April 19, 1966 F. DOLLHEIMER ETAL 3,246,526

TRIP MECHANISM

Filed Jan. 21, 1964 2 Sheets-Sheet 1

FIG. 1

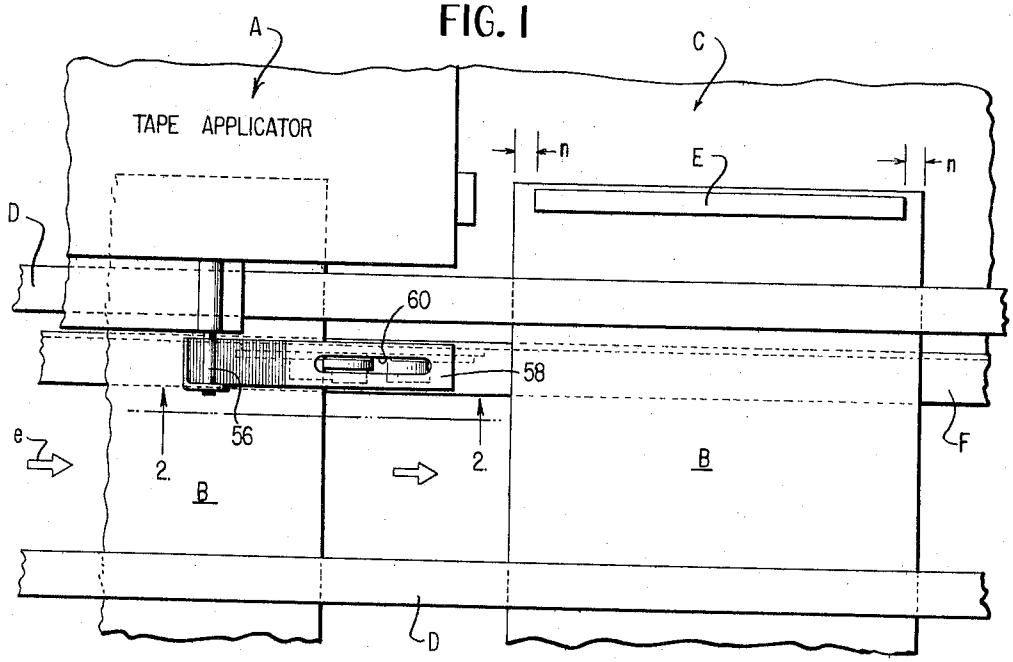


FIG. 2

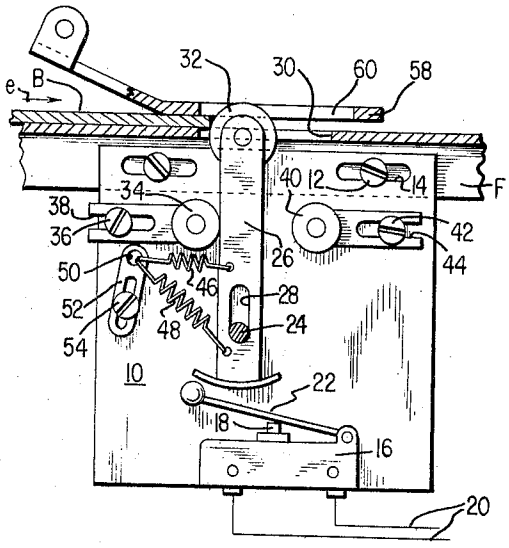
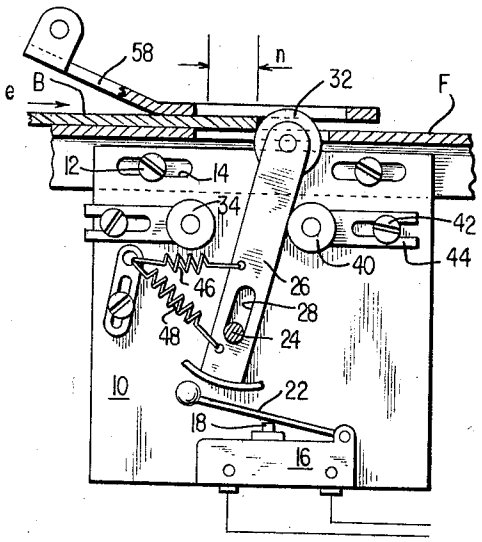


FIG. 3



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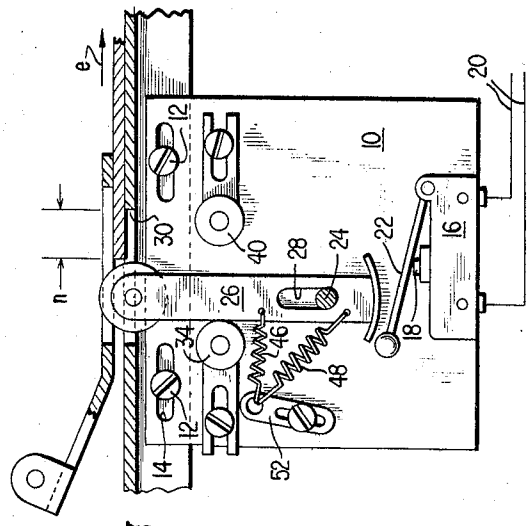


FIG. 6

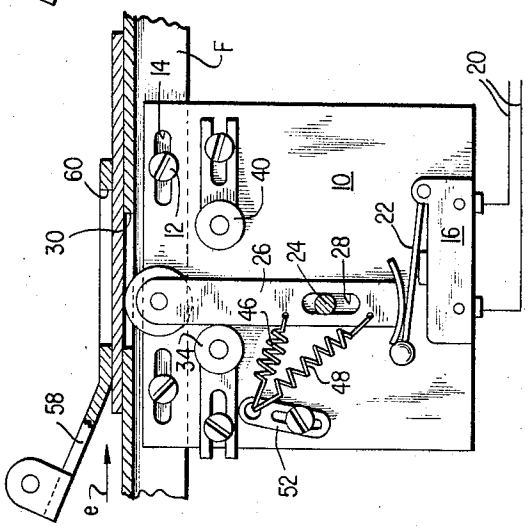


FIG. 5

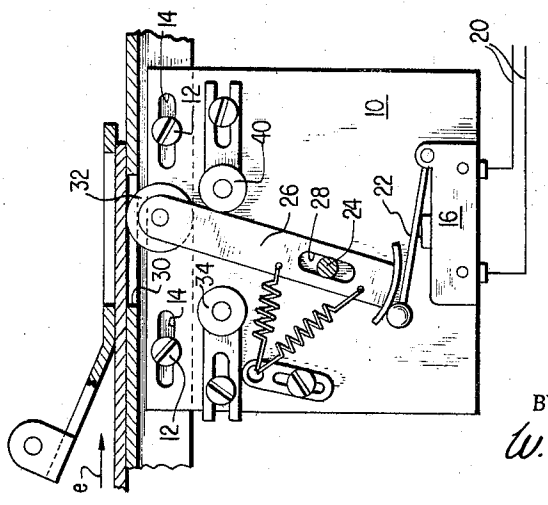


FIG. 4

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3,246,526

TRIP MECHANISM

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Filed Jan. 21, 1964, Ser. No. 339,298
8 Claims. (Cl. 74—1)

This invention relates to a trip mechanism for operating a tape applying machine or the like in response to the position of a work piece as it is moved along a fixed path.

In the manufacture of bags, cartons or other containers of paper board, fabric, plastic, plywood and other materials, it is common practice to apply a strip of tape or adhesive material to the container, or to a blank for making the container, with the ends of the strip terminating at a specified distance from the edges or corners of the container or blank. As the blanks or containers are moved along a fixed path by a conveyor, a tape applying machine is turned on and off in response to the position of the blanks as they pass the tape applying machine. This may be accomplished by positioning a plurality of microswitches or other control devices for actuating the machine in the conveyor path to be actuated by the blank or other work piece as it moves along the conveyor path. The positions of the control devices on the conveyor path must be frequently adjusted, particularly where the size of the blank or work piece varies in order that the tape is applied properly to the moving work piece.

An object of this invention is to provide a work piece actuated trip mechanism for turning a control device on and off when the leading and trailing ends, respectively, are at selected distances from the trip mechanism, irrespective of the length of the work piece traversing the trip mechanism.

Still another object is to provide a trip mechanism operable to depress and release the operating member of a control device in response to movement of a work piece past a trip mechanism with the depression and release of the operating member occurring when the leading and trailing ends, respectively, of the work piece are at selected adjustable distances from the trip mechanism.

Yet another object is to provide a work piece actuated trip mechanism for controlling a tape applying machine or the like with a single microswitch or similar control device.

In achievement of the foregoing, and other objects, a supporting plate member is mounted beneath a work table in a plane parallel to the path of movement of articles along the work table past a tape applying machine. Projecting from the support plate into the path of movement of the articles or blanks, is an actuating arm which is connected with the supporting plate by a pin and slot connection permitting both pivotal and reciprocal movement of the actuating arm with respect to support plate. Adjustable stop members are mounted on the inlet and discharge of the actuating arm for limiting the pivotal movement of the actuating arm on the plate member toward either end of the path of movement. Tension springs bias the actuating arm into pivotal engagement with the stop member on the inlet side of the path of movement with the end of the actuating arm projecting into the path of the moving articles. As articles advance along the work table from the inlet toward the discharge end, they successively engage the actuating arm causing it to pivot into engagement with the limit stop toward the discharge end of the work table, and the work piece then overrides the actuating arm to depress it into engagement with the operating

plunger of a microswitch to actuate the tape applying machine. The distance that the blank travels from the time its leading end strikes the actuating arm until the actuating arm engages the limit stop toward the discharge end of the path of movement determines the spacing of the end of the tape from thte leading end of the blank since the tape machine is inactive during this portion of the travel. During the time that the actuating arm is depressed by the blank, a strip of tape or adhesive is applied to the blank continuously as it advances toward the discharge end of the work table. As soon as the actuating arm is depressed, it returns to its position in abutment with the limit stop at the inlet side of the work table due to the biasing force of the spring, but remains in its depressed position. As soon as the trailing end of the blank passes over the upper end of the actuating arm, it then returns to its projected position to release the switch and turn off the tape machine.

Other objects, features and advantages of the invention will become apparent from the following description taken in connection with the accompanying drawings in which:

FIG. 1 is a partial plan view of the work table and tape applying machine illustrating the position of the trip mechanism embodying the invention;

FIGS. 2 through 6 are elevational views of the trip mechanism embodying the invention in its preferred form illustrating the successive steps in the operation of the trip mechanism as a blank or work piece moves past the trip mechanism.

With reference to FIG. 1, the tape applying machine A of conventional construction is supported on a work table C. Work pieces B, such as blanks for making containers, are advanced along work table C in a fixed path by conveying means (not shown), and are successively passed beneath the tape applying machine which attaches a strip of tape E along the length of the work piece. Work pieces B may be in the form of blanks for making cartons, bags, or other containers, or may be finished containers or any other articles to which a strip of tape is to be applied. In the illustrated embodiment, a strip of tape E is applied along one edge of the work piece, with the ends of the strip of tape spaced a distance "*n*" from the leading and trailing ends of the work piece.

Secured along one edge of the work table C is a frame member F, and the blanks or work pieces B pass beneath hold-down belts D as they pass from the inlet end (at the left of FIG. 1) to the discharge end (to the right of FIG. 1) of the work table or path of movement. Work pieces B are conveyed by any conventional type of conveying means such as a belt conveyer, or roller type conveyers.

Frame member F may be in the form of an angle section, and secured to the vertical flange of frame member F is a supporting member or plate **10** which lies in a plane parallel to the direction of movement of the work pieces as indicated by arrows *e*. Plate **10** is secured to frame member F by conventional screws **12** which are received in elongate slots **14** formed in plate member **10** permitting the plate member to be adjusted longitudinally along frame member F. Mounted along the lower edge of plate member **10** is a microswitch or other control device **16** having a movable operating plunger **18**. Electrical wires **20** connect switch **16** with the tape applying machine A and when plunger **18** is in its extended position as shown in FIG. 2, the tape machine is turned off, and when plunger **18** is depressed into the microswitch casing, the tape machine is actuated to apply tape to the moving work pieces. Thus, as the work pieces advance in the direction of arrows *e*, they successively depress

and release plunger 18 of the microswitch to turn the tape applying machine on and off by means of the mechanism to be presently described.

Pivotally mounted at one end on control device 16 is an operating lever 22 which rests on plunger 18 and serves to operate the plunger between its extended and depressed positions. Projecting outwardly from plate 10 is a pivot pin 24 which is received in a slot 28 of an actuating arm 26. As shown in FIG. 1, actuating arm 26 projects upwardly through a slot 30 formed in the horizontal flange of frame member F into the path of the moving work pieces B. Mounted at the end of actuating arm 26 is a roller 32.

Counterclockwise movement of actuating arm 26 about pivot pin 24 is limited by a stop member 34 in the form of a roller which is mounted on a slotted bracket 38 and secured to plate member 10 by a screw 36 received in the slot of bracket 38. Stop member 34 limits pivotal movement of actuating arm 26 toward the inlet end of the work table or path of movement. By loosening screw 36, the position of stop member 34 relative to pin 24 can be adjusted along the length of the slot in bracket 38. Similarly, clockwise movement of actuating arm 26 about pin 24, or toward the discharge end of the path of movement, is limited by stop member 40, which also may be in the form of a roller mounted on the end of a slotted bracket 44 and secured to plate 10 by a screw 42. With stop members 34 and 40 on either side of actuating arm 26, actuating arm 26 may pivot in a plane parallel to the direction of movement as indicated by arrows *e* within the limits determined by the spacing of stop members 34 and 40.

Actuating arm 26 is biased into engagement with the inlet stop member 34 by a pair of tension springs 46 and 48. Springs 46 and 48 each have one of their ends secured to actuating arm 26 on opposite sides of pivot pin 24 with their other ends received in an eyelet 50 formed in a spring support bracket 52 secured to plate 10 by a screw 54. Bracket 52 is slotted to permit both angular and linear adjustment of bracket 52 on plate 10, and hence the tension forces of springs 46 and 48. Springs 46 and 48 cooperate to bias actuating arm 26 to project upwardly into the path of movement of the work pieces B, and also bias the actuating arm into engagement with the stop member 34 on the inlet side of the actuating arm.

Mounted on the end of a rod 56 projecting from tape applicator A is a guide member 58 having a slot 60 formed therein which registers with slot 30 of frame member F. Guide member 58 rests against the top of the blanks or work pieces as they advance along the work table beneath the tape applicator A.

As blanks B advance in the direction of arrows *e*, the leading edge of each blank strikes roller 32 at the upper end of actuating arm 26 initially causing actuating arm 26 to pivot in a clockwise direction about pivot pin 24 to move it out of engagement with stop member 34 and into engagement with stop member 40 as shown in FIGS. 2 and 3. The distance *"n"* that the blank travels from the time that actuating arm 26 moves out of engagement with stop member 34 which is adjacent the inlet side of the path of movement and into engagement with stop member 40 adjacent the discharge end of the path of movement, is the distance from the leading end of the blank at which the tape machine is actuated.

When actuating arm 26 engages stop member 40, blank B overrides actuating arm 26 as shown in FIG. 4 to depress the actuating arm along slot 28 causing it to depress lever 26 and operating plunger 18 to actutate the tape machine. As soon as the blank overrides roller 32 to depress the actuating arm and retract it from the path of the blank, springs 46 and 48 cooperate to pivot actuating arm 26 in a counterclockwise direction about pin 24 until it again engages the inlet stop member 34 as shown in FIG. 5. In the latter position, plunger 18 is still in its depressed position and the tape machine continuously applies tape to the moving blank or work piece B. As the trailing end of the blank passes over roller 32, actuating arm 26 is released and springs 46 and 48 return it to its projected position to release plunger 18 and cut off the tape machine as shown in FIG. 6. Tape machine A is cut off when the trailing end of the blank is a distance *"n"* from the point at which the trailing end of the tape is cut from the supply. At the latter point, the strip of tape is cut from the machine and the tape E is centered on the blank B as shown in the right-hand blank in FIG. 1, with the ends of the tape a distance *"n"* from each of the leading and trailing ends of the blank.

By adjusting the positions of stop members 34 and 40, or the position of plate 10 on frame F through screws 12 and slots 14, the distance *"n"* can be varied as desired. The length of the work piece traversing actuating arm 26 is independent of the distance *"n"* since the control device or switch 16 is in its actuated position so long as the work piece is passing over the actuating arm. Consequently, operating plunger 18 of the control device is depressed after the leading end of the blank has passed a distance *"n"* from the point at which it strikes actuating arm 26, and remains in its depressed position until the trailing end of the blank is the same distance from the same point, at which point the plunger is released causing the tape machine to cut the tape.

It should be understood that the tape applying machine A is of conventional construction and the details thereof form no part of the present invention. Moreover, while the trip mechanism has been described in conjunction with a machine for applying tape to moving work pieces, it is apparent that it has other uses wherein it is desired to delay the actuation of a switch or control device actuated by moving work pieces.

While we have described and illustrated one embodiment of our invention, we wish it understood that we do not intend to be restricted solely thereto, but that we do intended to cover all modifications thereof which would be apparent to one skilled in the art, and which come within the scope and spirit of this invention.

What is claimed is:

1. A trip mechanism for actuating a control device having a movable actuating arm comprising;
   - a support member,
   - an actuating arm mounted on said support member for pivotal as well as limited reciprocable movement relative to the support member,
   - a first limit stop mounted on the support member on one side of the actuating arm for limiting the pivotal movement of the actuating arm in one direction,
   - a second limit stop mounted on the support member on the other side of the actuating arm for limiting the pivotal movement of the actuating arm in the other direction,
   - and means biasing said actuating arm into pivotal engagement with one of said limit stops, and to one extremity of its reciprocable movement relative to the support member.

2. A trip mechanism as defined in claim 1 in which;
   - said actuating arm is connected with the support member by means of a pin and slot connection with the limits of reciprocable movement of the actuating arm defined by the length of the slot,
   - and said biasing means comprises;
     - a first spring having one of its ends connected with said actuating arm on one side of the pin of the pin and slot connection, and its other end connected at a point on the support member spaced from the pin and slot connection,
     - a second spring having one of its ends connected with said actuating arm on the opposite side of the pin from said one end of said first spring, and its other end connected at said point on the support member.

3. A delayed action trip mechanism comprising;
a support plate,
a pivot pin projecting from the support member,
a slotted actuating arm mounted on said pivot pin for limited reciprocal movement and rotation relative to said pivot pin in a plane parallel to the plane of the support plate,
a pair of spaced limit stops on said support member, one on each side of the actuating arm for limiting rotation of said actuating arm about said pivot pin in either direction,
and means biasing the actuating arm to a position in abutment with one of the limit stops with the pivot pin engaged with one end of the slot of the actuating arm.

4. In apparatus for applying a strip of tape or the like along the length of a workpiece parallel to the direction of movement of the workpiece as it advances along a fixed path having an inlet end and a discharge end, with the ends of the tape spaced a selected distance from the leading and trailing ends of the moving workpiece,
a plate member supported in a plane parallel to the direction of movement of the workpiece,
an actuating arm mounted on the plate member for rotation and reciprocation relative to the plate member in a plane parallel to the path of movement of the workpiece,
means biasing the actuating arm to project into the path of the workpiece and against rotation on the plate member toward the discharge end of the path of the workpiece,
stop means on the plate member for limiting the rotation of the actuating arm toward the discharge end of the path of the workpiece,
and a control device having an operating member biased to an extended position and movable by said actuating arm upon retraction of the actuating arm from the path of the workpiece to a depressed position,
said actuating arm being engageable by said workpiece in its projected position and pivotable thereby into engagement with the stop member, said workpiece thereafter forcing the actuating arm to its retracted position to depress the operating plunger of the control device.

5. The construction defined in claim 4 in which said biasing means comprises;
a first spring having one end secured to said actuating arm on one side of the axis of rotation thereof and its other end secured at a point on said plate member on the opposite side of the actuating arm from said stop means,
and a second spring having one end secured to said actuating arm on the opposite side of the axis of rotation thereof from said one end of said first spring, and its other end secured to said point on said plate member.

6. The construction defined in claim 4 in which the position of said stop member on said plate member is adjustable, and in which said plate member is adjustable in the direction of movement of the workpiece.

7. The construction defined in claim 4 in which said actuating arm is mounted on the plate member with a pin and slot connection with the pin defining the axis of rotation of the actuating arm and the length of the slot defining the limits of reciprocable movement of the actuating arm relative to the plate member.

8. In apparatus for applying a strip of tape to articles moving along a fixed path from an inlet end to a discharge end with the ends of the strip of tape spaced a selected distance from the leading and trailing ends of the moving articles,
a support member,
a tape applicator control device mounted on the support member,
said control device having a movable operating member biased to project from the control device,
an actuating arm mounted on the support member for pivotal and slidable movement relative to the support member in a plane parallel to the direction of movement of the moving articles,
said actuating arm being movable between an extended position in which it projects into the path of the moving articles and is disengaged from the operating member of the control device, and a retracted position in which it is withdrawn from said path into engagement with said operating member to actuate the control device,
a first limit stop on the support member on the inlet side of said fixed path from the actuating arm engageable by the actuating arm to limit the pivotal movement of the actuating arm toward the inlet end of the fixed path,
a second limit stop on the support member on the discharge side of the actuating arm engageable by the actuating arm for limiting the pivotal movement of the actuating arm toward the discharge end of the fixed path,
and means biasing the actuating arm to its extended position and into engagement with said first limit stop,
the leading end of the moving articles being operable to engage the actuating arm to sequentially (1) pivot the actuating arm into engagement with the second limit stop and (2) thereafter override the actuating arm to move it from its extended to retracted position to actuate said operating member.

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MILTON KAUFMAN, *Primary Examiner.*