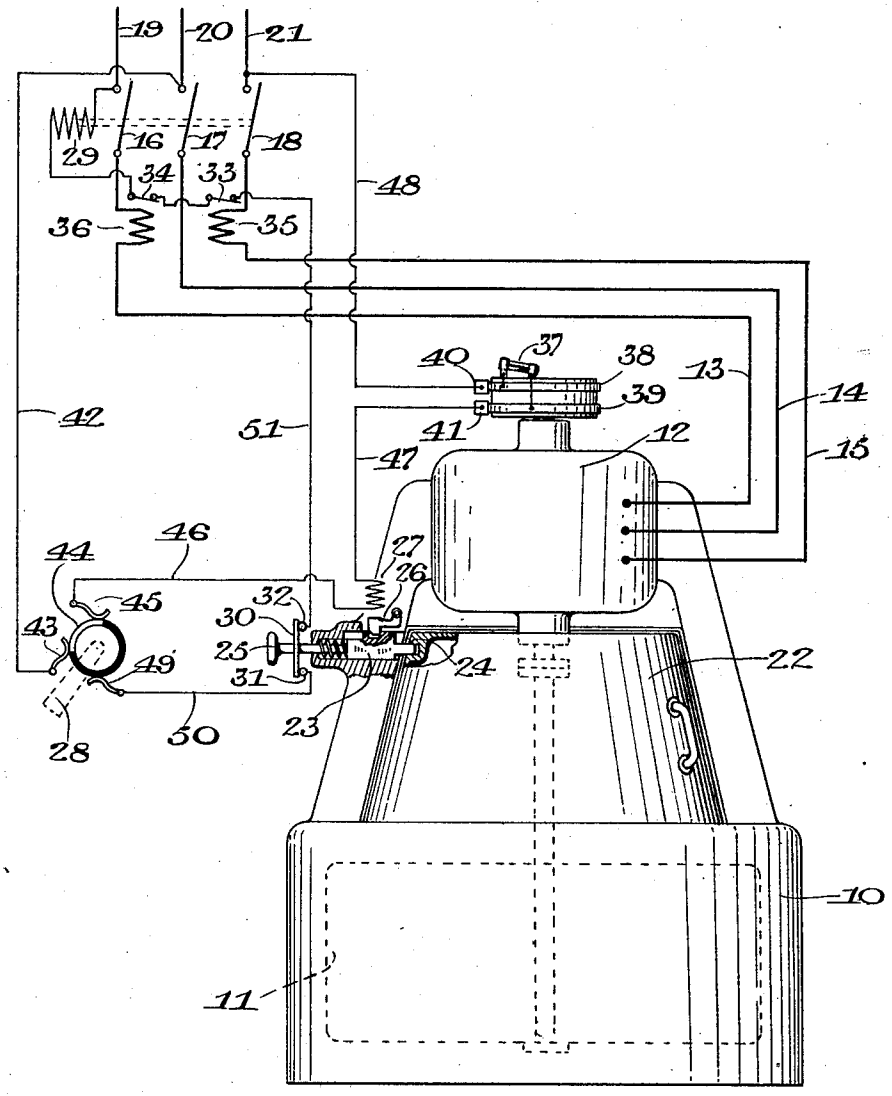
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SAFETY CONTROL FOR EXTRACTOR COVERS AND THE LIKE

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WITNESSES

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SAFETY CONTROL FOR EXTRACTOR COVERS AND THE LIKE

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This invention has for its object to provide a safety control for the covers of centrifugal separators used as extractors by laundries whereby the cover of the extractor is necessarily locked closed whenever the extractor is in motion.

Another object of the invention is to accomplish this purpose by providing automatic means for preventing the starting of the extractor motor when the cover is open and automatic means such as a centrifugal switch in a lock controlling circuit for preventing the opening of the cover while the extractor is in motion.

With the above and other objects in view the invention consists in the safety control for extractor covers and the like as herein claimed and all equivalents.

In the accompanying drawing the figure constitutes a diagram of motor circuits, motor controlling circuit and lock controlling circuit associated with an extractor in accordance with this invention.

In the drawing, 10 indicates a centrifugal separator such as those used by laundries and the like for extracting water from cloth and known as "extractors". The material-containing basket 11 thereof, shown by dotted lines, is suspended from and driven by an electric motor 12, here shown as a three phase alternating current motor, the leads 13, 14, 15, of which are controlled by a solenoid-operated switch 16, 17, 18, in their connection with the mains 19, 20, 21.

The sliding conical cover 22 of the extractor, when in its closed position, as shown, completely prevents access to the interior of the extractor, and a spring-pressed lock-bolt 23 slidably housed in one of the arms of the motor-supporting yoke engages a recess 24 in the cover to lock it in its closed position.

Although the lock-bolt 23 is provided with a handle 25, by which it may be withdrawn, such withdrawal is prevented by the engagement of a latch member 26 therewith. The latch member may consist of a pivoted arm having a beveled nose engaging a notch in the lock-bolt and it may be spring-pressed or depend on gravity for its engagement with the bolt, but for its release it depends upon an electro-magnet 27 in a circuit controlled by a hand switch 28.

This hand switch 28 also controls a circuit through the solenoid 29 of the motor-controlling switch 16, 17, 18, so that both circuits may not be established at the same time.

The lock-bolt 23 carries with it a switch member 30, which only engages its co-operating contacts 31 and 32 when the lock-bolt is in its locking engagement with the cover of the extractor and this switch is included in series with the hand switch 28 and a pair of overload switches 33 and 34 in the motor-controlling circuit with solenoid 29. The magnets 35 and 36 for operating the overload switches 33 and 34 respectively, are included in the motor leads 15 and 13 respectively.

A mercury tube switch 37 is mounted on the shaft of motor 12 and has its contacts connected respectively with a pair of contact rings 38 and 39 which are engaged by stationary brushes 40, 41, to include said switch in the circuit of the magnet 27. The mercury tube switch 37 is inclined and is so disposed with relation to the axis of rotation that during the rotation of the motor shaft the mercury therein is thrown by centrifugal force to the upper and outer end of the tube, where it fails to connect the contacts and consequently the circuit is open, but, when the motor is idle, the mercury settles to the lower end of the tube and completes connection between the contacts to close the switch.

The circuit connections for the lock controlling circuit may be traced as follows: With the motor at rest and the cover locked the turning of the hand switch 28 to the position shown completes the circuit from line wire 20, wire 42 to brush 43 of the hand switch, across the segment 44 thereof to brush 45, wire 46, magnet 27, wire 47, brush 41, mercury tube switch 37, brush 40, wire 48, to line wire 21. This causes the release of the latch 26, permitting the lock-bolt to be withdrawn by the handle 25 to unlock the cover.

The circuit connections for the motor controlling circuit may be traced as follows: With the motor at rest and the cover closed and locked as before but with the hand switch 28 turned to a position to connect

brushes 43 and 49, the circuit is from line wire 20, wire 42, brush 43 of the hand switch 28, across segment 44 to brush 49, wire 50, closed contacts 31, 30 and 32, wire 51, overload switches 33, 34, and solenoid 29 to line wire 19. This circuit energizes the solenoid 29 to close the motor controlling switch 16, 17, 18, and thereby starts the motor.

When the hand switch 28 is moved to interrupt this controlling circuit the solenoid switch 16, 17, 18, opens to interrupt the motor circuit and the extractor gradually comes to rest.

Should an attempt be made to close the lock controlling circuit while the extractor is still in motion, the turning of hand switch 28 will be ineffective for this purpose owing to the mercury switch being open, but as soon as the mercury switch closes, which will be when the machine stops, such circuit is effective for withdrawing the latch to permit the cover being unlocked and it may be opened to give access to the interior of the extractor. With the cover open any attempt at starting the motor by turning the hand switch will be ineffective by reason of the fact that switch 30 is then open and switch 30 cannot be closed until the cover is closed, for the lock-bolt has only the one opening in the cover and the open cover prevents the bolt from being moved. When the cover is closed, however, the lock-bolt springs into locking engagement therewith, where it is retained by the latch 26 and in so doing closes the switch 30 so that the hand switch 28 may complete the motor controlling circuit.

The overload switches 33 and 34 serve to stop the operation of the machine upon the occurrence of an overload by opening the motor controlling circuit.

From the foregoing it will be seen that while the hand switch controls both the motor controlling circuit and the lock controlling circuit, it has the switch 30 in circuit with it as an interlock to prevent the closing of the motor circuit when the cover is open in one instance and it has the mercury tube switch 37 in circuit with it as an interlock to prevent the closing of the lock controlling circuit while the machine is in motion.

By means of this invention it is assured that the motor cannot be started while the cover is open and the cover cannot be unlocked while the machine is in motion.

Although the invention is described as pertaining to a centrifugal separator used as an extractor for laundry purposes, it is obvious that it is capable of use in connection with other machines in which it is desired to prevent access to the interior while the machine is in motion and the term "extractor" as herein used is to be understood as including such other machines.

The term "motor-driven" covers any power means including a line shaft or the like.

What I claim as new and desire to secure by Letters Patent is:

1. In combination, a motor-driven extractor, a cover therefor, a lock for the cover, a latch for preventing the release of the lock, and means for withdrawing the latch controlled by the motion of the motor.

2. In combination, a motor-driven extractor, a cover therefor, a lock for the cover, a latch for preventing the release of the lock, a magnet for withdrawing the latch, and a mercury tube switch carried by the motor for controlling the magnet.

3. In combination, a motor-driven extractor, a cover therefor, a lock for the cover, a motor-controlling switch carried by the lock, a latch for holding the lock in its locked position, a magnet for releasing the latch, and a mercury switch driven by the motor for controlling the magnet.

4. In combination, a motor-driven extractor, a cover therefor, a lock for the cover, a switch carried by the lock, a motor-controlling switch controlled by said switch, a latch for holding the lock in its locking position, a magnet for withdrawing the latch, and a mercury tube switch driven by the motor and controlling the magnet.

5. In combination, a motor-driven extractor, a cover therefor, a lock for the cover, a switch carried by the lock, a hand switch, a motor-controlling switch controlled by the switch carried by the lock and by the hand switch in one position thereof, a latch for holding the lock in its locking position, a magnet for withdrawing the latch, and a mercury tube switch driven by the motor for controlling the magnet, said hand switch in another position serving to also control the magnet.

6. In combination, a motor-driven extractor, a cover therefor, a lock for locking the cover, a switch carried by the lock, a solenoid-operated motor-controlling switch with its magnet in circuit with the switch carried by the lock, a hand switch for completing said circuit in one position, a latch for holding the lock in its locking position, a magnet for releasing the latch, and a mercury tube switch driven by the motor in circuit with the magnet, said circuit being closed by the hand switch in another position thereof.

7. A motor-driven extractor having a cover, switch means dependent on the closed cover for permitting the operation of the motor, a lock for the cover, and electrically disabled means for preventing the release of the lock depending on the motion of the motor.

8. A motor-driven extractor having a cover, a motor-disabling switch means dependent on the position of the cover, a lock for the cover, and electrical means energized to cause the release of the lock and dependent on the motion of the motor.

9. In combination, a motor-driven extractor, a cover therefor, a lock for the cover, motor-controlling means dependent upon the lock, and electrical means energized to cause the release of the lock and dependent on the motion of the motor.

10. In combination, a motor-driven extractor, a cover therefor, a lock for the cover, motor-controlling means operated by the lock, and electrical means energized to control the release of the lock and dependent on the motion of the motor.

11. In combination, a motor-driven extractor, a cover therefor, a lock for the cover, and a latch for preventing the release of the lock controlled by the motion of the motor.

12. In combination, a motor-driven extractor, a cover therefor, a lock for the cover, a latch for preventing the release of the lock, and a magnet for withdrawing the latch controlled by the motion of the motor.

In testimony whereof I affix my signature.

THOMAS S. WATSON.