

Dec. 18, 1951

H. H. CADMAN ET AL

2,579,361

CHAIR CONSTRUCTION

Filed May 1, 1948

FIG. 1.

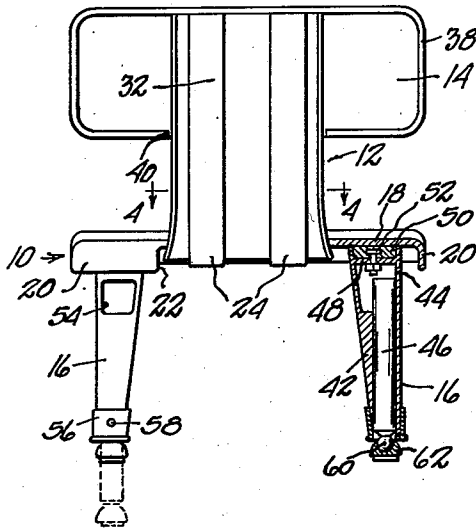


FIG. 2.

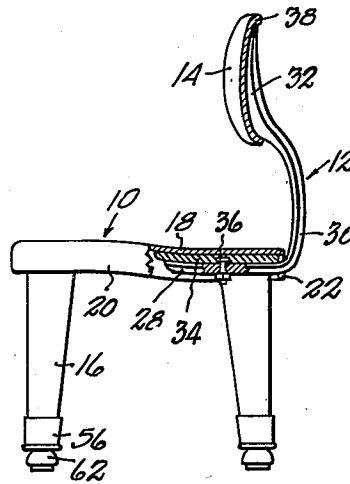


FIG. 3.

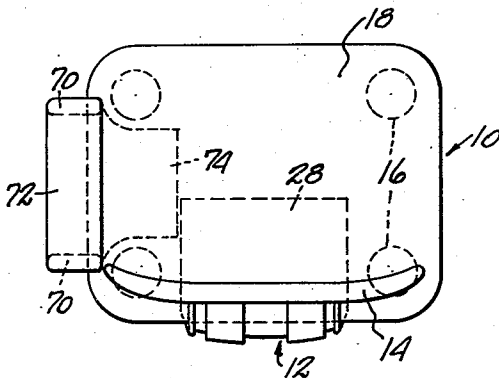


FIG. 5.

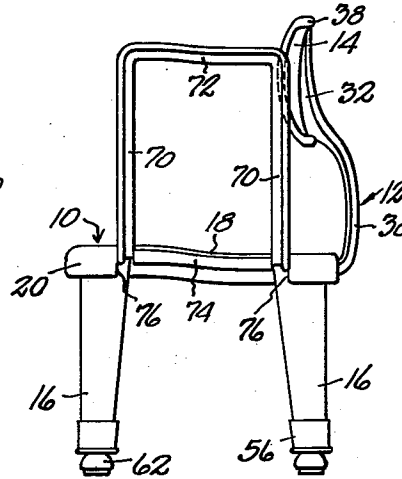
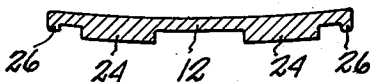


FIG. 4.



HARRY H. CADMAN.
JOHN J. DUCEY.
INVENTORS.

BY *Oltsch + Knoblock*

ATTORNEYS.

UNITED STATES PATENT OFFICE

2,579,361

CHAIR CONSTRUCTION

Harry H. Cadman and John J. Ducey,
Elkhart, Ind.

Application May 1, 1948, Serial No. 24,548

6 Claims. (Cl. 155—191)

1

This invention relates to improvements in furniture construction, and particularly to the construction of chairs, tables and other units, which are mounted upon legs or pedestals.

The primary object of the invention is to provide a novel furniture construction characterized by light weight, great strength, stability by reason of weight concentration at the legs thereof, ready cleanability, fire resistance, and resistance to damage by cleaning agents and disinfectants.

A further object is to provide a furniture construction formed of synthetic material of great tensile strength, such as molded or shaped fiber glass or other synthetic materials in the nature of thermoplastic resins or thermosetting plastics, or materials of this character reinforced or filled with fibrous material, wherein the parts are shaped to be of desired contour and configuration for comfort and convenience, are reinforced where necessary, and are constructed to be secured together either by fusing of the parts or by the use of mechanical interlocks or by a combination of the use of mechanical interlocks and fused joints.

A further object is to provide a chair construction well adapted for use by children and especially suited, by virtue of the shape thereof, for use by physically handicapped persons, to control posture when seated and to facilitate assumption of a seated position thereon, and also to facilitate rising therefrom.

A further object is to provide an article of furniture having a novel adjustable leg structure.

Other objects will be apparent from the following specification.

In the drawing:

Fig. 1 is a rear elevational view of a chair with parts shown in section to illustrate the construction thereof.

Fig. 2 is a side view of a chair with parts shown in section.

Fig. 3 is a top plan view of a chair.

Fig. 4 is a cross-sectional view of the chair back support taken on line 4—4 of Fig. 1.

Fig. 5 is a side elevational view of a chair provided with an arm rest.

Referring to the drawing which illustrates the preferred embodiment of the invention as applied or embodied in a chair, the numeral 10 designates the seat of the chair which mounts a backrest support 12 having a backrest 14 secured thereto. The seat 10 is mounted upon legs 16.

The seat 10 is formed or shaped in desired size and configuration having a continuous panel 18

2

bounded by marginal flanges 20 depending therefrom. At the rear of the chair the flange 20 is cut away at 22, as illustrated in Fig. 1.

The backrest support 12 is formed of an elongated member of the cross-sectional configuration best illustrated in Fig. 4, characterized by a wide plate portion from which a pair of longitudinal ribs 24 project. The opposite margins of the backrest support are preferably provided with rearwardly projecting marginal flanges 26. The configuration of the part 12 is best illustrated in Fig. 2, from which it will be apparent that the same has a substantially horizontal portion 28 shaped to conform with the contour of the bottom surface of the plate 18 and of a length to extend substantially one-half the length of said seat, that is, one-half the distance from the back to the front edge of the seat. The intermediate portion of the backrest support is bent at 30, and the portion 32 of the backrest support which engages the backrest 14 is reversely curved. The parts are so formed and proportioned that the backrest 14 preferably is located above and slightly forwardly spaced from the rear edge of the chair seat 10 to bear against the back of the user slightly above his hips and spaced below his shoulders. As best illustrated in Fig. 2, the portion 32 may be somewhat tapered toward its upper end, although this is optional. One or more reinforcing plates 34 are fused, bonded or otherwise anchored to the bottom surface of the chair seat panel 18. The portion 28 of the backrest support is suitably secured to the reinforcing plate or plates 34, preferably by bonding or fusing thereof; however, mechanical interlocking means between these parts may be provided as illustrated in Fig. 2, said mechanical interlocking means comprising bolts having head portions 36 imbedded in the plates 34 and their shanks projecting therebelow and passing through openings formed within the backrest support 28 so that nuts may be threaded upon said shanks and drawn tight for anchorage purposes.

The backrest 14 is bonded or fused to the backrest support 12 at the upper end of the latter and is preferably curved, both longitudinally and transversely, as illustrated. A marginal flange 38 may be formed integrally with and project rearwardly from the backrest, preferably being notched at 40, as illustrated in Fig. 1.

The seat 10, backrest support 12 and backrest 14 are preferably formed of fiber glass, molded or shaped in desired contour and configuration by any means found suitable. The fiber glass is of the character commonly known on the market

3

and comprises glass fibers which are bonded together by a suitable resin. Such material possesses great strength, resistance to impact, fire resistance and resistance to injury by cleaning and disinfecting materials. It will be understood that while the formation of this chair or other furniture parts from fiber glass is preferred, the parts may be formed of other material, such as molded or shaped thermosetting plastics or thermoplastic resins, used either in solid or pure form, or filled with fibrous reinforcing material, such as paper pulp, cloth, threads or the like. The molding or shaping of the parts permits them to assume desired contours for rigidity, strength and attractive and decorative appearance. Further, it reduces to a minimum the necessity of any finishing, machining or shaping operations performed upon the material after it has been shaped by the initial molding thereof.

The legs 16 of the article of furniture are preferably constructed as illustrated in Fig. 1. In this form the legs each comprise a molded elongated hollow structure preferably tapered as shown and having a main lower body portion 42 having a comparatively thick wall, and an upper reduced wall portion 44 defining a cavity above the portion 42. The portion 42 will preferably have a cylindrical bore therethrough within which an extension member, such as a metal rod 46, may fit slidably for guided vertical adjustment. A transverse wall 48 spans the upper end portion of the leg structure spaced below its end and cooperating with the side walls 44 to define an end socket or recess adapted to fit around a body 50 in the form of a plug secured to the bottom surface of the panel 18 of the chair seat by bonding or fusing. The inner surfaces of the socket will preferably be shaped to conform and fit snugly upon and around the plug 50 and may be fused or bonded thereto for the purpose of assembly of the parts. Alternatively, the plug or plugs 50 may have the head portion 52 of a bolt imbedded therein so that its shank projects downwardly therefrom for passage through an aperture in the transverse wall 48, so that a nut may be threaded upon the lower end of the shank of the bolt as shown in Fig. 2. In the forms using the mechanical interlock, a cut-out 54 will preferably be formed in the wall 44 of the chair leg so that access may be had to the interior cavity of the leg for adjustment and manipulation of the nut upon the bolt. A metal cup-shaped fitting 56 fits around the lower end portion of the leg and is adapted to mount and anchor a set screw 58 adapted for end bearing engagement with the rod or bar 46 for the purpose of anchoring said bar fixedly in selected adjustment endwise to the leg unit 16. The bar 46 preferably has a part-spherical head 60 formed at its lower end, and a foot portion 62 of any suitable construction is provided with a socket to have a swivel or universal connection with said head 60.

It will be apparent that the leg construction described has considerable strength by virtue of its tubular form, it being understood that the same may be made of fiber glass or other plastic or resin material shaped or molded to desired contour. The anchorage or connection of the leg with the seat, or, in the case of a table, with the table top, is firm and solid. The leg is adapted for longitudinal adjustment, as will be apparent, the adjusted or extended shape of the leg being illustrated in dotted lines at the left in Fig. 2. The extent to which the leg is adjust-

4

able may vary, and the bar 46 may be locked in any extended position by the manipulation of the set screw. One of the characteristics of this construction is the elongated tubular guide for the bar 46 formed by the portion 42 of the leg structure. Another important characteristic of the construction is that the swivel or universal joint which mounts the foot 62 accommodates the firm and stable bearing of the bottom of the leg upon any irregularity in the contour of a supporting surface.

The chair may be provided with an armrest, as illustrated in Fig. 5 and at the left in Fig. 3. Such armrest may be molded or shaped from the same fiber glass, thermoplastic resin or thermosetting plastic material mentioned above with a suitable cross-sectional configuration of the parts thereof to produce the required strength. As here illustrated, each armrest is formed in one unitary and integral part having uprights 70, the upper armrest 72 and a bottom plate portion 74 which bears against the bottom of the panel 18 of the chair seat. The plate portion 74 is shaped or contoured to correspond with the shape or contour of the bottom surface of the panel 18 and is of substantial size or area, as best illustrated in Fig. 3, so that by fusing or bonding thereof to the seat panel 18 a firm and rigid construction results. The uprights 70 may be formed of any desired curvature or contour and preferably are longitudinally curved in an upward direction adjacent the seat and then converge upwardly and inwardly so that the upper portion 72 assumes the lateral position best shown in Fig. 3. The marginal flanges 20 at the sides of the seat 10 are cut away at 76 to accommodate the assembly of the armrest units with the chair seat and to facilitate the positioning of the parts as described.

Where the terms "bonding" or "fusing" are used herein, it will be understood that they refer to the use of any material which may be used with the thermoplastic resin or the thermosetting plastic for the purpose of effecting a bond. Thus in the case of thermoplastic resins, the bonding agent may include a solvent for the resin which permits the integral bonding or joining of the engaging resin parts which have been softened by the application of the bonding agent. Other types of bonding agents which are suitable for the effecting of a fused or bonded joint may be used, if desired.

While the invention has been described and illustrated herein as applied to the construction of a chair, it will be understood that the same is applicable to any other article of furniture which is mounted upon legs or pedestals, such as a table, a stand or the like. The same construction of leg may be used in such articles of furniture, and the various parts, such as the table or tray top, may be molded and shaped, and may be anchored or supported upon the ends of the legs in the same manner illustrated and described herein for mounting the chair seat upon the legs.

While the preferred embodiment of the invention has been shown and described herein, it will be understood that changes in the construction may be made within the scope of the appended claims without departing from the spirit of the invention.

We claim:

1. An article of furniture comprising a plurality of legs and a substantially horizontal seat panel supported on and secured to said legs, each of said legs and seat panel being formed separately from

5

rigid plastic material, each leg having a socket formed in the upper end thereof defined by an integral longitudinal tubular portion and a transverse portion spaced inwardly from the upper edge of said tubular portion, and a plurality of depending portions fused to the bottom of said seat panel and each of a size and shape to fit snugly in said leg socket in face engagement with said tubular and transverse portions, said depending portion and leg socket portions being fused together.

2. An article of furniture comprising a plurality of legs and a substantially horizontal seat panel supported on and secured to said legs, each of said legs and seat panel being formed separately from rigid plastic material, each leg having a socket formed in the upper end thereof defined by an integral longitudinal tubular portion and a transverse portion spaced inwardly from the upper edge of said tubular portion, and a plurality of depending portions fused to the bottom of said seat panel and each of a size and shape to fit snugly in said leg socket in face engagement with said tubular and transverse portions, at least the upper end of each leg being hollow, said hollow part being spanned by a wall defining said transverse portion.

3. An article of furniture comprising a plurality of legs and a substantially horizontal seat panel supported on and secured to said legs, each of said legs and seat panel being formed separately from rigid plastic material, each leg having a socket formed in the upper end thereof defined by an integral longitudinal tubular portion and a transverse portion spaced inwardly from the upper edge of said tubular portion, and a plurality of depending portions fused to the bottom of said seat panel and each of a size and shape to fit snugly in said leg socket in face engagement with said tubular and transverse portions, at least the upper end portion of each leg being hollow and divided and spanned by a wall defining said transverse portion, a securing member including a part partially embedded in and projecting from said depending portion and extending through said wall to mount a part bearing against said wall, said leg having an access opening below said wall.

4. A chair comprising a seat supported in elevated position, a backrest, and a backrest support, each of said parts constituting a molded plastic panel, said seat and backrest having integral

6

marginal reinforcing flanges interrupted to accommodate and receive said support for face engagement and bonded connection with the panels thereof, said backrest support being of substantially L-shape and having a plurality of longitudinal integral thickened portions defining reinforcing flanges.

5. A chair comprising a seat supported in elevated position, a backrest, and a backrest support, each of said parts constituting a molded plastic panel, a molded plastic reinforcing panel bonded to the bottom surface of said seat, a bolt having a head imbedded in said reinforcing panel and a shank depending therefrom, said support including a forwardly projecting lower portion in face engagement with said reinforcing plate and apertured to receive said shank, and a fastener mounted on the lower end of said shank.

6. A chair comprising a seat supported in elevated position, a backrest, a backrest support and arm rests, each of said parts constituting a molded rigid plastic member, said seat constituting a panel having an integral depending marginal flange interrupted at its sides and back, each of said arm rests and said support including a substantially horizontal lower end portion passing between the edges of said flanges at said interruptions and bonded in face engagement with the bottom surface of said seat panel.

HARRY H. CADMAN.
JOHN J. DUCEY.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
705,653	Davis	July 29, 1902
842,641	Fernau	June 29, 1907
1,088,468	Smith et al.	Feb. 24, 1914
1,520,589	Matkovic	Dec. 23, 1924
1,580,522	Murray	Apr. 13, 1926
1,734,340	Overton	Nov. 5, 1929
1,934,746	Stoddard	Nov. 13, 1933
2,359,918	Johnson	Oct. 10, 1934

FOREIGN PATENTS

Number	Country	Date
582,740	Great Britain	Nov. 26, 1946