United States Patent

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[72] Inventors **Harmon W. Arnold;**
Lloyd E. Tieman, Carthage, Missouri

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[73] Assignee **Flex-O-Lators, Inc.**
Carthage, Missouri
a corporation of Missouri

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[54] **UPHOLSTERY DECK SUSPENDER**
5 Claims, 6 Drawing Figs.

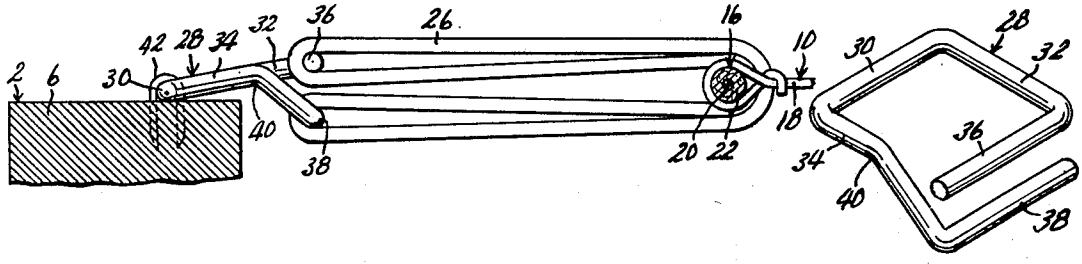
[52] **U.S. Cl.** **267/112**
[51] **Int. Cl.** **A47c 23/26**
[50] **Field of Search** 267/110, 111, 112, 142, 143, 144; 5/199, 233, 247; 24/265.3

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Primary Examiner—Arthur L. La Point
Attorney—John A. Hamilton

ABSTRACT: A suspender for mounting an upholstery deck having a generally planar upper surface in a rigid, open furniture frame, said deck having an at least partially unobstructed edge strand, said suspender comprising an endless band of elastic material flattened to form an elongated loop, said loop being adapted to be folded intermediate its ends about said deck edge strand with its ends projecting toward said frame, and a rigid hanger member adapted to be secured to said frame and including portions operable to be inserted transversely through said loop at the ends thereof.



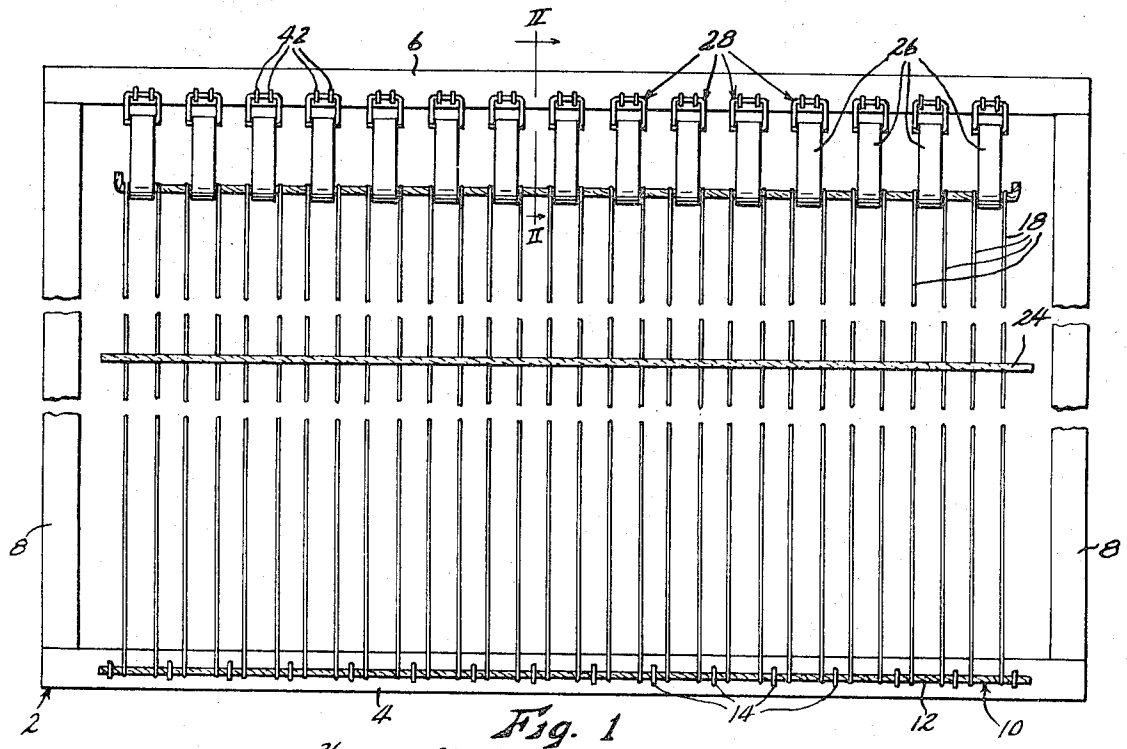


Fig. 1

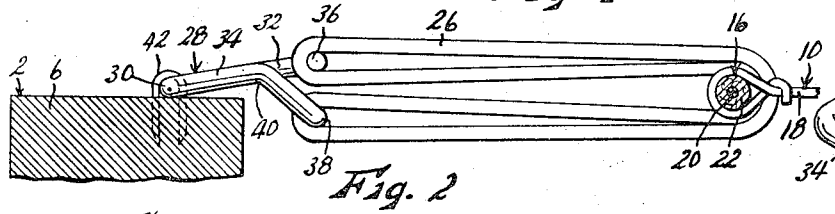


Fig. 2

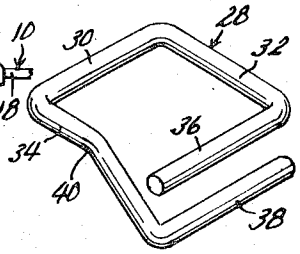


Fig. 3

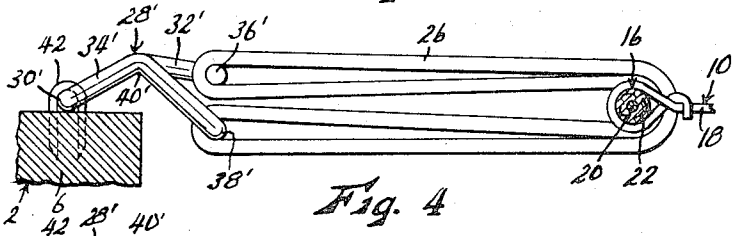


Fig. 4

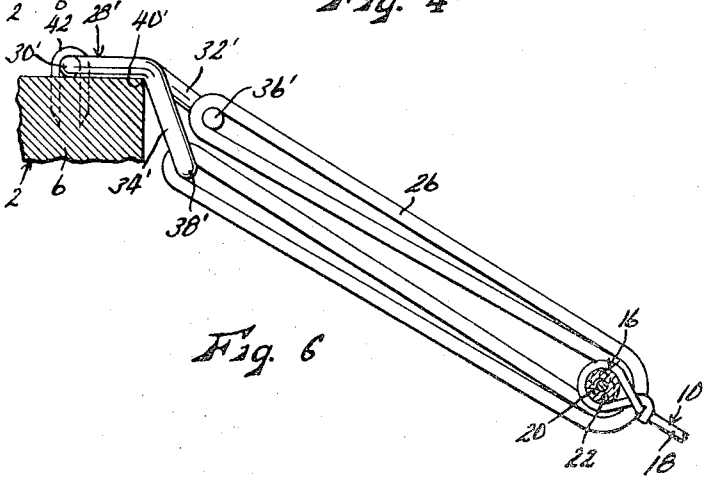


Fig. 6

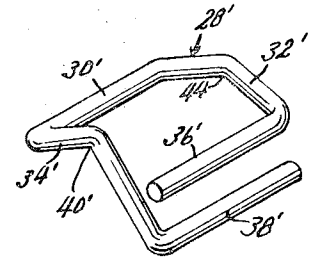


Fig. 5

INVENTORS.
Harmon W. Arnold
Lloyd E. Tieman
BY John A. Hamilton
Attorney.

UPHOLSTERY DECK SUSPENDER

SPECIFICATION

This invention relates to new and useful improvements in accessories for upholstered furniture, and has particular reference to devices for mounting or suspending generally planar spring deck members in furniture frames. Such decks comprise the support over which the padding and upholstery layers of the furniture are applied, and simple, thin, planar decks, resiliently supported in the frame at their edges, have come into wide usage in recent years, in preference to deep spring assemblies including coil springs and the like, as a result of the popularity of so-called "modern" thin-line furniture the frames of which do not provide sufficient depth for the mounting and concealment of deep spring assemblies. However, the yieldable edge suspension of these planar decks has presented certain persistent problems in the trade, such as the facts that the suspension means has often been unduly complicated, expensive, difficult or tedious to install, and that they often, to provide the desired "depth and "softness" softness of yieldability, require the deck edge to be so far from the frame that the suspenders themselves must serve as supports for the padding and upholstery layers, and are under these circumstances inadequate for support or even injurious to said overlying layers. Helical steel springs are perhaps most commonly employed as suspenders, but these are expensive, and also they tend to pinch, tear and otherwise damage overlying layers of padding between their convolutions as the springs are alternately tensioned and released in use. Rubber suspenders have also been proposed, but have not been widely adopted partially because the aging properties of rubber render them short-lived. Synthetic rubbers or other synthetic elastic materials have largely solved the aging problem in that they maintain elasticity and strength over adequately long periods of time, but often must be so long to provide the desired softness and yieldability of the deck that they themselves must form a part of the load supporting area of the deck, which function they are not well adapted to perform. Another general shortcoming of rubber or synthetic rubber suspenders has been that they generally have required some type of metal connector or hanger at each end thereof for connection respectively with the frame and with the deck. Such hangers have often been so complicated and expensive as to add objectionably to the overall cost of the suspender. Also, not only do such hangers add to the overall length of the suspender requiring the spacing of the deck still farther from the frame to provide an elastic member of given length, but also are often so arranged that the elastic member is subjected to frictional or abrasive rubbing thereon as the deck is alternately deflected and released in usage. The points of rubbing or friction of the elastic members on the hangers are usually the first points to fail and break.

Accordingly, the principal object of the present invention is the provision of an upholstery deck suspender which largely overcomes all of the above enumerated problems, in that it is extremely simple and economical in construction, efficient and dependable in operation is very easily and conveniently installed, that it provides greater yieldability and "depth" to the deck, that it generally permits a closer spacing between the frame and the deck edge, and that it largely eliminates friction of the elastic against the hanger.

Generally, these results are obtained by, and the invention may be summarized as, the provision of an upholstery deck suspender comprising an endless band of elastic material flattened to form an elongated loop, said loop being adapted to be folded intermediate its ends around an edge strand of the deck with its ends projecting toward the frame, a rigid hanger member including a pair of spaced apart horizontal members adapted to be inserted respectively through the ends of said loop transversely to the general extent thereof, and means for attaching said hanger member to said frame for pivotal movement about a horizontal axis transverse to the general extent of the loop.

With these objects in view, as well as other objects which will appear in the course of the specification, reference will be had to the accompanying drawing, wherein:

FIG. 1 is a top plan view, partially broken away and foreshortened, of a furniture seat frame having a spring deck mounted therein by means of deck suspenders embodying the present invention;

FIG. 2 is an enlarged, fragmentary sectional view taken on line II–II of FIG. 1;

FIG. 3 is a perspective view of the hanger member utilized in FIGS. 1 and 2;

FIG. 4 is a view similar to FIG. 2, but showing a slightly modified hanger member;

FIG. 5 is a perspective view of the hanger member utilized in FIG. 4; and

FIG. 6 is a view similar to FIG. 4, but showing the position assumed by the parts when the deck is deflected downwardly in use.

Like reference numerals apply to similar parts throughout the several views, and the numeral 2 applies generally to a furniture seating frame, although it will be understood that the invention is equally adaptable for use on furniture backs. The frame may be of any suitable construction, so long as it is open and rigid. As shown, it consists of a front rail 4, back rail 6, and a pair of side rails 8, all rigidly joined together to form an open rectangle. Mounted in said frame, in substantially coplanar relation with the upper surface thereof, is a generally planar spring deck indicated generally by the numeral 10. The deck also may be of different constructions, but as shown consists of a front edge strand 12 overlying front frame rail 4 and secured thereto at intervals along its length by staples 14, a rear edge strand 16 parallel with front strand 12 and disposed somewhat forwardly of back frame rail 6, and a series of closely spaced parallel spring wires 18 extending between front and rear strands 12 and 16 and secured thereto as by having their end portions twisted about said strands as shown in FIG. 2. Also as shown in FIG. 2, the front and rear strands may each consist of a spring wire core 20 having a sheath 22 of twisted paper or the like disposed thereabout. The sheath 22 provides good purchase for wires 18, and prevents metal-to-metal rubbing or grating noises which otherwise would occur. Wires 18 may be secured in properly spaced relation throughout their lengths by providing one or more strands 24 of twisted paper intermediate and parallel to strands 12 and 16, wires 18 piercing said intermediate strands.

Rear edge strand 16 is connected at intervals along its length to rear frame rail 6 by a series of suspenders forming the subject matter of the present invention. Each suspender includes an endless band 26 of elastic material such as rubber or synthetic rubber, synthetics generally being preferable as they are subject to less loss of strength and elasticity by aging than natural rubber. Said band is flattened to form an elongated loop, and the flattened loop is folded double, intermediate its ends, about rear edge strand 16 of the deck, between contiguous pair of wires 18 of the deck, and the ends of the loop are extended toward rail 6.

The ends of the loop formed by each band 26 are connected to rail 6 by a hanger member designated generally by the numeral 28 and formed of a single length of heavy wire stock. As shown in FIGS. 1, 2 and 3, each hanger has a straight, central base portion 30, a pair of arm portions 32 and 34 extending generally at right angles from the respective ends of base portion 30, and a pair of terminal portions 36 and 38 parallel with base portion 30 and extending in respectively opposite directions from the free ends of arms 32 and 34 so as to be generally coextensive. Arm 32 is straight, while arm 34 is angled downwardly intermediate its ends, as at 40, so that terminal portion 38 is disposed in spaced apart relation beneath terminal portion 36.

Base portion 30 of each hanger 28 is secured to the top surface of back frame rail 6 for pivotal movement about its own axis, by any suitable means, such as by a pair of staples 42 driven into rail 6. The arms 32 and 34 of the hanger extend forwardly to overhang the forward edge of rail 6, angle 40 of

arm 34 being disposed at or forwardly of the forward edge of rail 6, and the axis of base portion 30 is arranged to be transverse to the general longitudinal extent of band 26, and the ends of the loop formed by band 26 are applied respectively over the terminal portions 36 and 38 of the hanger, as clearly shown, some tensioning and stretching of band 26 being required for this purpose. The padding and upholstery layers, not shown, are applied over deck 10, and also over the suspenders, in the usual manner, being secured at their edges to the frame rails.

The suspender as shown has several advantages of function and operation. First, it is quite simple, easy and convenient to install, staples 14 being driven into front rail 4 to secure edge strand 12 thereto, staples 42 being driven into back rail 6 to secure hangers 28 thereto, and finally bands 26 being folded about edge strand 16 and looped about terminal portions 36 and 38 of each hanger. There is no necessity that the bands be tensioned while the hangers are secured.

Second, bearing in mind that it is not generally desirable to have the suspenders extend into the main load-supporting area of the seat frame, and that for this reason it is desirable that the suspenders be as short as possible to position deck edge strand 16 as close to rail 6 as possible, it will be seen that the folding of band 26 to secure it to edge strand 16 of the deck completely eliminates any necessity of a special hanger, which would correspond to hanger 28, at the deck end of the suspender. Any such special hanger would necessarily extend at least some degree toward the frame, shortening the effective span of the elastic, and hence would require greater spacing between the deck edge and the frame. Thus the present arrangement permits still closer spacing between the deck and the frame.

Third, the single hanger 28 which actually is used in each suspender is adapted to be positioned principally directly above rail 6, it being necessary only that the terminal portions 36 and 38 thereof project forwardly of the rail. This permits the elastic band to extend almost all of the way to rail 6, to utilize fully the space between the frame and the deck. Any hanger which for example, required fastening to the forward face of rail 6, would substantially shorten the effective span of the elastic.

Fourth, bands 26 define, when installed as shown, a generally smooth, planar surface at their tops, which will not damage padding material applied thereover. Helical steel springs, most commonly used at the present time as deck suspenders, have a tendency to pinch, tear and otherwise damage overlying padding material between the convolutions thereof as the springs are alternately expanded and contracted in use.

Fifth, it will be seen in FIG. 2 that the tension of band 26 normally holds hanger member 28 in such a position that the portions of arms 32 and 34 thereof directly above rail 6 are angled upwardly from said rail. Thus when deck 10 is depressed by a load applied thereto, the hanger is pivoted downwardly by rotation of base portion 30 thereof in staples 42, until arms 32 and 34 directly abut the rail. This pivotal movement tends to prevent or reduce relative rubbing movement between band 26 and terminal portions 36 and 38 of the hanger which would otherwise occur as deck 10 is loaded, and hence tends to prevent or reduce frictional wearing of the elastic at these points. Such frictional wear is perhaps the commonest cause of failure of elastic suspenders.

Sixth, the suspender is extremely simple and economical to manufacture, as well as very easy to install by semiskilled workmen.

Seventh, the opposite extension of terminal portions 36 and 38 of the hanger renders it extremely unlikely that band 26 can work or "creep" off of the hanger by accident during usage.

Eighth, the suspender is readily adaptable for use at any or all edges of deck 10. While usage thereof only at the rearward edge of the deck has certain advantages, in that in this position they are often disposed directly beneath the lower edge of a seat back cushion and are hence shielded from direct vertical loading, it will be apparent that if the deck were somewhat narrower from front to rear, suspenders as shown could be used to connect front edge strand 12 of the deck to front frame rail 4, and that if sidemost wires 18 of the deck were properly supported, they could be connected to side rails 8 by suspenders as shown. Actually, with the deck constructed as shown and if side support thereof is desired, it is more practical simply to turn the deck 90° from the position shown, so that strands 12 and 16 are parallel side rails 8.

Ninth, the suspender as shown is readily adaptable for use with many types of decks other than that shown. The only properties of the deck pertinent to the present invention are that it be flexible transversely to its plane, and that it have edge strands about which bands 26 can be folded, at the edges thereof which are desired to be suspended from the frame. The edge strands need not be as shown. For example, many decks comprise simply a pattern of wire links pivoted together to form in effect a chain mesh. In this case, the "edge strand" may consist of a series of aligned but separate reaches of wire, each of which is still capable of having one of bands 26 folded thereabout.

FIGS. 4, 5, and 6 show a deck suspender identical with that of FIGS. 1—3 except that it utilizes a hanger member 28', said hanger member being generally identical with hanger 28 of FIGS. 1—3, corresponding parts being indicated by corresponding primed numerals, except that both of the arms 32' and 34' thereof are angled downwardly intermediate their ends rather than just a single arm as in hanger 28. The angle of arm 34' is indicated at 40', and the angle of arm 32' is indicated at 44. Angles 40' and 44 are inequal in order to preserve a vertical spacing between terminal portions 36' and 38'. The effect of this provision is that when band 26 is horizontally tensioned as in FIG. 4, the portions of arms 32' and 34' adjacent base portion 30' are angled still more sharply upwardly from rail 6 than is the case in FIG. 2. This permits the deck to be still further depressed, and hanger 28' to be pivoted still further downwardly, as shown in FIG. 6, before pivotal movement of the hanger is arrested by abutment with the rail. This is a still further insurance against frictional or abrasive rubbing between band 26 and the hanger.

While we have shown and described certain specific embodiments of our invention it will be readily apparent that many minor changes of structure and operation could be made without departing from the spirit of the invention.

We claim:

1. An upholstery deck suspender for mounting an upholstery deck having an edge strand and having a generally planar upper surface, in a rigid furniture frame, said suspender comprising:

a. an elongated member of elastic material adapted to be folded intermediate its ends about said deck edge strand with its ends projecting toward an element of said frame, said elastic member comprising an endless band flattened to form an elongated loop; and

b. means for attaching said elastic member to said frame element, said attaching means comprising a rigid hanger member adapted to be mounted on said frame element and including elements transverse to said elastic member and insertable through the ends of the loop formed thereby.

2. An upholstery deck suspender as recited in claim 1 wherein said hanger member comprises a generally C-shaped member having a base portion adapted to be secured to said frame element, arm portions extending from said frame element toward the adjacent edge strand of said deck, and parallel spaced apart terminal portions extending in opposite directions from their respective arm portions, said terminal portions extending transversely to said elastic member and being insertable respectively through the ends of the loop formed by said elastic member.

3. An upholstery deck suspender as recited in claim 2 wherein the base portion of said hanger member is parallel to

the terminal portions thereof, and with the addition of means for securing said base portion to said frame element for pivotal movement about its longitudinal axis.

4. An upholstery deck suspender as recited in claim 2 wherein the base portion of said hanger member is parallel to the terminal portions thereof, and with the addition of means for securing said base portion to an upper surface of said frame element for pivotal movement about its longitudinal axis, whereby the arm portions of said hanger member overhang and project beyond the edge of said frame element toward said said deck, the arm portions of said hanger member being angled upwardly intermediate their ends above a plane including the axis of said base portion and bisecting the space between said terminal portions.

5. An upholstery deck suspender as recited in claim 1 with the addition of means for securing said hanger member to said frame element for pivotal movement relative thereto about an axis transverse to said elastic member.