United States Patent [19]
Slominski

[11] 3,755,833
[45] Sept. 4, 1973

[54] BOX SPRING FRAME

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[73] Assignees: Hoover Ball and Bearing Company, Saline, Mich.; Sealy, Incorporated, Chicago, Ill. ; part interest to each

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[21] Appl. No.: 208,292

[52] U.S. Cl. 5/247, 5/245
[51] Int. Cl. A47c 23/02
[58] Field of Search ..... 5/247, 260, 263, 5/264 R, 264 B, 245, 246; 267/100, 103, 107

[56] References Cited
UNITED STATES PATENTS

3,574,240 4/1971 Slominski 5/247
1,095,712 5/1914 D'Arcy ..... 5/264 R

Primary Examiner—James C. Mitchell
Attorney—Olsen & Stephenson

[57] ABSTRACT

A generally rectangular box spring frame consisting of wooden end and side rails and metal cross rails which are supported on the side rails and are particularly constructed in an inverted U-shape cross section so as to efficiently resist loads. The cross rails are assembled with the box springs that they support so as to enable use of some of the box springs in attaching the cross rails to the side rails.

7 Claims, 4 Drawing Figures

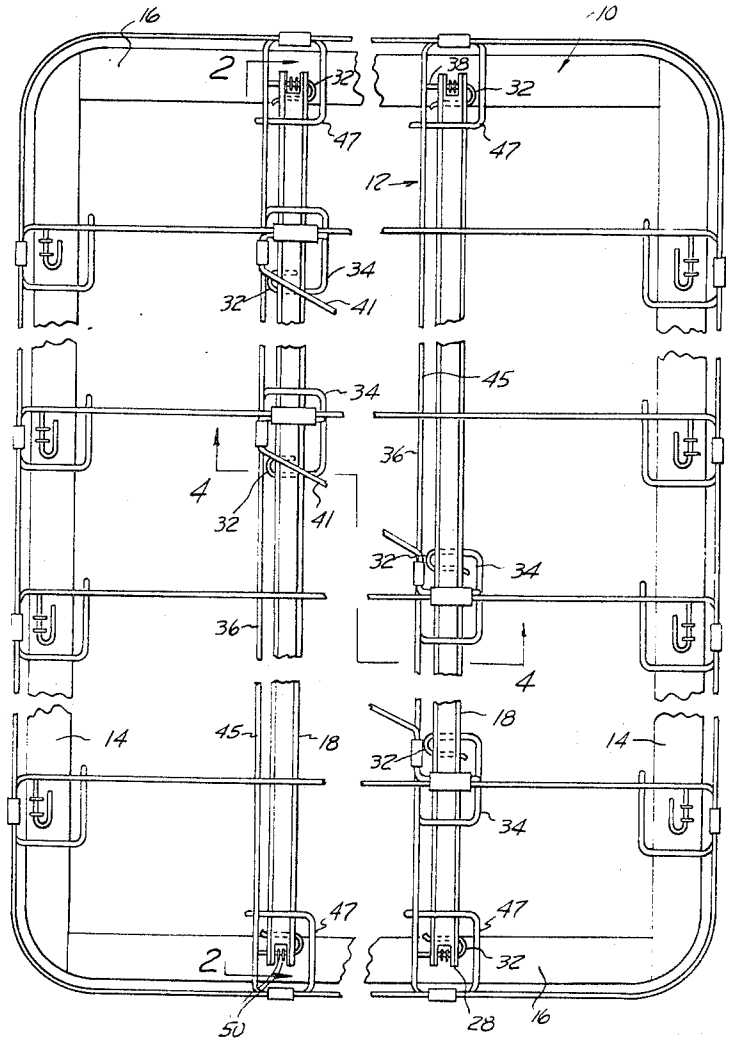
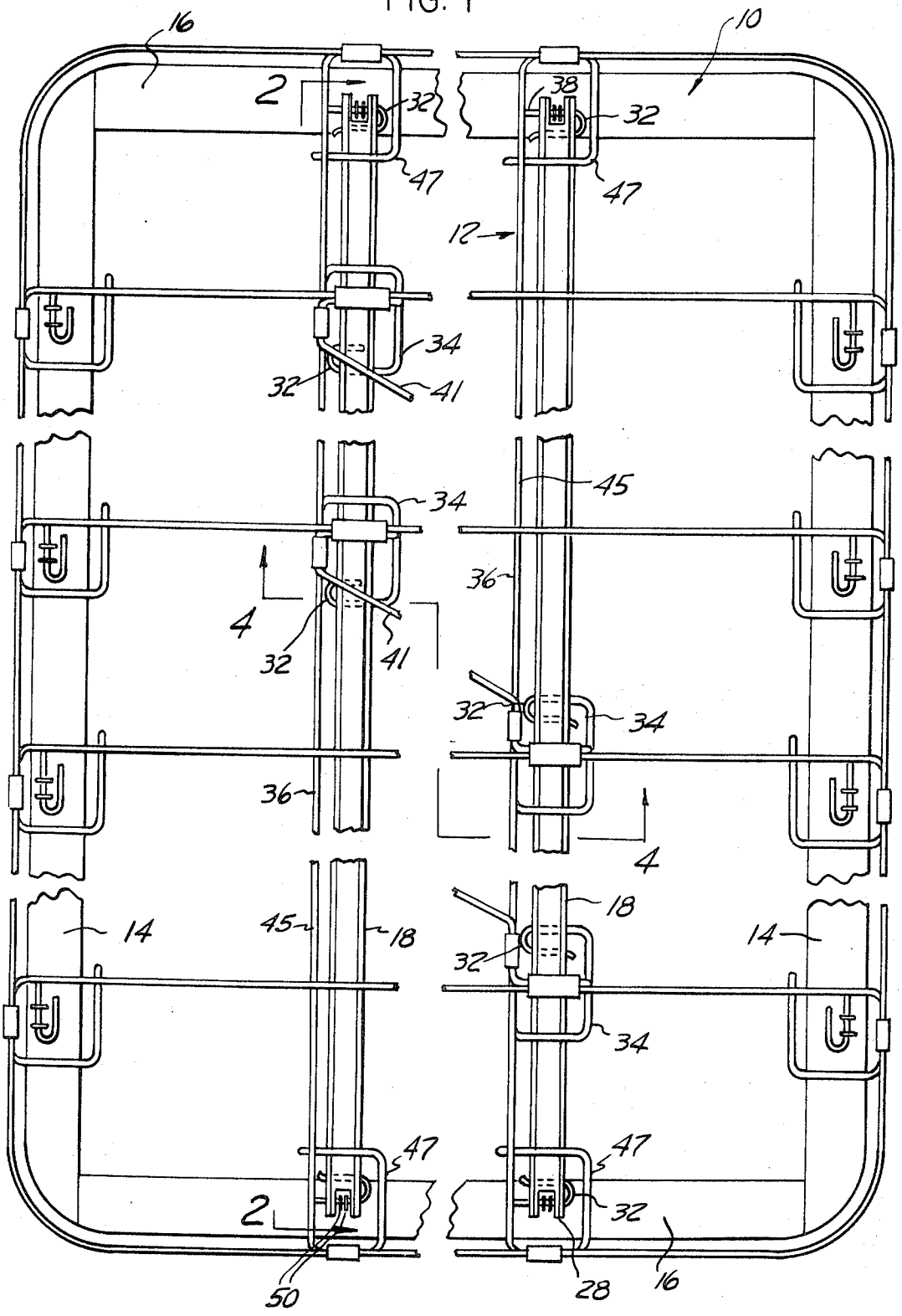


FIG. 1



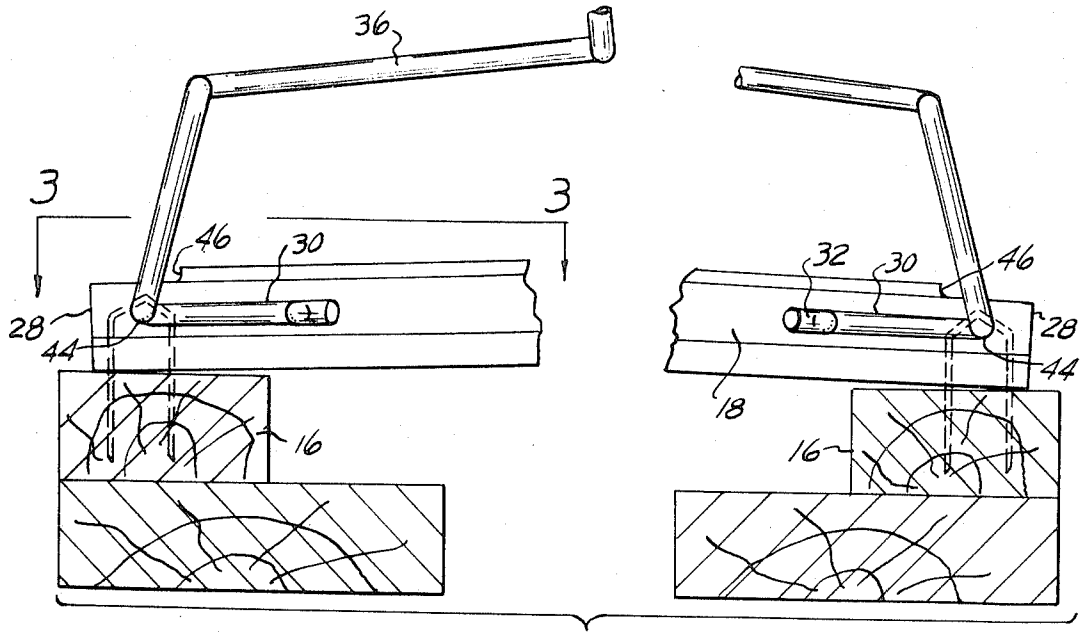


FIG. 2

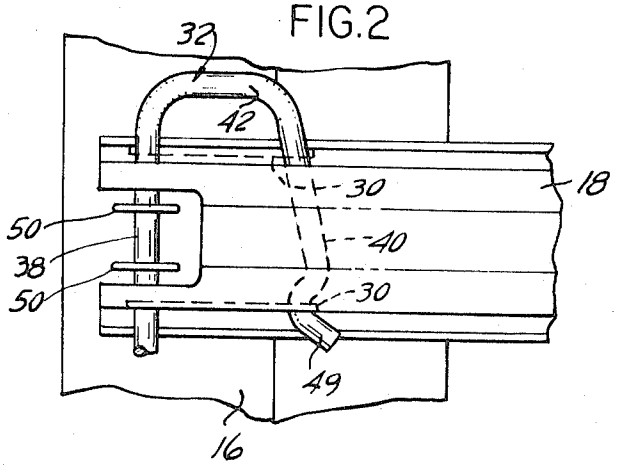
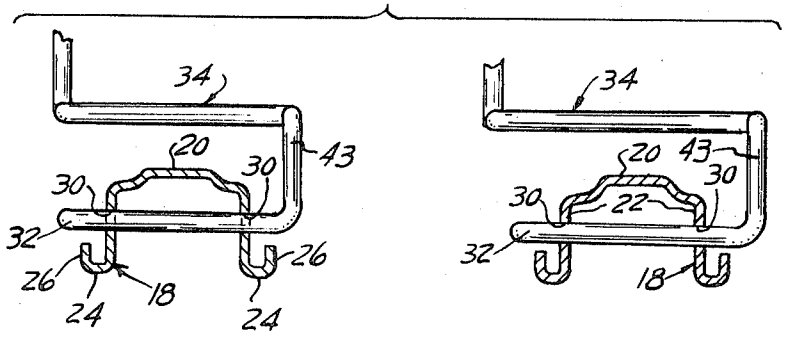


FIG. 3

FIG. 4



BOX SPRING FRAME

BACKGROUND OF THE INVENTION

Box spring and frame assemblies of the type shown in U.S. Pat. No. 3,574,241 are presently being used extensively. Such assemblies consist essentially of a plurality of connected springs of torsion bar type mounted on a rectangular wooden frame having side and end rails and wooden cross rails which are supported on and extend between the side rails. These spring and frame assemblies are entirely satisfactory but are subject to some objection on the ground of structural strength by virtue of the all wood construction of the frame. Wood is a non-uniform material and it is becoming increasingly difficult to obtain wood of the necessary quality. Accordingly, the principal object of this invention is to provide an improved frame for box spring and frame assemblies of the type shown in the aforementioned patent which employs cross rails formed of a rigid material such as metal.

SUMMARY OF THE INVENTION

The frame of this invention consists of the usual side and end rails that are formed of wood and are connected together so as to form the frame of a rectangular shape. Cross rails, formed of metal or similar rigid material, of substantially inverted U-shape, are supported at their ends on the side rails. Each cross rail has an upper generally horizontal base section and depending leg sections which are horizontally spaced and terminate at their lower ends in transversely extending flanges. The flanges provide substantial material in the lower ends of the rails to resist longitudinal lateral bending of the rails thereby enabling construction of the cross rails from a minimum thickness material.

The cross rails are also provided with slots arranged in horizontally aligned pairs, a plurality of such slots being provided in each cross rail. The purpose of the aligned pairs of slots is to enable easy assembly of the springs in the box spring assembly with the cross rails since the springs can then be readily snapped into supported positions in the slots. This assembly of rails and springs provides a product of improved quality relative to previous products which depended on operator care in stapling springs to wooden cross rails. The ends of the base section in each cross rail are cut away so that staples can be extended downwardly in positions straddling portions of the springs that are supported on the cross rail and into the side rails. As a result, in the frame of this invention, the springs also cooperate with the cross rails to enable easy mounting of the cross rails on the side rails.

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 plan view of a spring and frame assembly incorporating the novel concepts of this invention, with some parts broken away and removed for the purpose of clarity;

FIG. 2 is an enlarged foreshortened fragmentary sectional view of the spring and frame assembly of this invention as seen from the line 2—2 in FIG. 1;

FIG. 3 is a fragmentary view of a portion of the spring and frame assembly of this invention as seen from substantially the line 3—3 in FIG. 2; and

FIG. 4 is a fragmentary sectional view of another portion of the spring and frame assembly of this invention as seen from the line 4—4 in FIG. 1.

With reference to the drawing, the frame of this invention, indicated generally at 10, is shown in FIG. 1 in assembly relation with a spring assembly 12 of the type shown in the aforementioned U.S. Pat. No. 3,574,241. The frame 10 is generally rectangular and consists of a pair of end rails 14 which are connected by side rails 16. A plurality of cross rails 18, only two of which are shown in FIG. 1, are supported on and extend between the side rails 16. As shown in FIGS. 2 and 4, each cross rail 18 is generally of inverted U-shape in cross section having a top base section 20 and horizontally spaced depending leg sections 22. Each of the leg sections 22 terminates at its lower end in an outwardly extending generally horizontal flange 24 which has an upturned end section 26.

Since the cross rails 18 are subjected in use to downwardly extending generally vertical loads, each of the cross rails 18 is pre-stressed so that it is curved upwardly between its ends 28 that rest on the side rails 16. Intermediate its ends 28, each cross rail 18 is formed in its leg sections 22 with a plurality of slots 30, each of which extends longitudinally of the rail 18 between the upper and lower ends of the leg sections 22. The slots 30 are arranged in horizontally aligned pairs for supporting the attaching end portions 32 of the internal support springs 34 and the main springs 36 which constitute the major portion of the spring assembly 12 that is supported on the frame 10.

As shown in FIG. 3, the attaching end portion 32 of a spring consists of a horizontal torsion bar 38 and an integral foot 40 which is connected to the torsion bar 38 by a connection section 42 so as to form a generally U-shape attaching end portion 32. The foot 40 is stressed so that it tends to spring away from the torsion bar 38. As a result, when the attaching end portion 32 is inserted in a pair of aligned slots 30, the torsion bar 38 will be urged against the leg sections 22 at one end of the slots 30 and the foot 40 will be urged against the leg sections 22 at the opposite ends of the slots 30. The foot 40 terminates in a hook shape end section 49 which more or less straddles one of the leg sections 22 so as to preclude inadvertent or accidental dislodgment of a spring end portion 32 from a pair of slots 30. As shown in FIGS. 1 and 4, each of the internal support springs 34 has a body portion 41 and depending end portions 43 which are resilient, as is more particularly described in the aforementioned U.S. patent. The attaching end portions 32 extend from the end portions 43 in the same direction so that the spring 34 can be readily assembled by horizontal inserting movement with a pair of cross rails 18.

Each main spring 36 has a body portion 45 and depending end portions 47 which are resilient, as is more particularly described in the aforementioned U.S. patent. The end portions 47 terminate in attaching end sections 32 which are located in the slots 30 adjacent the ends 28 of the cross rails 18. As shown in FIG. 2, the outer end 44 of each end slot 30 is spaced a predetermined distance from the adjacent end 28 of the cross rail 18. The base section 20 of the cross rail 18 terminates at its ends 46 distances spaced from the adjacent cross rail ends 28 greater than the above-described predetermined distance. As a result, when a cross rail 18 is viewed from above, the torsion bars 38 at the ends

of the main spring **36** are visible in their supported positions on the cross rail **18.** This arrangement enables the application of staples **50** to the torsion bars **38** so as to secure the cross rails **18** to the side rails **16.** Each staple **50** straddles a torsion bar **38** and extends downwardly into the side rail **16** so as to apply a downwardly extending force to the cross rail **18** which will maintain it in assembly relation with the side rail **16.**

From the above description it is seen that this invention provides an improved box spring frame **10** utilizing metal or the like cross rails **18** which are constructed so that the flanges **24** are located in the lower edge of the cross rail **18** which is subject to the highest destructive stresses, namely, tensile stresses. Thus, the flanges **24** enable the cross rail **18** to be manufactured of a minimum gauge to resist loads without a permanent set. The manner in which the main springs **36** are assembled with the cross rails **18** enables the use of the springs in attaching the cross rails **18** to the side rails **16.** Without this cooperative relationship of the springs and the cross rails, attachment of the cross rails to the side rails would be difficult and involved by virtue of the shape of the cross rails. Thus, the cooperative arrangement of the side rails **16,** cross rails **18** and main springs **36** enables the construction of an improved box spring and frame assembly.

What is claimed is:

1. A generally rectangular frame for a box spring assembly which includes a plurality of connected wire springs that terminate in substantially horizontal attaching portions, said frame comprising side and end frame rails formed of wood and spaced spring supporting cross rails extending between said side rails, each of said cross rails being formed of a rigid material and being of a substantially inverted U-shape, each of said cross rails having upright leg sections which are horizontally spaced and have openings therein arranged in horizontally aligned pairs, said spring attaching portions on at least some of said springs being extended horizontally through pairs of said openings so as to mount said springs on said cross rails, the lower ends of said leg sections being positioned on the top sides of said side rails at the ends of said cross rails, one of said spring attaching portions being located adjacent the end of each cross rail at a position overlying a side rail, and connector means engaged with said one spring attaching portion and extending into the side rail therebelow so as to apply a downward force to the cross rail maintaining the cross rail in assembly relation with the side rail.

2. A frame for a box spring assembly according to claim **1** wherein said upright leg sections terminate at the lower ends thereof in transversely extending flanges to thereby provide substantial material in the lower ends of said rails to resist longitudinal bending of said rails.

3. A frame for a box spring assembly according to claim **2** wherein said flanges have upturned end portions.

4. A frame according to claim **3** wherein said flanges in each rail extend away from each other.

5. A frame according to claim **1** wherein said spring attaching portions are frictionally engaged with said leg sections.

6. A frame according to claim **1** wherein said connector means is a staple straddling said spring attaching portion.

7. A frame according to claim **1** wherein each of said cross rails has a pair of slots adjacent each end thereof and spaced therefrom a predetermined distance and a base section extending between said leg sections and terminating short of the ends of said cross rail distances greater than said predetermined distance.

* * * * *

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,755,833 Dated September 4, 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:

On the cover page, after "Inventor": add the name --

Edwin B. Watts, Lombard, Illinois ---.

Signed and sealed this 19th day of March 1974.

(SEAL)
Attest:

EDWARD M.FLETCHER,JR.
Attesting Officer

C. MARSHALL DANN
Commissioner of Patents