Oct. 4, 1966 S. A. DURFEE ETAL 3,276,818

CHAIR CONSTRUCTION

Filed May 25, 1965 2 Sheets-Sheet 1

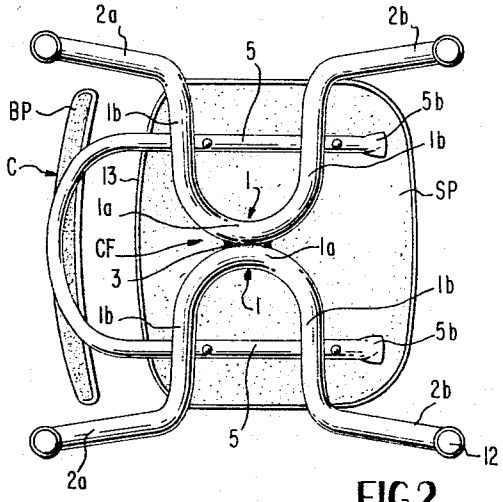


FIG.2

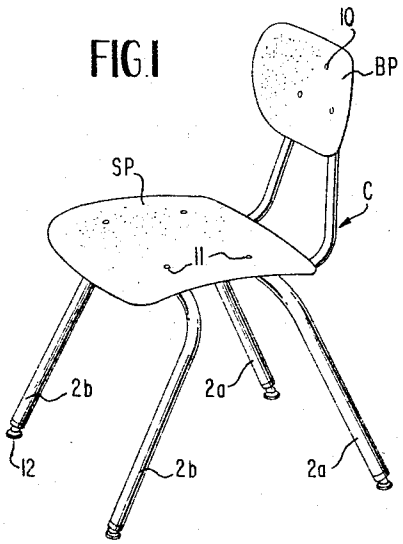


FIG.1

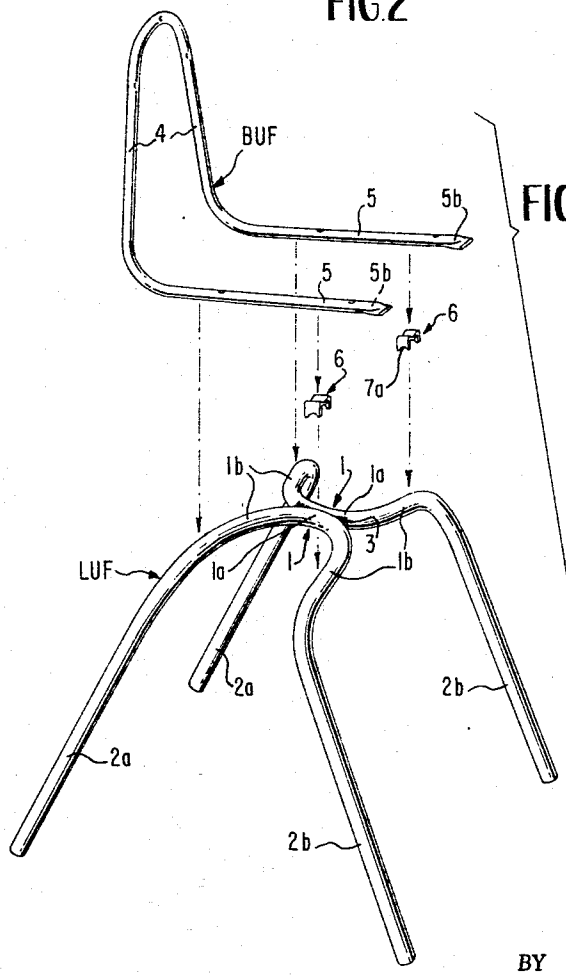


FIG.5

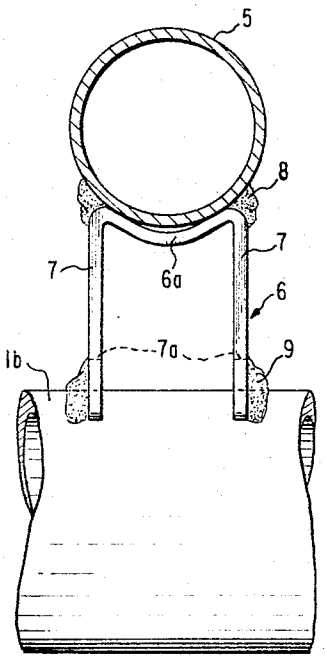


FIG.6

INVENTORS
SIDNEY A. DURFEE
BENNIE L. CULWELL
RAYMOND C. BARNES

BY Baldwin & Wight
ATTORNEYS

Oct. 4, 1966 S. A. DURFEE ETAL 3,276,818

CHAIR CONSTRUCTION

Filed May 25, 1965 2 Sheets-Sheet 2

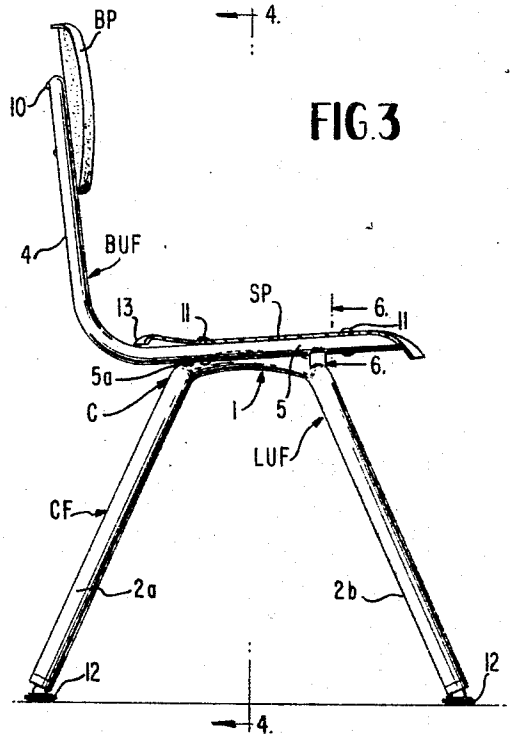


FIG.3

FIG.4

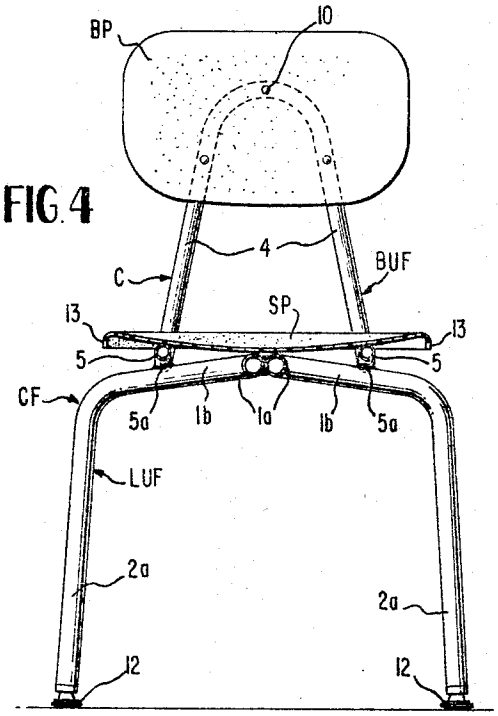


FIG.7

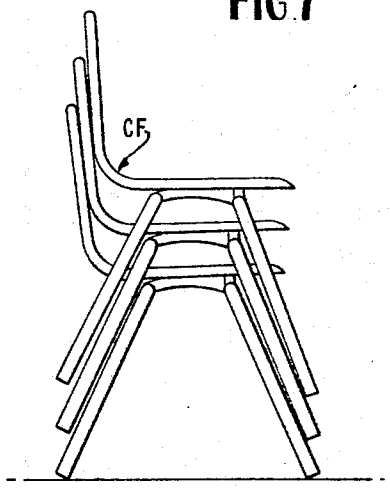
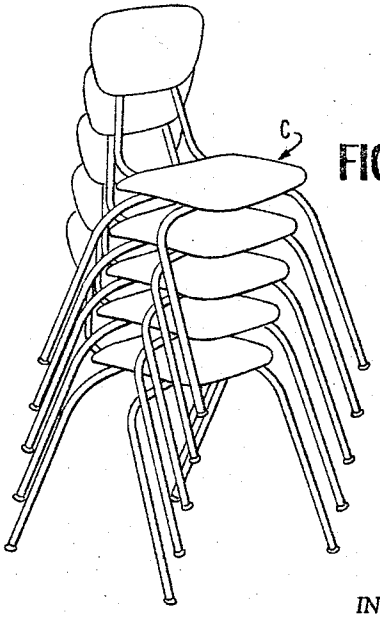


FIG.8



INVENTORS
SIDNEY A. DURFEE
BENNIE L. CULWELL
RAYMOND C. BARNES

BY Baldwin & Wight
ATTORNEYS

United States Patent Office

3,276,818

Patented Oct. 4, 1966

3,276,818

CHAIR CONSTRUCTION

Sidney A. Durfee, Bennie L. Culwell, and Raymond C. Barnes, all of Temple, Tex., assignors to American Desk Manufacturing Company, Temple, Tex., a corporation of Texas

Filed May 25, 1965, Ser. No. 458,546
13 Claims. (Cl. 297—445)

This invention relates to chair constructions and more particularly to chair constructions including frames constituted by elongated elements, e.g. tubes or bars, bent or otherwise formed to provide legs, back supporting means, and seat supporting means.

Steel tubing of various sizes has been bent and welded in many configurations to make various frames which, supporting seats and backs of various shapes and materials, have constituted chairs. The instant invention, however, represents that particular configuration and that particular construction method for a chair frame made of bent and welded steel tubing which is the simplest, most efficient, and, in summary, the most economical for making a chair frame which, when supporting a seat and back of any material, but in particular when supporting a seat and back of a resilient plastic material, can provide the degree of functional performance which the instant chair frame provides. The degree of functional performance includes, for example, the extreme strength and endurance demanded for satisfactory use in classrooms by contemporary schools, the high degree of comfort required for maximum learning of seated occupants, the injury-proof characteristics demanded for the safety of immature student users, light weight and easy movability, stackability and the "wall-saving" characteristic.

Accordingly, an object of this invention is to construct the chair frame of only two basic forms of bent tubing parts—one leg member part and one back post part. Two identical leg member parts plus one back post part are so bent that, when joined by means which may include two spacer parts, a complete chair frame is formed.

Another object of this invention is for the frame to so position the back and seat of the chair that the latter are at the proper heights, angles and distances in relation one to the other for the ideal support of the seated human body according to anatomical and anthropometric considerations.

Another object of this invention is for the frame to provide the maximum necessary structural strength and endurance, throughout the chair generally and in supporting the seat and back members of the chair, particularly, while at the same time allowing as much flexibility or resilience as possible throughout the chair generally and in the seat and back portions particularly. More specifically, this invention achieves this objective of providing the aforesaid maximum resilience without sacrifice of full strength and endurance by the most economical means of exploiting the natural resiliencies of the steel tubing used to make the chair frame and of the flexible plastic material used to make the seat and back. The instant method of frame construction ideally distributes any load upon the chair throughout the entire chair frame, and when the chair is in the upright position of its normal use as a seat, any load exerted downwardly upon it is distributed out through all four legs evenly to floor or ground. With the strength thus gained, the legs and entire frame of the chair can be constructed of lightweight tubing which will flex and yet provide a firm, non-twisting, non-distortable support. Furthermore, this method of frame construction gives a broad bearing surface on its members for seat mounting and seat support while maintaining cross-member type bracing. The under-seat construction of the frame provides support of a flexible

seat along the full side perimeters of the seat, with such support terminating at the two front corners of the seat in the two tube ends of the back post member which are formed to conform to the contour of the seat, and terminating at the back two corners of the seat where the back reinforcing flange of the seat is positioned just above the under-seat frame so that downward vertical forces exerted upon the back portion of the seat cause the aforesaid flange to flex downwardly and be supported by the under-seat frame structure. The center weld of the under-seat frame is the focal load-bearing point for downward vertical forces, and it underlies the center of the flexible seat, allowing room for the seat to flex downward a fraction of an inch and, at the same time, giving maximum support to the seat beyond this controlled point of flex.

The spacer parts are usually desirable for the attainment of some of the aforesaid objects of this invention, because they make possible the interchangeability of the leg member parts simultaneously with the proper positioning of the seat and back for the attainment of the other aforesaid objectives.

A further object of this invention is to provide a chair which will stack vertically with seats and backs attached or unattached.

A further object of this invention is to provide a chair which will have the "wall-saving" characteristic—that is, the back legs of the chair extend in the horizontal plane behind the rearmost point of the back member of the chair so that when the chair is pushed backward against a wall, the legs come in contact with the baseboard so as to prevent the back of the chair from coming in contact with the wall.

Other objects of the invention will become apparent from a reading of the following description, the appended claims, the accompanying drawings, in which:

FIGURE 1 is a perspective view of a chair embodying the invention;

FIGURE 2 is a bottom plan view;

FIGURE 3 is a side elevational view, a seat panel being shown in vertical section;

FIGURE 4 is a vertical section on the line 4—4 of FIGURE 3;

FIGURE 5 is an exploded perspective view of the parts of the chair frame;

FIGURE 6 is a fragmentary section on the line 6—6 of FIGURE 3, on an enlarged scale, showing in detail a spacer between a part of a leg and under-seat frame member and a part of a back and under-seat frame structure;

FIGURE 7 is a side elevation of a number of chair frames stacked on one another; and

FIGURE 8 is a perspective view of a number of complete chairs stacked on one another.

The invention may be embodied in chair frames and chairs particularly designed and sized for various uses. The invention is illustrated as being embodied in a school chair C comprising, generally, a chair frame, CF, a seat panel SP, and a back panel BP.

Preferably the frame components are formed of tubing of steel or other suitable metal, the frame elements being bent or formed to novel shapes and being assembled in a novel way. The chair frame components are semi-rigid, preferably having a degree of yieldability such as to permit adaptation to small unevenness in floor surface and avoidance of shock when being sat upon. The seat panel SP and back panel BP may be formed of various materials commonly used for such purposes, one preferred material being molded, somewhat resilient plastic material.

More particularly considered, the chair frame CF comprises two unitary combination leg and under-seat frame members LUF, and one back and under-seat frame structure BUF uniquely formed and assembled as described below in detail.