Oct. 22, 1940. A. H. HABERSTUMP 2,218,708

SPRING STRUCTURE

Filed May 4, 1938

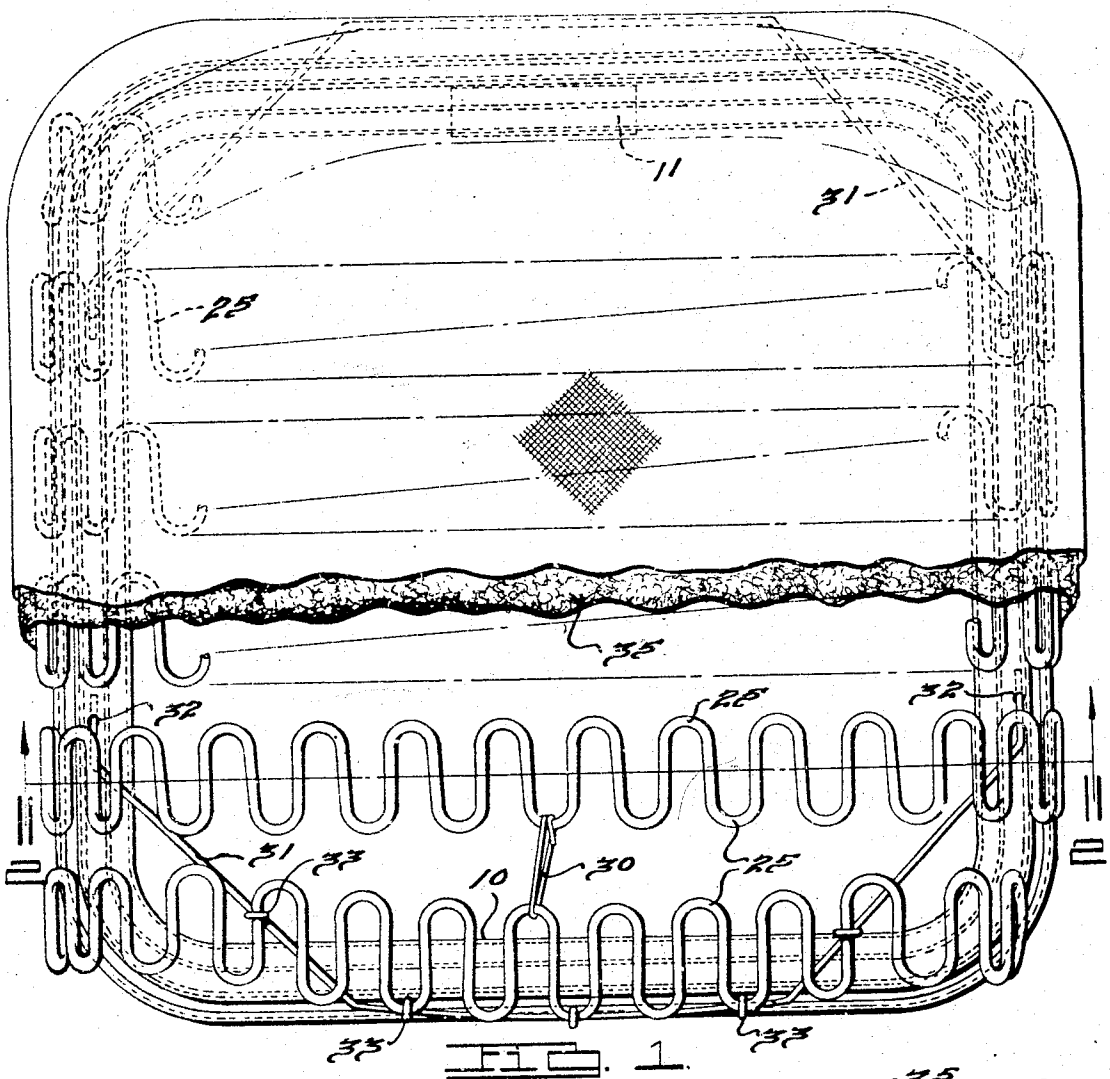


FIG. 1.

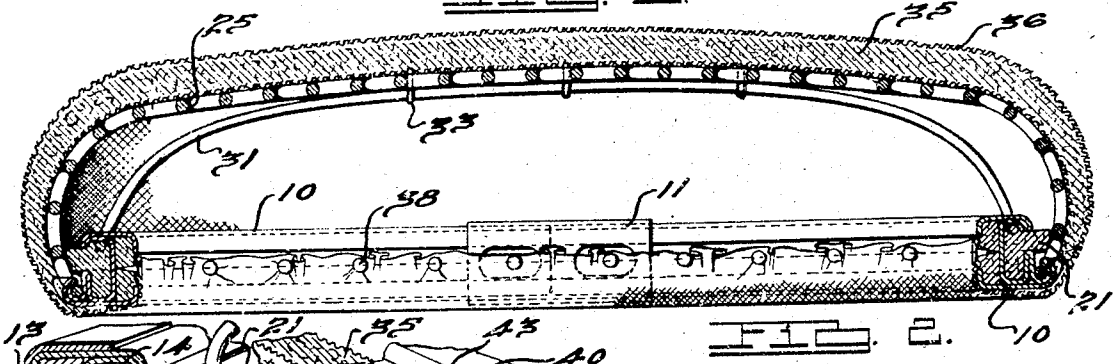


FIG. 2.

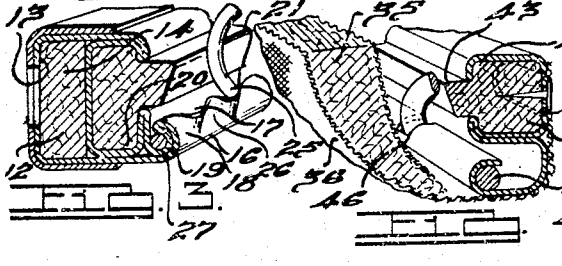


FIG. 3. FIG. 4.

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Patented Oct. 22, 1940 2,218,708

UNITED STATES PATENT OFFICE

2,218,708

SPRING STRUCTURE

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Application May 4, 1938, Serial No. 205,908

6 Claims. (Cl. 155—179)

This invention relates to spring constructions and more particularly, it relates to a novel and improved spring construction particularly adapted to provide a seat cushion.

A primary object of the present invention is to provide a relatively deep, soft, and resilient cushion construction in which the upper frame conventionally used in commercially known seat constructions is entirely eliminated and in which the spring elements which form the resilient portions of the cushion are anchored directly into the base frame and serve the purpose not only of providing a resilient surface for the seat cushion as a whole, but also serve to maintain the surface of the seat cushion resiliently spaced with respect to the base frame.

Still further, the invention contemplates the provision of a novel base frame construction which may easily and conveniently be formed of a suitable section of sheet metal rolled to the final desired form. This base frame has a channel therein adapted to receive a tacking strip and also includes a projecting abutment as well as means immediately beneath said abutment but spaced therefrom for easily and conveniently anchoring the last lateral convolution of the sinuous spring elements to the base frame.

Many other and further objects, advantages, and features of the present invention will become more clearly apparent when considered in connection with the following specifications and the drawing relating thereto.

In the drawing:

Figure 1 is a top plan view of a seat cushion with portions broken away illustrating one embodiment of the invention.

Figure 2 is a sectional view taken substantially on the line 2—2 of Figure 1, illustrating in detail the cross-sectional configuration of the improved seat cushion construction shown in Figure 1.

Figure 3 is a fragmentary perspective view showing a portion of the base frame, illustrating the same in detail.

Figure 4 is a fragmentary perspective view with parts in section, illustrating a modified form of base frame construction embodying a different means for anchoring the ends of the spring element therein.

With more particular reference to the drawing, specifically to Figure 1 thereof, it will be seen that the form of the invention disclosed therein includes a generally rectangular base frame 10 which may be conveniently made up of four separate frame elements comprising the front and rear sides and the ends, respectively, but which, in the specific form of the invention illustrated in Figure 1, comprises an integral length or strip of sheet metal bent to provide a generally rectangular structure. The adjacent abutting ends of this strip 10 may be secured together by a sleeve member 11 which telescopes over the ends and serves the purpose of anchoring the ends in fixed relation with respect to each other to provide a closed, integral, substantially rectangular frame.

By reference to Figures 2 and 3 of the drawing, it will be seen that the metallic portion of this base frame may be formed from a single strip of sheet metal bent upon itself and rolled to provide on its inner side a tacking strip receiving channel 12 having overhanging marginal edges or flanges 13. A suitable tacking strip 14, formed of paper rope or suitable similar fibrous material may be tightly seated in the tacking strip receiving channel 12. The purpose and function of this tacking strip will become more clearly apparent as the description of the invention proceeds.

A double thickness flange 16 of the strip from which the base frame is constructed may project exteriorly from the strip and this flange is bent to provide with the body portion of the strip a spring anchoring channel 17, as will be seen by reference to Figure 3. This flange may be crimped toward the body of the strip at points 18 throughout its length to provide tunnels 19 for receiving and mounting the springs in the manner hereinafter described in detail.

In addition, the strip 10 is bent to provide an abutment receiving channel 20 which has a paper or fiber abutment strip 21 seated therein and, as will be clearly apparent from reference to Figures 2 and 3, this abutment strip projects from the channel 20 over the spring receiving channel 17 and is spaced above the spring receiving channel.

The resilient portion of the seat cushion consists of a plurality of spring elements 25, which elements are each preferably formed of a section of spring wire bent upon itself to provide a series of similar adjacent lateral convolutions all lying in substantially the same surface. These spring elements are preferably normalized or initially set at the time they are formed so that they have an inherent tendency as a whole to lie along an arc of substantially smaller radius than the arc upon which they are disposed when mounted in the spring cushion. Each of these spring elements is cut off to leave a substantially transversely extending last lateral convolution 27 which, when the spring is assembled, may be slipped into the channel 17 and then laterally

through the tunnel 19, formed by the crimped in portion of the channel 18. In this way, the end of the spring will be firmly anchored in position. The walls of the channel may then be crimped together immediately behind the spring element, as shown at 26, to prevent lateral displacement of the last lateral convolution thereof.

In assembly of the seat cushion, one end of one of the spring elements is first anchored in the channel 17 at one side of the base frame in the manner described and then the spring element is tensioned across the frame and the opposite end is anchored in the channel 17 in the opposite side of the frame in a similar manner. The spring element will then engage the abutment strip 21 so that the spring will assume a configuration substantially as shown in Figure 2 of the drawing giving to the cushion construction a very substantial depth and resiliency.

After all of the spring elements have been installed in this manner, suitable wire clips 30 may be installed to interconnect the mating portions of adjacent spring elements 25 in order to preclude excessive transverse movement of the various spring elements.

In addition to the brace forming a support for the ends of the cushion, a wire brace element 31, having its ends seated in suitable apertures 32 at opposite sides of the frame, may extend diagonally upwardly and have its mid portion clipped to the outermost spring member 25 by means of suitable rings 33. This brace member 31 may be of relatively resilient material in order that it will not materially interfere with vertical flexing of the spring element which it serves to support, but, as is obvious from its position and construction, that it will aid in retaining the outermost spring element in substantially predetermined transverse position.

The spring elements 25, which make up the surface structure of the seat cushion, may then be covered with a suitable layer of padding material 35, as is conventional in constructions of this general character and the seat as a whole may be finished by covering the entire exposed surface thereof with a section of suitable fabric finish material 36 which may be drawn down over all sides of the cushion and turned up into the interior of the base frame 10. The marginal portions of this covering material may then be conveniently secured to the tacking strip 14 by means of tacks 38 thereby providing an exceedingly simple, neat appearing, and highly resilient seat cushion construction.

A modified and somewhat simplified form of base frame member is illustrated in the fragmentary perspective view of Figure 4. In this form of the invention, an abutment receiving channel 40 is formed in the strip and the base of this channel is provided at suitably spaced points with a series of longitudinally extending apertures 41 in order that an abutment strip 42, seated in the abutment strip receiving channel, may serve the dual purpose of providing a tacking strip as well as providing the outwardly projecting abutment 43 about which the spring elements fulcrum to tension them to predetermined desired configuration.

The lower side of this modified form of base frame construction comprises a projecting flange which is bent upon itself to provide an inwardly presented spring receiving channel 45 which is provided with notches 46 in the upper wall thereof at suitably spaced points throughout its length. It will be apparent that the last lateral convolution 25 of one of the spring elements may be inserted into the spring receiving channel 45 with the spring element extending through the notch 46. As this spring element is fulcrumed about the projecting portion 43 of the abutment strip 42, the end of the spring element will be positively and firmly locked in position within the channel 45 and precluded against bodily relative movement in any direction.

This somewhat simplified form of base frame construction serves to eliminate the necessity of performing crimping operations on the spring receiving channel in order to lock the spring elements therein.

Many other and further forms and modifications of the invention, falling within the generic scope of the invention as set forth in the appended claims, will become clearly apparent to those skilled in the art.

What is claimed is:

1. A cushion construction comprising a base frame, a plurality of spring elements each formed of a section of spring wire bent sinuously to provide a series of similar adjacent lateral convolutions, said spring elements being disposed substantially parallel to each other and each having their extreme ends anchored to said frame at opposite outer sides thereof, and abutments on said frame serving to engage said spring elements at a point above and outwardly of their point of anchorage to tension the same to the predetermined desired configuration.

2. A base frame for seat cushion constructions comprising a sheet metal strip preformed to provide means for anchoring the ends of spring elements therein and an abutment carried by said strip spaced above and projecting over said anchoring means and over which the spring is tensioned.

3. A cushion construction comprising a base frame having means formed therein for anchoring wire spring elements, abutments carried by said base frame spaced above and projecting outwardly over said anchoring means, a plurality of spring elements each comprising a section of spring wire bent to provide a similar series of adjacent lateral convolutions, one end of each of said spring elements being anchored in said anchoring means and extending upwardly therefrom and engaging said abutment, said spring element extending across said frame and downwardly over the abutment at the opposite side and having its opposite end anchored in the anchoring means.

4. A base frame for seat cushion constructions comprising a sheet metal strip bent upon itself to provide a channel having overhanging side walls, an abutment strip formed of fibrous material seated in said channel and anchored therein by means of said overhanging side walls, said abutment strip having a portion projecting from between said walls, and means formed in said sheet metal strip beneath the projecting portion of said abutment strip for anchoring the ends of spring elements.

5. A base frame for seat constructions comprising a sheet metal strip bent upon itself to provide a channel having overhanging side walls, an abutment strip formed of fibrous material seated in said channel and anchored therein by said overhanging side walls, said abutment strip having a portion projecting between said side walls, the base of said channel having a series of apertures therein whereby said abutment strip may serve as a tacking strip, and means formed

in said sheet metal strip beneath the projecting portion of said abutment strip for anchoring the end of spring elements in said base frame.

6. A cushion construction comprising a base frame having outwardly disposed abutments at opposite sides thereof, anchoring means below said abutments and disposed inwardly of the edge thereof, and a spring spanning the opposite sides of said frame and drawn over said abutments and secured by said anchoring means at both sides of the frame to tension and provide a predetermined configuration thereto.

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