

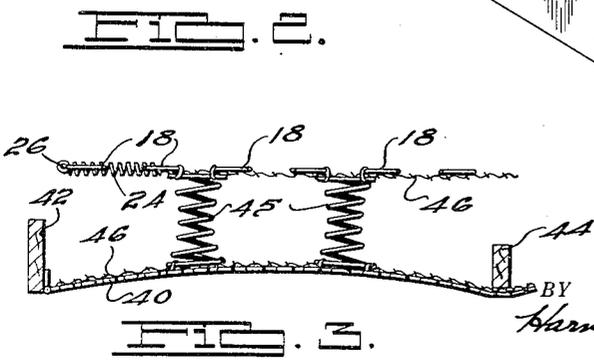
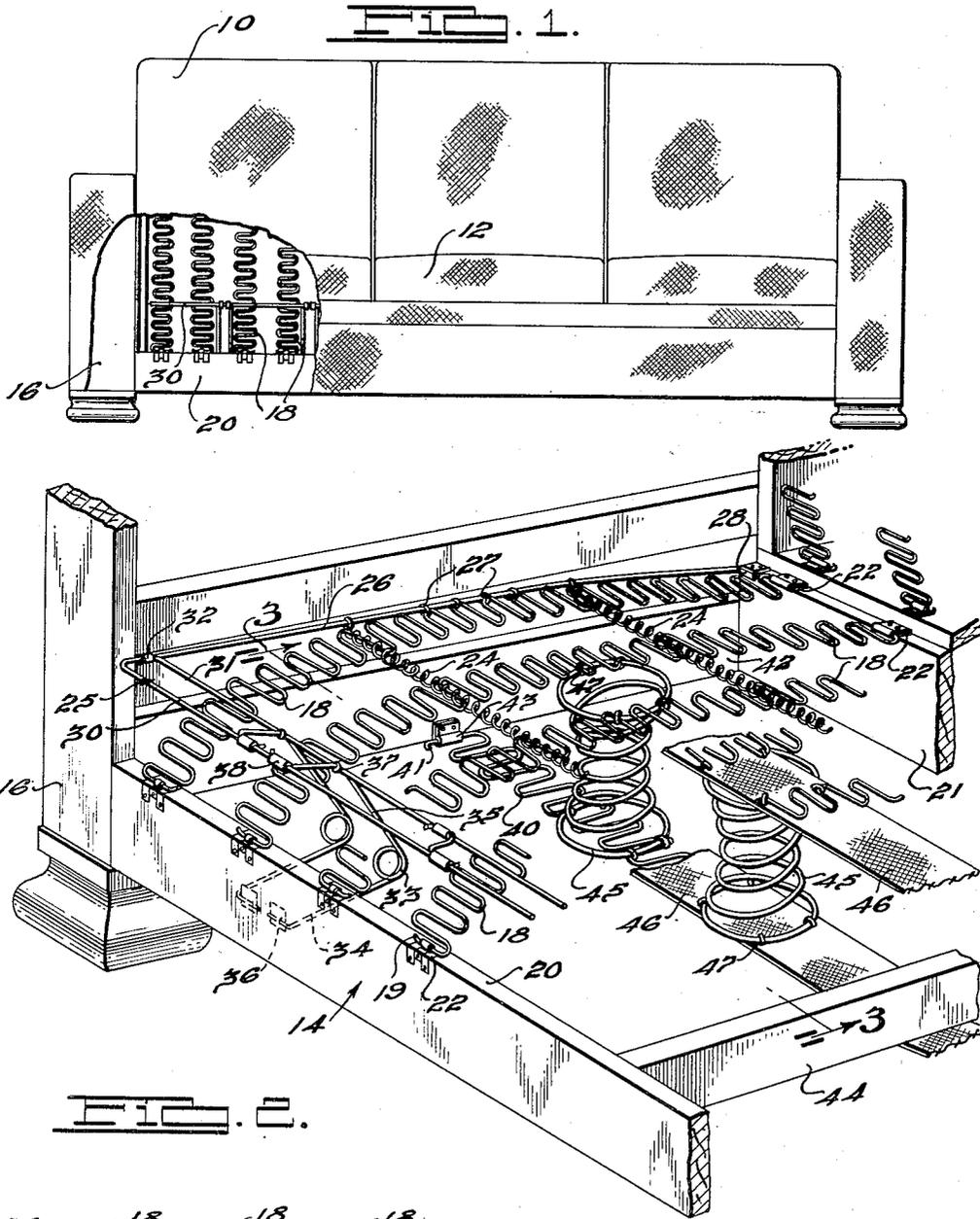
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SPRING SUPPORT

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2,234,253

## SPRING SUPPORT

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8 Claims. (Cl. 155—179)

The present invention relates to method and means for forming a spring cushion construction and it particularly relates to an improvement over the method and means for forming a cushion construction disclosed and claimed in the co-pending application of Kloppman, Serial No. 75,059, filed April 18, 1936, now Patent No. 2,149,350 issued Mar. 7, 1939.

The main object of the present invention is to provide a spring cushion construction for seats, back cushions, or the like, in which "bottoming" of the main spring supporting surface is prevented by providing a resilient support on the underside of the main spring supporting surface, so that when the main spring supporting surface is stressed a predetermined amount it will not come to an abrupt stop but may further resiliently deflect due to the resilient support.

Other objects of the invention are to provide a spring cushion construction which is durable, free of squeaks, and economical of manufacture.

The present invention utilizes the type of spring element disclosed in the Karl Kaden Patent No. 2,002,399, issued May 21, 1935, under which the assignee of the present application is an exclusive licensee, and in which a sinuous arcuately formed spring is illustrated, described and claimed which is unique in having an inherent tendency to resist movement from set position on an arc of small radius. To form a resilient surface a plurality of the springs are disposed in an arcuate plane by extending the ends and securing the ends to spaced supporting elements. An extremely thin resilient cushion is provided in this manner and since the arc in the spring elements is on a curvature having a radius less than the curvature of the arc on which they are employed, any deflection of the elements between their ends will be increasingly resisted by the tension in the elements so that an applied load will be supported with a resulting deflection substantially proportional to the weight of the load. After the load is removed, the elements will assume the bolster or arcuate shape which they originally had when secured to the seat frame.

According to the present invention a main load supporting spring surface is provided, according to the disclosure in the Kloppman application above referred to. Coil spring elements are connected to and disposed beneath the elements forming the main spring supporting surface, and the lower ends of these spring elements are then connected to an elongated sinuous arcuately formed spring element which extends transversely of the elements forming the main spring sup-

porting surface. Strips of webbing are placed between the coil springs and the elements forming the main load supporting surface and the resilient support in order to prevent squeaking when the cushion is used.

Other objects and features of novelty of the invention will be either specifically pointed out or will become apparent when referring, for a better understanding of the invention, to the following description taken in conjunction with the accompanying drawing wherein:

Figure 1 is a front elevational view of a seat and back for a davenport, with a part broken away, embodying features of my invention;

Fig. 2 is a fragmentary perspective view, with parts broken away, of a seat frame employed with the cushion construction illustrated in the davenport of Fig. 1;

Fig. 3 is a front elevational view taken substantially on the line 3—3 of Fig. 2.

In Fig. 1 a davenport 10 is illustrated, having a cushion construction 12 thereon which embodies a spring frame structure employing features of the present invention.

The spring frame structure is shown in greater detail in Figs. 2 and 3 and embodies a base frame 14 which is preferably made of wood and is secured to vertical supporting members 16 at the corners thereof in a conventional manner. It is to be understood that various types of frame elements known in the art to be suitable may be employed in place of the frame herein illustrated. A plurality of sinuous springs 18 of the type disclosed in the above mentioned Kaden patent have their ends 19 extended and secured to front and rear portions 20 and 21, respectively, of the base frame 14. The ends 19 of the springs may be secured in any manner and are herein illustrated as being attached by a plurality of clips 22, of metal or other suitable material which are nailed through or otherwise secured to the frame. The spring elements 18 are in this manner disposed on an arc on the bolster which is desired for the seat.

The spring elements 18 may be interconnected by small coil springs 24, to provide lateral continuity to the spring surface construction. The portion of the spring cushion construction formed by the spring elements 18 and 24 form the main load supporting spring surface for the seat.

To provide a front spring edge to the seat which is desirable in various constructions, such as upholstered chairs, davenports, seat backs, cushions and the like, there is provided a secondary spring assembly embodying a frame wire

25 of U-shape, the side portions 26 of which are secured to the side spring elements 18 by suitable clips 27, known in the upholstery art as "hog-rings." Such clips or rings are herein illustrated as being made from strap material and are looped over the frame wire 25 and the end of one of the convolutions of element 18 to draw them into intimate relation when the clip or ring 27 is closed upon itself. The rear ends of the side portion 26 inwardly as at 28 are suitably secured to the frame element 21 by means similar to clips 22, or the like.

A laterally extending front portion 30 is reinforced by a bracing wire 31, which is spaced inwardly from the portion 30 and connected to the side portions 26 by clips 32 which secure the ends of the bracing wire 31 thereto. The bracing wire 31 provides depth to the front edge 30 of the spring for supporting padding material which extends over the spring elements 18.

The front portion 30 of the spring frame 25 is supported on a plurality of jack springs 33, or similar resilient elements. The springs herein shown embody projecting arms 34 and 35 which extend from a substantially central coil portion. The end 34 of the jack spring is bent laterally and is secured to the base frame member 20 by means of a clip 36, or the like; and the end 35 is bent forwardly and then laterally and is secured to the reinforcing wire 31 by means of a hog-ring 37, or the like, and to the laterally extending front portion 30 by means of a clip 38, or the like.

The construction so far described comprises the main load supporting spring surface, and in order to resiliently reinforce this surface so that the objectionable bottoming effect is not produced a sinuous arcuately formed spring element 40 similar in construction to the spring element 18 is disposed beneath the spring element 18 extending transversely thereof along substantially the longitudinal center of the base frame 14. The spring element 40 is connected at its ends 41 to opposite sides 42 of the base frame 14 by means of clips 43 and may also be suitably secured to the under surfaces of transverse members 44 which are suitably connected to the front and rear portions 20 and 21, respectively, forming a part of the base frame. It is to be understood that the spring element 40 is arced upwardly in the same manner as the spring elements 18 and is formed on an arc of small radius in accordance with the teachings of the Kaden patent so that at all times it tends to maintain its arc shape and will return to that shape if deflected therefrom.

At spaced intervals along the length of the spring element 40 coil springs 45 are disposed between the spring elements 18 and the spring element 40. Strips of webbing 46 are preferably placed between the coil springs 45 and the spring elements 40 and 18, respectively, so as to prevent squeaking caused by metal to metal rubbing contact when the springs are deflected. The coil springs 45 are suitably connected to the spring elements 40 and 18 by means of hog-rings 47, or the like, so that the coil springs may not become displaced relative to the spring elements 40 and 18.

From the above description it is evident that upon application of a load to the spring surface formed by the element 18 that this surface will first become deflected due to the load, deflecting also, or compressing also, the coil springs 45. Upon compression of the coil springs 45 a predetermined amount any further tendency to compress these coil springs will cause deflection of

the spring elements 40. Thus it is evident that the bottoming effect which would be produced when the coil springs reach their limit of compression is eliminated by the present construction.

It is to be understood that the structure herein illustrated may be materially changed by utilizing various types of base frames than the one shown, and that it is applicable to spring constructions and cushion constructions other than the one illustrated, such as backs or cushions where it is desired to eliminate the bottoming of spring surfaces.

While I have described and illustrated a single embodiment of my invention, it will be apparent to those skilled in the art that various changes, additions, omissions and substitutions may be made therein without departing from the spirit and scope of my invention as set forth in the accompanying claims.

What I claim is:

1. A cushion including, in combination, a frame, a plurality of longitudinally extending independent spring elements spaced apart spanning opposite sides of said frame said elements being made of wire bent in zig-zag configuration, a longitudinally extending similar spring element disposed transversely of and beneath said first named spring elements and secured to said frame, and coil spring means connecting said first and second named spring elements.

2. A cushion including in combination, a frame, a plurality of independent spring elements spaced apart and forming when both ends are anchored to said frame a main load supporting surface said elements being made of wire bent into sinuous form, coil spring elements connected to and disposed beneath said first named spring elements, and a spring member similar to said first spring elements connected to said frame by its ends and forming a support for said coil spring elements upon which they rest.

3. A cushion including, in combination, a frame, a plurality of elongated spring elements made of wire formed into zig-zag shape arcuately spanning opposite sides of said frame and forming a main load supporting surface, coil spring elements connected to and disposed beneath said first named spring elements, and an elongated sinuous spring element similar to said first spring elements connected to said frame directly beneath said coil spring elements forming a spring support for said coil spring elements.

4. A cushion including, in combination, a frame, a plurality of longitudinally extending spring elements made of wire bent into zig-zag shape and arcuately spanning opposite sides of said frame, a longitudinally extending similar spring element arcuately disposed transversely of and beneath said first named spring elements and secured to said frame, and coil spring elements disposed between and connecting said first and second named spring elements.

5. A cushion including, in combination, a frame, a plurality of spaced spring elements made of zig-zag shaped wire arcuately spanning opposite sides of said frame, a longitudinally extending similar spring element arcuately disposed transversely of and beneath said first named spring elements and secured to said frame, coil springs connecting said first and second named spring elements, and webbing between said coil springs and said spring elements.

6. A spring structure including, in combination two pairs of spaced frame members, arcu-

ately disposed spring elements connected to one pair of frame members forming a top resilient surface which resists downward displacement, spring elements extending across and connected to the other of said frame members at right angles to said first spring elements and forming a bottom resilient surface, and coil springs interconnecting said two spring surfaces.

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7. In a spring construction, a frame, a zig-zag spring strip extending across said frame in one direction and secured at its ends against displacement to maintain an inherent resistance against downward displacement, a similar spring strip secured in like manner across said frame

at an angle to said first strip, and a coil spring disposed between said strips adjacent the point of intersection.

8. In a spring construction, a frame, a plurality of zig-zag spring strips extending across said frame in one direction and secured at their ends against displacement to maintain an inherent resistance against downward deflection, a similar spring strip secured in like manner across said frame and at an angle to said first strip, and coil springs disposed between said strips adjacent the points of intersection thereof.

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