

[54] **TIP-UP SEATING**

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[22] Filed: **Aug. 27, 1973**

[21] Appl. No.: **391,547**

[30] **Foreign Application Priority Data**

Aug. 29, 1972 Great Britain..... 40034/72

[52] U.S. Cl..... **297/335, 297/445**

[51] Int. Cl..... **A47c 1/02**

[58] Field of Search..... 297/35, 41, 55, 59, 60,
297/331-336, 445, 446, 411, 463

[56] **References Cited**

UNITED STATES PATENTS

1,152,480	9/1915	Bouk.....	297/332
3,025,100	3/1962	Morgan.....	297/41
3,173,723	3/1965	Hoven et al.	297/445 X
3,328,075	6/1967	Albinson.....	297/445
3,628,832	12/1971	Jennings.....	297/445 X

Primary Examiner—James C. Mitchell

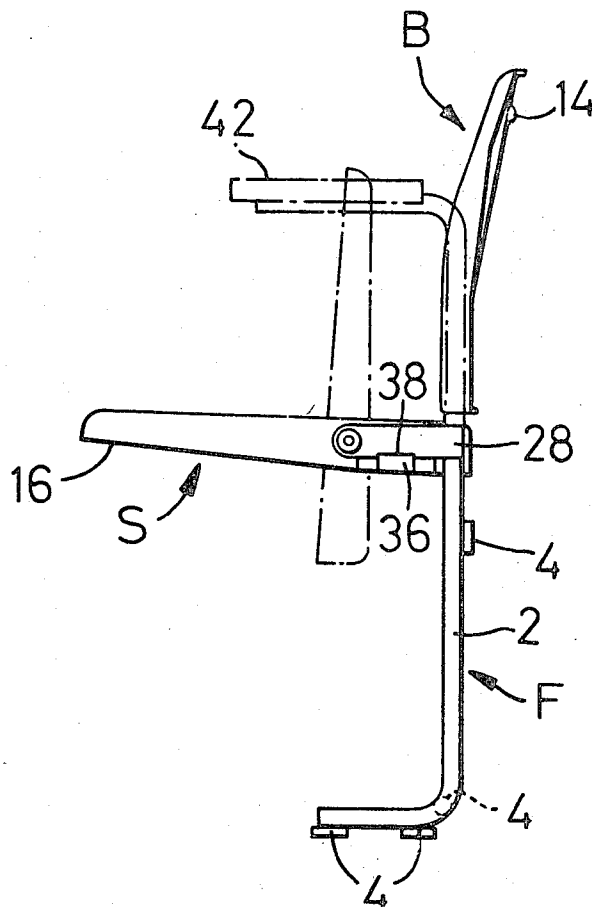
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[57]

ABSTRACT

A chair with a tip-up seat comprises a mounting and support frame having two spaced tubular metal uprights joined by at least one cross member, an injection moulded back rest member formed with sockets adjacent its side edges and receiving the upper ends of the tubular uprights, seat brackets secured to and extending forwardly from the uprights, an injection moulded seat member having a peripheral downturned flange, metal reinforcing members extending parallel to and within the flange adjacent each side edge of the seat member and secured to the latter, bushings extending from each side of the seat member through the flange and said reinforcing members, hinge pins extending through said seat brackets into said bushings to hinge the seat member to the support frame, and a counterweight attached beneath the rear of the seat member, the reinforcing members being formed with out-turned flanges which engage the seat brackets when the seat member is tipped down.

9 Claims, 3 Drawing Figures



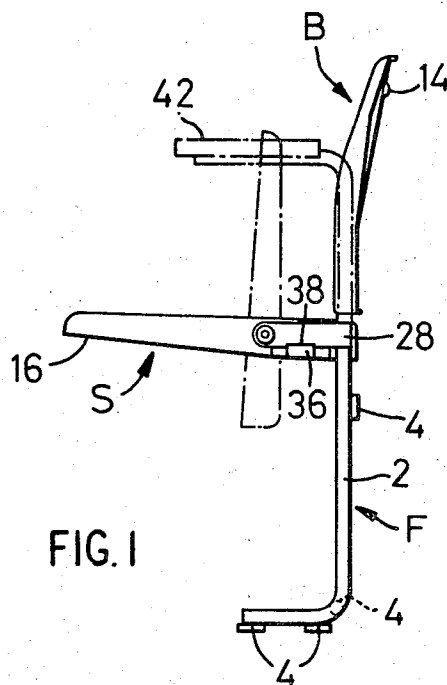


FIG. 1

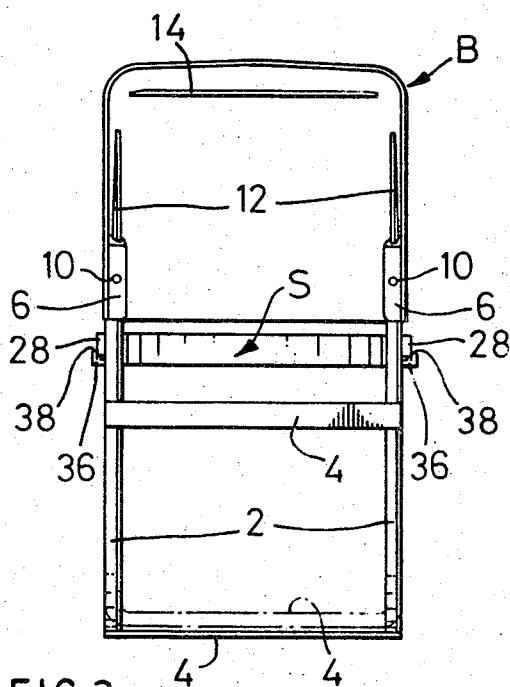


FIG. 2

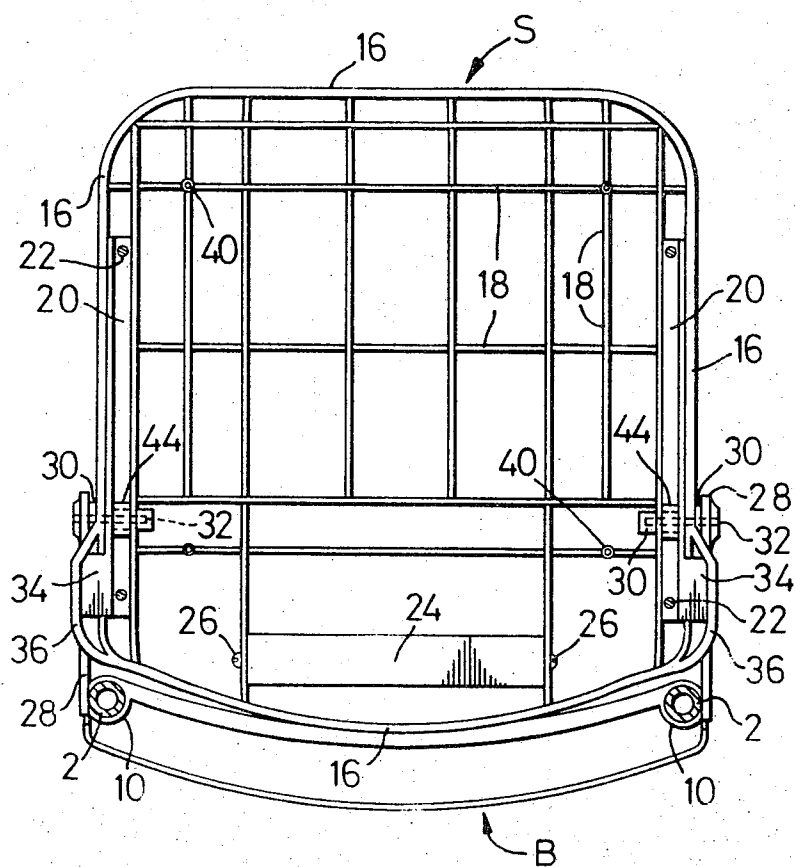


FIG. 3

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TIP-UP SEATING

This invention relates to seating for use in auditoriums, stadiums and other locations where fixed seating comprising chairs with tip-up seats is required.

Particularly in locations such as football grounds such seating must be more than ordinarily durable and resistant to abuse.

An object of the invention is to provide a seat capable of being made to meet the requirements of such locations, in which the seat and back may be injection mouldings and the frame is of a simple design readily modified for installation in different locations.

According to the invention, a chair with a tip-up seat comprises a mounting and support frame having two spaced tubular metal uprights joined by at least one cross member, an injection moulded back rest member formed with sockets adjacent its side edges and receiving the upper ends of the tubular uprights, seat brackets secured to and extending forwardly from the uprights, an injection moulded seat member having a peripheral downturned flange, metal reinforcing members extending parallel to and within the flange adjacent each side edge of the seat member and secured to the latter, bushings extending from each side of the seat member through said flange and said reinforcing members, hinge pins extending through said seat brackets into said bushings to hinge the seat member to the support frame, and a counterweight attached beneath the rear of the seat member, the reinforcing members being formed with out-turned flanges which engage the seat brackets when the seat member is tipped down.

Arm members may optionally be welded to one or both uprights so as to extend forwardly to one or both sides of the back member.

A preferred embodiment of the invention is described with reference to the accompanying drawings in which:

FIG. 1 is a side elevation of a chair with a tip up seat,

FIG. 2 is a rear elevation of the chair, and

FIG. 3 is an underside view of the chair on an enlarged scale with the bottom part of the frame omitted for the sake of clarity.

Referring to the drawings, the chair comprises injection moulded seat and back members S and B supported by a mounting and support frame F. The form of the frame F will vary according to the manner in which the chair is to be mounted, but in all cases two spaced tubular uprights 2 will be provided interconnected by at least one cross member 4. As shown in FIGS. 1 and 2, separate cross members 4 may be welded between the uprights 2, or, as shown in broken lines, the uprights 2 and a cross member 4 may be formed by a continuous length of metal tubing, the exact configuration being determined by the configuration of the foundation to which the seat is to be mounted, which may lie in a horizontal or vertical plane, or be stepped.

The back member B is an injection moulding formed with two sockets 6 extending adjacent its outer edges to receive the upper ends of the tubular uprights 2. The uprights 2 are secured within the socket by screws or rivets 10 which not only serve to secure the back member to the tubular members but also restrain torsional movement of the sockets about the uprights 2 thus substantially stiffening the back member. Additional stiff-

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ening of the back is provided by ribs 12 extending upwardly from the sockets, whilst resistance to forces applied to the back member from the rear by persons behind is provided by a lateral rib 14 extending across the rear surface of the seat member near its top edge.

The seat member S is also an injection moulding, formed with a peripheral downturned flange 16 and a grid of reinforcing flanges 18 on its under surface. Extending parallel to and within the flange 16 adjacent the side edges of the seat are two metal reinforcing members 20 secured beneath the seat member by screws 22, and beneath the rear of the seat member in a pocket formed by the flanges 16 and 18 is secured a counterweight 24 by means of screws 26.

The seat is supported on the frame F by means of seat brackets 28 extending forwardly from the uprights 2 to which the brackets are welded. Holes are drilled through the side portions of the flange 16 and through the adjacent portions of the reinforcing members 20 to form apertures receiving bushings 30 of low friction material such as nylon. Additional stiffening of the structure is obtained by passing the bushings through moulded spacers placed between the flange 16 and the members 20. The seat is then hingedly attached to the seat brackets by driving hinge pins 32 through bores in the seat brackets into the bushings 30. The hinge pins are of C-section and are slightly oversized relative to the bores in the seat brackets so that they resiliently engage the latter and resist loosening.

In order to determine the tipped down position of the seat, the reinforcing members 20 are provided at their rear ends with out-turned flanges 34 which engage the seat brackets 28. Some cushioning of this engagement is provided by overlapping flanges 36 formed on the seat members, and ribs 38 on the upper surface of the flanges 36 provide further cushioning and prevent damage to the flanges 36. The location of the bushings 30 relative to the sides of the seat member and hence the position of the bores in the seat brackets 28 should be as far forward as practicable without being in front of the centre of gravity of a user of the chair, since this reduces the stresses not only of the hinge pins 32 and associated parts but also on the flanges 34 and 36, and furthermore reduces the mass of the counterweight 24 required to restore the seat member to the tipped up position shown in broken line in FIG. 1 when not occupied.

The seat and/or back members may be upholstered by any known means. Moreover, the underside of the seat member S may be provided with a cover plate (not shown), secured in position by screws entering screw holes 40 preformed beneath the seat member. If desired the counterweight 24 may be attached to the coverplate instead of directly to the seat.

Arm members 42 may if desired be welded to either or both uprights 2 so as to extend forwardly on either side of the back member B, as shown in broken lines in FIG. 1.

The seat and back members should be moulded from a tough resilient material that is resistant to fatigue failure when subject to deformation. Polypropylene is a suitable material.

What I claim is:

1. A chair with a tip-up seat comprising a mounting and support frame having two spaced tubular metal uprights joined by at least one cross member, an injection moulded back rest member having socket means adja-

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cent its side edges receiving the upper ends of the tubular uprights, seat brackets secured to and extending forwardly from the uprights, an injection moulded seat member having a peripheral downturned flange, metal reinforcing members extending parallel to and within the flange adjacent each side edge of the seat member and secured to the seat member, bushings extending from each side of the seat member through said flange and said reinforcing members, hinge pins extending through said seat brackets into said bushings hinging the seat member to the support frame, the reinforcing members being formed with out-turned flanges which engage the seat brackets when the seat member is tipped down.

2. A chair according to claim 1, together with an arm member welded to at least one of the uprights so as to extend forwardly to one side of the back member.

3. A chair according to claim 1, wherein the hinge pins are of C-section, and are oversize relative to bores in the seat brackets into which they are driven.

4. A chair according to claim 1, wherein the seat

member is formed with out-turned flanges overlying the out-turned flanges on the reinforcing members.

5. A chair according to claim 1, wherein the socket means in the back member includes restraining means cooperating with the uprights retaining the socket means against torsional movement relative to the uprights.

6. A chair according to claim 5, wherein the back member is provided with a transverse reinforcing rib on its rear surface near its top edge, said rib extending across the center of said back member.

7. A chair according to claim 5 wherein upstanding stiffening ribs extend up the rear surface of said back member from said socket means.

8. A chair according to claim 1 wherein separate means releaseably secure said reinforcing members to said seat member.

9. A chair according to claim 1 wherein said out-turned flanges oppose under surfaces of said seat brackets when the seat member is tipped down.

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