Dec. 5, 1967 F. DOERNER 3,356,414

CHAIR CONTROL

Filed March 7, 1966 2 Sheets-Sheet 1

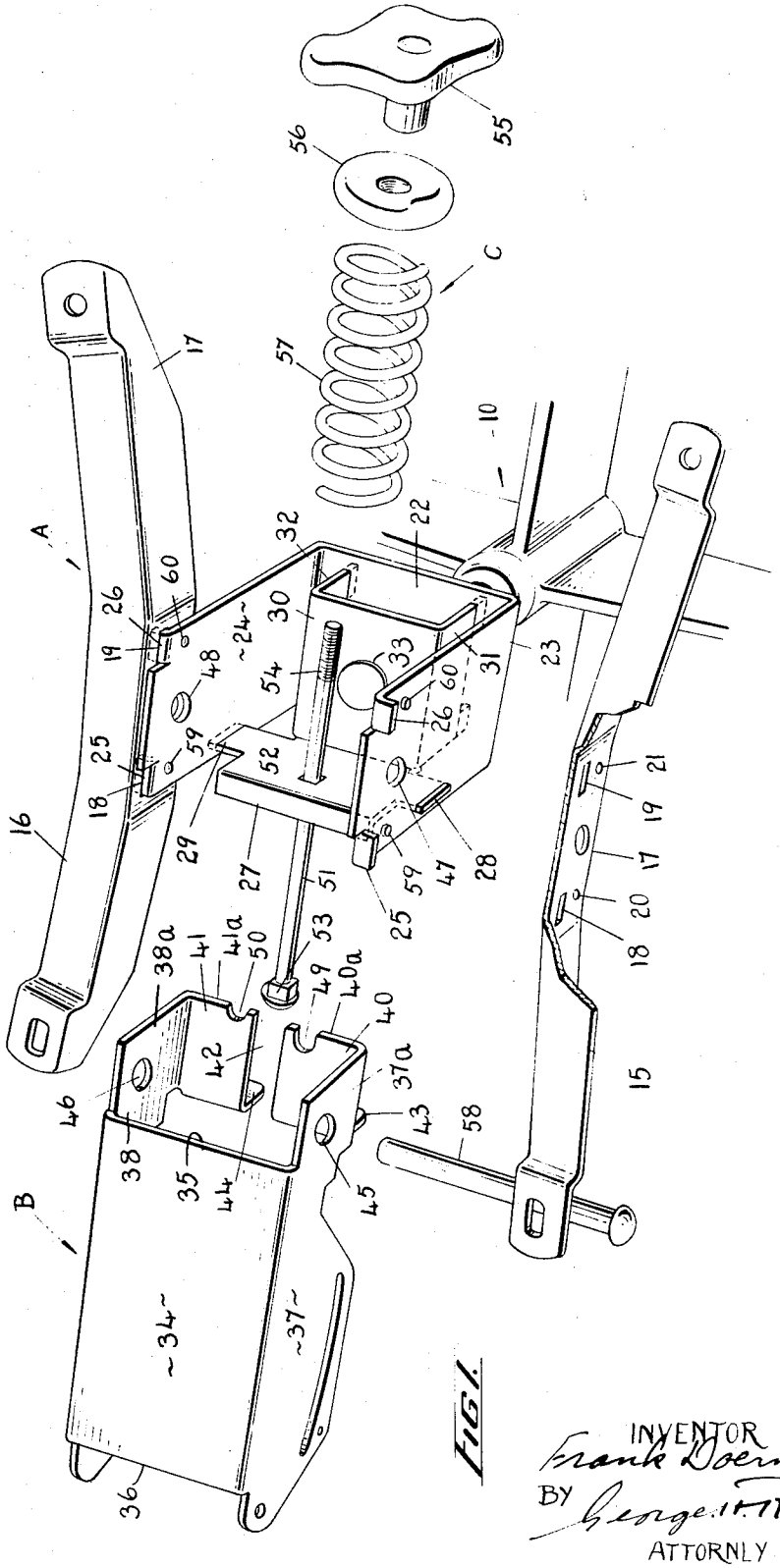



FIG. 1.

INVENTOR
Frank Doerner
BY George H. Fuches
ATTORNLY

Dec. 5, 1967 F. DOERNER 3,356,414

CHAIR CONTROL

Filed March 7, 1966 2 Sheets-Sheet 2

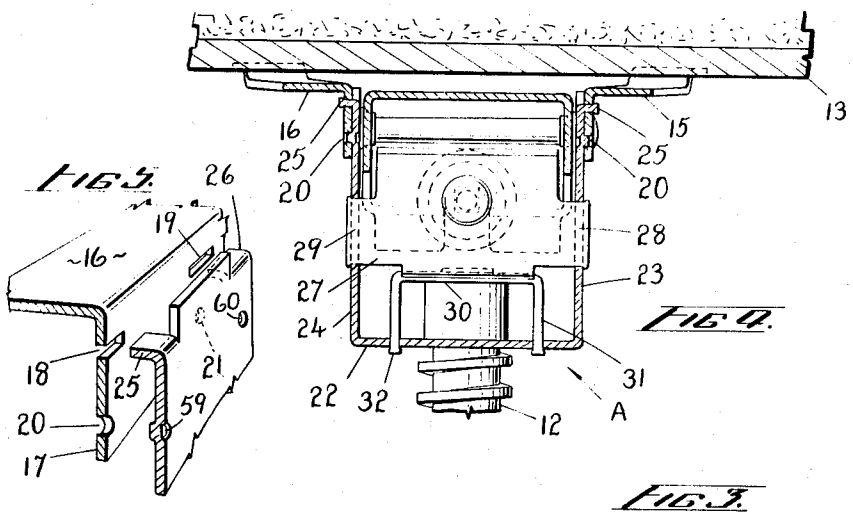



FIG 4.




FIG 3.

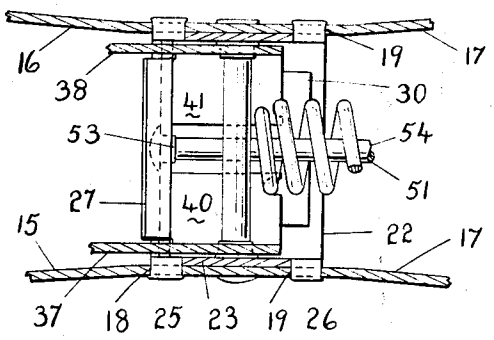






FIG 2.

INVENTOR
Frank Doerner
BY
George [illegible]
ATTORNEY

United States Patent Office 3,356,414 Patented Dec. 5, 1967



3,356,414

# CHAIR CONTROL

Frank Doerner, Waterloo, Ontario, Canada, assignor to Doerner Products Co., Limited, Waterloo, Ontario, Canada, a corporation of Canada

Filed Mar. 7, 1966, Ser. No. 532,187
2 Claims. (Cl. 297—301)

## ABSTRACT OF THE DISCLOSURE

A control unit for tilter chairs wherein the connection elements are formed integrally with the respective members in the form of lugs and slots; nibs and complementary nib-receiving holes are provided to facilitate assembly location and to assist in a load carrying capacity, and one member is so formed as to provide an abutment for the tension-spring bolt and a pressure plate for the spring per se.

This invention relates to a chair control for tilter chairs and in particular to a novel construction for connecting the frame members of the chair control together into a unitary structure.

The present manner of connecting the frame members of a chair control is to interconnect the parts by means of rivets and bolts. This type of structure makes it difficult to assemble the various parts together and also slows down the actual assembly operation. A further disadvantage of the present construction is that extra work is required when bolts and rivets are used for connecting the several parts together.

One of the objects of the present invention is to provide a construction of a chair control which can be easily and quickly assembled at the factory and in which the connecting elements are formed integrally with one of the parts and the other part is provided or formed with complementary slots which receive the connecting elements, the whole being permanently secured together by peening the protruding end of the integral part. This construction eliminates the use of bolts and rivets and also greatly facilitates the assembly of the parts into a unitary structure.

The parts which are to be connected together are further provided with complementary locating members consisting of nibs and nib receiving holes. These nibs also provide additional support to help carry the weight transferred from one frame member to the other. These complementary locating members when mated automatically position the connecting elements which are formed on one part with the element receiving slots formed in the other part to which such part is to be connected.

Other and further advantages of the present invention will be apparent from the following description in conjunction with the accompanying drawings in which:

FIGURE 1 is an exploded perspective view of a chair control constructed in accordance with the present invention.

FIGURE 2 is a side elevation of a posture chair utilizing the chair control of the present invention and in which parts of the chair control are shown in cross-section for purposes of clarity.

FIGURE 3 is a cross-section on the line 3—3 of FIGURE 2.

FIGURE 4 is a cross-section on the line 4—4 of FIGURE 2.

FIGURE 5 is a fragmentary view on an enlarged scale to show details of the means by which the various elements of the chair control are connected together.

FIGURE 2 illustrates a posture chair comprising a base 10 which is mounted on castors 11, a conventional



threaded post 12 which has mounted on the top thereof the chair control of the present invention which chair control is generally indicated by the letter A and which will hereafter be more particularly described, a chair seat 13 which is mounted on the chair control as hereinafter described, and a chair back 14 which is supported by the chair control for backward tilting from a substantially upright position.

The chair control A comprises a fixed frame consisting of a pair of spiders 15, 16 in spaced-apart relationship and which are attachable to the underside of the seat 13 in the usual manner, each spider having a skirt 17 which is lanced to form slits or openings 18, 19 and nib receiving holes 20, 21 positioned below the slits 18, 19, the holes 20, 21 being provided for the purpose to be hereinafter explained; a U-shaped frame member constituted by a base 22 and spaced-apart upright arms 23, 24, a portion of the top edge of each arm adjacent each lateral edge being bent to form outwardly projecting prongs 25, 26 which are positioned to register with the slits 18, 19 as shown and secured therein by peening; the arms 23, 24 are tied together by a cross-member 27 which carries prongs 28, 29 that are entered in slits formed in the upright arms 23, 24 to receive said prongs 28, 29, the prongs 28, 29 being secured therein by peening; a post mount constituted by an inverted U-member 30 having arms 31, 32 entered through slits formed in the base 22 and likewise secured therein by peening, the member 30 being provided with a post receiving hole 33 which registers with a corresponding hole formed in the base 22; a back plate which will be more fully described is generally indicated by the letter B; and a tension device for yieldingly resisting the backward tilting of the chair back which will also be described in more detail is generally indicated by the letter C.

The back plate B is made from a single piece of metallic material formed to the novel shape of the present structure and which, after so forming, comprises a flat horizontal portion 34 having front and rear edges 35, 36 respectively, and downwardly extending side portions 37, 38 which include the usual provision for mounting thereon adjacent the rear end thereof of a conventional back-back plate 39 on which is suitably mounted the chair back 14, the back-back plate 39 being provided with the usual adjustments for back height and angular position relative to the seat. As this is a conventional form and does not form any part of the present invention further details of that particular part and its construction and operation are unnecessary.

A novel feature of the back plate is the construction of the forward end which is the end that is pivotally attached to the arms 23, 24 of the U-shaped frame member previously described. The sides 37, 38 are extended outwardly from the front edge 35 to provide extensions 37*a*, 38*a* with inturned portions forming horizontal pressure plates 40, 41 having a channel 42 between the opposing edges of the pressure plates. The back edges of the pressure plates are bent downwardly to form stops 43, 44 which engage against the front face of the cross-member 27 as shown for the purpose which will hereinafter become apparent. The front or leading edges 40*a*, 41*a* of the pressure plates are each provided with circular notches 49, 50 respectively to form a seat for the compression spring which is to be described in conjunction with the tension device. The forward ends 37*a*, 38*a* are formed with pivot pin holes 45, 46 which when brought into register with pivot pin holes 47, 48 formed in the arms 23, 24 respectively receive a pivot pin 58 whereby the back plate is pivotally mounted on the arms 23, 24.

The tension device C which yieldably resists the backward tilting of the seat back 14 reacts between the cross-member 27 and the forward edges 40*a*, 41*a* of the pres-

sure plates **40**, **41**. The tension device comprises a bolt **51** which is anchored to the cross-member **27**. In the illustrated construction the anchoring is accomplished by entering the bolt through a central hole **52** formed in the cross-member **27** with the bolt head **53** abutting against the back face of the cross-member and centrally of the channel **42**. It is desirable that the pressure plates **40**, **41** be positioned relative to the pivot pin **58** so that the bolt will be coplanar with the pressure plates. The shank **54** of the bolt is substantially long and has the end opposite the head threaded to receive a tension adjustment handwheel **55** with the usual cup washer **56**. A compression spring **57** is mounted around the bolt **51** and is captured between the pressure plates and the cup washer **56** with the coil of the spring which is adjacent the pressure plates engaged in the notches **49**, **50**. It will be seen on reference to FIGURES 2 and 3 that when the chair control is assembled, the notches **49**, **50** are slightly forward of the vertical axis of the post **12**, of the pivot pin **58**. The notches **49**, **50** permit the spring to rock therein when the back plate B is rocked on the pivot pin **58**.

To aid in the positioning of the fixed frame for accurate location during assembly and also to help carry the weight transferred from the spiders to the frame the arms **23**, **24** are each provided with nibs **59**, **60** which project outwardly from the face adjacent the spiders and fit into the nib receiving holes **20**, **21** previously described.

FIGURE 1 which is an exploded view illustrates very clearly the manner in which the parts are assembled. The first step is to mount the U-member **30** to the base with its prongs extending through the base and then secure the prongs by peening. The cross-member is also brought into position with its prongs **28**, **29** entered through their respective slits in the arms **23**, **24** and permanently secured therein by peening. The next step is to bring the U-shaped frame member into position between the spiders **15**, **16**, the nibs **59**, **60** and the nib receiving holes **20**, **21** co-operating to locate the prongs **25**, **26** relative to the slits **18**, **19**. When the latter are in registration the prongs are forced into the respective openings and permanently secured therein by peening. The back plate is then brought into position with the pivot pin holes **45**, **46** in registration with the pivot pin holes **47**, **48** and the pivot pin driven therethrough. The tension device C is then assembled. When the tension device is tightened the normal position of the back plate will be as shown in FIGURE 2 in which position the stops **43**, **44** will engage against the cross-member **27** to limit the upward pivotal movement of the back plate B.

The foregoing description set forth a specific embodiment of the invention but this has been done by way of illustration and not by way of limitation.

What I claim as new and desire to protect by Letters Patent of the United States is:

**1.** In a chair having a base, a vertical post supported by the base, a chair seat and a chair back, a chair control comprising, in combination, a fixed frame mountable on the post, a back frame member having one end connected to and supporting said chair back and the other end pivotally attached to the fixed frame for pivotal movement relative thereto permitting backward tilting movement of the chair back from a normal substantially upright position to a reclining position, and a tension device yieldably resisting the backward tilting movement of the seat back from said normal position, said fixed frame comprising a pair of spaced-apart spiders attachable to the seat, an U-shaped member having a base and spaced-apart upwardly extending arms, a portion of each arm adjacent the top edge thereof being bent to form outwardly projecting prongs, said prongs being entered in slits formed in the spider whereby said U-frame is permanently connected thereto, and a cross-plate having prongs entered in prong receiving slits formed in said upright arms to permanently connect the cross-plate thereto, and a post mount carried by said base consisting of an inverted U-frame having prongs permanently connecting the U-frame to the base and having a post receiving opening registering with a post receiving opening formed in said base; said back frame being formed from a single piece of sheet metal with downturned side portions and having the forward ends thereof pivotally connected to said arms, said forward ends having inwardly projecting end portions forming a pressure plate, the leading edge of each end portion being recessed to form a seat for one end of a spring forming part of said tension device and the rear edge of said pressure plates having an integral downturned flange forming a stop member engageable with said cross-plate, said spring means reacting between said cross-member and said back frame to yieldingly resist backward tilting movement of the chair back.

**2.** In a chair control according to claim **1** in which each arm is formed with outwardly extending load carrying positioning nibs entered in nib receiving holes formed in the spiders.


**References Cited**

UNITED STATES PATENTS

| | | | |
|---|---|---|---|
| 1,336,510 | 4/1920 | Collier | 297—305 |
| 2,093,319 | 9/1937 | Herold | 297—301 |
| 2,105,510 | 1/1938 | Smith | 297—305 |
| 2,211,090 | 8/1940 | Bolens et al. | 297—305 |
| 2,329,327 | 9/1943 | Boerner | 297—304 |
| 2,374,350 | 4/1945 | Herold | 297—301 |
| 2,528,223 | 10/1950 | Fox | 297—301 |
| 2,838,095 | 6/1958 | Deaton | 297—305 |
| 2,956,619 | 10/1960 | Scharer | 297—303 |
| 3,046,054 | 7/1962 | Ericson et al. | 297—301 |
| 3,136,580 | 6/1964 | Parrott | 297—304 |


FRANCIS K. ZUGEL, *Primary Examiner.*