June 30, 1964 D. W. HAWLEY ETAL 3,139,307

ARTICLE OF SEATING

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FIG. 1

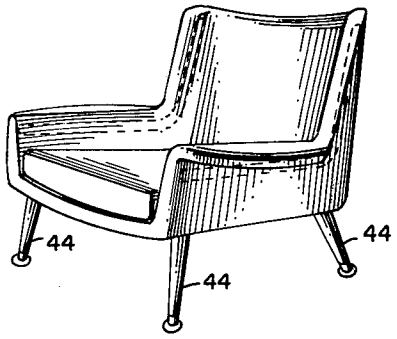


FIG. 2

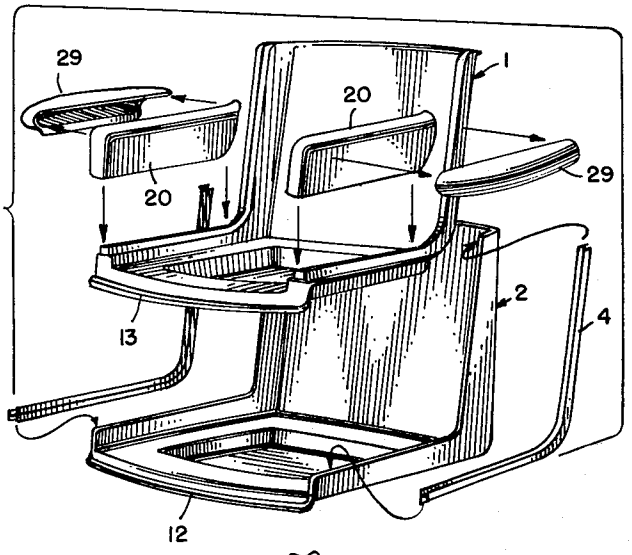


FIG. 3

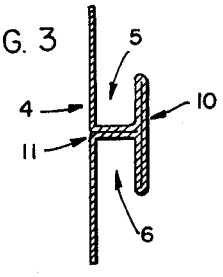


FIG. 4

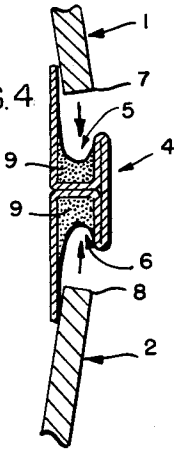
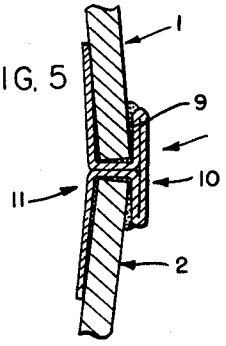


FIG. 5



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FIG. 6

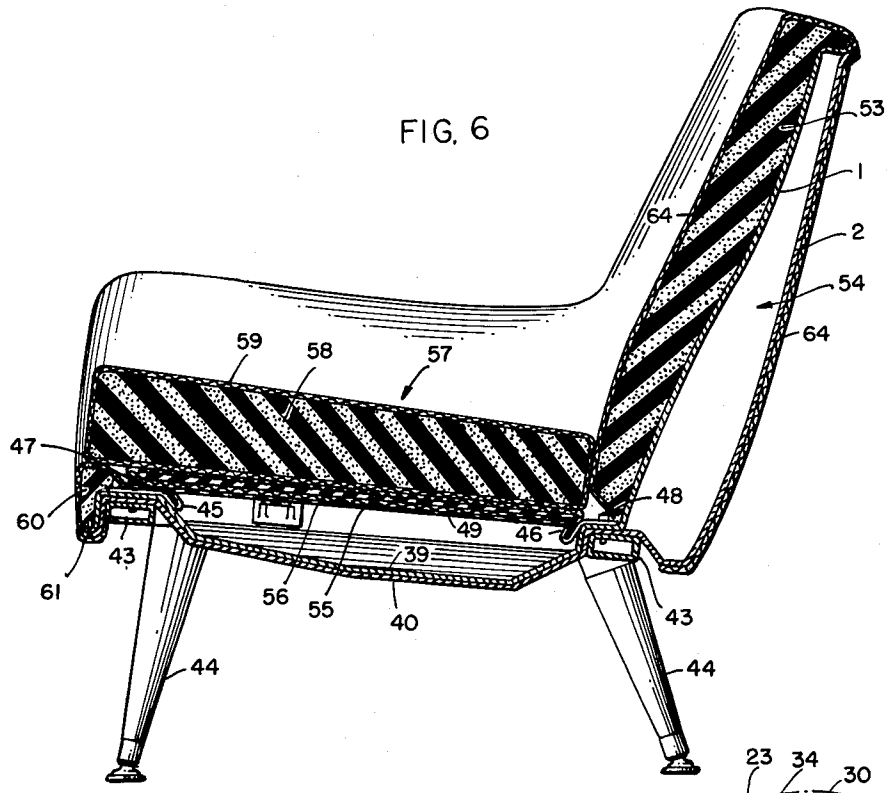
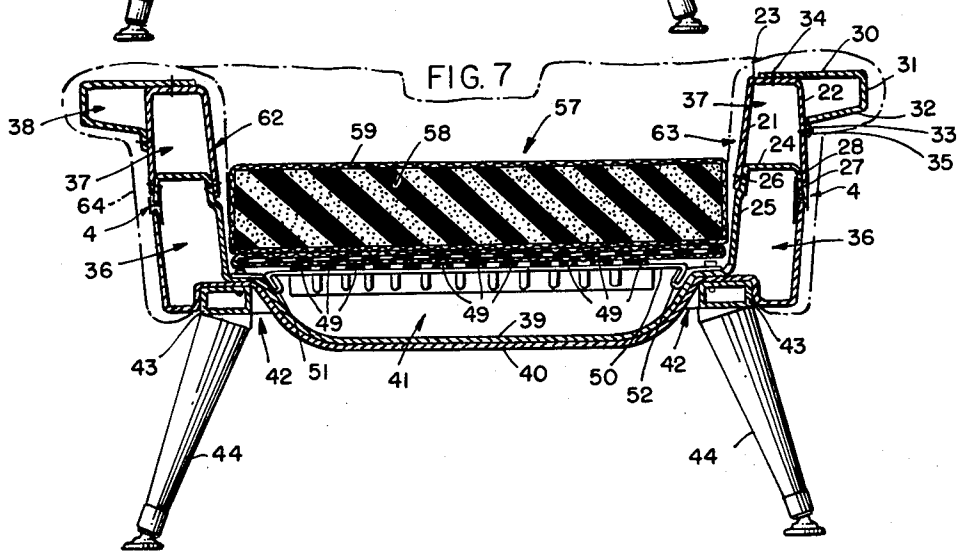


FIG. 7



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FIG. 8

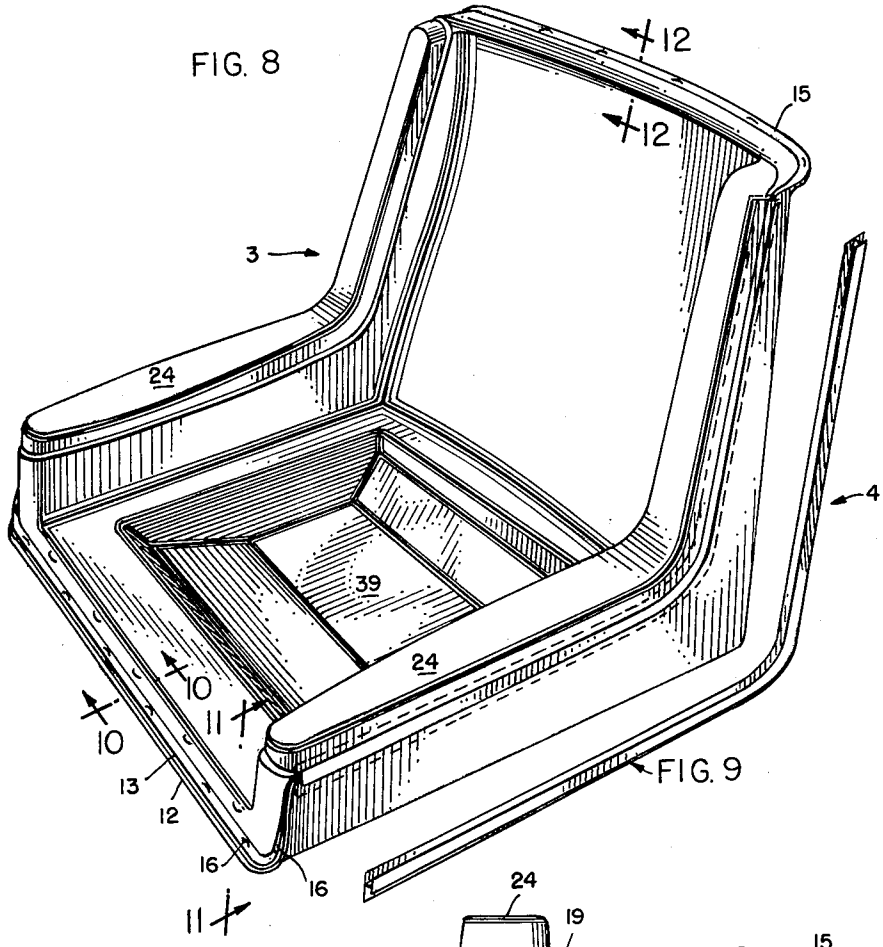


FIG. 9

FIG. 10

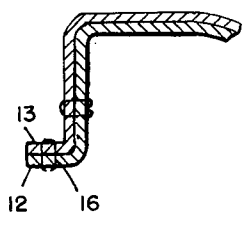


FIG. 11

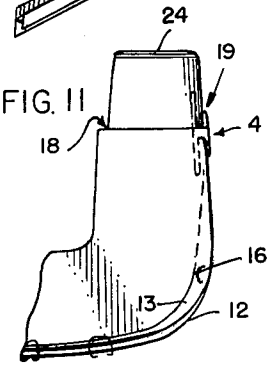
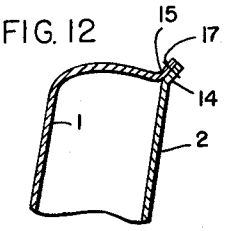


FIG. 12



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ARTICLE OF SEATING

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Filed Nov. 16, 1961, Ser. No. 152,797
3 Claims. (Cl. 297—454)

This invention relates to an article of seating and is especially concerned with upholstered furniture including, for example, chairs, sofas, and the like. The invention will be described particularly with reference to chairs but it will be understood that the general principles involved are applicable to other types of seating including automobile seating, aircraft seating and seating used in living rooms, lounges, recreation rooms and similar locations.

One of the objects of the invention is to provide a new and improved type of seating in which the basic structure consists of a pair of molded shells in assembled relationship.

Another object of the invention is to provide a new and improved method for uniting a pair of molded shells in seating of the type described.

Still a further object of the invention is to provide a method of assembling a plurality of molded shells in the manufacture of chairs and other seating articles which is simple and easy to practice and results in an unusually strong assembled structure.

Other objects and advantages of the invention will appear from the following description in conjunction with the accompanying drawings in which—

FIGURE 1 represents one embodiment of an upholstered chair provided in accordance with the invention;

FIGURE 2 is an exploded view of the components of the basic structure prior to assembly of the chair shown in FIGURE 1;

FIGURE 3 is an enlarged sectional view of one of the components shown in FIGURE 2;

FIGURE 4 is an enlarged partial sectional view of several of the components shown in FIGURE 2 illustrating the manner in which they are assembled;

FIGURE 5 shows the appearance of the components in FIGURE 4 after assembly;

FIGURE 6 is an enlarged vertical sectional view from front to rear through the center of the upholstered chair shown in FIGURE 1;

FIGURE 7 is an enlarged vertical sectional view from side to side through the center of the seat of the chair shown in FIGURE 1;

FIGURE 8 is an enlarged perspective view of the basic structure of the chair shown in FIGURE 1 resulting from the assembly of the component parts shown in FIGURE 2 without the arms and wings;

FIGURE 9 is a view of a generally L-shaped H-frame member employed in making the basic structure shown in FIGURE 8;

FIGURE 10 is an enlarged partial sectional view taken along the line 10—10 of FIGURE 8 showing one way in which the molded shells are fastened together;

FIGURE 11 is an enlarged partial view taken along the line 11—11 of FIGURE 8 showing the relationship of the assembled parts at one side of the basic structure; and

FIGURE 12 is an enlarged partial sectional view taken along the line 12—12 of FIGURE 8 showing the relationship of the assembled parts at the top of the basic structure.

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In general, the invention provides a seating article comprising a pair of molded shells which are adapted to be secured together to form a combined seat, side and back structure, each of said shells having a side and a back edge portion extending toward the respective side and back edge portion of the other shell, and means securing said shells together at said side and back edge portions comprising a frame having opposed channel portions which fit over the edges of said side and back portions.

Referring to FIGURE 2 of the drawings, the basic structure of the chair illustrated consists of a front or upper shell 1 and a back or lower shell 2. These shells are molded and are preferably made by felting cellulose fibers from an aqueous slurry onto a porous former or die in which the fibers accumulate to the desired thickness. In practice, it is preferable to make each shell as a preform of molded fibers and each preform is die dried to produce a final shell having a thickness from about 3/32" to 3/16". The two shells are so shaped that they telescope into each other and have contacting or coinciding edges along the front, bottom, sides and back with an air space in the sides and back. The two shells are then secured together at the points where they contact or coincide and, more particularly, at the edges either by means of adhesive or by stapling to produce a unitary structure 3 as shown in FIGURE 8.

According to the present invention a frame 4 having opposed channel portions 5 and 6 as shown in FIGURE 3 is used to assist in securing the shells 1 and 2 together along the side and back portions thereof. This is accomplished in the general manner shown in FIGURE 4 whereby the frame 4 is positioned between the lower side (or back) edge 7 of the upper shell 1 and the upper side (or back) edge 8 of the lower shell 2. An adhesive 9 of any suitable type as, for example, an epoxy resin glue, is placed in the grooves or channel portions 5 and 6 as illustrated in FIGURE 4, and the edges 7 and 8 of the shells 1 and 2 are then placed in the grooves or channel portions 5 and 6 as shown in FIGURE 5 and the adhesive 9 is allowed to cure or set to produce a strong bond.

It will be observed that the grooves 5 and 6 in the frame member 4 are sufficiently wide to permit the upper and lower shells to be assembled in the frame member 4 without undue pressure. It would be possible, of course, to secure the upper and lower shells to the frame member 4 by a press fit without using an adhesive. However, the ease of assembly is usually greater, especially with unskilled labor, where tolerance in dimensions is allowed as shown in FIGURES 3, 4 and 5.

It will also be observed that the frame member 4 shown in FIGURES 3, 4 and 5 is made of sheet metal which is bent to form a generally L-shaped piece having an H-cross section in which one of the legs 10 of the H-cross section is relatively short and the other leg 11 is relatively long. The leg 11 is preferably positioned on the inside of the shell structure. The H-frame structure while preferably made of steel can also be made of other metals and plastics. Likewise, it can be extruded either as a metal or a plastic and the invention contemplates, for example, the use of extruded aluminum.

Heretofore in making a basic frame structure of the type described from two molded shells it has been customary to mold a flange along the side and back edges of each shell which projects outwardly and is fastened together with stapling or in some other suitable manner. This has proven rather difficult to assemble and has the

further disadvantage that the projecting flange interferes with the upholstering of the chair.

This flange is also sometimes noticeable to the customer or user of the chair. The presence of similar flanges 12 and 13 (FIGURES 2, 8 and 10) in the lower part of the front of the seating structure and flanges 14 and 15 in the upper part of the back of the seating structure (FIGURES 8 and 12) does not create a similar problem. The flanges 12 and 13 are preferably secured together by means of staples 16 and the flanges 14 and 15 are preferably secured together by means of staples 17. It will be seen from FIGURE 11 that the flanges 12 and 13 extend upwardly on each side of the basic structure and terminate just ahead of the H-frame member 4.

The upper shell 1 is molded with offset 18 on the inside thereof as shown in FIGURE 11. The outside is not molded with an offset but an offset 19 is created by the frame member 4. Where it is desired to make an arm chair separate hollow pieces 20 are molded with an inner side 21, an outer side 22 and a top 23. The bottom part is open and the piece is so shaped that the bottom part will fit over the top 24 of the side of the upper shell 1 as shown in FIGURE 7. In this telescoped relationship the side 21 is secured to the side 25 of the upper shell 1 by means of staples 26 and is also secured to a depending flange portion 27 of the upper shell 1 by means of staples 28. The lower edge of the side 21 rests in the offset 18 (FIGURE 11) and the lower edge of the side 22 rests in the offset 19.

Where it is desired to make a seating article with a wing arm as shown in FIGURE 1, an additional hollow molded piece 29 is fastened to the arm as shown in FIGURE 7. The wing piece 29 has an upper part 30, a side part 31, a lower part 32 and a depending flange 33. The upper part 30 is fastened to the upper part 23 of the arm by means of staples 34, or in any other suitable manner. The depending part 33 is fastened to the side 22 of the arm by means of staples 35, or in any other suitable manner. The arms and wings are preferably constructed of the same type of molded material used in forming the molded shells 1 and 2 but may, if desired, be constructed of different types of materials.

From FIGURE 7 it will be seen that there are hollow spaces 36 in the sides of the basic structure, hollow spaces 37 in the arms and hollow spaces 38 in the wings. The bottom part 39 of the shell 1 coincides throughout with the bottom part 40 of the shell 2 and the two shells are recessed to provide a space 41. The two shells 1 and 2 are so shaped as to provide a space 42 which surrounds the space 41 and makes it possible to mount the basic structure on a hollow metal frame 43 which is generally rectangular and to which legs 44 are attached. A pair of metal plates 45 and 46 are provided at the front and rear and these are bolted by means of bolts 47 and 48, or otherwise fastened, to the metal frame 43 through the molded shells 1 and 2. A plurality of elastic strips 49 are attached to the members 45 and 46 and provide the necessary resilience or springing. An additional elastic webbing 50 is preferably provided and extends laterally between fasteners 51 and 52. Other types of springing such as metal coil or leaf springs can be used.

In order to obtain a cushioning effect in those parts of the seating article which are normally in contact with the user, it is preferable to use molded filler pieces made from a polyether type or a polyester type urethane foam. These pieces are preferably preformed to the contours of the basic structure. Thus, as shown in FIGURE 6, the back of the chair is provided with a preformed cellular cushioning material 53 which rests against the front surface of the shell 1. In this part of the seating article the shell 1 is separated from the shell 2 by an air space 54. A flat piece of cushioning material 55 covered with upholstery 56 is also placed over the webbing 49 in the seat of the article and a seat cushion 57 is provided which consists of a cellular plastic material 58 upholstered with a cloth fabric 59. A small piece of cellular plastic 60 is also provided in the front of the chair and this is covered with a cloth fabric upholstering material 61. Cellular plastic cushioning material is also preferably provided along the insides of the basic structure as indicated at 62 and 63 and covered with a suitable upholstering material 64 which lines the remainder of the seating article including the front and rear side of the back.

It will be understood that the present invention is not concerned with the general idea of providing a seating structure in which the basic structure consists of two molded shells but rather is more specifically concerned with a structure of this type in which the molded shells are secured together with a frame having opposed channel portions which fit over the edges of the side and back portions of the shells. The general shell structure not involving the use of such a frame is the subject of another patent application and the same is true of the fastening means used to secure the springing or webbing in the seat of the seating article. One of the advantages of the present invention is that it provides a very strong basic structure for an article of seating. It also makes it possible to have the upper and lower shells of the basic structure manufactured at a distant point and shipped in nested relationship before being assembled at a point of assembly. With the type of structure herein provided no special jigs or fixtures are required to assemble the molded shells even where unskilled labor is used.

The invention is not limited to the use of any particular material in manufacturing the shells. Cellulose fibers are preferably employed but other materials which are moldable to self-sustaining structures may be used including, for example, thermoplastic sheet materials, mixtures of cellulose fibers and cut bundles of glass filaments, mixtures of cellulose fibers and synthetic fibers, including, for example, polyamides such as nylon and polyesters such as Dacron, mixtures containing rubber and mixtures containing synthetic rubber. The various mixtures may also contain binders or reinforcing substances. Thus, mixtures of cellulose fibers and cut glass rovings (½" to 6" in length) containing 5% to 95% cellulose based on the weight of the total fibers, and 5% to 25% by weight of a polyester resin afford excellent shell structures for the purpose of the invention. Similarly asbestos and other fibers may be used.

The thickness of the pre-molded foam cushioning may vary substantially, for example, from ¾" on the arms to 2½" to 3" on the backs and even more in the seat cushion. As previously noted, however, the composition of the shell structure and the type of cushioning used are not critical from the standpoint of this invention.

The invention is hereby claimed as follows:

1. A seating article comprising a pair of molded shells which are adapted to be secured together to form a combined seat, side and back structure, each of said shells having a side and a back edge portion extending toward the respective side and back edge portion of the other shell, and means securing said shells together at said side and back edge portions comprising a frame having opposed channel portions which fit over the edges of said side and back portions.

2. A seating article comprising a pair of molded shells which are adapted to be secured together to form a combined seat, side and back structure, said shells having substantially vertically extending portions on each side of the seat and marginal portions extending toward each other on each side of the back of the respective shells, and means on the respective sides of said shells securing said vertically extending portions together and said back portions together, said means comprising a frame having opposed channel portions which fit over the portions to be secured together and extend from the front to the back of the seating article on each side thereof.

3. A seating article comprising a pair of molded shells which are adapted to be secured together to form a com-

bined seat, side and back structure, said shells having substantially vertically extending portions on each side of the seat and marginal portions extending toward each other on each side of the back of the respective shells, and means on the respective sides of said shells securing said vertically extending portions together and said back portions together, said means comprising a generally L-shaped H-frame having opposed channel portions which fit over the portions to be secured together and extend from the front to the back of the seating article on each side thereof.

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