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SAFETY DEVICE FOR LABELING MACHINES

Filed May 2, 1945

2 Sheets—Sheet 1

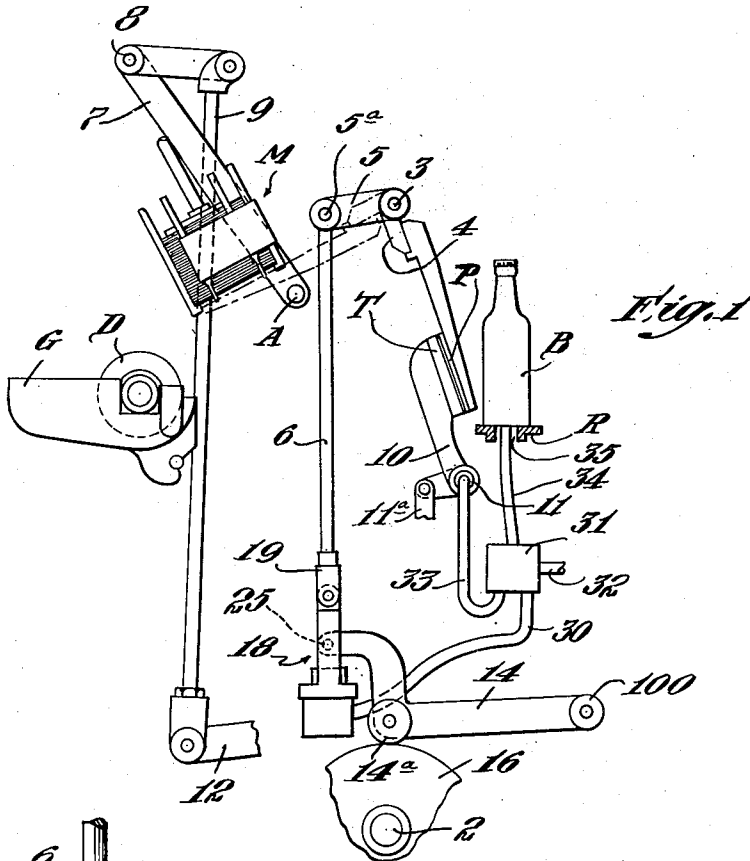


Fig. 1

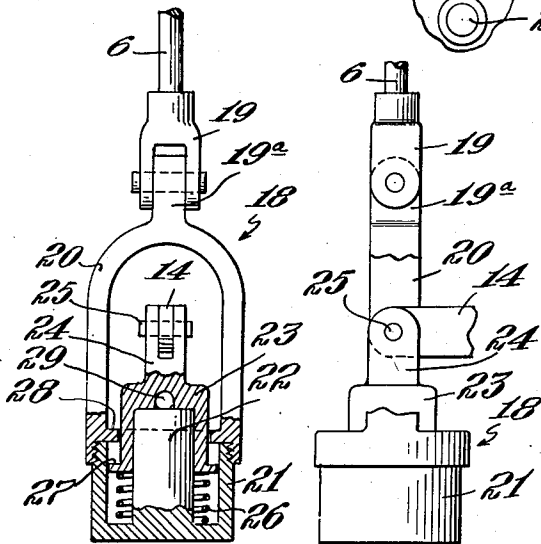


Fig. 2

Fig. 3

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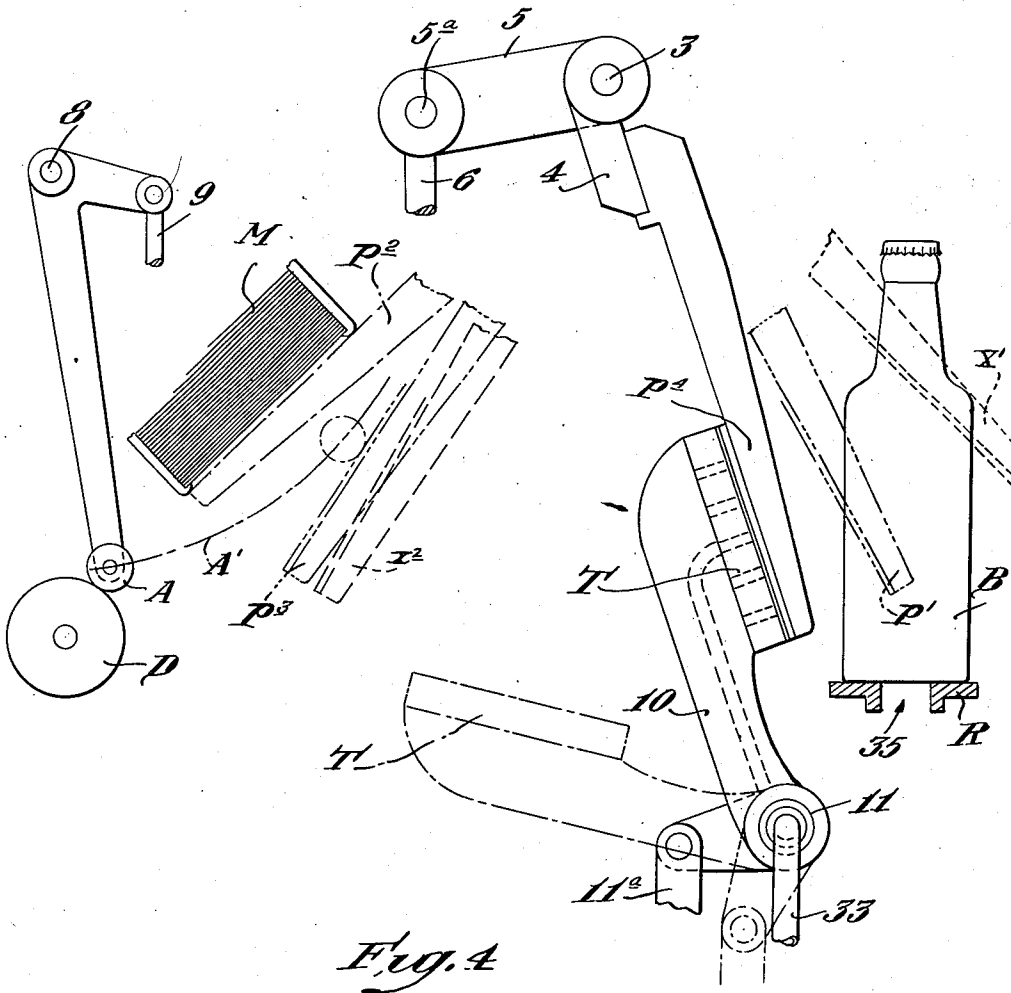


Fig. 4

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# UNITED STATES PATENT OFFICE

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## SAFETY DEVICE FOR LABELING MACHINES

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8 Claims. (Cl. 216—54)

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This invention relates to labeling machines and has for its principal object the provision of a safety device operative to prevent the label picker from withdrawing a label from the magazine except when an article is in position to receive the label. In automatic labeling machines it is not always possible to assure so constant a supply of the articles to be labeled that such an article will be in the label-receiving position every time the label-picking and applying cycle is performed. If the machine continues to run in the absence of articles to be labeled, the picker will ordinarily continue to remove labels one after another from the magazine, and the accumulated, gummed labels eventually drop off and are wasted, the dropped labels adhering to adjacent parts, and sometimes even jamming the machine.

In accordance with the present invention, novel control means is provided whereby, in the absence of an article from the label-receiving position, no label will be withdrawn from the magazine. Other and further objects and advantages of the invention will be pointed out in the following more detailed description and by reference to the accompanying drawings, wherein:

Fig. 1 is a fragmentary side elevation of a labeling machine of more or less conventional type, but embodying the present invention;

Fig. 2 is a fragmentary front elevation, partly in vertical section, illustrating details of the safety device of the present invention;

Fig. 3 is a side elevation of the part shown in Fig. 2; and

Fig. 4 is a fragmentary side elevation to larger scale indicating the path of movement of the picker and associated elements under different conditions of operation.

Referring to the drawings, the numeral 2 (Fig. 1) designates the main cam shaft on which are mounted cams for actuating the picking and label-applying devices. Above the shaft 2 there is arranged a horizontal shaft 3 turning in suitable bearings, not shown, to which is secured a pair of rigid arms 4 each carrying one of the blades of the picker P at its free end. This picker is of the kind which operates by having adhesive applied to the faces of its blades, after which the picker moves to bring its adhesively coated surfaces into contact with the exposed label in the magazine M, the picker then retreating from the magazine, carrying the label adhering to its gum coated surface. The shaft 3 is provided with an actuating arm 5 which is connected at 5<sup>a</sup> to the upper end of a rigid actuating rod 6. The picker P, here chosen for illustration, is of the general

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type disclosed more fully in the patent to Holm, No. 1,901,101, dated March 14, 1933, and comprising two adhesive-receiving blades disposed in edge-to-edge relation but capable of being moved toward and from each other by appropriate automatic mechanism.

The machine comprises a gum reservoir G in which turns a gum delivery roll D with which cooperates a gum transfer roll A carried by an arm 7 secured to a shaft 8, turning in suitable bearings (not shown). The shaft 8 has a second arm to which is attached the upper end of an actuating rod 9. After receiving the label, the picker swings away from the label magazine to the transfer position indicated at P<sup>4</sup> (Fig. 4) at which the transfer pad T is brought into contact with the ungummed surface of the label carried by the picker blades. This transfer pad T is carried by an arm 10 mounted on a hollow shaft 11, turning in suitable bearings, the shaft 11 having a second arm which is connected to the upper end of an actuating rod 11<sup>a</sup>. The transfer pad T is here shown as of the pneumatic type, having a series of suction ports which are connected, by a suitable passage in the arm 10, with the hollow shaft 11. It will be understood that when suction is created at the transfer pad T, the label is caused to adhere to the transfer pad so that when the picker blades are now laterally separated, the label is left on the transfer pad.

The lower end of the rod 9 is connected to the free end of a lever 12 whose other end is pivotally supported at 100, the lever 12 being provided with a cam follower roll (not shown) which engages a suitably contoured cam (not shown) on the shaft 2. The rod 11<sup>a</sup> is likewise connected at its lower end to a lever arm (not shown) also pivoted at 100 and which has a cam follower roll engaging a cam (not shown) on the shaft 2. A third lever 14 is also pivoted at 100 and is provided with a cam follower roll 14<sup>a</sup> (Fig. 1) which engages a suitably contoured cam 16 on the shaft 2.

The motion of the free end of the lever 14 is transmitted to the picker-actuating rod 6 through the connecting means 18 shown in detail in Figs. 2 and 3. The lower end of the rod 6 is provided with a fork 19 to which is pivotally connected a lug 19<sup>a</sup> at the upper end of a stirrup member 20. The lower part of this stirrup member 20 consists of a cup-like part comprising a cylindrical annular guide 21 and an upwardly directed cylindrical piston member 22. A cylinder 23 telescopes over this piston 22 and is provided with a lug 24 at its upper end which is connected by means of a pin 25 to the free end of the lever 14. A spring

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26 tends to separate the piston 22 and the cylinder 23, their relative movement away from each other being limited by stop members 27 and 28. The cylinder 23 is provided with a cavity 29 in its closed end, this cavity communicating with the space within the cylinder when the piston and cylinder are separated. The cavity 29 is connected by a flexible conduit 30 (Fig. 1) to a valve casing 31 which is connected by a conduit 32 to a suitable vacuum pump, not shown. Another conduit 34 extends from the valve casing 31 to a port 35 in the rest R which supports the article, for example, a bottle B, while the label is being applied. Another conduit 33 extends from the valve casing 31 to the hollow shaft 11 of the transfer pad T.

When an article to be labeled rests on the support R, it closes the port 35 and thus low pressure or suction may be maintained in the conduits 30 and 34 and in the cavity 29 in the cylinder 23. So long as this low pressure is maintained in the cavity 29, the cylinder 23 is drawn down onto the piston 22 in opposition to the spring 26. The distance between the pin 25 and the pin 5<sup>a</sup> which connects the upper end of the rod 8 to the arm 5, is thus at a maximum. When the parts are in this position, the rotation of the cam 16 rocks the lever 14 and causes the picker to move through an arc of predetermined extent, for example approximately 75°, whose limits are indicated by the position of the picker shown at P<sup>1</sup> and P<sup>2</sup>, respectively, (Fig. 4). On its way from the position P<sup>1</sup> to the position P<sup>2</sup>, the surface of the picker is exposed at position P<sup>3</sup> (Fig. 4) to the gum transfer roll A which swings along the arc A<sup>1</sup>. After the surface of the picker has been coated with adhesive, the picker continues on to the position P<sup>2</sup>, where it contacts the exposed label in the magazine M, its blades now being close together, the picker then retreating to the transfer point P<sup>4</sup> where the label is contacted by the transfer pad T as above described. At the transfer point, and while the label is held between the picker blades and the transfer pad, the picker blades are widely separated, thus spreading the adhesive evenly over the label and opening a gate for the passage of the transfer pad on its way from the transfer point to the label-applying position. This cycle of operations is continued so long as there is an article on the rest R in readiness to receive a label.

However, if the rest R is empty so that the port 35 is open, the suction in the line 34—30 is broken and the pressure rises in the cavity 29, thus permitting the spring 26 to push the cylinder 23 upwardly. This brings the pin 25 nearer to the pin 5<sup>a</sup> and since the throw of the lever 14 is constant, the result is to shift the positions of the limits of the arc of swing of the arm 5. The arrangement is such that under these conditions the picker no longer swings through the maximum arc between the points P<sup>1</sup> and P<sup>2</sup>, but instead swings through an arc whose limits are indicated at X<sup>1</sup> and X<sup>2</sup> (Fig. 4). In thus swinging through this latter arc, the picker not only fails to enter the magazine so as to withdraw the label therefrom, but does not reach the gum receiving position P<sup>3</sup>. Instead of dwelling at the transfer position, where it might be contacted by the transfer pad T, it continues on toward the limit X<sup>1</sup>, and dwells at a point such that the pad T does not contact it. Thus there is no danger that the picker will remove the label from the magazine nor that it will receive a coating of adhesive nor dwell at the transfer position

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where it might contact the transfer pad. While it is desirable to shift the path of the picker so that it moves between limits such as shown at X<sup>1</sup> and X<sup>2</sup>, the more essential feature is to prevent the picker from entering the magazine and withdrawing the label therefrom, and thus, if it be preferred, the path of the picker need not be shifted so far as indicated in Fig. 4, so long as it does not reach the position indicated at P<sup>2</sup> at which it actually encounters the label in the magazine.

While one desirable embodiment of the invention has been illustrated and described by way of example, it is to be understood that the invention is not necessarily limited to the precise arrangements disclosed but is to be regarded as broadly inclusive of any equivalent constructions falling within the terms of the appended claims.

I claim:

1. In a labeling machine of the kind wherein a picker element normally receives adhesive from a supply, presses its adhesive coated surface against the exposed label in a magazine, withdraws the label from the magazine and conveys it to a transfer point, a picker, a picker-actuating cam designed to move the picker through a path such that the picker may perform its normal cycle of operation, and control means responsive to the presence or absence, respectively, at the label-applying point, of an article to be labeled, said controlling means being operative so to limit the movement of the picker along said path as to prevent the picker from receiving its usual coating of adhesive.

2. In a labeling machine of the kind wherein a picker element normally receives adhesive from a supply, presses its adhesive coated surface against the exposed label in a magazine, withdraws the label from the magazine and conveys it and causes it to dwell at a transfer point, a movable picker, a picker-actuating cam designed to move the picker through a path of such extent as to permit it to perform its normal cycle of operations, and control means responsive to the presence or absence, respectively, at the label-applying point, of an article to be labeled, said control means being operative so to augment the movement of the picker along said path as to prevent the picker from dwelling at the label transfer point.

3. In a labeling machine of the kind wherein a picker element normally receives adhesive from a supply, presses its adhesive coated surface against the exposed label in a magazine, withdraws the label from the magazine and conveys it to a transfer point, a magazine, a movable transfer pad, a swinging picker, a picker-actuating lever, and means for transmitting motion from the lever to the picker including a rod having a stirrup attached to its end, the stirrup supporting a piston, a cylinder telescoping over the piston, a spring urging the piston away from the cylinder, means pivotally uniting the cylinder to the picker-actuating lever, and pneumatic means responsive to the presence or absence, respectively, at the label-applying point, of an article to be labeled, to vary the pressure in the cylinder, thereby to vary the effective length of the motion-transmitting connections.

4. In a labeling machine of the kind wherein a picker element normally receives adhesive from a supply, presses its adhesive coated surface against the exposed label in a magazine, withdraws the label from the magazine and conveys it to a transfer point, a magazine, a movable transfer pad, a support for an article to be labeled, a swinging

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picker, a cam designed to impart motion to the picker through an arc of sufficient extent to move the picker through its normal cycle, a lever actuated by the cam, and connections for transmitting motion from the lever to the picker, including a rod having a piston attached to its end, a cylinder which telescopes over the piston, means pivotally connecting the cylinder to the cam-actuated lever, a spring tending relatively to move the piston and cylinder, thereby varying the effective length of the motion-transmitting mechanism, the support for the article to be labeled having an air admission port which is closed by an article resting on the support, vacuum pump means tending to withdraw air from the cylinder thereby to cause the piston and cylinder to move in opposition to the spring, and means connecting the interior of the cylinder with the air admission port in the article rest whereby, in the absence of an article from said rest, air is admitted to the cylinder thereby permitting the spring relatively to move the piston and cylinder.

5. In a labeling machine of the kind wherein a picker element normally receives adhesive from a supply, presses its adhesive coated surface against the exposed label in a magazine, withdraws the label from the magazine and conveys it to a transfer point, a picker, a picker-actuating cam designed to move the picker through a path such that the picker may perform its normal cycle of operation, and pneumatic control means responsive to the presence or absence respectively, at the label-applying point of an article to be labeled, and including means defining an inlet port normally closed by an article in the label-applying position, said control means being operative so to limit the movement of the picker along said path as to prevent the picker from receiving its usual coating of adhesive.

6. In a labeling machine of the kind wherein a picker element normally receives adhesive from a supply, presses its adhesive coated surface against the exposed label in a magazine, withdraws the label from the magazine and conveys it and causes it to dwell at a transfer point, a movable picker, a picker-actuating cam designed to move the picker through a path of such extent as to permit it to perform its normal cycle of operations, and pneumatic control means responsive to the presence or absence, respectively, at the label-applying point, of an article to be labeled, said control means including a conduit having a port designed to be closed by the article to be labeled when the article is properly disposed in label-receiving position, said control means being operative if said

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port remains open when an article should be in the label receiving position so to augment the movement of the picker along said path as to prevent the picker from dwelling at the label transfer point.

7. In a labeling machine of the kind wherein a picker element normally receives adhesive from a supply, presses its adhesive coated surface against the exposed label in a magazine, withdraws the label from the magazine and conveys it to a transfer point, a picker, a picker-actuating cam designed to move the picker through a path such that the picker may perform its normal cycle of operation, and wherein a work rest, for supporting the article in position to receive a label, is provided with a port which is closed by an article properly positioned upon the rest, pneumatic control means responsive to the presence or absence respectively of an article to be labeled upon the work rest, said control means including a suction conduit leading from said port in the work rest, the controlling means being operative so to limit the movement of the picker along said path as to prevent the picker from receiving its usual coating of adhesive.

8. In a labeling machine of the kind wherein a picker element normally receives adhesive from a supply, presses its adhesive coated surface against the exposed label in a magazine, withdraws the label from the magazine and conveys it to a transfer point, a picker, a picker-actuating cam designed to move the picker through a path such that the picker may perform its normal cycle of operation, and pneumatic control means including a conduit having an entrance port designed to be closed by the article to be labeled when the article is properly disposed in label-receiving position, said control means being operative so to limit the movement of the picker along said path as to prevent the picker from receiving its usual coating of adhesive in the absence of an article from the label-receiving position at that time in the cycle of operations when an article should be in port closing position.

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