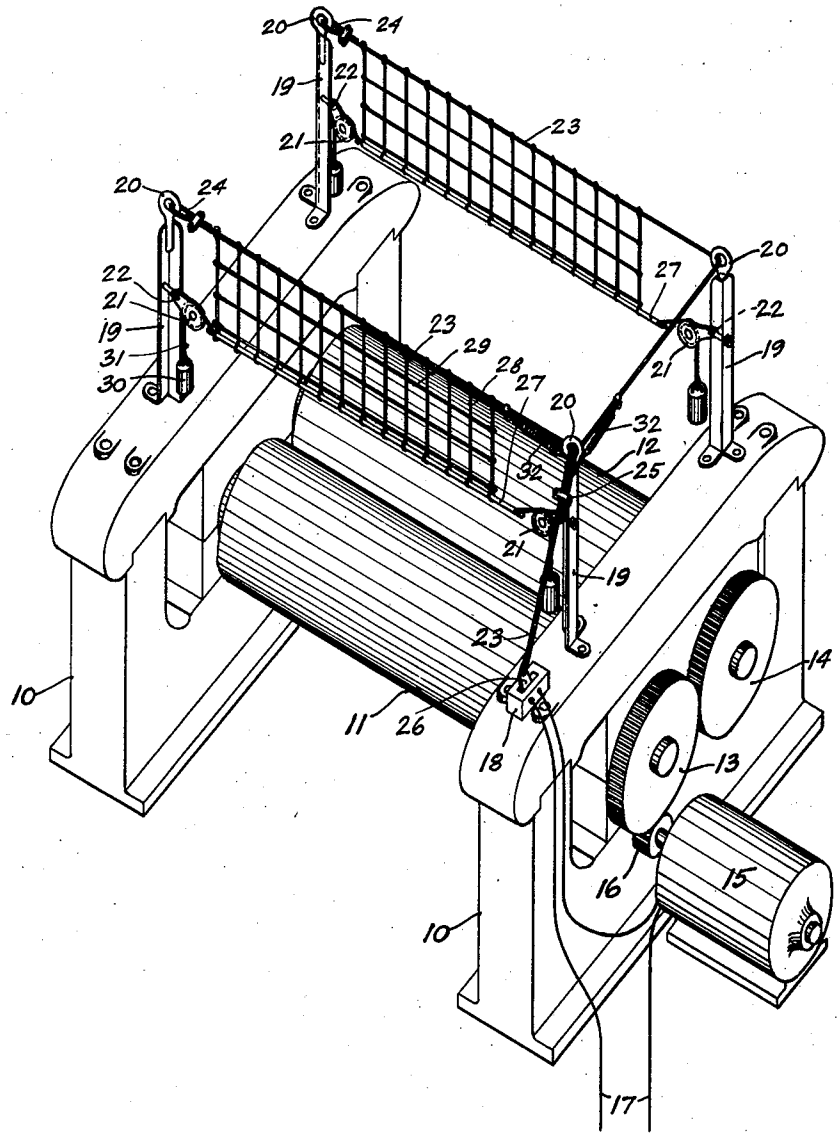
Sept. 8, 1942. A. J. WIEDINGER 2,295,441

SAFETY DEVICE

Filed May 16, 1940



Inventor
Arthur J. Wiedinger

By

Attorneys

Patented Sept. 8, 1942 2,295,441

UNITED STATES PATENT OFFICE

2,295,441

SAFETY DEVICE

Arthur J. Wiedinger, Akron, Ohio, assignor to Wingfoot Corporation, Wilmington, Del., a corporation of Delaware

Application May 16, 1940, Serial No. 335,533

10 Claims. (Cl. 192—133)

The present invention relates to safety devices to be used on machines in which there are exposed moving parts, and the principal object of this invention is to devise a safety device to stop the operation of the machine or to so minimize the dangerous character thereof as to render it harmless to the operator.

Another object of this invention is to provide a safety device of this character, in which an operator in the face of an impending accident may, without a great amount of mental consideration, operate the safety device to stop the machine, or otherwise render it harmless.

Other objects of this invention will appear hereinafter as the description hereof proceeds, the novel features, arrangements and combinations being clearly set forth in the specification and claims thereunto appended.

In the drawing the single figure represents a perspective view of my safety device as applied to a rubber mill.

My safety device is illustrated as applied to a rubber mill, but it is to be understood that the invention is not limited solely to machines of this character as its utility will be apparent for other types of machines in which there is an ever-present danger to the worker.

In the drawing, 10 indicates the end frames of a mill provided with the usual rolls 11 and 12 driven by the gears 13 and 14, respectively, which in turn are driven by a motor 15 or other power-operated means through the intermediacy of the gear 16. The motor is connected to a source of power through the usual power line 17, in which there is arranged a switch 18 to interrupt the flow of current to the motor if and when an emergency exists and it becomes imperative to stop the machine. In case of an emergency the switch is adapted to be thrown to the off position by my safety device when the safety device is operated and, if desired, in addition to stopping the operation of the motor, mechanism may be brought into play to separate the rolls 11 and 12.

Mounted on the end frames 10 of the mill are the standards 19, to the upper ends of which are secured, as by welding, the eyes 20. Also mounted on the standards are the pulleys 21 freely mounted at 22 for pivotal or swiveling action.

The main safety cables or control members at the front and back of the machine are indicated by the reference numeral 23. These cables have one end thereof secured, as at 24, to brackets 20 at the left and are threaded through the eyes 20 at the right as clearly illustrated in the drawing, the two cables being clamped together as at 25 by any suitable clamp or fastening device. One of the cables 23 is connected to the operating lever 26 of the switch 18, and it will be apparent that a pull exerted on either of the cables 23 will operate the lever 26 of the switch 18 and throw it to the off position.

Suspended from each of the cables 23 intermediate the brackets 20 is a longitudinal rod 27 arranged substantially parallel to the cable 23 and suspended therefrom by the vertical cords 28. The vertical cords are in turn connected transversely by means of the cords 29. With this arrangement it will be noted that the bar 27 is supported by a network of cords which covers an appreciable area close to the operator's position so that in case of an impending accident the operator may reach out and clutch at the network of cords and exert a pull on the network sufficient to pull the cable 23 and throw the switch 18 to the off position. An operator might easily miss grabbing a single cable located at a definite position even though he had an appreciation of approximately where that cable was located, but, in view of the extensiveness of the network embodied in this invention, the operator merely has to reach out in the general vicinity of the cable and as soon as his hand contacts the network he can grab and pull to stop the operation of the machine. In an emergency seconds may mean the difference between life or death, or at least it may mean the difference between being crippled for life and avoiding injury.

The weight of bar 27 at the bottom of the network tends to hold the network in a substantially fixed vertical plane and to hold the same more-or-less taut at all times, which greatly facilitates the operation of the network as the cords are tensioned at all times and will not therefore have a tendency to move away from the operator's hand when he clutches at the network. It is desirable however that the lower part of the network can swing, so that if accidentally hit by a lateral blow it will not tend to operate cord 23 and stop the machine. Also, some times in the operation of mills of this character, the rubber, after being rolled up on one roll by the operator, may strike the lower part of the guard when released by the operator to be fed into the bite of the rolls, and it is not desirable that the safety device be operated under these conditions. A mere upward or lateral push on the rod 27 will not normally operate the safety device and, since the lower part of the network is apt to be

struck by the operator or by the material he is working with, it is very desirable that the network be free to move out of position to some extent without stopping the machine if struck from the side or from below.

The bar **27** is kept from swinging and is steadied by the weights **30** suspended by cords **31** trained over the pulleys **21** and secured to the ends of the bar. In order to tension the cables **23** springs **32** are employed. These are connected at one of their ends to the cables **23** and at their other ends to the standards **19**. Thus, normally the weight of the network and bar does not tend to pull the switch **18** to the off-position since the weight is taken off the cords intermediate the springs and the switch. The springs, however, are approximately only sufficient to balance the weight of the network and connected mechanisms and, when the operator pulls on the network to operate the cord **23**, these springs will readily yield to the extra load and permit the operation of the switch in the manner aforesaid.

Summarizing the essence of the safety device, it will be apparent that there is provided a network of cords hanging more-or-less freely from the cord which operates the control switch. This network is preferably weighted at its lower end by the bar **27** and the bar is kept from swinging under ordinary conditions by means of the weights **30**. However, when occasion requires, the mere grasping of the network at any part of its area, together with a pull on same will cause the operation of the switch **18** to the off position, with the result that the motor is stopped. The rolls may or may not be connected to the safety device and be moved apart, depending upon the particular system that is to be employed.

Note that the two networks guard opposite sides of the apparatus to protect the operator while working at either side.

In a mill of this character there is the ever-present danger that through some slip the operator may be dragged into the bite between the rolls with naturally disasterous results. The device also has utility in case there is impending destruction of the rolls as, for instance, where a new operator might find a large piece of foreign material that is going down between the bite of the rolls. In this case he can reach out and quickly operate the safety device to stop the mill while foreign material is removed therefrom.

In certain types of mills the rubber stock is carried directly off the mill in a narrow strip upwardly to an overhead conveyor or to another floor of the building where it is to be used. Some times this strip breaks and the end of the strip snaps with a whipping action. If the mill is provided with an ordinary safety cable, a slight amount of contact between the end of this strip and the safety cable will operate the safety cable and not only stop the machine on which it is mounted, but will also stop a whole series of machines, since generally there is a tie-in between all of the mills on the safety feature so that an operator at any machine in the series may shut off all of the machines in the series, as it frequently happens that the operator of the machine at which there is an impending disaster may not be in a position to operate the cable himself, and by the time any one else reached the mill it might be too late.

With the present invention, however, the strip of material, if it breaks, will hit the lower bar of the safety device and this of course will not operate the safety cable. The practical result of this arrangement is that all of the mills in the series are kept running continuously, except when it is absolutely necessary to shut them down because of some impending disaster or accident. It is not a very easy thing to start the series of machines again after they have once been shut down because the mechanism is usually so arranged that the rolls, in addition to being stopped, are simultaneously moved into a greater spaced relation with respect to each other and considerable time is consumed in again getting all of the mills to function properly. For this reason the ordinary safety cable is not sufficient.

My improved device prevents undesired operation of the safety cable, while at the same time greatly facilitates the operation thereof when it is necessary to do so.

Obviously those skilled in the art to which this invention pertains may make various changes in the particular arrangement and construction of the parts shown therein without departing from the spirit of this invention, and therefore I do not wish to be limited except as may be hereinafter set forth in the claims.

Having thus fully described my invention, what I claim and desire to secure by Letters Patent of the United States is:

1. In combination with a machine having exposed moving parts representing a hazard to an operator working on said machine, of power means for driving said machine, a control member or the like extending a substantial distance across the operator's side of the machine, a network of cords or the like suspended from said control member adjacent the operator's position at said machine, actuating means operable to render said power means ineffectual to drive said machine, and a connection between said control member and said actuating means for operating said actuating means when said control member is either pulled or actuated by pulling on any part of said network.

2. In combination with a machine having exposed moving parts representing a hazard to an operator working on said machine, of power means for driving said machine, a cable or the like extending a substantial distance across the operator's side of the machine, a network of cords or the like suspended from said cable adjacent the operator's position at said machine, actuating means operable to render said power means ineffectual to drive said machine, and a connection between said cable and said actuating means for operating said actuating means when said cable is either pulled or actuated by pulling on any part of said network.

3. In combination with a machine having exposed moving parts representing a hazard to an operator working on said machine, of power means for driving said machine, a control member or the like extending a substantial distance across the operator's side of the machine, a network of cords or the like freely suspended from said control member adjacent the operator's position at said machine, a bar attached to said network and suspended thereby for keeping said network normally in a substantially vertical plane, actuating means operable to render said power means ineffectual to drive said machine, and a connection between said control member and said actuating means for operating said actuating means when said control member is either pulled or actuated by pulling on any part of said network or bar.

4. In combination with a machine having exposed moving parts representing a hazard to an operator working on said machine, of power means for driving said machine, a control member or the like extending a substantial distance across the operator's side of the machine, a network of cords or the like suspended from said control member adjacent the operator's position at said machine, a bar attached to said network and suspended thereby for keeping said network normally in a substantially vertical plane, yielding means connected to said bar to permit restrained swinging movement thereof, actuating means operable to render said power means ineffectual to drive said machine and a connection between said control member and said actuating means for operating said actuating means when said control member is either pulled or actuated by pulling on any part of said network or bar.

5. A safety device for rendering inoperative the power-operating means for driving a machine comprising means adapted to be connected to the power-operated means for said machine for rendering it inoperative, a flexible supporting element, and a network of flexible, substantially inextensible members carried by the element and adapted to be arranged in a convenient position to be reached by the operator while working at said machine, said element being connected to said means to actuate the same when a pull is exerted on substantially any part of said network.

6. A safety device for rendering inoperative the power-operating means for driving a machine comprising means adapted to be connected to the power-operated means for said machine for rendering it inoperative, a network of flexible, substantially inextensible members adapted to be arranged in a convenient position to be reached by the operator while working at said machine, and connected to said means to actuate the same when a pull is exerted on substantially any part of said network, and means weighting the lower edge of said network to stabilize the position of said network.

7. A safety device for shutting off the power to a power-operated machine, comprising a substantially horizontally disposed flexible element adapted to be connected to the said power means and arranged within easy reach of the operator for rendering said power means ineffective to drive said machine, and a plurality of flexible elements substantially parallel to said first element and suspended therefrom, whereby a pull exerted on any of said elements will actuate said first element to render said power means inoperative.

8. A safety device for shutting off the power to a power-operated machine, comprising a substantially horizontally disposed flexible element adapted to be connected to the said power means and arranged within easy reach of the operator for rendering said power means ineffective to drive said machine, yielding means for holding said flexible element in an inoperative position, and a plurality of flexible elements parallel to said first element and suspended therefrom, whereby a pull exerted on any of said elements will actuate said first element to render said power means ineffective.

9. A safety device for shutting off the power to a power-operated machine, comprising a substantially horizontally disposed flexible element adapted to be connected to the said power means and arranged within easy reach of the operator for rendering said power means ineffective to drive said machine, yielding means for holding said flexible element in inoperative position, a plurality of flexible elements parallel to said first element and suspended therefrom, whereby a pull exerted on any of said elements will actuate said first element to render said power means ineffective, and means for yieldingly resisting swinging movement of said flexible elements.

10. In combination with a machine having exposed moving parts at at least two different operators' positions and representing a hazard to an operator working on said machine, of power means for driving said machine, separate control members or the like extending for a substantial distance adjacent each of the operators' positions, a network of cords or the like suspended from each control member, actuating means operable to render said power means ineffectual to drive said machine and a common connection between each of said control members and said actuating means for operating said actuating means when either of said control members is either pulled or actuated by pulling on any part of either network.

ARTHUR J. WIEDINGER.