July 26, 1932. L. W. RADFORD 1,868,615

SAFETY DEVICE FOR CARDING MACHINES

Filed Sept. 10, 1927

Fig. 1.

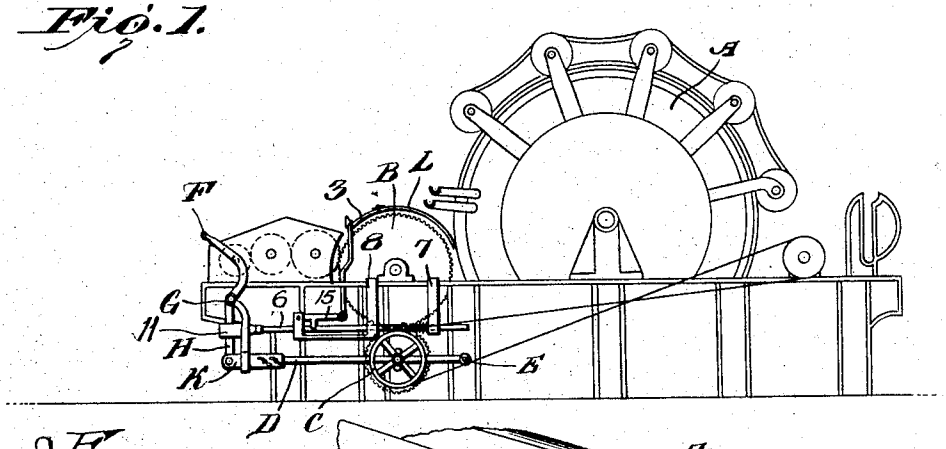


Fig. 3.

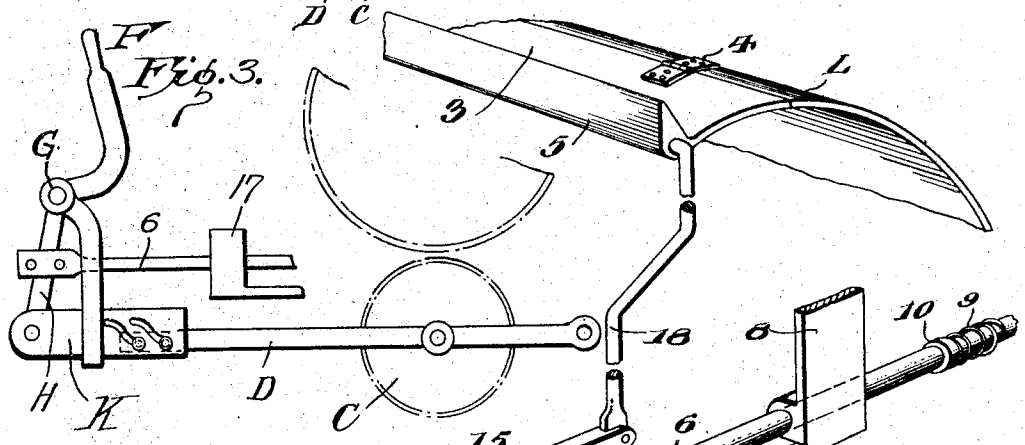
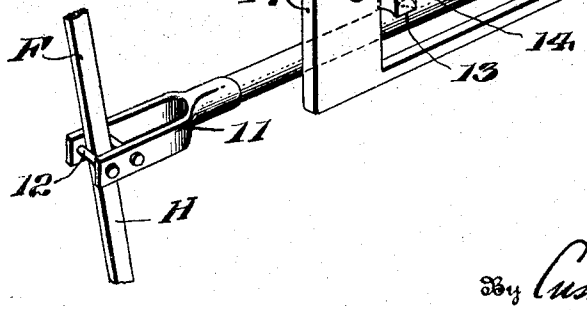


Fig. 2.



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Patented July 26, 1932

1,868,615

UNITED STATES PATENT OFFICE

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SAFETY DEVICE FOR CARDING MACHINES

Application filed September 10, 1927. Serial No. 218,685.

This invention relates to new and useful improvements in safety devices for automatically stopping the operation of a machine with which they are associated, and has particular reference to carding machines.

An important object of the invention resides in the provision of a safety device which will automatically stop the operation of the machine whenever an abnormal condition exists therein, as for instance, when an operative's fingers or hand are placed too close to the moving parts of the machine.

Another important object of the present invention resides in the provision of a simple and inexpensive safety device of the above character which can be readily applied to the present types of carding machines.

Other objects and advantages of the invention will become apparent during the course of the following description.

In the accompanying drawing forming a part of the application, and wherein like numerals are employed to designate like parts throughout the several views:

Figure 1 is a side elevation of a carding machine with the invention applied thereto.

Figure 2 is a fragmentary perspective view of the invention, and

Figure 3 is an enlarged detail of the stop mechanism.

Referring now more particularly to the drawing, the invention is illustrated as applied to a well known type of carding machine which includes a carding cylinder A, a doffer B and a drive element C, the latter forming a part of the usual stop mechanism of the carding machine as is customary. This drive element C carries a gear adapted for mesh with the gear of the doffer B in the well known manner, and is mounted for vertical movement into and out of mesh with the doffer gear by reason of its being connected with a link D pivotally connected as at E to the frame of the carding machine and adapted for swinging movement on its pivot E through the instrumentality of a shipper lever F. This shipper lever is fulcrumed at G and is provided with a vertical depending arm H pivotally connected at its lower extremity to a horizontally slidable bar K having a pair of cam slots for the reception of laterally extending pins carried by the link D. The foregoing construction is well known in the art of carding machine as a part of a stop mechanism for a carding machine and doffer, and requires no further description. Although I have illustrated the invention in connection with a carding machine, it is to be understood that its use is not limited to such machines, but may be used to advantage in conjunction with other mechanisms involving stop motions.

The type of carding machine illustrated herein, is usually provided with an arcuate cover plate L which covers the upper portion of the doffer cylinder B, and is stationary to constitute a fixed part of the doffer casing. In previous practice, this cover plate has been made stationary through its entire length, but my invention contemplates rendering the forward end thereof movable so as to constitute a guard plate designated in its entirety by the numeral 3. This guard plate is rendered movable, preferably by hingedly connecting it as at 4 to the transverse free edge of the stationary cover plate L on a horizontal axis. The forward or free edge of the guard plate 3 is equipped with an upstanding flange 5 tapered off toward its free edge so as to provide a more extensive abutment area for the guard plate.

The means provided for automatically controlling the stop mechanism whenever the guard plate is moved, consists of an actuator rod 6 slidably mounted in brackets 7 and 8 depending at the side of the carding machine frame and is normally urged toward the shipper lever F, by means of a coil spring 9 mounted thereon and abutting the bracket 7 at one end and a collar 10 fast to the rod at the other end. The forward end of the actuator rod 6 is provided with a fork 11 to embrace the vertical portion H of the shipper lever F and suitable pins 12 bridge the gap of the fork for maintaining the shipper lever in engagement therewith while permitting a small amount of play or lost motion.

The actuator rod 6 is also provided in its upper surface with a recess 13 for the recep-

tion of the depending nose 14 of a latch 15 mounted on a horizontal pivot 16 on an upstanding portion 17 which is a continuation of the bracket 8. When the actuator rod 6 is restrained by the latch 15, the shipper lever F is then positioned to cause operation of the carding machine as will be more fully explained hereinafter.

This latch 15 is connected to the guard plate 3 to partake of the same vertical movement by means of a connecting link 18 which is pivoted to both the latch and the guard plate, and is offset between its ends to make these connections.

Assuming that the actuator bar 6 is restrained against the action of the coil spring 9 by reason of the latch engaging the recess 13, it will be seen that the shipper lever is in such a position as to cause operation of the carding machine and doffer B. Should any abnormal condition arise about the carding machine, as for example, the fingers of an operative move between the doffer cylinder B and the guard plate 3, the latter will be moved vertically thereby lifting the latch 15 which releases the actuator bar 6 and permits the coil spring 9 to move this rod forwardly together with the lower portion of the shipper lever, which causes the slide K to move forwardly and cam the link D downwardly thereby lowering the drive gear C and removing it from mesh with the doffer gear.

This rapid stopping of the doffer cylinder will prevent the same from drawing the hand of the operative in between the same and the cover plate L and will obviate possible serious injury to the operative.

As soon as the foreign object is removed and the guard plate permitted to return to its normal position to guard a portion of the doffer cylinder, the latch 15 will be lowered so that its nose 14 rests upon the actuator rod 6 in a position to drop into the recess 13 as soon as the shipper lever F is moved to again start the operation of the carding machine and will normally maintain the mechanism in readiness for another emergency stop should conditions require it.

Various changes in the arrangement and shape of the various parts may be resorted to without departing from the scope of the appended claims.

Having thus fully described the invention, what I claim is:—

1. A safety device for carding machines including a doffer and stop mechanism, driving means normally operatively connected to said doffer and arranged to be moved out of engagement therewith, movable guard means enclosing a part of said doffer, a slidable spring pressed rod normally urging said stop mechanism to a predetermined position and having a notch, a pivoted latch engageable with said notch to restrain the normal tendency of said rod and controlled by said guard means, and means operatively connecting said rod to said driving means for moving the latter out of engagement with said doffer upon the actuation of said movable guard means.

2. A safety device for carding machines including a doffer cylinder, and arcuate cover casing therefor and a stop mechanism, driving means normally operatively connected to said doffer cylinder and arranged to be moved out of engagement therewith, a guard casing pivoted to said cover plate and forming a continuation thereof to extend in the same general direction thereof, actuating means normally urging said stop mechanism to a predetermined position, means controlled by said guard plate for restraining the normal tendency of said actuating means, and means operatively connecting said stop mechanism to said driving means for moving the latter out of engagement with said doffer cylinder upon the actuation of said guard plate.

3. A safety device for carding machines including a doffer cylinder, a cover plate therefor and a shipper lever, driving means normally operatively connected to said doffer cylinder and arranged to be moved out of engagement therewith, a guard plate pivoted to said cover plate and forming a continuation thereof, a slidable spring pressed rod normally urging said shipper lever to a predetermined position, a pivoted latch engaging said rod and restraining its normal action, a link pivotally connected to said latch and guard plate, and means operatively connecting said rod to said driving means for moving the latter out of engagement with said doffer cylinder upon the actuation of said guard plate.

4. A safety device for carding machines including a doffer cylinder, a cover plate therefor and a shipper lever, a guard plate pivoted to said cover plate, a horizontally slidable spring pressed rod having connection with said shipper lever to normally urge the same to a position to stop the doffer cylinder, said rod having a notch therein, a latch pivoted on a horizontal axis and having a depending detent engaging said notch when the rod is in a position to retain the shipper lever in a position to cause rotation of the doffer cylinder, means connecting said latch and guard plate whereby opening movement of the guard plate releases said rod to operate the shipper lever to stop rotation of said doffer cylinder.

5. A safety device for carding machines including a doffer and stop mechanism, movable guard means enclosing part of said doffer, a bracket secured to said machine and having a bearing and an upstanding projection, a spring pressed rod slidably associated with said bearing and having connection with said stop mechanism to actuate the same upon

release of the rod, said rod having a notch, a latch pivoted to said upstanding projection and having a detent engageable with said notch to retain said stop mechanism in operative position causing rotation of said doffer, and means connecting said latch and guard means whereby movement of the latter effects release of the detent and rod to actuate the stop mechanism and stop said doffer.

6. A safety device for carding machines including a doffer cylinder and stop mechanism, movable guard means for said cylinder, a slidable rod connected to said stop mechanism and normally urging the same to a position to stop said mechanism, said rod having an abutment shoulder, a latch adapted to engage said shoulder to restrain the normal tendency of said rod, and means connecting said latch and guard means whereby opening movement of the latter releases said rod to operate the stop mechanism to stop rotation of said doffer cylinder.

7. A safety device for carding machines including a doffer and stop mechanism, movable guard means adjacent said doffer, a bracket having a bearing and a mounting member, a spring pressed rod slidably associated with said bearing and having connection with said stop mechanism to actuate the same upon release of the rod, said rod having a shoulder, a latch movably associated with said mounting member and having a detent engageable with said shoulder to retain said stop mechanism in operative position causing rotation of said doffer, and means connecting said latch and guard means whereby movement of the latter effects release of the detent and rod to actuate the stop mechanism and stop said doffer.

In testimony whereof I have hereunto set my hand.

LEE WOOD RADFORD.