United States Patent [19]

Bosnich

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[54] **SELF-LEVELING AND SWIVELING CHAIR**

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[52] **U.S. Cl.** **114/191**

[51] **Int. Cl.** **B63b 29/12**

[58] **Field of Search** 114/191, 195, 194, 192; 244/122, 93; 297/346, 345, 240, 241; 248/188.4, 188.7; 177/252, 262, 250, 246

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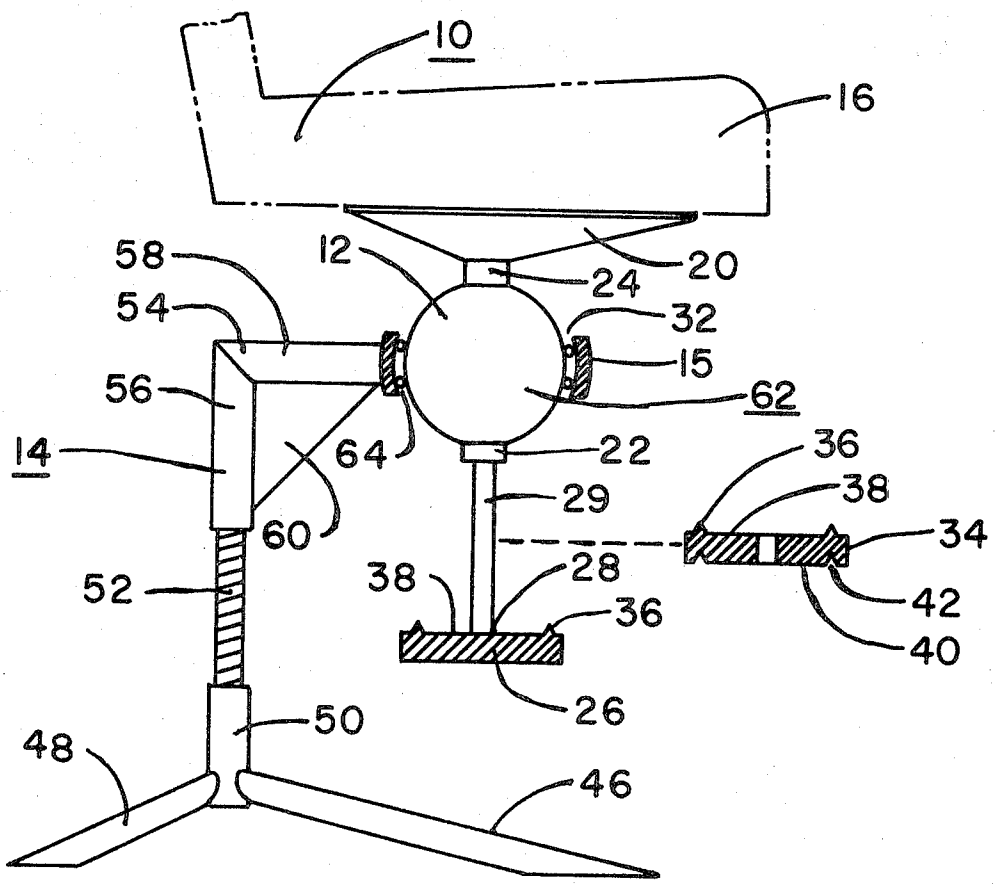
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[57] **ABSTRACT**

An adjustably counterweighted chair seat supported on a vertically adjustable stand, the chair seat and stand being interconnected by a ball and socket joint for providing movement therebetween in three normal axes of motion. The counterweight, adjustably mounted below the joint times the distance to the joint, exceeds the weight of the chair seat and occupant, above the joint, times the distance therebetween, to keep the chair seat level while the stand follows the roll and pitch of the ship on which it is supported. While remaining level the chair seat is also turnable about its vertical axis.

1 Claim, 2 Drawing Figures



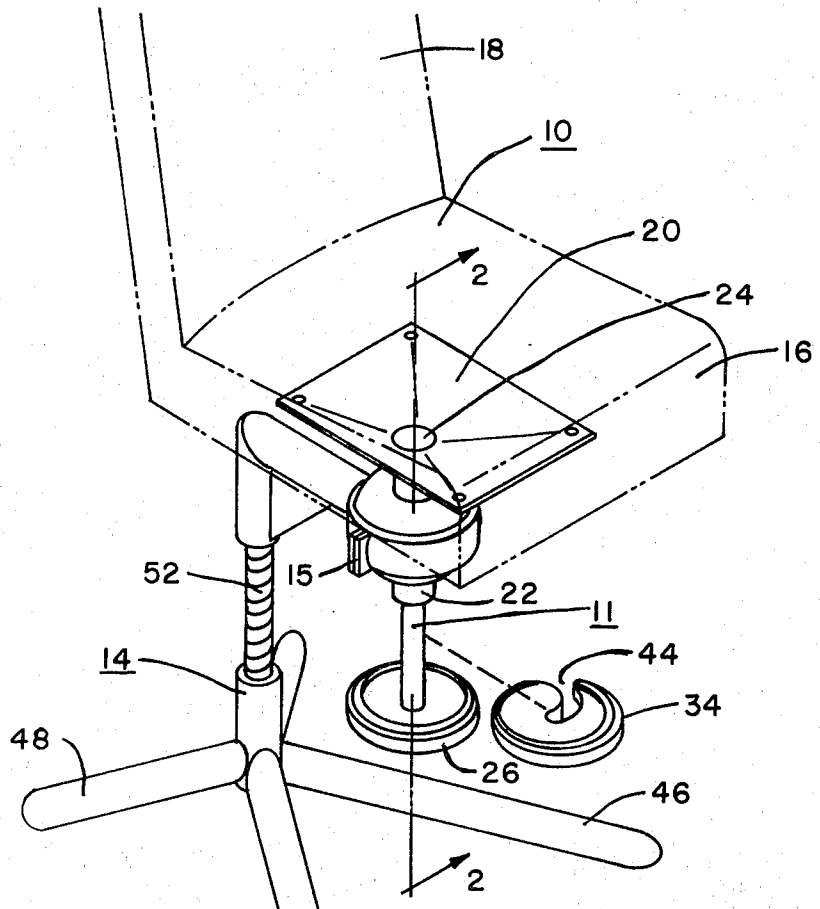

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FIG. 1

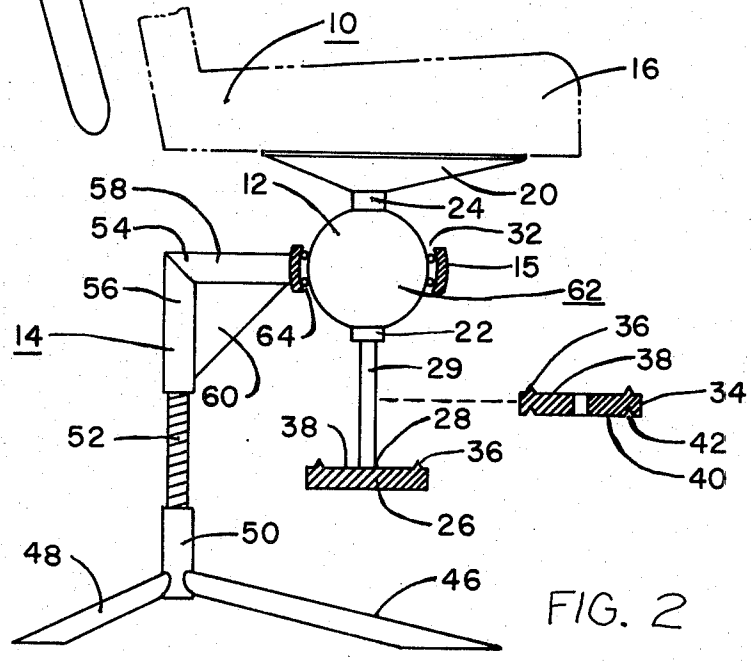

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FIG. 2

SELF-LEVELING AND SWIVELING CHAIR

The invention relates generally to chairs, and more particularly to chairs with self-levelling chair seats that are turnable about a vertical axis.

A captain of a ship is often required to remain on his bridge during bad weather for extended periods of time. Physical strain is not reduced if it is necessary to fight to remain seated in an ordinary chair.

It is old in the art to support chairs, lamps and tables in gimbals. In such cases the weight of the object itself acts as self levelling. Chairs and tables have been counterweighted to be self levelling but fixed with respect to turning and adjustment about a vertical axis.

It is an object of the invention to provide a chair seat that can be adjusted for any height and weight of the occupant and chair seat and with full turning about a vertical axis for permitting the occupant to look in any direction while remaining level with the horizon.

Other objects and a fuller understanding of the invention may be had by referring to the following specifications and drawings, in which:

FIG. 1 is a perspective view of the invention, partially in phantom and from above, and

FIG. 2 is a cross-sectional view taken along section lines 2—2 of FIG. 1.

Referring to FIGs. 1 and 2, the invention comprises a chair seat 10 fixed to a unitary counterweight 11 having a male connecting member 12, both of which are supported for movement in three axes of motion by a stand 14 having a female connecting member 15.

The chair seat 10 comprises a seat 16 and a back 18 fixed thereto. No arms are provided as none are required for an occupant to remain comfortably seated as will be more fully explained hereinafter.

The unitary counterweight and male connecting member comprises a plate 20 fixed to the bottom of the seat 16. A shaft 22 is fixed to plate 20, normal thereto, by an end 24 to extend downward therefrom. A weight base 26 is fixed to an end 28 oppositely disposed from end 24 of shaft 22. A ball 12 of a ball and socket joint 62 is rigidly mounted on shaft 22 as a diameter intermediate the ends 24 and 28. The shaft 22 is reduced in diameter in an area 29 between the ball and end 28 and provides means for adding and subtracting weights 34 to the weight base 26. Weights 34 (one only is illustrated) and the weight base 26 have raised flanges 36 adjacent edges of their respective upper surfaces 38. The lower surfaces 40 of the weights 34 respectively define grooves 42 adapted to receive flanges 36 immediately below. Weights 34 also define, respectively, a radial spiral channel 44 adapted to be received by shaft 22 along the area 29 of reduced diameter.

The stand and female connecting member comprises four radial feet, two longer feet 46 and two shorter feet 48, connected at adjacent ends by a tapped sleeve 50, normal to the adjacent ends of said feet. A threaded shaft 52 is threadably engaged in the sleeve 50. A dog-leg upper sleeve 54 has legs 56 and 58, normal to each other and braced with a bracket 60 mounted therebetween. Leg 56 is tapped reversely to tapped sleeve 50 and is adapted to threadably engage shaft 52. A socket 15 of the ball and socket joint 62 is fixed to a free end of leg 58 and adapted to engage ball 12 of said ball and socket joint for movement in three axes of motion. Ball bearings 64 are mounted between said ball and socket to reduce friction therebetween.

The chair can be moved as desired and supported on its feet 46 and 48. The height of the chair can be adjusted by turning the threaded shaft 52 to simultaneously screw in or out of sleeve 50 and leg 56 of dog-leg sleeve 54 to increase or decrease the vertical height of the stand 14.

The chair can be counterbalanced for the weight of an occupant by adding weights 34 to the weight base 26. The weights are added by respectively engaging their radial spiral channels 44 with shaft 22 along area 45 and resting on weight base 26 with complementary flanges and grooves interfitting to prevent inadvertent separation of the weights from the weight base and each other. Sufficient weights are added to more than counterbalance the weight of the occupant of the chair. More accurately, the weight of the occupant times the distance from the occupants center of gravity to the center of motion of the ball and socket joint must be less than the counterbalancing weights times the distance from their center of gravity to said center of motion. The occupant of the chair remains vertical with the horizon regardless of the roll and pitch of the ship and can swing the chair to face in any compass direction.

What is claimed is:

1. A self-leveling and swiveling chair having a seat for a sitter and comprising:

a. a shaft having oppositely disposed ends and fixed by one of said ends to said seat with the other free end depending;

b. a stand having radially extending feet for engaging a deck of a ship; a tapped sleeve joining adjacent ends of said feet and forming therewith a base; a straight threaded shaft having oppositely disposed ends one of which ends is adapted to be threadably engaged in said tapped sleeve for varying the length of said threaded shaft engaged in said tapped sleeve; a dog leg sleeve having two hollow legs, one of said legs being reversely tapped with respect to said tapped sleeve and adapted to threadably engage said threaded shaft for varying the length of said threaded shaft cooperatively with said tapped sleeve when said threaded shaft is rotated;

c. universal joint means having a ball and socket joint, said ball being mounted on said shaft between said seat and a counterbalancing weight and above the center of gravity of the swiveling chair, and said socket being mounted on said stand and adapted to engage said ball for relative movement therebetween about three axis of motion;

d. a flat weight base fixed to the free end of said shaft for at least counterbalancing the weight of said seat when empty;

e. and a plurality of flat weights for adding to said weight base for counterbalancing the weight of a sitter, each said weight having a curved radial slot defined therethrough that is adapted to engage around said shaft, said curved slot extending from a closed end at said weight's center and extending to an open end on its periphery with said open end being angularly offset from said closed end, each said weight being separately engageable radially on said shaft through the open peripheral end of said curved slot and being turned about about its axis normal to said slot to bring said shaft to the closed center end of said curved slot, whereby said weights are added from the side to the shaft in vertical formation and prevented from slidably disengaging therefrom inadvertently by the angular offset of the open and close-ends of said curved slots.

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