May 20, 1941. C. HOLM 2,242,974

LABELING MACHINE

Original Filed July 19, 1939 4 Sheets-Sheet 1

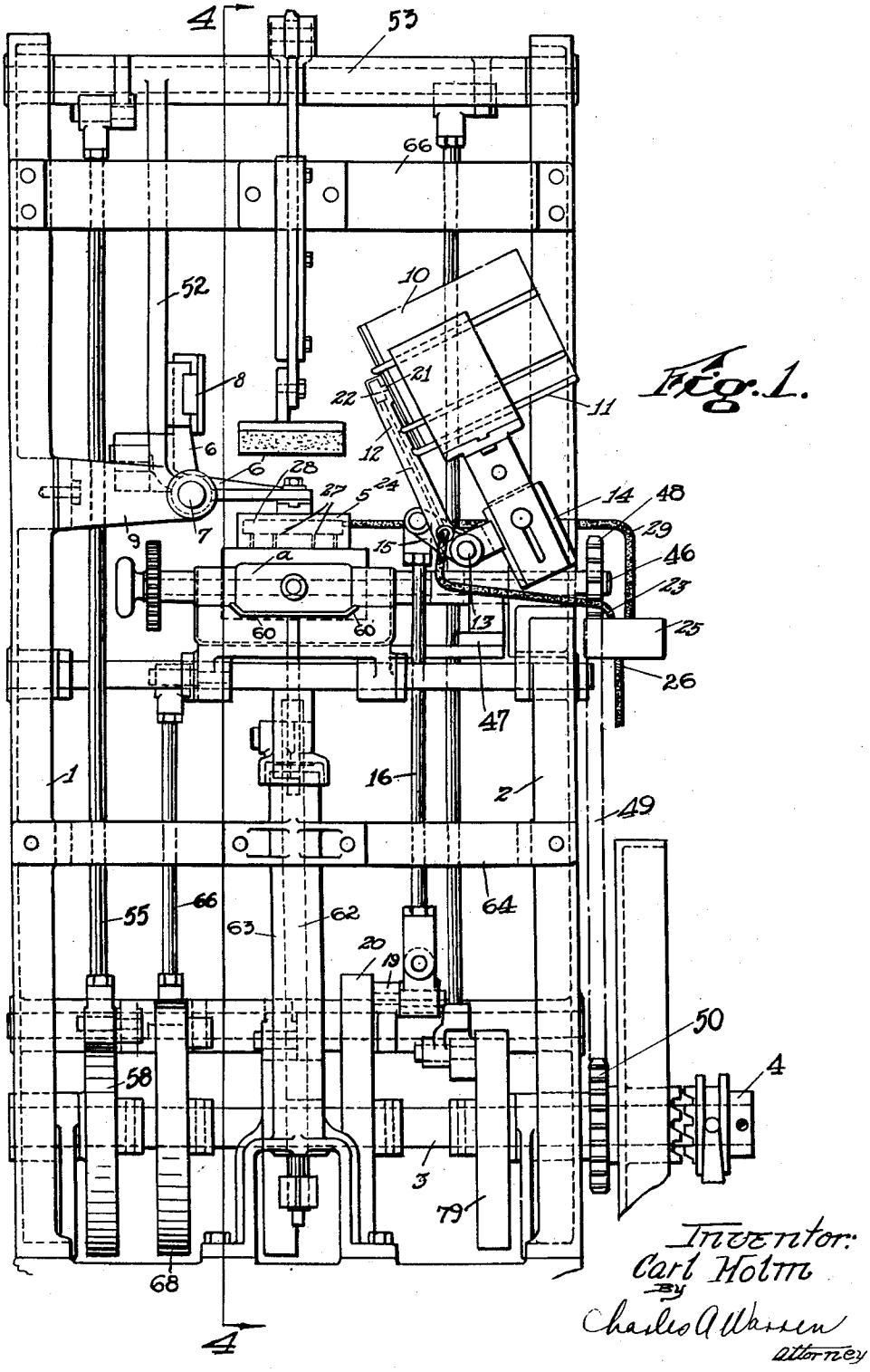


Fig. 1.

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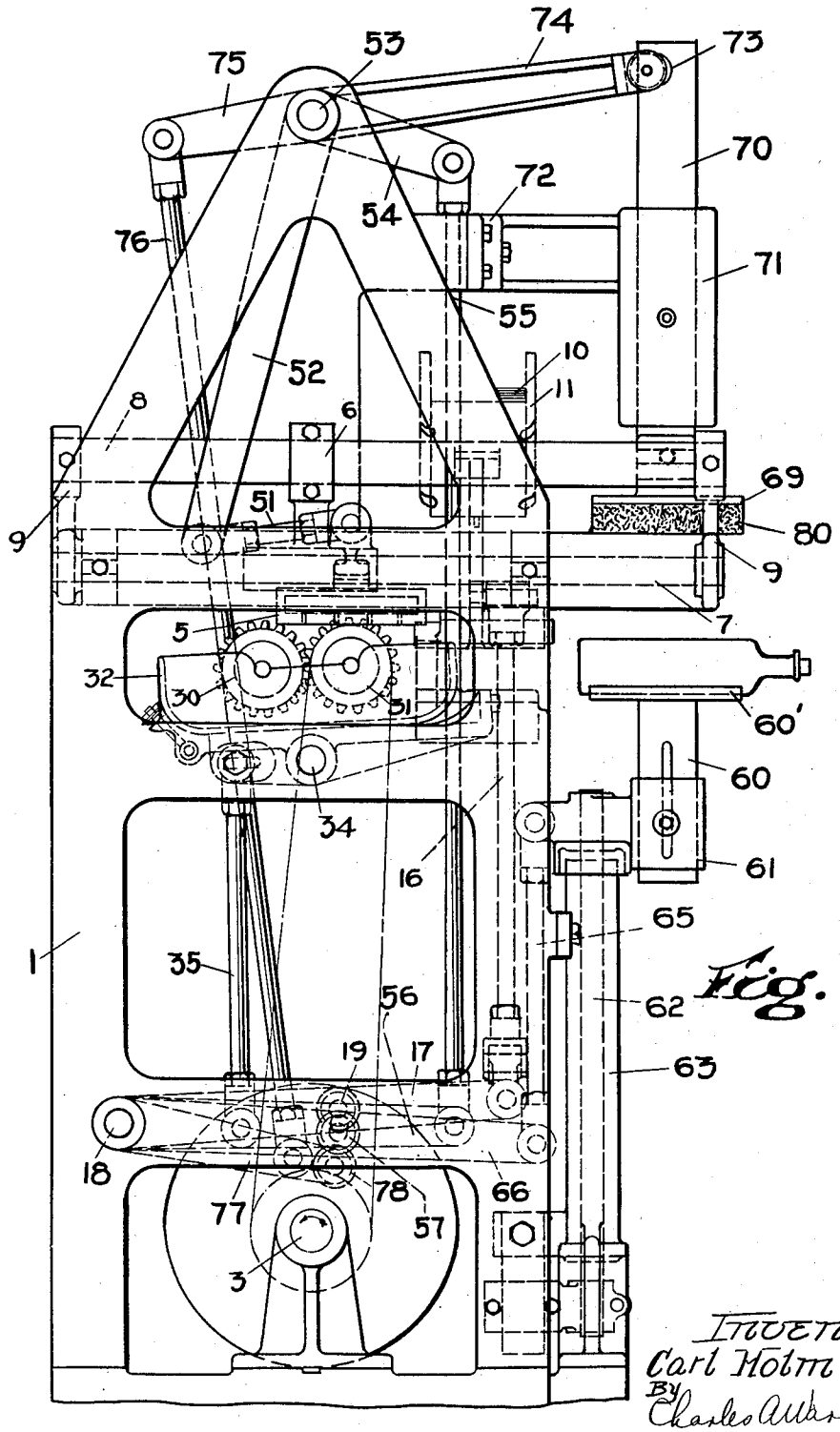


Fig. 2.

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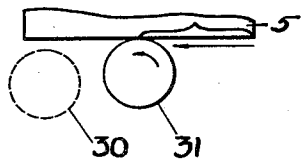


Fig. 5.

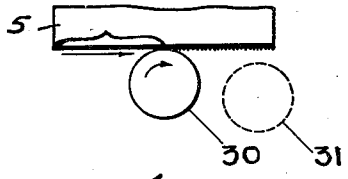


Fig. 6.

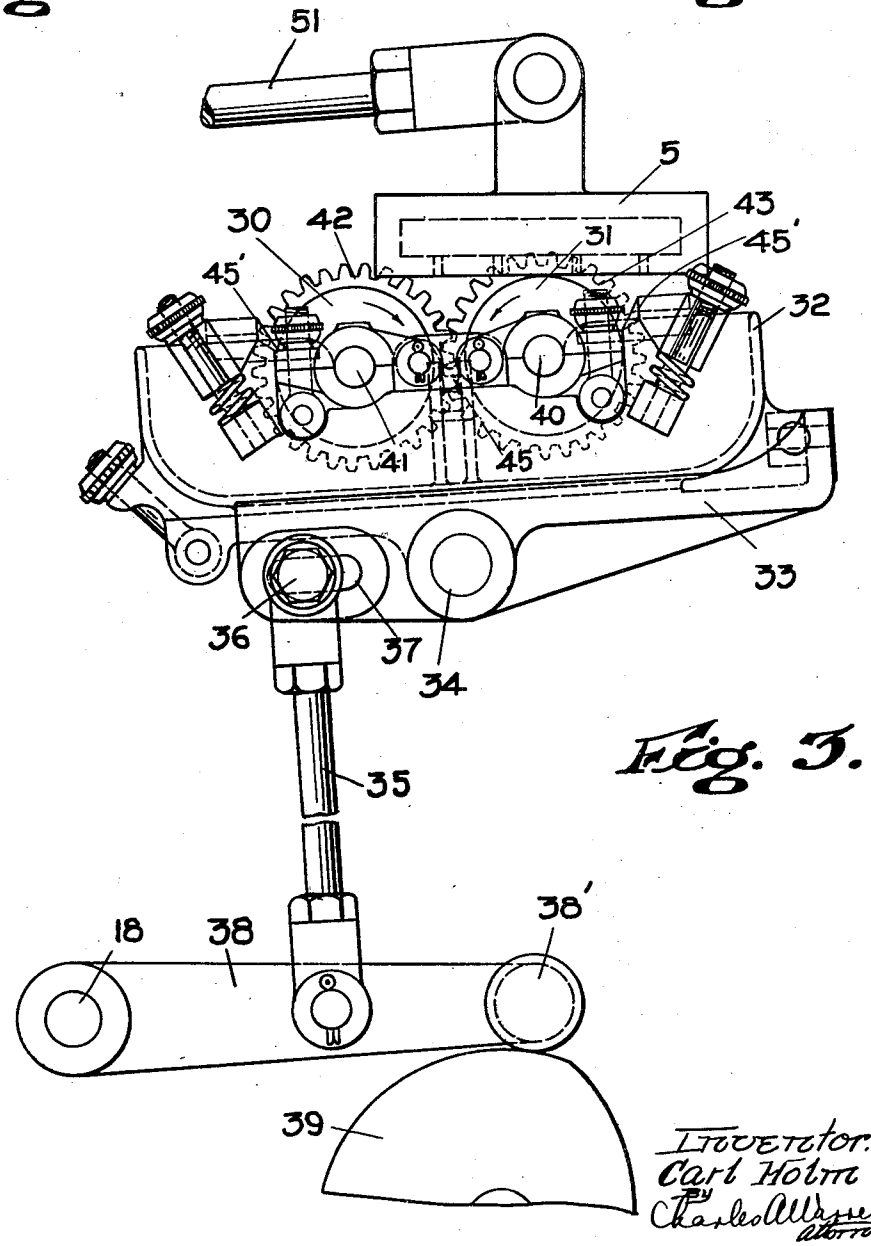


Fig. 3.

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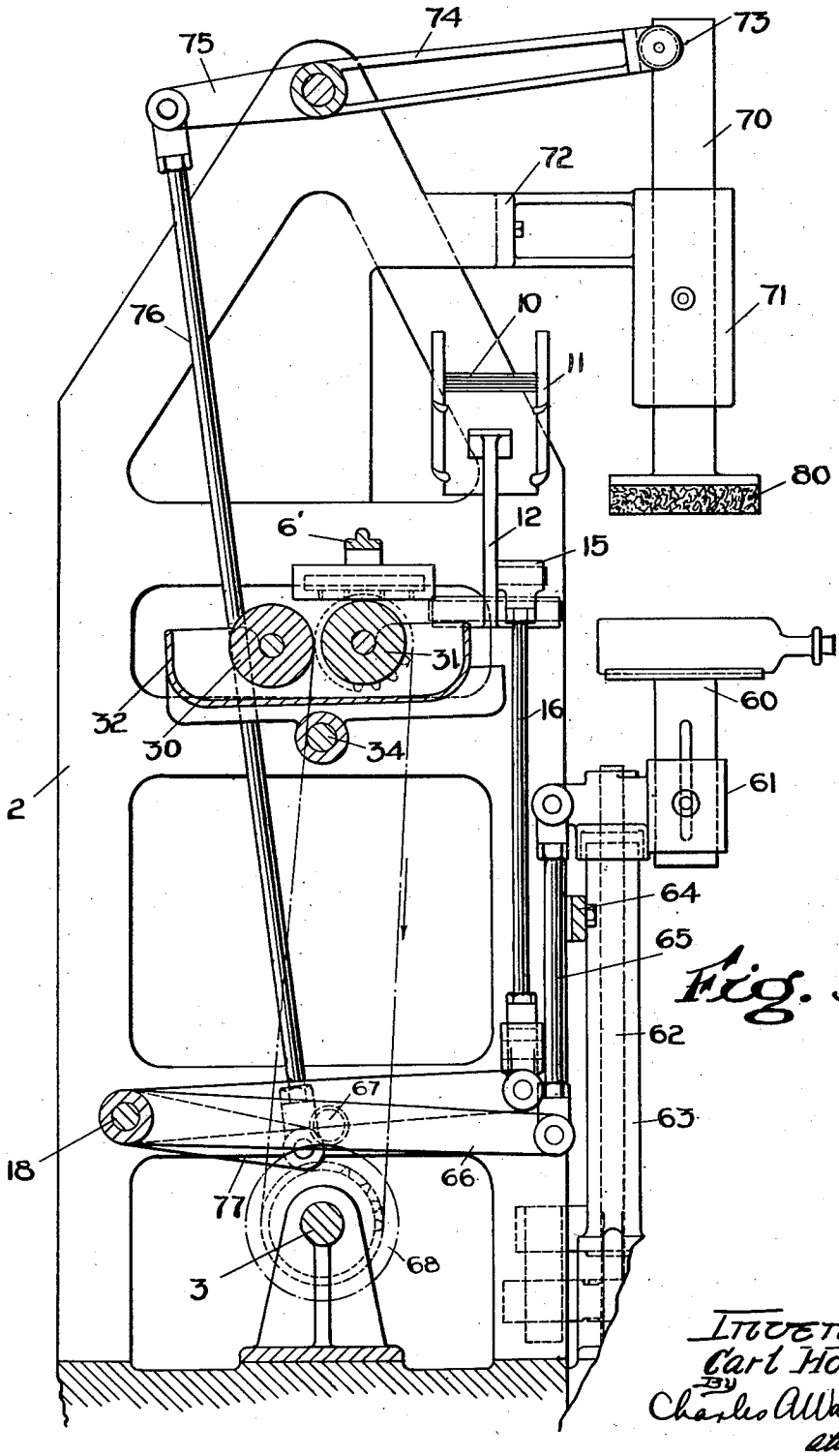


Fig. 4.

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Patented May 20, 1941

2,242,974

UNITED STATES PATENT OFFICE

2,242,974

LABELING MACHINE

Carl Holm, Worcester, Mass., assignor to Economic Machinery Company, Worcester, Mass., a corporation of Massachusetts

Original application July 19, 1939, Serial No. 285,306. Divided and this application February 7, 1940, Serial No. 317,712

9 Claims. (Cl. 216—55)

The present invention relates to a machine for applying labels to articles such as bottles. This application is a division of my copending application for Labeling machine, filed July 19, 1939, Serial No. 285,306.

One of the features of the invention is the provision of a movable support which, in its lowest position, receives each bottle or other article to be labeled, and then moves upwardly to a position where a label is applied to and pressed securely onto the article, this motion affordinig the maximum room for the presentation and withdrawal of the article as well as materially reducing the time required for each labeling operation of the machine. The machine also provides a novel and compact arrangement of its several instrumentalities, involving the disposal of its label holder between the gum-applying mechanism and the bottle or other article to be labeled.

Other and further objects and advantages of the invention will hereinafter more fully appear from the following description taken in connection with the accompanying drawings in which—

Fig. 1 is a front elevation of a machine embodying the invention.

Fig. 2 is a side elevation of the machine of Fig. 1.

Fig. 3 is a larger scale fragmentary side elevation of the gumming apparatus.

Fig. 4 is a sectional view substantially along the line 4—4 of Fig. 1, showing the label carrier, as well as the article supporting mechanism.

Figs. 5 and 6 are diagrammatic views illustrating successive portions of the label-gumming operation.

With reference to the drawings, the machine provides spaced sides or uprights 1 and 2, Fig. 1, having journalled in their base portions the main shaft 3, which carries a plurality of cams for controlling the several machine movements, as will hereinafter appear. The shaft 3 is actuated from any suitable source of power, not shown, through a one revolution clutch 4 of conventional construction. The clutch may be operated by a foot treadle, not shown, through any suitable connections.

The principal label-handling instrumentality of the machine is a horizontally reciprocating carrier 5, having suction openings on its underside by which to seize and hold the front or printed face of each label. Said carrier is suitably suspended from an arm 6', projecting from a member 6 which is slidable on a rod 7 and on a guide 8, both of which extend horizontally from front to rear of the machine and have their support in brackets 9, 9 secured to the upright 1.

The label supply is a stack 10, contained in and held nearly upright, edgewise, by a box or holder 11, which is adjustably mounted on a suitable bracket 14 secured to the side member 2. To an extension of this bracket is pivoted at 13 a hollow arm 12, whose free end, in the upper position (Fig. 1) of said arm, is adapted to engage and seize by suction the rear or unprinted face of the outermost or lowermost label of the stack 10, for removal of said label from the stack by the downswing of said arm. Said downswing of the suction picker 12 disposes the label in a substantially horizontal position, in or just below the plane traversed by the under surface of the carrier 5; with the arrival of said carrier just over the so-positioned label, the suction on the picker 12 is released, and the suction on the carrier is applied, thereby transferring the label from the picker to the under surface of the carrier, which then moves, as hereinafter described, to expose the label to a glue-applying operation, and then to deposit same on the bottle or other article to be labeled.

For the operation of the suction picker 12, a projecting arm 15 thereof has its outer end pivotally connected to a depending rod 16, whose lower end is pivotally connected to a rocker arm 17, journalled on a horizontal rod or shaft 18. Said arm 17 carries a roller 19 which cooperates with a cam 20 on shaft 3; this cam 20 is of the proper contour to produce the up and down swing of the picker 12 in correctly-timed relation to the movement of the label carrier 5.

The suction opening or openings 21 of the picker 12 communicate by an interior chamber 22 with a suction passage 24 extending the full length of the arm; said passage, by means of a flexible hose 23 or the like, is connected to a valve mechanism 25, having a suitable connection 26 to vacuum. Likewise the several suction openings 27 of carrier 5 communicate by an interior chamber 28 and by a flexible hose connection 29 with said valve mechanism 25. The latter is not here illustrated in detail, since its operation will be understood by those skilled in the art; any suitable valve mechanism may be employed to control, in properly timed relation, the application of suction to and the release of suction from the picker 12 and carrier 5.

After a label has been transferred, as hereinbefore described from the picker 12 to the carrier 5, the latter moves rearwardly (toward the left, Figs. 2 and 4) for the application of adhe-

sive to the label. This adhesive is applied first to one-half of the label as the carrier moves rearwardly, and then to the other half of the label as the carrier moves forwardly, this adhesive being supplied by a pair of parallel adhesive-applying rollers 30 and 31, Fig. 3, supported by the side walls of a box 32, which holds the fluid adhesive, and which is supported by a rocking plate 33. The plate is mounted on a shaft 34 extending between the uprights 1 and 2, and rocking of the box is effected through a rod 35 connected at its upper end by a pin 36 and slot 37 to the bracket, and at its lower end to an arm 38, which, like the arm 17, is journalled on the shaft 18. A follower 38' on the arm 38 cooperates with a cam 39 on the shaft 3, to produce the rocking of box 32 at the proper times.

The rollers 30 and 31 are mounted on shafts 40 and 41 journalled in the opposite side walls of the box 32, and these shafts have interengaging gears 42 and 43, Figs. 1 and 3, positioned outside of the box for assuring a rotation of the two rollers in opposite directions. As shown in Fig. 3, a comb 45 is positioned between the rollers, and has opposed edges engageable with the peripheries of the rollers to control the amount of adhesive carried by the roller surfaces. The gum box 32 supports at each end a scraper 45' of conventional construction, for cooperation with each of the rollers 30 and 31.

For driving the rollers 30 and 31, a shaft 46 is journalled in a bracket 47 mounted on the plate 33, Fig. 1. The shaft 46 has on the end thereof a sprocket 48 connected by a chain 49 to a sprocket 50 on the main drive shaft 3. It will be noted that the rotation of the rollers 30 and 31 is such that the upper surfaces of the rollers move toward each other, as indicated by the arrows, Fig. 3, so that the roller surfaces will be moving in the same direction as the label when either roller is engaged thereby.

The label carrier 5 is moved by a link 51, which connects the carrier to the lower end of an arm 52 journalled on a shaft 53, which in turn extends between the upper ends of the uprights 1 and 2. Integral with the arm 52 is a depending arm 54, the outer end of which is connected by a rod 55 to an arm 56 journalled on the shaft 18. The arm 56 carries a cam follower 57 engageable, as shown in Fig. 1, with a cam 58 on the shaft 3.

As the label carrier 5 moves inwardly of the machine (to the left, Fig. 2), the box 32 is tilted counterclockwise, Fig. 3, to bring the right-hand roller 31 against the underside of the label on the carrier, thereby gumming the right-hand half of the label from its middle portion to its right-hand edge, as shown in Fig. 5. As the carrier reverses, and begins its movement to the right, Fig. 3, the box is rocked clockwise, to bring the left-hand roller 30 against the underside of the label for applying gum or adhesive to the left-hand half of the label, from its middle portion to its left hand edge, as shown in Fig. 6. In this way, there is never any chance for the label, in its contact with either gumming roller, to wrap around or follow the roller surface, since the initial contact in each instance is with the label's middle portion, and never with a leading edge of the label. The carrier continues its movement toward the front of the machine (to the right, Fig. 2), until the carrier is in the label-depositing position, viz., the outer limit of its reciprocatory travel.

The bottle *a* or other article to be labeled, is adapted to be positioned on a vertically adjustable support 60, mounted in a member 61 on the upper end of a rod 62 which is vertically slidable in a guide member 63. The latter is supported on a cross bar 64 extending between the uprights 1 and 2. The member 61 has connected thereto a link 65, the lower end of which is connected to an arm 66 turnable on the shaft 18. This arm 66 has a cam follower 67, Fig. 4, cooperating with a cam 68 on the main shaft 3. The cam is so shaped as to raise the bottle *a* into a position directly beneath and practically flush with the label, as soon as the suction carrier 5 reaches its label-depositing position, so that the adhesive-coated lower surface of the label will contact the bottle, immediately upon the release of the suction exerted on said label by the carrier 5. The bottle *a* is held against undue displacement on its support by the lateral wings 60' thereon, best shown in Fig. 1.

As soon as the label has been released from the suction carrier and applied to the upper side of the bottle, the carrier moves rearwardly (to the left, Figs. 2 and 4), and the label presser 69 positioned above the bottle, moves downwardly, and assures a secure attachment of the label to the bottle. The label presser is carried on a vertically reciprocal bar 70, slidable in a bracket 71, which in turn is secured to a cross bar 72 extending between the uprights 1 and 2. The upper end of the bar 70 has a notch 73 to receive the projecting end of an arm 74 turnable on the same shaft 53 on which the arm 52 is mounted. Integral with the arm 74 is a second arm 75, and the free end of this arm is connected by a rod 76 to an arm 77 turnable on the shaft 18. The arm 77 has a cam follower 78 cooperating with a cam 79 on the shaft 3 by which the label presser is moved. The presser 69, as shown, has a sponge rubber or other resilient pad 80 on the underside thereof, for conforming to the contours of the bottle and for assuring a pressure over the entire surface of the label.

In operation, before the above described rearward movement of carrier 5 takes place, the picker 12 will have swung downwardly, carrying into a horizontal position the next-removed label from the stack 10. Then, as the carrier moves rearwardly, there is a momentary dwell of same over the picker-held label, during which the release of suction by the picker and the application of suction to the carrier procures the transfer of the label to the carrier. Then the carrier's rearward movement is resumed, and the picker 12 moves upwardly into the full line position of Fig. 1, in readiness to remove the next label from the stack.

As the carrier moves toward the rear of the machine, the gumming tray is rocked counterclockwise, Fig. 2, to bring the right-hand gumming roller against the underside of the label, when the rollers and label are substantially in the relative positions of Fig. 5, and thereby apply gum to the right-hand half of the label during the continued movement of the carrier to the left. The movement of the carrier is then reversed, and simultaneously therewith the gumming tray is rocked clockwise, Fig. 2, to bring the left-hand roller into position for engagement with the label, as shown in Fig. 5, thereby applying gum to the left-hand half of the label as the carrier moves toward the front of the machine. The portions of the label to which the adhesive is applied successively by the rollers 30 and 31 are shown in Figs. 5 and 6 respectively

by the enclosing brackets in these figures. The carrier then continues its forward movement, until it is in label-applying position directly over the bottle, in which position it remains long enough for the bottle to be elevated to engage the label, the suction in the carrier being at this time cut off to release the label, and the carrier is then withdrawn to its original label-picking position. As soon as the carrier is withdrawn, the label presser is moved downwardly, and assures a secure attachment of the label to the bottle.

While the carrier is in label-applying position, the picker arm 12, which has been in the raised position of Fig. 1, with the end thereof in engagement with the bottom label in the stack of labels, has suction applied thereto to pick up the bottommost label and transfer it by downward movement of the arm, to a position directly beneath the position of the carrier when the latter is in label-picking position. All of these machine movements are controlled by the cams on the shaft 3, and thus occur in predetermined relation to each other, the cams being suitably designed to control the machine movements in the proper sequence. Although I have shown my improvements, for purposes of illustration, in connection with a semi-automatic labeling machine wherein the articles to be labeled are manually presented to and withdrawn from labeling position, it will be understood that my invention is not so limited, but is applicable to any and all types of labeling machines.

The claims of the original application, of which this is a division, are directed to the structure by which adhesive is applied to the label, together with the mechanism for transferring the label to and from the cutting means. This divisional application incorporates claims directed to the label applying instrumentalities and to the particular arrangement of the several instrumentalities of the machine in their coordination with each other.

I claim:

1. In a labeling machine, a reciprocable article support, a reciprocable label carrier, the latter having a label applying position in line with the movement of the support, and means for moving the support toward the carrier, whereby a label on the carrier is applied to an article on the support.

2. In a labeling machine, a reciprocable article support, a reciprocable label carrier, the latter having a label applying position in line with the movement of the support, means for moving the support toward the carrier, whereby a label on the carrier is applied to an article on the support, and means for pressing the label onto the article.

3. In a labeling machine, a reciprocable article support, a reciprocable label carrier, the latter having a label applying position in line with the movement of the support, means for moving the support toward the carrier, whereby a label on the carrier is applied to an article on the support, and means for pressing the label onto the article after withdrawal of the label carrier from labeled applying position.

4. In a labeling machine, an article support having a reciprocatory movement into and out of label applying position, a label carrier having a reciprocatory movement from gumming position to label applying position, and means for moving the support into label applying position while the carrier is in label applying position.

5. In a labeling machine, an article support having a reciprocatory movement into and out of label applying position, a label carrier having a reciprocatory movement from gumming position to label applying position, means for moving the support into label applying position while the carrier is in label applying position, and means for pressing the label onto the article while the support is in label applying position.

6. In a labeling machine, an article support having a reciprocatory movement into and out of label applying position, a label carrier having a reciprocatory movement from gumming position to label applying position, means for moving the support into label applying position while the carrier is in label applying position, and a reciprocable presser movable into engagement with the label on the article while the latter is held in label applying position by the support.

7. In a label applying machine, a reciprocatory label carrier, a support for the articles to be labeled, a label gumming mechanism, said support and said mechanism being in a position to cooperate with the label carrier during its reciprocation, and a label delivering device between said support and said mechanism in a position to place a label on the carrier.

8. In a labeling machine, a reciprocable label carrier, an article support movable into and out of a position to receive the label from the carrier, means for applying adhesive to the label on the carrier, and means for delivering a label to the carrier, said last means being positioned between the article support and the adhesive applying means.

9. In a labeling machine, a reciprocable label carrier, an article support for supporting a bottle or like article in a position to receive a label from the carrier, means for applying adhesive to a label on the carrier during its reciprocation, and means for delivering a label to the carrier, said last means being positioned between the article support and the adhesive applying means.

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