I claim:

1. A spring assembly for furniture comprising a wire mesh formed of a border frame and two groups of wires lying parallel to a common plane and intersecting one another, said wires being welded together at their intersections, the wires of each group being substantially parallel to one another, the wires of at least one of said groups being formed with a plurality of return bends each providing a channel open in a common direction normal to the same surface of said mesh, said border frame extending around the periphery of said mesh, intersecting the ends of both of said groups of wires, and being welded to said ends, and a plurality of coil springs, said return bends being arranged in pairs, each pair freely receiving an end convolution of one of said coil springs in the channels thereof, said return bends being bent to overly said convolutions to lock said coil springs to said mesh.

2. A spring assembly as recited in claim 1, in which each of said return bends comprises first and third bights and a second central bight between said first and third bights and offset transversely therefrom, said bights forming a channel therebetween of a width substantially equal to the thickness of an end convolution of one of said coil springs for receiving said convolution snugly therein, said central bight being upset to overly and clamp said convolution against said first and third bights in said channel.

3. A spring assembly as recited in claim 2, said first and third bights of each return bend extending in a plane normal to said common plane, and said central bight extending in parallel spaced relation to said normal plane.

4. The method of making a spring assembly for furniture which comprises the steps of: forming a plurality of return bends in longitudinally spaced relation in each of a first group of wires, each of said return bends providing a channel open in a direction transverse to the wire; forming a wire mesh by arranging said first group of wires in parallel spaced relation and arranging a group of second wires in parallel spaced relation and intersecting said first group of wires, said first and second groups of wires being arranged in a common plane, said wires being located so that said return bends are arranged in opposed pairs spaced apart a distance equal to the diameter of an end convolution of a preselected coil spring, said opposed pairs being spaced between said intersections, and said channels are open in a common direction normal to said common plane and facing one surface of said mesh; providing a wire border frame; welding said wires to one another at their points of intersection and welding ends of said wires to said border frame; inserting an end convolution of each of a plurality of coil springs into an opposed pair of said channels; and upsetting said return bends over said convolutions to close said channels and lock said springs to said wire mesh.

5. The method recited in claim 4, in which the step of forming each of said return bends is carried out by forming a first bight lying in a plane axial to the wire, a transverse bend extending away from said axial plane, a central bight offset from and substantially parallel to said first bight, a further transverse bend extending into said axial plane, and a third bight lying in said axial plane, said bights and bends being formed to provide said channel therebetween of a width substantially equal to the thickness of an end convolution of each of said coil springs to clamp said convolution tightly in said channel upon completion of said upsetting step.

6. The method of making a spring assembly for furniture which comprises the steps of: forming a first group of wires with longitudinally spaced return bends providing open channels; arranging said first group of wires in parallel relation, and arranging a second group of wires in parallel relation, with said groups lying in a common plane in mutually intersecting relation, and with said channels arranged in rows spaced between intersections of said wires and open in a common direction normal to said common plane; arranging a wire border frame about said groups of wires to lie in said common plane and engage end portions of both of said groups of wires; forming a unitary mesh by welding said wires to one another at points of intersection between said groups, and to said border frame at points of engagement therewith; inserting an end convolution of each of a plurality of coil springs into a pair of said channels lying in the same row and formed in adjacent wires of said first group; and upsetting said channels to lock said convolutions of said springs to said mesh.