FUNCTIONAL POSTURE CONTROLLER FOR CHAIRS

Edwin R. Moore, New York, N. Y.

Application May 3, 1956, Serial No. 582,390

2 Claims. (Cl. 155—77)

My invention relates generally to chairs of the type having a tilting seat and back and in particular to a chair having seat and back elements which automatically adjust themselves relatively as the back is inclined, and commonly referred to as a posture chair, although the principle of my invention can be applied also to other devices.

One object of the present invention is the provision of a device of the character described which affords related posture control in all positions of a chair wherein the seat and the back tilt at different angles, so as to avoid that the tilting of the seat and back of the chair will cause a loss of posture fit or angular relation to the occupant while reclining. This feature of my invention also avoids the tendency of hitherto known similar chairs to pull out the occupant's shirt with an opposing motion of the chair back when reclining.

Another object of the present invention is the provision of a device of the character described which is provided with a lever or bell crank arrangement that has a forward and backward movability independent of the lowering and raising of the chair seat, and to which the chair back is attached in such a manner as to give a unison relation with the occupant's back, so that the chair back creeps forwardly when reclining, thus hugging the occupant's back with angular relation, and synchronizing all motions into one.

A further object of the present invention is the provision of a device of the character described which has a contour adjusting dial built inside of an adjustment wheel for the tension of a spring that tends to hold the chair upright; by turning said dial said spring is collapsed to any desired position allowing the chair to assume any contour position, which remains relative to the occupant's position at any adjustment in relation to the hip axis of the occupant.

Yet still another object of the present invention is the provision of a device of the character described which has a new and improved adjustment nut design and arrangement on the swivel spindle, said nut being partially split into segments and tapered at the ends to conform to an adapter collar. This arrangement will maintain a constant height of the chair seat, allows a finger touch adjustment of the same when desired, and eliminates the need for milling out a long keyway groove in the spindle, thus avoiding a weakening of the spindle and being more economical to manufacture than hitherto known similar constructions.

With the foregoing and other objects in view which will appear as the description proceeds, the invention consists of certain novel details of construction and combinations of parts hereinafter more fully described and pointed out in the claims, it being understood that changes may be made in the construction and arrangements of parts without departing from the spirit of the invention as claimed.

In the accompanying drawing a preferred form of the invention has been shown.

In said drawing:

Figure 1 is a side view of a preferred embodiment of my invention with the chair in an upright position;

Figure 2 is a side view like Fig. 1, showing the chair in an inclined position;

Figure 3 is an enlarged fractional sectional view on the line 3—3 of Fig. 1; and,

Figure 4 is a further enlarged fractional sectional view on the line 4—4 of Fig. 3.

Similar reference characters refer to similar parts throughout the several views.

In the drawing the numeral 1 denotes a base or pedestal which has mounted on its top a disk 2 provided with a central bore 3 (Fig. 4) through which extends a bushing member 4. A chair spindle 5 extends through the member 4, and a height adjustment nut 7 is screwed upon the spindle 5. The nut 7 has an exterior annular groove 10, is partially split into segments by means of upright slots 11, and has a tapered lower end 14. A cap member 15, through which extends the spindle 5, is firmly secured to the upper end of the nut 7 in such a manner that the nut 7 may be rotated relatively to the spindle 5 by turning the member 15. Thus the height of the chair can be finger-touch adjusted by turning the cap member 15. An adaptor collar 17, which has a taper portion 20 corresponding to the taper lower end 14 of the nut 7, is interposed between the member 4 and the nut 7. The aforementioned partially segmental splitting of the nut 7 by means of the slots 11 and the taper portions 14 and 20 cause a clinching effect of the nut 7 on the spindle 5, due to the weight of the occupant of the chair as well as of those parts of the chair which are supported by the spindle 5. Thus the nut 7 will hold securely on the spindle 5 and swivel with the spindle 5, so as to maintain a constant height of the chair, or allowing finger-touch adjustment by turning of the member 15 as previously referred to. A screw 21, screwed through a lug 22, which obliquely extends from the disk 2, engages the annular groove 10, so that the parts 5, 7, 15 and 17 cannot be separated from the parts 1, 2 and 4 inadvertently.

The seat 23 of the chair is secured by any suitable means, for instance by means of screws 25 (Fig. 3) to a seat frame consisting preferably of a pair of parallel angle bars 24, which have registering slots 27. A swivel frame 30 has a pair of angular portions 31 which are joined to each other by means of cross portions 32 and 33. The spindle 5 extends from the cross portion 33, to which it is firmly secured. The upper ends of the angular portions 31 of the swivel frame 30 are pivoted to the angle bars 24 at 35. Two pairs of link members 37 and 40 are pivoted to the horizontal sections of the angular portions 31 of the frame 30 at 41 and 42 respectively. A substantially U-shaped member 43, which has a pair of longitudinal flange portions 44 and a web portion 45 is movably interposed with its flange portions 44 between the bars 24. An upright member 47, which carries a chair back 50, is firmly secured to the web portion 45 of the member 43 so as to form therewith an angular member. The upper ends of the link members 40 are pivoted at 51 to the outer ends of the flange portions 44, and a fulcrum cross rod 53 is extended transversely through the slots 27 in the bars 24 as well as through the upper ends of the link members 40 and the flange portions 44 of the member 43. Thus the member 43, together with the member 47 and the back 50, has a forward and backward movability independent of the bars 24 and the chair seat 23 attached thereto. Spacing members 55, such as washers or the like, preferably are interposed between the bars 24 and the members 37,
and the rod 53 is slidable in the slots 27. Thus the fulcrum of the member 43, which is movable upwards and downwards as well as forwards and backwards, is pivotally attached to the bars 24 by means of the rod 53. The slots 27 allow an independent forward and backward movement while lowering or rising the chair seat, as may be seen in Figs. 1 and 2. The chair back 50 is attached by means of the member 47 to the member 43 about six inches back from the fulcrum, allowing sufficient leverage to drop the chair back 50 about one to one and one half inches more than the seat 23 drops in recline. This gives a union relation with the occupant's back. Moreover, due to the slots 27 in the bars 24, the chair back 50 crops forwardly in recline, hugging the occupant's back with angular relation, and synchronizing all motions into one. To one side of the rim portion of a disk 54 are secured a pair of lugs 56, through which extends the rod 53. To the center portion of the disk 54 at the other side thereof is secured a tubular adaptor member 57, which has an internally threaded portion 60 (Fig. 4). The cross portion 33 of the swivel base 30 has a threaded hole 61 through which is screwed the externally threaded tubular portion 62 of a hand wheel 63 for the adjustment of a collared spring 64. The wheel 63 has a preferably cup-shaped portion 66, which encompasses substantially a contour adjusting circular dial member 67. To the center of the member 67 is secured a threaded bolt 70, which extends through a second disk 71 and through a portion of the spring 64, and is screwed into the threaded portion 60 of the member 57. A portion of the spring 64 encompasses the member 57, and the chair is held upright by the force of the spring 64 from the cross portion 33 of the frame 30 to the swinging fulcrum rod 53.

The contour adjusting dial member 67 is a specific feature of my invention. When the member 67 is turned in one direction the spring 64 is collapsed to any desired position, allowing the chair to assume any contour, which will remain relative to the posture for the occupant of the chair at any adjustment of axis location in relation to the hip axis of the occupant.

Since certain changes may be made in the above article and different embodiments of the invention could be made without departing from the scope thereof, it is intended that all matter contained in the above description or shown in the accompanying drawing shall be interpreted as illustrative and not in a limiting sense.

It is also to be understood that the following claims are intended to cover all of the generic and specific features of the invention herein described, and all statements of the scope of the invention which are a matter of language might be said to fall therebetween.

Having thus fully described my said invention, what I claim as new and desire to secure by Letters Patent is:

1. A chair back, an angular member having two branch portions to the first of which said chair back is secured while the second is extended between the parallel portions of said seat frame, a fulcrum rod extending through the second branch portion of said angular member, a first pair of link members pivotally connecting said fulcrum rod to the angular portions of said swivel frame to which said seat frame is secured, a second pair of link members pivotally connecting the angular portions of said swivel frame to the outer end of the said branch portion of said angular member, resilient means interposed between said swivel frame and said fulcrum rod tending to hold said chair back upright and said seat in a horizontal position, and adjustable means for limiting the expansion movement of said resilient means.

2. In a tilting chair, the combination of a pedestal, a post extending upwardly from said pedestal, a swivel frame having a pair of angular portions joined to each other by cross portions one of which is secured to said post, a seat frame having a pair of parallel portions pivoted to the outer ends of the angular portions of said swivel frame and provided with registering longitudinal slots, a chair seat carried by said seat frame, a chair back, an angular member having two branch portions to the first of which said chair back is secured while the second is extended between the parallel portions of said seat frame, a fulcrum rod extending through the slots in said seat frame and through the second branch portion of said angular member, a first pair of link members pivotally connecting said fulcrum rod to the angular portions of said swivel frame to which said seat frame is secured, a second pair of link members pivotally connecting the angular portions of said swivel frame to the outer end of the second branch portion of said angular member, resilient means interposed between said swivel frame and said fulcrum rod tending to hold said chair back upright and said seat in a horizontal position, and adjustable means for limiting the expansion movement of said resilient means.

References Cited in the file of this patent

UNITED STATES PATENTS

1,872,894 Collier et al. ................. Aug. 23, 1932
1,928,801 Uhl ....................... Oct. 3, 1933
2,321,385 Herold ..................... June 8, 1943
2,403,928 Sheldrick et al. ......... July 2, 1946
2,420,745 Bolens ..................... July 2, 1946
2,447,601 Harman ..................... May 20, 1947
2,471,024 Sengpiel .................. Aug. 24, 1948
2,545,950 Cramer ..................... May 24, 1951
2,585,799 Fox ......................... Mar. 20, 1951