Sept. 29, 1964 D. R. P. JACKSON 3,151,014

APPARATUS FOR SECURING ADHESIVE LABELS TO PACKETS

Filed Oct. 12, 1961 5 Sheets-Sheet 1

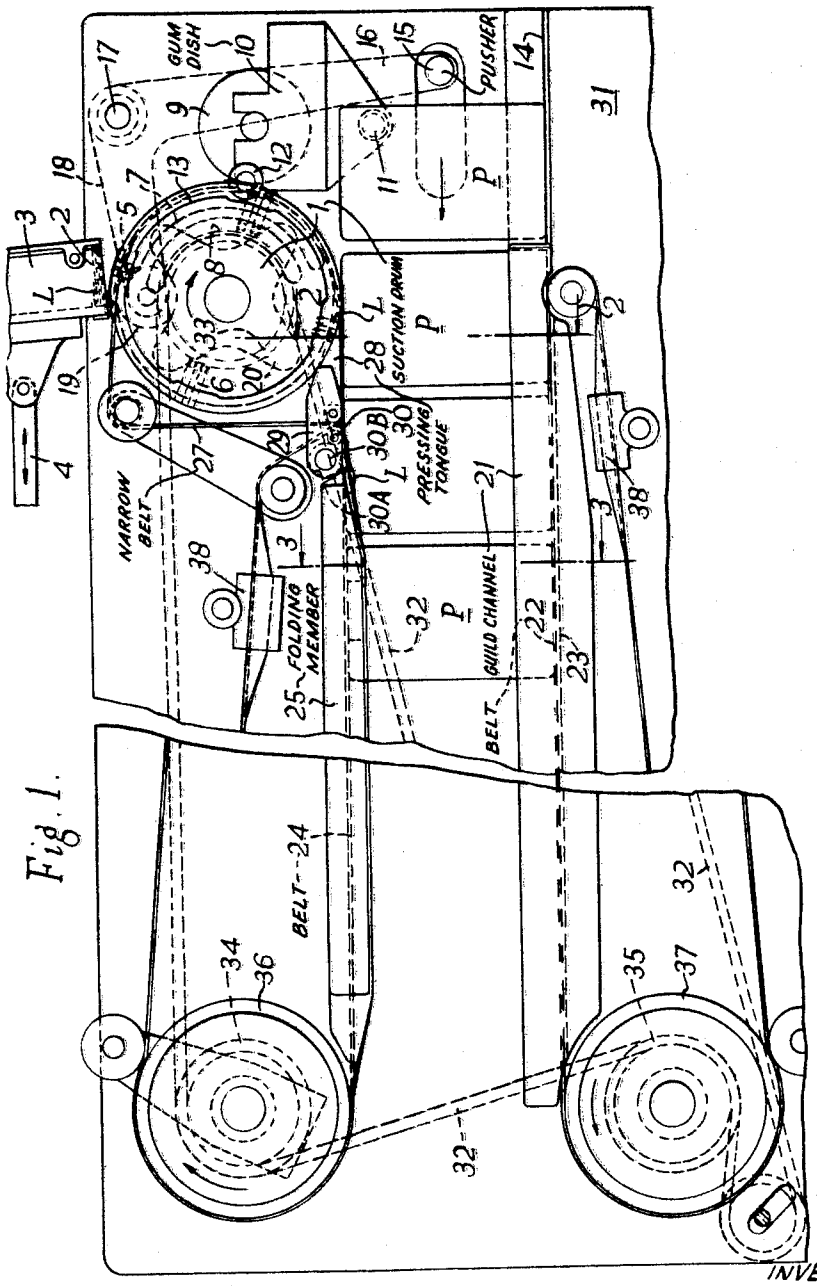


Fig. 1.

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APPARATUS FOR SECURING ADHESIVE LABELS TO PACKETS

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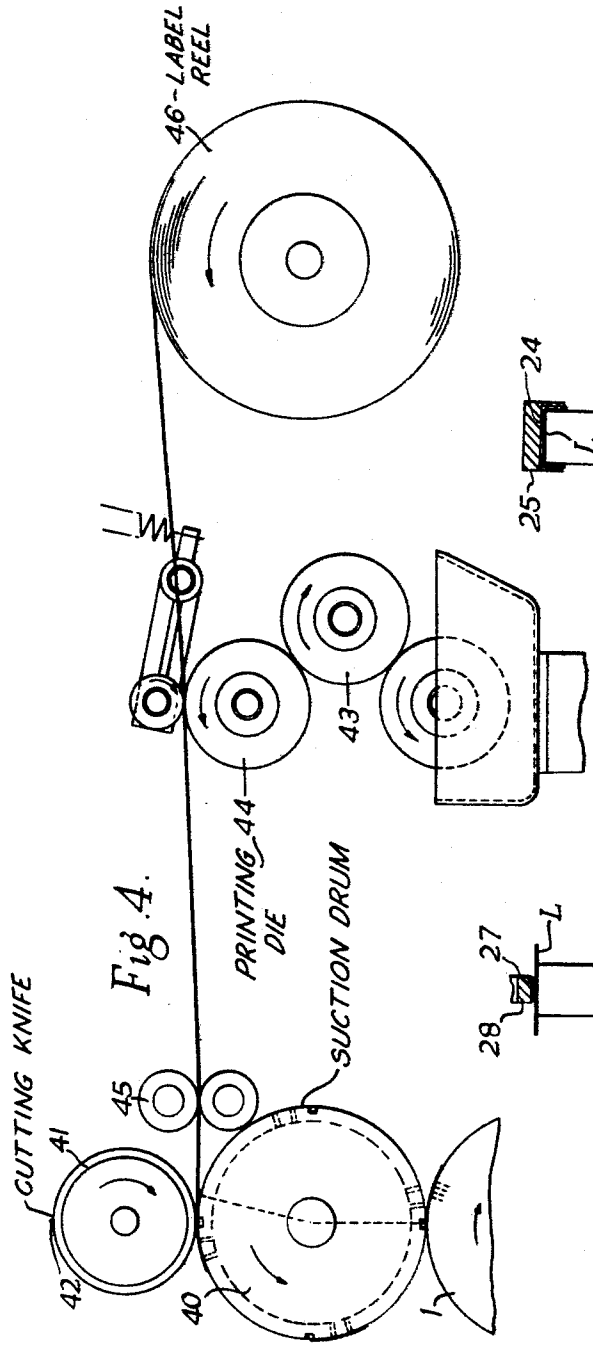


Fig. 4.

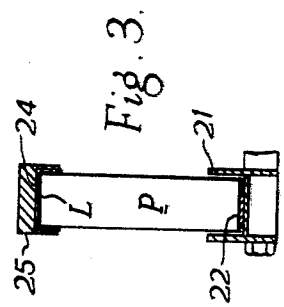


Fig. 3.

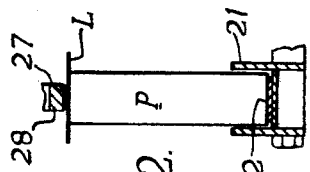


Fig. 2.

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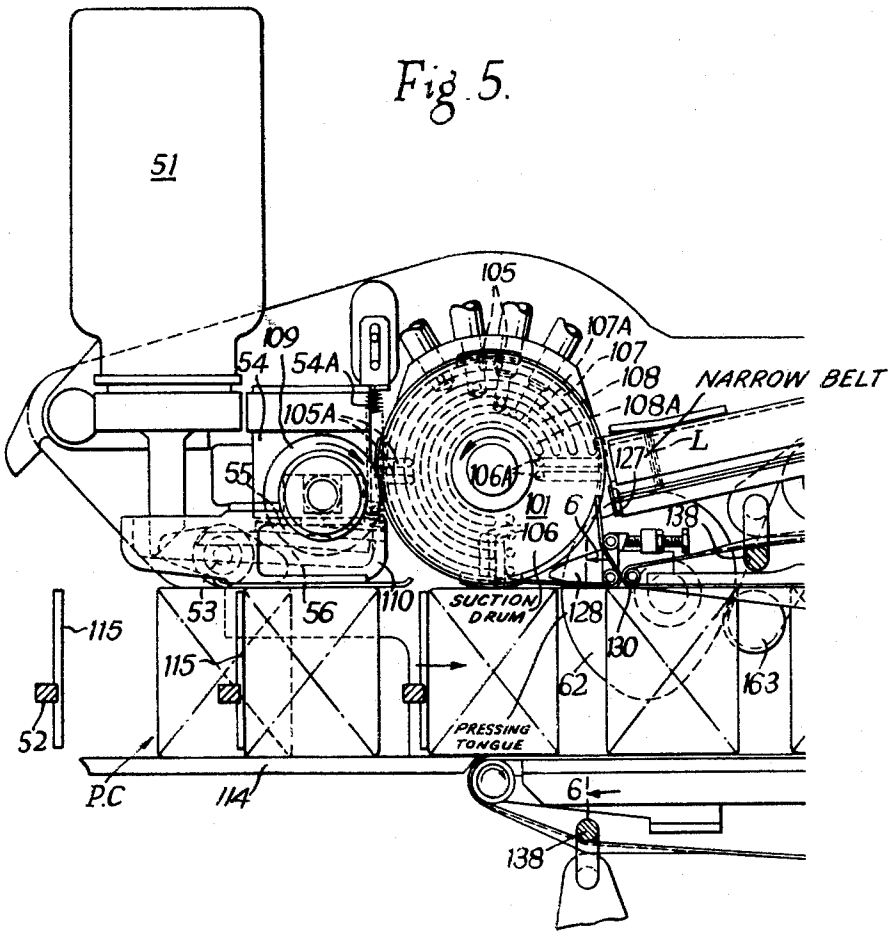
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APPARATUS FOR SECURING ADHESIVE LABELS TO PACKETS

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Fig. 5.



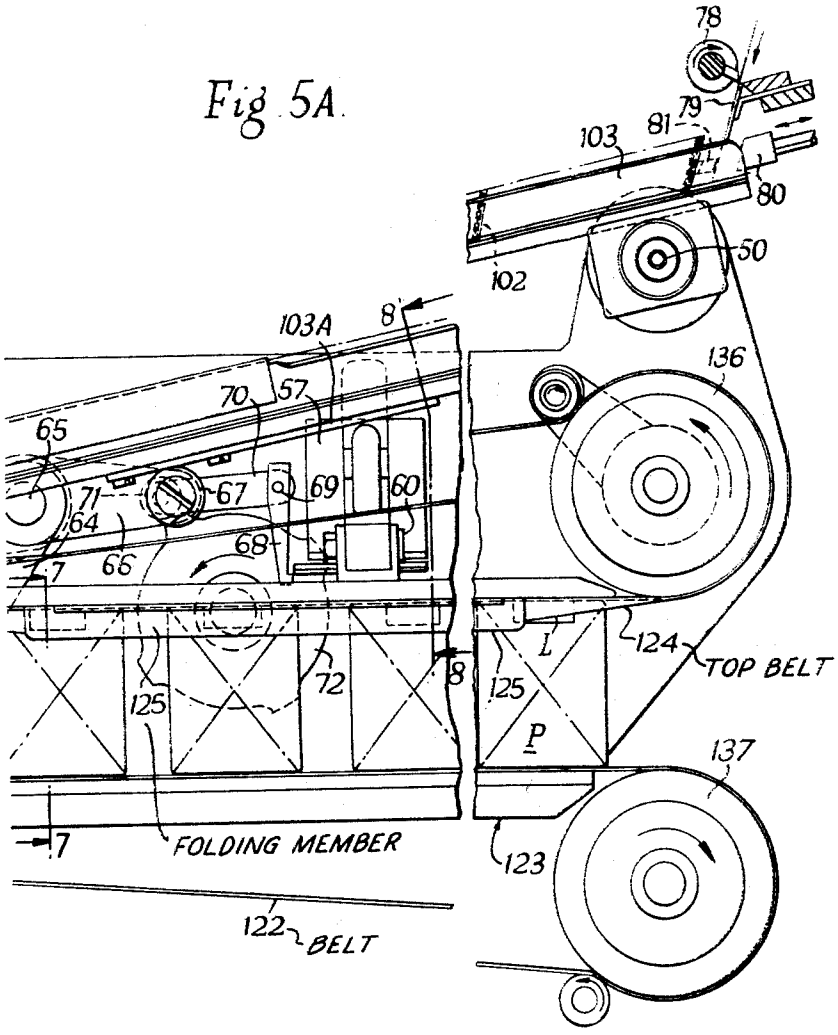
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APPARATUS FOR SECURING ADHESIVE LABELS TO PACKETS

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Fig. 5A.



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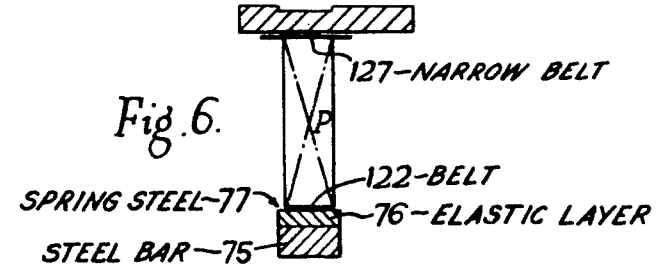


Fig. 6.

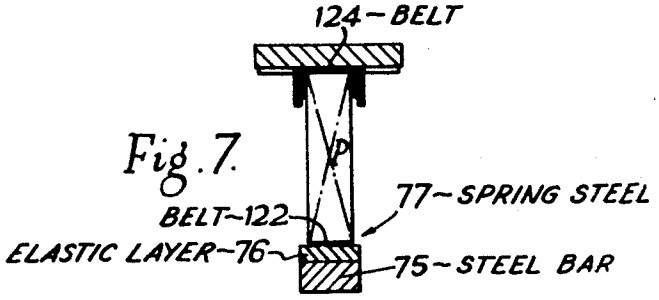


Fig. 7.

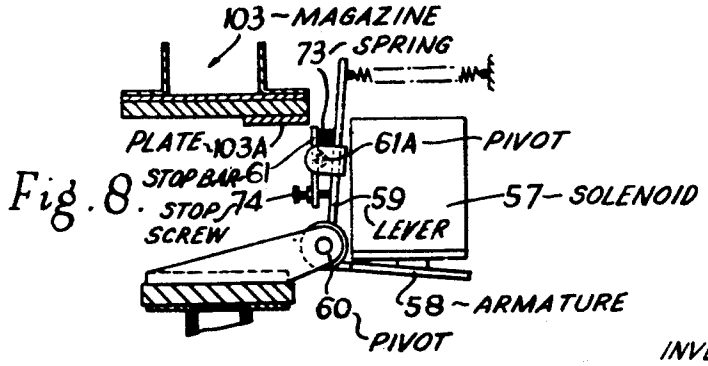


Fig. 8.

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3,151,014

APPARATUS FOR SECURING ADHESIVE LABELS TO PACKETS

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Claims priority, application Great Britain, Oct. 17, 1960, 35,511/60
13 Claims. (Cl. 156—475)

This invention concerns apparatus for securing adhesive labels to packets and if necessary applying the labels to the packets.

The apparatus is particularly suitable for securing labels to packets such as the popular American style cigarette packet where a label serves the purpose both of ornament and the closure member of the packet. In many countries revenue stamps are used for this purpose but this practice has been abandoned in the United States of America and a label similar in appearance to such a stamp is now used. The invention described later is however useful for securing revenue stamps, and the term "label" when used herein includes labels, stamps and the like.

The apparatus is suitable for securing a label to any packet in the way such labels are commonly fixed on cigarette packets, namely the label lies on one face, e.g., the top of the packet and is folded down on one or more adjacent faces (e.g., the two broad sides). Occasionally packets—e.g., cardboard cartons such as slide and shell cartons have the stamp across the top and down one broad side only and the apparatus would serve for this class of work.

According to the invention there is provided apparatus for securing adhesive labels to packets comprising means for moving a packet in a given path, a flexible belt moving with the packet and arranged to engage a face of the packet and hold an adhesive label in close contact with said face and means for folding at least one side of the belt over a packet face adjacent to the first said face to bring it into close contact with the second said face and fold an overhanging portion of the label on to the second face and secure it thereto.

According to the invention there is provided apparatus for securing adhesive labels to packets comprising a guide channel along which packets are conveyed, a conveyor engaging the bottom of the packets to effect such movement, and a flexible belt wider than the packet and arranged to engage the top of the packet and move therewith and hold an adhesive label in close contact with the top of the packet, said label extending at least beyond one side of the packet, and means for folding at least one side of the belt to bring it into close contact with the side of the packet whereby an overhanging portion of the label is folded on to said side and held thereto to secure it to the packet.

Normally, and particularly for American style packets, the label extends on both sides of the packet top and the belt is folded down on both sides.

The apparatus may include means for applying a label to the top of a packet the construction of said means depending to some extent on whether a label or a revenue stamp is to be applied. Labels can be fed from a printed web, which may be printed during the feeding operation, but revenue stamps are usually fed from a pile in a magazine.

The feeding of packets to the apparatus also depends on circumstances. They may be fed from a magazine but more commonly the packets are fed to the apparatus as they emerge from a packing machine.

The conveyor which engages the bottom of the packet

may be a belt and the top belt may also serve to move the packet along.

The invention will be more fully described by way of example with reference to the accompanying drawings in which:

FIGURE 1, shown broken, is a front elevation showing label applying and securing apparatus.

FIGURE 2 is a section of FIGURE 1 on the line 2—2.

FIGURE 3 is a section of FIGURE 1 on the line 3—3.

FIGURE 4 is a diagram showing a different kind of label feeding apparatus.

FIGURES 5 and 5A, shown boken, together form a front elevation of an improved construction a few parts being in section.

FIGURE 6 is a section of FIGURE 5 on the line 6—6.

FIGURE 7 is a section of FIGURE 5 on the line 7—7.

FIGURE 8 is a section of FIGURE 5 on the line 8—8.

Referring first to FIGURE 1, 1 is a suction drum which removes labels L from a pile 2 in a magazine 3 and carries them round through about 180° and applies them to the tops of packets P. The magazine is pivoted at a position some distance above the fragment shown and is rocked to and fro by a bar 4 so that as a label is removed the pile follows the movement of the suction drum. The drum is provided with suction ports 5 and 6 in the usual manner but the ports marked 6 are longer than those marked 5 as will now be explained. Air is sucked through the ports and suction passages 7 and 8 respectively the drum being provided with the usual stationary hub and connections to a source of suction in the ordinary manner. If it happens that the drum fails to remove a label from the magazine the suction apertures which should have taken that label are open to the air and in the ordinary way this would mean that these succeeding suction apertures will also be open to air at the time of removal of the label. It is in order to prevent this that the ports 5 which are short are arranged to communicate with the suction passage 7 while the alternate ports 6 which are long communicate with the passage 8.

A label removed in this manner is carried past a gum wheel 9 and eventually laid on top of a packet in the manner shown at the right-hand end of FIGURE 1. The gum wheel which is shaped to apply stripes of adhesive rotates in a gum dish 10 which is pivoted at 11 and has a cam roller 12 attached to it, this cam roller engaging a cam 13 which has a depression at each place where the suction ports are arranged in the drum. As the drum rotates the gum wheel is caused to oscillate to and fro so that it only applies gum stripes of a limited length on the label. The idea is to make gum stripes, say three, across the width of the label and extending to positions about 1 mm. from the edges so that when a label is applied to a packet gum does not exude from the edges of the label.

The packets are brought into the apparatus in a direction at right angles to the plane of the drawing, that is, a packet moves down on to the paper to occupy the position just to the right of the suction drum. The packets thus arrive on a platform 14 and each packet in turn is moved to the left by a pusher 15 which is attached to one arm 16 of a bell-crank lever pivoted at 17 the other arm 18 of the lever having a roller 19 at its end which engages with a cam 20 having four lobes as shown. Thus the pusher 15 makes a stroke for each set of suction ports passing a given point. A packet pushed in this manner passes into a guide channel 21 at the bottom of which is a conveyor shown as a belt 22. The belt 22 is supported by a fixed plate 23 which consitutes the bottom of the channel so that the belt cannot sag. In line with the top of the packets is another belt 24 which moves at the same rate as the packets and in fact helps to convey them along, that is the packets are held tightly between the top and bottom belts. The top belt is also held in position

by part of a folding member 25. The folding member as can be seen from FIGURE 3 is mainly shaped as a rectangular channel and serves to bend the belt 24 into the shape shown so that a label resting on the packet at the suction drum position has the parts which extend beyond the sides of the packet folded over.

When a label reaches the position where it is to be applied to the packet it is stripped from the suction drum by means of a belt 27 which is narrow and runs in a groove of the suction drum. Its width can be seen in FIGURE 2. As the label is in contact with the packet at the stripping position there is little risk of its being displaced but to ensure that it is accurately laid on to the top of the packet there is provided a pressing tongue 28 which holds the belt 27 firmly down on to the top of the label. The tongue is carried on a bar 29 which is fixed to the machine frame 31. Near the tongue 28 the belt 24 passes around a very small roller 30 and as this may easily bend under the tension of the belt it is supported by a backing roller 30A running on a pin 30B. If FIGURE 1 is examined at the part near the reference 30 a label will be seen which is partly flat and partly folded over, that is the leading end of the label has been partly folded. This folding is effected by means of the belt 24 which is flat at the right-hand end of the label being referred to but the outside edges are slowly twisting to make an eventual turn of 90 degrees and consequently the label is folded over so that eventually it becomes the shape shown in FIGURE 3. The belt 24 is twisted in this manner by a sloping part of the member 25 this being shaped after the manner of a plough-share as is customary in the art of folding paper and the like.

The suction drum 1 is driven from any suitable source and it has a sprocket wheel 33 at its back on which there is a chain 32 which passes around sprocket wheels 34 and 35 respectively. These drive rollers 36 and 37 respectively drive the belts 24 and 22. It will be seen from FIGURE 1 that various tightening pulleys sprockets and rollers are provided but these need no comment but in order to ensure that the belts 22 and 24 do not wander laterally each runs through a shoe 38 whose interior is shaped as a circular arc. This causes these belts to bend to a similar arc as shown and in this way the whole run of each belt is controlled and the belts are kept to their proper paths. The label feeding apparatus described above can be used with any kind of label but generally speaking if revenue stamps are used some such feeding arrangement is essential because revenue stamps have a cash value and are usually cut from sheets. A machine of this kind takes a great number and it would be very difficult to feed them accurately from rolls even if such were available as cutting would need to be exact because of the stamp value.

Where, however, an ornamental label is used a web feeding device may be provided as shown in FIGURE 4. This view is only a diagram as the kind of web feed is fairly well known. The suction drum 1 is shown broken away and above it there is another suction drum 40 which has the same number of suction ports as the drum 1 or at any rate is driven at such speed that equivalent numbers of suction ports pass the point of contact between the drums. The drum 40 is provided as a cutting drum since it would not be possible to cut labels on the drum 1 of FIGURE 1 because of the belt 27. Above the drum 40 is a cutting roller 41 having cutting knives 42 and this would be driven at twice the speed of the drum 40 in order to cut labels at the rate required.

The label material is fed from a reel 46 and passes a printing unit 43 having a printing die 44 which prints on the underneath side of the label. The remaining parts of the printing unit are orthodox, and need no description. The web is fed by a pair of pressure rollers 45 which are mounted at such a distance from the printing unit that the printed web has time to dry and the rollers 45 are driven at such speed that the web speed is lower

than the peripheral speed of the drum 40. Thus as soon as a label has been cut from the leading end of the web and held to the drum by suction it moves on in advance of the following web because the speed of the latter is determined by the rollers 45. The feed rollers 45 are mounted as near as possible to the nip of the drum 40 and roller 41 and after a label has been cut the leading end of the web remains close to the drum 40 and is instantly seized by the next set of suction ports when they reach the web.

The apparatus shown in FIGURES 5 to 8 is similar in many respects to that previously described and for ease of comparison parts performing similar functions have references increased by one hundred over those used for the earlier figures.

In this case a suction drum 101 removes labels L from a sloping stack 102 in a magazine 103. The magazine is pivoted at 50 and moves up and down as described later so that a label removed from the stack follows the movements of the drum. The drum is provided with suction ports as before but in this case every set of suction ports has its own suction passage for the reasons given earlier. The ports are numbered 105, 105A, 106, 106A and the passages 107, 107A, 108, 108A.

A label removed by the drum from the stack is carried past a gum wheel 109 which rotates in a gum dish 110 which is fed by a bird-fountain type of tank 51, the wheel being operated as described later.

The packets P are brought into the apparatus at right-angles to the plane of the drawing, the packets moving upwards to said plane in a column P.C. As before, the packets arrive on a platform surface, marked 114, and they are moved to the right, FIGURE 5, by pushers 115 which are spaced apart and carried by a horizontal chain (not shown) to which they are attached by blocks 52 after the manner of chain conveyor construction. The conveyor moves at such a rate that a packet passes the drum 101 each time a set of suction ports is in position to apply a label to the packet. The pushers eventually move the packets on to a belt 122 which is supported by a plate of composite construction, detailed later, bearing the reference 123. A top belt 124 co-operates with the belt 122 in the same manner as before and the packets are conveyed along so that they pass through a folding member 125 operating as previously described to support and fold over the belt 124, thus folding the label down on the sides of the packet and pressing the label on to the top of the packet. Belt shoes 138 are provided for reasons given before.

When a label carried by the drum reaches the position where it is to be applied to a packet it is stripped from the drum, as before, by a narrow belt 127. A pressing tongue 128 is also provided for reasons given earlier. Label folding takes place in the manner previously described and there is no need to repeat the explanation. Just beyond the tongue, in the direction of packet movement is a small roller 130 around which the belt 124 passes. Driving arrangements have been omitted from FIGURE 5 as they are substantially as before and their addition would only confuse the view but the belt driving rollers are numbered 136 and 137 respectively and various belt tighteners are shown.

The above description covers the general construction and operation of the apparatus shown in FIGURE 5 and other details will now be described.

The gum dish 110 is pivoted at 53 and rests in its operative position (as shown) by its own weight. Should the machine stop however with a label in the process of being gummed (again as shown) and left in that position for some time there is a possibility of the gum drying off and sticking to the gum wheel so to prevent this happening every time the machine stops the solenoid 54 is energised. It then attracts its armature 55 which is attached to a plate 56 fixed to the gum dish and the gum dish is lifted into an inoperative position. To overcome any excessive

weight acting against the pull of the solenoid a counter balancing spring 54A is fitted.

If a packet is missing from the column P.C. approaching the apparatus a feeler (not shown) detects the gap and closes a switch (not shown) to energize a solenoid 57. This is best seen in FIGURE 8. The solenoid then pulls its armature 58 upwards and a lever 59 attached to it moves on a pivot 60 and shifts a stop bar 61 to the left, FIGURE 8. The upper end of the bar is then positioned beneath the label magazine 103. As previously mentioned this is pivoted at 50 and it is raised and lowered by a cam 62 engaging a roller 63 on a lever 64 pivoted at 65 and another lever 66 fixed to the lever 64 has a roller 67 at its free end which contacts a plate 103A fixed to the base of the magazine, so the magazine rises and falls once per revolution of the cam 62, or once per packet to be labelled. As long as the magazine moves in this manner labels are supplied to the suction drum but if the stop bar 61 prevents the magazine from moving down a label is not taken by the drum, the parts of course being timed so that the label which is prevented from being taken by the drum corresponds to the missing packet.

A catch 68 pivoted at 69 and having a lever 70 provided with a cam roller 71 fixed to it is swung once per packet by a cam 72 having four raised parts, one per packet. It will be appreciated that a gap in the packet supply might occur at any instant and since the magazine is rising and falling uniformly it may well happen that the stop bar may be pushed against the side of the magazine and cannot get under it for a moment. For this reason the stop bar is provided with a spring 73 and stop screw 74, the latter also providing a little adjustment for the stop bar about its pivot 61A. If then the solenoid 57 is actuated at such time that the stop bar cannot get under the plate 103A the spring 73 compresses and the bar snaps under the plate as soon as the plate is in a position to permit this. Further as the energization of the solenoid only lasts a very short time and the label feed has to be checked for the time of one cycle (or the passage of a packet past the applying position) it is necessary to hold up the magazine for a time longer than the solenoid energization lasts. The catch 68 is therefore provided, moving into catch-engaging position once per cycle to hold the stop bar 61 in operative position for the necessary time.

The plate 123 previously mentioned is constructed as best seen in FIGURES 6 or 7. The base is a steel bar 75 and on top of this is an elastic layer 76 made, for example, of foam rubber. This is covered by a very thin piece of spring steel forming the surface marked 77 so that the belt 122 can run easily over it but the resilient layer enables the packet to pass along though the distance between belts 124 and 122 is slightly less than the height of the packets, thus applying gentle and resilient pressure.

If it is desired to cut labels from a web this may be printed as previously described and labels cut off by a cutter 78 from which they slide down a forked slide 79 into the magazine, the stack being pushed along by a pusher 80 which passes through the fork, the stack being held when still by ratchets or the like 81 in the well known manner.

What I claim as my invention and desire to secure by Letters Patent is:

1. Apparatus for securing adhesive labels to containers comprising means for moving a container in a given path, said container having adjoining first and second faces, means for applying an adhesive label to said first face such that a portion of said label extends beyond the edge of said first face adjacent said second face, a continuous flexible belt moving with said container engaging said first face to press said adhesive label against said first face securing it thereto, and means for folding one side of said belt over said second face of said container to engage said second face to fold said portion of said label against said second face securing it thereto.

2. Apparatus as claimed in claim 1 wherein said container has a third face adjoining said first face opposite said second face and a second portion of said label when applied extends beyond the edge of said first face adjacent said third face and means are provided for folding the opposite side of said belt over said third face of said container to engage said third face to fold said second portion of said label against said third face securing it thereto.

3. Apparatus as claimed in claim 1 wherein means is provided for stripping labels from said suction drum, which applies labels to containers, said means comprising a belt narrower than said drum, a peripheral groove in said drum on which said belt may move beneath the level of the label-carrying surface of the drum and guide rollers positioned to engage said belt causing it to leave said drum tangentially at the label-applying position.

4. Apparatus as claimed in claim 1 wherein said means for moving a container in a given path comprises a guide channel along which containers are conveyed in succession and a conveyor engaging the bottom of said containers to effect such movement.

5. Apparatus as claimed in claim 4 comprising means for applying labels to containers said means comprising a printer adapted to print labels on a web, feed rollers for continuously feeding the printed web, a rotatable suction drum to receive the web from said feed rollers and cutting means coacting with said drum to successively cut labels from said web, said drum being driven at a peripheral speed faster than the linear speed of said web whereby a cut label becomes spaced apart from the following web, a further suction drum rotatable in proximity to the first said drum to successively remove said labels therefrom, carry said removed labels past adhesive-applying means whereby adhesive is applied thereto, and apply the adhesive-backed labels to the first face of each of said containers.

6. Apparatus as claimed in claim 4 wherein a pusher is provided for thrusting containers into said guide channel and means are provided for operating said pusher in synchronous relationship with said suction drum which applies the labels to the containers such that each container passes the suction drum at a time when a label on said drum is positioned to engage a container.

7. Apparatus as claimed in claim 6 wherein said pusher reciprocates during operation.

8. Apparatus as claimed in claim 1 wherein said means for applying an adhesive label to the first face of said container comprises a magazine in which labels are stacked, a rotatable suction drum being located in proximity with the outlet of said magazine to successively remove said labels therefrom, carry said removed labels past said adhesive-applying means whereby adhesive is applied thereto, and apply the adhesive-backed labels to the first face of each container.

9. Apparatus as claimed in claim 8 wherein the adhesive-applying means comprises a rotatable gum wheel which applies the adhesive to said labels on said suction drum as it rotates and means to oscillate said gum wheel towards and away from said labels on said drum whereby it makes contact with each label for only a limited portion of the length of each label.

10. Apparatus as claimed in claim 8 wherein means are provided for moving said adhesive-applying means out of operative position if said apparatus stops said means comprising a solenoid which is energized as the machine stops moving said adhesive-applying means to an inoperative position.

11. Apparatus as claimed in claim 8 wherein the magazine is pivoted and positioned to slope towards said suction drum and means are provided for rocking the magazine towards and away from said suction drum about said pivot in synchronous relationship with the rotary movement of the said suction drum such that when said magazine is closest to said suction drum the drum is able to receive a label from said magazine, a

stop bar movable to a position beneath said magazine to prevent movement towards said suction drum, a solenoid energized when a container is missing from the succession passing to said guide channel to move said stop bar to a position beneath said magazine and a cam-operated catch positioned to engage said stop bar in position beneath said magazine as the solenoid becomes de-energized until a label is required to be applied to the next container of the succession.

12. In container labelling apparatus of the kind in which labels are removed from a magazine by a suction drum which carries each removed label past adhesive-applying means and then applies it to the top face of a container so that the label extends beyond at least one side of the container while said container is moved along a guide channel by a conveyor which engages the bottom of the container after which the top of said container is engaged and pressed by a flexible belt wider than said container and which moves at the same rate as the conveyor, means for folding at least one side of said belt to bring it into close contact with the side of said container

whereby the extending part of said label is folded against that side and held thereto to secure it to said container.

13. Apparatus as claimed in claim 12 wherein means are provided for stripping a label from the suction drum which applies a label to a container said means comprising a belt narrower than said drum, a peripheral groove in said drum on which said belt may move beneath the level of the label-carrying surface of the drum and guide rollers positioned to engage said belt causing it to leave the drum tangentially at the label-applying position.

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