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V. B. BOLLING ETAL
MOLDED CHAIR CONSTRUCTION
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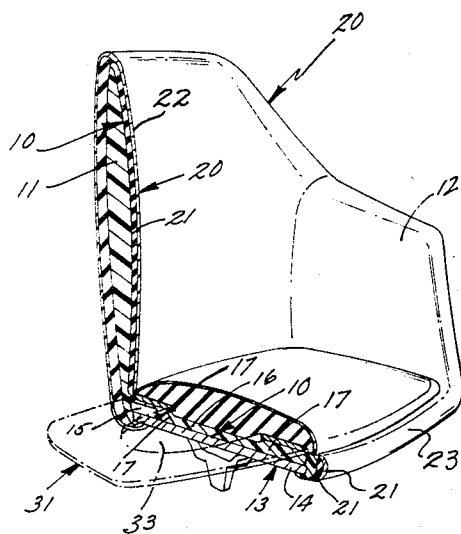


FIG. 2.

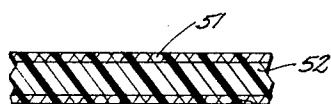


FIG. 4.

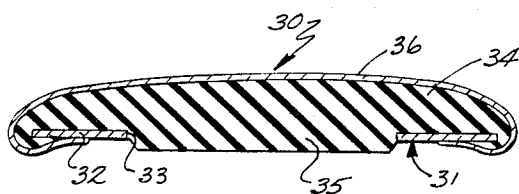


FIG. 3.

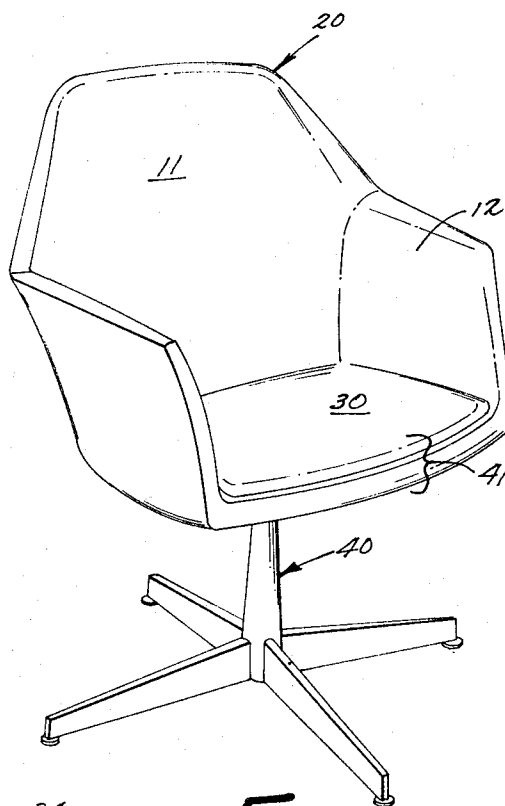


FIG. 1

INVENTORS
VERNON B. BOLLING
EDWARD C. LEVIT
BY *Price & Hennel*
ATTORNEYS

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MOLDED CHAIR CONSTRUCTION

Vernon B. Bolling and Edward C. Levit, Grand Rapids, Mich., assignors to Steelcase, Inc., Grand Rapids, Mich., a corporation of Michigan

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ABSTRACT OF THE DISCLOSURE

A chair construction embodying one integrally molded shell member which is fabricated by molding a rigid foamed urethane core with layers of weftless material on opposite surfaces thereof whereby the core is sandwiched between the layers. This shell has a seat section on the bottom of which is integrally molded a planar reinforcing member and on the upper surface of which a well or recess is provided. Mounted on this seat section is a seat board which has a central aperture with a padding member overlying the seat board. The padding member has a central portion which extends downwardly beyond the seat board into the well or recess of the shell's seat section. This construction provides a rigid, lightweight and relatively thin appearing seat section.

This invention relates to chair constructions and, more particularly, to such constructions embodying one integrally molded shell member.

The integrally molded shell type of chair construction has become increasingly popular in recent years. Some of the factors to which this popularity is attributable are the relatively light weight, the relative ease of manufacture, the relative strength and, of course, the over-all eye-appealing qualities which may be obtained through a construction process of this type. Usually, the chairs are fabricated by injecting a plastic such as urethane into a suitable mold.

As noted, the innovation of chair structures of this type has made possible streamlined chair configurations which possess many eye-appealing qualities and, thus, may be readily marketed. Many of these qualities, however, have markedly degraded the functional characteristics of the chairs and, thus, have produced many unhappy customers. Compare, for example, the desirability of having the actual seat section as thin as possible in order to provide optimum eye-appealing qualities with the desirability of having sufficient padding within the seat of the chair to make it comfortable to the occupant. These seemingly incompatible features have had a negative effect on the marketability of chair structures of the type described.

It is an object of this invention to provide a molded chair construction which is not subject to the disadvantages outlined above.

More particularly, it is an object of this invention to provide a molded chair structure which incorporates functional, as well as eye-appealing, characteristics and, therefore, provides a chair which is light in weight, comfortable in use and a decorator credit in any suitable surrounding.

It is an object of this invention to provide a chair of the type described which possesses sufficient structural qualities to prevent premature breaking or damage thereof during ordinary use.

It is an object of this invention to provide a chair of the type described wherein the lower seat section has an over-all thin appearance and, yet, is sufficiently padded to provide a comfortable seat.

It is yet another object of this invention to provide a unique article of the type described wherein the basic, rigid, foam structural member is re-enforced at particular strain points to prevent premature damage to the chair during the course of ordinary usage.

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It is an object of this invention to provide a chair having an integrally molded structural shell of the type described wherein the structural shell integrally cooperates with the seat padding member to provide a comfortable sitting surface.

These and other objects of this invention will be readily understood by those skilled in the art with reference to the following specification and accompanying figures in which:

FIG. 1 is a perspective view of a chair fabricated in accordance with the teachings of this invention;

FIG. 2 is a fragmentary, perspective view, partially in cross section, of the chair body which also indicates the over-all shape of the seat board in phantom lines;

FIG. 3 is a cross sectional view of the seat board, seat pad and the fabric covering therefor; and

FIG. 4 is a cross sectional view of the reinforced urethane shell.

Briefly, this invention comprises a single piece molded resin shell member having a seat section, a back section and generally opposite arm sections extending upwardly therefrom. The upper surface of the seat section has peripheral boundaries of greater thickness than the central section thereof and these boundaries define a recess in the central section.

A seat board is provided which is adapted to overlay the upper surface of the seat section. The seat board has a central aperture with boundaries generally corresponding to the boundaries of the recess in the seat section. A padding member, which has a generally continuous upper surface, overlays the seat board. The central portion of the padding member is of expanded thickness and extends downwardly from the lower surface of the pad, through the aperture in the seat board and into the recess in the seat section to provide a relatively thick padding at the body-contact surface and, yet, maintain the over-all thickness of the bottom of the chair within acceptable limits.

Structural rigidity and means for base and seat board attachment is provided by a plurality of reinforcing members molded integrally with the chair shell. Additional strength is gained by adding such materials as burlap, cotton, linen, felt, jute, paper, sisal or the like into the mold prior to the time that the foam is injected thereinto.

Referring now to the figures, a preferred embodiment of this invention will be described in detail. The shell member 10 has a back section 11, arm sections 12 and a seat section 13. The entire shell is molded in a single operation from suitable polymers to form the rigid structure shown. The shell may, for example, comprise rigid urethane foam. The reinforcing member 14, which is a piece of plywood, and the tacking strips 15 are placed into the mold and integrally bonded to the urethane foam during the molding process. Conveniently, the reinforcing member 14 may be predrilled prior to its placement in the mold to allow attachment of the base, chair iron mechanisms, or leg structure to be utilized with the chair.

At those points in the construction where it is desired to provide a higher degree of surface toughness and/or greater strength than is provided by the rigid urethane alone, burlap, cotton, linen, felt, jute, paper or other weftless suitable material is placed into the proper position in the mold prior to the introduction of the foam. During the molding process, the resin collects at the surfaces of the expanding rigid urethane foam and penetrates into the fibres of the inserts. As the foam cures, the fibres form a tough outer skin which automatically provides a composite or "sandwiched" structure having a high density, high strength outer skin surface, as well as a relatively light weight and high resistance to denting. Thus, as illustrated in FIG. 4, pieces of burlap 51 have been placed on opposite faces of the mold prior to in-

jection of the rigid urethane 52 to provide added strength and surface toughness at the particular location.

Of particular importance to this invention is the provision of a recess 16 within the central section of seat section 13 of the shell. The recess corresponds in size to the usual area of body contact of a person sitting in the chair and is defined peripherally by section 17 of the shell 10 which provides the requisite structural characteristics for the chair. The provision for recess 16 may, of course, be incorporated directly into the particular mold being utilized.

The back and arm sections of the shell are covered by a suitable shell covering 20 which may comprise, conveniently, a foam padding member 21 covered with a suitable fabric. The fabric is tacked to the bottom of reinforcing member 14 and, also, to the tacking strips 15. The tacking strips 15 are necessitated by the relative inability of the rigid urethane to retain tacks or other fabric fasteners. The padding 21 is also wrapped about the front edge of the seat section 13 as indicated at 23. This, of course, provides a relatively soft surface against which the back of the occupant's leg may rest.

The seat board assembly 30 comprises a seat board 31 having a ring-shaped periphery 32 defining an aperture 33 at the central section thereof. The outer periphery of seat board 32 corresponds to the general peripheral boundaries of the seat section 13 of the chair while the inner peripheral boundaries thereof correspond to and overlay the peripheral boundaries of recess 16 in the central section of seat section 13 (see FIG. 2).

Overlying seat board 32 and, conveniently, overlapping the edges thereof in the manner shown in FIG. 3 is a padding member 34 which may conveniently comprise flexible urethane upholstery material. The pad 34 has a depending section 35 adapted to protrude through and beyond aperture 33 in seat board 32 and completely fills recess 16 in shell 10 when the seat assembly 30 is in place. The pad 34 is secured to the seat board 31 by means of a fabric cover 36 which is tacked to the underside of seat board 32. The seat assembly 30 may be secured into the chair by gluing, tacking or other suitable means.

The assembly is completed by affixing a suitable base such as the support structure or legs 40 to the structural reinforcing member 14 which, as noted previously, may be predrilled before it is integrally molded into shell 10. The support structure 40 may, of course, be of a swiveling nature or, alternatively, may comprise conventional stationary legs.

Once the chair has been assembled, the co-action of the recess 16 in shell 10, the aperture 33 in seat board 32 and the depending section 35 of pad 34 provide a comfortable seating surface—i.e. a relatively thick padding at the point of body contact—while still rendering it possible to keep the thickness of the forward edge of the chair 41 within reasonable limits. This is accomplished without structurally weakening the shell of the chair by provisions of the peripheral sections 17 of the shell adjacent the recess 16.

While a preferred embodiment of this invention has been described in detail, it will be readily apparent to those skilled in the art that many other embodiments may be conceived and fabricated without departing from the spirit of this specification and the accompanying claims. Such other embodiments are to be deemed as included within the scope of the following claims unless these claims, by their language, expressly state otherwise.

We claim:

1. A chair comprising:

a single piece molded resin shell member having a seat section, a back section and generally opposite arm sections extending upwardly therefrom, said seat section having a generally planar reinforcing member integrally molded therewith along the lower surface thereof adapted to detachably receive a supporting

base mechanism, the upper surface of said seat section having peripheral boundaries of greater thickness than the central section thereof and defining a recess in said central section;

a seat board adapted to overlay the upper surface of said seat section, said seat board having a central aperture with boundaries generally corresponding to the boundaries of said recess when it overlays said seat section;

a padding member overlying said seat board, said padding member having a generally continuous upper surface and central portion of expanded width depending downwardly from the lower surface thereof, said central section adapted to fill said aperture and said recess when said padding member is placed thereover.

2. The structure as set forth in claim 1 which further comprises:

a series of tacking strips integrally molded within said shell adjacent the boundaries of said seat section, said back section and said arm sections;

a pad of resilient material enclosing said back and arm sections; and

a fabric covering overlying said pad, said covering being secured to said tacking strips within said shell and to said reinforcing member without said shell.

3. The structure as set forth in claim 2 which further comprises:

padding means overlying the forward edge of said shell between said arm section; and

fabric means overlying said padding means and affixed to said shell.

4. The structure as set forth in claim 1 which further comprises a fabric covering overlying the upper surface of said padding member, said covering curving around the edge of said seat board and being secured to the lower surface thereof.

5. The structure as set forth in claim 4 wherein said padding member curves around the forward edge of said seat board.

6. A chair comprising:

a single piece molded resin shell member having a seat section and a back section extending upwardly therefrom, the upper surface of said seat section having peripheral boundaries of greater thickness than the central section thereof to define a recess in said central section;

a seat board adapted to overlay the upper surface of said seat section, said seat board having a central aperture with boundaries generally corresponding to the boundaries of said recess when it overlays said seat section; and

a padding member overlying said seat board, said padding member having a generally continuous upper surface and a central portion of expanded width extending downwardly from the lower surface thereof, said central section adapted to fill said aperture and said recess when said padding member is placed thereover.

7. The structure as set forth in claim 6 wherein said shell member is reinforced by the introduction of weftless material into the mold prior to injection of the molded resin.

8. A chair comprising:

a single piece molded resin shell member having a back, opposing arm and seat sections, the upper edge of said back section curving downwardly from each side thereof and integrally joining said arm sections, said seat section having a generally planar reinforcing member integrally molded therewith along the lower surface thereof adapted to detachably receive a supporting base mechanism and having a recess in the upper surface thereof;

a seat board adapted to overlay said seat section, said seat board having an aperture with boundaries gen-

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erally corresponding to the boundaries of said recess when it overlays said seat section; and
a pliable padding member overlaying said seat board, said padding member having a central section of expanded width depending downwardly therefrom and adapted to be received by and fill said aperture and said recess.

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10 CASMIR A. NUNBERG, *Primary Examiner.*