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[73] Patentee Shanghai Nanxin Nursing Equipment and Supplies Co., Ltd.

Address No. 389, Lianming Road, Minhang District, Shanghai 201101

[72]Inventors Xu Jianan Xu Dan Dai Ji

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Agent Ding Jitie

Claims 3 Pages

Specifications 5 Pages

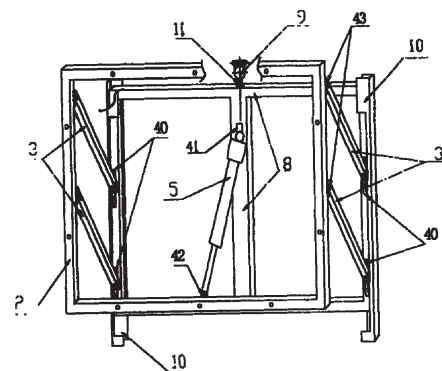
Drawings 6 Pages

[54]Title of Invention

An automatic lifting cabinet

[57] Abstract

An automatic lift cabinet is disclosed that can not only lift automatically, but also perform an extension. It includes an oscillating device consisting of two four-bar linkages and at least one motorized telescopic rod connected to the four-bar linkages and driving the said four-bar linkages to move. The four connecting rod mechanism is a parallel quadrilateral mechanism consisting of two connecting rods, a movable frame and a sliding frame, wherein the two connecting rods are opposite sides, the movable frame and the sliding frame are opposite sides, and both ends of the two connecting rods are respectively connected to the movable frame and the sliding frame through a pin holder, which is fixed on the movable frame and the sliding frame respectively, and the cabinet is fixed on the movable frame. The motorized telescoping rod has a manual control system.



1. An automatic lifting cabinet, characterized in that it includes a swinging device, the said swinging device is composed of two four-bar linkages and at least one motorized telescopic rod, the said motorized telescopic rod is connected to the four-bar linkages and drives the said four-bar linkages to move.

2. The automatic lifting cabinet as claimed in Claim 1, characterized in that the said four connecting rod mechanism is a parallel quadrilateral mechanism, which consists of two connecting rods, a cabinet and a sliding frame, wherein the two connecting rods are opposite sides, the cabinet and the sliding frame are opposite sides, and both ends of the said two connecting rods are respectively connected to the said cabinet and the said sliding frame by a pin holder, and the said pin holder is respectively fixed on the said cabinet and the said sliding frame.

3. The automatic lifting cabinet as claimed in Claim 1, characterized in that the said four connecting rod mechanism is a parallel quadrilateral mechanism consisting of two connecting rods, a movable frame and a sliding frame, wherein the two connecting rods are opposite sides, the movable frame and the sliding frame are opposite sides, and both ends of the said two connecting rods are respectively connected to the movable frame and the said sliding frame through a pin holder, which is fixed on the said movable frame and the said sliding frame respectively, and the cabinet is fixed on the said movable frame.

4. The automatic lifting cabinet as claimed in Claim 2, characterized in that a pin holder is fixed on the said slide frame and connected to the said electric telescoping rod by the pin holder, and the other end of the said electric telescoping rod is connected to the said cabinet by the pin holder fixed to the said cabinet.

5. The automatic lifting cabinet as claimed in Claim 3, characterized in that a pin holder is fixed on the sliding frame and connected to the motorized telescopic rod by the pin holder, and the other end of the motorized telescopic rod is connected to the movable frame by the pin holder fixed to the movable frame.

6. The automatic lifting cabinet as claimed in Claims 2 or 3, characterized in that a pin holder is fixed on the slider frame and connected to the motorized telescopic rod through the pin holder, and the other end of the motorized telescopic rod is connected to the connecting rod through the pin holder fixed to the connecting rod.

7. The automatic lifting cabinet as claimed in any one of Claims 2 to 5, wherein the said slide frame is connected to a lifting device, the said lifting device includes a slideway, a lifting mechanism, the said slideway is fixed on a wall, the said slide frame can move up and down within the slideway, and the said lift mechanism is connected to the said lifting mechanism, and the lifting mechanism is fixed on a wall, and it can drive the slide frame to move.

8. The automatic lifting cabinet as claimed in Claim 6, characterized in that the said slide frame is connected to a lifting device, the said lifting device includes a slide, a lifting mechanism, the said slide is fixed on a wall, the said slide frame can move up and down within the slide, and is connected to the said lifting mechanism, and the lifting mechanism is fixed on a wall. It can move the slide frame.

9. The automatic lifting cabinet as claimed in any one of Claims 2 to 5, characterized in that the said sliding frame is fixed on a wall.

10. The automatic lifting cabinet as claimed in Claim 6, characterized in that the sliding frame is fixed to a wall.

11. The automatic lifting cabinet as claimed in Claims 1, 4 or 5, characterized in that, the electric telescopic rod is a worm gear-screw rod or an electro-hydraulic driven hydraulic cylinder or piston rod with back pressure, or it can be a linear motor.

12. The automatic lifting cabinet as claimed in Claim 6, characterized in that, the electric telescopic rod is a worm gear-screw rod or an electro-hydraulic driven hydraulic cylinder or piston rod with back pressure, or it can be a linear motor.

13. The automatic lifting cabinet as claimed in Claim 10, characterized in that the said motorized telescoping rod has a manual control system.

14. The automatic lifting cabinet as claimed in Claim 11, characterized in that the said motorized telescoping rod has a manual control system.

15. The automatic lifting cabinet as claimed in Claim 1, wherein it further comprises a limit switch and a movable plate, and the said limit switch and movable plate are located at the bottom surface position of the cabinet.

An automatic lifting cabinet

Field of Technology

The present invention relates to a lifting cabinet, particularly a cabinet that can be automatically lifted under electric drive and manual control.

Background Art

Currently, the height of the wall cabinets in libraries, laboratories, archives, and high-end cabinets is fixed. This is inconvenient for people who are small and tall to get items from the cabinet. Especially for people with disabilities who are inconvenient to stand.

At present, in order to solve the above problems, there are many patented technologies, but they are only so that the cabinet can produce vertical lifts, such as Chinese Patent 90221898. They cannot allow the cabinet to stretch at the same time. This sometimes makes it impossible to meet some special needs.

Summary of the Invention

The present invention provides an elevating cabinet that can not only be automatically elevated, but also be extended.

In order to solve the above problems, the present invention provides the following technical solution: An automatic lifting cabinet comprising a swinging device consisting of two four-bar linkages and at least one motorized telescopic rod connected to the four-bar linkages and driving the said four-bar linkages to move.

The four-bar linkage mechanism is a parallel quadrilateral mechanism consisting of two connecting rods, a movable frame and a slide frame, wherein the two connecting rods are opposite sides, the movable frame and the slide frame are opposite sides, and both ends of the two connecting rods are respectively connected to the movable frame and the slide frame through a pin holder, the pin holder is respectively fixed on the movable frame and the slide frame, and the cabinet is fixed on the movable frame.

A pin seat is fixed on the slide frame and connected with the motorized telescopic rod through the pin seat, and the other end of the motorized telescopic rod is connected with the movable frame through the pin seat fixed on the movable frame.

The said slide frame is connected to a lifting device, which includes a slide, a lifting mechanism, and the said slide is fixed on a wall. The said slide frame can move up and down within the slide, and is connected to the said lifting mechanism, and the lifting mechanism is fixed on a wall, which can drive the slide frame to move.

The motorized telescoping rod has a manual control system.

The present invention has significant advances compared to the prior art as follows: Because the present invention has a swinging device, it can not only achieve up and down lifting motions, but also achieve front and rear stretching motions at the same time; in addition, the present invention also incorporates current lifting devices that can be simply lifted, so that the lifting distance can be greater and easier to use. Dual telescopic rocker units are available for more stable operation and manual control systems for more flexibility in different situations.

Description of Drawings

The present invention is further described below in connection with the accompanying drawings and detailed description.

Fig. 1 is a schematic diagram of an oscillating device of the present invention;

Fig. 2 is a schematic diagram of a lift device in the present invention;

Fig. 3 is a schematic diagram of a structure of the present invention;

Fig. 4 is a state schematic diagram of the swinging mechanism of Fig. 3 when retracted;

Fig. 5 is a state schematic diagram of the swinging mechanism of Fig. 3 as it moves downward;

Fig. 6 is a state schematic diagram of both the swinging mechanism and the lifting device of Fig. 3 as they both move downward;

Fig. 7 is a schematic structural diagram of the oscillating mechanism of the present invention fixed to a wall;

As shown in Fig. 8, yet another structural schematic diagram of the present invention;

As shown in Fig. 9, yet another structural schematic diagram of the present invention;

As shown in Fig. 10, a schematic diagram of a double telescoping rod swing device of the present invention is shown.

Specific Embodiments

As shown in Fig. 1, it is a schematic view of an oscillating device of the present invention. Among them, the swinging device consists of a four-bar linkage mechanism and an electric telescopic rod 5, wherein the four-bar linkage mechanism consists of a slider frame 8, a movable frame 2, and four connecting rods 3 having parallel lengths to each other, forming a parallel quadrilateral mechanism, wherein the electric telescopic rod may be a worm gear-screw rod or an electric fluid-driven hydraulic cylinder or piston rod with back pressure, or a linear motor. The slide frame 8 is embedded in the middle of two open slide channels 10. The slide frame 8 has four shaft pin holder 40 symmetrically consolidated on two sides, the movable frame 2 has four shaft pin holder 43 symmetrically consolidated on two sides, and the movable frame 2 and slide frame 8 are hinged by two side parallel connecting rods 3 through the shaft pin holders 43 and 40, respectively. One end of the motorized telescopic rod 5 is hinged to the upper part of the middle bar of the slide frame 8 through the shaft pin holder 41, and the telescopic end is hinged to the lower side of the movable frame 2 through the shaft pin holder 42. By the telescopic movement of the telescopic rod 5, the movable

frame 2 and the cabinet 1 (see Fig. 2) fixed to the movable frame 2 are together made to move perpendicular to the upper and lower planes of the slide frame 8, thereby completing the front and rear telescopic and upper and lower lifting actions.

As shown in Fig. 2, it is a lifting device in the present invention, including a skid 10 and a lifting mechanism. The lifting mechanism is composed of a screw rod 11 and a worm gear reducer 9, wherein the worm gear reducer 9 and the skid 10 are fixed on the wall A. The screw rod 11 is in the cavity of the skid 10, the screw rod 11 is connected to the sliding frame 8 through threads, and the sliding frame 8 is driven to take up and down lifting action. The screw rod 11 is driven by the worm gear reducer 9.

The following description is made with reference to Figs. 3-6, wherein Fig. 3 is a structural schematic diagram of the oscillating mechanism of the present invention fixed to the lifting device, and Fig. 5 is a schematic diagram of the state of the oscillating mechanism of Fig. 3 when the oscillating mechanism moves downward. The cabinet 1 is fixed on the movable frame 2, and the limited position safety switch 7 and the movable plate 6 are fixed on the cabinet 1. When the obstacle B (B may be an object, human body, human hand or other non-compressible object) is encountered during the downward motion of the cabinet as shown in Figs. 5 and 6, the movable plate 6 lifts the limit position safety switch 7, turns off the power, then the cabinet motion stops, or automatically returns to rise (this is specified by the control circuit).

Fig. 4 is a state schematic diagram of the swinging mechanism of Fig. 3 when retracted, which may be fully retracted when a cabinet is not in use, which facilitates space savings. In addition, at this time, it is also possible to achieve vertical up and down elevation of the cabinet subsystem along wall A only through the drive of the worm gear reducer 9 without moving the swing structure.

As shown in Fig. 6, it is a schematic view of the state in which both the swinging mechanism and the lifting mechanism of the structure of Fig. 3 move downward. Generally, if the height of the drop is not sufficient, the worm gear reducer 9 may be activated to move the screw rod 11, and then the screw rod 11 causes the entire system

to continue to drop for a period of travel until obstacle B is encountered, so as to adapt to the needs of the disabled person who cannot stand upright.

As shown in Fig. 7, it is a structural schematic diagram in which the oscillating mechanism of the present invention is fixed to a wall. This allows the cabinet to be raised and lowered using only the swinging mechanism.

As shown in Fig. 8, it is also a structural schematic diagram of the present invention, in which one end of the motorized telescopic rod 5 is directly hinged in a position in the middle of the connecting rod 3, so that the connecting rod 3 can be driven by the motorized telescopic rod 5, and then the connecting rod 3 drives the movement of the entire system.

As shown in Fig. 9, it is also a structural schematic diagram of the present invention, in which the electric telescopic rod 5 adopts a worm gear mechanism, which includes a motor 16, a worm 15, and a worm gear 14, in which the worm gear 14 is consolidated on the connecting rod 3, so that the connecting rod 3 can be driven to swing through the motor 16, a worm 15, and a worm gear 14, and then the movement of the movable frame 2 and the cabinet 1 is driven by the connecting rod 13.

In addition, a manual device may be connected on the worm gear, as shown in Fig. 9. The manual device consists of a handwheel 18 and a transmission chain 17. The handwheel 18 drives the motor 16 to turn through the transmission chain 17 (which may be a variety of color transmission chains composed of a soft shaft system with clutch, universal joint system or wheel train, etc.), thereby enabling the lifting and lowering of the manual operating cabinet. This allows for both electric and manual functions depending on the situation.

As shown in Fig. 10, it is also a structural schematic of the present invention, which allows for smoother operation and also increases the load capacity by adding two parallel synchronous motorized telescoping rods 5 between the slide frame 8 and the movable frame 2.

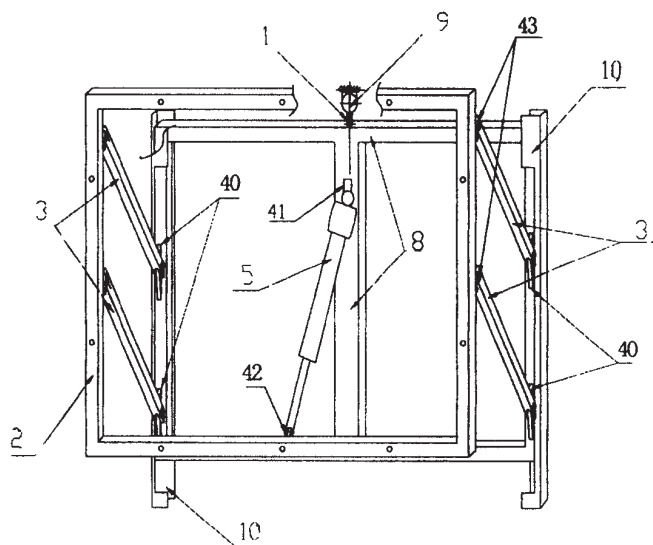


Fig. 1

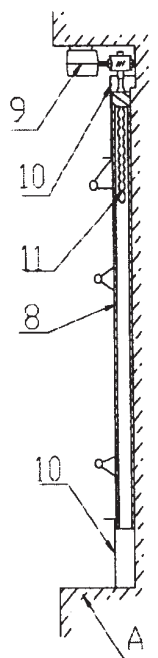


Fig. 2

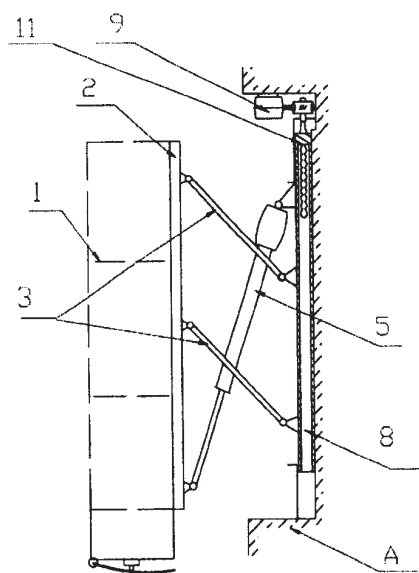


Fig. 3

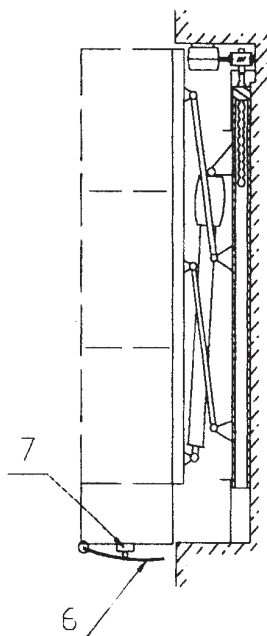


Fig. 4

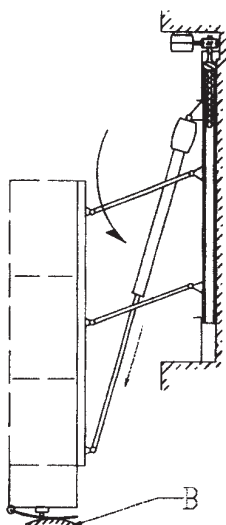


Fig. 5

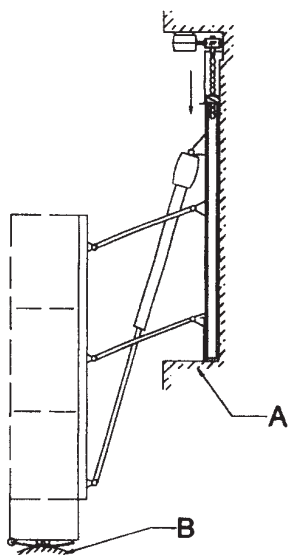


Fig. 6

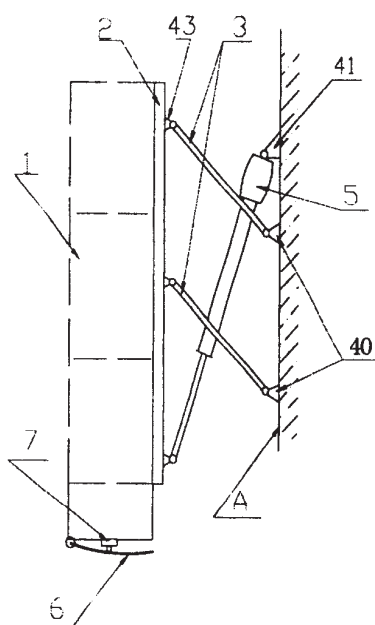


Fig. 7

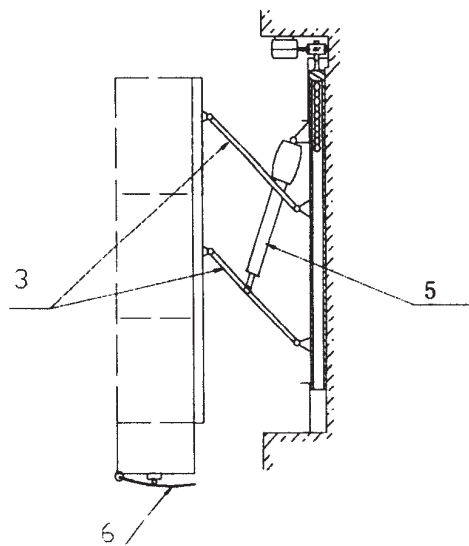


Fig. 8

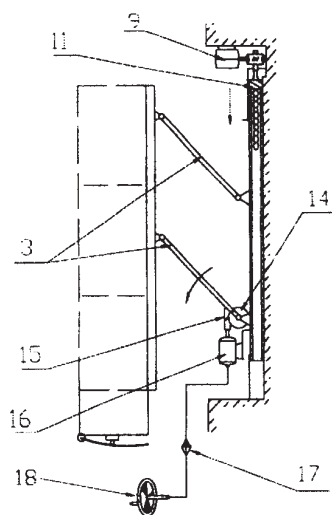
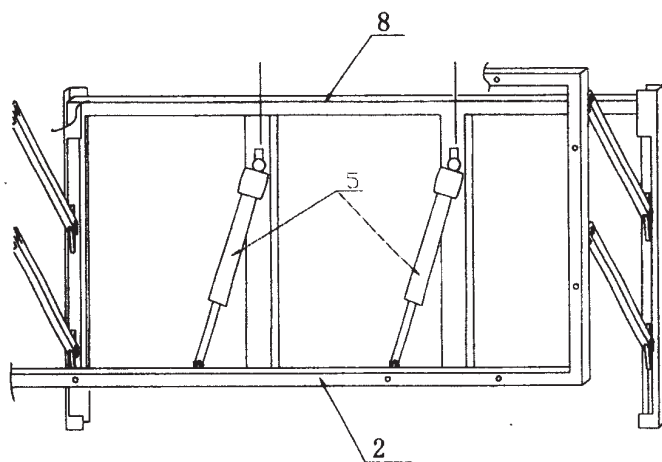
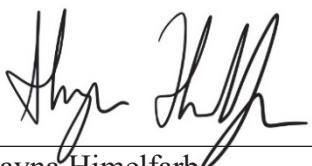


Fig. 9

**Fig. 10**

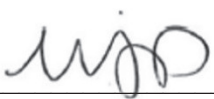
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