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Cohn

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[54] **ELECTRIC CONTROL SAFETY MECHANISM**

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[52] **U.S. Cl.** ..... **74/616;** 192/131 R; 200/322

[51] **Int. Cl.²** **F16P 3/00**

[58] **Field of Search** ..... 74/616; 200/334, 333, 322, 200/304; 100/53; 192/131 R

[56] **References Cited**

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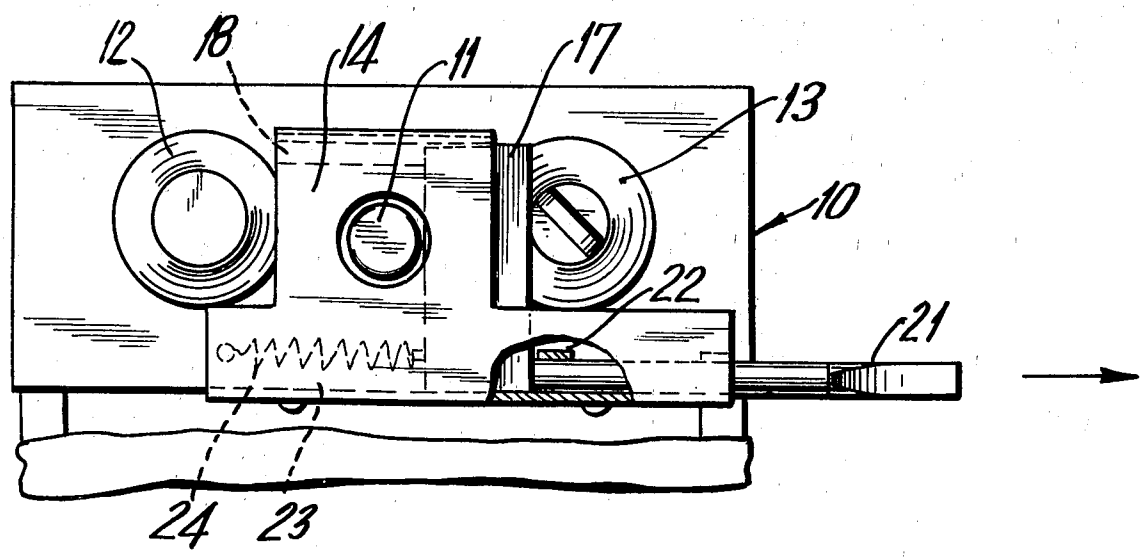
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[57] **ABSTRACT**

A safety mechanism requiring two hands of an operator before activating a machine or closing an electric circuit. A push button is positioned under a support plate having an opening through which the button can be depressed. A safety plate is slidably mounted under the support plate and over the push button thereby normally closing the opening and preventing the depression of the button. The safety plate is coupled to a spring return means and also to a manually operated handle which pulls the safety plate clear of the opening and permits access to the push button.

11 Claims, 3 Drawing Figures



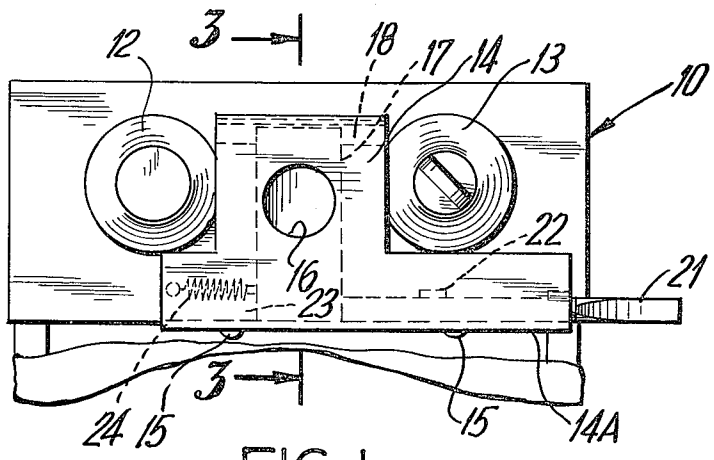


FIG. 1

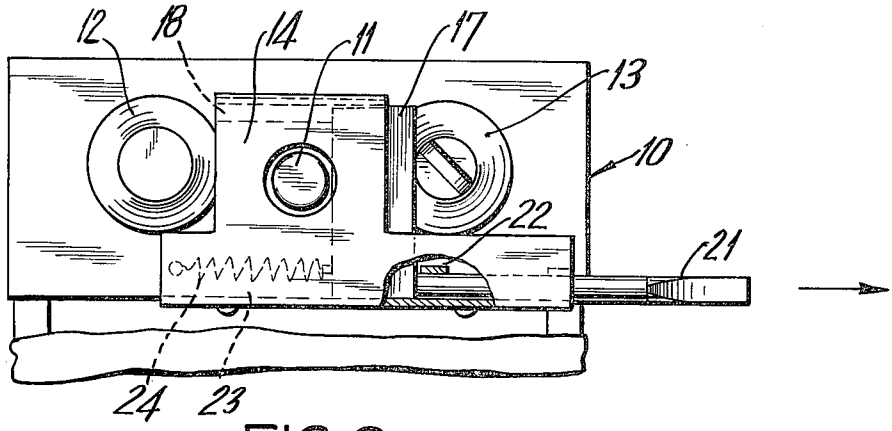


FIG. 2

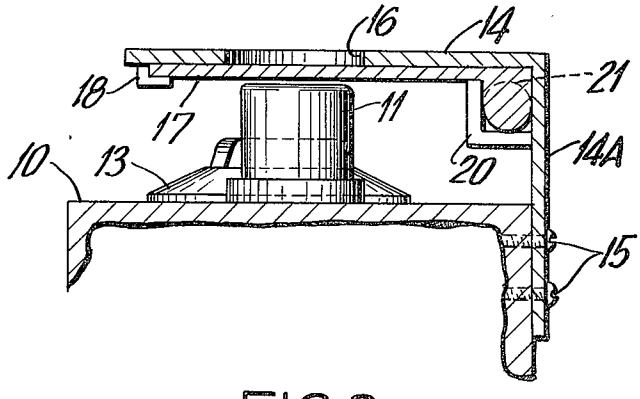


FIG. 3

ELECTRIC CONTROL SAFETY MECHANISM

BACKGROUND OF THE INVENTION

Many heavy machines, such as punch presses, drop hammers, and other power operated machines present considerable danger to an operator, especially when work pieces must be placed in the machine and manually adjusted. Many prior safety devices have been proposed, most of these requiring the operation of two levers or buttons, spaced apart so that two hands are required for the operation. Many of these safety devices can be rendered ineffective by the operator since it is possible to tie down one of the levers and then use the other lever to operate the machine. Such an operation leaves one hand free to insert items into the machine but increases the danger to an unacceptable degree.

The present invention uses a single push button to start the operation but two hands are always required because one hand must be used to remove a shield from its normal position over the button. The mechanism is designed so that it is impossible for an operator to tape or wire the safety plate in its operating position and run the machine using only one hand to operate the push button.

One of the features of the invention is the simplicity of the mechanism, using only a single moving part to provide safety of operation.

Another feature of the invention is the construction of a handle which must be moved, against the force of a spring to operate the mechanism. The handle is made cylindrical or flat with or without mechanical extensions, knobs, or lugs which may assist an operator to position the safety plate in its operating position. An additional feature of the invention is the adaptability thereof to existing machinery's push button stations making an additional push button and rewiring unnecessary.

SUMMARY

The invention comprises a two-hand safety mechanism which can be applied to a push button or switch control station. A support plate is secured to the control station and extends over the start push button or switch. The support plate is formed with an opening positioned over the push button or switch so that an operator can actuate the button or switch by reaching through the opening. The opening is normally closed by a safety plate which is slidably mounted under the support plate and is movable between positions covering and uncovering the support plate opening. A biasing member such as a spring is secured to the safety plate to bias the plate to a position covering the opening and a handle is also secured to the safety plate to enable an operator to move the plate with one hand to uncover the opening while the other hand is used to activate the button or switch and start the machine. Additional details of the invention will be disclosed in the following description, taken in connection with the accompanying drawings.

BRIEF DESCRIPTION OF THE FIGURES

FIG. 1 is a plan view of the safety mechanism with the safety plate in its normal position.

FIG. 2 is a plan view similar to FIG. 1 but showing the safety plate removed from the opening and exposing the operating push button.

FIG. 3 is a cross-sectional view of the mechanism taken along line 3—3 of FIG. 1.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The figures show a base **10** which is the push button control station of any operating machine such as a punch press, an envelope folding machine, an envelope manufacturing machine, or any type of automatic processing machine. The control station is shown with three control buttons; in this case, a start button **11** to start the machine, a selector button **12** to limit the machine to single or multiple operations, and a "run" button **13**, to keep the machine in operation until stopped by other means. The central button **11** is reserved for starting and it is important to guard this control so that maximum safety is maintained when it is operated. To this extent a support plate **14** is provided, extending over the start button **11** and formed with a bend **14A** which extends down over the front portion of the control station **10** where it may be secured thereto by fastening means **15.**

The support plate **14** is continuous except for one or more openings **16** which is positioned directly over the start button **11.** The dimensions are such that an operator cannot move a finger under the support plate and depress the start button **11.** A safety plate **17** is mounted under the support plate and is held in close proximity thereto by support means **18** and **20** (FIG. **3**). Angle bracket **20** also supports a portion of a handle **21,** secured to the safety plate **17** by welding or by other permanent fastening means. The handle **21** extends a distance from the support plate **14** where it can be grasped by an operator and pulled to the right along with the safety plate **17.** The safety plate is limited in its movement by stops **22** and **23.**

The safety plate **17** includes a flat plate normally blocking the opening **16** (FIG. **1**). When the operator pulls the handle **21** to the right, the plate **17** abuts against stop **22** and uncovers the hole **16** in the support plate and permits an operator to depress the start button by entering a finger through the hole **16.** In order to retain the safety plate **17** in the safety position when not moved by an operator, a spring means **24** is secured between a portion of the safety plate **17** and the support plate **14.** The spring **24** pulls the safety plate **17** to its non-operating position against stop **23** as soon as the operator releases the handle **21.** Of course, once the safety plate **17** is moved by the operator and his finger depresses the start button **11,** it is possible to keep the finger in the hole to hold the door open but the spring **24** is strong enough to make it uncomfortable on the operator's finger. Once the finger is removed, the operator is required to use two hands to open the safety plate and depress the start button. While in the embodiment shown the actuating member is a push button it is equally adaptable to a machine put into operation by a switch means.

In accordance with the invention, the safety mechanism can be made for either left or right handed operation and can be constructed for protecting a plurality of push button or switch machine activating members.

From the above description it will be evident that the safety mechanism requires an operator to use both hands to start a machine operation, thereby insuring that both hands have been removed from the moving machine parts.

The embodiments of the invention in which an exclusive property or privelege is claimed are defined as follows:

1. In combination with a switch means control station including a start switch for actuating a machine, a two-hand safety mechanism comprising: a support plate secured to said control station and extending over the start switch, said support plate formed with an opening therein disposed over said start switch to enable an operator to actuate the start switch; a safety plate slidably mounted under said support plate and movable between positions covering and uncovering the opening in the support plate; biasing means for biasing said safety plate to a position covering the opening in said support plate; and a handle means secured to said safety plate in order to enable the operator to overcome said biasing means and move said safety plate with one hand to a position which uncovers said start switch whereby said start switch may then be depressed with the other hand to activate the machine.

2. A safety mechanism according to claim **1** wherein said safety plate is held adjoining the under surface of said support plate by a bracket.

3. A safety mechanism according to claim **2** wherein the motion of said safety plate is limited by stops secured to said support plate, said motion being limited to areas under said support plate.

4. A safety mechanism according to claim **1** wherein the opening is circular.

5. A safety mechanism according to claim **1** wherein the opening is rectangular.

6. A safety mechanism according to claim **1** wherein said biasing means is a spring means.

7. A safety mechanism means according to claim **1** wherein said spring means is a helical spring coupled between portions of the safety plate and the support plate.

8. A safety mechanism according to claim **1** wherein said handle is a smooth surfaced cylinder.

9. A safety mechanism according to claim **1** wherein said support plate is flat and is parallel to the surface of the control station.

10. A safety mechanism according to claim **7** wherein said handle is flattened.

11. A safety mechanism according to claim **1** wherein a plurality of said switches are provided.

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