United States Patent [19]

Slominski

[11] **3,715,766**

[45] **Feb. 13, 1973**

[54] **CONNECTOR AND STIFFENER MEMBER FOR INTERSECTING WIRES**

[75] Inventor: **Walter V. Slominski,** Lexington, Ky.

[73] Assignee: **Hoover Bell and Bearing Company,** Saline, Mich.

[22] Filed: **Sept. 18, 1970**

[21] Appl. No.: **73,299**

[52] **U.S. Cl.**.....**5/247,** 5/276

[51] **Int. Cl.**.....**A47c 23/02**

[58] **Field of Search** 5/247, 276; 267/91, 105

[56] **References Cited**

UNITED STATES PATENTS

3,487,480	1/1970	Slominski	5/247
742,117	10/1903	Hoefer	5/276

FOREIGN PATENTS OR APPLICATIONS

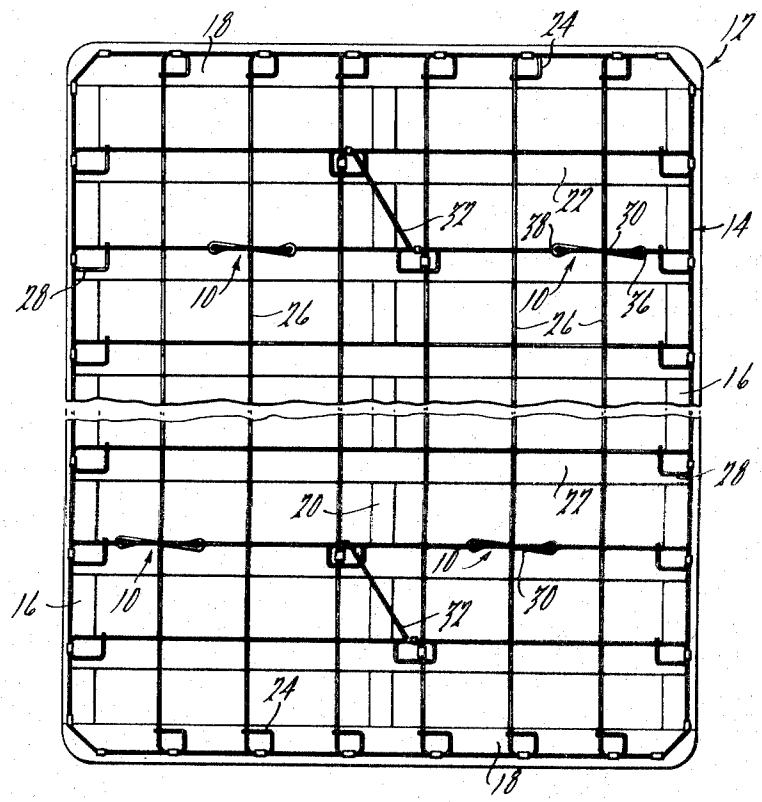
745,241	2/1956	Great Britain	5/276

Primary Examiner—Bobby R. Gay
Assistant Examiner—Andrew M. Calvert
Attorney—Olsen and Stephenson

[57] **ABSTRACT**

A connector and stiffener member for upper and lower intersecting wires consisting of a length of wire engaged intermediate its ends with the lower one of the intersecting wires substantially at the intersection of the upper and lower wires and having its ends hooked over the upper one of the intersecting wires at positions on opposite sides of the intersection. The connector and stiffener member is stressed so that the hook shape end portions apply downward forces to the upper one of the intersecting wires and an intermediate portion of the connector and stiffener member applies an upward force to the lower one of the intersecting wires at the intersection.

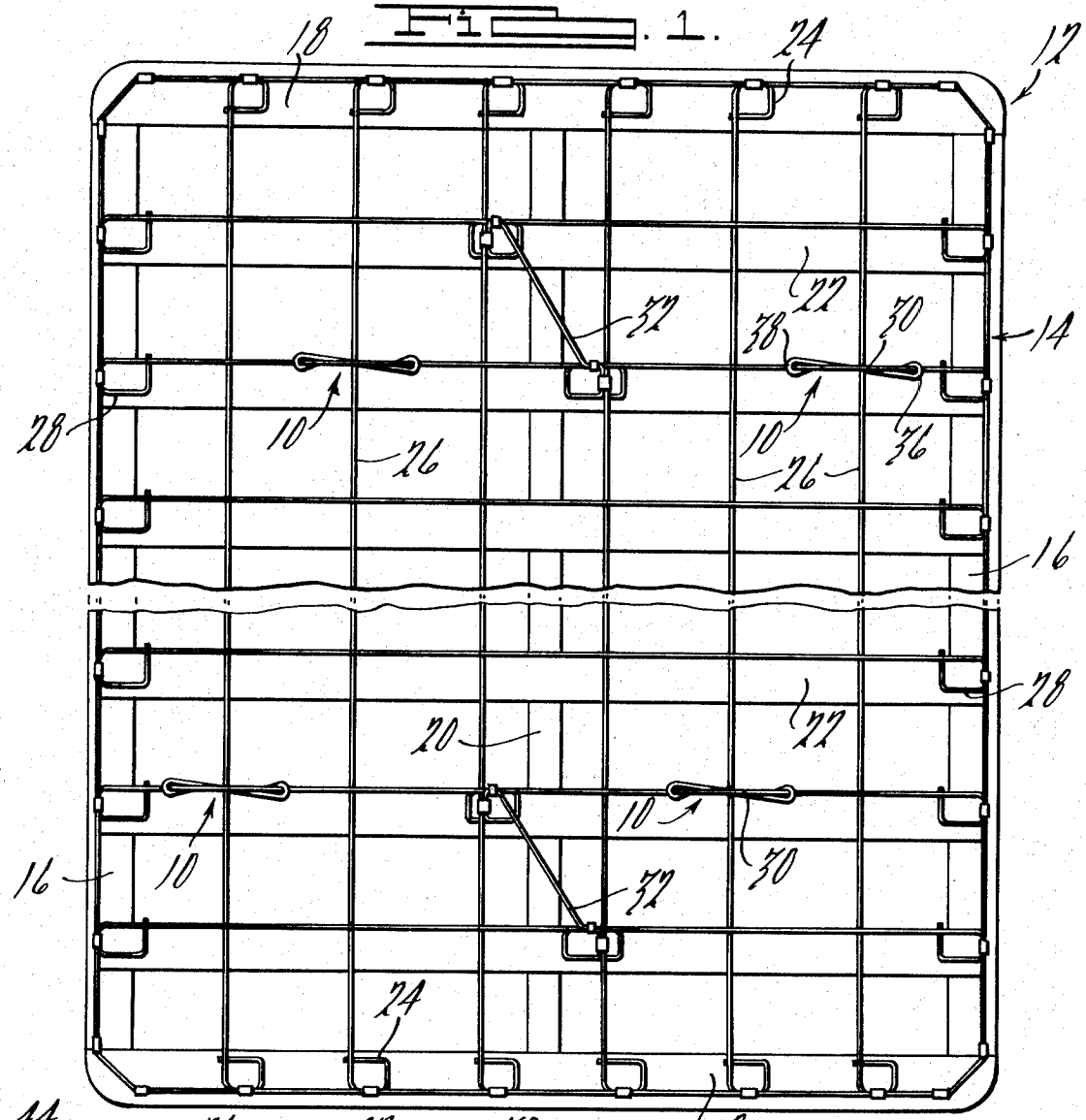
9 Claims, 4 Drawing Figures



PATENTED FEB 13 1973

3,715,766

Fig. 1.



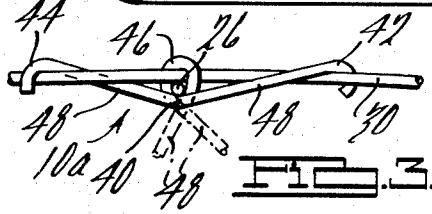


Fig. 3.

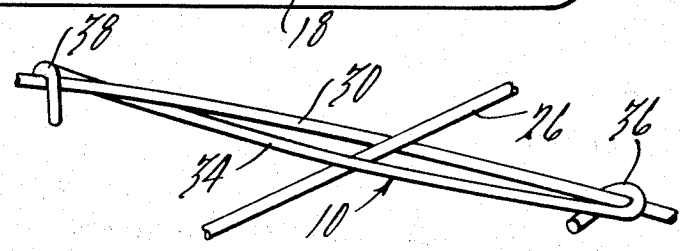


Fig. 2.

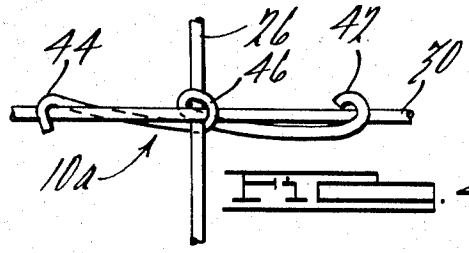


Fig. 4.

INVENTOR

Walter V. Slominski.

BY Olsen and Stephenson

ATTORNEYS

CONNECTOR AND STIFFENER MEMBER FOR INTERSECTING WIRES

BACKGROUND OF THE INVENTION

The connector and stiffener member of this invention is particularly adapted for use in box spring assemblies of the type illustrated in my earlier U.S. Pat. Nos. 3,286,281 and 3,487,480, although its use is not limited to this purpose. The box spring assemblies illustrated in the aforementioned patents include a frame and frame mounted main springs which have straight body portions arranged in a crisscross fashion at a position above the frame. This arrangement results in some of the main spring body portions being arranged in an intersecting relation with one body portion being above the other and with the lower body portion engaging the underside of the upper body portion. In instances wherein there is a substantial space between adjacent intersecting spring body portions, there is a tendency for the intersecting body portions to separate when the box spring assembly is subjected to load and this separation is discernible by the user, thus adversely affecting user comfort. It is an object of the present invention, therefore, to provide a connector and stiffener member which, when applied to intersecting main spring body portions, will prevent separation of the body portions during use and impart additional desired firmness to the body portions.

SUMMARY OF THE INVENTION

The connector and stiffener member of this invention consists of a length of wire having hook shape end portions which face in relatively opposite directions. When the member is applied to a pair of intersecting wires, an intermediate portion of the stiffener member engages the underside of the lower wire and the hook shape end portions are hooked from opposite sides over the upper wire. The stiffener member is originally stressed so that the hook shape end portions will apply downward forces to the upper wire and the intermediate portion will apply an upward force to the lower wire thus positively precluding separation of the wires and stiffening of the upper wire at the intersection of the wires. The stiffener member is preferably formed from a length of relatively stiff wire between the hook shape end portions. In one form of the invention the stiffener member when applied is of a generally concave shape between the hook shape end portions. In another form of the invention the stiffener member is return bent upon itself in between its ends and is looped over the intersecting wires at the intersection. In both forms of the invention, the connector and stiffener member positively prevents separation of the intersecting wires and imparts desired stiffness to the spring assembly at the intersection.

Further objects, features and advantages of this invention will become apparent from a consideration of the following description, the appended claims, and the accompanying drawing in which:

FIG. 1 is a foreshortened top view of a box spring assembly provided with a plurality of the connector and stiffener members of this invention;

FIG. 2 is an enlarged fragmentary perspective view of a portion of the spring assembly of FIG. 1 showing one of the connector and stiffener members therein in applied position;

FIG. 3 is a side view of a modified form of the connector and stiffener member of this invention shown in assembly relation with a pair of intersecting wires; and

FIG. 4 is a top view of the structure shown in FIG. 3.

With reference to the drawing, a plurality of connector and stiffener members of this invention, indicated generally at **10**, are illustrated in FIG. 1 installed in a box spring assembly **12** of the type illustrated and described in detail in the aforementioned patents. The box spring assembly **12** includes a rectangular frame **14** having side rails **16**, end rails **18**, a center reinforcing rail **20**, and slats or cross frame members **22** supported on the side rails **16**. The spring assembly **12** also includes a plurality of main springs **24** which extend longitudinally of the frame **14**, are supported on the end rails **18**, and have substantially straight body portions **26** arranged above the frame **14**. Similar main springs **28** extend transversely of the frame **14**, are supported on the side rails **16**, and have substantially straight body portions **30** disposed above the frame **14** and arranged in a crisscross relation with the body portions **26**. Internal support springs **32**, supported on the slats **22** and connected to the body portions **26** and **30**, support the body portions **26** and **30** in the internal area of the box spring assembly **12** between the rails **16** and **20**. The connector and stiffener members **10** of this invention enable the construction of a satisfactory box spring assembly **12** with a fewer number of the internal support springs **32** thus reducing the amount of wire required in the box spring assembly **12** with a corresponding reduction in the cost of the assembly **12**.

As shown in FIG. **2**, a connector and stiffener member **10** consists of a length of wire **34** formed at its ends with hook shape portions **36** and **38** and engaged intermediate its ends with the underside of the wire spring body portion **26** which is positioned below the wire spring body portion **30** in the illustrated embodiment of the invention. The length of wire **34** is initially straight so that when applied to the body portions **26** and **30** it is stressed so that it assumes an upwardly concave shape and exerts an upwardly directed force to the body portion **26** at its intersection with the body portion **30**. The hook shape end portions **36** and **38** extend up and over the body portion **30** from opposite sides of the body portion **30** to prevent the hook shape end portions **36** and **38** from rolling off the body portion **30** when the spring assembly **12** is subjected to a severe concentrated load in the area of the intersection of the body portions **26** and **30**. The hook shape end portions **36** and **38** apply downwardly directed forces to the body portion **30** to positively preclude separation of the body portions **26** and **30** when the spring assembly **12** is subjected to the usual downwardly directed loads. Furthermore, the stiffener member **10** imparts stiffness to the body portion **30** in the area of its intersection with the body portion **26** which is desirable from the standpoint of comfort of the user of the box spring assembly **12**.

A modified form of the connector and stiffener member of this invention, indicated generally at **10*a*** in FIGS. **3** and **4**, likewise consists of a length of wire **40** having oppositely facing hook shape end portions **42** and **44**. Intermediate its ends, the length of wire **40** has a return bent upon itself portion **46** which engages the underside of the body portion **26** and is looped up and

over the body portion **30** and then under the body portion **26**. The length of wire **40** is initially stressed so that the portions **48** thereof which extend in opposite directions from the loop portion **46** assume the downwardly inclined positions shown in broken lines in FIG. **3**. Thus, the hook shape end portions **42** and **44**, when moved to the applied positions shown in FIG. **3**, tend to return to their broken line positions and thus apply the desired downwardly directed forces to the body portion **30** which cooperate with the upwardly directed force applied to the body portion **26** at the intersection to maintain the body portions **26** and **30** against separation and stiffen the body portion **30**.

From the above description it is seen that this invention provides stiffener and connector members **10** and **10***a* for intersecting wires **26** and **30** which is economical to manufacture and is readily applied to the wires **26** and **30** so as to maintain them in fixed intersecting positions in which they cannot separate when subjected to load. In addition, the connector and stiffener members of this invention impart desired stiffness to the wires in the area of their intersection.

What is claimed is:

1. In a spring assembly which includes a frame and a plurality of wire springs mounted on said frame wherein said springs include substantially straight body portions arranged in an intersecting crisscross relation above said frame, means for preventing relative vertical movement of at least two of said crisscrossed wires at the intersection thereof, said means comprising a connector and stiffener member engaged intermediate the ends thereof with the lower one of said point of intersecting wires at the intersection of said wires, said stiffener member having end portions extending over the upper one of said intersecting wires at positions spaced from said intersection so as to apply downward forces to said upper one of said wires on opposite sides of said intersection and apply an upward force to the lower one of said wires at said point of intersection.

2. The structure according to claim **1** wherein said stiffener member is a wire member having hook shape end portions.

3. The structure according to claim **2** wherein said hook shape end portions extend from opposite sides over the top side of the upper one of said wires.

4. The structure according to claim **3** wherein said wire stiffener member is of an upwardly concave shape between said hook shape end portions and engages said lower wire substantially midway between said hook shape end portions.

5. The structure according to claim **3** wherein said wire stiffener member includes a return bent upon itself portion intermediate the ends thereof which extends under the lower one of said wires and over the top side of the upper one of said wires and wherein said wire stiffener member is initially stresses so that the end portions thereof are urged downwardly toward each other.

6. A wire stiffener and connector member for a pair of intersecting wires one of which constitutes an upper wire and the other one of which constitutes a lower wire disposed against the underside of the upper wire at the point of intersection of said wires, said stiffener and connector member comprising a length of wire engaged intermediate the ends thereof with the underside of said lower wire at said point of intersection and engaged with the top side of said upper wire at locations spaced from said intersection so as to apply downwardly directed forces to said upper wire and an upwardly directed force to said lower wire.

7. A wire stiffener and connector member according to claim **6** wherein said length of wire is formed at the ends thereof with generally hook shape portions which extend up and over said upper wire from relatively opposite sides thereof.

8. A wire stiffener and connector member according to claim **7** wherein said length of wire is of a generally upwardly concave shape between said hook shape portions and is engaged with said lower wire substantially midway between said hook shape portions.

9. A wire stiffener and connector member according to claim **7** wherein said length of wire includes a return bent upon itself portion intermediate the ends thereof which extends under the lower one of said wires at said intersection and over the top side of the upper one of said wire members at said intersection and wherein said length of wire is initially stresses so that said hook shape end portions are urged downwardly toward each other.

* * * * *

PO-1050
(5/69)

UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,715,766 Dated February 13, 1973

Inventor(s) Walter V. Slominski

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Col. 3, claim 1, line 32, cancel "point of"; line 33, before "intersection" insert -- point of --.

Col. 4, claim 5, line 12, "stresses" should be -- stressed --.

claim 9, line 42, "stresses" should be -- stressed --.

The Assignee's name on the first page of the patent should read --

-- Hoover Ball and Bearing Company --

Signed and sealed this 10th day of July 1973.

(SEAL)
Attest:

EDWARD M.FLETCHER,JR.
Attesting Officer

Rene Tegtmeyer
Acting Commissioner of Patents