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SPRING FRAME

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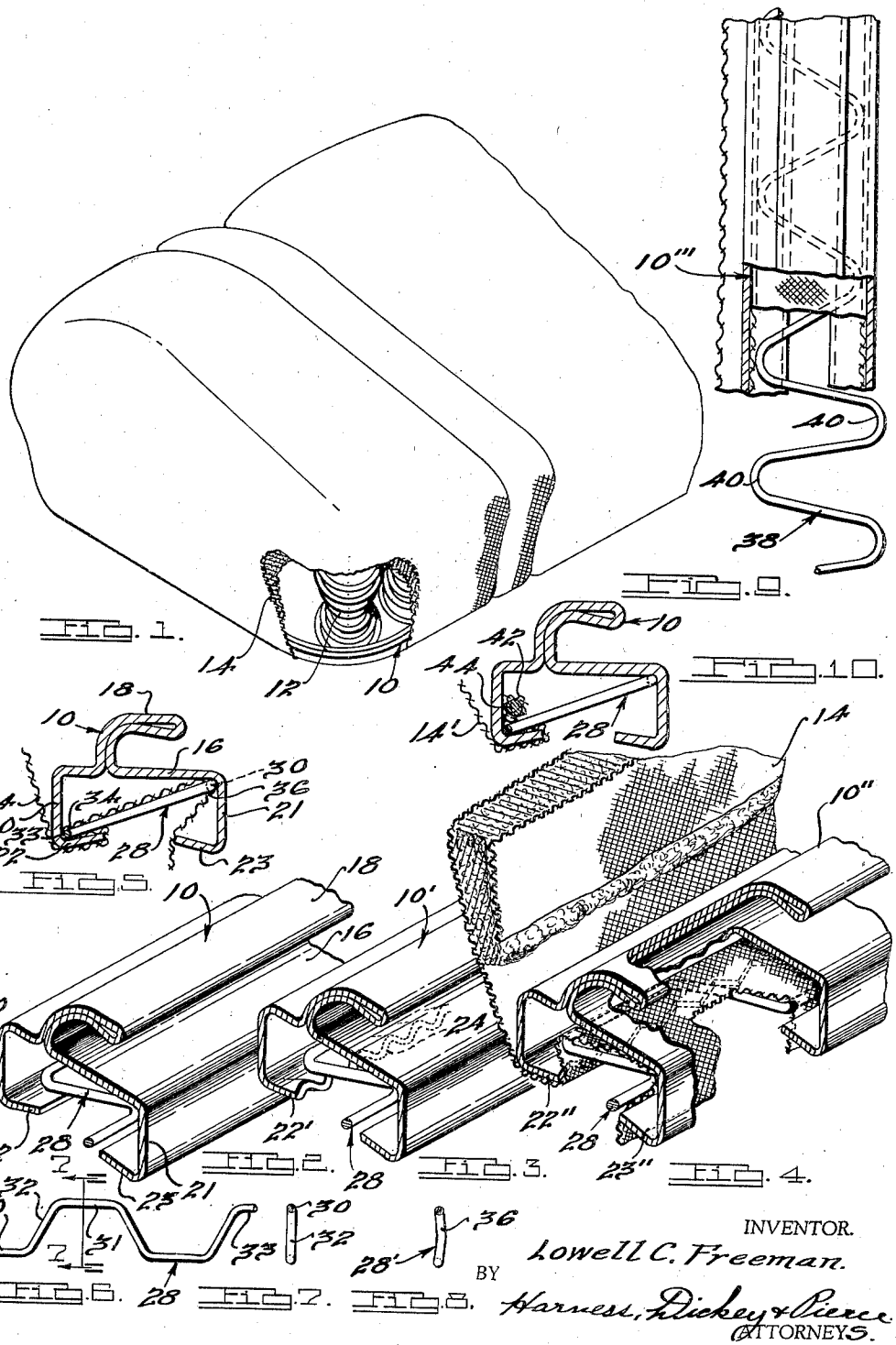


Fig. 1. Fig. 9. Fig. 10. Fig. 5. Fig. 2. Fig. 3. Fig. 4. Fig. 6. Fig. 7. Fig. 8.

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SPRING FRAME

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The present invention relates to seat constructions, and in particular provides an improved frame structure for a seat, and an improved means for securing the covering material to the frame.

Principal objections of the present invention are to provide a seat construction which may be economically manufactured and which may be rapidly and economically assembled; to provide such a construction embodying a frame of generally downwardly extending channel form, and including an element positioned within the frame member for securing a covering material in place; to provide such a construction in which the retaining element is readily insertable and removable; to provide such a construction in which the retaining element cooperates with the walls of the channel shaped frame member to wedgingly hold the covering material in place; and to provide such a construction in which the marginal edges of the frame member are deformed so as to enable the frame member to interlock with the covering material and secure the latter in place.

With the above as well as other objects in view, which appear in the following description and in the appended claims, preferred but illustrative embodiments of the invention are shown in the accompanying drawing, throughout which corresponding reference characters are used to designate corresponding parts and in which:

Figure 1 is a view in perspective of an illustrative seat construction embodying the invention;

Fig. 2 is a view in perspective showing the details of construction of one form of frame member;

Fig. 3 is a view in perspective of a modified form of the invention;

Fig. 4 is a view in perspective, with certain of the parts broken away, showing a further modification of the invention, and also showing the manner in which the covering material is interlocked within the frame member;

Fig. 5 is a view in transverse section based upon the construction in Fig. 2;

Figs. 6 and 7 are views in elevation and transverse section, respectively, showing details of one form of retaining element;

Fig. 8 is a view in transverse section of a modified form of retaining element;

Fig. 9 is a fragmentary view of a further form of retaining element; and

Fig. 10 is a view in section in further modification of the invention.

Referring particularly to Fig. 1, the illustrated seat construction comprises a lower frame member 10, which extends entirely around the seat, and forms a support for a plurality of coil springs 12, which extend from the plane of the frame 10 to the plane of the upper surface of the seat. The seat is covered by conventional covering material 14, the marginal edges of which extend below and into the frame member 10 as described below.

It will be understood that in accordance with conventional practice, supporting members may extend between the front and rear sides as well as between the lateral edges of the frame 10 to support the springs 12, and, that, if desired, a suitable upper frame member may be provided. These elements form no part of the present invention and, accordingly, are not shown in detail in the drawing.

In the form shown in Fig. 2, the frame member 10 preferably is constituted by a single length of metal of generally downwardly presenting channel shape, which extends completely around the seat, and the abutting ends of which may be suitably secured together in butt to butt relation, as by a welding operation. The back 16 of the frame member 10 is extended and folded upon itself, as indicated at 18, to form a conventional retaining flange within which the lower ends of the associated springs 12 are secured. It will be understood that after the lower ends of the springs 12 are fitted in place, the flange 18 may be pressed downwardly toward the back 16, so as to securely lock the springs in place. The flanges 20 and 21 of the frame member 10 terminate in inwardly, and slightly upwardly, turned portions 22 and 23 respectively. The flange 21 extends at a slight flaring angle from the back 16.

In the form shown in Fig. 3, the outer inwardly turned portion of the frame 10' is provided along its length with a series of corrugations 24, which interlock, as hereinafter described, with the covering material 14 to further retain the latter in place. In the further modified form shown in Fig. 4, the outer inwardly turned portion 22'' is provided with a saw tooth edge 26, the function of which corresponds to that of the corrugated edge 24. In all other respects, the constructions of Figs. 3 and 4 may, and preferably do, correspond to that of Fig. 2.

In accordance with the present invention, the covering material 14 is interlocked within the channel part of the associated frame member 10, 10', or 10'' by means of a retaining element 28. In the form shown in Figs. 6 and 7, the retaining element is formed of spring wire or resilient rod-like stock, sufficiently flexible to facilitate its in-

sertion into the associated frame, but rigid enough to securely hold the fabric therewithin. The retaining element, as shown in Fig. 7, is formed to define the offset, generally parallel, portions 30 and 31, which are interconnected by angularly disposed portions 32. The portions 30, 31, and 32 may be generally linear in form, and preferably lie in the same plane.

It will be appreciated that the retaining elements 28 may be rapidly and economically manufactured, and it will be further appreciated that in practice, a single continuous length of retaining element 28 may be provided which extends entirely around the seat frame, with the ends thereof in closely adjacent or slightly overlapping relation. Alternatively, several separate lengths of retaining element 28 may be utilized, and be arranged in end to end relation.

The degree of offset between the portions 30 and 31 of the retaining elements 28 is such that the retaining elements may be relatively snugly fitted in the channel portion of the associated frame 10, 10', or 10'' in the relation shown in Fig. 5, in which figure one lateral portion is engaged and held in the angle formed by the junction between the adjacent flange and portion 22, and the opposite portion is received in the angle formed between the back 16 and adjacent flange 21. The dimensioning of the parts is preferably such that a slight wedging action is required to insert the retaining element 28 into the position shown so that, it will be understood, a firm interlocking relation is provided.

In assembling a seat construction embodying the arrangement of any of the Figures 2, 3, and 4, it will be understood that after the assembling together the lower frame member, the springs 12, and an upper frame member (where used), the covering material is fitted over the thus provided framework with the marginal edges of the covering material extending freely beyond the lower frame so as to afford sufficient material for cooperation with the retaining element 28.

Immediately prior to the insertion of the retaining element 28 within the frame member, at least that part of the marginal edge of the covering material 14 which is adjacent the point of intended application of the retaining element, is stretched across the lower open side of the channel of the frame member. Thereafter, a free end such as 33 of the retaining element 28 may be inserted into the channel of the frame member and moved to the position shown in Fig. 5. This movement is facilitated by cocking the retaining element as a whole relative to the length of the channel in the frame member, and, in its movement, the end 33 carries the covering material 14 therewith, and forms a fold 34 therein. In forming the fold 34, the end 33 of the retaining element 28 also slightly additionally stretches the covering material 14, thus insuring that the latter remains properly stretched over the frame structure as a whole.

After seating the end 33 of the retaining element 28 in the relation shown in Fig. 5, the next successive opposite straight portion 30 may be moved to the position shown in Fig. 5, in which it bears against the opposite upper corner of the channel. This movement forms an additional fold 36 in the covering material 14, and locks such fold between the retaining element and the channel.

With the free end 33 and the next successive straight portion 30 in seated relation as above described, it will be appreciated that the next successive portion 31 associated with the outer flange 20 may be introduced into the channel by springing the retaining element 28 so that the straight portion 30 clears the inner edge of the inwardly turned portion 22. This same springing movement also enables the insertion of the next successive opposite straight portion 30 associated with the inner flange 21 to be moved into place. Stated in another way, the insertion of the retaining element may readily be effected by cocking the retaining element relative to the length of the channel of the frame so as to seat a straight portion associated with both the outer and inner flanges 20 and 21, and thereafter springing the retaining element 28 so that the next successive straight portion 30 associated with the outer flange 20 clears the inner marginal edge of the inturned portion 22, thus permitting the straight portion 31 and the immediately opposite portion 30 to be received within the channel. The inserting operation thus occurs in a succession of steps. It will be understood that each such springing operation tends to momentarily enlarge the angle between each lateral portion 30 and each connecting portion 32. The retaining element 28, however, is preferably formed of spring steel as previously mentioned so that the retaining element 28 immediately tends to reassume its original form as soon as it is inserted.

In certain cases, it is found desirable to introduce a slight bend in the connecting leg portion of each retaining element, in the manner indicated at 36 in Fig. 8. The bend thus introduced in each connecting leg portion tends to direct the straight portion 30 associated with the inner flanges 21 toward the final position thereof, and overcomes any otherwise existing tendency of the inwardly turned portion 23 associated therewith to interfere with such insertion.

The retaining element 28 may, of course, be readily removed by simply reversing the above mentioned assembly operation. To further facilitate its removal, it is preferred to slightly flare the inner flange 21 of the frame member 10 so that the diagonal which is opposite to the one occupied by the retaining element 28 in Fig. 5 is longer than such normal diagonal. With this relation, it will be appreciated that by forcing the retaining element from the normal diagonal position to such opposite and longer diagonal, the retaining element 28 becomes loosened and may be very readily removed. Such shifting may be accomplished without injury to the covering material, since, during the shift, a slight amount of additional covering material may be stretched around the marginal portion 22.

In the alternative form shown in Fig. 9, the retaining element 38 is formed of sinuous shape, and the preferred dimensioning thereof is such that the normal width spacing between the turns 40 is substantially greater than the length of the normal diagonal discussed above with reference to Fig. 5. With this relation, it will be appreciated that in inserting the retaining element 38 within the channel of the associated frame member 10''', the retaining element is stretched so as to reduce such width spacing between the bends 40 to the size of the just mentioned normal diagonal. The just mentioned stretching of the retaining element 38 stresses it, and the stresses thus introduced continuously tend to shorten the element and increase the width spacing between the bends 40. This action firmly wedges the bends 40 in the associated corners of the channel.

The embodiment of the invention shown in

Fig. 10 distinguishes primarily from the previously described embodiments in that the covering material 14' is interlocked between the frame member 10 and only one lateral side of the retaining element 28. This arrangement enables the use of a narrower marginal edge on the covering material and thus affords a saving in the amount of covering material required.

It has been found practical, particularly in instances where the frame member 10 is provided with interlocking corrugations or teeth, such as are described with reference to Figs. 3 and 4, to rely entirely upon the wedging effect between one side of the retaining element 28 and the corresponding side of the frame member to hold the covering material in place. In other instances, it has been found desirable to provide the otherwise so-called raw edge of the covering material 14' with an enlargement or bead and this is the arrangement specifically shown in Fig. 10. As illustrated, the inner marginal edge of the covering material 14' is provided with an enlargement formed by sewing the material 42 around a cord so as to form a welt. Alternatively, it will be appreciated that the enlargement may be formed by adding a binding instead of the welt. The enlargement, however formed, serves to effectively prevent a withdrawal of the covering material from its position between the retaining element and the frame member, so that an extremely effective securing action is afforded.

Although only several specific embodiments of the invention have been described in detail, it will be appreciated that various changes in the form, number, and arrangement of parts may be made within the spirit and scope of the invention.

What is claimed is:

1. In a seat construction, the combination of a frame member of downwardly presenting channel shape, having an inwardly turned portion at the extremity of one flange thereof, a covering material having a marginal edge adapted to be received in said channel, and a spring-like retaining element adapted to be wedged into place so as to hold said material in said channel, said retaining element being adapted to wedge on a diagonal such that one side of the retaining element is received within the angle formed between the inwardly turned portion and the associated flange, and the other lateral side of the retaining element is received in the angle formed between the opposite flange and the base of the frame member.

2. In a seat construction, the combination of a frame member of downwardly presenting channel shape, one flange whereof terminates in an inwardly turned portion and the other flange whereof is slightly flared, so that a diagonal from a corner formed by said one flange and said portion and extending to the junction between the other flange and the base of the channel is somewhat shorter than an opposite diagonal; a covering material the marginal edge whereof is adapted to be received within said channel; and a retaining element adapted to be received into said channel, said retaining element being of such size that it is wedgingly received in said channel when positioned on said first mentioned diagonal, and is loosely received in said channel when it is positioned on said second mentioned diagonal.

3. In a seat construction, the combination of a frame member of downwardly presenting channel shape, having an inwardly turned portion at the extremity of one flange thereof, a covering material having a marginal edge adapted to be received in said channel, and a spring-like retaining element adapted to be wedged into place so as to hold said material in said channel, said retaining element being adapted to wedge on a diagonal such that one side of the retaining element is received within the angle formed between the inwardly turned portion and the associated flange, and the other lateral side of the retaining element is received in the angle formed between the opposite flange and the base of the frame member, said material being turned around said inwardly turned portion into said channel and being wedged therein by at least said one side of the retaining element.

4. In a seat construction, the combination of a frame member of downwardly presenting channel shape, having an inwardly turned portion at the extremity of one flange thereof, a covering material having a marginal edge adapted to be received in said channel, and a spring-like retaining element adapted to be wedged into place so as to hold said material in said channel, said retaining element being adapted to wedge on a diagonal such that one side of the retaining element is received within the angle formed between the inwardly turned portion and the associated flange, and the other lateral side of the retaining element is received in the angle formed between the opposite flange and the base of the frame member, said material being turned around said inwardly turned portion into said channel and being wedged therein by at least said one side of the retaining element, and said inwardly turned portion having an irregular marginal edge so as to interlock with the material.

5. A connection between a foldable element and a supporting member of generally box-like form having the wall portions arranged to define first and second substantially diagonally opposite corners defining a relatively long and a relatively short diagonal, characterized as comprising a spring-like retaining element adapted to be received in said supporting member and wedged in the corners defining the shorter diagonal, the foldable element being adapted to be wedged between the retaining element and at least one of said corners, said element being dimensioned to be loosely received between the corners defining the longer diagonal, whereby the element may be freely introduced into the member and then snapped into place along the shorter diagonal.

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