Oct. 23, 1956 D. K. ALLEN 2,767,776

FOLDING CHAIR

Filed Sept. 27, 1955 2 Sheets-Sheet 1

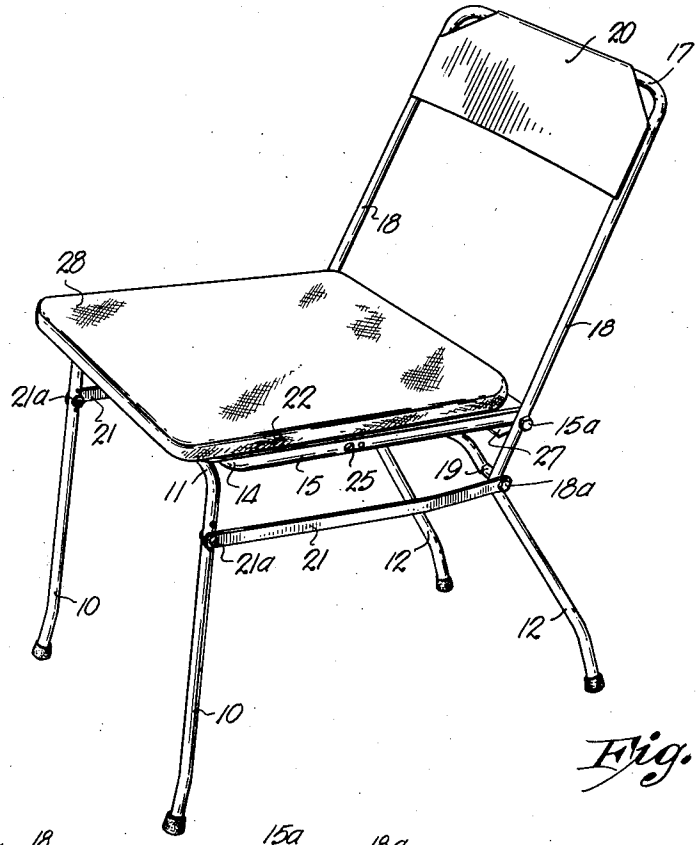


Fig. 1.

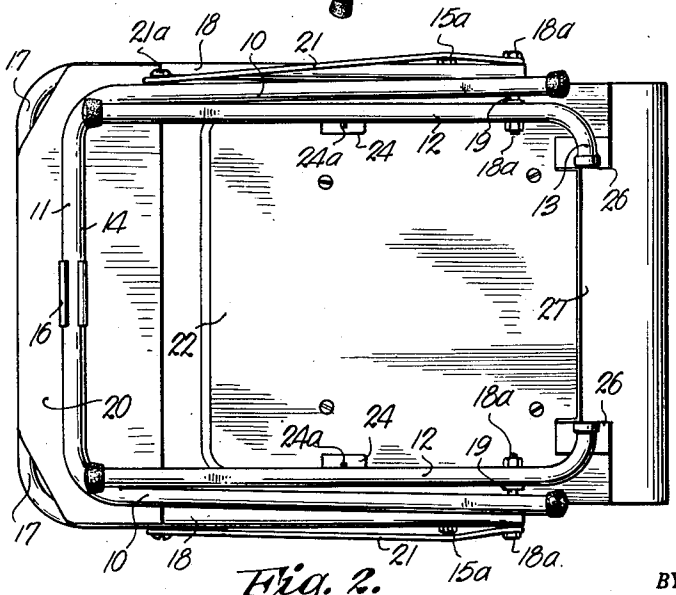


Fig. 2.

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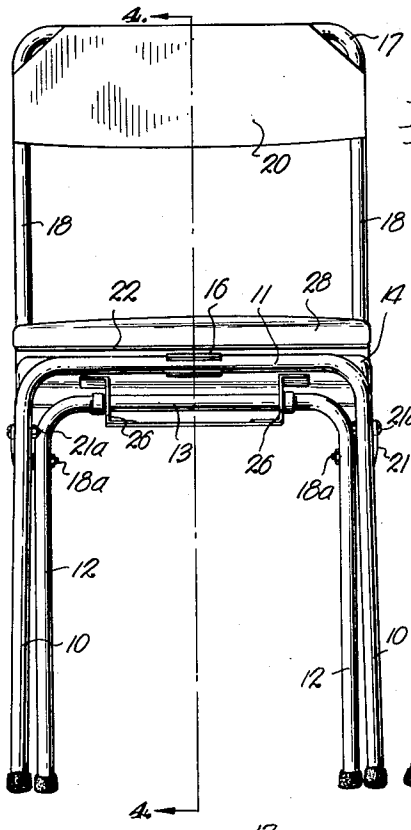


Fig. 3.

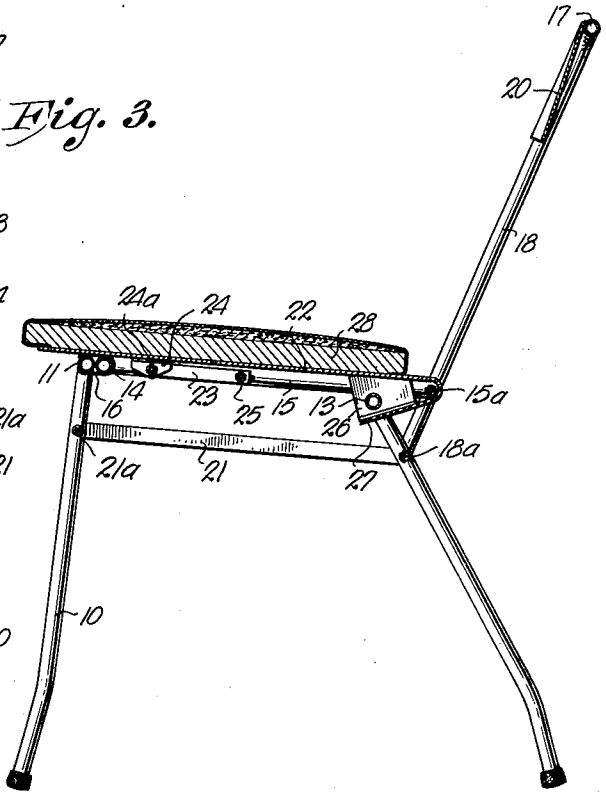


Fig. 4.

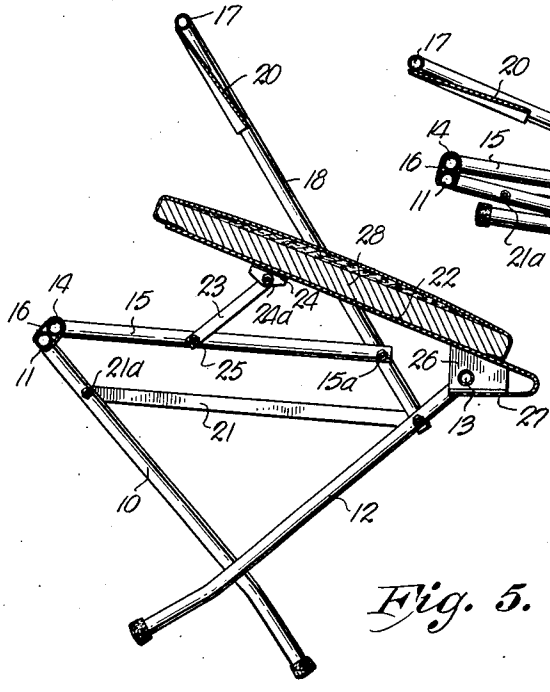


Fig. 5.

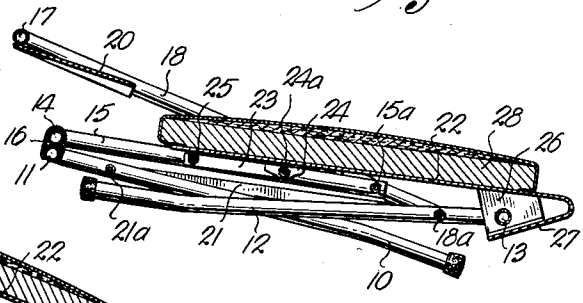


Fig. 6.

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FOLDING CHAIR

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6 Claims. (Cl. 155—148)

This invention relates to folding chairs and refers particularly to a folding bridge or utility chair which is completely collapsible upon itself to occupy a minimum volume of storage space.

Previously, many types of folding chairs have been provided for home and general seating purposes in auditoriums and other places of entertainment. The main objection to these conventional types of folding chairs in both their home and professional use is that, despite their relative collapsibility compared to non-collapsible chairs, they, nevertheless, take up too much storage space and the partially collapsed frames contain too much "dead" air volume. Storage space is at a premium in modern-day small houses and apartments as well as in public entertainment places. Additionally, the existing conventional types of folding chairs are not convenient for insertion into auto trunks for transportation to picnic spots and the like due to, again, the incomplete folding of the chair frame in its collapsed position.

Therefore, an object of the present invention is to provide a lightweight, compact, attractive, folding utility or bridge chair which has a completely collapsible frame which, in collapsed position, takes up a minimum of storage space.

Another object of the present invention is to provide such a completely collapsible folding utility or bridge chair which may be easily and conveniently stored on closet shelves, in car trunks or may be hung on closet walls or doors.

Another object of the present invention is to provide a folding utility or bridge chair which is completely collapsible upon itself, is strong, has a dependable, simple folding and unfolding operation, is highly portable and nestable with a plurality of folded like chairs for multiple storage thereof.

Still another object of the present invention is to provide a completely collapsible folding utility or bridge chair which may be stored in either a flat or erect position when collapsed without either the back or seat portion contacting the floor.

Other and further objects of the invention will appear in the course of the following description.

In the drawings, which form a part of the instant specification and which are to be read in conjunction therewith, there is shown an embodiment of the invention and, in the various views, like numerals are employed to indicated like parts.

Fig. 1 is a three-quarter perspective view of the inventive chair in erect assembled position.

Fig. 2 is a bottom plan view of the inventive folding chair in folded position.

Fig. 3 is a rear elevation of the inventive chair of Fig. 1 in erect position.

Fig. 4 is a view taken along the lines 4—4 of Fig. 3 in the direction of the arrows.

Fig. 5 is a side sectional elevation of the inventive chair illustrating an intermediate stage in either the folding or unfolding process thereof.

Fig. 6 is a side sectional elevation of the inventive folding chair just before it is in a completely folded position or just after the unfolding process is begun, illustrating the positions of the various parts.

Referring to the drawings, the structure of the chair itself will be first described and then the operation and motion of the parts relative one another in the folding and unfolding process.

The inventive folding chair has a pair of front legs **10** rigidly attached to a crossarm **11** at their upper ends. For convenience of manufacture of the chair, an inverted U-frame may be employed to form the front legs **10** and their crossarm **11**. The chair also has a pair of rear legs **12** rigidly attached to a crossarm **13** at their upper ends. Again, an inverted U-frame may be employed to provide the rear legs **12** and crossarm **13**. The front leg U-frame is preferably of greater width than the rear leg U-frame so as to fold thereover when the chair is collapsed. The front **10** and rear **12** legs are angled outwardly at their bases in assembled side view of the chair to provide a stable sitting base therefor. A U-frame having a crossarm **14** and rearwardly extending legs **15** is rotatably fastened by clip **16** to the front leg crossarm to form a seat base. The seat base U-frame is preferably of essentially the same width as the front leg U-frame. The seat base U-frame lies essentially horizontally in the assembled side view of the chair. The chair back is preferably formed of another U-frame having crossarm **17** and legs **18**. The back U-frame is rotatably fixed at its free lower ends by bolts **18***a* to the rear legs below their crossarm **13** and also to the free rearwardly extending ends of the seat base U-frame **15** by bolts **15***a* above its connection to the rear legs **12**. The back U-frame is preferably of greater width than the seat base and front leg U-frames. The inner sides of the legs **18** of the back U-frame are attached to the outer sides of the rear legs **12** and the outer sides of the legs **15** of the seat base U-frame are fixed to the inner sides of the back U-frame legs **18**. Rotatable positioners **19** are fixed between the rear legs **12** and the ends of the back U-frame by bolts **18***a* to compensate for the width differences therebetween. In assembled side view of the chair, the back U-frame angles rearwardly from the vertical to provide a leaning rest. Back shield **20** is preferably mounted relative crossarm **17** of the back U-frame to provide a rest thereon. A pair of linkages **21** connect the front legs **10** below their crossarm **11** with the interconnection of the back U-frame with the rear legs. Bolts **21***a* engage the front ends of linkages **21** with front legs **10** and bolts **18***a* engage the rear ends of the linkages. The linkages **21** attach the outer sides of the front legs **10** to the outer sides of the back U-frame legs **18** at the aforementioned rotatable connection with the rear legs **12**. The linkages **21** assume an essentially horizontal position in the assembled side view of the chair and carry a portion of the lateral loads thereof. A seat plate **22** is connected to the seat base U-frame by a pair of pivoted arms **23**. Arms **23** are attached to the underside of the seat plate at flange **24** by bolts **24***a* and to the insides of the seat base U-frame legs **15** by bolts **25**. The seat plate **22** is essentially the same width as the seat base U-frame crossarm **14** and the front leg crossarm **11**. The seat plate **22** rotatably engages the rear leg crossarm **13** by depending flanges **26** from the lower side thereof. Flanges **26** are positioned between the rear legs **12** so as to clear the rearward extension of the seat base U-frame legs **15** as they move back and forth during the folding and unfolding of the chair. Seat plate **22** also has turned under flange **27** at the rear end thereof whereby to engage the ends of the seat base U-frame legs **15** when the chair is in erect assembled position. Flange **27** may be formed by the bending under

of the rear edge of seat plate **22**, if such is desired. Flange **27** receives and abuts the ends of the seat base U-frame legs **15** when the chair is in assembled position. Seat plate **22** lies on top of the seat base U-frame and in an essentially horizontal position when the chair is in assembled position. Cushioned seat **28** may be fixed to the upper surface of seat plate **22**.

In operation, to close or collapse the folding chair from the position as shown in Figs. 1, 3 and 4, the front of the seat plate **22** is grasped with one hand and the back crossarm **17** with the other. The front of the seat plate **22** is lifted against a counterforce with the other hand against the back crossarm **17**. This action rotates the front of the seat plate **22** up over the arc of the pivotal arms **23** attaching it to the seat base U-frame legs **15** and the seat plate **22** may then be shoved rearwardly, thus clearing the depending seat base U-frame leg receiving flange **27** from the seat base U-frame leg ends **15**. The front edge of the seat plate **22** is then pushed backwardly and the back U-frame crossarm **17** is pushed forwardly simultaneously roughly parallel one another whereby the back legs **18** rotate about their connection with the seat base U-frame legs **15** towards the seat plate **22**. The rear legs **12** rotate inwardly in side view around their connection with the lower ends of the back U-frame legs **18** and linkages **21**. Rear legs **12** also rotate inwardly in side view relative the underside of the seat plate **22** through the flange **26** connection with the rear leg crossarm **13**. The front legs **10** rotate inwardly in side view relative the seat base U-frame legs **15** through the clip **16** connection to the seat base U-frame crossarm **14**, and also relative linkages **21** through the connections therewith. Seat plate **22** moves rearwardly over the arc of pivoted arms **23** relative the seat base U-frame legs **15** and the seat plate **22** and seat **28** pass under the back rest shield **20**.

Referring to Figs. 5 and 6, as well as Fig. 2, the chair, in folded position, may be described as follows: The rear legs **12** are folded between the front legs **11**. The seat base U-frame overlies the front leg U-frame. The back U-frame is outside of and partly overlying the seat base U-frame. The seat plate **22** and seat **28** are between the back legs **18** and overlying the seat base U-frame. In Fig. 2 the lower linkage **21** is disconnected from the front leg **10** to better show the interrelationship of the parts in folded position.

To open the inventive folding chair from the folded position, the back cross arm **17** is separated from the seat base U-frame crossarm **14**. The operator reaches therebetween and seizes the front of seat plate **22** and seat **28**. The seat plate **22** is pulled forwardly while the back cross arm **14** is pushed rearwardly. The back U-frame rotates in side view around the connection with the seat base U-frame leg ends away from the seat base U-frame. The front legs **10**, under the impetus of the linkages **21**, rotate through the clip **16** connection away from the seat base U-frame. The rear legs **12** rotate around the back U-frame and linkage **21** connection as the seat **22** is pulled through away from the seat base U-frame. The seat plate **22** moves forwardly over the arc of the pivotal arms **23** relative the seat base U-frame and the downwardly depending rear flange **27** thereon engages the ends of the legs of the seat base U-frame as the chair comes into assembled position.

From the foregoing it will be seen that this invention is one well adapted to attain all of the ends and objects hereinabove set forth together with other advantages which are obvious and which are inherent to the invention.

It will be understood that certain features and subcombinations are of utility and may be employed without reference to other features and subcombinations. This is contemplated by and is within the scope of the claims.

As many possible embodiments may be made of the invention without departing from the scope thereof, it is to be understood that all matter hereinabove set forth or shown in the accompanying drawings is to be interpreted as illustrative and not in a limiting sense.

Having thus described my invention, I claim:

1. A folding chair comprising a pair of front legs rigidly attached to a crossarm at their upper ends, a pair of rear legs rigidly attached to a crossarm at their upper ends, a U-frame rotatably fastened at its closed end to the crossarm of the front legs, a U-shaped back rotatably fixed at its free lower ends to the rear legs below their crossarm and to the free rearwardly extending ends of the U-frame above its free lower ends, linkages connecting the front legs below their crossarm and the connections of the U-shaped back with the rear legs, a seat plate positioned above the U-frame and connected to the side arms thereof by a pair of pivoted arms attached at one end to the bottom of the seat and at the other to the U-frame, said seat having a turned under flange at the rear end thereof whereby to engage the ends of the arms of the U-frame and a fitting fixed to the underside thereof whereby to rotatably receive the crossarm of the rear legs.

2. A folding chair comprising a U-frame defining a pair of front legs in inverted position, a U-frame defining a pair of rear legs in inverted position, a U-frame seat base rotatably fastened at its closed end to the crossarm of the front leg U-frame, an inverted U-frame defining a chair back rotatably fixed at its free ends to the rear leg U-frame below the crossarm thereof and to the rear ends of the seat base U-frame above its free ends, a pair of linkages connecting the front leg U-frame below its crossarm to the interconnection of the rear leg and the back U-frames, a seat plate connected to the side arms of the seat base U-frame by a pair of pivoted arms attached at one end to the bottom of the seat and at the other to the seat base U-frame arms, said seat having a turned under flange at the rear end thereof whereby to engage the ends of the arms of the seat base U-frame and a fitting fixed to the underside thereof whereby to rotatably receive the crossarm of the rear leg U-frame.

3. Apparatus as in claim 2 wherein the front leg U-frame is of greater width than the rear leg U-frame so as to fold thereover, the seat base U-frame is essentially the same width as the front leg U-frame, the back U-frame is of greater width than hte seat base and front leg U-frames, rotatable positioners are fixed between the back U-frame and rear leg U-frame at the connection thereof to compensate for the width differences therebetween and the seat is essentially the same width as the seat base and front leg U-frames.

4. A folding chair comprising an inverted U-frame defining a pair of front legs, an inverted U-frame defining a pair of rear legs, a U-frame seat base rotatably fastened to the front leg crossarm, the free ends thereof extending rearwardly, a U-frame forming a back with its closed end and having its free ends rotatably fixed to the outer sides of the rear legs below the crossarm thereof, the free ends of the seat base U-frame attached to the inner sides of the U-frame back above its connection to the rear legs, linkages attaching the outer sides of the front legs below the crossarm to the outer sides of the back U-arm at its interconnection with the rear leg U-arm, a seat plate positioned relative to the U-arm seat base, a pair of arms rotatably connecting the underside of the seat plate to the inner sides of the seat base U-arm, the rear edge of the seat plate bent under to form a seat base U-arm receiving flange, a rear leg crossarm receiving fixture attached to the underside of the rear end of the seat plate to rotatably receive the crossarm of the rear leg U-arm, said fixture positioned between the rear legs so as to clear a path for the rearward extension of the seat base U-arm legs as they move backward and forwardly as the chair is folded and unfolded.

5. A folding chair as in claim 4 wherein the front leg U-frame is of greater width than the rear leg U-frame so as to fold thereover, the seat base U-frame is the same

essential width as the front leg U-frame, the back U-frame is of greater width than the seat base and front leg U-frames, rotatable positioners are inserted between the back U-frame and the rear leg U-frame at their connection to compensate for the width differences thereof, and the seat is essentially the same width as the seat base and front leg U-frame.

6. A folding chair comprising an inverted U-frame defining a pair of front legs, an inverted U-frame defining a pair of rear legs, said rear and front leg U-frames angled outwardly at their bases in assembled side view to provide a stable base for the chair, a U-frame forming an essentially horizontal seat base in assembled side view rotatably clipped to the crossarm of the front leg, the free ends thereof extending rearwardly, an inverted U-frame forming the chair back with its closed end and having its free ends rotatably fixed to the rear legs below the crossarm thereof, the back angling rearwardly from the vertical in assembled side view to provide a leaning rest for the chair, the free ends of the seat base U-frame attached to the arms of the back U-frame above its connection to the rear leg U-frame, linkages attaching each of the front legs below the front leg crossarm to the

corresponding interconnection between the rear leg and the back U-arms, said linkages essentially horizontal in assembled side view, a seat plate attached to the seat base U-arms by a pair of pivotal arms and rotatably engaged with the rear leg cross arm by a fitting depending from its lower side, said seat plate lying on the seat base U-arm tops and in essentially horizontal position in assembled side view, and a seat base U-arm abutting and receiving flange depending from the rear end of the seat plate engaging the rear ends of the seat base U-arms in assembled position.

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