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3,343,871

AUTOMATICALLY OPERATED INVALID CHAIR

Filed March 3, 1966

2 Sheets-Sheet 1

FIG. 1

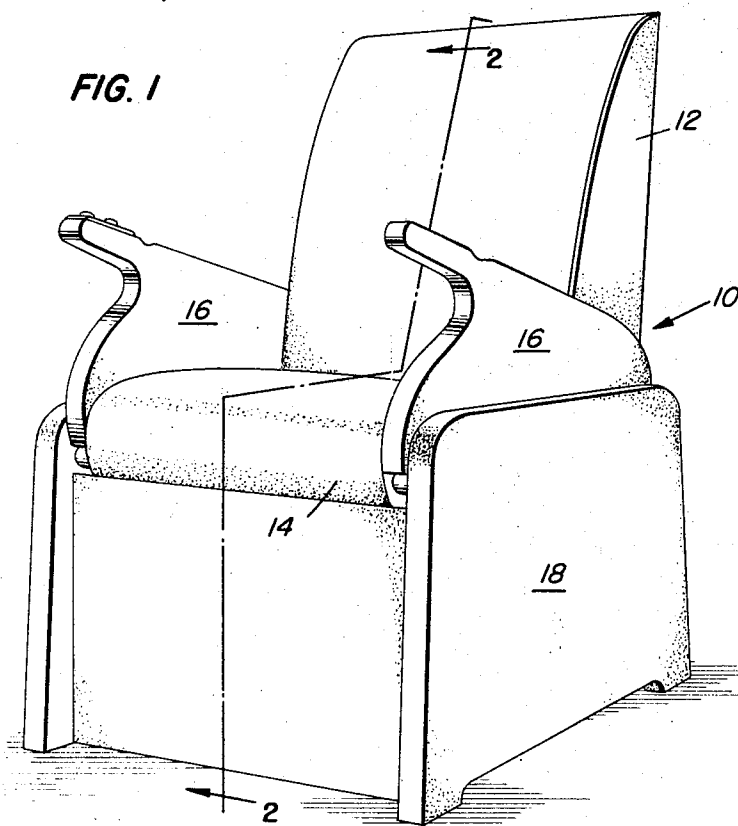
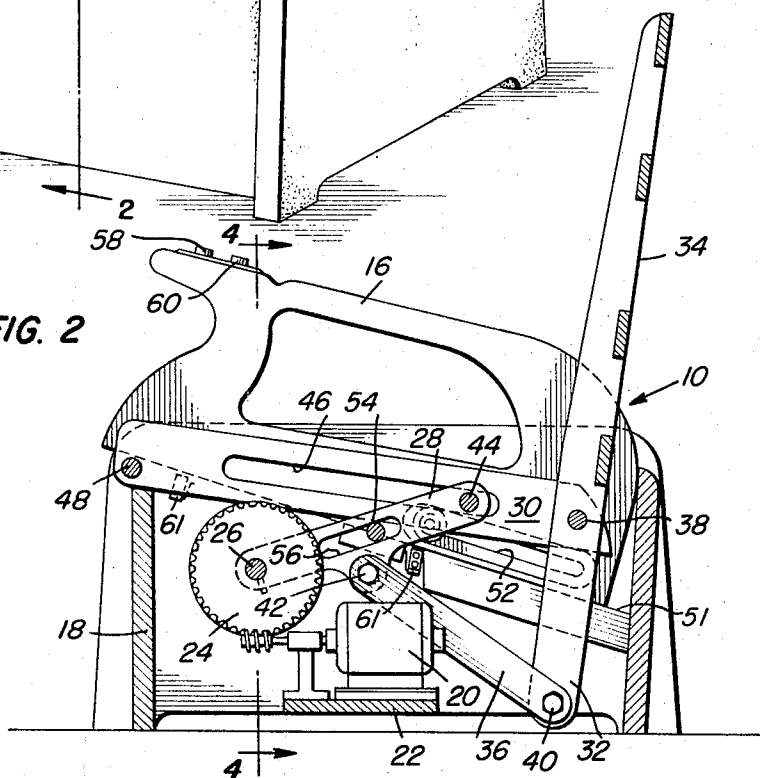


FIG. 2



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FIG. 4

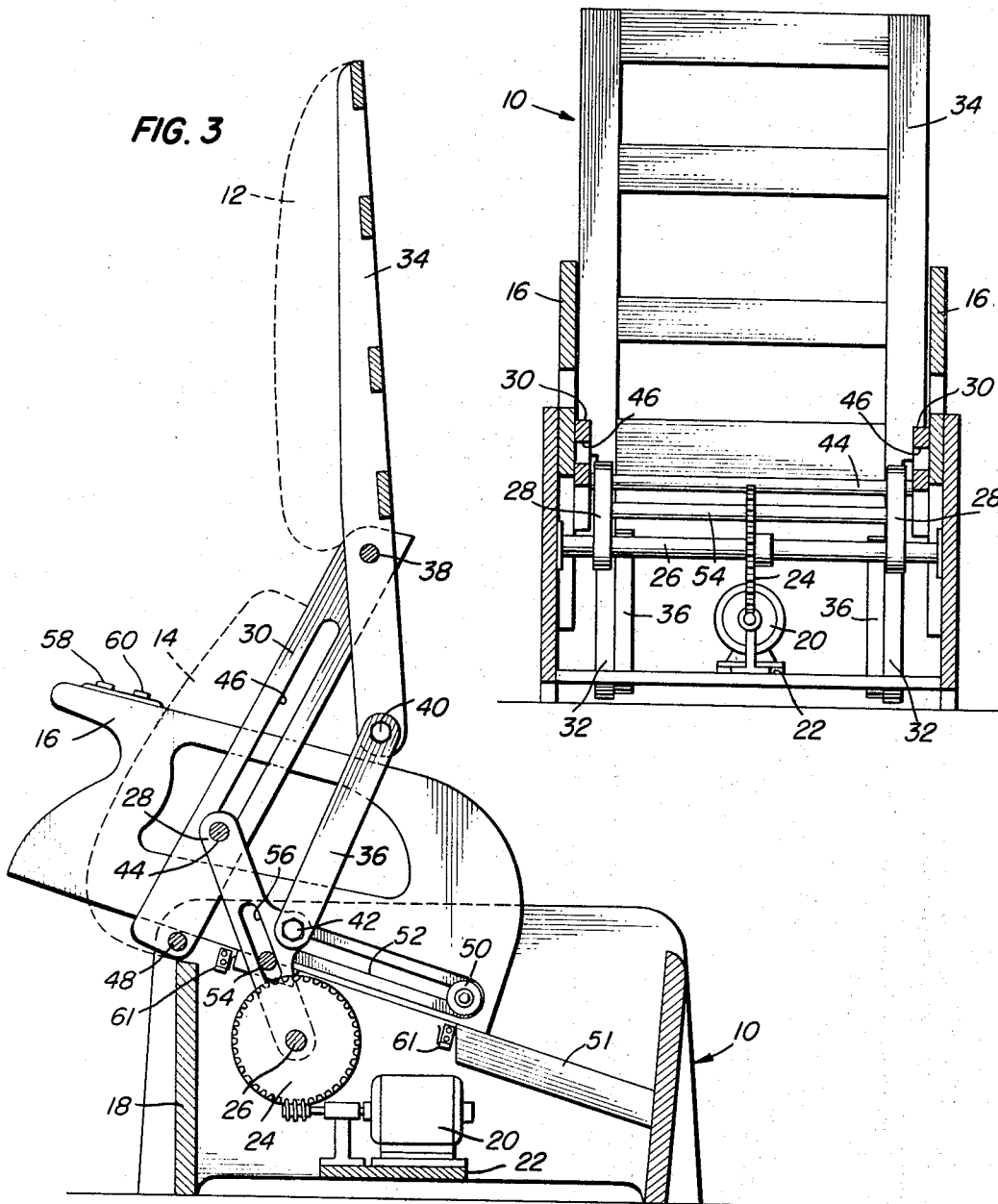
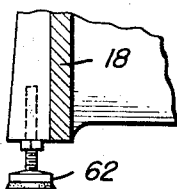


FIG. 5



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AUTOMATICALLY OPERATED INVALID CHAIR
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ABSTRACT OF THE DISCLOSURE

An invalid chair is constructed from a seat and a back pivotally mounted to said seat, an erecting arm assembly for simultaneously tilting the seat and back forward, a rotating gear for driving the erecting arm assembly, a motor-driven worm gear for driving the rotating gear, forwardly and upwardly extending guide rails, arm rests movable along said guide rails and stub shafts extending from the arm rests and pivotally captivated by the erecting arm assembly to move the arm rests along the guide rails upon tilting of the seat and back forward.

This invention relates generally to chairs, and more particularly it pertains to an automatically operated seat tilting chair for assisting an invalid to rise to a standing position.

Often an invalid is able to walk quite satisfactorily but is unable to seat himself or arise from a chair without assistance. Since the trouble generally lies in weak knees, any arrangement which will give support to the thighs while the knees are bent will greatly assist during the transition from a standing position to a seated one or vice versa.

Accordingly, it is a principal object of this invention to provide an automatic chair which will continuously support an invalid during the transition from a seated to standing position.

Another object of this invention is to provide an automatically operated chair for assisting an invalid from seated to standing position by power positioning his thighs and back and giving lift to his body by way of this arms.

Yet another object of this invention resides in the provision of a power operated chair which can be adjusted simultaneously for seat and back tilt and height of arm rests, the positions of which are linked together for optimum comfort and support from a deeply seated position to an upstanding one in any degree.

Other objects and attendant advantages of this invention will become more readily apparent and understood from the following detailed specification and accompanying drawings in which:

FIG. 1 is a perspective view of an arm chair for invalid use incorporating features of this invention;

FIG. 2 is a vertical section taken on line 2—2 of FIG. 1, with the upholstery omitted;

FIG. 3 is a view similar to FIG. 2 but showing the chair in its forward or erected position; and

FIG. 4 is a vertical section taken on line 4—4 of FIG. 2.

Referring now to the details of the invention as shown in the drawings, reference numeral 10 indicates generally an automatically operated invalid's arm chair. This chair 10 outwardly appears to be a conventional chair having upholstered back cushion 12, seat cushion 14 and a pair of arms 16.

Within the pedestal portion 18 of the chair 10, however, a motor 20 is installed centrally on a cross member 22 as shown in FIGS. 2 and 4. This motor 20 is adapted by means of a worm and gear drive 24 to rotate a shaft 26 journaled in a fixed transverse position within pedestal portion 18.

Erecting arms 28 are keyed to the shaft 26 near each end and these arms 28 are part of a trapezoidal linkage which includes the sides of a seat 30 and extensions 32 of a back 34 and a pair of links 36.

The back 34 is pivotally joined to the rear end of the seat 30 with a cross shaft 38 and rises upwardly unsupported thereabove. The extensions 32 of the back 34 extend downwardly into the pedestal portion 18 on each side and pivotally join to the links 36 with stub shafts 40. The other ends of links 36 are pivotally joined to an intermediate point on the erecting arms 28 with stub shafts 42.

The trapezoidal linkage is closed with a cross shaft 44 in the ends of the erecting arms 28 and which extend through elongated slots 46 running parallel with each other, one in each side of the seat 30.

Observing the four pivot points 38, 40, 42, and 44 of the linkage, it will be noted by comparing FIGS. 2 and 3 that when motor 20 operates to raise the erecting arms 28, the seat 30 tilts forwardly being pivoted at 48 to the pedestal 18. At the same time, the back 34 rises and also tilts forward but not to the degree of seat 30 due to the sliding of cross shaft 44 in slot 46. This positions an occupant of the chair 10 in a nearly upright position with his knees straightened and feet on the floor, back erect or a little bent forward.

To assist in his rising, the arms 16 of the chair 10 are arranged to travel forwardly and upwardly thus giving an upward and forward thrust on his upper arms. This motion is accomplished through the agency of upwardly and forwardly extending rails 51 on which the lower edges of arms 16 are slidably supported. Slots 52 are provided in arms 16 for receiving and guiding roller type bearings or wheels 50 each attached at one end thereof to the pedestals 18. Motion from the erecting arms 28 is transmitted to the chair arms 16 through a cross shaft 54 fired thereto connecting the chair arms and extending through longitudinal slots 56 in the erecting arms.

Push buttons 58 and 60 located in the forward portion of one of the chair arms are conveniently available to operate the chair 10 and to stop it at any desired intermediate point. Limit switches 61 stop the motor 20, preventing any over travel of the mechanism.

While an electric motor drive has been shown for operating the chair, it follows that a fluid actuated cylinder with its piston rod linked to the erecting arm 28 would serve equally as well.

Obviously many modifications and variations of the present invention are possible in light of the above teachings. It is, therefore, to be understood that within the scope of the appended claims the invention may be practiced otherwise than as specifically described.

What is claimed is:

1. An automatically operated invalid chair, comprising, a chair having a seat and a back for supporting a user in a seated position and arm rests for supporting the arms of said user in said seated position, means for tilting said seat forward to assist said user to rise to a standing position, means for simultaneously raising, moving and tilting said back forward during the forward tilting of said seat to support the back of said user while rising to a standing position, rail means extending forwardly and upwardly and means for moving said arm rests along said rail means in response to the forward tilting of said seat and back to enable said user to support himself while rising to said standing position.

2. In combination, a chair having a seat and a back for supporting a user in a seated position and arm rests for supporting the arms of said user in said seated position, means including a rotating gear for tilting said seat forward to assist said user to rise to a standing position, guide rails extending forwardly and upwardly, and means

3

including mechanism for translating the rotating movement of said gear to movement of said arm rests forward and upward along said rails during the forward tilting of said seat to enable said user to have support while rising to said standing position.

3. The chair of claim 2 and linkage mechanism for translating the rotating movement of said gear to the tilting motion of said seat.

4. The chair of claim 3, wherein said linkage mechanism moves said back forward and upward during the tilting motion of said seat.

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