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Somerset

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[54] **CHAIR**

[76] Inventor: **David Somerset,** 4 Fosbury Mews, Inverness Terrace, London W 2, England

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[52] **U.S. Cl.** **297/339;** 297/DIG. 10

[51] **Int. Cl.²** **A47C 3/32**

[58] **Field of Search** ..... 297/339, DIG. 10, 338, 297/337, 346, DIG. 4; 248/419, 420; 108/138, 147

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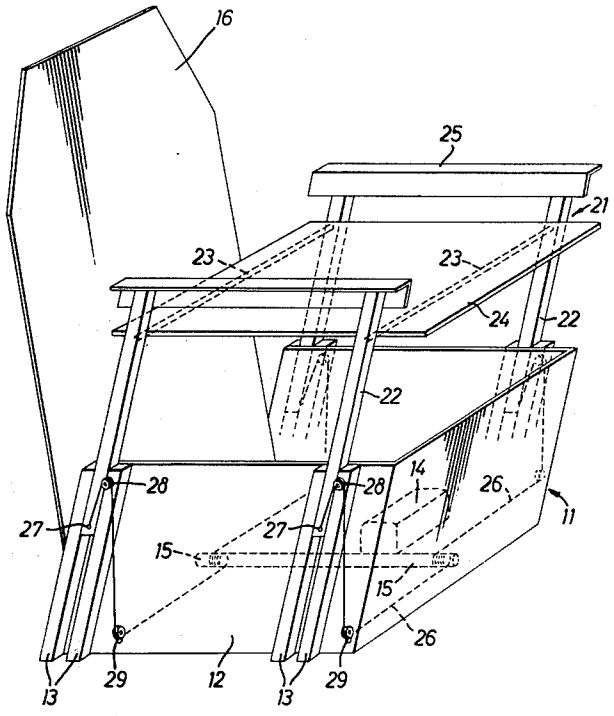
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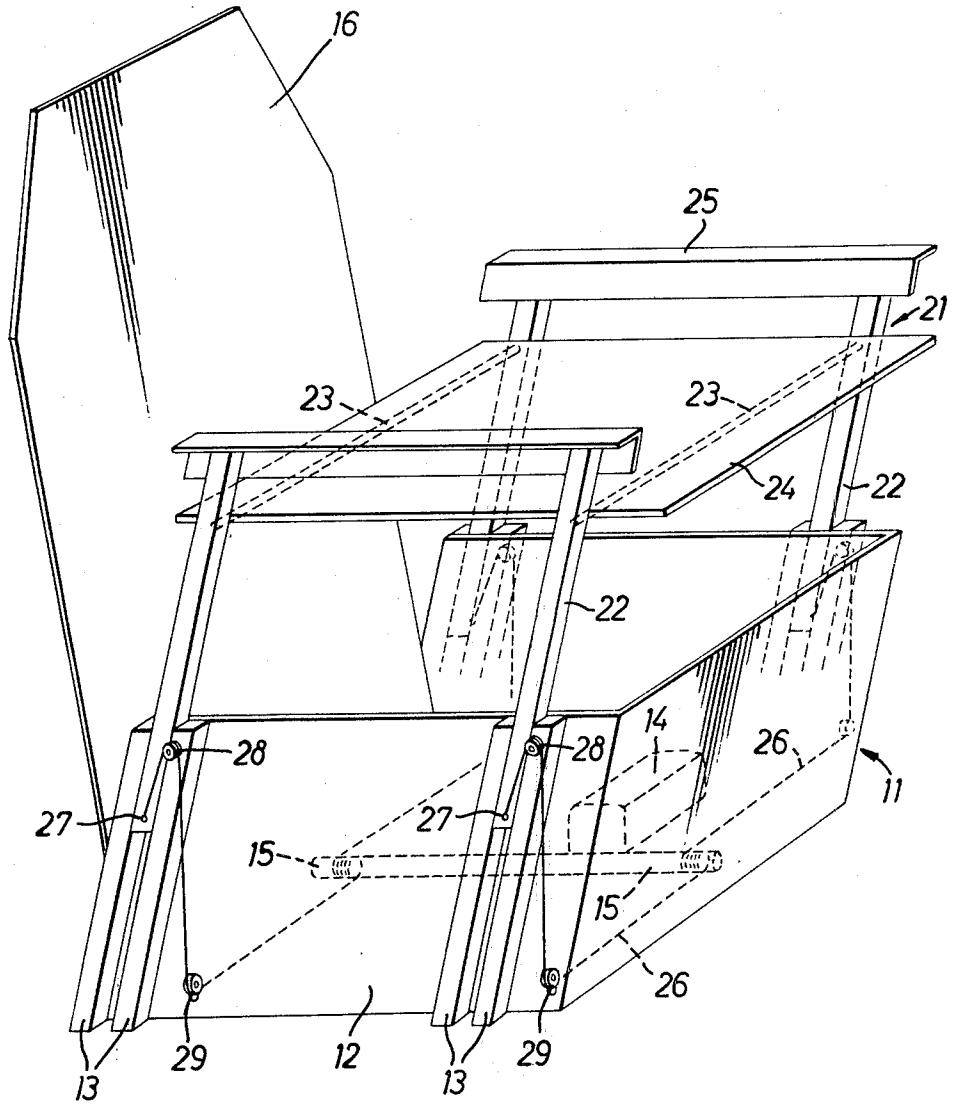
Primary Examiner—Francis K. Zugel
Attorney, Agent, or Firm—William F. Frank

[57] **ABSTRACT**

Disclosed is a chair having a base portion and a seat frame, with means for raising and lowering the seat frame relative to the base portion so the seat frame remains at the same angle relative to the horizontal during raising and lowering. Means are also provided to guide the seat frame on a path relative to the base portion inclined to the vertical so that the raising and lowering movement is accompanied by forwards and backwards movement respectively.

4 Claims, 1 Drawing Figure




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CHAIR

This invention relates to chairs whose seats can be raised and lowered while the occupant is sitting thereon.

Some disabled people find it difficult to regain the standing positon after sitting in a chair. Special chairs have been devised in which the seat can be raised in order to assist the disabled person to regain the standing position. Such chairs have raised the rear portion of the seat about a pivot axis at the front of the seat, thus tipping the occupant forward on his feet. However, such designs have not been entirely satisfactory as they tend to tip the disabled person so much that he may fall over forwards.

According to the present invention there is provided a chair having a base portion and a seat frame, means for raising and lowering the seat frame relative to the base portion so the seat frame remains at the same angle relative to the horizontal during raising and lowering, and means to guide the seat frame on a path relative to the base portion inclined to the vertical so that the raising and lowering movement is accompanied by forward and backwards movement respectively.

Preferably the seat frame is provided with a seat portion pivotable on a horizontal transverse axis relative to the seat frame and spaced from the front of the seat portion. The seat frame is preferably provided with arms movable therewith.

An example of the invention will now be described with reference to the accompanying drawing which is a schematic diagram with some portions cut away of a chair having a seat frame which can be raised and lowered relative to its base portion.

In the drawing, a base portion **11** has side walls **12** on the outside of each of which are provided two pairs of guides **13** inclined forwards at an angle of about **20°**. Between the side walls **12** there is provided a reversible electric motor **14** which drives capstans **15** through a reduction gear not shown. At the rear of the base portion, a tall back **16** is provided, inclined backwards at about **20°**.

The chair comprises a seat frame **21** having four parallel slider members **22** which respectively slide between the sets of guides **13** of the base portion. Two transverse rodes **23** join pairs of the slider members transversely of the chair. A seat plate **24** is mounted on the rods **23,** the mounting at the front rode being by brackets which allow the seat plate to pivot about the axis of the front rod **23.** The mounting of the seat plate **24** about the rear rod **23** is free, so that the seat plate may lift relative to the rear rod. The slider members **22** on either side of the chair are joined together by arm-rests **25** at a suitable height above the seat plate **24.**

The slider members **22** can be raised and lowered relative to the guides **13** by means of cables **26** wound on the capstans **15.** The cables **26** are connected to the bottom end **27** of the slider member **22** and pass over a pulley **28** mounted on the front guide **13** of each pair and over a second pulley **29** mounted on the base member below the first pulley, the cables then passing into the interior of the base member to wind upon the capstans **15.** The cables **26** are wound upon the capstans **15** so that all four cables are wound in or out by the same amount on rotation of the motor. The motor can be driven to raise or lower the slider members by actuation of appropriate electrical switches which are conveniently mounted at the front ends of the arm-rests **25,** one switch for raising the seat frame **21,** and the other for lowering it. The switches and the connecting wires to the motor **14** are not shown in the drawing.

When the occupant is sitting in the chair with its seat frame at the lowest position, he may actuate the switch to raise the seat frame, thus causing the motor **14** to wind the cables **26** onto the capstans **15** so as to raise the slider members **22** in the guides **13** so that the seat frame **21** is raised relative to the base **11,** and because of the forward inclination of the guides **13,** the seat frame also moves forward relative to the base, so that the occupant's feet can be placed backwards of the front edge of the seat plate **24.** When the seat frame **21** has been raised sufficiently, the occupant can move his weight forwards so that the centre of gravity moves from behind the front rod **23** to in front of it so that the seat plate pivots about the front rod **23.** As this front rod is behind the front edge of the seat plate **24** (by about **5** inches in the preferred embodiment), the front edge of the seat plate will move downwards and backwards, allowing the occupant to assume a vertical position. A non-slip pedestal **31** may be provided at the front of the base **11** for the occupant when he stands up from the seat.

The location of the electric switches at the front of the arm-rests **25** enable the occupant to operate the raising and lowering of the seat from both the sitting and standing positions. Limit switches (not shown) are provided to stop the raising and lowering at the limits of movement in case the occupant forgets to switch off the motor **14** himself.

The seat described above provides a stable support for the occupant, because his weight is normally located behind the front rod **23,** and the seat will only tip forward when the occupant moves his weight forward of the front rod **23.** This should only be done when the seat has been raised sufficiently so that the occupant can place his feet behind the vertical plane of his knees so that he can assume the vertical position when the seat plate **24** pivots about the front rod **23.**

The chair described above may be modified without departing fron the invention. For example, the pivoting of the seat plate **24** about the front rod **23** could be caused by a motor if the occupant was unabled to shift his own weight pass the front rod **23.** Any convenient means could be provided to cause the motion of seat frame **21** relative to the base **11,** remaining in the same inclination to the horizontal.

What is claimed is:

1. A chair having a base portion and a seat frame, means for raising and lowering the seat frame relative to the base portion as the seat frame remains at the same angle relative to the horizontal during said raising and lowering, and guide means on each side of said base portion to guiding the seat frame on a path relative to the base portion which path is inclined to the vertical so that the raising and lowering movement is accompanied by forwards and backwards movement respectively of said seat frame relative to said base portion said seat frame comprising a pair of spaced, elongated members slideably guided on each side of said base portion, a pair of horizontal rods transversely joining the front and rear members of each said pairs of members relative to the plane of each pair of members, a seat member pivotally mounted on the foremost of said rods and freely resting on the rearmost rod whereby the

seat member may lift relative to the rearmost rod, an armrest joining each pair of elongated slideable members to move with said seat frame, said raising and lowering means comprising a plurality of motor driven cable drives with cables connected to said elongated members on the seat frame.

2. A chair as claimed in claim **1** comprising means for controlling said raising and lowering means.

3. A chair as claimed in claim **1** wherein the raising and lowering means further comprises a single capstan, an electric motor for driving the capstan, said plurality of cables being wound on said capstan.

4. A chair as claimed in claim **1** comprising a back portion inclined upwardly and rearwardly, said back portion being mounted on said base portion.

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