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SAFETY GUARD FOR MACHINES

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FIG. 1.

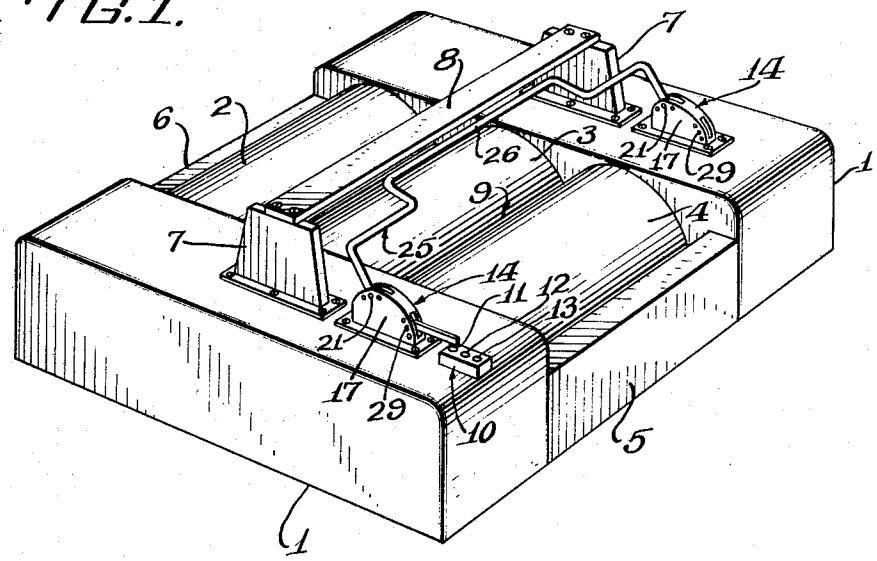
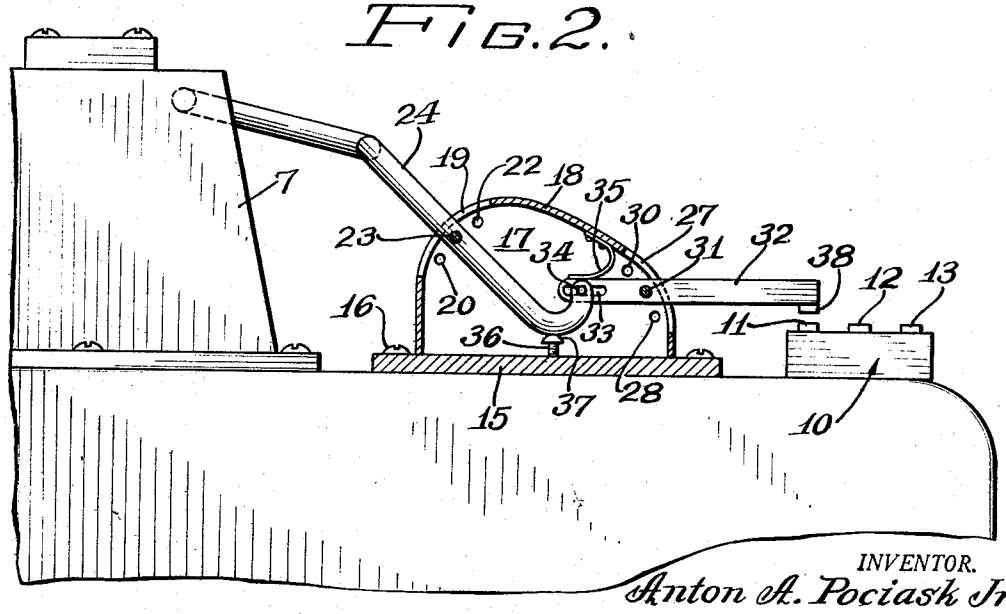


FIG. 2.



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SAFETY GUARD FOR MACHINES

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2 Claims. (Cl. 192—130)

This invention relates to improvements in a safety guard for machinery, and refers particularly to a safety guard for machines having osculating rolls such as ink mills, paint mills, rubber mills and the like, the device being so contrived that an approach of the operator's hand or arm to the danger zone, that is, the nip of the rolls, triggers the guard which stops the rolls.

One of the important features of the invention resides in the simplicity of the guard mechanism which is so compact and unobstructive that it will not materially interfere with the operator's normal tasks in connection with the machine. It has been found by safety engineers and inspectors that an operator is anxious to have safety appliances upon his machine so long as they do not interfere with his normal work in connection with the machine, but where the device is of such a nature that its presence renders his daily tasks harder or slower such safety devices are frequently surreptitiously removed from the machines or rendered inoperative by the operator who prefers to rely upon the speed of his reactions or caution rather than employ an inconveniently placed, obstructive safety device. The simple and unobstructive nature of the present invention, accordingly, is of major importance as to its ultimate use as a safety device.

Other objects and advantages of my invention will be apparent from the accompanying drawing and following detailed description.

In the drawing, Fig. 1 is a diagrammatic perspective view of a mill having mounted thereon my improved safety guard.

Fig. 2 is an enlarged side elevational view, partly in section, of the device shown in Fig. 1.

Referring in detail to the drawing, 1, 1 comprises opposite frame members of a mill which may comprise an ink mill, a paint mill, a rubber mill or the like, the frame members functioning to support contacting or osculating rolls 2, 3 and 4. Suitable electrical means, such as, an electric motor (not shown) may be employed to drive the rolls. End members 5 and 6 are connected to the side frame members 1, 1 to complete the frame construction.

In mills of the general type, hereinbefore described, supports 7, 7 may be mounted upon the upper portions of the frame members 1, 1, said supports carrying a bar 8 which may span the machine. The bar 8 is disposed above and preferably offset from the feed nip 9 into which the ingredients to be milled are fed, the bar functioning as a support for a receptacle from which the operator may feed the ingredients to the nip.

Although my safety guard device operates ideally when a support bar is employed, it is to be understood that my device may also be used upon machines where such support bars are not employed.

At the forward end of the machine a push button switch 10 is positioned having push buttons 11, 12 and 13, which may comprise a stop button, a start button and a reverse button, respectively. Of course, the function of the button 13 may be other than a reverse button, if

desired, such, for example, a slow motion or "inching" button. However, for purposes of my invention it is only important that a "stop" button be available upon the switch 10, for reasons to be hereinafter more fully described.

The device comprising my invention includes a pair of oppositely disposed housings 14, 14 each having base portions 15 adapted for securement to the tops of the side frame members 1, 1. The means of securement may be conveniently screws 16 or other suitable fastening devices. Each housing 14 comprises opposed side walls 17 with curvilinear contours and a spacer strap 18 bridging the opposed side walls. Each of the housings is provided with a slot 19 provided by the omission of the spacer strap 18. A plurality of aligned pivot openings 20, 21 and 22 are provided in the side walls 17 adjacent the slot 19 in corresponding openings on each side of the machine, pins 23 are positioned to function as a pivot for levers 24. A transverse guard member 25 may be formed integral with levers 24, said guard member spanning the machine. The guard member 25 may have a central offset portion 26 or may be straight, as desired, depending upon the positional relationship desired between the guard member and the nip 9.

A second slot 27 is provided in each of the housings 14 and a plurality of aligned openings 28, 29 and 30 are provided in the walls 17. A pin 31 is positioned in one pair of openings in one housing, namely, the housing adjacent the stop button 11, said pin functioning as a pivot for a lever 32. The lever 32 is provided with a slot 33 at its inner end portion through which a pin 34 extends, said pin also extending through an end portion of lever 24 whereby the ends of levers 24 and 32 are pivotally connected.

A leaf spring 35 is secured at one end portion to the inner face of strap 18 and its opposite end bears resiliently upon lever 32 whereby lever 32 is urged counterclockwise about pin 31 and lever 24 is urged clockwise about pin 23, as viewed in Fig. 2. An adjustable stop may be mounted upon the base member 15, said stop comprising a screw which may be turned to raise or lower the head 37 which abuts lever 24 to prevent excessive clockwise movement of lever 24.

An abutment 38 may carried at the outer end of lever 32 and may be disposed immediately above the stop button 11, whereby when lever 32 is rocked counterclockwise about pivot pin 31, as will be hereinafter more fully described, the abutment 38 contacts the stop button 11 and disconnects the driving motor for rolls 2, 3 and 4 from its source of current.

In the operation of the device, pivot pins 23 and 31 may be positioned in desired pivot openings 20, 21 or 22, and 28, 29 or 30, respectively, whereby the bar 25 may occupy a desired positional relationship with respect to the feed nip 9 and stop 36 may be adjusted as desired. The rolls 2, 3 and 4 may be actuated by depressing button 12 and the milling operation commenced. During operation of the mill if the operator's hands or arms move to a dangerous position with respect to the nip 9, bar 25 will be contacted thereby rocking levers 24 counterclockwise and lever 32 clockwise, as viewed in Fig. 2, whereby the stop button 11 will be depressed stopping the rotation of the rolls and thus saving the operator from injury.

For production purposes both housings 14 may be made identical but only one lever 32 will normally be employed which can be positioned on either side of the machine depending upon the location of the switch 10. Of course, as has been hereinbefore described, the bar 25 may be straight, have an offset portion, as at 26, or may be of any desired shape depending upon the nature and use of the machine guarded.

It will be noted that three pairs of pivot openings are provided adjacent the slot **19** in each housing **14**. The arrangement is such that the levers **24** may be pivoted at any aligned pair of pivot openings by appropriately positioning the pins **23**. In this fashion the guard bar **25** may be disposed at a desired position relative to the nip **9**. Similarly, arm **32** may be adjustably pivoted in openings **28**, **29** and **30** whereby the abutment **38** may be raised or lowered relative to the stop button **11**. This adjustment controls the criticalness or sensitivity of the device.

Many modifications of my invention may be contrived without departing from the spirit of the invention and, hence, I do not wish to be limited except as necessitated by the appended claims.

I claim as my invention:

1. A safety device for machines which comprises a pair of supports for mounting upon opposite frame portions of a machine, a lever pivotally mounted on each support, a guard bar carried by said levers and spanning said machine adjacent a portion thereof to be guarded, an arm pivotally mounted on one of said supports, a pivotal connection between one end of said arm and an end of one of said levers on said support whereby movement of said guard bar rocks said arm, resilient means on that support carrying said arm for urging said pivotally connected arm and lever about their respective pivotal mountings upon said support in opposite angular directions, push button switch means for controlling operation of said machine disposed adjacent said arm whereby movement of said arm in opposition to said resilient means causes said arm to contact said switch button to stop said machine, and adjustable stop means carried by said support for limiting movement of said guard bar in response to the urging of said resilient means and to position said guard bar at a predetermined position relative to the portion of the machine to be guarded and dispose said arm at a predetermined set position from said switch.

2. A safety device for a milling machine having a pair of osculating rolls forming a nip which comprises, a pair of closed housings for mounting upon opposite frame portions of said machine, a lever pivoted on each housing having a portion extending exteriorly of said housing and a portion extending interiorly of said housing, a guard bar carried by the exterior portions of said levers and disposed substantially parallel to the axes of said rolls and above and adjacent said nip, an arm pivotally mounted upon one of said housings having a portion extending interiorly thereof and a portion extending exteriorly thereof, pivotal means connecting the interiorly extending portion of a lever and the interiorly extending portion of said arm within said housing whereby movement of said lever rocks said arm, resilient means carried within said last-mentioned housing for urging said lever and arm about their respective pivotal mountings upon said housing in one direction, a push-button switch for controlling rotation of said rolls disposed adjacent the exteriorly extending portion of said arm whereby movement of said arm in opposition to said resilient means causes said exteriorly extending portion thereof to contact said switch and stop said rolls.

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