This invention relates to labelling machines and more particularly relates to a precision label cut-off actuating device for such machines. It is a prerequisite of a labelling machine that the label be precisely cut on a line that is in definite spaced relationship to the printed matter on the label, that the label after application, show no indentations on its periphery that is indicative of a machine operation or is foreign to the label as applied or that mars the appearance of the label.

In prior art devices indexing holes or squares remain in evidence after the label has been applied, in the form of notches or semi-circular indentations on the periphery of the label. It is therefore an object of this invention to provide a label cut-off actuating device that functions to cut a label from a ribbon of labels in a manner that leaves no evidence on the periphery of the label after it has been applied to a package or container.

Another object of this invention is to provide a label cut-off actuating device that will present a surface to the edge of the ribbon that will minimize the wear on the label edge and thereby prevent frayed or torn labels. Another object of this invention is to provide a label cut-off actuating device that is readily adjustable to take various width ribbons of labels and automatically adjusts to cut off labels of different lengths. Other objects of this invention are to provide an improved device of the character described that is easily and economically produced, which is sturdy and compact in construction, and which provides a maximum of ease in adjustment when setting up the labelling machine for application of the labels to a package or container.

With the above and related objects in view, this invention consists in details of construction as hereinafter shall be described.

As this invention relates to a precision label cut-off actuating device, only that portion of the labelling machine and its associated parts will be described. Suffice to say that the ribbon of labels are fed by power driven feed rollers into the label cut-off actuating device and, after passing through and tripping the label cut-off actuating device, continue as a ribbon through a cutting device. This cutting device is mechanically operated by a cam means (not shown) on the main drive shaft of the machine.

The description will be more readily understood when the description is read in conjunction with the accompanying drawings, in which:

FIG. 1 is a perspective view of a label cut-off actuating device embodying the present invention, the device being shown in operation upon a ribbon of labels.

FIG. 2 is an elevational view of the indexing mechanism taken along line 2—2 of FIG. 1, some parts being omitted for greater clarity of the parts shown.

FIG. 3 is an elevational view of the indexing mechanism similar to FIG. 2 but with a part broken away, the mechanism being shown in its tripped position.

FIG. 4 is an elevational view taken along line 4—4 of FIG. 1 with parts being omitted for greater clarity of the parts shown, the indexing mechanism being in the position where the indexing finger has been engaged by a slit in the ribbon of labels.
a corresponding recessed portion of the carrier 13 (see FIG. 8). With this arrangement it will be readily observed that although the cut-off arm of the arm 15 moves back and forth, as hereinafter described, the carrier 13 moves in a horizontal plane while slidably held against the stop 18 by the spring 16. During such horizontal movement, the finger 12 projects above the upper surface of the indexing mechanism, except as hereinafter described (see FIGS. 2, 3, 4 and 5).

The ribbon of labels B is pulled through the machine by feed rollers R and R' (note FIG. 3). The individual labels are severed from the strip by a knife K. The feed rolls R and R' and the knife K are actuated in synchronism by a responsive feed cam and knife cam on the main drive shaft. The main drive shaft is operated by means of a handle or foot pedal-operated one-revolution clutch (not shown) which is arranged to engage the main drive shaft with the main drive motor (not shown) for one revolution.

When the finger 12 of the indexing mechanism projecting through a slit 9 on the ribbon of labels B, the carrier 13, on which the finger 12 is mounted, is moved linearly by the ribbon of labels B. As the carrier 13 is attached to the arm 15, this movement of the finger 12 and carrier 13 causes the arm 15 to pivot around the pin 19. The pivotal movement of the arm 15 sets up tension spring 20, which is fixedly attached to a pin 20A on the arm 15 and to a pin 20B fixedly attached to the frame 23 of the label cut-off actuating device A.

When the carrier 13 is moved linearly a predetermined distance, it corresponds to a pivotal distance of the arm 15 which is just sufficient to move a projecting arm 24, disposed parallel to the trip arm pin 19, downward. As the projecting arm 24 is normally disposed to engage the contact 25 of a switch 26 (see FIGS. 2 and 8), the downward movement of the projecting arm 24 is sufficient to release pressure against contact 25 thereby opening the switch 26 (see FIGS. 2 and 3). When the switch 26 is open, an electrical circuit (see FIG. 10) de-energizes the feed roll drive mechanisms (as hereinafter more fully described) and the ribbon B stops its linear motion. The knife K is then actuated by the knife cam on the main drive shaft to cut a label from the ribbon.

The switch 26, used in the illustrated embodiment of the invention, is of the micrometer type that functions precisely at a definite position in the movement of the contact 25 to break the electrical circuit.

In setting up and subsequently adjusting the labeling machine, the initial cut-off actuating device A is positioned such that the knife K cuts a label from the ribbon A on a line that coincides with the slits 9 in the ribbon. In this manner, a label is cut from the ribbon in such a manner that there is no indication where the indexing finger was used. There is also no marring of the periphery of the cut-off label.

The actuating means for discontinuously operating the machine includes a solenoid 27 having a plunger 28. A solenoid lever arm or rocker arm 29 is provided at its lower end with an offset flange 30, while at its upper end, it is pivotally connected to a pin 31 fixed to the frame 23. The flange 30 is hingedly positioned in an open-ended slot 28A formed in the end of plunger 28 by means of a hinge pin 30A.

The solenoid 27 is adapted to be momentarily energized by a switch (not shown) which is closed by the aforementioned feed cam on the main drive shaft when said drive shaft is engaged by the aforementioned one-revolution clutch. Upon such energization, the plunger 28 is drawn into the solenoid 27.

Fixedly attached to the solenoid lever arm 29 at the pivot end is a trip bar 32 which extends over and is positioned to engage a trip lug 33 on the carrier 13 (see FIGS. 1 and 5).

When the solenoid 27 is energized and the solenoid plunger 28 is drawn into the solenoid, the pivotally at-
What is claimed as the invention is:

1. A label cut-off device comprising a frame, a support and guide means on said frame for a label mover, a ribbon of labels having linearly spaced slots therein to define the edges of the labels, said support and guide means being operatively disposed relative to a carriage fixedly positioned beneath the path of said ribbon during the cut-off operation, a finger movably connected to said carriage and adapted to be engaged in the slots of said ribbon, said finger being pivotally and linearly movable relative to said carriage whereby said finger may move linearly with said ribbon when said finger is engaged in one of said slots and may be pivotally removed from the slot, biasing means urging said finger toward said ribbon and into engagement with said slot, control means to momentarily pivot said finger out of the slot, means for selectively actuating said control means, normally open switch means on said carriage, engagement means operatively connected to said finger and normally closing said switch means, means for moving said engagement means away from said switch means upon predetermined linear movement of said finger whereby said switch means is permitted to open, means returning said finger into a position where said finger may be again engaged with a slot, feed rolls for moving said ribbon linearly, drive means for said feed rolls, actuating means for said drive means, said switch means being electrically connected to said drive means to de-activate said drive means, and a knife for severing the labels of said ribbon from each other, said knife being actuated in timed relationship with said feed rolls.

2. The cut-off device of claim 1 wherein said finger is mounted on a carrier, said carrier being pivotally mounted on an arm, said biasing means urging said carrier to a predetermined position on said arm whereby the carrier is parallel to the linear path of the ribbon, said arm being pivotally connected to said carriage, a second biasing means urging said arm toward a predetermined position around its pivotal axis, said engagement means being connected to said arm, said switch means comprising a switch on said carriage, and said switch having a contact normally engaged by said engagement means when said carrier is in its predetermined position.

3. The cut-off device of claim 2 wherein a lever arm is pivotally connected to said carriage, said lever arm having a trip bar at one end and being in pivotal engagement with a solenoid plunger at the other end, said trip bar being in engagement with said carrier, and said solenoid plunger extending from a solenoid coil operatively connected to a selectively actuated operating means.

4. The cut-off device of claim 1 wherein said support and guide means comprises a pair of spaced, laterally adjustable support rails.

5. The cut-off device of claim 1 wherein an adjustable weight is provided on said frame for bearing down upon said ribbon to hold it in operative position relative to said finger.

6. A label cut-off device for severing individual labels from a ribbon of labels having linearly spaced slots therein, said device comprising a frame, said frame including a pair of plates having guide bars extending between them, a pair of support-rail holding means slidably positioned on said guide bars, each of said holding means having a support and guide rail depending therefrom, means for locking said holding means in slidably adjusted positions on said guide bars, a weight holder slidably positioned on said guide bars between said holding means, means for locking said weight holder in slidably adjusted position on said guide bars, a weight pivotally mounted on said weight holder, an additional guide bar between said plates of said frame, said additional guide bar being vertically spaced below said first mentioned guide bars, a carriage slidably mounted on said additional guide bar, means for locking said carriage in slidably adjusted position on said additional guide bar to hold said carriage in fixed position during the cut-off operation, a finger movably connected to said carriage and adapted to be engaged in the slots of said ribbon, said finger being pivotally and linearly movable relative to said carriage whereby said finger may move linearly with said ribbon when said finger is engaged in one of said slots and may be pivotally removed from the slot, biasing means urging said finger toward said ribbon and into engagement with said slot, drive means for moving said ribbon linearly, drive means for said drive means, actuating means for said drive means, said switch means being electrically connected to said drive means to de-activate said drive means, and a knife for severing the labels of said ribbon from each other, said knife being actuated in timed relationship with said feed rolls.

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