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SAFETY DEVICE FOR LABELING MACHINES

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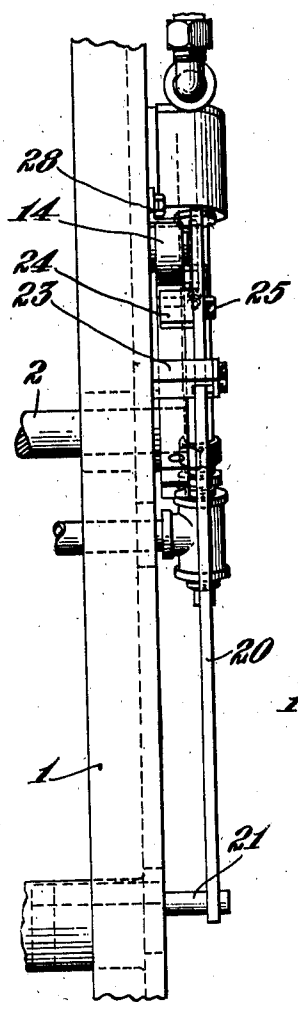


Fig. 2

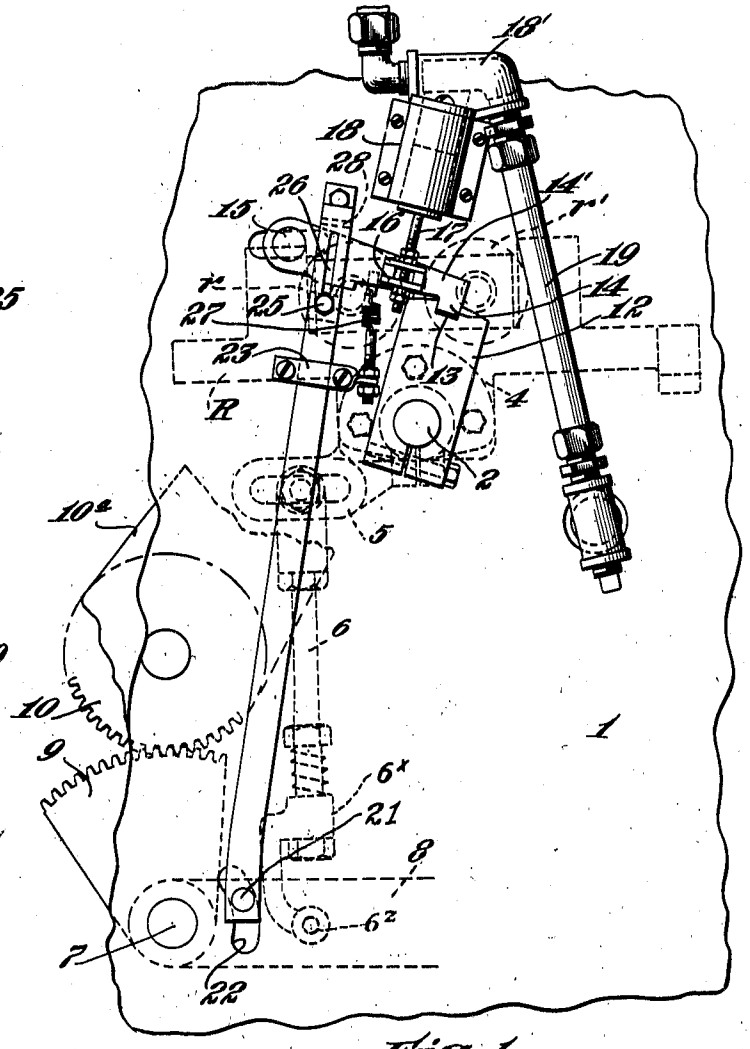


Fig. 1

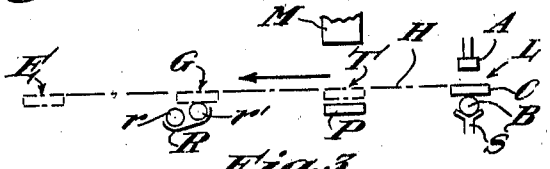


Fig. 3

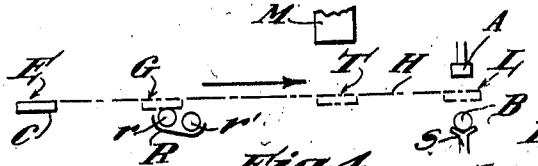


Fig. 4

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SAFETY DEVICE FOR LABELING MACHINES

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Application November 19, 1941, Serial No. 419,747

17 Claims. (Cl. 216—55)

This invention pertains to labeling machines and relates more particularly to a safety device for such a machine, the present invention constituting an improvement upon the mechanism disclosed in the patent to Henry A. E. Sjoberg et al., No. 2,292,093, dated August 4, 1942. In a labeling machine of the kind in which the label is supported by a moving carrier, while adhesive is being applied to the surface of the label, it is highly desirable automatically to prevent the application of adhesive to the surface of the carrier itself, if for any reason the carrier is unprovided with a label as it moves past the gumming means. In the labeling machine described in the above-referred to application, as well as that described in the patent to Holm, No. 2,242,974, dated May 20, 1941, the label is first removed from a magazine by a suction picker and is carried by the latter to a transfer station where the label is delivered to the suction bed of a label carrier forming part of a carriage which reciprocates along a definite path rearwardly from a label-applying station, past the transfer station and a gumming station, and then immediately moves forwardly past the gumming station and the transfer station to the label-applying station. Automatic valves control the establishment and cessation of suction at the picker and transfer carrier in properly timed relation to the other functions of the mechanism.

The gumming means comprises a rocking support carrying a gum reservoir and a pair of alternately operative applicator rolls, one of which is elevated to gum-applying position as the carrier moves rearwardly and the other of which is elevated to gum-applying position as the carrier moves forwardly—both rolls being out of operative relation to the carrier path when the rocking support is horizontal. In the Sjoberg application there is described means automatically operative to lock the rocking support in its horizontal, inoperative position whenever, during the operation of the machine, the picker fails at the proper time to pick up a label for delivery to the carrier. Such automatic means comprises a pneumatic motor which is responsive to the presence or absence of suction at the picker.

While the automatic safety device disclosed in the Sjoberg application is very desirable and commercially valuable, it has been found that during the operation of the machine the carrier itself may fail occasionally to retain the label, even if the label be properly delivered to the transfer station by the picker and that in consequence of the dropping of the label from the carrier, either during or after transfer or its improper location on the carrier, the carrier may be fouled with adhesive due to the continued action of the gumming means as the exposed suface of the carrier passes the gumming means.

The principal object of the present invention is to provide means automatically operative to prevent the application of adhesive to the label-receiving surface of the carrier whenever, in passing the gumming station, the label-receiving surface of the carrier is exposed due to the absence of a label or the improper placing of a label and regardless of whether a label has been properly delivered by the picker to the transfer station.

A further object is to provide simple and effective means responsive to the presence or absence of suction at the label-receiving surface of the carrier for controlling the operation of the gumming means.

A further object of the invention is to provide means effective to prevent the return of the gumming means to active position, after it has been made inoperative, prior to the movement of the carrier past the transfer station on its next rearward stroke.

Other and further objects and advantages of the invention will be pointed out hereinafter in the more detailed description and by reference to the accompanying drawing in which:

Fig. 1 is a fragmentary elevation of the left-hand side of a labeling machine of the general type of that disclosed in the above patent to Holm, showing the improved safety mechanism of the present invention, the parts being illustrated as in position for holding the gumming means out of action;

Fig. 2 is a fragmentary rear elevation of the machine showing the parts illustrated in Fig. 1; and

Figs. 3 and 4 are diagrammatic views illustrating the movement of the carrier backwardly and forwardly, respectively, from the labeling station past the transfer station and gumming station and return.

Referring first to Figs. 3 and 4 of the drawing, the letter H designates the path along which a label carrier C moves back and forth from the labeling station L past a transfer station T and a gumming station G to a point of reversal E and then forwardly again past the gumming station and the transfer station to the labeling station. At the labeling station there is a suport S for

the article B to which the label is to be applied and a vertically movable presser device A which presses the gummed label against the surface of the article B after the carrier C has deposited the label on the article and has started rearwardly along the path H. At the transfer station T a picker P functions to present a label to the under surface of the carrier C as the latter moves rearwardly through the transfer station, the carriage actuating means being preferably so designed that the carriage hesitates momentarily at the transfer station to permit transfer of the label to take place. The picker moves back and forth from a label magazine M from which it picks up a label and moves it down to the transfer station in readiness to be picked up by the carrier, as just described. Both the picker and the carrier are provided with suction pads by means of which the label is caused temporarily to adhere to the picker and carrier, respectively, the suction at these pads being controlled automatically in proper time with the movements of the picker and carrier by means of automatic valve mechanism.

At the gumming station G there is provided a rocker R arranged to rock about a substantially horizontal axis transverse to the path of the carrier, and this rocker is provided with a reservoir for adhesive and with a pair of applicators, for example rolls *r*, *r'*, which, by the rocking movement of the rocker, are caused alternately to be advanced upwardly toward the carrier path so as to apply gum or other adhesive means to the under surface of the label which is supported by the carrier. As the carrier moves rearwardly, as shown in Fig. 3, the applicator roll *r'* is moved upwardly while the carrier is passing so that the applicator roll first contacts the surface of the label substantially midway the length of the label and remains in contact until the right-hand edge of the label reaches the roll. On the return stroke of the carrier, as illustrated in Fig. 4, the rocker is so tipped as to raise the applicator roll *r* to contact with the surface of the label at about the mid-portion of the length of the latter and to remain in contact with the label until the left-hand end of the label reaches the roll.

The above mode of and means for applying adhesive to labels drawn one by one from a magazine and delivered to an article to be labeled is substantially as is disclosed and more fully described in the patent to Holm, No. 2,242,974, May 20, 1941.

Referring to Figs. 1 and 2, the numeral 1 designates a portion of the left-hand frame member of the labeling machine to which the present invention is applied, and the numeral 2 designates a rock shaft journaled at its opposite ends in the frame member 1 and in the corresponding right-hand frame member (not shown). The rocker R above referred to, is arranged in the space between these frame members. This rocker is provided with a reservoir for adhesive and supports the applicator rolls *r* and *r'*. This rocker R is provided with a pair of downwardly directed bosses 4 having openings which receive the rock shaft 2—the bosses being fixedly secured to the shaft with provision for adjustment if desired. One of these bosses is provided with a substantially horizontal extension 5 having an elongate horizontal slot which receives a pin secured to the upper end of an actuating rod 6. The lower end of the rod 6 slides in a guide bore in a rigid bracket 6^x. A nut on the lower end of the rod limits its upward movement relatively to the bracket. A heavy coil spring urges the rod upwardly but permits the rod to yield relatively to the bracket. The bracket 6^x has a pivotal connection at 6^z with a lever (not shown) which corresponds in function to the lever 38 of the above referred to Holm patent and which may be operated by means similar to that disclosed in said Holm patent, thereby to tilt the rocker R first in one direction and then in the other as the label carrier moves back and forth along its path.

As herein illustrated, a second rock shaft 7 has its opposite ends respectively journaled in the frame member 1 and in the opposite frame member (not shown), and a rock arm 8 is fixedly secured at its rear end to this shaft and adjacent to its forward end is provided with a cam follower roll (not shown) which engages a cam (not shown) mounted on the main cam shaft of the machine, the arrangement being such that the rock arm 8 is rocked up and down in time with the movement of the carrier. There is also fixed to the rock shaft 7 a gear segment 9 which meshes with a gear 10 which is mounted to turn on a stub shaft suitably supported in the frame. A lever arm 10^a is fixed at its lower end to the hub of the gear 10 so as to rock with the latter, and this arm 10^a extends upwardly (although here shown as broken off) and at its upper end is connected to the carrier, thereby to move the carrier back and forth along the carrier path. Parts corresponding to the elements designated by the characters 7, 8, 9, 10 and 10^a and associated elements are disclosed in the patent to Sjoberg et al., No. 2,292,093, above referred to, it being understood that so far as the improvements herein claimed are concerned, equivalent means may be employed for actuating the carriage, for example, such as disclosed in the patent to Holm above referred to.

The safety means of the present invention comprises a rocking latch arm 12 fixed to the left-hand end of the shaft 2 which projects outwardly beyond the frame member 1, said arm being here shown as provided with a notch 13 in its free upper end. This notch is designed, at times, to receive a downwardly directed latch element 14 formed at the right-hand extremity of a latch lever 14' pivotally supported at 15 upon an adjustable stud carried by the frame. At a point intermediate its ends, this latch lever 14' is provided with spaced apertured lugs 16 through which passes a piston rod 17, provision being made for accurate adjustment of the rod relative to the lugs 16. A piston (not shown) which moves up and down within a cylinder 18 is connected to the upper end of rod 17, the piston and cylinder constituting a pneumatic motor by means of which the latch lever 14' may be raised so as to hold the latch element 14 out of the notch 13. The cylinder 18 is connected to a conduit 18' which freely communicates with the suction conduit leading from a suction pump to the suction pad of the label transfer carrier. The maintenance of the working vacuum in this conduit is dependent upon the presence of a label on the suction pad of the carrier, the suction pad being provided with openings through which atmospheric air may freely pass into the conduit 18' unless these openings are closed by the label. If the openings are not closed by the label, then the normal suction or vacuum in the conduit 18' cannot be maintained.

As here illustrated, the rock arm 8, which ac-

tuates the gear segment 9, is provided with a pin 21 which projects out through a curved slot 22 in the frame member 1 and which is pivotally connected to the lower end of a latch lifter bar 20. The upper part of this bar 20 is guided as the bar slides up and down by a block 23 secured to the frame member 1 and having a guide slot through which the bar passes. Secured to the upper part of the bar is a latch lifter block 24 (Fig. 2) which is adjustably secured to the bar by means of a bolt 25 passing through an elongate slot 26 in the bar. A spring 27 secured at its upper end to the latch lever 14' and at its lower end to the guide member 23, constantly urges the latch lever downwardly. A stop member 28 secured to the frame 1 limits the upward movement of the latch lever.

As illustrated in Fig. 1, the rocker R is in the horizontal position, that is to say, its mid position or neutral position, in which both rolls *r* and *r'* are inactive, being so far below the path of the carrier that neither roll would contact a label supported by the suction pad of the carrier. The several parts are so arranged that as the gear segment 9 rocks in a clockwise direction, the carrier moves rearwardly from the labeling station past the transfer station and the gumming station to its rearmost point, and as the gear segment 9 rocks in a counterclockwise direction, the carrier moves forwardly.

If, as the carrier moves back from the labeling station past the transfer station, it receives a label in proper position from the picker, the suction in the conduit 18' will be properly maintained, such suction being established by the operation of an automatic valve (as described in the above-named Holm patent) at the instant at which the suction pad of the carrier hesitates at the transfer station while standing immediately above the picker. So long as this suction is properly maintained in the conduit 18', the piston is held in the elevated position in the cylinder 18 and thus the latch element 14 is held out of the notch 13. The latch arm 12, together with the rock shaft 2 and the rocker R, is thus free to be rocked by its actuating cam and the rocking of this rocker takes place in the proper sequence relative to the movement of the carrier as illustrated in Figs. 3 and 4. During the rearward movement of the carrier from the transfer position back through the gumming position to the point of reversal and then forwardly through the gumming station to the transfer station, the pin 21 is so located, at the various corresponding positions of the lever 8, that the latch lever 14' is free to drop and operatively engage the notch 13 if permitted to do so by the pneumatic motor. However, while the carrier is moving forwardly from the transfer position toward the labeling position and then from the labeling position back to the transfer position, the lever 8 is moving through that portion of its path wherein the pin is held so high that the block 24 engages the latch lever 14' and positively raises the latter and/or holds it in raised position although in moving rearwardly from the labeling position to the transfer position the transfer carrier does not support a label. However, just as the carrier arrives at the transfer station the pin 21 reaches so low a position that the block 24 no longer supports the latch. The pneumatic motor is thus now free to raise the latch or to permit the latter to drop in accordance with suction conditions.

If the carrier reach the transfer station and the suction be applied by the operation of the automatic valve, but no label is available to close all of the holes of the suction pad of the carrier, as for example if the picker fail to present a label or if the label so presented should slip off of the carrier pad or should be improperly oriented on said pad, then the normal suction in the conduit 18' fails, and the spring 27 pulls the latch lever 14' downwardly so that the latch 14 engages the notch 13 and thus holds the rocker R in neutral position, and thus no gum can be applied to the exposed surface of the carrier during either the rearward or forward strokes of the latter.

While one desirable embodiment of the invention has herein been shown and described, it is to be understood that the invention is not necessarily limited to the precise details of construction but is to be regarded as broadly inclusive of any equivalent arrangements falling within the scope of the appended claims.

I claim:

1. A machine of the kind which comprises a label transfer carrier, article-supporting means and a label presser at a labeling station, a picker operative at a transfer station to deliver a label to the transfer carriage, a movable gum-applying element, means normally operative at the gumming station to advance the applying element to apply adhesive to a label supported by the transfer carriage, and means for moving the carriage along a definite path from the labeling station past the transfer and gumming stations, characterized in having locking means operative to prevent operative advance of the gum-applying element if the carriage approach the gumming station without a label, said locking means including a part which normally moves in time with the carriage, a latch operative at times to engage and stop said part, and means for controlling the latch.

2. A labeling machine of the kind which comprises a magazine, a label transfer carrier movable back-and-forth between a label-gumming and a label-applying station, said carrier including a suction pad for supporting a label on the carrier, adhesive-applying means movable toward and from the carrier path, a suction picker operative to remove a label from the magazine and to deliver it to the transfer carrier, air-exhaust means operative to create a partial vacuum at the picker and at the transfer carrier for temporarily and successively attaching a label to the picker and carrier respectively characterized in having a movable stop element operative, when in one position, to prevent advance of the adhesive-applying means into operative relation to the transfer carrier, a pneumatic motor responsive to said partial vacuum and operative to hold said stop element out of action only so long as a label is properly attached to the carrier during the advance movement of the latter toward the attaching position, and means operative to move said stop element to operative position whenever the carrier advances toward the attaching station without a properly positioned label thereon.

3. A machine of the kind which comprises a label transfer carrier, article supporting means and a label presser at a labeling station, a picker operative at a transfer station to deliver a label to the transfer carriage, gumming means normally operative at a gumming station to apply adhesive to a label supported by the transfer carriage, and means for reciprocating the carriage along a definite path rearwardly from the label-

ing station past the transfer and gumming stations and then back forwardly past the gumming and transfer stations to the labeling station, characterized in having means operative to prevent the gumming means from functioning if the carrier approach the gumming station from either direction without a label, said means including an element which normally moves in time with the carriage and a part cooperable with said element for stopping the movement of the latter.

4. A machine of the kind which includes a label transfer carrier, article supporting means and a label presser at a labeling station, a picker operative at a transfer station to deliver a label to the transfer carriage, gum-applying means at a gumming station, means for moving the carriage along a definite path rearwardly from the labeling station past the transfer and gumming stations to a point of reversal and then forwardly past the gumming and transfer stations to the labeling station, the gum-applying means comprising applicator elements movable toward and from operative position relative to the path of the carriage, and actuating means normally operative to move the applicator elements into operative position as the carriage approaches the gumming station from either direction, characterized in having means, including a latch element and a part cooperable therewith, operative automatically to lock said actuating means out of action if the carriage approach the gumming station from either direction without a label.

5. A machine of the kind which comprises a label transfer carrier, article supporting means and a label presser at a labeling station, a picker operative at a transfer station to deliver a label to the transfer carrier, gum-applying means at a gumming station, means for moving the carrier along a definite path rearwardly from the labeling station past the transfer and gumming stations to a point of reversal and then forwardly past the gumming and transfer stations to the labeling station, the gum-applying means comprising applicator elements movable toward and from operative position relative to the path of the carrier, and actuating means normally operative to move the respective applicator elements into operative position as the carrier approaches the gumming station from either direction, characterized in having means operative automatically to lock said actuating means out of action if the carrier approach the gumming station from either direction without a label, and means operative positively to release said locking means as the carrier approaches the transfer station in its rearward stroke.

6. A machine of the class described, including a label transfer carrier, article supporting means and a label presser at a labeling station, a picker operative at a transfer station to deliver a label to the transfer carrier, gum-applying means at a gumming station, means for moving the carrier along a definite path rearwardly from the labeling station past the transfer and gumming stations to a point of reversal and then forwardly past the gumming and transfer stations to the labeling station, the gum-applying means comprising applicator elements movable toward and from operative position relative to the path of the carrier, and actuating means normally operative to move the respective applicator elements into operative position as the carrier approaches the gumming station from either direction, characterized in having means operative automatically to lock said actuating means out of action if the carrier approach the gumming station from either direction without a label, and means operative positively to release said locking means and to hold it out of action while the carrier is moving forwardly from the transfer station to the labeling station and while it moves rearwardly from the labeling station to the transfer station.

7. A machine of the kind which comprises a label transfer carrier, article supporting means and a label presser at a labeling station, a picker operative at a transfer station to deliver a label to the transfer carrier, gum-applying means at a gumming station, means for moving the carrier along a definite path rearwardly from the labeling station past the transfer and gumming stations to a point of reversal and then forwardly past the gumming and transfer stations to the labeling station, the gum-applying means comprising applicator elements movable toward and from operative position relative to the path of the carrier, and actuating means normally operative to move the applicator elements into operative position as the carrier approaches the gumming station from either direction, characterized in having a latch device operative at times to prevent operation of said actuating means, pneumatic means operative, only if the carrier has previously been supplied with a label, to hold said latch device out of action while the carrier moves rearwardly from the transfer point past the gumming station and then moves forwardly past the gumming station toward the transfer point, and means operative to hold said latch out of action while the empty carrier moves rearwardly from the labeling station to the transfer station.

8. A machine of the kind which comprises a label transfer carrier, article supporting means and a label presser at a labeling station, a picker operative at a transfer station to deliver a label to the transfer carrier, gum-applying means at a gumming station, means for moving the carrier along a definite path rearwardly from the labeling station past the transfer and gumming stations to a point of reversel and then forwardly past the gumming and transfer stations to the labeling station, the gum-applying means comprising applicator elements movable toward and from operative position relative to the path of the carrier, and actuating means normally operative to move the applicator elements into operative position as the carrier approaches the gumming station from either direction, characterized in having a latch device operative at times to prevent operation of the actuating means, a pneumatic motor operative at times to hold said latch out of action while the carriage is moving rearwardly from the transfer station past the gumming station and then forwardly past the gumming station, said pneumatic motor being operative to hold the latch out of action only while the carrier is supplied with a label, and mechanical means operative to hold the latch out of action, whether or not the carrier is provided with a label, as the carrier moves forwardly from the transfer station to the labeling station and back toward the transfer station.

9. A machine of the kind which includes a label transfer carrier, article supporting means and a label presser at a labeling station, a picker operative at a transfer station to deliver a label to the transfer carrier, gum-applying means at a gumming station, means for moving the carrier along a definite path rearwardly from the label-

ing station past the transfer and gumming stations to a point of reversal and then forwardly past the gumming and transfer stations to the labeling station, the gum-applying means comprising applicator elements movable toward and from operative position relative to the path of the carrier, and actuating means normally operative to move the respective applicator elements into operative position as the carrier approaches the gumming station from either direction, characterized in that said actuating means including a rocking latch arm, a latch device engageable at times with said latch arm so as to prevent the latter from rocking, thereby retaining both applicator elements in inoperative position, primary lifting means operative to hold said latch out of action while the carriage moves rearwardly from the transfer station past the gumming station and then forwardly past the gumming station, said primary lifting means being operative to hold the latch out of action only so long as the carrier supports a label, and secondary lifting means operative to lift the latch out of action, whether or not the carrier supports a label, while the carrier is moving forwardly from the transfer station to the labeling station and then back to the transfer station.

10. A machine of the kind which includes a label transfer carrier, article supporting means and a label presser at a labeling station, a picker operative at a transfer station to deliver a label to the transfer carrier, gum-applying means at a gumming station, means for moving the carrier along a definite path rearwardly from the labeling station past the transfer and gumming stations to a point of reversal and then forwardly past the gumming and transfer stations to the labeling station, the gum-applying means comprising applicator elements movable toward and from operative position relative to the path of the carrier, and actuating means normally operative to move the respective applicator elements into operative position as the carrier approaches the gumming station from either direction, characterized in that said actuating means including a latch arm which normally swings in one direction as the carriage moves rearwardly and in the other direction as the carriage moves forwardly, said latch arm having a notch in its free end, a pivoted latch engageable at times in said notch thereby to hold the latch arm in mid-position with both applicator elements out of operative position, a pneumatic motor operative to lift and to hold the latch out of the notch while the carrier moves rearwardly past the gumming station to the end of its rearward stroke and then while it moves forwardly past the gumming station, said motor being operative to lift and to hold the latch out of action only so long as the carrier supports a label, and a positive mechanically actuated part, engageable with the latch whether or not the carrier supports a label, thereby to hold the latch out of the notch while the carrier is moving backwardly from the label-applying station to the transfer station.

11. A labeling machine of the kind which comprises a reciprocating label carrier, gumming means including a pair of alternately operative applicator elements, and means operative to cause said applicator elements to move into and out of operative position, characterized in having spring-actuated latch means for locking both of said elements in inoperative position whenever the carrier approaches the gumming means without a label, and a pneumatic motor for controlling the latch means.

12. A labeling machine of the kind which comprises a reciprocating label carrier, gumming means including a pair of alternately operative applicator elements, and cam means operative to cause one of said applicator elements to advance into operative position as the carrier moves in one direction and to advance the other of said elements into operative position as the carrier moves in the other direction, characterized in having relatively movable latch elements operative to lock both of said applicator elements in retracted inoperative position whenever the carrier approaches the gumming means without a label.

13. A labeling machine of the kind which comprises a reciprocating label carrier, and an oscillating gum reservoir having means therein for applying adhesive to a label on the carrier, characterized in having relatively movable latch elements for locking the gum reservoir against oscillation while in mid-position thereby to retain the adhesive-applying means in inoperative position whenever the carrier approaches the gum reservoir without a label.

14. A labeling machine of the kind which comprises a reciprocatory label carrier, and gumming means including an oscillatory support carrying applicator means for applying adhesive to the label on the carrier characterized in having means for locking said support against oscillation thereby to retain the adhesive-applying means in inoperative position whenever the carrier approaches the gumming means without a label, said locking means including a part which oscillates in time with said support and a latch engageable with said part to stop oscillation thereof, and means for retaining the latch out of engagement with said oscillating part so long as a label is properly positioned on the carrier.

15. A labeling machine of the kind which comprises a reciprocable label carrier, and gumming means including an oscillatory support carrying a pair of adhesive-applying rolls journaled on parallel axes and arranged alternately to engage a label on the carrier as the support is oscillated, and cam means for oscillating the support, characterized in having latch means for locking said support against oscillation when in its mid-position and while both of the rolls are out of position to engage a label on the carrier, said latch means including a movable latch engageable with a part rigidly united to the support, and means for engaging the latch with said part whenever the carrier approaches the gumming means without a label.

16. A labeling machine of the kind which comprises a reciprocable label carrier, and gumming means including an oscillatory support carrying a pair of adhesive-applying rolls journaled on parallel axes and so arranged as alternately to engage a label on the carrier as said support is oscillated, means for oscillating the support, characterized in having means for locking the support against oscillation when the support is in mid-position and while both of the rolls are out of position to engage a label on the carrier, and means including a pneumatic motor operative, whenever the carrier approaches the gumming means without a label or with a label improperly positioned, to cause said locking means to become operative.

17. A labeling machine of the kind which comprises a reciprocable label carrier, gumming

means past which the carrier is moved for the application of adhesive to a label thereon, a picker for transferring labels from a supply to the carrier, and suction means for holding the label to the carrier, characterized in having a part rigidly united to and movable with the carrier and having a latch-receiving notch, a latch engageable with said notch for holding the gumming means in inoperative position, and suction means operatively connected to the carrier for holding the latch out of engagement with said notch, so long as a label is properly held on the carrier.

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