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3,438,423

DEVICE FOR OPERATING ELONGATED CORDS

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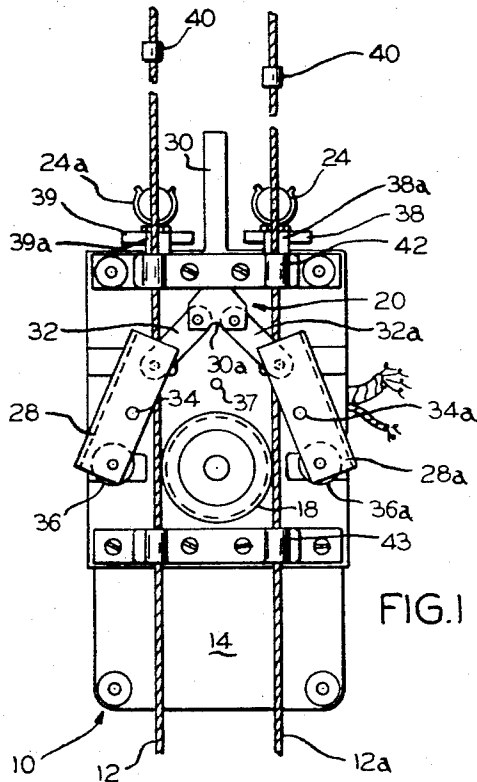


FIG. 1

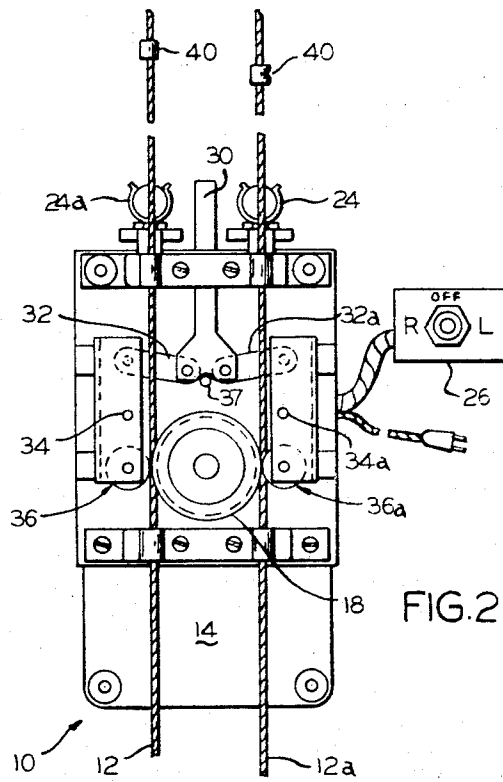


FIG. 2

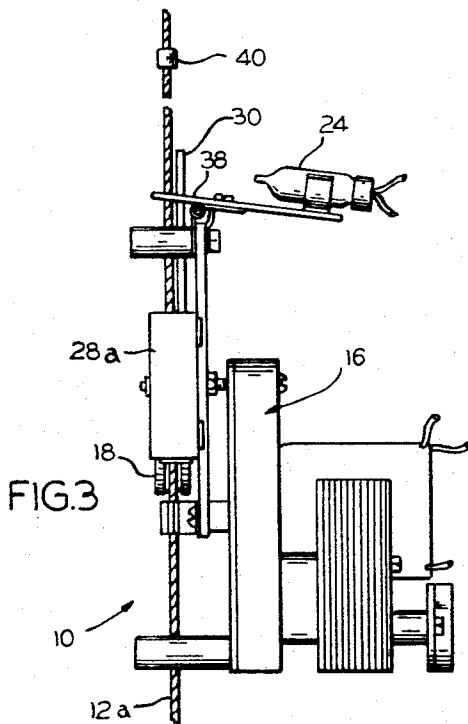


FIG. 3

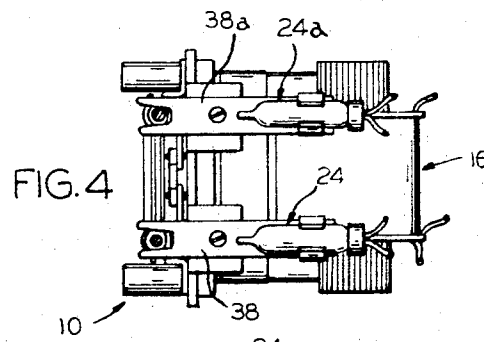


FIG. 4

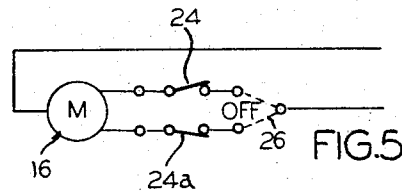


FIG. 5

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DEVICE FOR OPERATING ELONGATED CORDS  
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9 Claims

## ABSTRACT OF THE DISCLOSURE

A pulley operatively connected with a reversible motor for rotatable driving thereby, said pulley having a groove therein sized to receive and engage elongated cords, releasable locking means for forcing said cords into engagement with opposing sides of said pulley, and switch means for reversing the direction of said motor.

This invention relates to an electrical apparatus and more particularly, to a device which incorporates a motor to operate a pair of elongated cords that are moved in opposite directions in connection with actuating draperies, or the like.

Various types of curtain and drapery operating mechanisms have been heretofore known in the art. However, such mechanisms had inherent disadvantages such as; for example, not compact enough for practical purposes, being difficult to install; requiring special types of connecting means; or being inefficient or unreliable in operation.

It is therefore, a primary object of our invention to provide actuating mechanisms for operating curtains, draperies, or the like, which require reciprocal actuation of elongated cords, to overcome the disadvantages in prior art devices.

It is a further object of our invention to afford a novel electro-mechanical apparatus for opening and closing draperies, or the like, which may be used with any type or size of traverse rods already installed or to be installed.

A further object of our invention is to afford an apparatus of the aforementioned type which may quickly and easily be installed as a part of present drapery installations.

Still a further object of our invention is to afford a novel apparatus of the aforementioned type which is so constructed and operates in such a manner that the operating cord of the curtain or drapery being actuated is subjected to a minimum of strain and/or wear.

Still another object of our invention is to afford a novel apparatus of the aforementioned type which automatically cuts off the drive mechanism for the apparatus in a novel and expeditious manner at the intended end of travel of the cord or drapery.

It is still even a further object of our invention to afford a novel apparatus of the aforementioned type which maintains proper tension on the elongated cords which are associated with the drapery mechanism.

Still even further, it is also an object of our invention to provide a device of the character described that can be operated manually as well as mechanically without using any tools.

Other and further objects of the present invention will be apparent from the following description and claims that are illustrated in the accompanying drawings which, by way of illustration, show a preferred embodiment of the present invention and the principles thereof in what we now consider to be the best mode in which we have contemplated applying these principles. Other embodiments of the invention embodying the same or equivalent principles may be used and structural changes may be

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made as desired by those skilled in the art without departing from the present invention and the purview of the appended claims.

In the drawings:

FIGURE 1 is a front elevational view of the device embodying the principles of our invention, showing the apparatus in an open position prior to locking the elongated cords into engagement with a pulley;

FIGURE 2 is a front elevational view similar to FIG. 1 illustrating our device after it has been actuated to its locked position to thereby engage the elongated cords with the pulley of our device therebetween;

FIGURE 3 is a side elevational view of our device in the operative position as illustrated in FIG. 2; and

FIGURE 4 is a top view of our device in the operative position illustrated in FIGS. 2 and 3; and

FIGURE 5 is a schematic wiring diagram illustrating the control system for the motor of our device.

Referring to the drawings wherein like characters of reference illustrate corresponding parts throughout, our device for operating a pair of elongated cords to control draperies, or the like, is generally designated by the character reference 10. While a drapery actuating mechanism is not pictured, it shall be understood that the pair of elongated cords 12, 12a in practice are intended for association with a drapery actuating mechanism or the like, wherein the mode of operation contemplates opposite movement of the cords in either direction.

The device in general includes, in addition, a frame 14 that supports a motor 16 as well as a pulley 18 associated therewith for rotatable motion. A releasable lock means 20 is operatively associated with the frame 14 and pulley 18 to force the elongated cords 12, 12a into engagement with opposing sides of the pulley. In addition, manual reversing switch means 26 shown diagrammatically in FIG. 5 has a center off position for removing power from the motor. Mercury switches 24, 24a are provided in parallel in the line in order to turn the motor off at the point where the intended limit of travel of the elongated cords 12, 12a are as will be explained later. Also, the reversing switch 26 in the line circuit is operated for the purpose of reversing the motor manually when this is desired. The motor is preferably a reversible shaded pole induction motor so that in addition to being reversible, it is low in costs and causes no interference with radio or TV.

Referring more in detail to the drawings, it will be seen that the releasable lock means includes a pair of arms 28, 28a, that are actuated by a lever means 30 via a pair of toggle arms 32, 32a which have one of their ends pivotally attached to a respective one of the arms 28, 28a and the other end thereof, each respectively pivotally attached to said lever 30. The arms 28, 28a are each rotatably mounted on the fulcrums 34, 34a and each respectively have rollers 36, 36a rotatably mounted thereon as illustrated in order that when the releasable lock means is in its locked position as illustrated in FIG. 2, the rollers are forced against the pulley 18 and engage the elongated cords as illustrated.

It will be noted that the lever 30, has a portion 30a which may be of any shape, i.e. arcuate or straight which engages a stop means 37 which is attached to the frame 14 so that when the lever is in its closed position, the portion 30a is "over center," as illustrated in FIG. 2 or is in a position with the portion 30a past an imaginary line drawn between the pivot points of the arms and the toggle arms.

It will be seen from the drawings that the mercury switches 24, 24a are pivotally attached to the frame 14 by means of the brackets 38, 39 which have groove portions 38a, 39a, proximately located with respect to the

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endless cords 12, 12a so that actuating means 40 can be attached to the endless cord in selectable positions where the mercury switches will be opened by rotating the brackets 38 or 39 and thereby cut off the current to the motor at the desired limits of operation for the elongated cord.

While guiding brackets 42, 43 are attached to the frame 14 as illustrated in FIGS. 1 and 2, for purposes of guiding the elongated cords 12, 12a through our device, it should be realized that when it is desired to manually operate the elongated cords, the guiding brackets 42, 43 do not have to be removed from the device to enable the elongated cords to be operated freely without association with the pulley or motor.

Thus, in operation, when it is desired to associate the elongated cords 12, 12a for purposes of selectively reciprocating them, the guiding brackets 42, 43 can be removably fastened to the frame 14 and the elongated cords 12, 12a can be positioned as illustrated in FIGS. 1 and 2. Thereafter, the lever 30 can be actuated to its locked position whereupon its arcuate portion 30a is "over center" and contacting the stop member 37. In this position, the arms 28, 28a are rotated so that the rollers are forced against the elongated cords and cause the elongated cords to be engaged by the pulley which is interposed therebetween. Then referring to the circuit diagram of FIG. 5, the manual reversing switch 26 can be actuated to energize the motor whereupon the motor shall run and cause one of the elongated cords to be moved in one direction and the other to be moved in a correspondingly opposite direction by means of the pulley, until either the mercury switches 24, or 24a are actuated by the actuating means 40 on the elongated cords 12, 12a or the reversing switch 26 is moved to a position where the motor is reversed and the elongated cords are urged in respectively opposite directions from what they were originally.

Having thus understood the operation of our device, it will be seen that our device fulfills the objects hereinabove stated in a remarkably unexpected fashion. The device, in addition to being easy to install and reliable in operation, can be used with different sized traverse rods while still subjecting the cords to a minimum of stress or wear. Also, the device automatically cuts off the motor by means of the mercury switches. In addition, the novel releasable locking means 20 forces the cords 12 and 12a against the pulley 18 with equal pressures. Also, when it is desired to operate the device manually, the device can be operated by merely leaving the locking means in its open position.

We claim:

1. A device for operating a pair of elongated cords that are reciprocated in connection with actuating draperies, or the like, comprising:

a motor,  
means for supporting said motor,  
a pulley operatively connected to said motor for rotatable driving thereby,  
said pulley having a groove therein that is sized to receive and engage said cords,  
releasable locking means for forcing said cords into engagement with opposing sides of said pulley, and  
switch means for reversing the direction of said motor, whereby said elongated cords can be selectively actuated in two directions by means of said motor in addition to being operated manually by releasing said lock means.

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2. A device as defined in claim 1, wherein said releasable lock means includes a pair of arms that are actuated by a common lever means, said lock means having a locked position and an open position,

said arms forcing said elongated cords into engagement with said pulley in said locked position and allowing said cords to be disengaged from said pulley in said open position.

3. A device, as defined in claim 2, wherein said arms are each pivotally mounted to said device proximate to opposite sides of said pulley, whereby said arms can be actuated away from or into contact with said cords by rotation.

4. A device, as defined in claim 3, wherein said arms each have rollers thereon, said arms being positioned to have said rollers engage said cords by being forced equally against said pulley when said releasable lock means is in said locked position.

5. A device, as defined in claim 3, wherein a toggle lever having a pair of pivotally mounted toggle arms is associated with each of said arms by having each of said toggle arms pivotally attached to a respective arm of said device, said lever being actuable to said locked position by having one end thereof positioned "over center" past an imaginary line drawn between the points where said arms and said toggle arms are pivotally mounted to each other.

6. A device, as defined in claim 5, wherein stop means are provided for stopping said lever at a point "over center" where said elongated cord is forced into engagement with said pulley.

7. A device, as defined in claim 6, wherein limit switch means are provided and are operable by said cords at the desired limits of operation of said cords, whereby said motor is deactivated when said limits are reached.

8. A device, as defined in claim 3, wherein activating means for actuating said limit switch means are adjustably associated with said cord.

9. A device, as defined in claim 8, wherein mercury switch means are pivotally mounted thereon and operatively associated with said cords and limit switch actuating means to deactivate said motor at said desired limits of operation of said cords.

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