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3,133,762

NESTING AND INTERLOCKING CHAIRS

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2 Sheets-Sheet 1

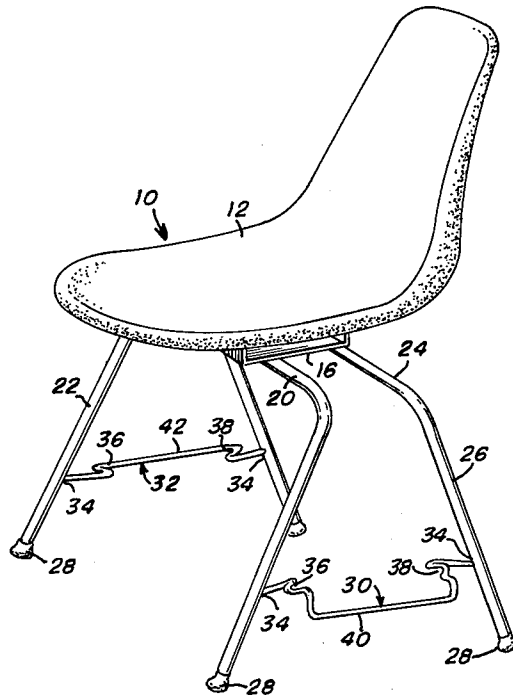


FIG. 1

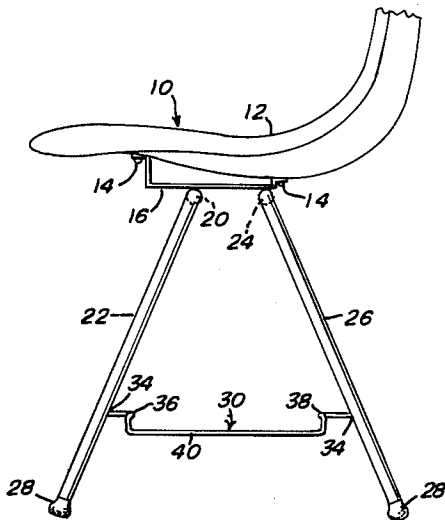


FIG. 2

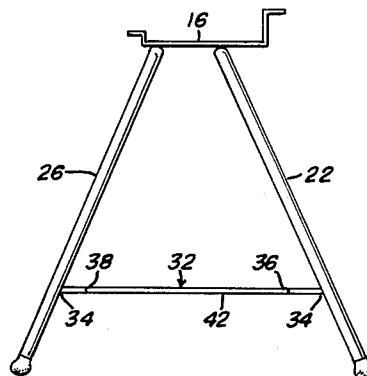


FIG. 3

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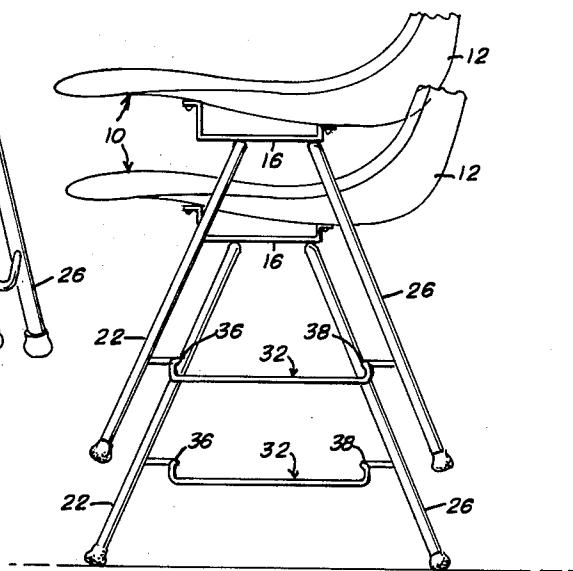
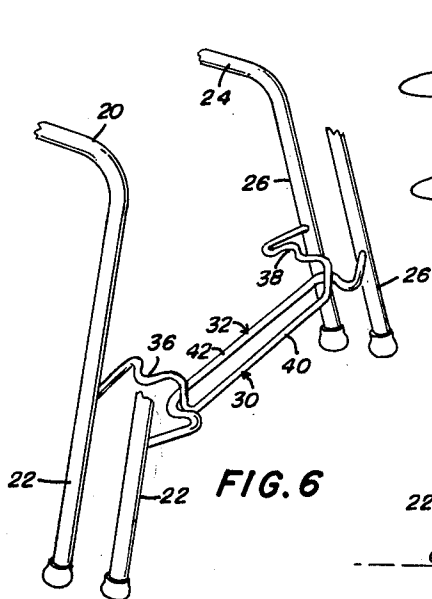
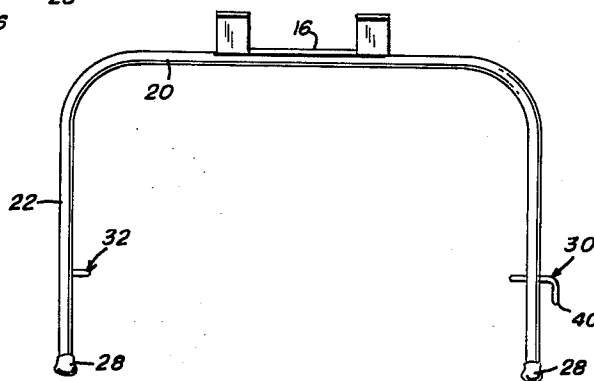
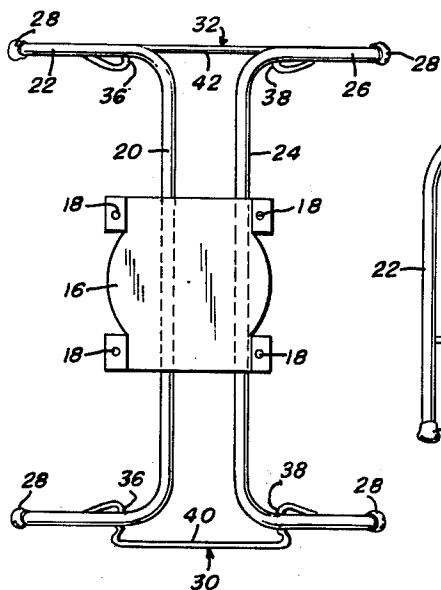
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NESTING AND INTERLOCKING CHAIRS

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2 Claims. (Cl. 297-239)

This invention relates to chair construction. Particularly the invention relates to a chair construction which is adapted to being nested or stacked without undesirable contact between chairs adjacent in the stack. More particularly the invention relates to a chair construction which has a new and unique feature which permits nesting without undesirable contact between two nested chairs and which allows for horizontal locking between adjacent chairs when arranged in rows of single chairs for group seating. As will be more clearly described as this description proceeds this nesting-interlocking feature is provided by a new and unique transverse leg bracing means not hitherto known to those familiar with the art.

The advantages of light sturdy chairs that may be stacked in vertical relation one on another and at the same time may be interlocked when disposed in horizontally arranged rows are self evident. Storage space for this type of chair when not in use has long been a problem and the concept of vertical stacking has been utilized for some time. With vertical stacking, however, there arises another problem which must be overcome—that of preventing undesirable contact between stacked chairs such as between the top of the seat portion or front side of the back of one chair and the bottom of the seat portion or back side of the back of the chair directly superimposed thereon. Such contact between chairs will result, in time, in an undesirable scuffing or marring of the seat, back, leg portions, or any part of the chair which is in contact with a part of another chair. This problem has been solved in various fashion by chairs of the prior art, and one feature of the chair construction of this invention is directed to the solution of this contact problem.

The well-known folding chairs which have long been in use demonstrate a shortcoming which has existed for as long as moveable chairs have been used—lack of stability when disposed in horizontal relationship for seating. Persons moving in and out of rows of chairs have dislodged these moveable chairs from their aligned position resulting in loss of seating space, ease of access to seating, etc. Locking devices for moveable chairs to solve the problem of stability in alignment have also been known for some time and an improved concept of this feature is contemplated by this invention.

There is a third unique feature in the chair of the instant invention which a diligent study of the prior art does not disclose and which adds considerably to the success of the chair of the instant invention. Prior art chair construction allowing for nesting means and incorporating interlocking devices uniformly result in rigidity of the leg members in relation one to the other. This means that there is no lateral or transverse movement possible of the leg members when placed in position for seating so there is no adjustment possible to take care of even minor irregularities in the floor or surface on which the chair is resting. The result of such rigidity of leg members is an unstable chair when one or more of the "feet" of the chair is in contact with an irregularity in the floor surface. In the instant chair construction, however, there is sufficient resiliency in the leg members so that a minor amount of transverse movement is possible when one foot strikes an irregularity and the resulting movement allows for the necessary self-adjustment of the foot of the chair to recover the desired stability.

In brief, therefore, the novel chair construction to which this invention is directed provides for a chair of outstand-

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ing stability which incorporates a simple and effective interlocking means when disposed in horizontal side-by-side relation and a nesting feature which prevents undesirable contact when disposed in vertical stacking, or nesting relation.

Thus, one object of this invention is to provide a chair construction which is light, yet sturdy and comfortable.

Another object of the invention is to provide a chair construction which can be easily and simply joined together when disposed in a horizontal side-by-side relation, thus preserving their spacing and alignment during use.

Another object of the invention is to provide a chair construction which may be stably stacked without undesirable contact, thus providing a space saving method of storage in a stable vertical relation.

Another object of this invention is to provide a chair construction which has sufficient resiliency of transverse or lateral leg movement to adjust to minor floor irregularity and to provide a stable seating surface under such conditions.

Other and further objects of this invention will become evident as this description proceeds.

Turning now to the drawings:

FIG. 1 is an oblique side elevational view of the chair construction of this invention.

FIG. 2 is a partial side elevational view of the chair construction showing the supporting and interlocking feature from the right side when facing the chair.

FIG. 3 is a partial side elevation of the legs and base portion of the chair construction from the left side when facing the chair.

FIG. 4 is a top plan view of the chair construction showing the seat supporting base member and a top plan view of the supporting and locking device.

FIG. 5 is a partial front elevation of the legs of the chair construction showing a front view of the locking and stacking device.

FIG. 6 is a fragmentary oblique side elevation of the locking and stacking device of two chairs engaged in locked relation.

FIG. 7 is a fragmentary side elevational view of two chairs disposed in a vertical stacked relation one upon another.

The chair construction of this invention comprises identical front and back leg structures each having a pair of legs which are connected together by a cross member. A base member is rigidly affixed to these cross members and the seat portion of the chair is attached to this base member. The front and back leg members are connected by means of brace members which are so designed to include both the stacking and locking features. The leg members and side brace members are so arranged that when disposed in vertical relation, the leg members of the bottom chair receive the concavities formed in the leg brace members of the top chair, thus forming a stable stack of chairs. When used in this description, "front" and "back" refer to the left and right sides of FIG. 2 and "right" and "left" refer to the right and left sides of the chair when viewing from the front. "Horizontal" and "vertical" are used in reference to the floor or surface on which the chair rests.

In the drawings, reference numeral 10 designates a chair having a seat 12. Seat 12 is attached by means of four screws as shown at 14 to base member 16, the screws passing through holes 18 and into female recesses in the bottom of seat 12. If desired, rubber bushings may be provided to fit between base member 16 and seat 12.

Seat 12 is preferably formed in contour shape and adapted to fit the human body, however any seat struc-

ture may be used. Moulded fiberglass material has found favor with seat manufacturers and this material may be used. The seat may be covered with decorative fabric and may be padded with material with which the art is familiar.

Base member 16 is rigidly attached to front cross member 20 which is an integral part of front leg member 22, each leg member being in the form of an inverted U. This attachment is accomplished by known means such as spot welding, screws, bolts, etc.

Base member 16 is similarly rigidly attached to rear cross member 24 which is an integral part of rear leg member 26, also in the form of an inverted U and identical in size and shape with front member 22. It is contemplated that these leg members be constructed of material which is strong yet light in weight and preferable materials of construction is tubular in shape, such as chrome steel tubing and the like. It is recognized, of course, that any desired materials may be used for constructing these leg members.

Leg members 22 and 26 are disposed in angular relation so that the bottom ends, or "feet" portions shown as 28 are spaced further apart than front and rear cross members 20 and 24. This angular relation imparts stability to the chair construction. Front leg member 22 and rear leg member 26 are disposed in a vertical plane and when nested or stacked, the leg members of the chair which is superimposed on another rests in the same vertical plane as the leg members of the bottom chair.

Leg member 22 is held in fixed relation to leg member 26 by means of brace members. Reference numeral 30 designates the right brace member and numeral 32 the left brace member. These brace members are attached to the corresponding leg members at a point approximately one third the length of the leg member from feet 28. The brace members, which incorporate novel and unique features, are preferably fabricated of chrome plated heavy gauge wire, but they may be made of any like material which is capable of performing the function assigned to them.

From the point of attachment to the leg member, shown at 34, the brace member extends outwardly in the plane of the leg member and forms concavities, or half-loops, 36 and 38 in the plane of the leg member, with the convex portions of the half-loops toward the leg member. The pair of half-loops in each brace member has approximately the same radius of curvature as the leg member and are adapted to engage or receive the leg members therein when nested or stacked as shown in FIG. 7. Front half-loop 36 fits over front leg member 22 and rear half-loop 38 fits over the rear leg member 26 of the chair on the bottom, or directly underneath.

Right brace member 30 extends outwardly from the plane of the front and rear leg members and is then bent downwardly to form an elongated hook portion as shown at 40. Left brace member 32 also extends outwardly from the plane of the left leg member and forms an elongated loop 42 which is of a dimension slightly larger than hook portion 40 and is adapted to receive the hook portion of an adjacent chair when aligned therewith, as shown in FIG. 6.

Thus it is seen that the leg brace members perform two functions due to their unique design; they support a superimposed chair by adapting to the corresponding side leg member by virtue of the two half-loops, or concavities, in the plane of the leg members, one of said half-loops being concave and the other convex with the convex portion of each being toward the nearest leg member to which it is attached. The brace members also continue from the half-loops to form an elongated downwardly disposed hook portion on the one side and to form an elongated horizontally disposed loop portion on the other side of the chair, so that adjacently aligned chairs may be locked in alignment by engaging the elongated hook of one chair in the elongated loop of the

adjacent chair. The feature of elongation allows for a greater contacting surface in the locking means and imparts greater stability to the locked chairs than does the narrower, point locking devices previously known.

It is imperative that the point of attachment of the braces to the legs be such that, when stacked, contact between stacked or nested chairs is possible only at the loops of the top chair and the leg members of the bottom chair. This is easily adjudged prior to construction and usually calculates to be about a third of the distance from the cross member and the foot portion of the leg. It will depend, of course upon the angular displacement of the leg member and the base member, but, once established, will not vary during the production.

To reiterate briefly, the instant invention relates to improved chair construction which incorporates novel and unique features permitting nesting without contact to other than leg and brace surfaces of nested chairs, alignment in a stable and firm manner, and self-adjusting legs which stabilize themselves on an irregular surface. The chair construction of the invention forms vertical stacks which are stable and take little space in storage, and alignment stability when disposed in horizontal relation. The chair construction consists essentially of a seat, a base member attached to said seat, a pair of inverted U-shaped leg members each of which includes a cross piece slightly wider than said seat in order to permit nesting without seat contact. The leg members are interconnected by means of brace members. The brace members include, in the plane of attachment to the leg members, a convex and a concave portion, or half-loop, which adapts to the leg member of a chair which is beneath it in a stack, or when it is placed in vertical relation to another. The brace members also are formed into an elongated loop, or an elongated hook; the loop of one chair receiving the hook of an adjacent chair when aligned therewith. The brace members are resilient, or give somewhat when subjected to a strain, and thus allow for transverse movement of the legs in relation to one another, and permit adaptation to an irregular surface.

It will be recognized, of course, that many variations are possible utilizing the novel features of the chair construction of this invention. Those familiar with the art will see many modifications of the construction. The inventive concept contemplates such modifications and variations and is to be considered to be limited only by the scope of the appended claims.

What is claimed is:

1. In a chair construction having a seat and aligned front and rear leg members on the chair for supporting the seat, means secured between each pair of aligned front and rear legs of said chair enabling the stacking of a plurality of said chairs and the side by side interlocking of a plurality of said chairs as desired, said means consisting of a continuous rod like bracing member having a concave and convex half-loop section in a horizontal plane adjacent each end of said bracing member, said half-loop sections adapted to receive the legs of the chair immediately below when in stacked relation, one of said bracing members further including an elongated hook section connecting said half-loop sections and extending outwardly in the plane of and thence downwardly from the plane of said half-loop sections and the other of said bracing members including a section connecting said half-loop sections extending outwardly in the plane of said half-loop sections and adapted to receive said hook section from one of said chairs when in side to side arrangement.

2. A chair construction which comprises a seat, a base member attached to said seat, a pair of inverted U-shaped leg members, each of which includes a cross member slightly longer than the width of said seat members and a pair of legs, said cross members being secured to said base member, and said leg members being aligned front and rear, means secured between each pair of aligned front and rear legs enabling the stacking of a plu-

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rality of said chairs and the side by side interlocking of
 a plurality of said chairs as desired, said means consisting
 of a continuous rod like bracing member having a con-
 cave and convex half-loop section in a horizontal plane
 adjacent each end of said bracing member, aligned with
 and having a radius of curvature slightly greater than
 that of said legs, said half-loop sections adapted to re-
 ceive the legs of a chair in stacked relation thereto, one
 of said bracing members further including a section con-
 necting said half-loop sections and extending outwardly
 in the plane of and thence downwardly from the plane
 of said half-loop sections to form an elongated hook por-

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tion, and the other of said bracing members including a
 section connecting said half-loop sections, extending out-
 wardly in the plane of said half-loop sections and adapted
 to receive said hook portion from one of said chairs when
 in side to side arrangement.

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