

Oct. 20, 1970

E. HEINZEL

3,534,937

SWIVEL CHAIR

Filed July 25, 1968

2 Sheets-Sheet 1

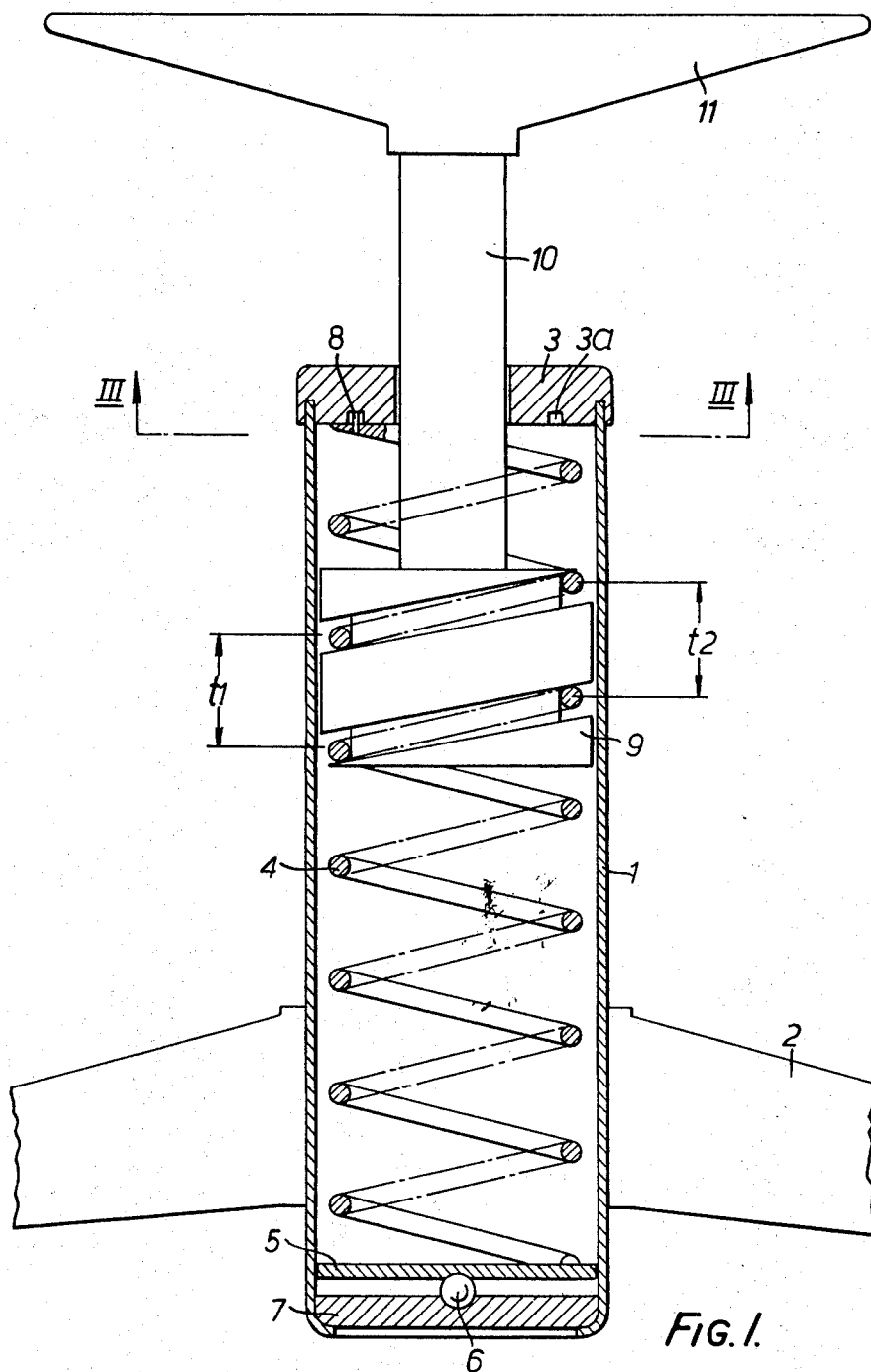


FIG. 1.

INVENTOR
EBERHARD HEINZEL

BY
Moson, Mann & Allright
ATTORNEYS

Oct. 20, 1970

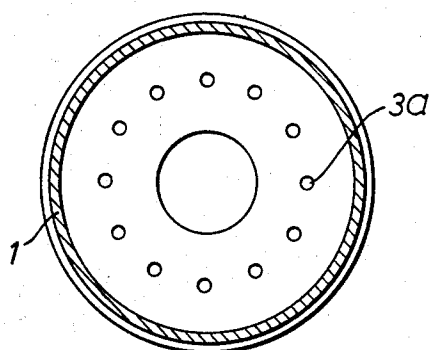
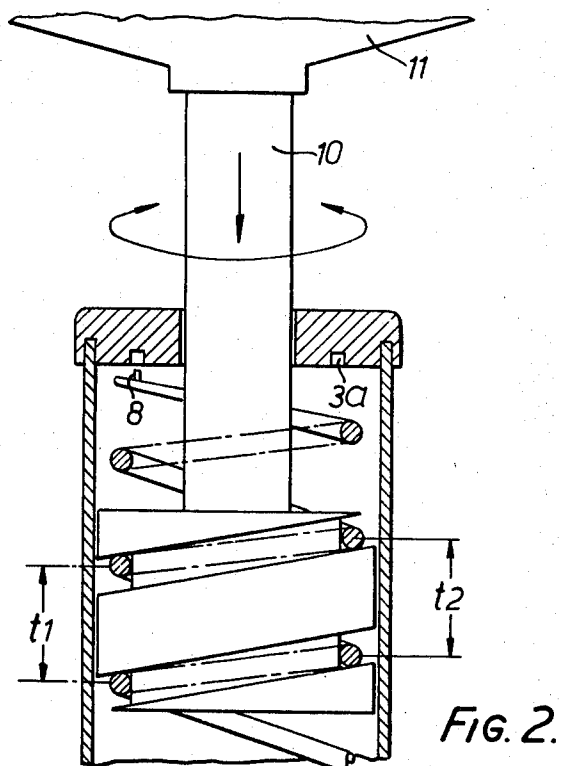
E. HEINZEL

3,534,937

SWIVEL CHAIR

Filed July 25, 1968

2 Sheets-Sheet 2



INVENTOR
EBERHARD HEINZEL

BY
Mason, Mason & Albright
ATTORNEYS

1

3,534,937

SWIVEL CHAIR

Eberhard Heinzel, Eimbeckhausen, Germany, assignor to Wilkhahn Wilkening & Hahne, Eimbeckhausen, Germany

Filed July 25, 1968, Ser. No. 747,540

Claims priority, application Germany, Aug. 17, 1967,

W 44,576

Int. Cl. A47c 3/20

U.S. Cl. 248—403

2 Claims

ABSTRACT OF THE DISCLOSURE

A swivel chair includes a tubular upright supported at its lower end by a plurality of splayed feet. A helical spring is supported by a rotatable mounting at the bottom of the upright and a screw-threaded member lies within a few coils of the spring and is rigid with a rod which extends through a cap of the tubular upright and which carries the seat. The upper end of the spring engages in a recess in the underside of the cap when the seat is unloaded and hence rotation of the seat will cause the screw-threaded member to move relatively to the spring and up or down the tubular upright. When loaded the spring disengages from the cap and rotation of the seat will not cause the member to move relatively to the spring.

BACKGROUND OF THE INVENTION

Field of the invention

The invention relates to a swivel chair which is adjustable for height.

Description of the prior art

Chairs incorporating a guide tube closed by a cap, within which tube are fitted a pre-stressed helical spring and a plunger connected to the seat have already been proposed but such chairs have the drawback of being awkward to manipulate, of complicated construction and liable to failure in use.

The object of the invention is accordingly to provide a swivel chair that is extremely simple to manipulate and relatively uncomplicated in construction, requires no maintenance and is reliable in use.

SUMMARY OF THE INVENTION

The object of the invention is achieved by virtue of the plunger being made in the form of a screw-threaded spindle, the screw thread of which has the same or substantially the same pitch as the helical spring, one end of the latter, which acts as a nut on the plunger spindle, being connected to a rotary bearing, while the other end of the spring being coupled to the cap when the chair is unoccupied.

In one particularly advantageous embodiment in accordance with the invention, one end of the spring carries a projection which engages in appropriate holes in the cap to provide the coupling action.

The rotary bearing may with advantage be in the form of a ball-type thrust bearing.

The seat of the chair here proposed can be adjusted and swivelled with the utmost ease in the minimum of time. When the chair is occupied, the coupling formed by the catch and the corresponding holes in the cap is released, enabling the rotary bearing to become effective. The seat can then be rotated without being raised or lowered. There is thus no relative motion between the helical spring and the screw-threaded plunger.

The height of the seat can be adjusted only when this is unoccupied. As soon as the chair is relieved of the occupant's weight, the coupling comes into action as the

2

projection at one end of the helical spring engages in the corresponding hole in the cap. The spring being thus anchored by one end, the rotary bearing is ineffective and takes no further part. The seat can now be raised or lowered by turning, the helical spring constituting a nut in engagement with the threaded plunger. When the seat comes under load again, the anchored end of the spring is uncoupled from the cap, with the result that the rotary bearing becomes effective once more.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1, partly in section and partly in elevation, shows a portion of a height-adjustable swivel chair in accordance with the invention, in the unloaded condition;

FIG. 2 also shows a portion of the chair but, in the loaded condition; and

FIG. 3 is a horizontal section along the line III—III of FIG. 1.

A guide tube 1 is fitted in the intersection 2 formed by the feet of the swivel chair and is closed at its upper end by a cap 3 or other closure means.

The guide tube 1 accommodates a pre-loaded helical spring 4 or other resilient means, one end of which is connected to a rotatably supported mounting which consists of a plate 5, which is fixed to one end of the spring 4 and has a part-spherical recess for a ball 6 in its under surface. A second plate 7 also forms part of the mounting and has a substantially hemi-spherical recess for the ball 6 in its upper surface. The parts of the spring mounting together constitute a ball-type thrust bearing.

The other (upper) end of the helical spring 4 has a projection 8, which engages in one of a plurality of holes 3a in the cap 3 when the chair is unoccupied. A plunger 9, has the form of a coarsely screw-threaded spindle engaged in a few turns of the helical spring 4. The spring 4 thus acts as a nut on the plunger 9. The pitch t_1 of the screw-thread on the plunger 9 is the same or substantially the same as the pitch t_2 of the helical spring 4 when in its unloaded condition.

The plunger 9 is connected by a rod 10 to the intersection 11 formed by the members on which the chair seat rotates, the seat itself not being shown, for the sake of simplicity.

The mode of operation of the swivel-chair here in described is as follows:

When not under load, the parts occupy the positions shown in FIG. 1. Only in this position can the seat of the chair be adjusted for height. Because the projection 8 of the spring is positively engaged in the opening 3a in the cap 3, the rotary bearing is ineffective. Should the seat now be rotated, the plunger 9 will move in the helical spring 4 after the manner of a screwed threaded spindle moving in a nut. In this way, the rotary movement of the seat is converted into translational movement.

With the chair occupied, the connection between the top end of the spring 4 and the cap 3 is broken by virtue of the projection 8 being disengaged from any of the holes 3a. This, however, results in rendering the rotary bearing effective, so that the helical spring 4 is able to rotate together with the plunger 9. No relative motion takes place between the plunger 9 and the spring 4 while the seat is under load, this can rotate but has no translational motion whatever.

I claim:

1. In a swivel chair a seat adjustable for height, rod means extending beneath the seat, an upright tubular member accommodating at least a part of the rod means and resilient means arranged within the tubular member and acting on the rod means, the improvement comprising

3

a helical spring serving as said resiliene means and having two ends,

a member rigid with said rod means and having a screw-thread of a pitch substantially corresponding to that of the helical spring and engaging at least one turn of the spring,

rotary bearing means supporting one end of the helical spring,

closure means rigid with the end of the tubular member remote from the bearing means, and

means for coupling that end of the spring remote from the bearing means to closure means when the seat is unloaded, said coupling means comprising

means defining a plurality of abutments in said closure means arranged arcuately around the axis of the spring, and

a projection on said helical spring arranged to engage one of said abutments, said coupling means being ineffective when the seat is loaded to couple the spring and the closure means,

rotation of the seat relative to the tubular member when the coupling means is ineffective resulting in no change in height of the seat relatively to the tubular member, whilst rotation of the seat when the cou-

4

pling means is effective causing relative movement between the screw-threaded member and the spring and hence a change in height of the seat.

2. A chair according to claim 1, wherein said rotary bearing includes

a plate fast with the tubular member and having a centrally disposed part-spherical recess therein, a movable plate having a central part-spherical recess opposite the recess in the first-mentioned plate, and a ball interposed between the plates and engaged in said recess.

References Cited

UNITED STATES PATENTS

1,777,204	9/1930	Korsten et al.	248—403
2,058,451	10/1936	Herold	248—406
2,650,645	9/1953	Granlund	248—403
2,812,799	11/1957	Sodenberg	248—406

FOREIGN PATENTS

746,711	8/1944	Germany.
---------	--------	----------

EDWARD C. ALLEN, Primary Examiner

U.S. Cl. X.R.

248—406