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CONTROL DEVICE FOR LABEL CUTTING AND FOLDING MACHINE

Filed July 18, 1962

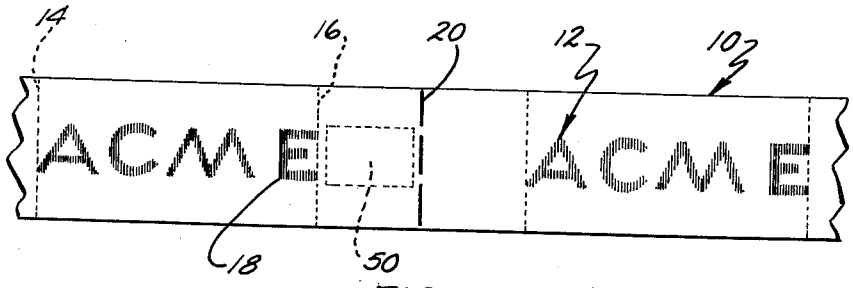


FIG. 1.

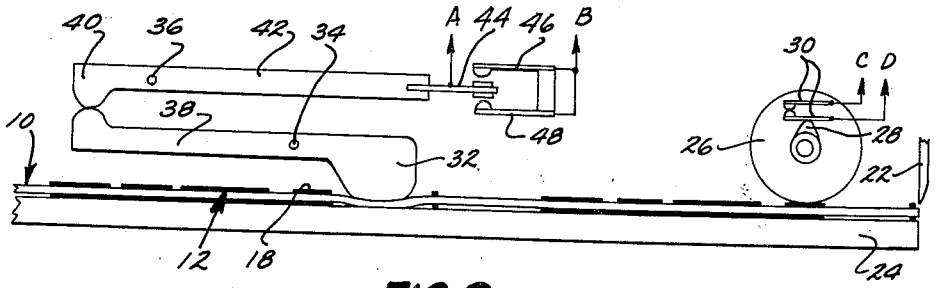


FIG. 2.

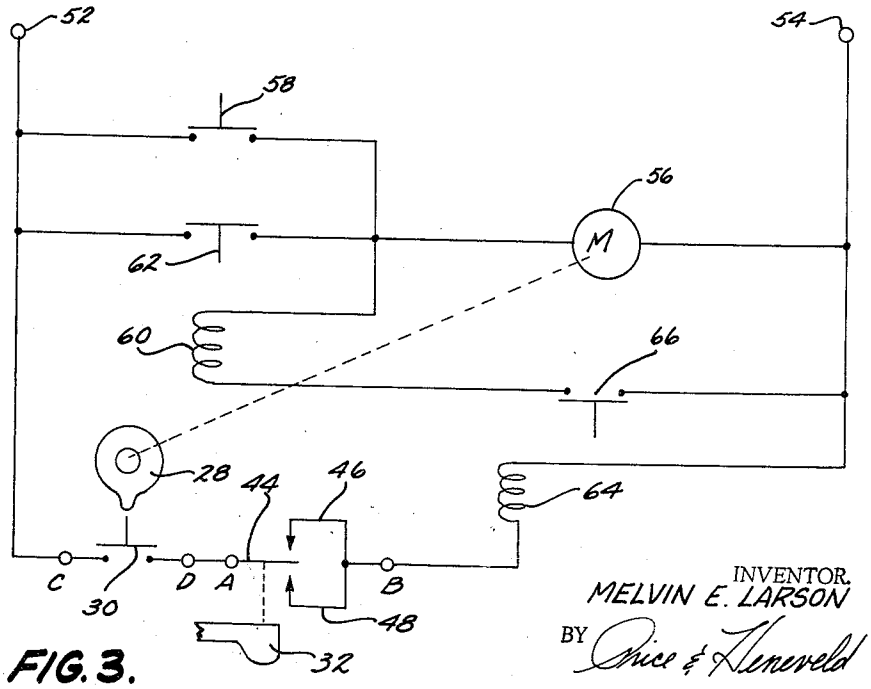


FIG. 3.

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CONTROL DEVICE FOR LABEL CUTTING AND FOLDING MACHINE

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1 Claim. (Cl. 200—61.13)

This invention concerns control devices for automatic label-making machines, and more particularly a control device for woven label machines which stops the machine whenever the thickness of the label at predetermined points along the label strip is either excessive or insufficient.

In the manufacture of woven labels, a strip of prewoven labels is fed through a machine which cuts the strip into individual labels and folds the ends of these labels for attachment to garments. The writing on these labels is formed by a weave composed of a large number of parallel threads running crosswise of the label along the underside of the label, but protruding above the label at predetermined places to form the writing. Consequently, the thickness of the labels is greater in the center of the label where the writing appears than at the ends where the label is only as thick as the thickness of the base strip.

Various devices for assuring proper registration of the labels to properly position them under the cutter are well-known. These devices, however, cannot sense whether or not the label strip is in fact in proper register, or whether any label strip is in the machine at all. Consequently, it occasionally occurs that the registering device is thrown off by an improper splice in the label strip, or that a failure of the feed mechanism or the exhaustion of the label strip causes the machine to idle. In each of these cases, it is desirable to stop the machine to avoid the production or rejects or the useless running of the machine.

The present invention is designed to avoid such faulty operation of the machine by sensing the thickness of the label strip and stopping the machine if the portion of the label strip adjacent the sensing finger at a predetermined moment in the cycle of operation is too thick (strip out of register or mis-spliced) or too thin (strip frayed or exhausted). This is accomplished in a preferred embodiment of the invention by connecting the sensing finger to a floating electrical contact which closes an electrical circuit if the sensing finger either drops below or rises above a median position corresponding to the thickness of the strip body in the absence of crossthreads. A cam operative in synchronism with the label feed is provided to close a second pair of contacts momentarily at the point in the cycle of the machine at which a blank portion of the strip body should be underneath the sensing finger if the machine is functioning correctly. If both the cammed contacts and the contacts operated by the sensing finger are closed at the same time, an electrical signal is produced which shuts off the machine by any appropriate means.

It is therefore the object of this invention to sense the thickness of a woven label strip at intervals along the strip and to actuate remedial devices if the thickness at the sensed point is outside a predetermined range.

This and other objects of this invention will become apparent from the following specification, taken in connection with the accompanying drawings in which:

FIG. 1 is a plan view of a woven label strip to be sensed by the device of this invention;

FIG. 2 is a schematic diagram showing the mechanical operation of the device of this invention; and

FIG. 3 is an electrical diagram showing its electrical interconnection.

Referring now to the drawings, FIG. 1 shows a label strip 10 on which a legend 12 is produced by weaving. The legend 12 is produced by a series of crossthreads located underneath the label strip 10 between the lines 14, 16 but brought to the top thereof at appropriate places to form the legend 12, as for example at 18. Raised indexing threads 20 are provided to separate one label from the next and to cooperate with the indexing device which brings the label strip into proper register with the cutting knife 22 (FIG. 2) during each cycle of the machine.

The label strip 10 is drawn through the machine over a guide platen 24 by appropriate feed means symbolized in FIG. 2 by the roller 26. The feed roller 26 or corresponding mechanism is so interconnected with the cam 28 that the cam 28 closes the contacts 30 each time one label has been fed past the cutting knife 22.

A sensing finger 32 rests on the label strip 10 either under its own weight or under the influence of an appropriate spring. The motion of sensing finger 32 is preferably multiplied by the mechanical motion multiplier system consisting of pivots 34, 36 and lever arms 38, 40 and 42. The magnified motion of sensing finger 32 is transmitted to contact arm 44 which is mounted at the end of lever arm 42 in such a manner at to cause contact arm 44 to normally float between the contacts 46, 48 but to touch contact 48 if sensing finger 32 drops all the way to the platen 24, or to rise into contact with contact 46 if sensing finger 32 is raised by the crossthreads 18.

In the position shown in the drawing, sensing finger 32 rests in the area 50 of the label strip 10 (FIG. 1). In this position, it senses only the thickness of the body of label strip 10 and breaks the electrical circuit between points A and B (FIGS. 2 and 3).

Operation

As is best shown in FIG. 3, electric power from the terminals 52, 54 may be supplied to the drive motor 56 of the machine by depressing push button 58. This causes energization of relay 60 which locks itself in through armature 62 and thus continues to supply power to the motor 56 after push button 58 is released. As long as the machine functions properly, the sensing finger 32 will be in its intermediate position with its switch open when the contacts 30 are closed it thus continues to operate. In other words so long as the label strip is in register the machine continues to operate. If, however, the label strip becomes out of register the sensing finger 32 senses too small a thickness at the moment when cam 28 closes contacts 30 and an electrical circuit will be established from terminal 52 through point C, contacts 30, points D and A, contact arm 44, contact 46, point B, and the winding of relay 64 in either of these cases to terminal 54. Further, if the label strip is exhausted or defrayed, sensing finger senses this and closes contact arm 44 on contact 46 simultaneously with the closing of contacts 30. The resulting energization of relay 64 in either of these cases opens normally closed contact 66. This causes relay 60 to drop out and break the circuit at contact 62, whereupon the motor 56 stops until it is manually re-energized by depressing push button 58.

It will be understood that instead of electrically disconnecting the motor 56, the stopping mechanism may take the form of a solenoid arranged to disengage the clutch of the feed mechanism if the machine is provided with one.

It will be understood that the above described embodiment is illustrative only, and that the principle of

this invention can be carried out in many different ways. Consequently, I do not desire to be limited by the embodiment shown and described above, but only by the scope of the following claim.

I claim:

A device for controlling the flow of a woven label strip having spaced periodic extra thick woven areas, comprising: a machine for causing the flow of said strip; a means including a freely movable sensing finger forced against and riding on said strip and following the contour of the thickness thereof as it varies from woven area to nonwoven areas located between said woven areas, said finger being thus arranged to move up and down in accordance with the existence and non-existence of said woven areas as said strip flows past said sensing finger; electric contact means operatively connected to said sensing finger to close a continuously powered electric circuit whenever said sensing finger rides on a woven area; cammed contact means coupled to said machine

for enabling current flow in said circuit only during the predetermined portion of he operating cycle of said machine when said sensing finger is on the strip between said extra thick woven areas; and means for stopping said machine when said electric contact means and cammed contact means are closed simultaneously causing current to flow in said electric circuit.

References Cited by the Examiner

UNITED STATES PATENTS

1,989,971	2/35	Cretin	340—260
2,179,517	11/39	Pelosi	200—61
2,211,657	8/40	Hudson	340—259
2,743,925	5/56	Elliott et al.	200—61
3,069,570	12/62	Abadie	200—61

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