SLED BASE FRAME CHAIR

Inventors: Chester J. Barecki, Grand Rapids; Bror W. Henrikson, Wayland, both of Mich.


Filed: June 3, 1971

Appl. No.: 149,703

U.S. Cl. 297/239, 297/457, 297/DIG. 2

Field of Search 297/239, 297/457, DIG. 2, 297/452, 218, 248

References Cited

UNITED STATES PATENTS

2,731,076 1/1956 Rowland.............. 297/457 X
3,222,108 12/1965 Pablos............... 297/457
3,365,233 1/1968 Uyeda.................. 297/239

3,031,227 4/1962 Van Buren.............. 297/239
3,328,075 6/1967 Albinson............... 297/239
3,146,028 8/1964 Grosfillex............. 297/457 X
3,261,640 7/1966 Strait................ 297/248 X
3,194,601 7/1965 Hoven.................. 297/248
3,404,916 10/1968 Rowland.............. 297/239

Primary Examiner—Francis K. Zigler
Attorney—Dawson, Tilton, Fallon & Lungmus

ABSTRACT

A chair has a generally U-shaped tubular frame with the bottom portion of the U bent upwardly and provided with bracket shoes and with the rear portion of the frame formimg sled runners merging into vertical back risers and, cooperating with the frame, is a one-piece plastic shell forming a seat and back provided with pockets which receive the bracket shoes of the frame front and the frame back risers to interlock the shell and chair frame.

6 Claims, 24 Drawing Figures
SLED BASE FRAME CHAIR

BACKGROUND AND SUMMARY

Simplifying the structure of a chair and the assembly of parts with a minimum of labor, while also permitting stacking of the chairs, has been a problem over the years. We have discovered that a chair frame can be provided to interlock with a plastic chair shell in such a manner invention; production costs are low, assembly cost is greatly reduced, while at the same time a very sturdy and serviceable chair is obtained and which can be stacked to save space. Such a chair has the generally U-shape shown in the drawings, and the shell is equipped with pockets for interlocking with the frame parts, bumpers being provided to protect the frame structure during stacking. By employing a one-piece sculptured shell, which interlocks with the frame, great stability can be obtained without additional fastening parts.

DRAWINGS

In the accompanying drawings,

FIG. 1 is a front perspective view of a chair embodying our invention;

FIG. 2, a rear perspective view of the chair shown in FIG. 1;

FIG. 3, a view similar to FIG. 2 showing a smaller tube structure with a cross brace;

FIG. 4, a view similar to FIG. 3 but showing a round brace bar;

FIG. 5, an exploded view of a chair such as is shown in FIG. 2, the parts being separated;

FIG. 6, a perspective view of several chairs in stacked relation;

FIG. 7, a perspective view of a chair glide and its attaching speed clip;

FIG. 8, a broken front view of the chair frame showing the glides and bumpers applied to the frame;

FIG. 9, a broken rear view of the chair assembly with a larger tubing frame, as shown in FIG. 2;

FIG. 10, a view similar to FIG. 9 but showing the smaller tubing with a square cross tube having two drive bumpers inserted into the lower side of the cross tube;

FIG. 11, a rear view similar to FIG. 10 showing two conical bumpers at the extremity of the cross rod;

FIG. 12, a view similar to FIG. 11 but showing the round cross brace provided with cylindrical bumpers;

FIG. 13, a perspective view of the plastic shell positioned on its side to show the seat pockets and back pockets;

FIG. 14, a fragmentary side view of a seat pocket, the view being taken at line 14—14 of FIGS. 13 and 15 but with the seat attachment brackets or shoes shown in the pocket;

FIG. 15, a fragmentary sectional view of the seat pocket and attachment bracket, the section being taken at line 15—15 of FIG. 14 to show the bearing surface of the shell seat;

FIG. 16, a fragmentary sectional view of the back pocket with the end of the back tube or riser in it, the section being taken as indicated at line 16—16 of FIGS. 13 and 17 to show the bearing surface of the shell back;

FIG. 17, a fragmentary sectional view of the back pocket and back tube or riser, the section being taken at line 17—17 of FIG. 16 to show the bearing surface of the shell back;

FIG. 18 a fragmentary side view, similar to FIG. 16 to show the end of the back tube or riser in the pocket;

FIG. 19, a fragmentary sectional view of the end of the small back tube or riser to show how the riser is reformed to fit into the recess of the back tube;

FIG. 20, a sectional view of the reformed tube, the section being taken as indicated at line 20—20 of FIG. 19;

FIG. 21, a fragmentary sectional view similar to FIG. 17 showing the reformed tube end in the back pocket;

FIG. 22, a fragmentary perspective view of the end of the small left back tube or riser with shims welded to its front and left side surfaces;

FIG. 23, a sectional view of the tube and shims, the section being taken at line 23—23 of FIG. 22;

and FIG. 24 a fragmentary perspective view, similar to FIG. 21, with tube and attached shims shown in the back pocket.

DETAILED DESCRIPTION

In general, applicants have provided a two-piece chair structure, one piece consisting mainly of the tubular chair frame, and the other piece consisting of a plastic shell providing a back and seat. The shell is provided with pockets under the seat portion and pockets at the rear of the back portion which are united with the frame to form a complete chair structure. If the frame tubes are made smaller in cross section, we prefer to add a cross brace at the rear of the frame near the seat to provide a sturdy structure even though smaller tubing is employed. For facility in construction, we prefer the back pockets of a uniform size, and when smaller tubing is employed the top of the tubing may be provided with reformed or enlarged ends or with shims so as to fit snugly within the back pockets.

The tubular frame, which is preferably square in cross section, is generally U-shaped with the bottom portion of the U bent upwardly and provided with bracket shoes and with the rear portion of the frame forming sled runners merging into vertical back risers. The one-piece shell, formed of any suitable material but preferably formed of plastic, provides a seat and back, the seat being provided with pockets to receive the bracket shoes of the frame and the back being provided with pockets to receive the rear risers of the frame.

The runner portion of the frame is preferably spread apart to enable the chairs to be stacked, as shown best in FIG. 6, and the rear of the frame is provided with bumpers of resilient material, such as rubber, plastic, etc., to protect the frame parts during stacking and unstacking. We also prefer to provide the runners with glides of plastic, metal, or any other suitable material, with lips on the inner side to protect the chairs during stacking.

Referring to the drawings, the chair 30 consists of a one-piece sled base chair frame 31 and a one-piece sculptured plastic shell 32, the frame 31 being made of square tubing of moderate size as three-fourths inch in cross section, or of small size such as five-eighths inch in cross section. For the moderate size tubing, as shown in FIGS. 1 and 2, the only addition to the frame is a pair of seat mounting bracket shoes 33 which are welded in place, as shown in FIG. 5.

If the small size tubing is used, we prefer to employ a cross brace which may consist of a piece of square
The chair frame 31 may be equipped with glides 36 which are designed with a lip 37 to act as a bumper when the chairs are stacked, as shown in FIGS. 6, 7 and 8. The glide base 38 is rectangular in shape and has a cylindrical stem 39 for attachment to the chair frame by the use of a speed clip 40. The speed clip 40 slips onto the stem, with the flange 41 down, resting on the glide base 38. Then the stem and clip are inserted into a hole in the square tube and are held firmly in place by the springs 42 which prevent them from being pulled out. The slightly inwardly tilting upper portion 43 of the clip digs into the stem and prevents the stem from being removed from the clips.

There are two drive bumpers 44 in the upper portion of the frame front, as shown in FIG. 8, and these afford added protection to the preceding chair being stacked. FIGS. 9 through 12 show bumper protection at the rear of the chair. On the frames of the larger square tubing, a pair of barrel-type bumpers 45 are attached to the back tubes 46 with a blind pop rivet 47 for each bumper, as shown in FIGS. 2 and 9. On the frames of the smaller square tubing where a cross brace of square tubing 34 is used, a pair of drive bumpers 48, as shown in FIG. 16, are driven into holes in the lower surface of the cross tube. A notch 49 may be cut out of the corner of the shell side 50, and pop rivets 51 may be used to hold the shell side in place.

When a round rod 35 is used as a strengthening brace on the frame, as shown in FIGS. 4 and 11, conical bumpers 52 may be placed on the ends to protect the preceding chair and to hold down the lower shell side as the rod is attached. An alternate method is to use a pair of cylindrical bumpers 53, as shown in FIG. 12.

As shown in FIG. 13, the plastic shell has two seat pockets 54 and two back pockets 55. The seat pocket has a bearing rib 56 resting on the top flat surface of the seat mounting bracket, as shown in FIGS. 14 and 15. There is a slight notch 57 in the rib, at the rear of the bracket, to prevent the bracket or shoe 33 from sliding out of the pocket after it has been snapped into place. There is also a notch designated 58 in FIGS. 13 and 14 in the long front-to-rear rib 59 which makes up one side of the pocket, this notch allowing ample room for the front cross tube or brace 60 of the chair frame 31, as shown in FIGS. 5 and 14.

As shown best in FIGS. 16, 17 and 18, the back pocket is between the lower shell side 50 and the upper shell side 61, both of which rest against the sides of the back tube or riser 46. There is a bearing rib 62 which rests against the front side of the back tube 46. The pocket top 63 is at a steep angle, being inclined rearwardly and downwardly, to hold the tapered end 64 of the back tube or riser inside the pocket.

As shown best in FIG. 17, the sides of the back tube rest against the upper and lower shell sides, and the front side rests against the rear surface of bearing rib 62, while the rear side of the back tube is flush with the rear edges of the shell sides, the larger square tubing, as shown in FIGS. 1 and 2, being used. When the smaller square tubing, as shown in FIGS. 3 and 4, is used, the upper end of the back tube must be enlarged so as to fit into the same pocket. FIG. 19 shows the upper end of the tube or riser reformed at 65 and 66, while FIG. 22 shows two shims 67 and 68 welded to the front and left side of the tube. FIGS. 20 and 23 are cross sectional views of the two structures for adapting the tube ends to fit the back pockets, and FIGS. 21 and 24 show how the modified tubes fit snugly in the pocket.

While in the foregoing description we have set out specific structures in considerable detail for the purpose of illustrating the invention, it will be understood that such details may be varied widely by those skilled in the art without departing from the spirit of our invention.

We claim:

1. A chair structure comprising a one-piece plastic shell chair body providing an integral seat and back, said seat having a pair of longitudinally extending, laterally spaced ribs on its underside and first and second seat pockets located adjacent the forward ends of said ribs respectively and partially defined thereby, each pocket being further provided with an upper longitudinal bearing rib defining a notch to engage an associated mounting bracket, said back having first and second lower shell sides and an upper shell side extending outwardly of said both of said first and second lower shell sides and cooperating therewith to provide a pair of back pockets, one at each side of said chair back; and a one-piece tubular frame member formed to provide first and second side leg structures each including a bottom runner and front and rear legs extending upwardly and inwardly of their associated runners, said frame member forming a cross brace for supporting said seat and extending between the upper parts of said front legs and provided with a pair of mounting bracket shoes received in said seat pockets and held in snapping engagement in the longitudinal bearing rib of the associated seat pocket, the upper portions of the rear legs of said frame extending upwardly to provide risers, each riser received in one of said back pockets for supporting said chair back, said bottom runners of said side leg structures being offset outwardly of their associated front and rear legs whereby a plurality of chair structures may be stacked vertically with the front and rear legs of an upper chair being located forwardly of and parallel to the corresponding forward and rear legs of a lower chair when said chairs are in stacked relation.

2. The structure of claim 1 wherein each of said back pockets further comprises a top formed integrally with said chair back and extending rearwardly and downwardly thereof, and wherein the upper ends of each of said risers is tapered according to the inclination of its associated pocket top and engages the underside thereof when received in its associated back pocket, whereby said inclined pocket top engages and holds the upper tapered end of its associated riser.

3. The structure of claim 2 wherein each of said back pockets further includes a generally vertical bearing rib located at the central forward portion of the pocket to engage the front side of an associated riser.

4. The structure of claim 1 further comprising a second cross brace interconnecting said leg structures adjacent the junction between the seat and back portions of said chair shell.

5. The structure of claim 4 further comprising first and second bumpers adjacent the distal ends of said second cross brace for separating two chairs assembled in stacked relation.

6. The structure of claim 1 further comprising a plurality of glides on each of said runners, each glide in-
including a base and an inner lip, said lip serving as a bumper when two chairs are stacked, said base including a cylindrical stem, said structure further including a clip for each glide, each clip including a lower flange and outwardly extending spring means for holding said clip within a runner, each clip receiving and engaging the stem of an associated glide.

* * * * *