United States Patent [19]

Blodee

[11] **3,774,960**

[45] **Nov. 27, 1973**

[54] **STACKING CHAIR**

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[21] Appl. No.: **264,499**

[52] **U.S. Cl.** **297/239,** 297/445
[51] **Int. Cl.** **A47c 3/04**
[58] **Field of Search** 297/239, 294, 295, 297/445, 452, 447; 108/150, 91

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Primary Examiner—Francis K. Zugel
Attorney—Gordon W. Hueschen et al.

[57] **ABSTRACT**

A stacking chair comprising a sheetform seat and back member in one or more pieces, a base member comprising two leg members in the form of a tube or rod which are substantial mirror images of each other and each of which has an upper generally horizontal and rearward reach, a forward generally vertical reach, and a forward angularly outwardly extending reach terminating in a generally horizontal rearward reach constituting a floor-engaging portion of the leg member, a central recess being provided at the forward edge of the seat portion of said chair having dimensions suitable to receive the generally vertical reach of the base member of an identical stacking chair, the stacking height of the leg members and thickness of the seat portion of the sheetform seat and back member enabling close vertical nesting of a plurality of identical chairs upon stacking, at least at some point on said reaches.

12 Claims, 14 Drawing Figures

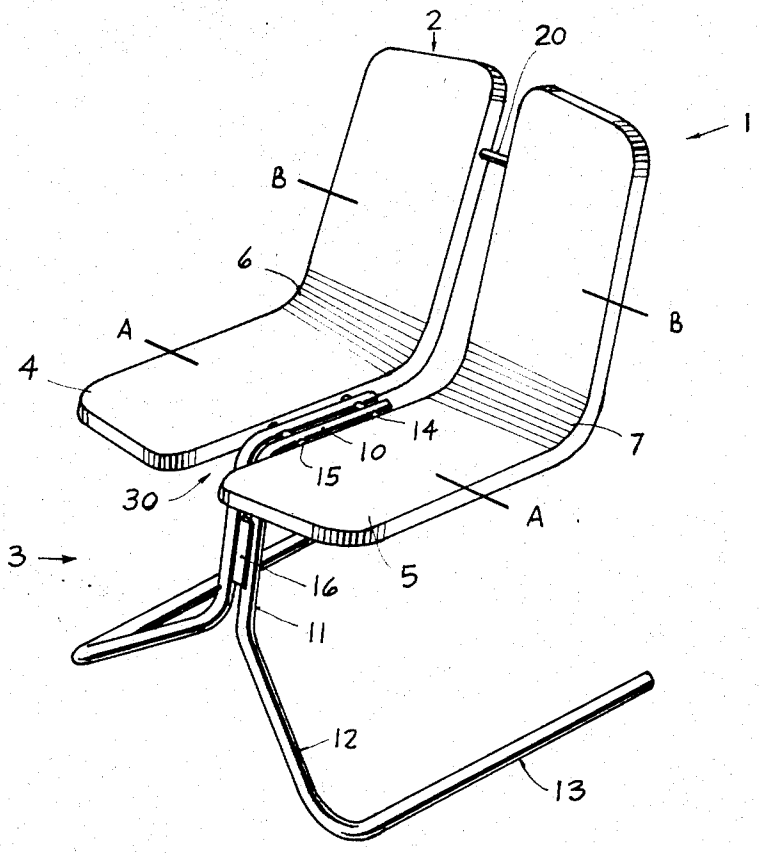


FIG. 2

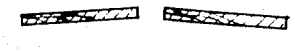


FIG. 3



FIG. 1

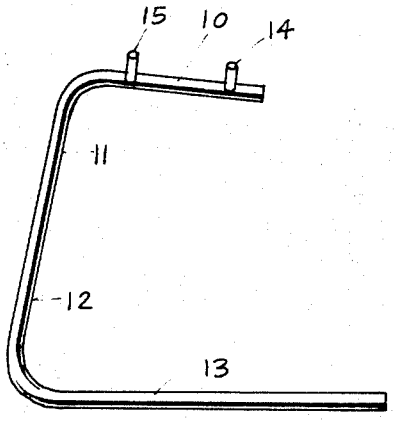


FIG. 5

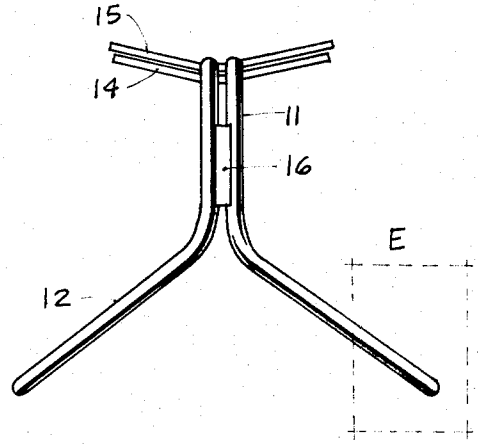


FIG. 4

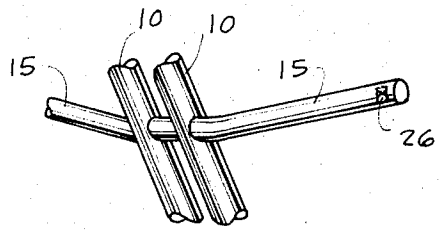


FIG. 6

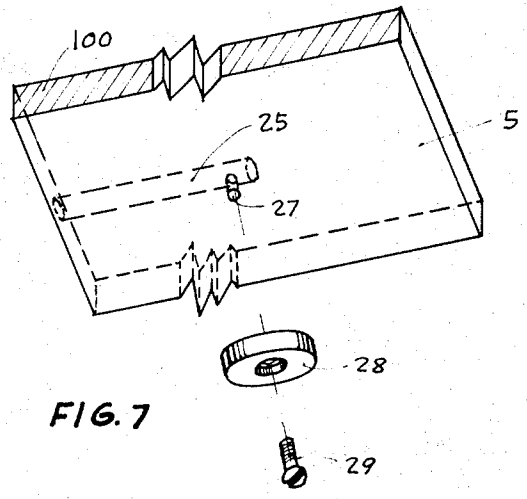


FIG. 7

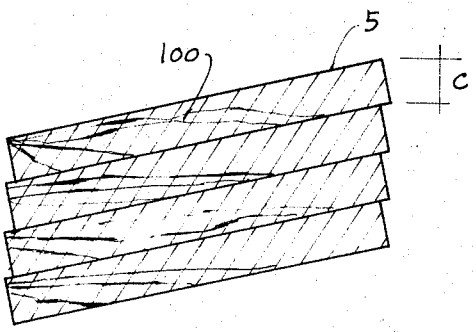


FIG. 8-B

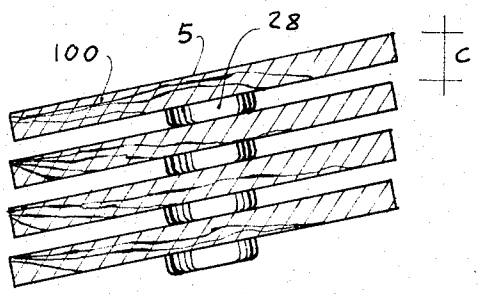


FIG. 8-A

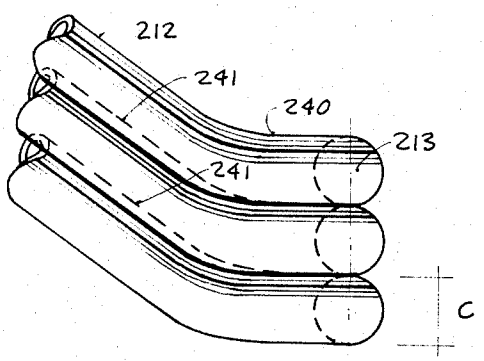


FIG. 13

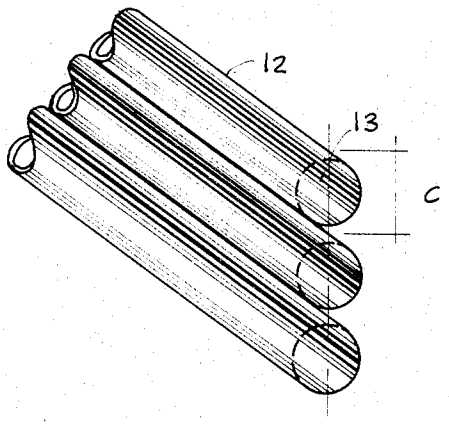


FIG. 9

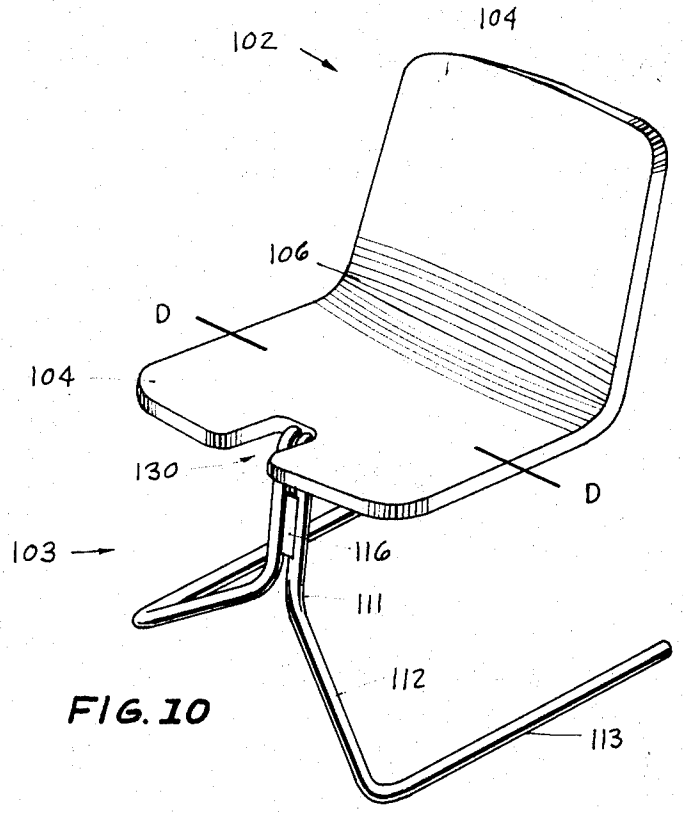


FIG. 10

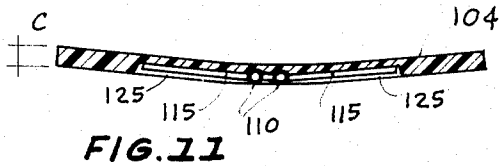


FIG. 11

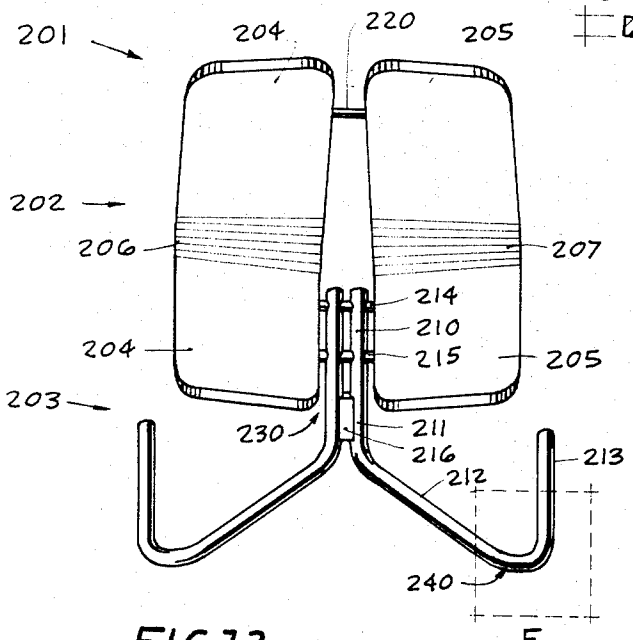


FIG. 12

STACKING CHAIR

BACKGROUND OF THE INVENTION

1. Field of Invention

Seating; especially stacking chairs.

2. Prior Art

Stacking chairs in many versions are to be found in the prior art. Many such stacking chairs are fully satisfactory for the purposes for which intended. However, to accomplish efficient stacking, appearance and comfort is frequently sacrificed. Conversely, when it is attempted to retain appearance and comfort, few satisfactorily stacking charis are available. The present invention has as its object to provide a chair which stacks efficiently and in sufficient numbers to be an effective stacking chair for purposes of conserving floor space when not required for actual use, but yet at the same time to provide adequate comfort, economy, and an attractive appearance to the chair as a whole. In fact, the present invention relates to an entirely new concept in stacking chairs.

SUMMARY OF THE INVENTION

The present invention relates to a stacking chair comprising a sheetform seat and back member and a base member comprising two leg members in the form of a tube or rod, said leg members being substantial mirror images of each other and each having an upper generally horizontal and rearward reach, a forward generally vertical reach, and a forward angularly outwardly extending reach terminating in a generally horizontal rearward reach constituting a floor-engaging portion of said leg member. Said mirror image leg members are secured together at their upper reaches and include laterally extending seat support members which are secured to a seat portion of said sheetform seat and back member. A central recess is provided at the forward edge of the seat portion of said chair having dimensions suitable for receiving therein the generally vertical reach of the base member of an identical stacking chair. The generally horizontal floor-engaging reaches of said leg members and said angularly outwardly extending reaches of said leg members are adapted to engage and support identical stacking chairs upon stacking, at least at some point on said reaches. The stacking height of the leg members corresponds to a thickness of the seat portion of said chair to enable close nesting of a plurality of identical chairs and support thereof upon stacking.

In one embodiment, the thickness of the seat member includes bumper means for compensating for difference between the stacking height of said leg members and the thickness of the seat portion of the sheetform seat and back member *per se*. In another embodiment, the leg members are also secured to each other at their generally vertical reaches. In a preferred embodiment, said sheetform seat and back member comprises two identical members positioned at opposite sides of the upper horizontal reach of said base member and secured to seat support members. In a further embodiment, such two identical seat and back members are also secured together at the back portions thereof. In another embodiment, the seat and back members are slightly pitched inwardly toward the upper horizontal and rearward reach of the base member and toward the space between their respective back portions. In a further preferred combination, the outwardly angled reaches of the leg members also include at the lower portions thereof a forward generally horizontal reach which terminates in said generally horizontal rearward floor-engaging reach, which embodiment has the function of minimizing stacking height of the leg members. In additional embodiments, the seat and back members may be secured to the base member by seat support means extending into apertures provided in the seat portions thereof for receiving said seat support members, which support members may be secured in said apertures by external fastening means, which external fastening means may also be employed to secured bumper means at the bottom surface of the seat portions of said seat and back members.

OBJECTS

It is an object of the present invention to provide a novel and attractive stacking chair having all of the characteristics and advantages mentioned in the foregoing. It is another object of the invention to provide an attractive and comfortable chair which can be stacked conveniently and which provides and entirely novel concept in the area of stacking chairs. Additional objects will become apparent hereinafter and still other objects will be apparent to one skilled in the art.

BRIEF DESCRIPTION OF THE DRAWINGS

In the drawings,

FIG. **1** is a front perspective of a stacking chair according to the invention.

FIG. **2** is a cross section taken along the line B—B of the back section of the chair of FIG. **1**.

FIG. **3** is a cross section taken along the line A—A of the seat portion of the chair of FIG. **1**.

FIG. **4** is a front view of the base of the chair shown in FIG. **1** showing the complimentary leg members and attached seat support members before assembly of the chair.

FIG. **5** is a side elevational view of one of the mirror-image leg members used in constructing the base member of the chair of FIG. **1**.

FIG. **6** is a detail of a seat-support member showing its attachment to the base member of the chair of FIG. **1**.

FIG. **7** is a detail of the seat portion of the chair of FIG. **1**, partially in section, partially exploded, showing the manner of attachment of the seat-support member to the seat portion of the chair of FIG. **1**.

FIG. **8**–A is a detail view of a section through the seat portion of a chair of FIG. **1** along the sectional line shown in FIG. **7** when a plurality of such chairs are arranged in stacked position with bumpers attached to the bottom surfaces of the seat portions thereof.

FIG. **8**–B is the same as FIG. **8**–A but for an embodiment in which the thickness of the seat is sufficient that bumpers are not required.

FIG. **9** is a detail of the indicated portion E of the base member shown in FIG. **4**, when three chairs are arranged in stacked position.

FIG. **10** is a front perspective view of another embodiment of a chair of the invention having a single integral sheetform seat and back member.

FIG. **11** is a cross section taken along the line D—D of FIG. **10**, showing a detail of the seat support means on said base member.

FIG. **12** is a front perspective view of another embodiment of the invention, wherein the base member

comprises leg members including generally horizontal reaches at the lower forward portions thereof.

FIG. 13 is a detail of the indicated portion F of FIG. 12 illustrating the stacking height of the chair leg members when three chairs are vertically stacked.

In all of the drawings, the dimension "C" is used to denote the stacking height, in FIGS. 8–A and 8–B of the chair seat, with bumper and without bumper, in FIG. 11 of the chair seat, and in FIGS. 9 and 13 of leg members having slightly different configurations.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

FIG. 1 shows a stacking chair according to the invention generally as **1,** having seat and back members generally identified as **2** and a base member generally identified as **3.** The seat and back members comprise sheetform elements **4** and **5,** having an appropriate bend between seat portions and back portions thereof respectively at **6** and **7.** The base member comprises mirror image leg members, each having an upper generally horizontal and rearward reach **10,** a forward generally vertical reach **11,** a forward angularly outwardly extending reach **12,** and a generally horizontal rearward reach **13** constituting the floor-engaging portion of said leg member. The leg members include laterally extending seat support members **14** and **15** extending therefrom at their upper generally horizontal reaches, and are secured together at their upper generally horizontal reaches by passage therethrough of laterally extending seat-support members **14** and **15.** The mirror image leg members are also secured together at their forward reaches **11** by spacer **16.** Sheetform seat and back members **4** and **5** are secured together at their back portions by pin **20.** As will be observed from FIG. **1,** central recess **30** is provided at the forward edge of the seat portion of the chair, of dimensions obviously suitable to receive therein the generally vertical reach **11** of the base member of an identical stacking chair. As will be apparent from FIG. **1,** the generally horizontal floor-engaging reaches **13** of the leg members and the angularly outwardly extending reaches **12** of said leg members are adapted to engage and at least partially support identical reaches of an identical stacking chair upon stacking, at least at some point on said reaches. As will be apparent from an inspection of FIG. **1,** for the chairs of the type of FIG. **1** to stack, the stacking height of the leg members at **12** and **13** must correspond to the stacking height of the seat portion of said sheetform back and seat member **5,** especially to enable close nesting of a plurality of identical chairs upon stacking.

As will be seen from FIG. **2,** also to facilitate better stacking as well as comfort, the back portions of sheetform seat and back member **4** and **5** are slightly pitched toward the central void between them, and as will be seen from FIG. **3,** for the same reason, the seat portions of sheetform seat and back members **4** and **5** are likewise slightly pitched toward the upper generally horizontal and rearward reach **10** of base member **3** which lies between them.

The forward generally vertical reach **11** of the leg members, the forward angularly outwardly extending reach of the leg members **12,** the spacer **16** between them, and the laterally extending seat supports **14** and **15** extending therefrom and between them are all more clearly seen in FIG. **4.**

FIG. **5** again shows the forward generally vertical reach **11,** the forward angularly outwardly extending reach **12,** and the generally horizontal rearward floor-engaging reach **13,** as well as the upper generally horizontal and rearward reach **10** and the laterally extending seat support members **14** and **15** extending therefrom. As will be readily apparent, the other corresponding leg member is a mirror image of the one shown in FIG. **5.**

FIG. **6** shows the upper generally horizontal and rearward reaches **10** of the leg members comprising base member **3,** and their securement together by means of laterally extending seat support member **15,** in this case shown as a hollow tube or rod having a threaded aperture **26** therein.

In FIG. **7** is seen a partially exploded partially section-alized view of the seat portion of a seat and back member **5,** showing chamber **25** for insertion thereinto of laterally extending seat support member **15,** aperture **27** extending to the bottom surface of the seat, and screw **29** which may be used as one form of external fastener to secure laterally extending seat support member **15** in chamber **25.** If the thickness of the seat portion of the seat and back member **5** is not of sufficient stacking height to correspond with the stacking height of the base member employed, bumper **28** having a countersunk opening for insertion of screw **29** thereinto may be employed and secured to the bottom of the seat by passing the screw through the opening therein, through opening **27** in the seat, and securing the same in threaded aperture **26** of seat-support member **15.**

FIG. **8–A** shows four seat portions of the seat and back member **5** of a chair of the invention viewed in section from the forward edge **100** of the section shown in FIG. **7,** or from the forward edge of the section shown in FIG. **3,** each with its bumper **28** on its lower surface, the stacking height of such seats having the dimension C shown in FIG. **8–A.**

FIG. **8–B** shows four seat portions taken along the same cross-section, in this case, having a greater thickness, corresponding to the stacking height of the base element employed, so that bumpers **28** are not required.

In FIG. **9** is seen a detail of the base member constituting the portion of the leg member indicated as E in FIG. **4** when three chairs are arranged in stacked relationship. Generally horizontal rearward reaches **13** extend rearwardly, one above the other, and forward angularly outwardly extending reaches **12** lie slightly above and forward of each other as shown in FIG. **9.** In this embodiment, the stacking height dimension C is somewhat greater than that shown for stacking height C in FIG. **13,** since there is no forward generally horizontal portion **240** and since the forward angularly outwardly extended reaches **12** therefore contact each other in a different plane providing a greater dimension between points of contact.

FIG. **10** shows another version of the stacking chair of the invention, having a single sheetform seat and back member **104** but having the important central recess provided at the forward edge of the seat portion thereof identified as **130.** From FIG. **11** will be seen in cross-section a detail of the manner of mounting the sheetform seat and back member **104** upon the base member **103.** The stacking height C, being the thickness of the seat itself, will also be apparent. Chamber

125 provided in the bottom of the seat portion of the seat and back member **104** receives transversely extending seat support members **115**, which are in turn secured to the upper generally horizontal and rearward reach **110** of the leg members which together comprise the base member **103** for the chair of this embodiment. The cross-section of FIG. **11** is taken along the line D—D of FIG. **10**, as will be apparent.

FIG. **12** shows another version of the stacking chair of the invention. All of the elements are the same as in FIG. **1**, with the exception that the base member comprises mirror image leg members having an upward generally horizontal and rearward reach **210**, a forward generally vertical reach **211**, and a forward angularly outwardly extending reach **212**, which includes at the lower portion thereof a generally horizontal reach **240** which terminates in generally horizontal rearward floor-engaging reach **213**. In this embodiment, the stacking height of the leg members is minimized, as shown in detail in FIG. **13** which shows the detail indicated as F in FIG. **12** for three stacked chairs. From this detail of FIG. **13**, it will be apparent that the generally rearwardly extending floor-engaging portions of the leg member **213** extend rearwardly, and that the portions **240** lie above each other, but that the outwardly extending reaches **212** lie forward of each other but vertically overlap each other partially, as indicated by overlap lines **241**. Thus, upon stacking three chairs of the version shown in FIG. **12**, the stacking height of a single leg member, and consequently of the leg members of three chairs, will be slightly less than that for a chair of FIG. **1**, as further indicated in FIGS. **9** and **13**. For the embodiment of FIG. **12**, it will be apparent from FIG. **13** that the contact between leg members will be a line contact between members **213** lying in a horizontal plane.

It should also be apparent that the relationship of the depth of the recess **30, 130,** or **230** at the forward edge of the seat portion of the chair according to the invention to the vertical reach **11, 111,** or **211** is significant in that the greater the depth of the recess, the more chairs can be stacked atop each other vertically, providing the vertical reach is of sufficient length to permit the angled reaches **12, 112, 212** of the legs to stack upon each other below the forward edge of the seat and back members **4, 5; 104;** and **204, 205.** It is obvious that vertical reaches **11, 111,** or **211** of stacked chairs **1, 101, 201** lie in contact with the corresponding reaches of the next adjacent stacked chair upon stacking.

It should also be apparent that, for maximum convenience and safety, and especially from the standpoint of maximum stackability, the lateral dimension between the two rearwardly extending floor-engaging reaches (**13, 113, 213**) of the base member (**3, 103, 203**) should be in excess of the maximum lateral dimension of the seat portion of the chair seat and back member (**4** and **5**; **104, 204** and **205**). This enables those portions of the base member to be located outwardly from the seat lateral edges upon stacking.

In the embodiment of FIG. **5**, no glides are shown on horizontal member (**13, 113, 213**). However, in other embodiments, conventional glides may be present. In a preferred embodiment, such glides can be contoured, e.g., concavely, to provide and maintain contact between horizontal members (**13, 113, 213**) of a plurality of chairs upon stacking.

Glides may also be used to increase the stacking height of the leg members **3, 103, 203,** if desired.

In all embodiments shown, such horizontal members (**13, 113, 213**) are shown as the terminal portion of the base members (**3, 103, 203**). A further added vertical reach at the rear extremity thereof may also be present, and may or may not be further attached to chair seat and back members (**4,5; 104;** or **204, 205**). Such added vertical reach, if present, should have little or no effect upon stackability and serves only for rigidization of the chair structure. It is not an essential of the present invention.

It will be apparent that the sheetform seat and back members of the stacking chair of the invention can be of any suitable material, such as wood, filled plywood, plastic, molded plastic, plastic foam, metal, or the like, and that the leg members having the form of a tube or rod can be either solid or hollow and of any suitable material such as aluminum, steel, stainless steel, plastic, or the like. It should also be apparent that, where metal components are used, these can be secured or fixedly secured together, as for example, the joints between upper generally horizontal and rearward reaches **10** and laterally extending seat support members **14** and **15**, or between spacer plate **16** and vertical reaches **11**, or even between seat support members **15** or **115** or **214** and **215** and seat and back member **4, 5, 104, 204, 205,** may be of any suitable type, such a soldering, welding, brazing, press-fitting, swaging, or cementing.

It is to be understood that the invention is not to be limited to the exact details of operation or the exact structure, methods, or procedures shown and described, as all of the foregoing are subject to numerous variations and modifications without departing from the spirit of the invention and obvious modifications and equivalents will be apparent to one skilled in the art.

I claim:

1. A stacking chair comprising a sheetform seat and back member and a base member comprising two leg members in the form of a tube or rod, said leg members being substantial mirror images of each other and each having an upper generally horizontal and rearward reach, a forward generally vertical reach, and a forward angularly outwardly extending reach terminating in a generally rearward reach constituting the floor-engaging portion of said leg member, said mirror image leg members being secured together at their upper generally horizontal reaches and including a laterally extending seat support member extending therefrom, said seat support member being secured to a seat portion of said sheetform seat and back member, a central recess being provided at the forward edge of the seat portion of said chair having dimensions suitable to receive therein the generally vertical reach of the base member of an identical stacking chair, the generally horizontal floor-engaging reaches of said leg members and said angularly outwardly extending reaches of said leg members being adapted to engage and support identical reaches of said identical stacking chair upon stacking, at least at some point on said reaches.

2. The combination of claim **1**, wherein the thickness of the seat member includes bumper means for compensation for difference between the stacking height of said leg members and the thickness of the seat portion of said sheetform member *per se*.

3. The combination of claim 1, wherein said leg members are also secured to each other at their generally vertical reaches.

4. The combination of claim 1, wherein said sheetform seat and back member comprises two identical members positioned at opposite sides of the upper horizontal reach of said base member and secured to seat support members.

5. The combination of claim 4, wherein said sheetform seat and back members are also secured together at the back portions thereof.

6. The combination of claim 4, wherein said seat and back members are slightly pitched inwardly toward the upper horizontal and rearward reach of said base member and toward the space between their respective back portions.

7. The combination of claim 4, wherein said seat and back members are secured to said base member by seat support means extending into apertures provided in the seat portions thereof for receiving said seat support members.

8. The combination of claim 7, wherein said support members are secured in said apertures by external fastening means.

9. The combination of claim 8, wherein said external fastening means also retain bumper means at the bottom surface of the seat portions of said seat and back members.

10. The combination of claim 1, wherein said forward outwardly angled reaches of said leg members also include at the lower portions thereof a generally horizontal reach which terminates in said generally horizontal rearward floor-engaging reach to minimize stacking height of the leg members.

11. The combination of claim 1, wherein the lateral dimension between the two rearwardly extending floor-engaging reaches of the base member is in excess of the maximum lateral dimension of the seat portion of the chair.

12. A stacking chair comprising a sheetform seat and back member and a base member comprising two leg members in the form of a tube or rod, said leg members being substantial mirror images of each other and each having an upper generally horizontal and rearward reach, a forward generally vertical reach, and a forward angularly outwardly extending reach terminating in a generally rearward reach constituting the floor-engaging portion of said leg member, said mirror image leg members being secured together at their upper generally horizontal reaches and including a laterally extending seat support member extending therefrom, said seat support member being secured to a seat portion of said sheetform seat and back member, a central recess being provided at the forward edge of the seat portion of said chair having dimensions suitable to receive therein the generally vertical reach of the base member of an identical stacking chair, the stacking height of said leg members corresponding to a thickness of said seat portion of said sheetform seat and back member to enable close nesting of a plurality of identical chairs and support thereof upon stacking.

* * * * *