Dec. 13, 1960 C. A. RASSIER 2,964,092

CHAIRS

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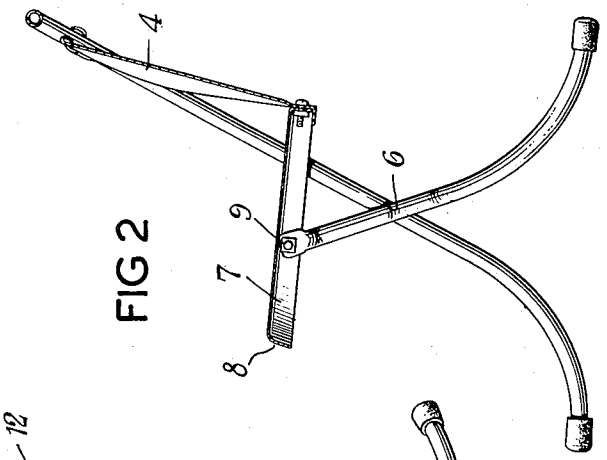


FIG 2

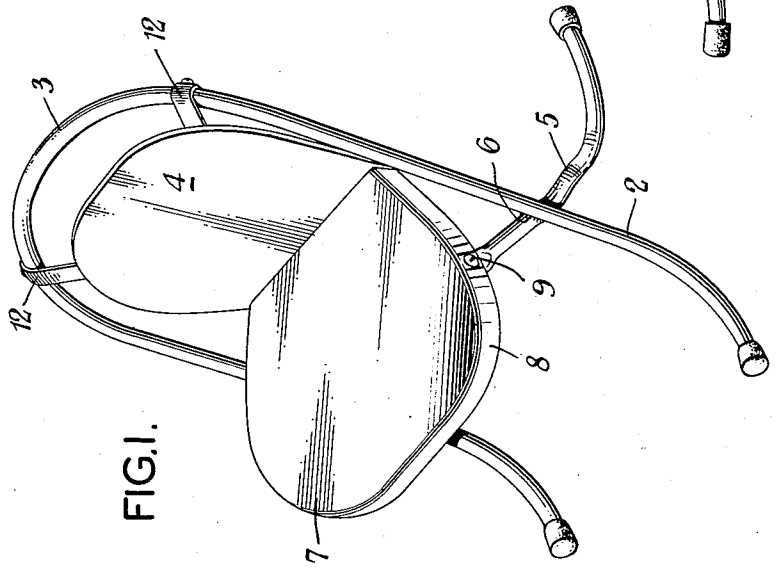


FIG.I.

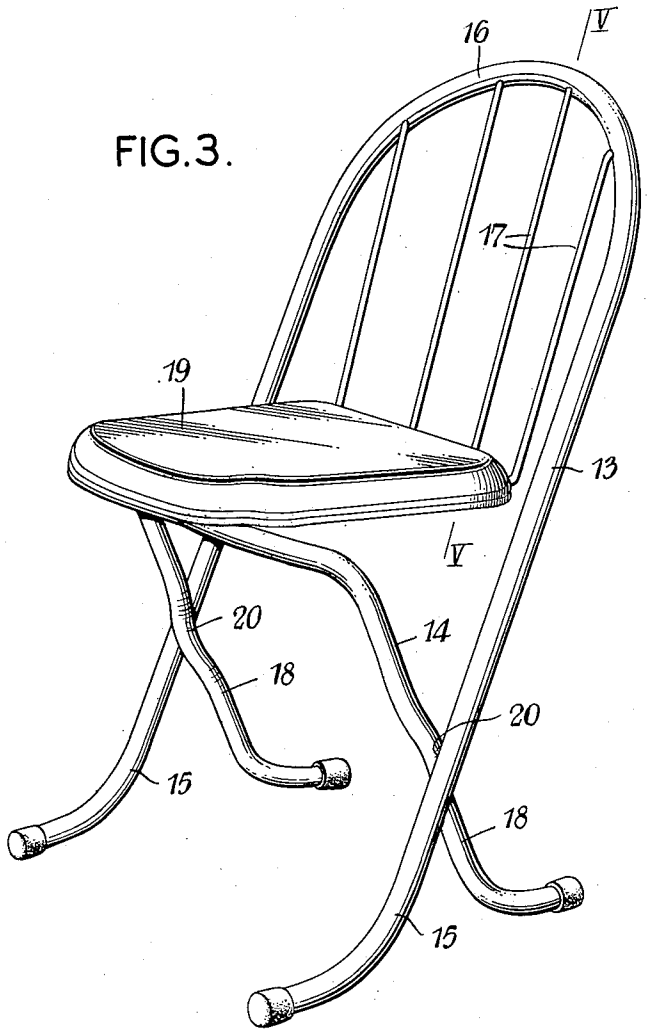
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FIG.3.



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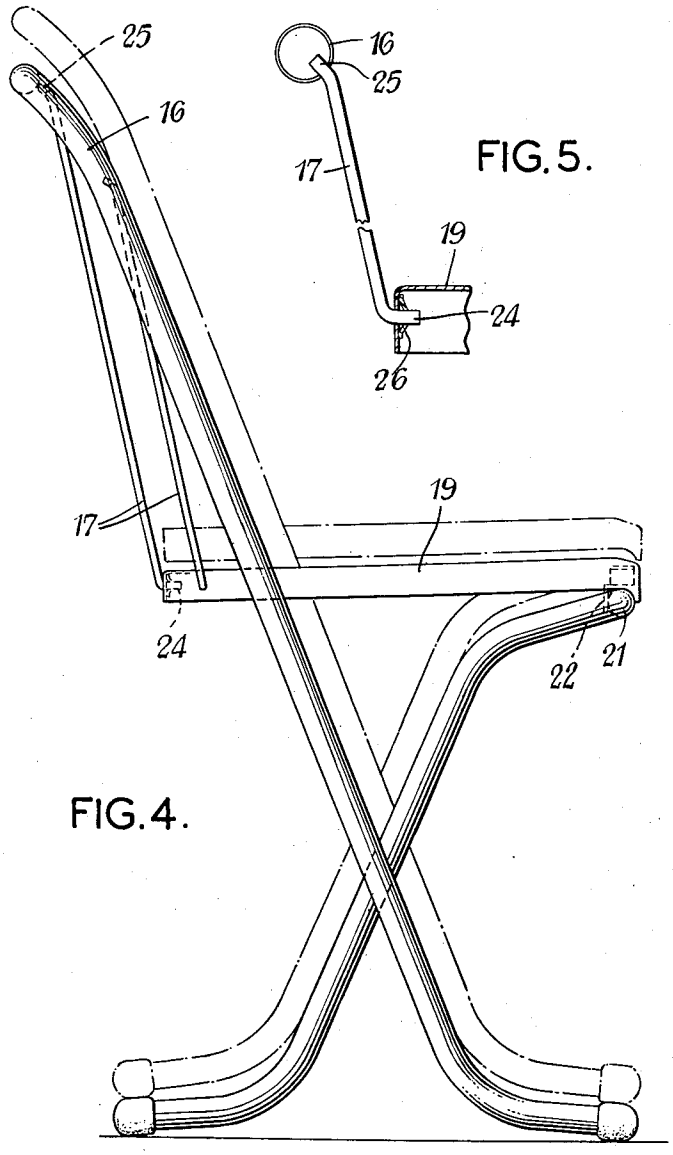


FIG. 5.

FIG. 4.

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CHAIRS

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3 Claims. (Cl. 155—2)

The present invention relates to chairs more particularly non-collapsible chairs that can be stacked, and has an object to provide an improved construction of stackable non-collapsible chair.

Broadly a stackable non-collapsible chair according to the invention comprises a framework supporting a seat and a back-rest in such manner to permit the chair to be stacked with a chair of like construction, and in which the seat extends substantially horizontally and the back-rest inclines upwardly therefrom at an angle such as to permit vertical stacking of the chairs.

Conveniently, the said framework comprises a pair of X frames at each side of the chair and laterally spaced from the seat and the back-rest to permit stacking, the lower ends of the X frames forming the front and rear legs respectively of the chair, the upper ends of the rear legs extending forwardly to support the seat of the chair and the upper ends of the front legs extending upwardly and rearwardly to support the back-rest.

In one construction of the invention the seat and the back-rest member are both made of sheet material, the back rest member and the seat tapering to the point where they are connected together to allow the legs of the chair to be stacked to pass between the seat and back-rest member and the back-rest frame.

In another embodiment the back rest is formed by a number of spaced members, for example rods or tubes, the lower ends of which are secured to the rear edge of the seat member and the upper ends of which are secured to the back rest frame.

The invention will now be described with reference to the accompanying drawings in which:

Figure 1 shows a chair constructed in accordance with the present invention in a perspective view;

Figure 2 shows a cross section of the chair shown in Figure 1;

Figure 3 shows a perspective view of another construction of chair in accordance with the present invention;

Figure 4 shows in side elevation a chair as shown in Figure 3 with a similar chair stacked upon it; and

Figure 5 shows a fragmentary view of a detail of construction of chair shown in Figures 3 and 4.

Referring to Figures 1 and 2 the framework is constructed of tubular metal and comprises an inverted U-shaped member **1** the lower ends of the legs of which form the front legs **2** of the chair and the closed upper end forms the back rest frame **3** which supports the back-rest member **4** of the chair. The said inverted U-shaped member slopes upwardly and rearwardly from the floor engaging ends of the legs thereof, and to each leg **2** of the said inverted U-shaped member there is secured a tubular member **5** in crossed relation therewith thereby to provide an X frame at each side of the chair. The connection of the said tubular member **5** to the leg **2** of the inverted U-shaped member **1** is positioned longitudinally thereof so that each said tubular member inclines rearwardly and downwardly from the point of connection **6** to provide a rear leg of the chair, and upwardly and forwardly from the point of connection to support the seat **7** of the chair at the forward upper end portion thereof.

The seat **7** is in the form of a metal pressing having a downwardly extending peripheral flanged edge **8** to which the upper ends of the tubular members are secured as by bolts **9** (or rivets for example), the said supper ends lying behind the edge flange **8** and thereby normally obscured from view. The seat **7** reduces in width towards the rear end thereof so that the rear end of the seat extends between the legs of the inverted U shaped member **1** in spaced relation therewith. The said rear end of the seat **7** is supported from the closed end **3** of the inverted U shaped member **1** by the back-rest **4** in the form of a metal pressing which is secured to the flanged edge at the rear of the seat by screws or rivets **11** and inclines upwardly and rearwardly therefrom to be supported at its upper end by straps **12** secured around the closed end of the inverted U shaped member or by lugs extending inwardly from the said closed end. The back-rest **4** tapers towards its lower end to a width equal to the width of the rear end of the seat **7** and at its upper end is spaced from the closed end of the inverted U shaped member by means of the aforementioned straps **12**.

The lower ends of the front and rear legs **2** and **5** are respectively curved forwardly and rearwardly so as to lie substantially along the floor or other supporting surface and the chair can be stacked with a chair of like construction by inserting the legs of one chair in the space between the seat and the inverted U shaped member at each side of the seat.

In order to provide for truly vertical stacking of the chairs one upon the other, it is a requirement that the back-rest slopes upwardly and rearwardly from the rear of the seat as hereinbefore described, and furthermore that the respective angles of slope of the components of the back-rest be such that they do not prevent the seat portions stacking closely together. Thus the thicker the component the greater the angle of slope. This also applies to the legs **2** and **5**. Furthermore the legs when they cross must subtend equal angles to the surface upon which the chair rests.

In the construction of chair above described, this may be achieved by bending forwardly the depending flanged edge at the rear of the seat at an angle with respect to the surface of the seat so that when the lower portion of the backrest **4** is secured to the said flanged edge, the backrest slopes upwardly and rearwardly at an angle which meets the above mentioned requirements. Alternatively the backrest **4** may be creased transversely level with the seat surface and inclined backwardly at the required angle.

The invention is of course not limited to the above described construction. For example, the framework may be formed of other than tubular members, and the seat and backrest need not necessarily be metal stampings. They could be of moulded plastic construction for example, and the lower or floor engaging ends of the legs of the chair may be provided with rubber or like resilient ferrules.

An alternative construction of chair in accordance with the present invention is shown in Figures 3 to 5. In this construction the back-rest is formed by a plurality of separate members to give a railed effect.

Referring to the drawings a pair of inverted metal tubular members **13** and **14** serve as the framework, the inverted U shaped members being assembled so that their legs cross at each side of the chair the front legs **15** extending rearwardly and upwardly to form a back rest frame **16** for supporting the back rest members **17** and the rear legs **18** extending upwardly and forwardly to

serve as the support for the front of the seat member **19**. The inverted U member **14** serving as the rear legs **18** is disposed inside the inverted U member **13**, forming the front legs **15** and at their intersection the members are connected rigidly as for example by welding. Conveniently to allow ease of stacking the inner legs **18** are bulged outwardly at the point of intersection **20** to allow a good clearance for the rear legs of the chairs stacked upon it.

The seat member **19** consists of a metal pressing the front end of which is supported upon the horizontal base **21** of the U member **14** forming the rear legs and conveniently secured thereto by depending lugs **22** on the underneath of the metal seat pan and which are apertured to take bolts or rivets (not shown) which extend into the metal tube of the inverted U member.

The rear of the seat pan is apertured to receive the lower turned ends **24** of a number of rods **17** which extend upwardly and are turned at their upper ends **25** to pass through apertures in the back rest frame **16**. The apertures in the tubular back rest frame are so positioned that the rods lie at a tangent with respect to the tubular back rest frame.

The rods **17** are assembled in the back rest frame **16** by turning over their upper ends **25** at such an angle that when inserted into the tubular back rest frame member **16** and their lower ends **24** inserted into the seat pan member the upper end cannot leave the frame member **16**. The lower ends **24** may be secured to the seat pan member by any convenient means as by swelling the ends after insertion through the apertures or by applying metal washers **26** which automatically lock upon the rod when applied.

In order for the chair to stack vertically with chairs of a like type the slopes of the back rest frame and the rods or other back rest members must be such that the chairs can stack closely together and the angles of the legs when they cross must subtend equal angles to the surface upon which the chairs stack.

Both embodiments described above show a feature of the invention which is that by using a back-rest member which is thinner than the back-rest frame which has to be of robust construction, it is possible for the seat to be extended rearwardly of the back-rest frame to give a deeper seating area and for the back-rest member to be at a steeper and a more natural sitting angle since being of thinner material it can be at a steeper angle without impeding the vertical stacking.

What I claim is:

1. A stackable non-collapsible chair comprising a first frame member and a second frame member at each side of the chair and rigidly secured one to the other in crossing relation to form an X frame at each side of the chair, a downwardly and rearwardly extending lower portion of said first frame member forming a rear leg of the chair, a downwardly and forwardly extending lower portion of said second frame member forming a front leg of the chair, upwardly and forwardly extending upper portions of said first frame members, a seat supported on said upper portions and extending rearwardly therefrom, upwardly and rearwardly extending upper portions of said second frame members, a backrest suspended by said upper portions of the second frame members, means securing the lower end of the backrest to the rear end of the seat for supporting the said rear end, the said seat having a width at its front end equal to or greater than the lateral spacing of the said X frames and having a width at its rear end less than the lateral spacing of the upper portions of the second frame members and laterally spaced therefrom to permit of stacking of similar chairs one upon the other, the said backrest tapering downwardly to a width at its lower end substantially equal to the width of the rear end of the seat.

2. A stackable non-collapsible chair comprising a pair of inverted U shaped members forming the frame and legs of said chair, one of said members having its legs at a wider spacing than the other of said members and positioned outwardly of the respective legs of said other member, said legs at each side of the chair being rigidly joined at their points of crossing, a seat supported on the closed end of the said other member and extending rearwardly therefrom and having a width at its front end equal to or greater than the spacing of the legs of said other member and having a width at its rear end less than the spacing of the legs of said one member and laterally spaced therefrom to provide for passing the legs of narrower spacing of a similar chair between the lateral edges of the seat and the legs of the said one member, and a backrest supported at its upper end by the closed end of said one member and tapering downwardly to a width at its lower end substantially equal to the width of the rear end of the seat, and means securing the lower end of the backrest to the rear end of the seat.

3. A stackable non-collapsible chair as claimed in claim 2 in which the backrest comprises a plurality of downwardly extending laterally spaced elongated members, secured at their upper ends to the closed end of said one member and at their lower ends to the rear end of the seat.

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