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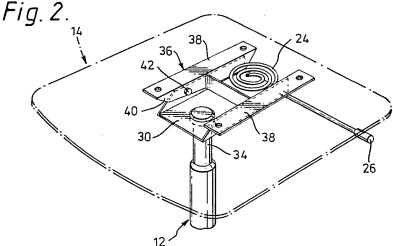
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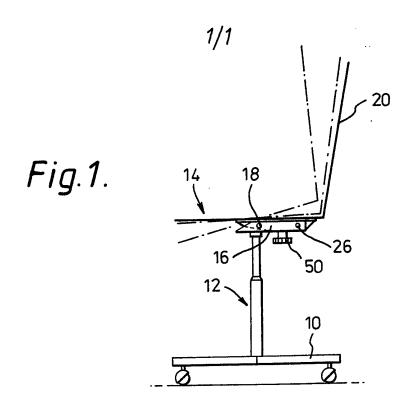
(54) A forward tilting chair

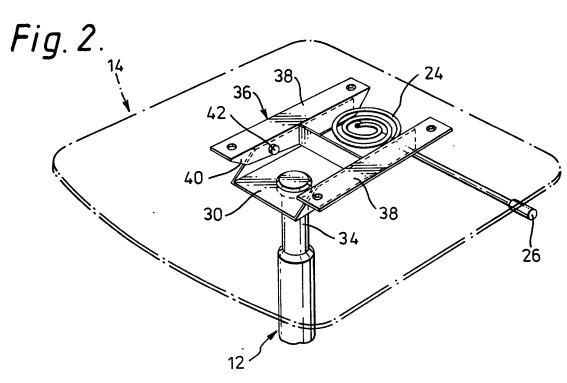
(57) A chair is disclosed, particularly for operators of equipment incorporating video display units and the like, which is capable of controlled forward tilting, for optimum comfort, when the operator leans forward.

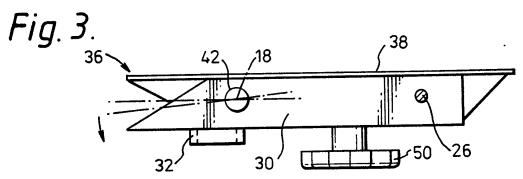
The chair described comprises a base 12 and a seat 14 mounted on the base for pivoting about a transverse horizontal axis 42 disposed towards the rear of the seat, resilient biasing means 24 such as a torsion bar, leaf spring or compression spring arrangement being provided to counteract the operators' weight and to urge the seat towards its horizontal position assumed when the occupant is seated normally. The pivoting movement may be locked by means of a handle 26.



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SPECIFICATION A forward tilting chair

This invention relates to a chair having a seat tiltable about a transverse horizontal axis. The invention is particularly, but not exclusively, concerned with a chair for use in offices and the like utilising video display units.

There is a trend for increasing use of computers and the like electronic equipment utilising video 10 display units in the office environment, but it has been found that chairs up till now used in offices are not entirely suited to use by personnel using such video display units, as the latter frequently require the viewer to sit forwardly, and generally 15 somewhat uncomfortably, on the front edge of his or her seat to gain a clear view of the video display unit. It is an object of the present invention to provide an improved chair suitable for use by personnel utilising video display units and the like.

According to the invention, there is provided a chair comprising a base or supporting structure, and a seat mounted on or in said base or supporting structure for pivoting about a horizontal transverse axis disposed nearer to the 25 rear of the seat than to the front thereof, the arrangement being such that the seat can tilt forward about said axis, from at least a generally horizontal orientation to a position in which the front of the seat is lowered relative to the rear of 30 the seat, resilient biasing means being provided adapted to urge the seat to tilt rearwardly about said axis, at least whilst the seat remains tilted forwardly from said generally horizontal orientation.

An embodiment of the invention is described below by way of example with reference to the accompanying drawings in which;

FIGURE 1 is a schematic side view of a chair embodying the invention,

FIGURE 2 is a partial perspective view of a chair 105 40 embodying the invention and showing a forward tilting action, and

FIGURE 3 is a side view of the forward tilting action shown in Figure 2.

Referring to Figure 1 the chair shown incorporates a conventional 4 or 5 star base, indicated generally at 10, with a vertical pillar 12 extending upwardly therefrom. A seat 14 is mounted at the upper end of the pillar 12, via a 50 tilting action 16 secured to the underside of the seat, so as to be pivotable, relative to the pillar 12, about a horizontal transverse axis 18. The axis 18is disposed closer to the rear of the seat 14 than to the front thereof so as to be to the rear of the 55 centre of gravity of the occupant when the occupant is in a normal seated position. Resilient

biasing means, taking the form of a coil spring 24 in Figure 2, but which may, in variants, be, for example, a torsion bar, a leaf spring, or the like 60 arrangement, acts to counteract the turning moment applied about axis 18 by the weight of the occupant and to urge the seat 14 towards the equilibrium position shown in solid lines when the seat 14 is tilted forwardly, about axis 18, as

65 indicated in broken lines. The placing of the pivotal axis 18 closer to the rear of the seat 14 than to the front thereof gives an effectively long lever arm for forces applied to the front of the seat, and this, in conjunction with an appropriate selection of the 70 spring rate or the equivalent of the resilient biasing means allows the weight of the occupant to cause the chair to adjust automatically, tilting forwardly about the axis 18, (as indicated in broken lines, to the correct angle for comfortable 75 efficient working as the occupant leans forward over the video display unit or other equipment, and returning automatically to its position shown in full lines in the drawing as the occupant resumes a normal sitting position. Thus, when the occupant 80 leans forwardly, the seat 14 also tilts forwardly, so that the front edge thereof is low relative to the rear edge, avoiding a concentration of pressure on the occupants' legs.

A manually operable locking device may be associated with the resilient biasing means or with the pivotal mounting of the seat 14, for example to secure the seat in the horizontal position shown in full lines in the drawing and prevent forward tilting thereof. In the embodiment 90 shown the manually operable locking device takes the form of a spring loaded locking handle

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The seat 14 may have a back 20 fixedly or adjustably secured thereto, to tilt with the seat. 95 The pivotal mounting of the seat 14 on the pillar 12 may, as regards mechanical details, be similar to arrangements already known for rearwardly tilting office chairs, but with the differences that the pivotal axis 18 is relatively close to the rear of the: seat 14, and is to the rear of the normal location of the centre of gravity of the occupant, (as opposed to the normal location of the tilting axis of a tilting chair substantially below the centre of gravity of the occupant), and with adaption to allow forward tilting of the seat whist ensuring that the seat of the chair is level in the normal sitting position. Furthermore the resilient biasing means in the forward tilting action the subject of the invention must exert a substantially lesser pivoting moment 110 on the chair seat, for a given displacement from the normal sitting position, than a normal rearward tilting action for a chair, the latter being designed to take virtually the whole weight of the occupant, whereas, in embodiments of the present 115 invention, the resilient biasing means is designed to operate under the much lighter loading applied by leaning the body forward.

Referring in more detail to Figures 2 and 3, the forward tilting action includes a bracket 30, substantially of shallow channel section having a horizontal base and upstanding side walls. A socket 32 fixed in the base of bracket 30, e.g. by welding, is arranged to receive, on the underside of the bracket 30, a vertical spindle 34 on which the bracket is supported.

The spindle 34, and with it the action and the seat, are pivotable, in a manner known per se, about the vertical axis of the pillar 12 and may be resiliently mounted for vertical movement relative

to the lower part of the pillar 12 and the base 10, for example by means of a rigid or gas spring suspension arrangement.

The bracket 30 carries a bracket 36 which has flanges 38 by means of which it is secured to the underside of the seat base. The bracket 36 has downwardly extending walls 40 which lie on the inner sides of the side walls of bracket 30, close to and parallel with the last-noted side walls, and the bracket 36 is mounted for pivotal movement, about axis 18, on the bracket 30, for example by means of pivot pins 42 extending through the side walls of the brackets 30 and 36.

The coil spring 24 acts between the brackets 30 and 36, in a manner not shown in detail, and the locking handle 26, also in a manner not shown in detail, is operable to lock the bracket 36 with respect to the bracket 30.

In the arrangement shown in the drawings, the vertical axis of the pillar 12 is arranged to pass substantially through the centre of gravity of the seat and occupant whilst, as shown, the pivotal axis 18, defined by the pivot pins 42, is disposed substantially rearwardly of the vertical axis of the pillar 12, and thus of the centre of gravity of the seat and occupant.

However, it is possible for the vertical axis of the pillar to be placed rearwardly of the centre of gravity of the seat and occupant, in which case, for example, the transverse tilting axis may intersect the vertical axis of the pillar.

The tension of the spring 24 acting between the brackets 30 and 36, and thus the pre-stress or the spring rate of the spring can be adjusted by means of a knob 50 projecting from the underside of the bracket 30 and rotatable about a vertical axis to effect such adjustment.

The arrangement disclosed with reference to the drawings not only permits the seat and back to tilt forward, but also to adjust automatically to the correct and the most comfortable angle of forward tilt for the individual user, without the use of manual, gas spring or other mechanical adjustment.

If desired, of course, some form of base structure may be adopted, other than the 4/5 star base with vertical pillar shown, or the seat may be adapted to operate on a fixed underframe or base.

CLAIMS

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1. A chair comprising a base or supporting structure, and a seat mounted on or in said base or supporting structure for pivoting about a horizontal transverse axis disposed nearer to the

- rear of the seat than to the front thereof, the 55 arrangement being such that the seat can tilt forwardly about said axis, from at least a generally horizontal orientation to a position in which the front of the seat is lowered relative to the rear of the seat, resilient biasing means being provided 60 adapted to urge the seat to tilt rearwardly about said axis, at least whilst the seat remains tilted forwardly from said generally horizontal orientation.
- 2. A chair according to claim 1 including means 65 operable manually to prevent such forward tilting movement of the seat, or allow such movement, as desired.
 - 3. A chair according to claim 1 wherein said biasing means comprises a torsion bar, leaf spring, or coil spring.
 - 4. A chair according to claim 1 wherein said biasing means has a locking device associated therewith.
- 5. A seat action for a chair according to claim 1, comprising a first member adapted for connection directly or indirectly with a base or supporting structure, a second member adapted to be secured to a seat to mount said seat on said base or supporting structure, the second member being pivotally connected to the first member for 80 pivoting about an axis thereof, and the action including resilient biasing means acting between said members to pivot one in a predetermined sense relative to the other, about said axis, the action being arranged, when said first member is so connected to said base or supporting structure and said second member is so secured to a seat, to mount said seat for pivoting about a horizontal transverse axis, coinciding with said axis of the 90 action and disposed nearer to the rear of the seat than to the front thereof, in such a way that the seat can tilt forwardly about said axis, from at least a generally horizontal orientation to a position in which the front of the seat is lowered 95 relative to the rear of the seat, resilient biasing means being provided acting between said first and second members for urging the seat to tilt rearwardly about said axis, at least whilst the seat remains tilted forwardly from said generally 100 horizontal orientation.
 - A chair substantially as hereinbefore described with reference to, and as shown in, the accompanying drawings.
 - 7. A seat action substantially as hereinbefore described with reference to, and as shown in the accompanying drawings.
 - 8. Any novel feature or combination of features described herein.

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