Jan. 10, 1956 B. FELTWELL 2,730,587

SWITCH ACTUATING MECHANISM FOR SET-UP MACHINES AND THE LIKE

Filed Jan. 9, 1953

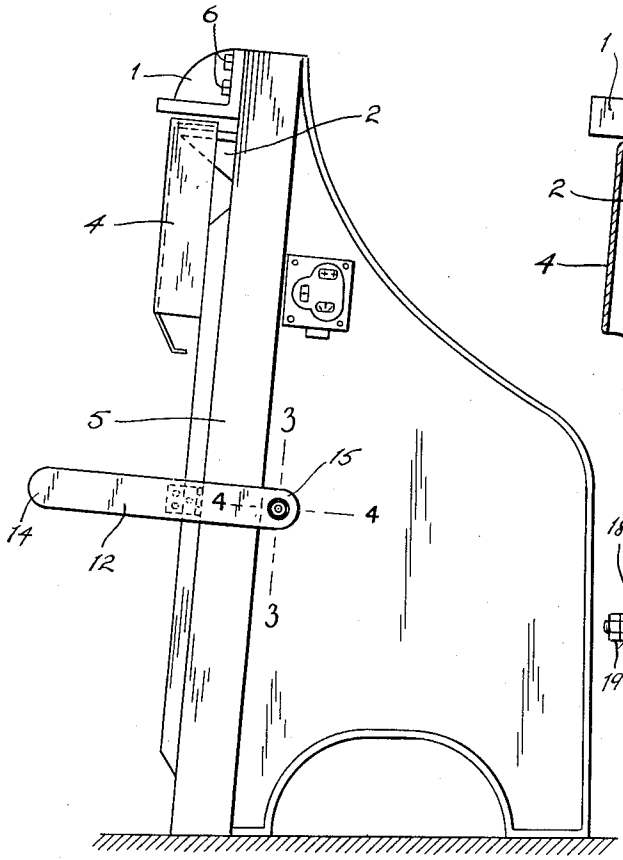

Fig. 1.

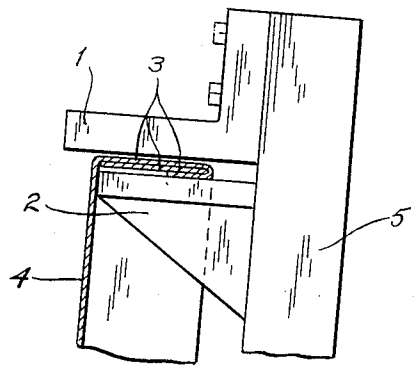

Fig. 2.

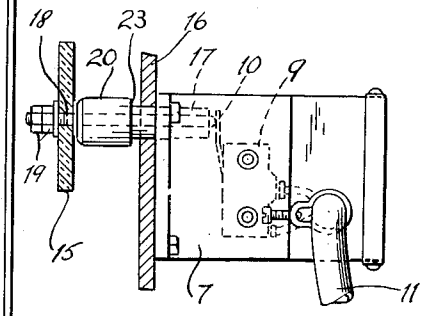

Fig. 3.

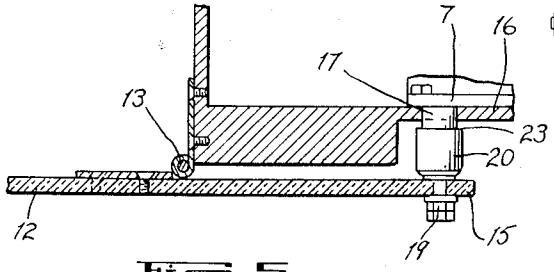

Fig. 5.

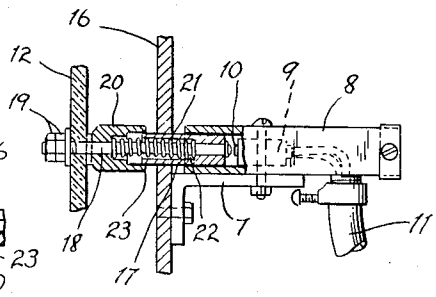

Fig. 4

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United States Patent Office 2,730,587 Patented Jan. 10, 1956

2,730,587

SWITCH ACTUATING MECHANISM FOR SET-UP MACHINES AND THE LIKE

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Application January 9, 1953, Serial No. 330,465

8 Claims. (Cl. 200—61.58)

This invention relates to improvements in machines, such as the semi-automatic box setting-up machines and the like wherein the operator must trip or energize the operating mechanisms for each operation of the machine. In the majority of machines of this type at the present a foot treadle is utilized and when the operator has positioned his work he presses the treadle with one foot requiring the shifting of his weight to the other and in time tiring the operator.

It has been proposed to use a hand-operated switch mechanism in which the contact member is actuated by the hand as the work is being advanced into position. To achieve this operation the hand or the work must follow a predetermined path thus placing a restriction on the handling of the work and interfering with the freedom of movement of the operator. Moreover, the tripping of the operating mechanisms of the machine before the work reaches its final position is a dangerous practice.

It is therefore the object of the present invention to enable the machine mechanism to be tripped without requiring either the shifting of weight to one foot or the moving of the work or hands on a predetermined path with the consequent restriction of the free handling of the work.

Another object is to eliminate any bruising or abrading or other injury to the body or clothing of the operator under the repeated actuation of the tripping device.

The principal feature of the invention resides in supporting the tripping device in a position to be manipulated by the legs of the operator under a slight swaying or turning of the body and to yield therewith, and transmitting the swaying movement into controlled movement of regulated extent of the switch or energizing control operated by the tripping mechanism.

Another important feature resides in forming the tripping mechanism as a flat highly polished bar of low friction material with the flat side of the bar being presented for engagement by the operator's leg.

Referring to the accompanying drawings,

Figure 1 is a side elevational view of a conventional box setting-up machine equipped with a trip device constructed in accordance with the invention.

Figure 2 is an enlarged elevational view of the presser members and showing the blank as formed up by the operator in section.

Figure 3 is a vertical section on the line 3—3 of Figure 1.

Figure 4 is a horizontal sectional detail on the line 4—4 of Figure 1.

Figure 5 is a longitudinal fragmentary sectional view through the trip device and adjoining part of the machine frame.

In the forming or setting up of boxes from flat blanks, the blanks are normally fed through a gluing mechanism and the flaps folded at least partly by hand and placed in folded relation between a pair of presser members which are then actuated by the operator to press the glued and folded parts together. Thus, each time, the presser

mechanism must be operated in time with the speed of the individual operator in handling each blank and presenting it between the pressing jaws. To get this timing it is therefore necessary that the operator trip the machine mechanisms which operate the presser members for each operation of the machine.

With reference to the drawings, the presser members 1 and 2 which press the flaps 3 of the carton blank 4 are mounted on an upright frame 5. The upper presser member or jaw 1 is normally stationary and is shown secured by a bolt 6 while the lower presser member or jaw 2 is arranged to slide on the frame towards and away from jaw 1.

The members 1 and 2 are actuated for relative movement by suitable power-operated mechanisms and control circuits are provided to operate these power mechanisms as is well understood in the art. As the present invention does not pertain to these devices their illustration and description is omitted for the sake of simplicity.

Mounted on the frame 5 intermediate the height thereof at one side is a bracket 7, Figures 3 and 4, carrying a channel 8 within which is arranged a switch 9 having a movable contact operating member 10. The switch 9 is arranged in the control circuit 11 and the movable member 10 is spring-urged to normally open-circuit the control circuit 11.

Mounted at the side of the machine frame 5 at which the switch 9 is arranged is a flat bar 12 supported to pivot about a substantially vertical axis by a hinge 13 secured to the face of the frame 5 from which the presser members 1 and 2 project. One end 14 of this bar projects beyond the frame 5 at one side thereof to lie adjacent the legs of an operator introducing the blank 4 between the presser members 1 and 2.

The position of the hinge 13 is intermediate the length of the bar 12 so that its inner end 15 projects to a point adjacent to the switch 9.

Extending through the side wall 16 of the machine carried by the frame 5 is a sleeve 17 fixed to the wall 16 and entering the channel 8. Secured to the inner end 15 of the bar 12 is a plunger member in the form of a bolt 18 having its head at the inner end of the sleeve 17 and secured to the bar by lock nuts 19.

Mounted on the bolt 18 is a second sleeve 20 which telescopes on the sleeve 17. A spring 21 arranged in a counterbore 22 in the sleeve 17 and the bore of the sleeve 20 encircles the bolt 18 and acts on the sleeves to urge their separation.

The bar 12 is preferably formed of Plexiglass and is arranged in an upright plane so that it presents a broad, flat and extremely smooth surface which will not catch or abrade the clothing including the sheerest of stockings worn by the operator.

Moreover the bar is relatively highly resilient so that it gives readily under pressure of the operator's leg and will not bruise or cause other injury upon repeated engagement.

In operation, the operator picks up a carton blank from the gluing mechanism and folds at least some of the flaps 3, placing the carton in position between the presser members 1 and 2. Then with a slight swaying of the body the trip bar 12 is operated to swing on its hinge 13, forcing the plunger assembly as constituted by the bolt 18, sleeves 17 and 20 and the spring 21 inwardly against the movable contact operating member 10 to force same inwardly of the side wall 16 to circuit-energizing position.

The end 23 of the sleeve 20 is adapted to abut the wall 16 to provide a stop, limiting inward movement of the inner end 15 of the trip bar 12 to prevent damage to the movable member 10. Although the inner bar end 15 is constrained to a regulated movement under pressure against the extended end 14, the inherent resiliency of

the bar enables the extended end to flex to the extent required to accommodate lateral swaying movement of the body of the operator, so that such movement will be, at first, gently resisted to prevent bruising.

On release of the pressure against the outer end **14** of the trip bar the spring **21** will return the inner end outwardly allowing the movable contact operating member **10** to recover to the open-circuiting position of Figures 3 and 4.

It will be understood that the degree of extension of the plunger on the inner bar end **15** may be controlled by adjusting nuts **19** and details of the operating coupling interposed between the inner bar end of the member **10** may readily be varied.

Also, a device such as described may be utilized to trip machines other than the particular box setting-up machine wherever the operator is required to actuate the mechanism upon each individual machine operation.

Further, it will be understood that a trip mechanism such as described will be capable of energizing air and hydraulic circuits as well as electrical control circuits.

What I claim as my invention is:

1. In a box setting-up machine or the like having an upright frame, relatively movable presser members adjacent the top thereof, and power-operated means for effecting relative movement of said presser members, a movable member for effecting energization of said power means located intermediate the height of said frame, and trip means actuatable by the leg of an operator to effect movement of said movable member, said trip means comprising a resiliently flexible bar pivoted intermediate its length intermediate the height of said frame and having one end projecting beyond said frame to a point adjacent the operator's leg and the other end projecting to adjacent said movable member, means constraining said latter bar end to substantially linear straight-line movement towards and from said movable member and operatively associating said latter bar end and said movable member to impart bar movement thereto and stop means limiting the extent of linear movement of said latter bar end while said resiliently flexible bar end projecting beyond said frame is adapted to flex relative to said latter bar end to move in an arcuate path under applied body pressure to absorb and dissipate applied body pressure progressively on said arcuate path.

2. A device as claimed in claim 1 in which said bar comprises a flat, highly polished bar presenting a broad substantially frictionless surface to be contacted by an operator pivoted about a vertical axis at one side of said frame.

3. A device as claimed in claim 1 in which said means operatively associating the bar end and the movable member comprises a rigid element secured to said latter bar end and projecting therefrom, a guide for said rigid projection, said movable member being located in the path of said rigid projecting element upon pivotal movement of said bar to be actuated thereby to a position energizing said power means, and spring means acting to retract said movable member from energizing position.

4. A device as claimed in claim 1 in which said movable member is spring-urged from a power energizing position and said means operatively associating the bar end and the movable member comprises a rigid plunger secured to said latter bar end, a sleeve through which said plunger operates aligning the path of movement of said plunger to actuate said movable member to energizing position, spring means acting on said bar to retract said plunger from position actuating said movable member, and stop means limiting movement of said rod relative said sleeve.

5. A trip mechanism for a box setting-up machine or the like having a power-operated device to be tripped by the operator comprising in combination with the machine frame, of a flat highly polished resilient, flexible bar pivoted intermediate its length on a vertical axis to said frame at a point spaced above the bottom thereof and presenting a broad, smooth yielding surface to be engaged by an operator, said bar having one end projecting beyond said frame, a movable member to actuate the power-operated device of the machine positioned adjacent the other end of said bar, means imparting movement of said latter bar end to said movable member and constraining said latter bar end to substantially linear movement towards and from said movable member, stop means limiting the extent of linear movement of said latter bar end while said resilient flexible bar end projecting beyond said frame is adapted to flex relative to said latter bar end to move in an arcuate path under the applied body pressure of the operator to absorb and dissipate said applied body pressure progressively on said arcuate path.

6. A device as claimed in claim 5 in which a fixed guide sleeve is interposed between said latter bar end and said movable member, and the means imparting bar movement to said movable member comprises a plunger projecting from said latter bar end towards said movable member and operating through and guided in a linear straight-line path by said sleeve, a sleeve carried by said plunger in telescoping relation with the aforesaid sleeve and abutting said bar, a stop surface against which said latter sleeve is adapted to abut to limit the extent of telescope of said sleeves to limit movement of said latter bar end towards said movable member, and spring means urging said sleeves apart to urge said bar in a direction to retract said plunger from said first-mentioned sleeve.

7. A device as claimed in claim 6 in which means are provided to adjustably regulate the extent of projection of said plunger.

8. A trip mechanism for a box setting-up machine or the like having a power-operated device to be tripped by the operator, comprising in combination with the machine frame, of a movable contact-making switch member to energize the power-operated device of the machine located intermediate the height of said frame, a smooth, flat resilient flexible bar pivoted intermediate its length intermediate the height of said frame, one end of said bar projecting beyond said frame, means restricting movement of the other end of said bar to substantially linear straight-line movement over a length corresponding to the range of movement of said switch member, and means imparting the restricted movement of said latter bar end to said switch member while said resilient flexible bar end projecting beyond said frame is adapted to flex relative to said latter bar end to move in an arcuate path under applied body pressure to absorb and dissipate applied body pressure progressively on said arcuate path.

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