ABSTRACT: The following specification describes a support body having a rectangular cross section for a torsion-bar chair control utilized in office type chairs with the post-support member located behind the torsion bar and engaged with the lower and upper support body walls.
CHAIR CONTROL STRUCTURE

BACKGROUND OF THE INVENTION

1. Field of the Invention
This invention relates in general to torsion bar chair controls for office-type chairs and more particularly to a more rigid and economical chair control of the type described having improved torsion bar action and appearance.

2. Description of the Prior Art
In office-type chairs, the back and seat are fixed to each other and pivot as a unit in response to a backward leaning movement of the chair occupant. In an office-type chair utilizing a torsion bar the elongate axis of the bar is usually located directly above the chair post which is received by a post support member attached to an elongate support body, as, for example, shown in U.S. Pat. No. 2,971,569. The elongate support body in turn supports the bar ends with one end of the bar nonrotatably connected to one end of the support body.

The elongate support body, which is usually an open-sided channel member, is subject to various stresses including both bending and twisting stresses and is connected to the post support member and post only at its bottom wall. This arrangement provides insufficient resistance to these stresses.

Further, the location of the bar directly above the post results in a chair control of considerable height and produces a large moment arm on the post support body.

SUMMARY OF THE INVENTION

The present invention proposes to avoid the above and other difficulties through the extremely simple expedient of using a support body formed of a rectangular or square cross section tubing. This type of support avoids many of the fabrication and welding problems associated with the elongate channel member permits the post support member to be held in both the upper and lower walls of the support body instead of a single wall while permitting the torsion bar to be displaced from the axis of the post and located below the top post. This location and support body construction provides a stiffer member which enables the use of lighter gauge metal while retaining in the height of the chair control provides a more pleasing appearance.

Accordingly, it is among the objects of the present invention to provide a torsion bar chair control for an office type chair having improved rigidity, stress resistance and a more pleasing appearance.

It is another object of the present invention to provide a more economical torsion bar chair control for an office-type chair.

Other objects of the present invention will become apparent upon examination of the following specification and claims together with the drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is an isometric view of a chair control utilizing the principles of the present invention; and
FIG. 2 is an exploded isometric view of the major components of the chair control shown in FIG. 1.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

In FIGS. 1 and 2 a chair control for an office-type chair is indicated therein by the reference character 10. The chair control 10 includes a support body 12 of rectangular cross section and through which a torsion bar 14 of square or rectangular cross section extends along a horizontal axis. A post support member 16 is provided directly behind the torsion bar and along the central axis of the support body 12 for receiving the upper end of a post 18. The post 18 is threaded for conventional height adjustment of the chair control and in turn is conventionally supported in a pedestal (not shown) resting on the floor or support surface.

The torsion bar 14 is received in an opening 20 in one end wall or plate 22 of the support body 12 with the opening 20 being of similar dimension to the bar 14 so that the corresponding bar end is nonrotatably supported relative the support body 12. The other end of the bar 14 passes through a bushing 24 having an opening of corresponding section to the bar and rotatably supported in an end wall or plate 26 for body 12 opposite wall 22.

The end of bar 14 adjacent wall 26 passes through an opening in a torque lever 28 with the torque lever opening being of corresponding section or dimension to the bar 14 so as to be nonrotatably secured to the bar and both ends of the bar, then pass through bushings 30 each having an opening of corresponding section to the bar and in turn rotatably supported in openings 32 located in respective vertical legs of L-shaped spaced spider arms 34 and 35. Cylindrical washers 36 placed over the bar ends prevent axial movement of the bar 14.

The spider arms 34 and 35 carry the chair seat and back (not shown) in fixed relationship thereto. The horizontal leg of spider arm 35 is engaged towards its rearward end by the end of an adjustment stud 38. Stud 38 extends through a threaded opening in the torque lever 28 to connect the end of the bar 14 to the spider arm 35 nonrotatably with the spider arm 35 and thereby enables the application of a resilient twist to the bar in response to a backward leaning movement of the chair occupant. The adjustment of stud 38 against spider arm 35 serves, of course, to pretension the bar 14 and moves the chair seat into the desired horizontal position and the back into the desired vertical position.

The support body 12 has a wall thickness of approximately 0.1 inch and as mentioned previously is rectangular in cross section and is an extruded integrally formed piece generally available commercially. The body 12 has top and bottom walls 40 and 42, respectively, approximately 2 3/4 inches wide and front and rear walls 44 and 46, respectively, approximately 11/2 inches high to form a closed loop or channel member provided in the lower wall 42 and an aperture of slightly smaller diameter is provided in the upper wall 44 to receive the post support member 16. The apertures are located generally midway between the ends of the support body 112 and have a center line approximately 1 1/4 inch form the rear wall 46 of the support 12 and 1 1/4 inches from the front wall 44. The post support member is annular and has an internal Morse taper for locking receiving the end of post 18 which may be similarly tapered.

A shoulder 48 less than 1/4 inch thick on the bottom end of the post support member 16 and a shoulder 50 adjacent the upper end of the support member 16 engage against the lower surface of the walls 40 and 42 respectively. The upper end of the support member 16 is staked over against the upper surface face of wall 40 to form an upper shoulder less than 1/2 inch thick. The support body 12 is therefore supported at two positions on the post support member spaced approximately 1 1/2 inches apart.

The upper wall 40 is provided with notches at each end such as 54 with the edges of the notches engaging slots 56 in respective moulded neoprene stop members 58. The use of two spaced resilient stops 58 contributes to more pleasing chair operation and their use is facilitated by the economies of the described construction. The stop members 58 engage the lower surface of the horizontal legs of L-shaped spider arms 34 and 35 to limit pivotal movement of the seat and back in the rearward direction.

End walls 22 and 26 close the respective notches 54 to prevent displacement of the respective stop members 58. The walls 22 and 26 also project rearwardly, forwardly and above the respective walls 46, 40 and 44 with the forward upper edge 60 of the end walls adapted to engage the spiders 34 and 35 to limit forward tilting of the chair seat and back. The end walls 22 and 26 are apertured with the edges of the aperture being defined by bosses 62 and 64, respectively, formed from the metal originally occupying the apertures and projecting inwardly toward the post to locate the end walls properly with respect to the walls 40, 42, 44 and 46 and for providing supporting surfaces therefor. The opening 20 in plate 22 for the
torsion bar 14 also has a peripheral boss formed about the opening to provide additional support area for the bar. The plates 22 and 26 are also welded to walls 40, 42, 44 and 46 along the external periphery of the walls.

It will be noted that the center line of aperture 20 and torsion bar 14 is located approximately ¼ inch below top wall 40 and approximately ½ inch from the rear surface of front wall 44. The hole in plate 26 for receiving bushing 24 is similarly positioned so that the torsion bar is located below the post top and intermediate the ends of the post support member 16 and post 18 to reduce the overall height of the chair control. From the foregoing dimensions it will be seen that the post axis is displaced less than ¼ inch from the torsion bar axis. Since the post support member 16 engages both walls 40 and 42 substantially only 1 inch apart, the forces are distributed over relatively short moment arms, while the dual support positions for the support body and integral closed loop structure provides enhanced rigidity to the support body 12.

A chair occupant on leaning backwards causes the spider arms 34 and 35 to tilt rearwardly thereby applying pressure against the stud 38 and the torque lever 28 to twist the bar 14 about its position in plate 22 until the spiders 34 and 35 engage stops 58. With the closed-loop support body 12 held by the post support members 16 and post 12 at positions spaced closely to the axis of the bar, the support body 12 provides improved stress resistance. On forward tilting by the chair occupant, the twist on the bar 14 is relieved as the stud 38 and torque lever 28 follow the movement of the spider arms 34 and 35 until the spider arms 34 and 35 engage the stop surface 60 on plates 22 and 26 to terminate rotation in the forward direction.

What I claim is:

1. A chair control adapted to be carried by a post for use with an office-type chair utilizing spider arms for carrying a seat and back, the improvement comprising a support body having top and bottom walls integrally interconnected with each other, and end plate fixed to each end of said top and bottom walls, a torsion bar intermediate said top and bottom walls, means for securing said torsion bar adjacent one end in nonrotatable relationship to one of said end plates, means adjacent the other endplate for securing one of said spiders in nonrotatable relationship to said torsion bar adjacent the end of said torsion bar opposite said one end, and a post support member engaging both said top and bottom walls for receiving said post along an axis displaced from the axis of said torsion bar to enable said support body to resist stress at two spaced positions adjacent said bar axis.

2. The improvement claimed in claim 1 in which said end plates each have a boss formed thereon for engagement with said top and bottom walls to resist displacement therebetween.

3. The improvement claimed in claim 1 in which said means securing said torsion bar to said one plate includes a boss on said plate extending along the axis of said bar and defining a passageway having a cross section and dimension corresponding to said bar to prevent rotation of said bar in said passageway.

4. In the improvement claimed in claim 1 a notch at opposite ends of said top wall, a resilient stop member for each arm received in each notch with each stop member having slots for receiving the edges of the respective notch and engaged by a respective end plate for preventing displacement of each stop member longitudinally relative said slots.

5. The chair control claimed in claim 1 in which said post support member is engaged with said top and bottom walls at positions spaced substantially 1 inch apart.

6. The chair control claimed in claim 1 in which the axis of said bar is displaced forwardly of the axis of said post by a distance less than ¼ inch and said torsion bar axis is located substantially ½ inch below said top wall.

7. A chair control adapted to be carried by a post for use with an office-type chair utilizing spider arms for carrying a seat and back, the improvement comprising a support body having top and bottom walls integrally interconnected with each other, and plates fixed to each end of said top and bottom walls, a torsion bar encircled by said interconnected top and bottom walls, a passageway in one of said end walls for securing said torsion bar adjacent one end in nonrotatable relationship to said one end wall, means adjacent the other end wall for securing one of said spiders in nonrotatable relationship to said torsion bar adjacent the end of said torsion bar opposite said one end, and a post support member engaging both said top and bottom walls for receiving said post and having an axis displaced from the axis of said torsion bar less than 1 inch with the axis of said torsion bar lying substantially intermediate the positions of engagement between said post support member and said top and bottom walls.

8. The improvement claimed in claim 7 in which said top and bottom walls are substantially 2 inches wide and spaced substantially 1 inch apart.

9. The improvement claimed in claim 7 in which said torsion bar axis is displaced from said top walls by substantially ¼ inch and from said bottom wall by substantially ½ inch.

10. The improvement claimed in claim 7 in which said top and bottom walls are less than ¼ inch thick.

11. The improvement claimed in claim 7 in which said post support member is provided with upper and lower shoulders engaging respectively the upper surface of said top wall and the lower surface of said bottom wall with the opposite ends of said shoulders being spaced less than 3 inches apart.