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June 25, 1963 E. J. KLASSEN 3,095,236

STACK CHAIR

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Fig. 1

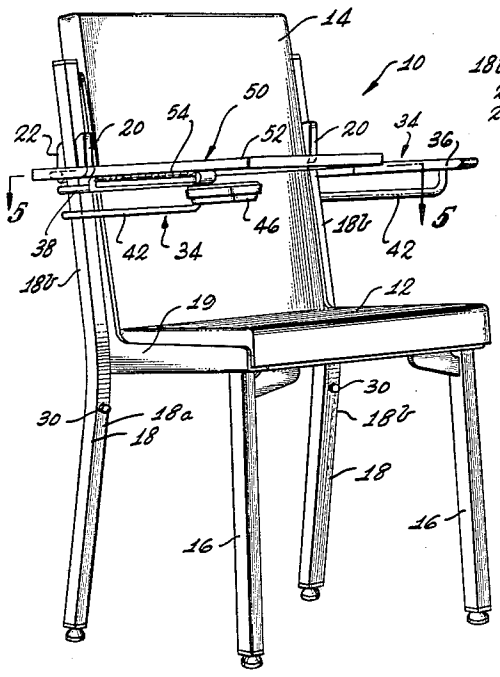


Fig. 2

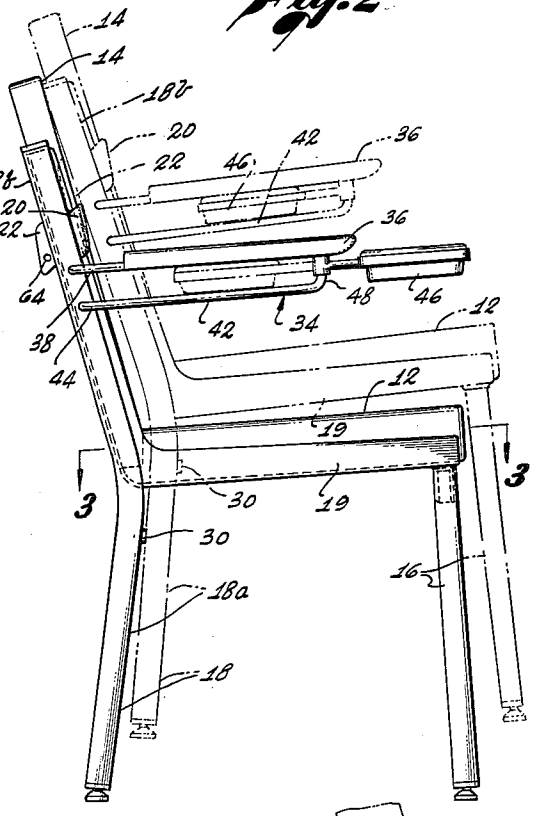


Fig. 3

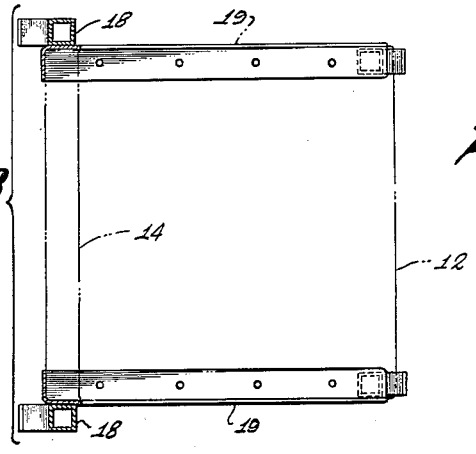
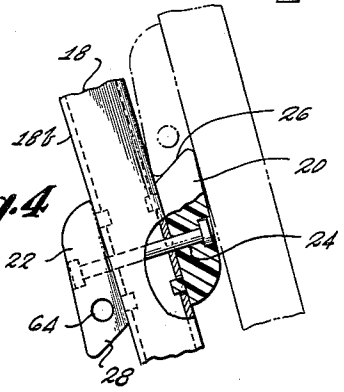


Fig. 4



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Fig. 5

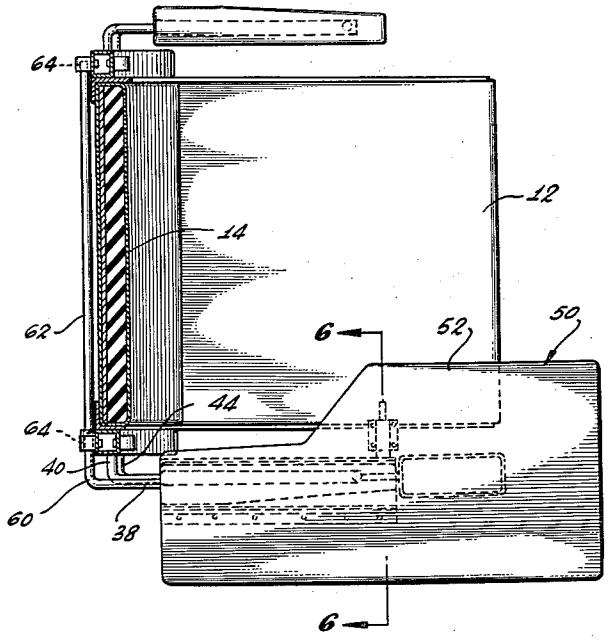


Fig. 7

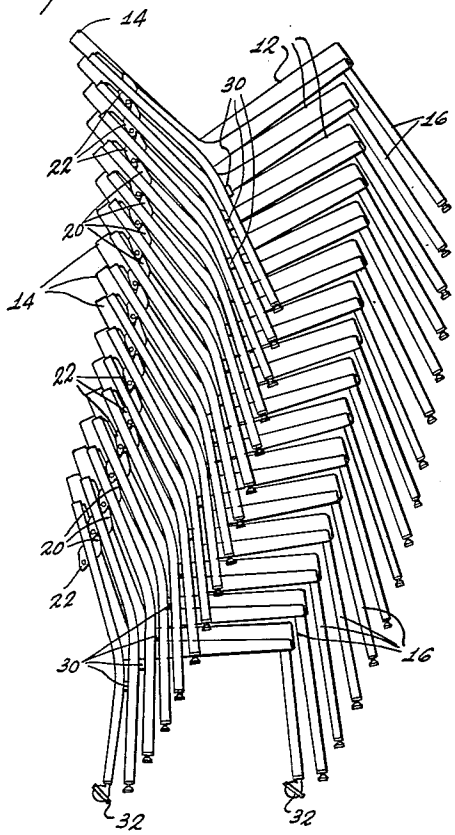
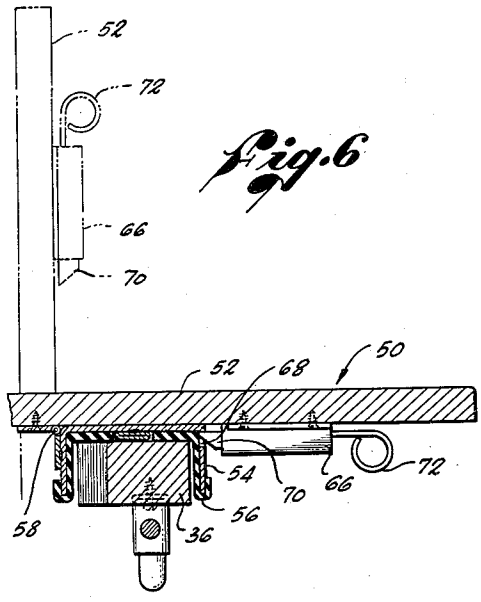


Fig. 6



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3,095,236

STACK CHAIR

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7 Claims. (Cl. 297—239)

This invention deals generally with articles of furniture and, more particularly, with an improved stack chair.

Chairs of the type which are used to furnish temporary seating for auditoriums and other public meeting places, as well as chairs for home or office use, are frequently designed for compact storage when not in use. For example, some chairs of this type are constructed so that they may be folded to a compact condition while other chairs, commonly referred to as stack chairs, are arranged so that they can be stacked in an unfolded condition one on top of the other.

A general object of this invention is to provide an improved stack chair.

A more specific object of the invention is to provide a stack chair which is so constructed that when several of the chairs are stacked one on top of the other, the center of gravity of the stack remains over the area bounded by the legs of the lower chair in the stack so as to assure a stable stack.

Yet another object of the invention is to provide a stack chair of the character described equipped with integral stacking brackets by which each chair in a stack of the present chairs is supported on the adjacent lower chair in the stack.

A further object of the invention is to provide a stack chair of the character described which is upholstered and arranged so that each chair in a stack of the present chairs is held out of contact with the seat and back cushions of the adjacent lower chair whereby compression of the cushions of the lower chairs in the stack by the weight of the upper chairs is avoided.

A further object of the invention is to provide a stack chair of the character described which is equipped with arm rests.

Yet a further object of the invention is to provide a stack chair of the character described having a unique detachable writing desk.

A still further object of the invention is to provide a stack chair of the character described which is relatively simple, inexpensive to manufacture, and otherwise ideally suited to its intended purposes.

Other objects, advantages, and features of the invention will become readily apparent as the description proceeds.

The invention will now be described in detail by reference to the attached drawings, wherein:

FIG. 1 is a perspective view of the present stack chair;

FIG. 2 illustrates two of the present chairs stacked one on top of the other;

FIG. 3 is a section taken along line 3—3 of FIG. 2;

FIG. 4 is a detail, partially broken away, of the stacking brackets on the present stack chair;

FIG. 5 is a section taken along line 5—5 of FIG. 1;

FIG. 6 is an enlarged section taken along line 6—6 of FIG. 5; and

FIG. 7 illustrates several chairs of the present invention stacked one on top of the other, the arm rests on the chairs being eliminated for the sake of clarity.

Chair 10 of this invention comprises a rectangular seat 12, a back rest 14 along the rear edge of the seat, front legs 16 adjacent the front edge of the seat, and a pair of rear legs 18 at the rear of the seat. These several parts of the chair are rigidly joined to form a rigid chair structure by means including generally L-shaped metal side frame members 19.

The rear legs of the chair are located beyond the side

edges of the chair seat 12, as may be best observed in FIGS. 1, 3 and 5, and include lower ends 18*a* which extend below the seat and upper ends 18*b* which extend above the seat along the side edges of and coplanarly with the back rest 14. The lower ends 18*a* of the rear legs as well as the upper ends of these legs and the back rest 14 are rearwardly inclined with respect to a plane passing through the rear edge of the seat normal to the latter so that the included angle between these parts, measured at the rear side of the chair, is less than 180°.

Mounted on the front sides of the upper ends 18*b* of the rear chair legs, which actually form part of the back rest of the chair, are a pair of brackets 20. Mounted on the rear sides of the upper ends 18*b* of the rear legs are a pair of identical but inverted brackets 22. As will shortly be seen, these brackets are used when stacking several of the present chairs and, for this reason, are referred to herein as stacking brackets. The pair of front and rear stacking brackets 20, 22 at each side of the back rest are located approximately in a common plane parallel to the sides of the chair. The adjacent front and rear brackets are joined by a headed fastener 24 which extends through the brackets and upper end 18*b* of the adjacent rear leg 18, as shown in FIG. 4.

The front stacking brackets 20 define coplanar, upwardly facing shoulder surfaces 26. The rear stacking brackets 22 define coplanar, downwardly facing shoulder surfaces 28. As may be observed best in FIG. 4, these shoulder surfaces are disposed at an acute angle to the back rest of the chair.

When stacking the present chairs, one chair is placed on top of another with the rear legs 18 of the upper chair straddling the seat 12 of the lower chair and the rear stacking brackets 22 on the upper chair resting on the front stacking brackets 20 on the lower chair, with the shoulder surfaces 26 and 28 of the brackets in contact, as shown in FIGS. 2 and 4. The upper chair is thereby supported on the stacking brackets of the lower chair. The acute angular disposition of the shoulder surfaces of the brackets with respect to the back rest affords the brackets with a hook-like action that securely locks the upper chair against tipping forward.

The rear legs 18 of the upper chair rest against the rear legs of the lower chair, as shown in FIG. 2. Preferably, the rear chair legs mount bumpers 30 at their forward sides against which the rear legs of the upper chair engage to prevent marring or scratching of the rear chair legs during stacking.

As may be observed best in FIG. 2, the upwardly facing shoulder surfaces 26 on the front stacking brackets 20 are spaced above the downwardly facing shoulder surfaces 28 on the lower stacking brackets 22 a distance which is slightly greater than the thickness of the chair seat so that when one chair is stacked on top of another, in the manner shown in FIG. 2, the seat 12 of the upper chair is spaced from the seat of the lower chair. Also, the stacking brackets space the back rest of the upper chair from the back rest of the adjacent lower chair, as shown. Crushing of upholstery or cushions on the seats and back rests of the lower chairs by the weight of the upper chairs is thereby avoided.

It will be observed that when two of the present chairs are stacked in the manner shown in FIG. 2, the rear legs and back rest of the upper chair are displaced upwardly with respect to the rear legs and back rest of the lower chair. As a consequence, the points of contact of the rear legs of the lower chair on the rear legs of the upper chair (i.e., at the bumpers 30 on the rear legs of the lower chair) are offset downwardly along the rear legs of the upper chair with respect to the points at which the rear legs of the lower chair would contact the rear legs

of the upper chair if they were at the same elevation. Because of the rearward bend or inclination of the rear legs and back rests of the chairs, this displacement of the first-mentioned points of contact along the rear legs of the upper chair places those points further to the rear on the upper chair than the second-mentioned points of contact with the result that the upper chair is tipped upwardly at a slight angle with respect to the lower chair, as may be readily observed in FIG. 2.

When several chairs are stacked one on top of the other, of course, each chair in the stack is tipped upwardly slightly with respect to the next lower chair so that the stack curves forwardly and then back over the lowermost chair, in the manner illustrated in FIG. 7. As a consequence, the center of gravity of the stack remains over the area bounded by the legs of the lowermost chair so that the stack is stable and will not tip under its own weight.

It is obvious that the angle through which each chair is tipped with respect to the next lower chair depends on various factors, such as the angle between the back rest and rear chair legs, the length of the bumpers **30**, etc. and, therefore, may be changed by changing these factors to accommodate stacking of different numbers of chairs. For example, the illustrated chair is adapted best for a sixteen chair stack. If a lesser number of chairs are to be stacked, the chair is preferably designed so the angle of tip of each chair with respect to the next lower chair is slightly greater than that shown so that the upper chairs in the stack will be located more directly over the lower chair. Similarly, if a greater number of chairs are to be stacked, the chair is designed for a lesser angle of tip.

It is obvious that this upward tip of one chair in a stack of chairs with respect to the next lower chair, so as to maintain the center of gravity of the stack over the lowermost chair, can be achieved in other ways than by inclining the back rest and rear legs of the chair, as shown. For example, the back rest of the chair and rear legs could be substantially coplanar and each chair in a stack of chairs could be held at the required angle with respect to the next lower chair by suitable elongated bumpers on the rear chair legs, or bumpers on the sides of the seat ahead of the rear chair legs.

If desired, the lowermost chair in the stack can be provided with ball-type swivel casters **32** to permit the stack to be easily moved from one place to another. Ball-type swivel casters are preferable because of the inclination of the legs on the chair which would cause conventional casters to swivel improperly.

The chair may also be provided with side arms **34**. These side arms comprise arm rests **36** attached to metal rods **38** having rear, right-angled ends which extend into and are fixed to the back rest **14** of the chair. The side arms further comprise lower reinforcing rods **42** which support the forward ends of the arm rests **36** and have rear, right-angled ends **44** extending into and fixed to the back rest **14**. An ash tray **46** may be hinged to the forward, vertical end **48** of one rod **42** for swinging between its solid line extended position of use, shown in FIG. 2, and its phantom line retracted position of that figure. To permit the chairs to be stacked, of course, the rear ends of the side arm rods **38** and **42** must be located beyond the sides of the rear chair legs **18**, as shown in FIG. 5, so that the rear legs of one chair may straddle the seat of another chair in the manner described earlier.

The invention also provides a detachable writing desk **50** for the chair. This desk comprises a flat top member **52** below which is a downwardly opening channel **54** (FIG. 6) that fits over one arm rest **36** of the chair. The channel is lined with a suitable material **56**, such as a plastic material, to avoid marring of the arm rest. The top **52** is hinged to the channel **54**, for pivoting between its full line position of use and its phantom line retracted position of FIG. 6, by hinge means **58**.

Rigidly fixed to and extending rearwardly from the channel **54** is a metal rod **60** having a long, right-angled rear end portion **62** which is rotatably and removably received in coaxial bores **64** in the rear stacking brackets **22**.

The desk **50** is easily removed from the chair, to permit stacking of the latter, by simply swinging it upwardly to disengage the channel **54** from the arm rest **36** and then axially withdrawing the rear end **62** of the desk rod **60** from the rear stacking brackets. The desk may be replaced, of course, by reversing this procedure.

A spring-biased latch **66** is mounted on the underside of the desk top **52** for locking engagement in a slot **68** in the side of channel **54** to retain the top in its full line position of use. The movable latch member **70** has a ring **72** by which it may be pulled to release the latch to permit the top to be hinged to its retracted position.

Clearly, therefore, the invention herein described and illustrated is fully capable of attaining the several objects and advantages preliminarily set forth.

Numerous modifications of the invention are, of course, possible within the spirit and scope of the following claims.

What is claimed is:

1. A stack chair comprising a rigid chair structure including a seat, a back rest, front legs and rear legs, said rear legs being disposed beyond the side edges of said seat, a pair of front stacking brackets mounted on the front side of said back rest adjacent the side edges thereof and defining upwardly facing shoulder surfaces, a pair of rear stacking brackets mounted on the rear side of said back rest adjacent the side edges thereof and defining downwardly facing shoulder surfaces, said front brackets projecting beyond the front side of said back rest and said rear brackets projecting beyond the rear side of said back rest, the front and rear brackets at each side of the chair being located approximately in a common plane parallel to the sides of the chair and said shoulder surfaces of the front brackets being spaced above said shoulder surfaces of the rear brackets a distance which is greater than the thickness of said seat, whereby one chair may be stacked on top of another with the rear legs of the upper chair straddling the seat of the lower chair and the downwardly facing shoulder surfaces of the rear stacking brackets on the upper chair resting on the upwardly facing shoulder surfaces of the front stacking brackets on the lower chair to support the upper chair on the lower chair with the back rest and seat of the upper chair retained out of pressured contact with the back rest and seat, respectively, of the lower chair.

2. The subject matter of claim 1 including side arms on said first-mentioned chair located beyond the sides of the rear legs, respectively, and a removable desk on the chair including a right angularly extending shaft at the rear of said desk rotatably and removably received in a horizontal bore extending through said rear stacking brackets to support said desk for vertical swinging movement on the chair, and a downwardly opening channel member mounted on the underside of said desk for fitting over one of said arms.

3. A stack chair comprising a rigid chair structure including a seat, a back rest, front legs and rear legs, said rear legs being disposed beyond the side edges of said seat, bumpers mounted at the sides of the chair forwardly of said rear legs, a pair of front stacking brackets mounted on the front side of said back rest adjacent the side edges thereof and defining upwardly facing shoulder surfaces, a pair of rear stacking brackets mounted on the rear side of said back rest adjacent the side edges thereof and defining downwardly facing shoulder surfaces, said front brackets projecting beyond the front side of said back rest and said rear brackets projecting beyond the rear side of said back rest, the front and rear brackets at each side of the chair being located approximately

in a common plane parallel to the sides of the chair and said shoulder surfaces of the front brackets being spaced above said shoulder surfaces of the rear brackets a distance which is slightly greater than the thickness of said seat, whereby one chair may be stacked on top of another with the rear legs of the upper chair straddling the seat of the lower chair and resting against said bumpers on the lower chair and the downwardly facing shoulder surfaces of the rear stacking brackets on the upper chair resting on the upwardly facing shoulder surfaces of the front stacking brackets on the lower chair to support the upper chair on the lower chair with the back rest and seat of the upper chair spaced from the back rest and seat, respectively, of the lower chair.

4. A stack chair comprising a rigid chair structure including a seat, a back rest, front legs and rear legs, said rear legs being disposed beyond the side edges of said seat and being rearwardly inclined at a small angle to the plane of the back rest, a pair of front stacking brackets mounted on the front side of said back rest adjacent the side edges thereof and defining upwardly facing shoulder surfaces, a pair of rear stacking brackets mounted on the rear side of said back rest adjacent the side edges thereof and defining downwardly facing shoulder surfaces, said front brackets projecting beyond the front side of said back rest and said rear brackets projecting beyond the rear side of said back rest, the front and rear brackets at each side of the chair being located approximately in a common plane parallel to the sides of the chair and said shoulder surfaces of the front brackets being spaced above said shoulder surfaces of the rear brackets a distance which is slightly greater than the thickness of said seat, whereby one chair may be stacked on top of another with the downwardly facing shoulder surfaces of the rear stacking brackets on the upper chair resting on the upwardly facing shoulder surfaces of the front stacking brackets on the lower chair to support the upper chair on the lower chair with the back rest and seat of the upper chair spaced from the back rest and seat, respectively, of the lower chair and the rear legs of the upper chair resting against the rear legs of the lower chair to incline the seat of the upper chair upwardly at a slight angle with respect to the seat of the lower chair.

5. A stack chair comprising a rigid chair structure including a seat, a back rest, front legs and rear legs, said rear legs being disposed beyond the side edges of said seat, a pair of front stacking brackets mounted on the front side of said back rest adjacent the side edges thereof and defining upwardly facing shoulder surfaces inclined at acute angles to the back rest, a pair of rear stacking brackets mounted on the rear side of said back rest adjacent the side edges thereof and defining downwardly facing shoulder surfaces inclined at acute angles to the back rest, said front brackets projecting beyond the front side of said back rest and said rear brackets projecting beyond the rear side of said back rest, the front and rear brackets at each side of the chair being located approximately in a common plane parallel to the sides of the chair and said shoulder surfaces of the front brackets being spaced above said shoulder surfaces of the rear brackets a distance which is slightly greater than the thickness of said seat, whereby one chair may be stacked on top of another with the rear legs of the upper chair straddling the seat of the lower chair and the downwardly facing shoulder surfaces of the rear stacking brackets on the upper chair resting on the upwardly facing shoulder surfaces of the front stacking brackets on the lower chair to support the upper chair on the lower chair with the back rest and seat of the upper chair spaced from the back rest and seat, respectively, of the lower chair.

6. A stack chair comprising a rigid chair structure including a seat, a back rest, rear legs and front legs, said back rest and rear legs being rearwardly inclined with respect to a plane normal to and parallel to the rear edge of the seat whereby the included angle between the back rest and legs at the rear of the chair is less than 180°, bumpers on the front side of said rear legs adjacent said seat, said rear legs being located beyond the side edges of said seat and including upper ends which extend along the side edges of said back rest in the plane of the latter, a pair of front stacking brackets mounted on the front sides of said upper ends of the legs and defining coplanar, upwardly facing shoulder surfaces inclined at an acute angle to the back rest, a pair of rear stacking brackets mounted on the rear sides of said upper ends of the legs and defining coplanar, downwardly facing shoulder surfaces inclined at an acute angle to the back rest, said upwardly facing shoulder surfaces of the front brackets being spaced above said downwardly facing shoulder surfaces of the rear brackets a distance which is slightly greater than the thickness of said seat, whereby one chair may be stacked on top of another chair with the downwardly facing shoulder surfaces of the rear brackets on the upper chair resting on the upwardly facing shoulder surfaces of the front brackets on the lower chair and the rear legs of the upper chair straddling the seat of and resting against said bumpers on the rear legs of the lower chair so as to support the upper chair on the lower chair with the seat of the upper chair spaced from and inclined upwardly at a slight angle to the seat of the lower chair.

7. The subject matter of claim 6 including side arms on the chair located beyond the sides of the rear legs, respectively, and a removable desk on the chair including a flat top member, a right angularly extending shaft at the rear of said member rotatably and removably received in a horizontal bore extending through said rear stacking brackets to support said member for vertical swinging movement on the chair, and a downwardly opening channel member mounted on the underside of said member and removably fitting over one arm of the chair.

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