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Amstutz

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[54] **CONVERTIBLE CHAIR**

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

[58] **Field of Search** 297/78, 79, 330, 348, 71, 297/75

[56] **References Cited**

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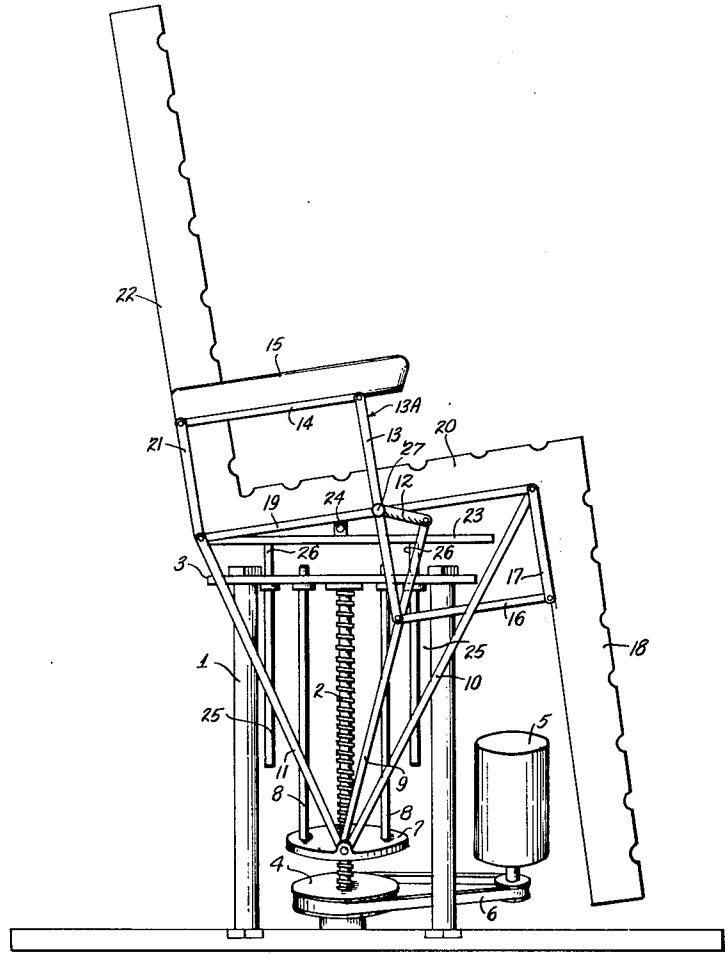
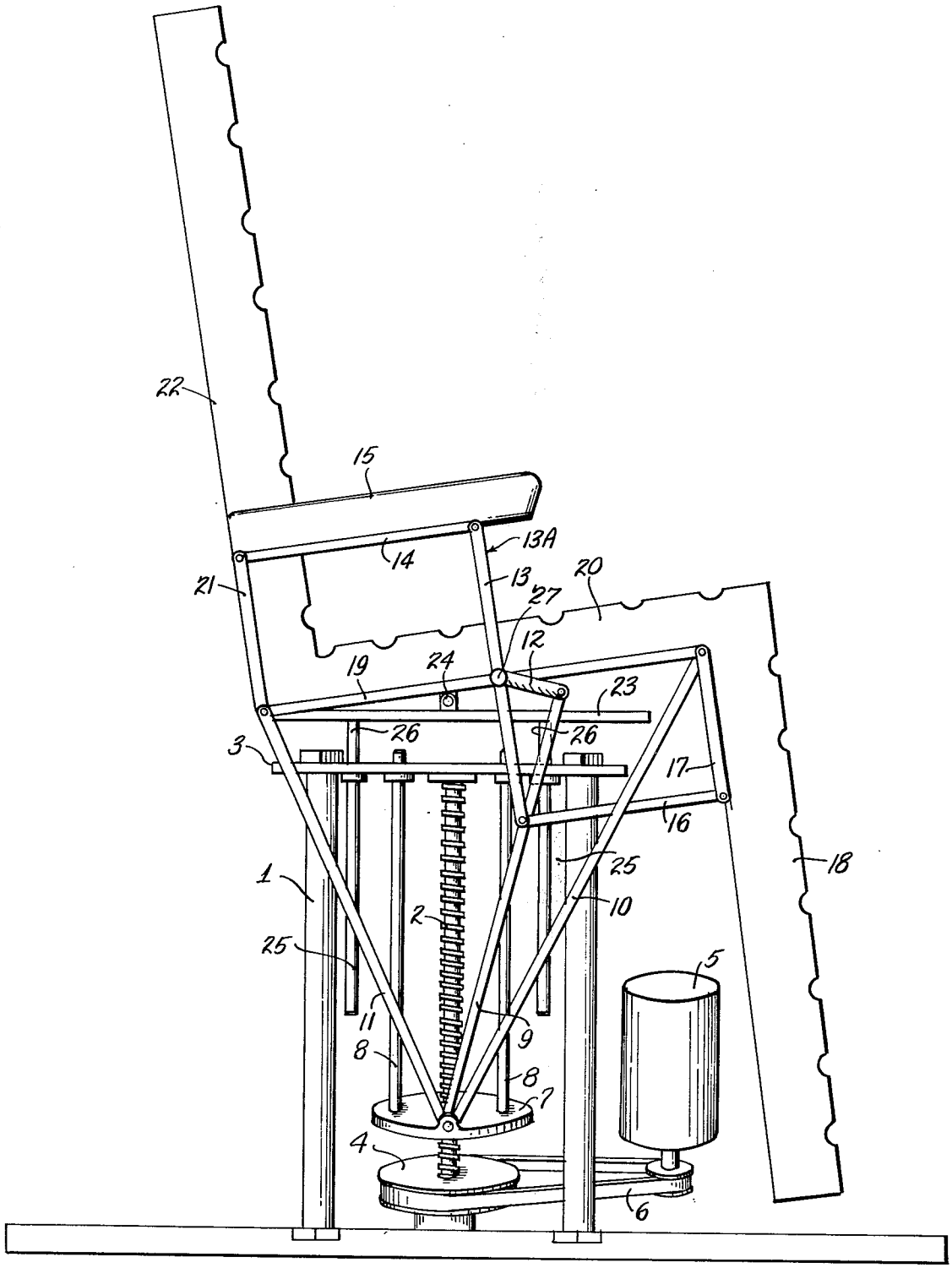
[57] **ABSTRACT**

Convertible chair as converted to various configurations by means of parallelogram linkage actuated by a crank which is in turn actuated by screw means.

3 Claims, 1 Drawing Figure

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CONVERTIBLE CHAIR

SUMMARY OF THE INVENTION

This invention relates to a convertible chair which may be adapted to serve as a reclining chair, an easy chair and a low or high table.

Convertible chairs are well known, some of which are manually operated by a lever and held in position by a screw, and some of which are semi-automatic, but limited in movement. In this case they are elevated by a hydraulic cylinder and their position is modified by a screw actuated by a crank.

It is the purpose of the present invention to eliminate these disadvantages.

It is accordingly the object of the present invention to provide a chair which can be transformed from a normal chair to a reclining chair or a horizontal table by continuous uninterrupted movement and which may be automatically adjusted to different heights.

In the course of the following description one embodiment of the invention will be described purely by way of illustration and example. The chair according to the invention comprises a back, a seat, and a leg support which are pivotally connected to each other. The seat is supported on movable platform by means of shaft pivotally connecting the seat thereto. This supporting platform is carried and guided by shafts sliding in the upper platform of a stationary frame beneath the supporting platform of the chair. Suitable stops make it possible to maintain a constant space between the upper platform of the stationary frame and the movable supporting platform of the chair so that the chair may be transformed by the deformation of a double deformable articulated parallelogram on which the back, seat and leg support are mounted. This parallelogram comprises a bar carrying the back, which arm is connected at one end to a crossbar supporting the back and at its other end to another cross bar serving as an arm rest. The crossbar serving as an arm rest is then connected to a second bar. This second bar is connected to a bar supporting the seat by means of a shaft which is attached to a crank one end of which is attached to the bar supporting the arm rest, while its other end is pivotally attached to a connecting rod.

At the other end of the bar supporting the arm rest is a crossbar connected to the crossbar supporting the arm rest, which is connected to the bar supporting the seat. The connecting rod which controls the movement of the crank and the deformation of the articulated double parallelogram consisting of the bars and the crossbars changes the position of the seat and is pivotally attached to a movable plate guided by two shafts serving as supporting guides. This movable plate is mounted on a threaded screw which is supported on the platform of the fixed frame and attached at its lower end to a pulley held in a base connected by a belt to a motor which, when it transmits its movement to the threaded screw, moves the movable plate through the connecting rod and crank to displace the bar to which it is attached and deform the double articulated parallelogram and change the position of the chair.

Telescopic arms are pivotally attached to this movable plate and determine the position of the seat to the extent that the movable plate is moved. The space between the platform of the fixed frame and the supporting plate of the chair makes it possible to convert the chair from a normal position to a horizontal position

while passing through a reclining position before the slide members of the movable plate come into contact with the supporting platform of the seat, which lifts the seat into a horizontal position to the extent that the movable platform is moved by the screw.

In order that the seat may be held in a horizontal position during the lifting period the pivotal connections of the components of the parallelogram linkage are provided with stops.

In another embodiment of the invention, in dependence upon the position of the shaft holding the arms of the double parallelogram thereto, the crossbars are telescopic. In yet other embodiments of the invention and in order to allow for possible failure of the motors, the screw may be actuated by a manual crank permitting conversion of the chair. The device for starting the motor may be controlled by a pedal actuated by a person other than the one seated in the chair, which may be replaced by electrical contacts positioned on one of the arm rests of the chair so that the seated person may voluntarily control the conversion of the chair.

The attached drawing is a schematic side view of a preferred embodiment of my invention.

This chair comprises a stationary frame **1.** A threaded screw **2** is journalled in the upper platform **3** of the frame **1** and its lower end is driven by a pulley **4** driven by a motor **5** through a belt **6.** A movable plate **7** is mounted on this screw and moves axially of the screw as the screw rotates. It is guided by guides **8** extending through the platform **3** of the frame **1.** The movable plate **7** is pivotally attached to a connecting rod **9** and telescopic rods **10** and **11.** The connecting rod **9** is connected to a crank **12** fixed to a pin **27** which is itself fixed to a bar **13** of a deformable articulated double parallelogram **13A** but journalled in bar **19** of the same parallelogram. These bars **13** serve to hold the crossbars **14** supporting the arm rests **15** and the crossbar **16** holding the cross-bar **17** to which the leg support **18** is attached. This crossbar **17** is connected to the bar **19** holding the seat **20,** which is itself pivotally connected to the arm **13** perpendicularly to the crank **12.** At the other end of the bar **19** a crossbar **21** is connected to the crossbar **14** supporting the arm rest **15.** This crossbar **21** serves to support the back **22.** The seat **20** and the bar **19** are pivotally connected to the movable platform **23** by a shaft **24.** The movable platform **23** is supported and guided by shafts **25** which slide in the platform **3** of the stationary frame **1.** Stops **26** on the stationary platform **3** hold the two platforms **3** and **23** apart when the seat is being converted. During movement of the chair to a reclining position, rotation of the screw **2** raises the platform **7** from the position shown in the drawing, thus causing connecting rod **9** to swing the crank **12,** which is fixed by pin **27** to the arm **13,** which pin is journalled in the bar **19.** This swings the upper end of the arm **13** to the left and its lower end to the right of the figure, thus lowering the back **22** and lifting the leg rest **18.** Continued rotation of the screw after the crank has reached its top dead center position causes the crank to lift the linkage and seat as a unit. Rotation of the screw **2** in the opposite direction returns the chair to the position shown in the drawing.

The invention described may be applied to all sorts of chairs and particularly when it is desired to provide a chair making it possible to obtain a seated, relaxed, or high or low horizontal position. Particularly valuable applications lie in the medical, surgical, and paramedi-

cal fields. The chair may also be used in beauty parlors and by invalids.

What is claimed is:

1. Convertible chair comprising a seat, a back pivotally connected to the rear of said seat, and a leg rest pivotally connected to the front of said seat, double parallelogram linkage supporting said seat, back, and leg rest, said linkage comprising a first main bar supporting said seat and common to two parallelograms of said linkage, a second main bar pivotally connected near the center of said first main bar, and also common to both parallelograms of said linkage, a first shorter bar pivotally connected to one end of said first main bar and supporting said back, a second shorter bar pivotally connected to one end of said second main bar and one end of said first shorter bar to form a first parallelogram, a third shorter bar pivotally connected to the other end of said first main bar and supporting said leg rest, and a fourth shorter bar pivotally connected at one end to the other end of said second main bar and at the other end to said third shorter bar, a stationary platform, a movable platform mounted to slide vertically relative to said stationary platform, said seat being pivotally attached to said movable platform, motor driven screw means, and a crank connected to be driven by said screw means and to turn one of said main bars relative to the other between a first position in which said linkage supports said back and leg rest in a generally upright attitude and a second position in which said linkage supports said leg rest and back in a substantially horizontal attitude when said screw means is driven in a first direction, said crank being also connected to lift said linkage and seat vertically when said screw means continues to turn in said first direction after said crank has reached said second position.

2. Chair as claimed in claim 1 in which said screw means comprises a vertical screw which rotates in a nut pivotally connected to the end of said crank remote from the connection of said crank to one of said main bars.

3. Chair as claimed in claim 2 comprising two telescopic rods, one end of each rod being pivotally connected to said first main bar and the other end of each rod being pivotally connected to said nut.

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