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(54) Chair control arrangement

(57) A chair control arrangement for a chair (1) movable on castors (11) and having an horizontally swivelable seat is shown. It comprises locking means (13, 38) for locking translational movement of a chair on its castors (11) and/or swivel movements of the chair seat and control means (41, 85) for controlling the locking means (13,38) and situated in a position usable by the user of the chair when sitting therein.

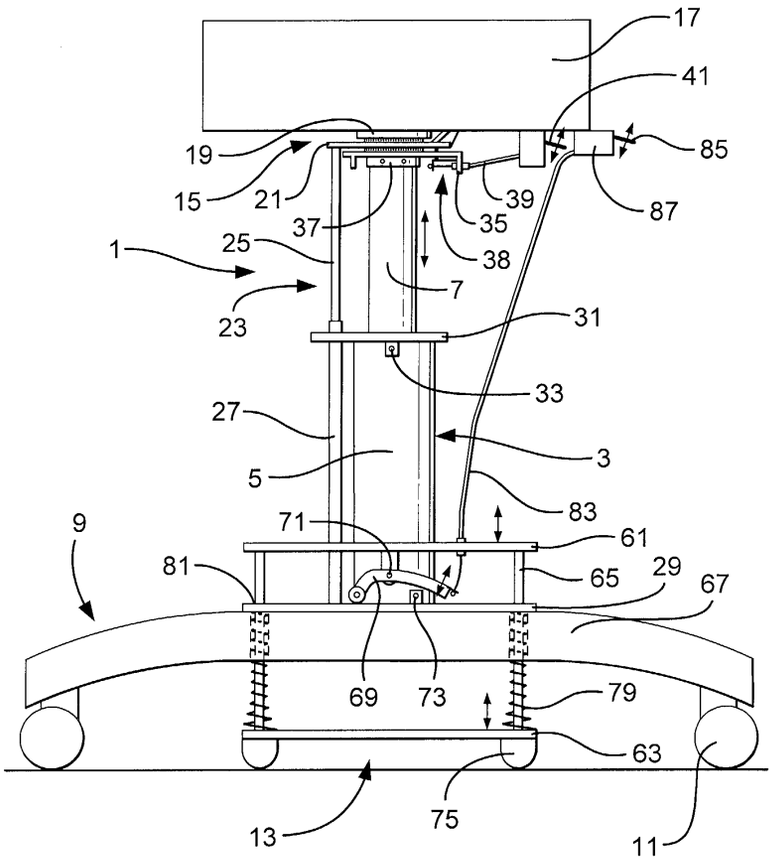

Fig.1

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Description

[0001] This invention relates to a chair control arrangement for use, particularly, but not exclusively, by disabled people.

[0002] The type of chair to which this invention relates is a pedestal type chair movable on castors located at the base of the pedestal, the chair itself being swivelable in a horizontal plane about the pedestal. Such is a typical construction of office chair which may be of the "typist type" without arms or the executive type with arms. A further common feature of such chairs is the provision of means for preventing movement of the chair once it has been placed in its desired position. Such a feature is particularly useful for disabled people.

[0003] The problem with these arrangements is that, while it is common to provide control arrangements controlling the height, inclination of the chair seat and the seat back by controls within the reach of the user, with the usual construction of the swivel mechanism and the braking arrangements, it is not possible to provide controls for these mechanisms in suitable positions for control by a person sitting in the chair; these mechanisms must have controls elsewhere so that, in order to operate them, the user has to get out of the chair. This is a serious disadvantage for the disabled, who then require assistance in setting up the chair in accordance with their needs.

[0004] The present invention seeks to provide a chair control mechanism in which the control of swivel and/or braking mechanisms can be controlled by the user when sitting in the chair.

[0005] According to the invention, there is provided a chair control arrangement for a chair movable on castors and having an horizontally swivelable seat comprising locking means for locking translational movement of a chair on its castors and/or swivel movements of the chair seat and control means for controlling the locking means and situated in a position usable by the user of the chair when sitting therein.

[0006] The control means may comprises a Bowden cable and the Bowden cable may be operated by a lever situated on the part of the chair carrying the chair seat.

[0007] Where the locking means locks the translational movement of the chair, it may comprise a plurality of feet raisable and lowerable into and out of engagement with the floor on which the chair is standing. The feet may be biased in the direction of the floor, suitably by means of a spring.

[0008] Where a Bowden cable and lever are used, when the lever is operated, the Bowden cable may act to raise the feet against the action of the spring and when the lever is released, the Bowden cable may be released allowing the feet to be lowered to the floor under the action of the spring.

[0009] The feet may be mounted on a framework movable upwards and downwards in relation to a fixed member on the base part of the chair. The framework may be moved upwards by means of a pivotal lever pivoted on the frame and having one end in contact with an upper surface of the frame work.

[0010] The framework may comprise one or more rods passing vertically through apertures in the fixed member.

[0011] When the locking means locks the swivel movement of the chair seat, it may comprise a pin on a first member swivelable with or stationary relative to the chair seat co-operating with a plurality holes in a second member stationary relative to or swivelable with the chair seat respectively, the pin acting to prevent swilling movement of the chair seat when engaged in one of the holes.

[0012] When a Bowden cable and lever are used, the pin may be carried by a first plate swivelable with the chair seat and the holes are arranged circumferentially on a second plate stationary with respect to the chair seat, the plates being stacked one above the other around the swivel axis of the chair.

[0013] The pin may be movable towards and away from the second plate and may be biased towards the second plate by means of a spring.

[0014] The Bowden cable may be arranged to act on the pin to move it away from the second plate when the lever is actuated.

[0015] The lever may be movable between a first position in which the Bowden cable is released allowing the pin to move under the action of the spring and a second position in which it acts on the Bowden cable to move the pin away from the second plate.

[0016] Means may be provided for selectively locking the lever in its second position.

[0017] Stop means may be provided to prevent the chair seat from swivelling through 360 degrees. Preferably, the angle of swivel allowed by the stop means is between 220 and 350 degrees.

[0018] The invention will now be described in greater detail, by way of example, with reference to the drawings, in which:-

Figure 1 is a schematic side view of a chair mechanism incorporating one embodiment of the control arrangements of the invention;

Figure 2 is an enlarged view of the upper part of the chair mechanism as shown in figure 1 in an unlocked position, and

Figure 3 is a view similar to figure 2 but with the mechanism in a locked position.

[0019] Referring to the drawings, there is shown a chair swivelling and braking control mechanism. The chair 1 comprises a telescopic pedestal 3 including a base part 5 and a telescopic rod 7. The base part is carried by a castor arrangement 9, in this case comprising four castors 11, only two of which can be seen. The cas-

tor arrangement 9 is provided with a braking arrangement 13 which will be described in more detail hereafter.

[0020] The telescopic rod 7 carries at its upper end a swivel mechanism 15 on the top of which is carried the chair seat carrier, indicated at 17. For the sake of clarity neither the seat itself, the usual backrest nor the arms, if any, are shown.

[0021] The two mechanisms and their operation will now be described:

1. Swivel Mechanism

[0022] The chair seat carrier 17 is carried by a top plate 19 which is welded to the inner stem of the chair formed by the telescopic rod 7 and thus swivels with the chair seat carrier 17,

[0023] Beneath the top plate 19 is located a centre plate 21 which is connected to the outer chair stem or base part 5 by a telescopic bar 23 having a telescopic rod 25 at its upper part extending from a base part or barrel 27. The lower end of the barrel 27 is located in a fixed position in relation to the castor arrangement 9 by a lock plate 29. The barrel 27 also carries a locking plate 31 by means of which it is attached to the base part 5, suitably by means of grub screws 33.

[0024] Under the centre plate 21 is located a base plate 35 which is attached to the top plate 19 via a tube 37 through locking grooves therein so that the base plate 35 is constrained to move with the top plate 19 and chair seat 17. The base plate 35 carries a locking mechanism 38 which is operated by a Bowden cable 39 under the control of a lever 41 located on a bracket arrangement 43 attached to the chair seat.

[0025] The locking mechanism comprises a pin 45 which is biased upwardly into engagement with the centre plate 21 by means of a spring 47. The centre plate 21 is provided with a number of circumferentially arranged holes (not shown) through which the pin 45 can pass to lock the chair in one of a number of positions, the number of available positions depending on the number of holes in the centre plate 21.

[0026] In the locked position as shown in figure 3, the pin 45 is located in one of these holes so as to prevent swivelling of the chair. To unlock the chair, the lever 41 is raised from the position shown in figure 3 to the position shown in figure 2. In this position, the pin 45 is pulled out of the hole in which it was located by the Bowden cable 39, permitting swivelling of the chair. Preferably, the lever 41 can be retained in its upper position by any suitable known means.

[0027] To re-lock the chair against swivelling, the lever 41 is lowered, letting the pin move upwards under the biasing of the spring 47 to engage the underside of the centre plate 21. Further movement of the chair in either direction will allow the pin 45 to enter a hole in the centre plate 21 and so lock the chair.

[0028] Because of the cable operation of the locking mechanism, it is essential to prevent a full 360 degree revolution of the chair as this would cause the cable 39 to be ripped from its mounting. Thus movement of the chair is limited to between 220 and 350 degrees by means of one or more stops 49 formed on the base plate 35 and shaped to engage the telescopic rod 25, preferably through the intermediary of rubber pads used for cushioning purposes.

[0029] Suitable bearings 51 are provided between the plates 19, 21 and 35. These may take the form of smooth surfaced washers ball or needle rings.

2. Chair Movement Lock

[0030] This locking arrangement 13 comprises an upper plate 61 attached to a lower plate 63 by way of two or more steel rods 65 which pass through or outside the chair legs 67 carrying the castors 11. The upper plate 61 is held at a constant height, other than when in an unlocked state, above the lock plate 29 by means of a pivot arm 69 pivoted at 71 to the upper plate 61 and resting at one end on the top surface of the lock plate 29. The lock plate 29 is maintained in fixed position with regard to the base portion 5 of the telescopic pedestal 3, suitably by grub screws 73. Thus the height of the lock plate 29 can be adjusted for variations in or curvature of the castor arrange 9.

[0031] Provided on the lower part of the lower plate 63 are feet 75 which make contact with the floor surface. These are biased into contact with the floor by means of springs 79 surrounding the rods 65 and acting between the lock plate 29 and the lower plate 63. Nylon guides 81 ease the movement of the rods 65 through the lock plate 29.

[0032] Connected to the pivot arm at the opposite end to that resting on the lock plate 29 is a Bowden operating cable 83 which is operated by a lever 85 attached to a bracket 87 on the chair seat carrier 17.

Operation of this locking mechanism will now be considered:

[0033] In the position shown in figure 1, the chair is prevented from movement by the fact that the feet 75 are held in engagement with the floor by their springs 79. To permit the chair to be moved, the lever 85 is raised, pulling on the Bowden cable and rotating the pivot arm 69 anticlockwise. This causes the upper plate 61 to be raised relative to the lock plate 29, thus raising the feet 75 away from the floor against the action of the springs 79 and freeing the chair. Releasing the lever 85 will release the pivot arm 69 and allow the feet 75 to return to the floor, preventing movement of the chair. While it is preferred that the chair cannot be held in the free position, means may be provided, if desired, to lock the lever 85 in its upper position.

[0034] It will be appreciated that additions to or modification of the above described embodiment may be made without departing from the scope of the invention.

For example, the Bowden cable arrangement could be replaced by a suitable mechanical linkage. In the swivel lock, the plate 35 could be stationary and the plate 21 could be made to rotate with the chair seat carrier. This will enable the chair to rotate 360 degrees.

Claims

1. A chair control arrangement for a chair (1) movable on castors (11) and having an horizontally swivelable seat comprising locking means (13, 38) for locking translational movement of the chair (10) on its castors (11) and/or swivel movements of the chair seat and control means (41, 85) for controlling the locking means (13, 38) and situated in a position usable by the user of the chair when sitting therein.

2. An arrangement as claimed in claim 1, wherein the locking means (13) locks the translational movement of the chair (10) and comprises a plurality of feet (75) raisable and lowerable into and out of engagement with the floor on which the chair (10) is standing.

3. An arrangement as claimed in claim 2, wherein the feet (75) are biased in the direction of the floor by means of a spring (79).

4. An arrangement as claimed in claim 3, wherein the control means (13) comprises a Bowden cable (83) operated by a lever (85) situated on the part (17) of the chair (10) carrying the chair seat and wherein, when the lever (85) is operated, the Bowden cable (83) acts to raise the feet (75) against the action of the spring (79) and when the lever (85) is released, the Bowden cable (83) is released allowing the feet (75) to be lowered to the floor under the action of the spring (79).

5. An arrangement as claimed in claim 4, wherein the feet (75) are mounted on a framework (65) movable upwards and downwards in relation to a fixed member (67) on the base part of the chair (10).

6. An arrangement as claimed in claim 1, wherein the locking means (38) locks the swivel movement of the chair seat and comprises a pin (45) on a first member (35) swivelable with or stationary relative to the chair seat co-operating with a plurality holes in a second member (21) stationary relative to or swivelable with the chair seat respectively, the pin (45) acting to prevent swilling movement of the chair seat when engaged in one of the holes.

7. An arrangement as claimed in claim 6 wherein the pin (45) is carried by a first plate (35) swivelable with the chair seat and the holes are arranged circumferentially on a second plate (21) stationary with respect to the chair seat, the plates being (35, 21) stacked one above the other around the swivel axis of the chair (10).

8. An arrangement as claimed in claim 7, wherein the pin (45) is movable towards and away from the second plate (21).

9. An arrangement as claimed in claim 8, wherein the pin (45) is biased towards the second plate (21) by means of a spring (47).

10. An arrangement as claimed in claim 9, wherein the control means (38) comprises a Bowden cable (39) operated by a lever (41) situated on the part (17) of the chair (10) carrying the chair seat and wherein the Bowden cable (39) is arranged to act on the pin (45 to move it away from the second plate (21) when the lever is actuated.

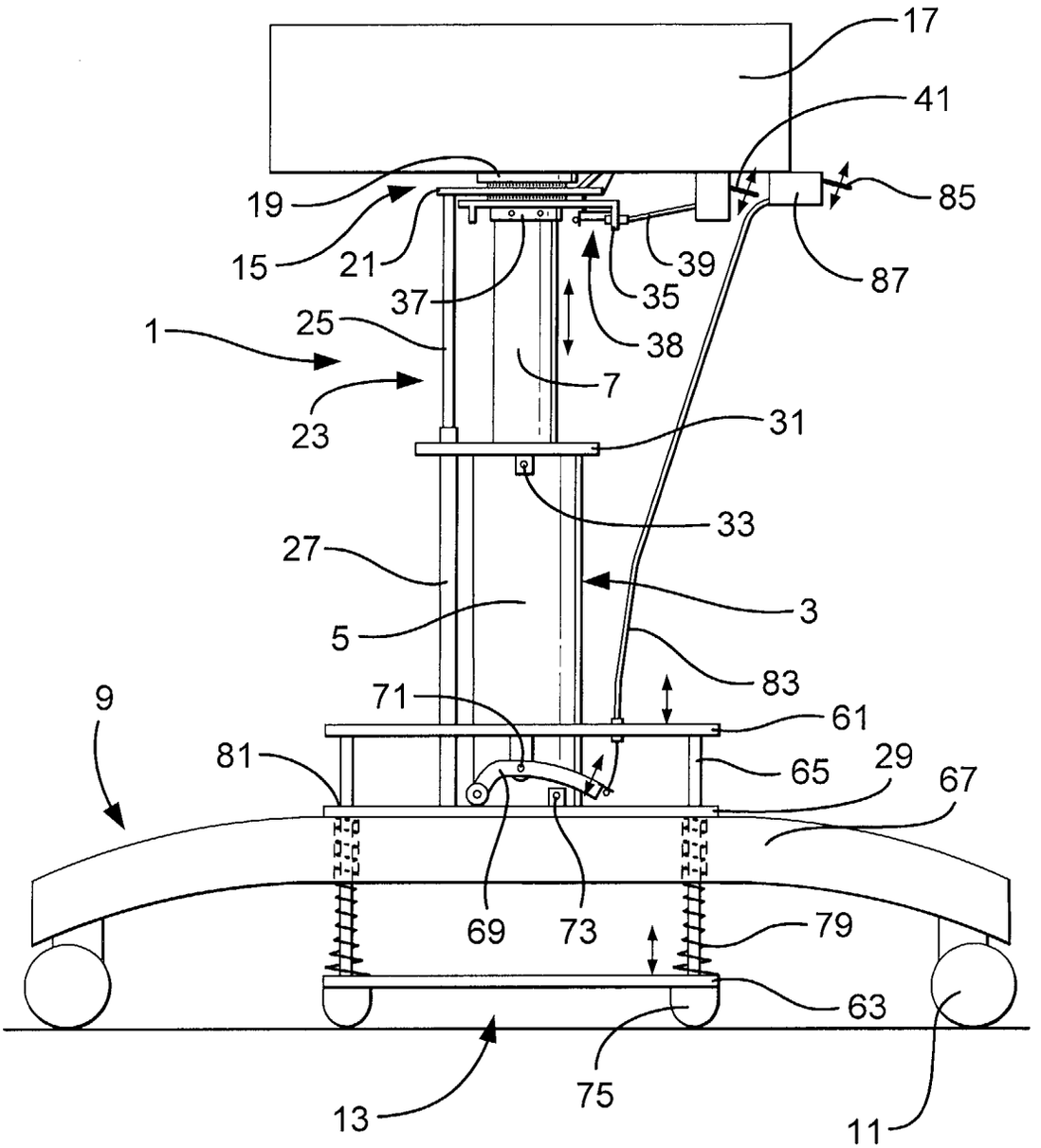
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Fig. 1

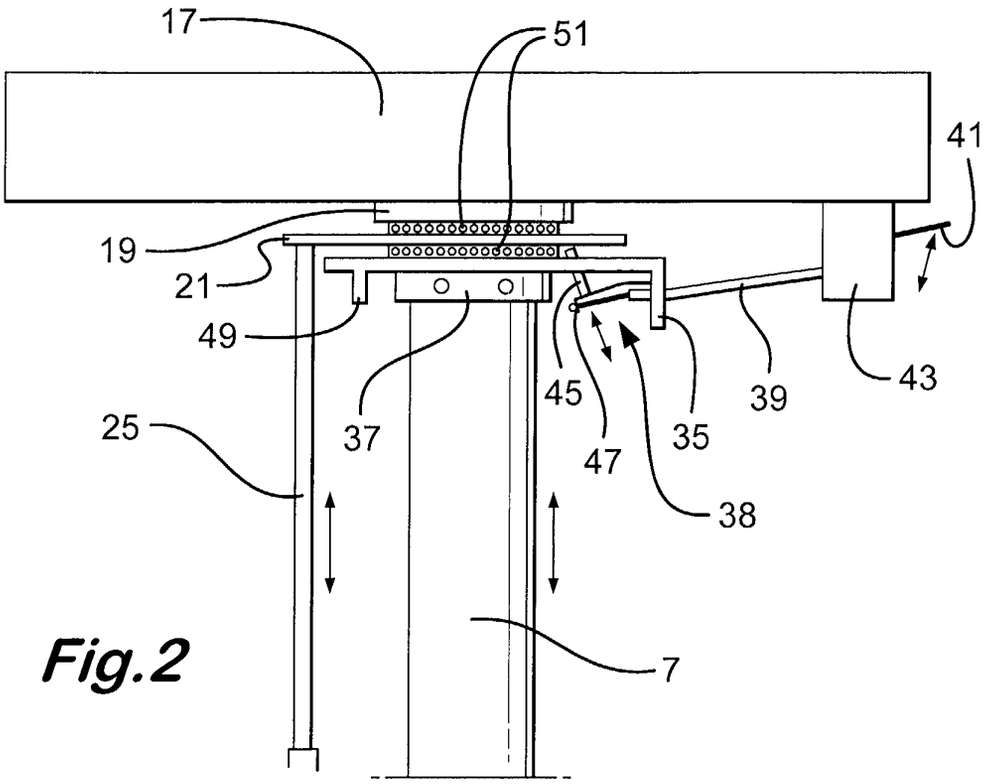
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Fig.2

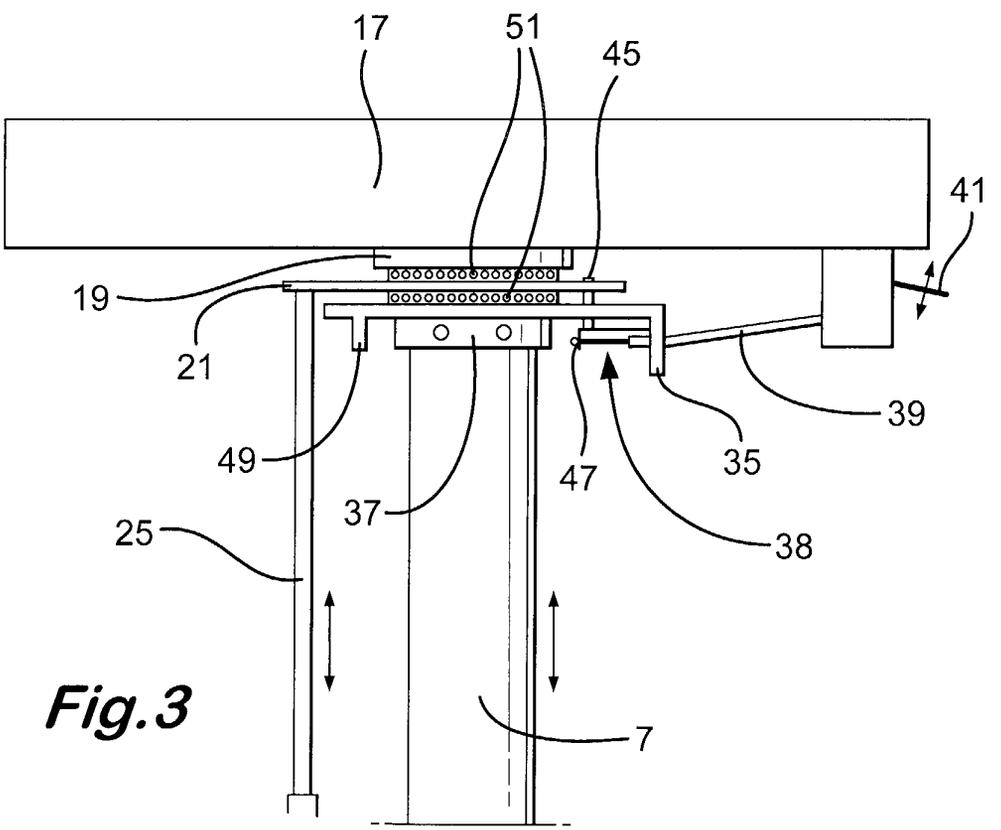
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Fig.3

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EUROPEAN SEARCH REPORT

Application Number
EP 03 25 2807

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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	28 August 2003	Amghar, N

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