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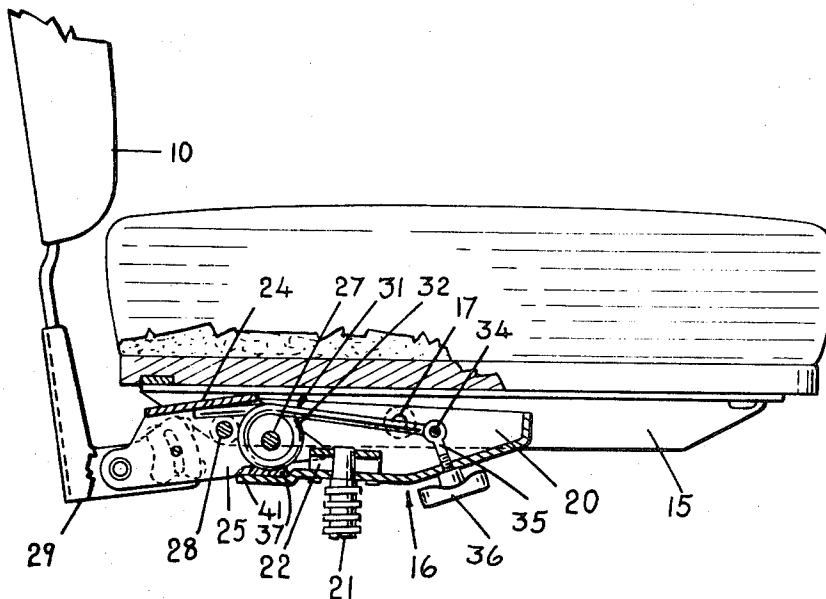
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[54] **CHAIR CONTROL WITH TORSION SPRING WITH TILTING SEAT AND CHAIR BACK**
 3 Claims, 4 Drawing Figs.

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 B60n 1/02
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 292

[56] **References Cited**
UNITED STATES PATENTS
 2,498,106 2/1960 Elleman 297/301

ABSTRACT: A chair control for tilting and posture wherein the control has a first frame member and a second frame member pivotally attached together by a first pivot. The first frame member is mountable on the top end of the chair post which is carried by the chair base. The first frame member is pivotally connected, by a second pivot, to a seat-support member, adjacent the front end thereof allowing the support member to have pivotal movement. The second frame member, in addition to being pivotally connected to the first frame is also pivotally connected to the seat-support member, adjacent the rear portion, by a third pivot. A coiled torsion spring biases the second frame against movement from and return to a normal position to permit pivotal movement of the second frame relative to the first frame. A chair seat is pivotally fastened to the first frame for limited up and down tilting on its pivot. The chair back is mounted in an upright position to the second frame for limited backward movement against the tension of the torsion spring. When the chair back is tilted backward the seat is caused to pivot so that the seat will be tilted downwardly toward the back to a slight extent.



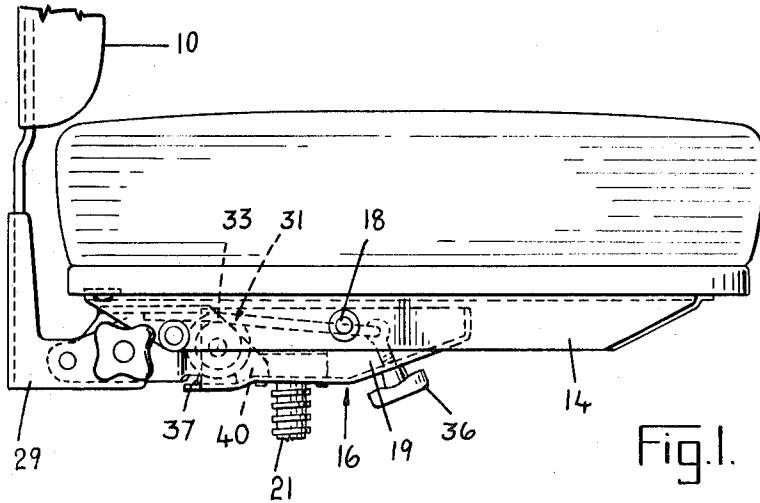
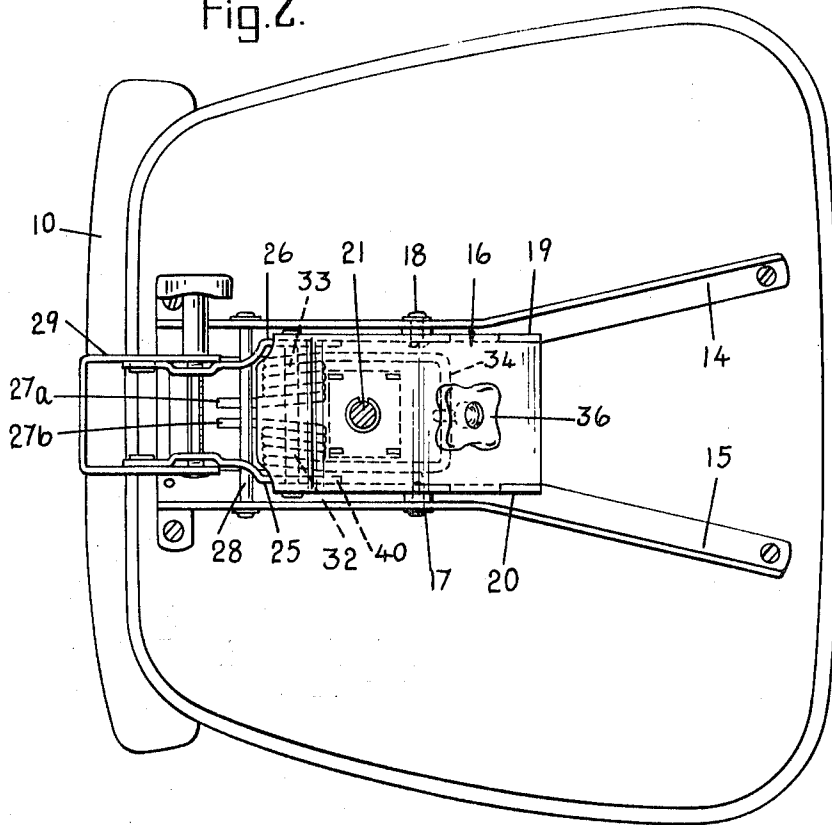
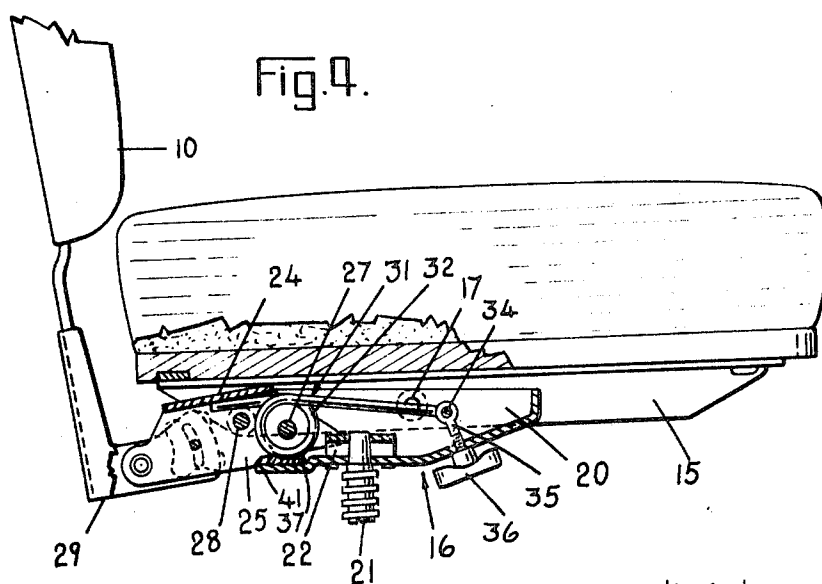
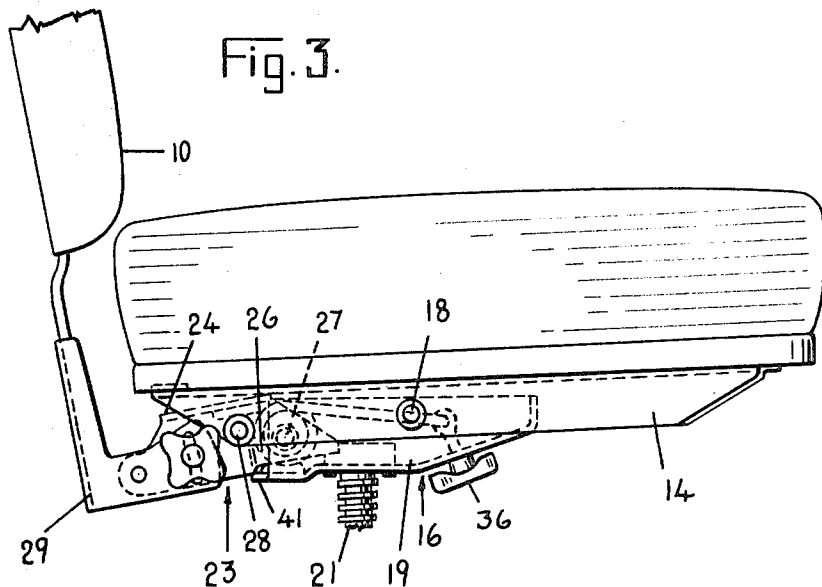


Fig. 1.

Fig. 2.



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CHAIR CONTROL WITH TORSION SPRING WITH TILTING SEAT AND CHAIR BACK

BACKGROUND OF THE INVENTION

The present invention is an improvement on the chair control disclosed in my prior Canadian Pat. No. 771,456 dated Nov. 14, 1967 and its United States counterpart, U.S. Pat. No. 3,339,973 dated Sept. 5, 1967. In that structure, only the chair back has tilting movement against the resistance of the torsion spring which biases the pair of frame members. In some chairs it is desirable to provide for the seat and chair back to have a tilting action for the added comfort of the occupant of the chair. Heretofore this has required enlarging the chair control to provide space for the additional elements. This invention has for its object the construction of a chair control in which the tilting of the chair seat and chair back is effected by a simple mechanism that is compact, unobtrusive and easy to manufacture.

DESCRIPTION OF THE INVENTION

For an understanding of the present invention and its advantages, reference is to be had to the following description taken in conjunction with the accompanying drawings in which:

FIG. 1 is a side view of a tilter chair employing the chair control of the present invention with the chair back in its upright position;

FIG. 2 is a plan view of the underside of the chair seat showing the chair control attached thereto;

FIG. 3 is a side elevation, similar to FIG. 1, but with the chair back and chair seat tilted; and

FIG. 4 is a side elevation similar to FIG. 3 partly in vertical cross section to show the interior of the chair control.

The chair control includes a pair of spaced-apart independent support members 14, 15, a first frame member 16 pivotally mounted on the support members by means of pins 17, 18 which are entered through the respective sides of the support members and sidewalls 19, 20 of member 16. It will be seen from the drawings that the member 16 is substantially pan shaped and provides a space for containing and concealing the control mechanism. The means for mounting the member 16 on the conventional chair post or spindle 21 comprises an inverted U-shaped plate 22 which is mounted on the bottom of the member 16 on the inside thereof and secured in place by staking.

The plate 22 is provided with an aperture to register with a corresponding aperture through the bottom of the member 16. These apertures provide the conventional means for mounting the control on the top end of the chair base spindle 21.

The second frame member 23 includes a plate portion 24 having sidewalls 25, 26 which have their forward or right-hand ends 40 fitting into the member 16, which forward ends are pivotally connected to the adjacent part of the member 16 by a first pivot pin 27. This allows the second member to have pivotal movement relative to the first member.

The second frame member 23 is pivotally mounted on the support members 14, 15 by means of a second pivot pin 28. The frame member is extended rearwardly from the pin 28 and has mounted thereon, in a conventional manner, a back support 29. It will be seen from FIGS. 3 and 4 that when a person leans back in the chair the second frame member is pivoted downwardly by rocking on the first pivot pin 27. At the same time, because of the pivotal connection between the support members and the second frame, established by pin 28, the seat and support members are rocked on the pins 17, 18. The result is that the seat is given a slight stop to the rear. The amount of tilt will be dependent on the extent of the backward tilt of the back support.

Tilt-resisting spring-biasing means is provided for the chair control to urge the chair back 10 to a normal or first position

as illustrated in FIG. 2 and resist movement to the second position as shown in FIGS. 3 and 4.

The aforementioned spring-biasing means comprises a coiled torsion spring 31 including a pair of oppositely wound coils 32, 33 coiled about the hinge pin 27 and mounted between the spaced apart sidewalls of the frame member 23. The torsion spring 31 also includes oppositely extending ends 27a, 27b of each of said coils respectively which engage against the member 23, the opposite ends of each coil being joined together by a connection portion 34. The connecting portion 34 is connected to the first frame member 14 by connecting means comprising a threaded rod 35 which is hooked at one end over the connecting portion 34 and which extends at its other end through the bottom of the first member 16 and is threaded into a manually operable tension adjusting nut 36. Said adjusting nut 36 being easily accessible on the outside of the first frame member 14. The spring-biasing means is similar to that disclosed in the above mentioned patents.

The spring 31 acts on the member 23 to hold the seat and chair back in their normal position in which position the forward ends 40 of the member 23 are engaged against the inside of the bottom portion of the member 16. This constitutes a stop means for holding the two members in their normal position. The rearwardly extending portion of the member 16 acts as a stop 41 which is engaged by the member 23 at the limit of the backward tilt of the chair back.

It will be seen that the hinge pin 27 passes centrally through the coiled tension spring as shown. The spring 31 is preferably supported on a pad 37 which extends under the spring between the spaced-apart sidewalls of the member 16. The pad 37 is preferably made of nylon and has its upper surface concaved to fit the curvature of the coils and is supported, on the base portion of the frame 16 in close proximity to the plate 21. In this modification the forces created by the torsion spring 31 are thus carried on rigid parts that are adapted to carry heavy loads.

I claim:

1. A chair comprising a chair seat and a chair back relatively tiltable about a horizontal axis, a chair control including support means carrying said chair seat, a first frame member, pivot means connecting the first frame member to said support means for relative pivotal movement between the first frame member and said support means; a second frame member having one end attachable to said chair back; a pivot pin pivotally connecting an opposite end of the second frame member to an adjacent end of the first frame member to permit pivotal movement between the first and second frame members; contact means on said second frame member disposed at a side of said pivot pin adjacent said adjacent end of said first frame member engageable with said support means when the second frame member is pivoted in a first direction in response to backward tilt of the chair back for pivoting said support means and said chair seat in an opposite direction thereby at least at times effecting simultaneous pivoting of said chair seat and chair back, and spring-biasing means urging the first and second frame members to a normal position at which said spring-biasing means resists backward tilting of the chair back under the influence of an external force effectively applied thereto.

2. A chair as defined in claim 1 wherein said support means is defined by a pair of spaced-apart rigid supports carrying said chair seat, said first frame member including means for mounting the same upon a top end of an associated vertical post, and stop means for limiting the pivotal movement of said second frame member.

3. The chair as defined in claim 2 wherein said biasing means is a torsion spring carried by the first frame member and being coiled around said pivot pin in coaxial relation thereto, said spring having one end secured to and acting on said first frame member and its other end engaging the second frame member to resist pivotal movement between said first and second frame members.