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(54) **Door closure mechanism**

(57) A door closure mechanism (21) for a cubicle (11), comprising damping means (22), biasing means (24) and a pivot arm (25), all arranged to be located within a headrail (14) relative to which the door (13) is pivotally mounted. The damping means (22) has its distal end fixed relative to the headrail (14) and its proximal end pivotally connected to one end of the pivot arm (25). The biasing means (24) has its distal end fixed relative

to the headrail (14) and its proximal end pivotally connected the other end of the pivot arm (25). The pivot arm (25) is pivotally mounted relative to the headrail (14) and is arranged to be rotationally fixed relative to the door (13); whereby pivotal movement of the door (13) relative to the headrail (14) causes the pivot arm (25) to rotate relative to the headrail (14) thereby simultaneously moving the respective proximal ends of the damping means (22) and biasing means (24).

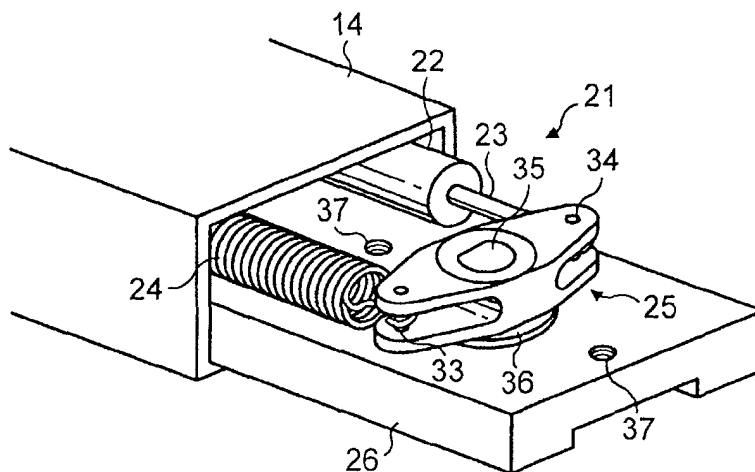


FIG. 3

Description

[0001] The present invention relates to a door closure mechanism. It is particularly applicable to door closure mechanisms for cubicle doors, especially cubicles which are prefabricated and assembled on site.

[0002] In general, doors for cubicles do not have closure mechanisms, although this would be desirable, for aesthetic and other reasons. Door closure mechanisms are in themselves very well known, however they tend either to be visible or to be located with in the fabric of the building, either above or below the door or in the adjacent wall.

[0003] In the case of cubicles, visible door closure mechanisms are undesirable because they are unsightly and are also prone to vandalism. However due to the nature of cubicles, it is not practical to locate door closure mechanism in the fabric of the building.

[0004] It is therefore an object of the present invention to provide a hidden closure mechanism for a cubicle door.

[0005] According to one aspect of the invention, there is provided a door closure mechanism for a cubicle, comprising damping means, biasing means and a pivot arm, all arranged to be located within a fixed part relative to which fixed part the door is pivotally mounted, and in which: the damping means has its distal end fixed relative to the fixed part and its proximal and pivotally connected to one end of the pivot arm; the biasing means has its distal end fixed relative to the fixed part and its proximal end pivotally connected the other end of the pivot arm; and the pivot arm is pivotally mounted relative to the fixed part and is arranged to be rotationally fixed relative to the door; whereby pivotal movement of the door relative to the fixed part causes the pivot arm to rotate relative to the fixed part thereby simultaneously moving the respective proximal ends of the damping means and biasing means.

[0006] According to a second aspect, the invention extends to such a door closure mechanism in combination with the fixed part and the door.

[0007] According to a third aspect, the invention extends to a cubicle or series of cubicles incorporating one or more such combinations.

[0008] Preferably, the damping means is an hydraulic piston/cylinder arrangement. Preferably, the biasing means is a helical spring. Preferably, the fixed part is a hollow cubicle headrail. Preferably, the damping means, the biasing means and the pivot arm are located on a rigid base which is itself fixed within the headrail.

[0009] Preferably, the pivot arm is connected to the door by means of an eccentric or non-circular cross-section shaft which is located in respective correspondingly shaped openings in the pivot arm and in the door at its upper edge. Preferably, the shaft passes through a circular or other hole in the base, allowing the shaft to rotate relative to the base. Preferably the hole is constituted by a bearing such as a journal bearing or a roller

bearing.

[0010] Preferably, the biasing means is arranged to urge the pivot arm to rotate and in turn the door to move in a desired direction. This may be towards a door closed or a door open (or even an intermediate) position. Thus, as the door is moved in the opposite direction, the effect of the biasing means is increased.

[0011] Preferably, the damping means acts to damp the effect of the biasing means thus damping the fall velocity of the door and ensuring that the door does not slam.

[0012] Preferably, the door is a laminated, composite, or glass door. It is preferably pivotally supported at the bottom by a bottom support bracket. A bearing, such as a brass roller bearing may be provided in the support bracket which may receive a pin extending from the lower part of the door.

[0013] It will be appreciated that the entire closure mechanism is housed within the headrail and is therefore not visible. This means that aesthetically, there is no detrimental effect while at the same time, the mechanism is protected from damage by vandalism.

[0014] The invention may be carried into practice in various ways and one embodiment will now be described by way of example with reference to the accompanying drawings, in which:

Figure 1 is a partial perspective view of a cubicle;

Figure 2 is a perspective view of a door closure mechanism in accordance with the invention;

Figure 3 is an end view of the pivot arm of the closure mechanism;

Figure 4 is a simplified plan view of the closure mechanism with the door closed; and

Figure 5 is a view similar to Figure 4 but with the door open.

[0015] Referring to Figure 1, a cubicle 11 is defined by a rear wall (not shown), two side panels, one of which is shown at 12, and a door 13. The door 13 is suspended from a headrail 14, to which the panel 12 is also attached, and is pivotally supported by a bottom support bracket 15. The panel 12 is supported by a foot (not shown).

[0016] Movement of the door 13 is controlled by a closure mechanism 21 located within the headrail 14 and shown in detail in Figures 2 and 3. The mechanism 21 comprises an hydraulic damping piston/cylinder 22 with a piston rod 23, a helical tension spring 24, a pivot arm 25 and a solid base 26. The distal end of the cylinder 22 is fixed to the base 26 eg. by means of bolts 27, while the distal end of the spring 24 is attached to the base 26 eg. by means of a pin 28 as shown in Figures 4 and 5.

[0017] The pivot arm 25 comprises a solid core 29

with upper and lower laterally extending tongues which thus define two later U-shaped cavities 31, 32. In each U-shaped cavity 31, 32, a respective pin 33, 34 extends between the upper and lower tongues. The proximal end of the spring 24 is hooked around the pin 33 while the pin 34 extends pivotally through the proximal end of the piston rod 23.

[0018] An eccentric shaft 35 passes through a corresponding eccentrically shaped opening in the pivot arm 25 and extends rotatably through a circular hole in a bearing 36 located in the base 26. The end of the shaft 35 then received in a corresponding eccentrically shaped bore (not shown) defined in a housing (not shown) in the top edge of the door 13. The base 26 is screwed to the headrail 14 by means of tapped holes 37.

[0019] Figure 4 shows the mechanism in the at-rest, door-closed position, with the spring 24 exerting a tensile force on the pivot arm 25, tending to move it clockwise about the axis of the shaft 35. As the door 13 is opened as shown in Figure 5, the shaft 35 is rotated anti-clockwise taking with it the pivot arm 25 which rotates anti-clockwise relative to the base 26. This causes the piston rod 23 to retract into the cylinder 22 and causes the spring 24 to stretch.

[0020] When the door 13 is released, the tension in the spring 24 rotates the pivot arm 25 clockwise, bringing with it the door 13. The motion of the door is damped by the cylinder 22 within the hydraulic cylinder.

Claims

1. A door closure mechanism (21) for a cubicle (11), comprising damping means (22), biasing means (24) and a pivot arm (25), all arranged to be located within a fixed part (14) relative to which fixed part (14) the door (13) is pivotally mounted, and in which: the damping means (22) has its distal end fixed relative to the fixed part (14) and its proximal and pivotally connected to one end of the pivot arm (25); the biasing means (24) has its distal end fixed relative to the fixed part (14) and its proximal end pivotally connected the other end of the pivot arm (25); and the pivot arm (25) is pivotally mounted relative to the fixed part (14) and is arranged to be rotationally fixed relative to the door (13); whereby pivotal movement of the door (13) relative to the fixed part (14) causes the pivot arm (25) to rotate relative to the fixed part (14) thereby simultaneously moving the respective proximal ends of the damping means (22) and biasing means (24).
2. A mechanism as claimed in Claim 1, **characterised in that** the damping means is an hydraulic piston/cylinder arrangement (22).
3. A mechanism as claimed in Claim 1 or Claim 2, **characterised in that** the biasing means is a helical

spring (24).

4. A mechanism as claimed in any preceding Claim, **characterised in that** the fixed part is a hollow cubicle headrail (14).
5. A mechanism as claimed in Claim 4, **characterised in that** the damping means (22), the biasing means (24) and the pivot arm (25) are located on a rigid base (26) which is itself fixed within the headrail (14).
6. A mechanism as claimed in any preceding Claim, **characterised in that** the pivot arm (25) is connected to the door (13) by means of an eccentric or non-circular cross-section shaft (35) which is located in respective correspondingly shaped openings in the pivot arm (25) and in the door (13) at its upper edge.
7. A mechanism as claimed in Claim 6, **characterised in that** the shaft (35) passes through a circular or other hole in the base (26), allowing the shaft (35) to rotate relative to the base (26).
8. A mechanism as claimed in any preceding Claim, **characterised in that** the biasing means (24) is arranged to urge the pivot arm (25) to rotate and in turn the door (13) to move in a desired direction.
9. A mechanism as claimed in any preceding Claim, **characterised in that** the damping means (22) acts to damp the effect of the biasing means (24) thus damping the fall velocity of the door (13) and ensuring that the door (13) does not slam.
10. A door closure mechanism (21) as claimed in any preceding Claim, in combination with a door (13).
11. A cubicle or series of cubicles incorporating one or more combinations as claimed in Claim 10.

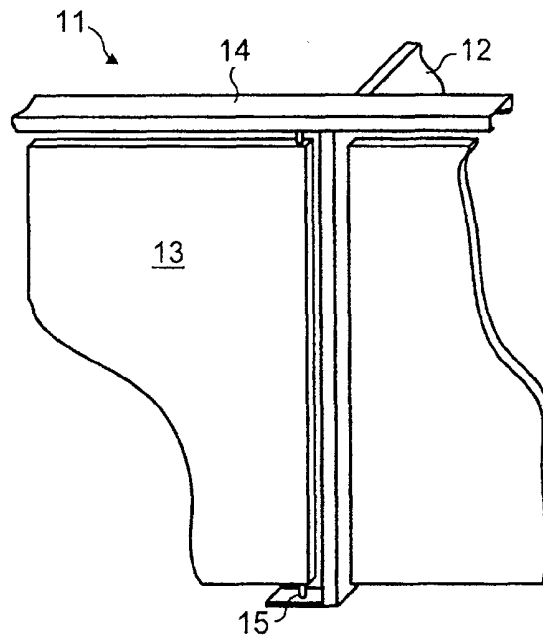


FIG. 1

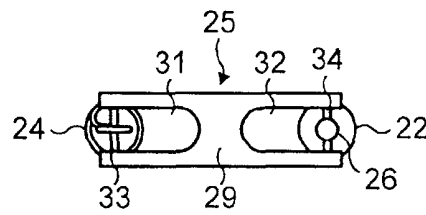


FIG. 2

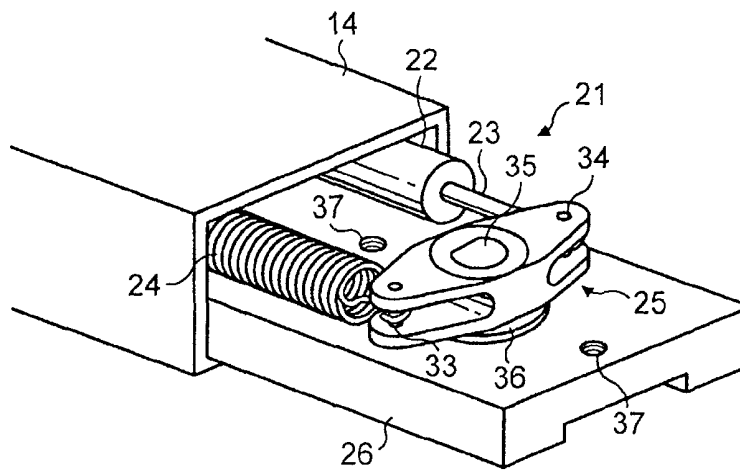


FIG. 3

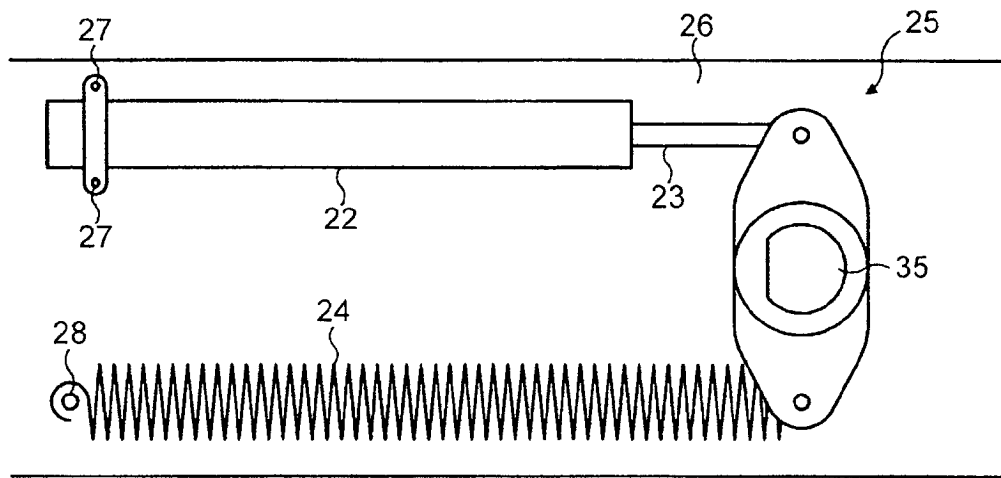


FIG. 4

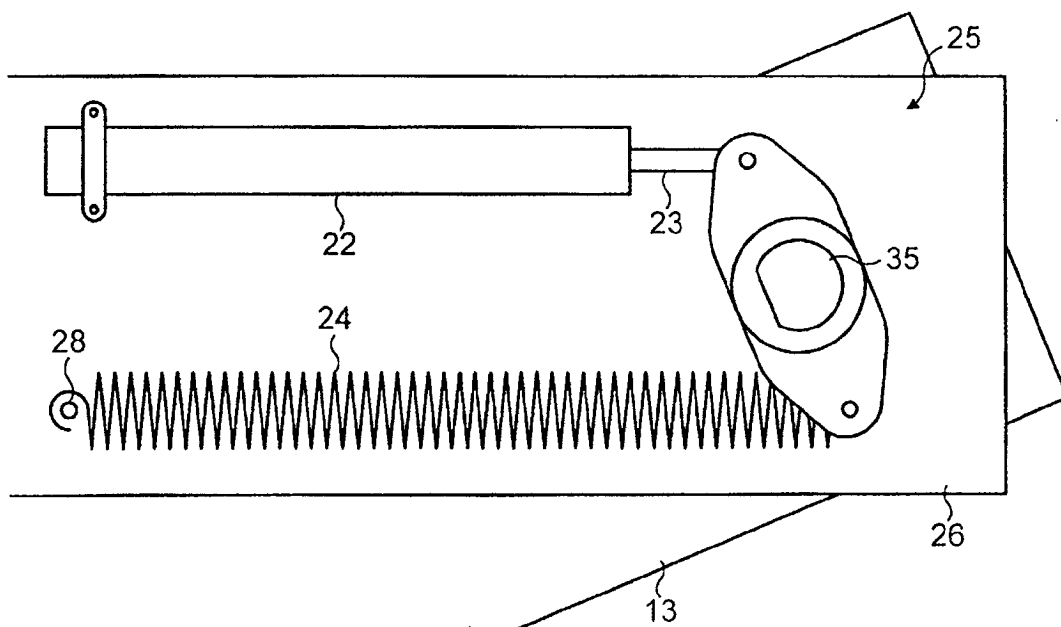


FIG. 5