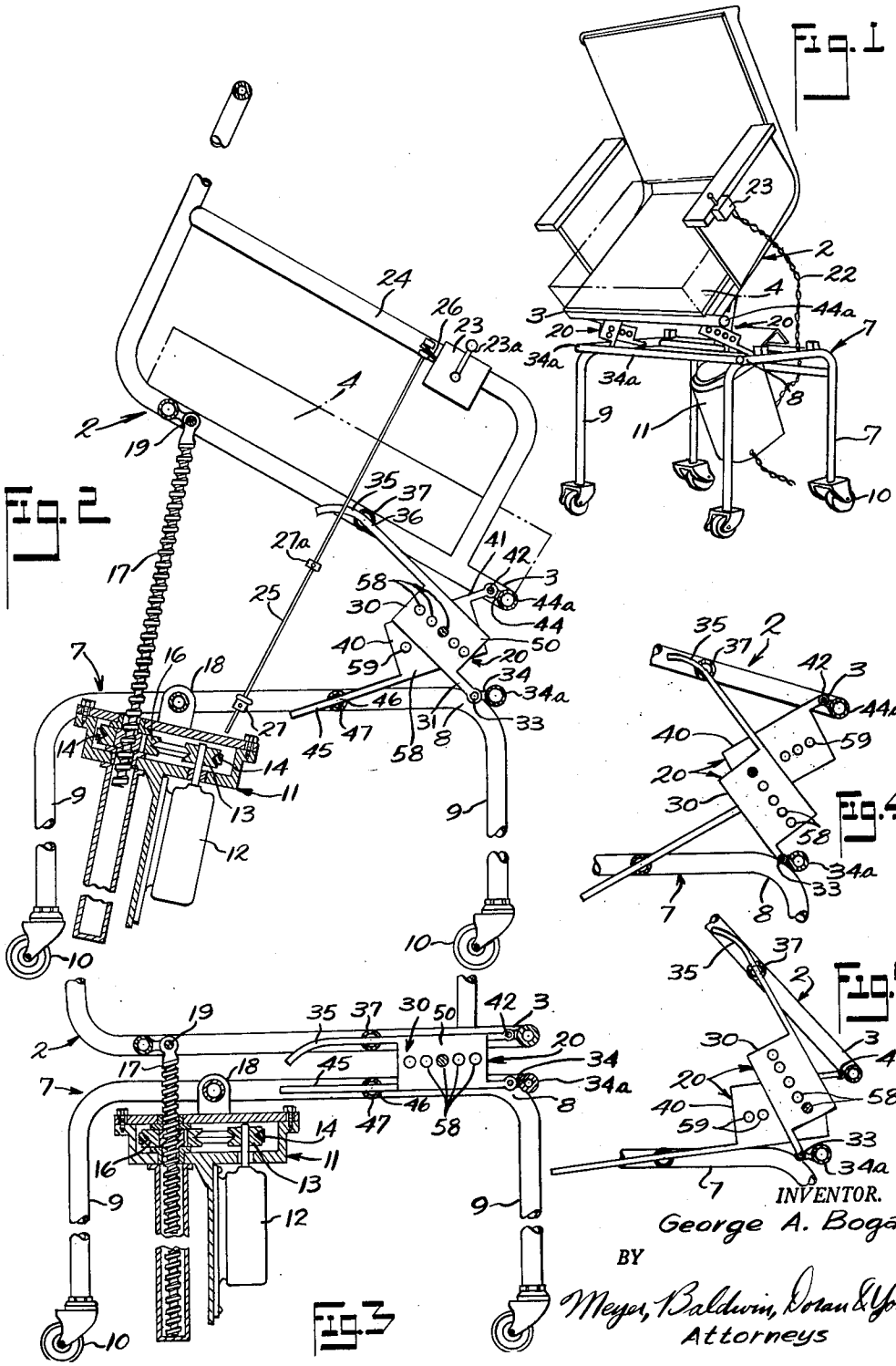
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ADJUSTABLE CHAIR

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# ADJUSTABLE CHAIR

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The present invention is directed to an adjustable chair and is particularly directed to a chair that is adapted for use by individuals with limited muscular control such as persons crippled with arthritis and the like, the chair being constructed to help such persons change from a sitting position to a standing position and vice versa.

It is an object of the present invention to provide an improved adjustable chair that can be used by an individual with limited muscular control such as a person whose legs are crippled with arthritis, the chair having a tilting seat frame that aids the person in or out of the chair.

It is an object of the present invention to provide an adjustable chair that has a tilting seat frame for aiding a person of limited muscular control in sitting or standing and which can be easily adjusted to accommodate individuals of different sizes.

It is an object of the present invention to provide a chair for use by an individual having limited muscular control such as a person who has arthritis in his legs and hips, the chair having a tilting seat frame having a forward portion that is adapted to support the person's legs just above his knees during the act of sitting down in the chair or during the act of getting up out of the chair.

These and other objects will be apparent from the specification that follows, the appended claims, and the drawings in which:

FIG. 1 is a perspective view showing an adjustable chair embodying the present invention with the seat frame in its tilted position;

FIG. 2 is a fragmentary side elevational view, partly in section, of the adjustable chair and shown with the seat frame in its tilted position;

FIG. 3 is a fragmentary side elevational view of the chair of FIG. 2 with the seat frame in its normal collapsed position;

FIG. 4 is a fragmentary enlarged view showing the adjustable connecting means for hingeably connecting the seat frame and the base frame of the chair, the connecting means being adjusted so that the forward portion of the tilted seat frame is raised to its highest position above the front portion of the base frame; and

FIG. 5 is a fragmentary view of the adjustable connecting means shown in FIG. 4 except that the connecting means is adjusted so that the distance the forward portion of the tiltable seat frame moves above the front part of the base frame is the least amount.

The present invention provides an adjustable chair for use by individuals with limited muscular control such as persons having ailments such as arthritis in their legs. The chair is so constructed that the forward portion of the seat supports the backs of the legs of a person just above the knees and simulates the natural movement of the knees and legs in getting up from a sitting position or in sitting down on the chair. As will hereinafter appear in more detail, all the person needs to do in going from a sitting to a standing position is to straighten out from the very slightly stooped position that he is placed in by the tilting and upward movement of the chair seat.

The improved adjustable chair comprises a seat frame 2 with a forward portion 3 and a seat cushion 4, and a base frame 7 for supporting the seat frame. The base frame 7 includes a forward portion 8 and preferably has



four legs 9, each of which legs may be provided with a wheel 10 as shown in the drawings.

Means for tilting the seat frame is provided comprising a motor, pulley and lead-screw assembly 11 which includes a motor 12, the motor being operatively connected to a driving pulley 13. The pulley 13 drives an internally threaded pulley 16 by means of a V-belt 14 and, the pulley 16 is in threaded engagement with a lead screw 17, which, in turn, pushes the seat frame 2 up into its tilted position or pulls it down into its normal collapsed position.

As best seen in FIGS. 2 and 3, the motor, pulley and lead-screw assembly 11 is pivotably mounted to the base frame by a pivotal connection 18. Also, the upper end of the lead screw is pivotably connected to the seat frame at point 19 so that the entire assembly 11 can swivel or pivot with the tilting of the frame.

In accordance with the present invention, connecting means for hingeably connecting the front part 3 of the seat frame and the front part 8 of the base frame together is provided, the connecting means including a pair of hinge members 20, each hinge member being located preferably under a front corner of the seat frame. The connecting means is so arranged and constructed that the front portion 3 of the seat frame is raised upwardly and outwardly away from the forward portion 8 of the base frame when the seat frame is tilted from its normal collapsed position shown in FIG. 3 to its tilted position shown in FIG. 2. Thus, it can be seen that the front part 3 of the seat frame travels in an arcuate path during the tilting motion of the seat frame.

Means is provided for reversibly actuating the above described tilting means effective to move the connecting means so as to carry the front portion 3 of the seat frame forwardly and upwardly above the front portion 8 of the base frame. As best seen in FIG. 2, the means for actuating the tilting means comprises a switch 23 which is connected to motor 12 by an electrical conduit 22 for activating the lifting or retracting movement of the lead screw 17. The switch 23, having a handle 23*a*, is mounted on an arm 24 of the seat frame 2 and is connected to a long rod 25 by a short lever bar 26. The lower end of rod 25 is provided with a locking nut 27 which can be moved up and down on the rod to a predetermined position to provide a means of stopping the upward travel of the lead screw. Thus, when the locking nut 27 hits the base frame 7 as shown in FIG. 2, the switch 23 is moved to its off position by the lever action of bar 26. The turning of the switch to its off position stops the motor 12 and, thus, the lead screw advance is stopped and the seat frame is in its tilted position where a person can ride the seat frame to a sitting position or else can get off the seat frame and assume a normal standing position from a slightly stooped stance.

In a similar manner, when desiring the seat frame to be returned to its normal position, that handle 23*a* can be placed in its "on" position to activate the motor and retract the lead screw 17. The retraction of the lead screw 17 is stopped by means of a collar 27*a* which hits the base frame 7 and, preventing further downward movement of rod 25 and causing lever arm 26 to move switch arm 23*a* to its off position.

Describing the above mentioned connecting means and adjusting means in detail, the connecting means, as previously indicated, comprises the pair of hinges 20, each hinge member disposed under one front corner of the seat frame and comprising a first lever 30 having one end 31 pivotably connected at point 33 to the base frame by a yoke 34 to a horizontal frame bar 34*a* and its other end 35 slidably connected to the seat frame 2 by means of an opening 36 in a hollow upper stabilizing swivel

rod 37 and a second lever 40 having one end 41 pivotably connected to the seat frame at point 42 by a yoke 44 to a horizontal front seat frame bar 44*a* and its other end 45 slidably connected to the base frame 7 through opening 46 in a hollow lower stabilizing swivel rod 47.

The levers 30 and 40 not only hingeably connect the seat frame and base frame together when the seat frame is tilted to a position to discharge or receive a person, but the levers also provide a stabilizing action to prevent lateral movement of the seat frame with respect to the base frame. Thus, the slidable connections of the two levers through the swivel bars 37 and 47 stabilize and steady the seat frame on the base frame.

As previously indicated, an important part of the present invention is the co-action of the levers 30 and 40 by which action the forward part 3 of the seat frame is moved upwardly and forwardly from the front part 8 of the base frame. As seen by comparing the position of front part 3 of the seat frame with the front part 8 of the base frame in FIG. 3 with the tilted positions shown in FIGS. 2, 4 and 5, the front of the seat frame is thrown forwardly of the front of the base frame an appreciable distance. Thus, pivot point 42 of the front seat frame moves upwardly and forwardly in a path that is an arc of a circle with the pivot point 33 of the front base frame the center of the circle. To obtain still a greater forward distance and to help stabilize the tilted position of the chair to reduce any tendency for the front end to collapse, the finger end 35 of the lever 30 is preferably curved or arcuate in shape. The curved finger 35, thus, slides through the opening of the swivel bar 37 readily, but at the same time rides in the opening 36 with two decided contact points to provide a slightly greater frictional drag on the finger; also, the distal end 35 is preferably curved downwardly as shown in the drawings so that it does not rise above the seat level and hence does not get in the way of the person using the chair.

Novel adjusting means is provided for the connecting means whereby the distance that the front portion 3 of the seat frame is raised above the front portion 8 of the base can be changed to accommodate any individual-regardless of his build. Continuing to describe the connecting means including the novel adjusting means, each of the levers 30 and 40 is provided with an enlarged central portion 50 and 55, respectively. The central portion 50 of lever 30 is provided with a plurality of generally parallel pin-receiving openings 58 which are disposed generally along its longitudinal axis while central portion 55 of lever 40 is provided with a plurality of openings 59 which are positioned in a row generally parallel to its longitudinal axis.

In accordance with the present invention, and by using the openings 58 and 59 above described, the distance that the front portion 3 of the seat frame is pushed forwardly and above the front part 8 of the base frame can be easily and quickly adjusted.

As shown in FIGS. 2 and 3, a pin 60 is inserted through the middle opening of the openings 58 of lever 30 and the middle opening of the openings 59 of lever 40 to provide a pivotal connection therebetween. When it is desired to have the front part 3 of the seat frame move higher above the base frame front 8 when the chair is tilted, the pin 60 can be moved to the extreme left hand opening of the openings 58 and the extreme left-hand opening of the openings 59 as shown in FIG. 4. If it be considered that the short finger 31 of lever 30 and the short finger 41 of lever 40 be the jaws of a nut cracker, it can be seen that the fingers or jaws 31 and 41 are spread open the widest when the pin is in the position shown in FIG. 4.

In a similar manner, when less distance is desired between the seat frame front 3 and the base frame front 8 as when a person with relatively short legs desires



to use the chair, the pin 60 may be inserted between aligned holes 58 of lever 30 and 59 of lever 40 as shown in FIG. 5, the aligned holes being the holes on the extreme right end of the row of openings 58 and 59, respectively.

Thus, the distance that the front part 3 of the seat frame moves above the base frame front 8 can be conveniently changed to accommodate individuals of various builds. The pin 60 may be placed in any pair of the aligned openings of the rows of openings 58 and 59, depending upon the individual using the chair. With each adjustment of pin 60 to accommodate various individuals, the locking nut 27 on rod 25 may be adjusted to stop the upward travel of the lead screw at a proper predetermined position.

It is to be understood that, in accordance with the provisions of the patent statutes, various modifications of the present invention may be made without departing in spirit and scope thereof.

What is claimed is:

1. An adjustable chair having a seat frame with a front portion and a base frame with a front portion for supporting the seat frame, reversible tilting means for moving the seat frame toward and away from the base frame and including connecting means for hingeably connecting the front portion of the seat frame with the front portion of the base frame including a pivotal connection on the upper front portion of the base frame and a pivotal connection on the lower front portion of the seat frame, the pivotal connections being generally vertically aligned when the seat frame is in its normal collapsed position, means for reversibly actuating said tilting means effective to move said connecting means to tilt said seat frame and to carry the front portion thereof in an arcuate path forwardly of and above the front portion of the base frame and move the lower front seat frame pivotal connection in a direction forwardly of the pivotal connection on the base frame whereby the pivotal connections are not vertically aligned.

2. An adjustable chair having a seat frame with a front portion and a base frame with a front portion for supporting the seat frame, reversible tilting means for moving the seat frame toward and away from the base frame and including connecting means for hingeably connecting the front portion of the seat frame with the front portion of the base frame including a pivotal connection on the upper front portion of the base frame and a pivotal connection on the lower front portion of the seat frame, the pivotal connections being generally vertically aligned when the seat frame is in its normal collapsed position, means for reversibly actuating said tilting means effective to move said connecting means to tilt said seat frame and to carry the front portion thereof in an arcuate path forwardly of and above the front portion of the base frame and move the lower front seat frame pivotal connection in a direction forwardly of the pivotal connection on the base frame whereby the pivotal connections are not vertically aligned, and said connecting means includes adjusting means for selectively varying the arcuate distance the front portion of the seat frame moves relative to the front portion of the base frame.

3. An adjustable chair having a seat frame with a front portion and a base frame with a front portion for supporting the seat frame, the front portion of said base frame being vertically aligned with the front portion of the seat frame when the chair is in its normal collapsed position for supporting a human body in a sitting position, reversible tilting means for moving the seat frame toward and away from the base frame and including connecting means for hingeably connecting the front portion of the seat frame with the front portion of the base frame including a pivotal connection on the upper front portion of the base frame and a pivotal connection on the lower front portion of the seat frame, the pivotal connections being generally vertically aligned when the seat

frame is in its normal collapsed position, means for reversibly actuating said tilting means effective to move said connecting means to tilt said seat frame and to carry the front portion thereof in an arcuate path forwardly of and above the front portion of the base frame and move the seat frame pivotal connection in a direction forwardly of the pivotal connection on the base frame whereby the pivotal connections are not vertically aligned, and said connecting means includes adjusting means for selectively varying the arcuate distance the front portion of the seat frame moves relative to the front portion of the base frame.

4. A chair as defined in claim 1 including means for reversibly actuating the tilting of the seat frame and interconnected between the seat frame and the base frame.

5. A chair as defined in claim 4 in which the tilting means includes a reversible driven lead screw having one end pivotably connected to the seat frame and the other end drivingly connected to a power means for advancing and retracting said lead screw.

6. A chair as defined in claim 5 in which said other end of the lead screw and the power means is pivotably connected to the base frame.

7. A chair as defined in claim 1 in which the connecting means comprises a first lever having one end pivotably connected to the base frame by said pivotal connection on the upper front portion of the frame and the other end slidably connected to the seat frame and a second lever having one end pivotably connected to the seat frame by said pivotal connection on the front bottom portion of the seat frame and the other end slidably connected to the base frame, each of said levers having a middle portion with a plurality of pin-receiving openings and there being a pin inserted through aligned openings of the first and second levers to provide an adjustable pivotal connection therebetween.



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