United States Patent

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Continuation-in-part of application Ser. No. 858,329, Sept. 16, 1969.

[54] **FLEXIBLE SUPPORT APPARATUS**
3 Claims, 6 Drawing Figs.

[52] **U.S. Cl.** ..... **160/327,** 287/54.1, 287/20.92 C, 297/445
[51] **Int. Cl.** **B25g 1/04**
[50] **Field of Search** ..... 287/125, 127, 128, 126, 20.92 C, 20.92, 54 A, 54 B, 54 C, 189, 36 R, 189.36 C, 54.1; 52/665; 248/287, 298; 297/445; 46/29; 160/327, 383, 402, 403

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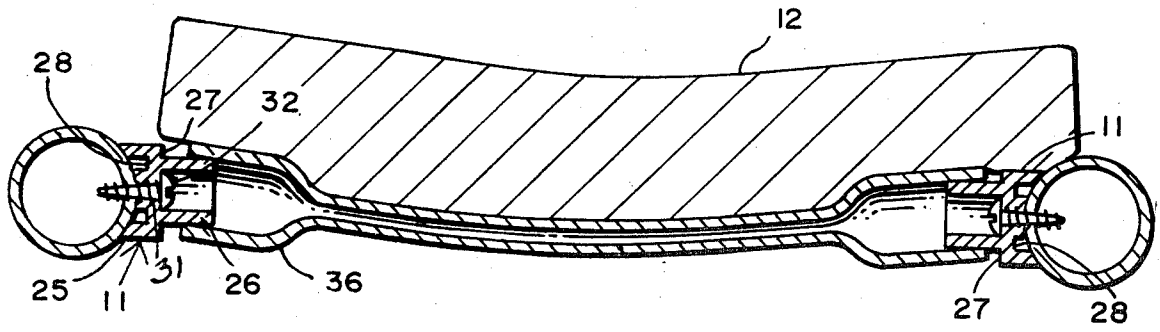
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ABSTRACT: A cushion-supporting flexible apparatus for chairs, lounges and other furniture having a pair of spaced-apart crossmembers with a plurality of flexible members constituting the cushion-supporting flexible apparatus extending between the crossmembers. Each of the flexible members consisting of an elongated resilient hollow member having cylindrical end portions and a flattened arcuate cross section therebetween upon which the cushion rests. Cylindrical fittings are fastened to the crossmembers at one end portion and the other end is telescopically received by the hollow cylindrical end portions of flexible members so that when a person sits on the cushion, the elongated resilient members are flexed downwardly as their end portions slide in a direction away from the crossmembers without becoming disengaged therefrom.



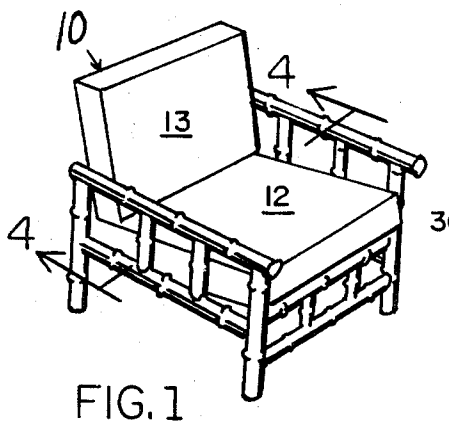


FIG. 1

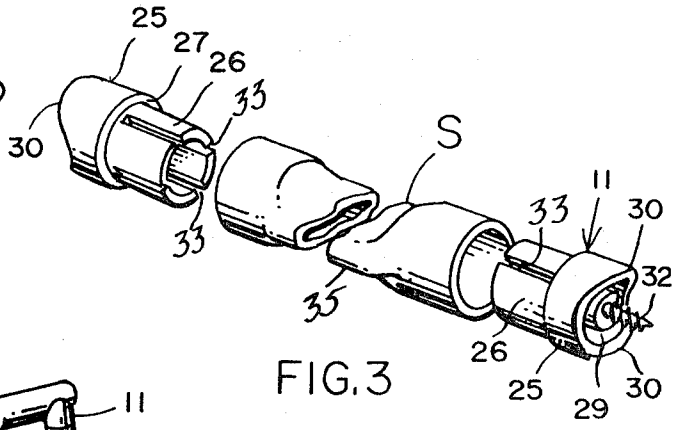


FIG. 3

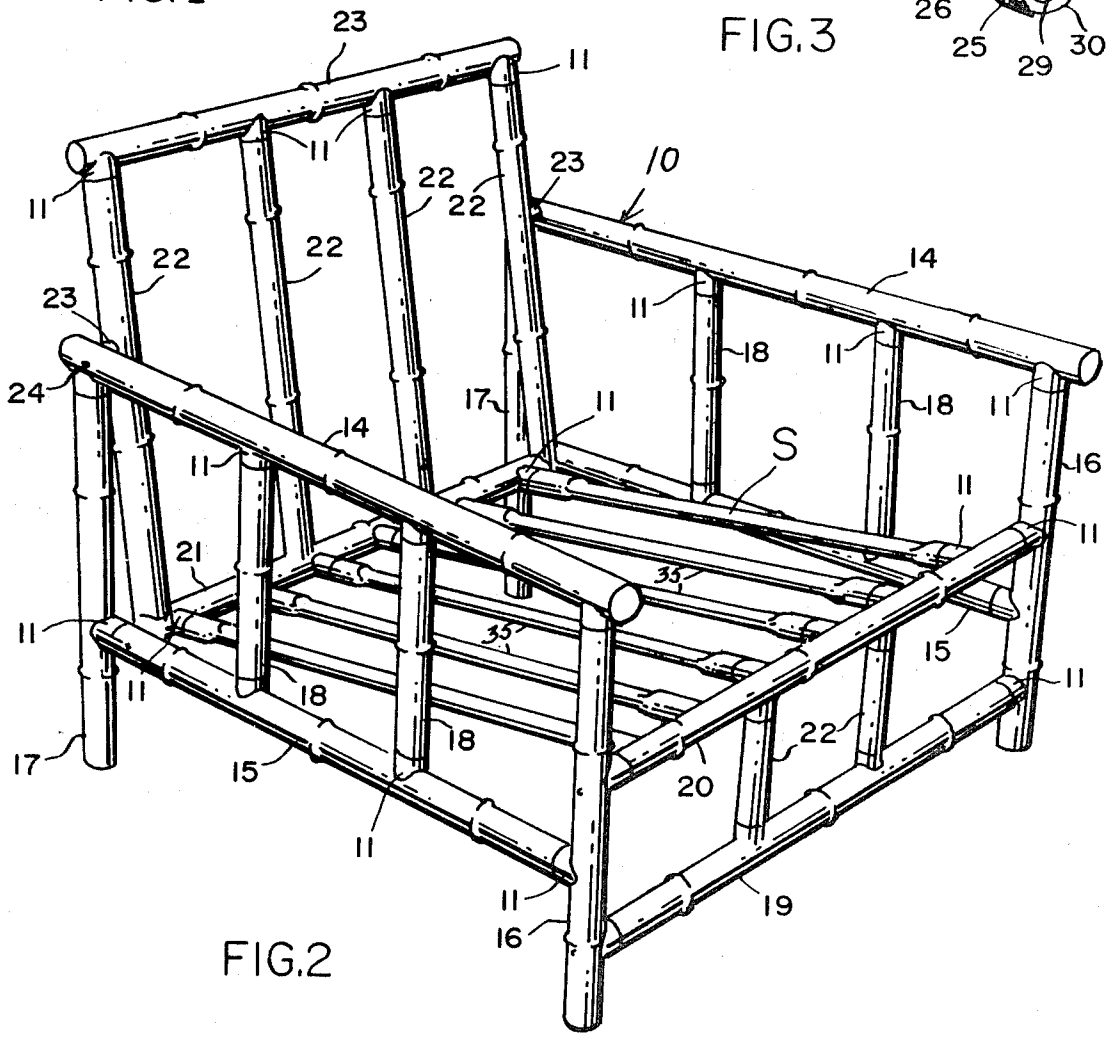


FIG. 2

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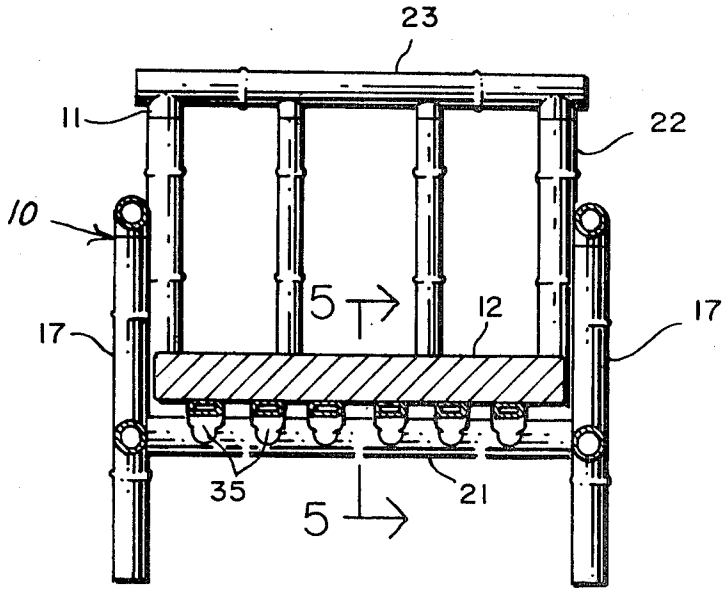


FIG. 4

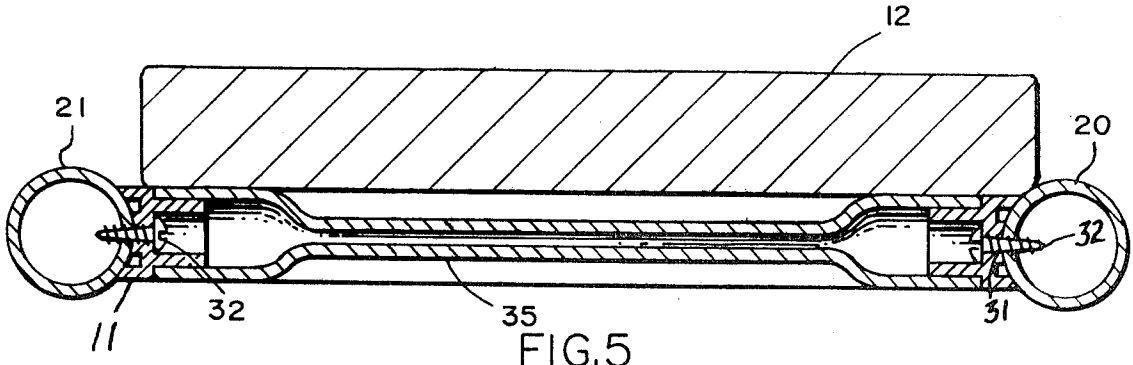


FIG. 5

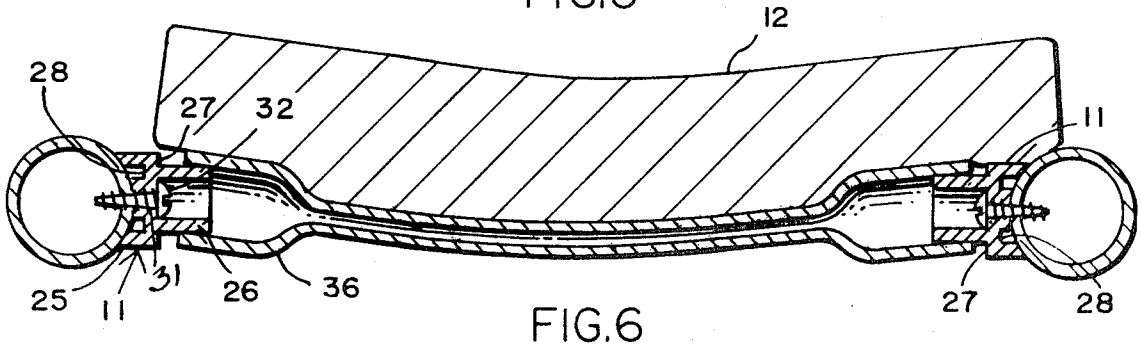


FIG. 6

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FLEXIBLE SUPPORT APPARATUS

The present invention is a continuation-in-part of my copending patent application, Ser. No. 858,329, filed on Sept. 16, 1969, for Molded Plastic Fitting.

This invention relates generally to furniture construction and is more particularly directed to a flexible support apparatus for articles of furniture such as chairs, divans, lounges, settees, davenports, beds and the like.

In my copending patent application, I show and describe a molded fitting for use in the manufacture of plastic tubular furniture. The identical molded fitting is adapted for use in the fabrication of the flexible support for the cushions that sustain the weight of a person seated or lying on the chair or lounge.

At the present time, the chairs, lounges and the like are provided with metallic springs, rubber elements and elastic members for supporting the seat cushions in order to provide flexibility or "give" for the comfort of the person seated on the chair. These flexible members will rust, lose their flexibility over a period of time and chafe the fabric of the cushion resting on the flexible support as well as being expensive in both original cost and assembly in the manufacture of the article of furniture. The present invention contemplates avoiding the above-indicated undesirable features of the conventional flexible cushion support members and has as its principal object the provision of a flexible cushion support apparatus consisting of deformed tubular members slidably mounted on molded fittings fastened to tubular crossmembers.

Another object of the present invention is to provide a flexible support apparatus that is chemically inactive, will never lose its flexibility or resiliency under normal conditions of use and will not stain or chafe the fabric of the cushions and the like resting thereon.

A further object of the present invention is to provide articles of furniture with a flexible support apparatus having resilient bars, supporting cushions, and the like wherein the bars swivel to shape themselves to conform to the portion of the person's body resting on the cushions and flexing sufficiently to resiliently support the person.

With these and other objects in view, the invention will be best understood from a consideration of the following detailed description taken in connection with the accompanying drawings forming a part of this specification, with the understanding, however, that the invention is not confined to any strict conformity with the showing of the drawings but may be changed or modified so long as such changes or modifications mark no material departure from the salient features of the invention as expressed in the appended claims.

In the drawings:

FIG. 1 is a perspective view of a chair embodying cushion support members constructed in accordance with my invention.

FIG. 2 is a similar enlarged view shown with the cushions removed.

FIG. 3 is an exploded fragmentary view of a single spring member.

FIG. 4 is a cross-sectional view taken along the line 4—4 of FIG. 1.

FIG. 5 is a cross-sectional view taken along the line 5—5 of FIG. 4.

FIG. 6 is a similar view showing the manner of the flexing of the cushion support members.

Referring to the drawings wherein like numerals are used to designate similar parts throughout the several views the numeral 10 refers to a chair embodying my invention and constructed generally of thermoplastic tubular members such as polyvinyl chloride plastic fabricated to simulate bamboo and joined to molded plastic fittings 11 which function as connecting members for the various tubular members. The tubular members S that support a seat cushion 12 are fabricated from the similar tubular members as aforementioned and are shaped to provide flexibility when a person sits in the chair as is explained in greater detail hereinafter.

The chair 10 which is shown by illustration only, since any type chair, lounge, settee, davenport, bed and the like may be used in connection with the present invention consists of two pairs of horizontal tubular members 14 and 15 secured at their ends by upright support tubular members 16 and 17 with intermediate upright support members 18 extending between the horizontal tubular members 14, 15. The tubular members 14 form armrests, while the tubular members 16 and 17 function as legs for the chair 10. The front legs 16 are joined together by cross tubular members 19 and 20, while the rear legs 17 are joined at their lower portion by a tubular crossmember 21, the tubular members 20 and 21 forming end supports for the cushion-seat-supporting members S as best shown by FIG. 2. The tubular crossmembers 19 and 20 are provided with spaced upright tubular members 22 that extend therebetween. The backrest consists of the horizontal tubular member 21 joined to a further horizontal tubular member 23 by a plurality of upright tubular members. The end upright tubular members 22 are fastened to the rear end portions of the armrests 14 by screws 24 extending through the tubular members 14 and 22 and a conventional fitting 23 that is interposed between the members 22 and 14.

It is to be noted that all of the tubular members 14–22 are connected together by means of fittings 11 which are described in detail and claimed in the aforementioned patent application. These fittings 11 are identical in construction to the fitting 11 used in my cushion-seat-supporting members S, the subject matter of the present invention.

The fittings 11 consist of a generally enlarged cylindrical body portion 25 joined by a reduced hollow cylindrical portion 26 forming a peripheral shoulder 27 with an interior wall portion 28 in coplanar relation with the shoulder 27. The enlarged body portion 25 is recessed axially as at 29, with the outer surface of the body portion 25 defining a concave face to form two projecting side wings 30 to conform with the curved surface of the tubular members to which they are attached. The fittings 11 are provided with a centrally disposed bore 31 for receiving a screw 32 that holds the fitting 11 tightly to the tubular member until the adhesive or solvent used to bond two members together becomes set to weld the two members together. The hollow body portion 26 is slotted radially to form slots 33 in the wall portion thereof to permit the body portion 26 to fit tightly in telescopic fashion into the ends of the various tubular members.

The cushion support members S which extend between the tubular members 20 and 21 consist of a cushion support bar 35 formed from a tubular member identical to the tubular members 14–22 that had been deformed into an oval cross-sectional shape by the use of heat and pressure along most of its length, and whose ends 36 are permitted to remain in their original cylindrical shape. Telescopically mounted in the ends 36 of the support bars 35 are fittings 11 whose reduced ends 26 are slidably positioned within the cylindrical ends 36. The fittings 11 are fastened permanently to the cross tubular members 20 and 21 upon cementing the wing portions 30 to the sidewalls of the tubular members 20 and 21 with a screw 32 extending through the bore 31 of the fittings 11 and threaded into the sidewalls of the tubular members 20 and 21.

As readily noted by this construction, when a person is seated on the cushion 12, the support bars 35 of the cushion support S will flex downwardly as illustrated by FIG. 6 with the end portions 36 sliding on the fittings 11 in the direction away from the shoulder 27. Upon the person removing himself from the seat 10, the support bars 35 will flex back to its original position with the end portion 36 sliding along the reduced body portions 26 to their abutting relation with the shoulders 27. The degree of flexibility of the support bars 35 is such that under even extreme conditions of a heavy person seating himself on the chair 10, the support bars 35 will not flex so much that the end portions 30 will slip beyond the free ends of the fittings 11, but will return to its normal unflexed position when the person removes himself from the chair 10.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. In a flexible support apparatus for furniture and the like having crossmembers mounted in spaced relation to each other, resilient support members extending between said crossmembers, said resilient support members comprising elongated hollow members having a substantially flattened arcuate cross section, connecting members telescopically mounted at the end portions of said elongated hollow members and engaging said crossmembers and fastening means securing said connecting members to said crossmember s whereby upon the flexing of said elongated hollow members said end portions will slide along said connecting members.

2. The structure as recited by claim 1 wherein said crossmembers, said connecting members and said end portions of said elongated hollow members are cylindrical in cross section and said connecting members being received by said end portions of said elongated hollow members.

3. The structure as recited by claim 2 whereby said connecting members comprise an end portion having a concave face engaging the arcuate surface of said crossmembers and a peripheral shoulder extending about said connecting members adjacent said one end portion adapted to engaged by said end portions of said elongated hollow members.