Aug. 3, 1954 H. HOPKES, JR 2,685,328

SEAT AND BACK FRAME ASSEMBLY

Filed June 18, 1948 2 Sheets-Sheet 1

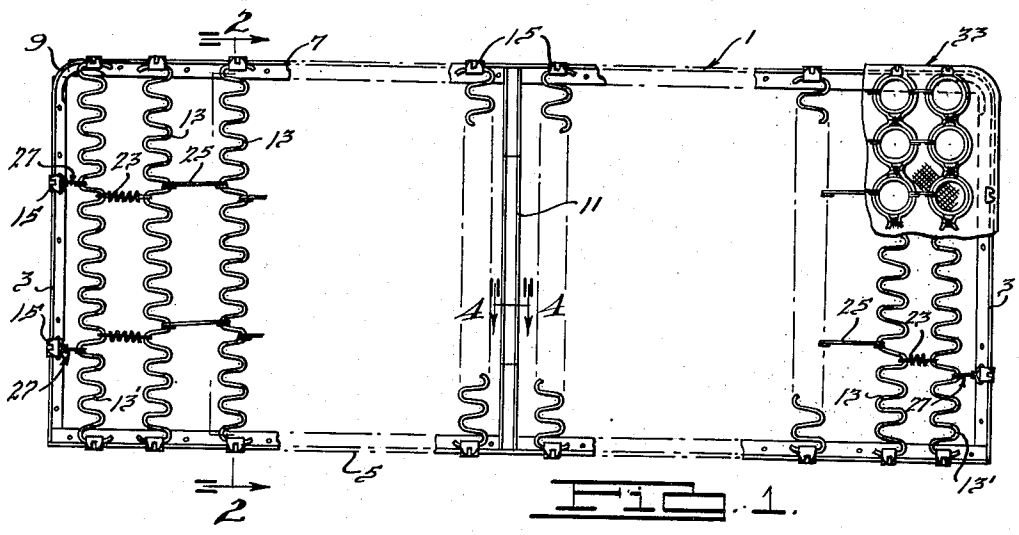


FIG. 1.

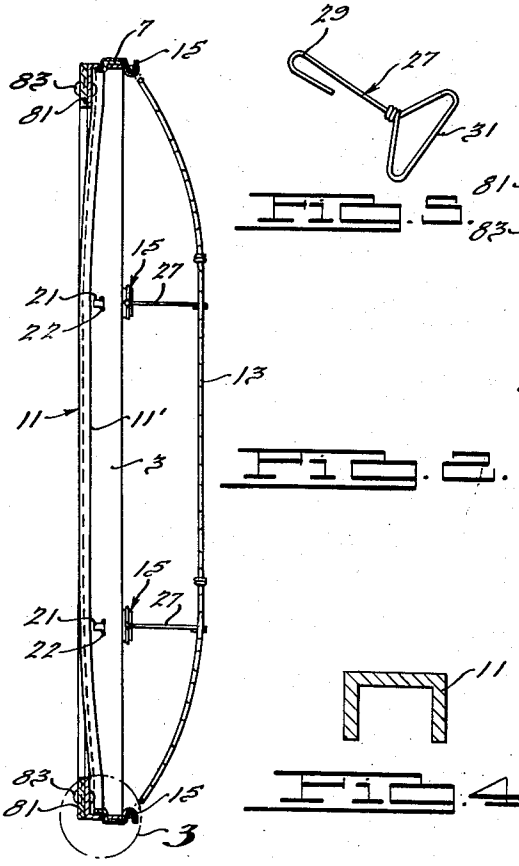


FIG. 2.



FIG. 5.

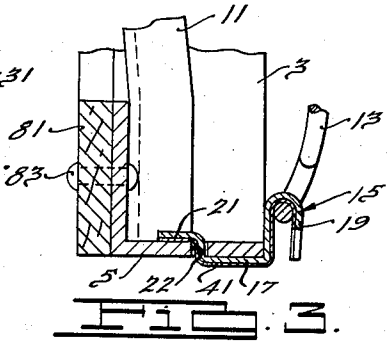


FIG. 3.



FIG. 4.

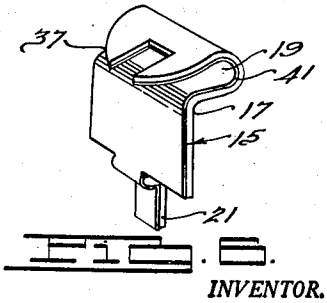


FIG. 6.

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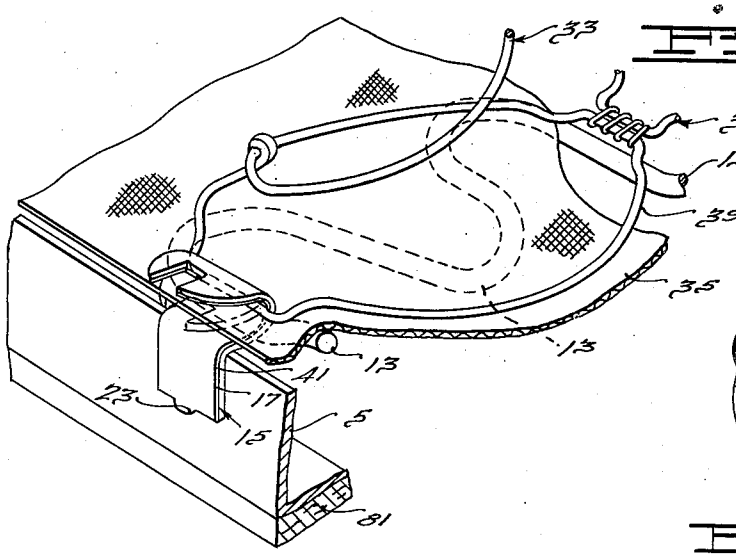



FIG. 7.

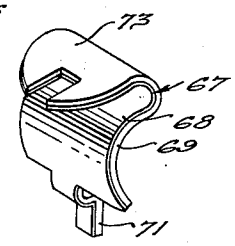



FIG. 11.

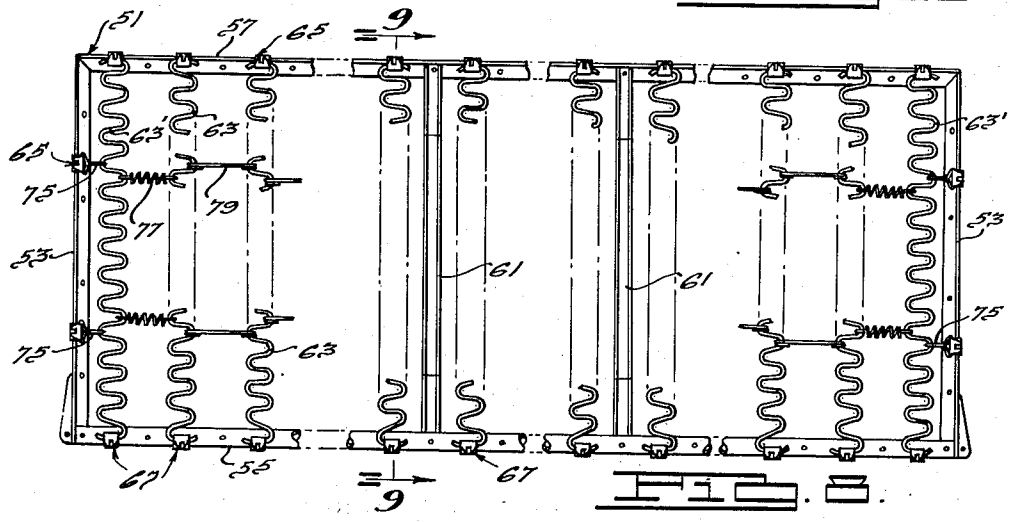



FIG. 8.

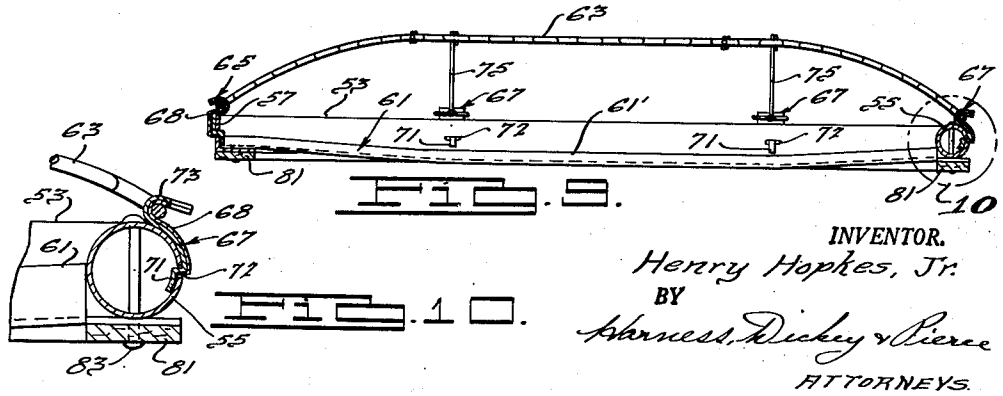



FIG. 9.

FIG. 10.

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# UNITED STATES PATENT OFFICE

2,685,328

## SEAT AND BACK FRAME ASSEMBLY

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Application June 18, 1948, Serial No. 33,731

7 Claims. (Cl. 155—179)

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This invention relates to frames employed in the construction of beds, chairs and the like.

During recent years, the use of sinuous spring strips similar to those described in the Kaden Reissue Patent No. 21,263 has become widespread in the construction of resilient body-resting means. As is well known, these springs comprise sinuous elastic wires bent upon an arc of lesser radius than that which they form when attached to the frames. A plurality of these spring members arranged transversely or longitudinally of the frame form a resilient surface which has no tendency to pierce covering fabric and which has a marked beneficial effect upon the cushioning characteristics of the construction wherein they are employed.

Since the use of such springs is comparatively recent, the art of connecting them to the frame members and to each other has not been developed to the point of ultimate satisfaction. Hence, an object of the present invention is to provide new and improved means for such connection.

In certain types of construction it is desirable to use the sinuous springs in combination with the more conventional nests of coil springs. In sofa beds, for example, this combination of springs is desirable. It will be recognized that such a construction introduces new problems of how to attach the spring devices to the frames and how to prevent noise-creating contact therebetween. Hence, another object of this invention is to provide a construction in which the spring assembly may be simply, efficiently, and noiselessly connected to the frame.

Further objects of the invention are to provide a frame construction for springs of the type referred to above which is rigid and strong and which is capable of receiving upholstering tacks or other means for attaching fabrics thereto.

A preferred form of the novel means for accomplishing these and other objects will be described in connection with the accompanying drawings showing the invention applied to a sofa-bed construction and in which:

Figure 1 is a plan view with parts broken away of the frame for the back of the sofa-bed;

Figure 2 is a section taken along the line 2—2 of Figure 1;

Figure 3 is an enlarged view of the structure included within the confines of the dotted circle 3 in Figure 2;

Figure 4 is a cross section along the line 4—4 of Figure 1;

Figure 5 is a detail view in perspective of a link for attaching the sinuous springs to the frame;

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Figure 6 is a detail view in perspective of the clip member for attaching various elements to the frame;

Figure 7 is a perspective view showing the manner in which the clip of Figure 6 connects various elements to the frame;

Figure 8 is a plan view of the seat frame for a sofa-bed;

Figure 9 is a section taken along the line 9—9 of Figure 8;

Figure 10 is an enlarged view of the structure included within the confines of the dotted circle 10 in Figure 9; and

Figure 11 is a detailed view in perspective of the clips used to connect various elements to the tubular rail employed in the seat frame.

In Figures 1 to 7 inclusive, a preferred embodiment of the invention is shown applied to the back frame of a sofa bed. The frame 1 is substantially rectangular and is comprised of inwardly and upwardly opening angle strips forming the longitudinal side border rails 3, a front or lower border rail 5, and a rear or upper border rail 7. These border rails are rigidly interconnected by suitable means and, if desired, arcuate sections 9 may be used to join the side rails 3 and the rear or upper rail 7. A longitudinal channel 11 may be affixed to the central sections of the front and rear rails 5 and 7 to increase the rigidity of the frame 1.

A resilient surface is formed over the frame 1 by means of sinuous spring elements 13 in accordance with practice well known in the art. These springs are preferably longitudinally disposed, that is disposed in spaced parallel relationship to the side border rails 3, and have their ends connected to the upstanding webs of the front and rear rails. The connecting means for this purpose comprise the clips 15 which are described and claimed in a copending application Number 675,063 of the present inventor, filed June 7, 1946, and now abandoned, entitled "Spring Supporting Clips." The clips 15 comprise a body section 17 having portions at right angles to each other, an upper hook portion 19, and a lower inwardly and downwardly disposed tail section 21. The rails 3, 5 and 7, have spaced, elongated, lateral apertures 22 which removably receive the tail section 21 of the clips 15. The lateral ends of the spring elements 13 are hooked or engaged with the outwardly opening hook portion 19 of the clips 15 so that, as will be recognized from Figure 3, tension in the springs tending to pull the clips 15 inwardly is resisted by

the tail sections 21 bearing upon the upstanding webs of the rails.

Central sections of the individual spring elements 13 may be interconnected in conventional fashion by means of springs 23 or links 25. The end springs 13' have their central portions connected to the side rails 3 in a novel manner by means of links 27. These links are a fixed length and have hook portions 29 at their inner ends which fit around the wire sections of the springs 13' and loop portions 31 at their outer ends which fit over the hook portions 19 of the clips 15 and which may comprise either a continuous loop, as shown, or opposed hooklike portions to constitute a loop in effect.

In a construction of this sort it is desirable very often to use nests of coil springs such as indicated at 33. In order to prevent rubbing contact and noise produced thereby between the springs 33 and the sinuous springs 13, a cover 35 of burlap fabric or other suitable cushioning material may be placed between these spring assemblies. The ends of the hook portions 19 of the clips 15 are sharpened or otherwise suitably pointed or adapted to pierce this material as shown at 37, so that it may be stretched over the springs 13 and firmly held in position by the clips 15. The coil nests 33 likewise may be attached to the frame by means of the clips 15 by looping a lower connecting hook 39 (Fig. 7) through the hook portions 19 of the clips 15. Thus, the clips 15 serve to commonly connect the springs 13, the cover 35, and the springs 33 to the border rails 3, 5, and 7 of the frame 1. In final assembly, the hook portions 19 of the clips 15 are preferably bent downwardly to more securely encase the elements engaged thereto, as shown by the dotted lines in Fig. 7. The clips 15, as shown in Figure 1, also serve to connect the intermediate portions of the springs 13' to the side border rails 3 through the medium of the links 27.

To further reduce the possibility of noise produced by friction between the springs and the outer surfaces of the clips 15, material such as a layer of cloth, paper or other material may be secured by a suitable adhesive or a suitable coating of rubber, fibre, or the like may be applied to one surface of the clips 15, as shown at 41.

The seat frame construction 51 of Figures 8–11 inclusive is very similar to that which has been described in connection with Figures 1 to 7 inclusive. Thus the frame 51 has side border rails 53 rigidly connected by suitable means to a front rail 55 and a rear rail 57, the rails 53 and 57 being, as before, constructed of inwardly opening angle strips in order to secure increased rigidity and strength. It is desirable to form the front rail 55 from tubing, as indicated in Figure 10, having a diameter which is approximately equal to the depth or width of the angular strips. This increases the strength of this member which in normal usage carries the maximum load. If desired, spaced longitudinal reinforcing channels 61 may be affixed to the front and rear rails 55 and 57. The frame 51 also has laterally spaced, longitudinally extending, sinuous springs 63 which are attached, as before, to the angular side and rear rails 53 and 57 by clips 65 which are identical to the clips 15 hereinbefore described.

The body portions of the clips for the front rail 55 are rounded to conform to the periphery of the tubular material from which it is constructed. Clips 67 having such a rounded body 69 are shown in Figures 9, 10 and 11, and it will be recognized



that the tail sections 71 thereof, when fitted through apertures 72 in the outer side of the rail 55, will bear upon the inner wall of the tubular rail to resist inward forces on the outwardly presented hook portions 73 such as are applied thereto by the ends of the springs 63 hooked therein. The clips 65 and 67 may also be coated with soundproofing material, as indicated at 68.

In the same manner as heretofore described in connection with the frame 1, the end springs 63' may be connected at intermediate points to the side rails 53 by means of links 75 which are identical to the links 37 and thus are hooked over the springs and looped over the hook portions 73 of the clips 67. The various spring elements 64 may be interconnected by means of laterally disposed springs and links 77 and 79.

Also, as above described, a cover and a nest of coil springs (not shown) may be placed over the resilient surface formed by the springs 63 and anchored to the frame by means of the clips 67.

The longitudinal brace members 11 and 61 of both the back and seat frames 1 and 51 are preferably inclined downwardly from their outer ends so that the central sections 11' and 61' thereof lie in planes somewhat beneath the undersides of the border rails. This provides a greater depth to the frame construction and tends to prevent bottoming of the resilient surfaces formed by the sinuous springs. The undersides of the border rails of both frames also may have tacking strips 81 for upholstery rigidly affixed thereto by suitable means such as rivets 83. The tacking strips 81 may be constructed of any suitable material such as wood or plastic board and preferably are of sufficient thickness so that their undersides lie in planes with the undersides of the lower central sections 11' and 61' of the brace members 11 and 61.

Although but one form of the invention has been shown herein, it will be understood by those skilled in the art that various changes may be made in the size, shape and construction of the various parts without departing from the spirit of the invention.

What is claimed is:

1. A body rest construction comprising a frame having two pairs of parallel interconnected border rails forming a rectangular frame, lengths of sinuous spring elements forming a resilient surface and being disposed substantially parallel to a first pair of opposite rails of the frame, coil springs on said surfaces, a fabric cover between the springs and said spring elements, and clips commonly attaching the coil springs, cover, and the spring elements to the rails.

2. A construction for seats or the like comprising a frame having interconnected border rails with spaced elongated longitudinal apertures in the outer side portions thereof, a plurality of clips, each said clip having a tail which individually extends through an aperture and abuts the lower part of the inner walls of said side portions, each said clip having a body extending upwardly above the rails and provided with outwardly presenting hook portions which rest upon the top of the rails, and sinuous spring elements having their ends hooked to said hook portions.

3. A construction for seats or the like comprising a frame having interconnected border rails with spaced elongated longitudinal apertures in the outer side portions thereof, a plurality of clips, each said clip having a tail which individually extends through an aperture and abuts the lower part of the inner walls of said

side portions, each said clip having a body extending upwardly above the rails and provided with outwardly presenting hook portions which rest upon the top of the rails, sinuous spring elements providing a resilient surface substantially parallel to the frame, and a nest of coil springs on said resilient surface, said elements and coil springs having portions thereof removably engaging the hook portions of said clips above the top of said frame within the confines thereof

4. A construction for seats or the like comprising a frame having interconnected border rails, said rails having spaced elongated longitudinal apertures in the outer side portions thereof, a plurality of clips, each said clip having a tail which individually extends through an aperture and abuts the lower part of the inner walls of said side portions, each said clip having a body extending upwardly and angularly disposed to rest upon the top of the rails, said angularly disposed portions being reversely bent to form outwardly presenting hook portions having pointed projections on the ends adapted to pierce fabriclike material, sinuous spring elements providing a resilient surface substantially parallel to the frame, a cover of fabric material over said elements, said spring elements being removably attached to said hook portions and said cover being pierced by and connected to said hook portions.

5. A construction for seats or the like comprising a frame having interconnected border rails, said rails having spaced elongated longitudinal apertures in the outer side portions thereof, a plurality of clips, each said clip having a tail which individually extends through an aperture and abuts the lower part of the inner walls of said side portions each said clip having a body extending upwardly and angularly disposed to rest upon the top of the rails, said angularly disposed portions being reversely bent to form outwardly presenting hook portions having pointed projections on the ends adapted to pierce fabriclike material, sinuous spring elements providing a resilient surface substantially parallel to the frame, a nest of coil springs on said surface, a cover of fabric material between the surface and coil springs, said spring elements and coil springs being removably attached to said hook portions and said cover being pierced by and connected to said hook portions.



6. A construction for seats or the like comprising a frame having interconnected border rails, said rails having spaced elongated longitudinal apertures on the outer portions thereof, a plurality of clips, each said clip having a tail which individually extends through an aperture which abuts the lower part of the inner walls of said side portions, each said clip having a body extending upwardly above the rails and providing outwardly presenting hook portions, sinuous spring elements having their ends hooked to said hook portions, and fixed length links each having a loop end and a hook end, said loop ends being looped around the clip bodies and the hook ends being hooked to central sections of the end spring elements.

7. A spring construction comprising a frame having two pairs of parallel interconnected border rails forming a rectangular figure, lengths of sinuous spring strips forming a resilient surface when secured parallel to a first pair of opposite rails of the frame, a row of coil springs on each said spring strip, and clips secured to the second pair of opposite rails in alignment with the spring strips and rows of coil springs, said clips having a U-shaped end opening outwardly of and resting upon the top of said second pair of opposite rails, the end portions of the spring strips and the rows of coil springs being secured in said U-shaped ends of the clips.

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