April 11, 1950 S. T. CARTER 2,503,799

LABEL TRANSFER MEANS FOR LABELING MACHINES

Filed April 9, 1948 3 Sheets-Sheet 1

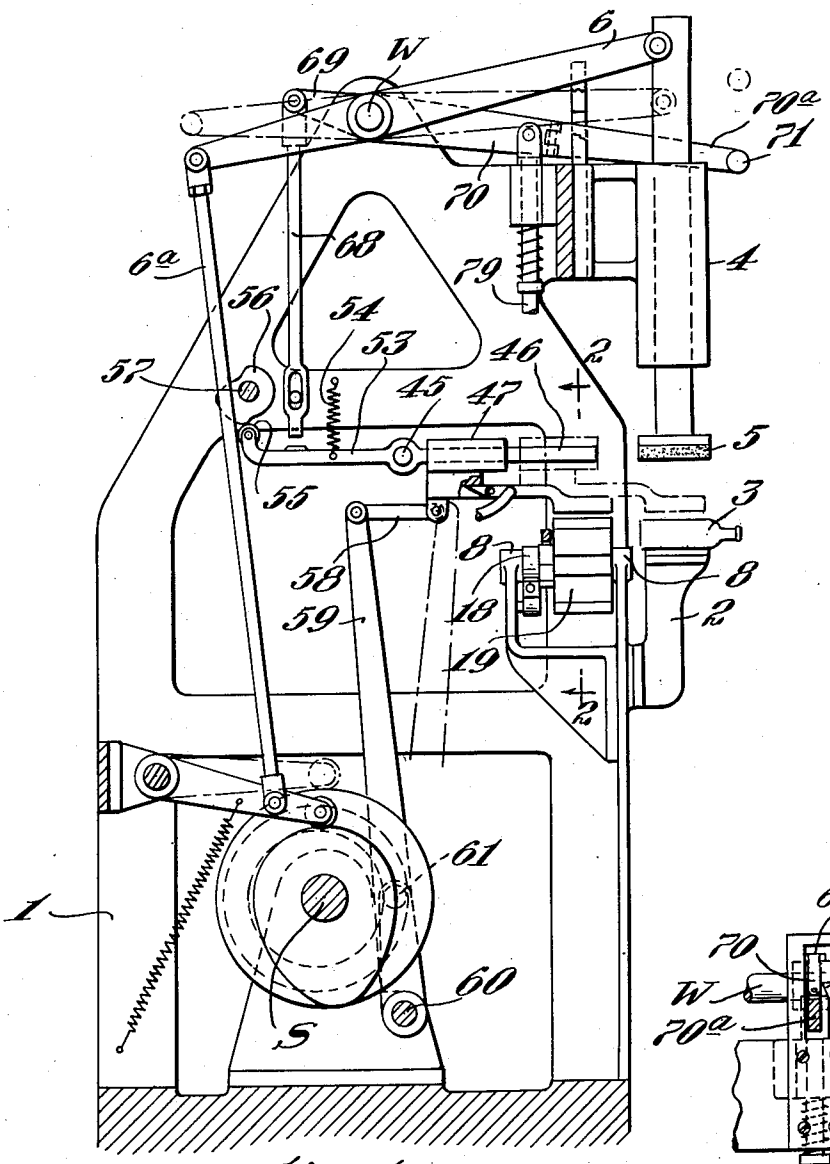


Fig. 1

Fig. 7

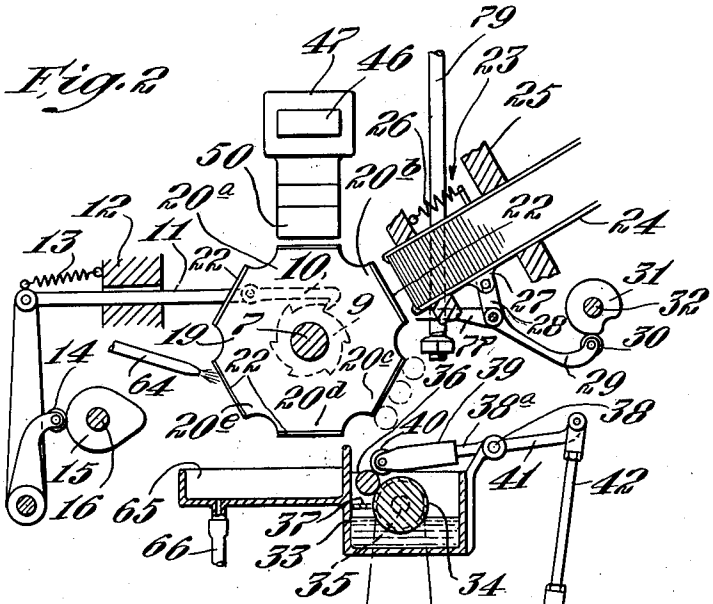
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LABEL TRANSFER MEANS FOR LABELING MACHINES

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Fig. 2



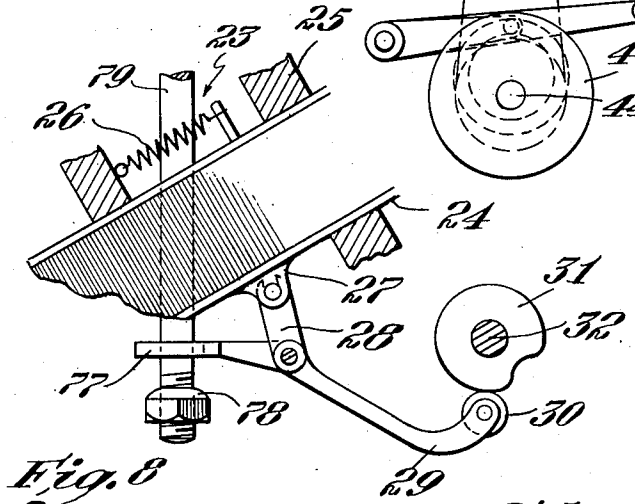


Fig. 8

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LABEL TRANSFER MEANS FOR LABELING MACHINES

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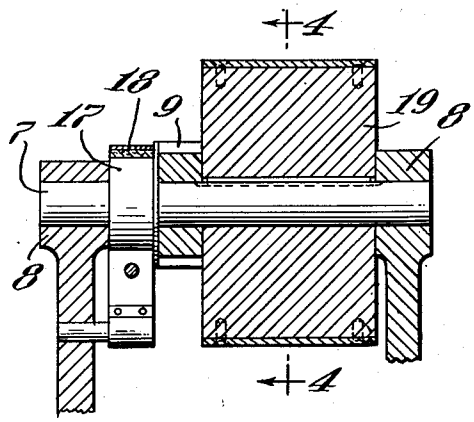


Fig. 3

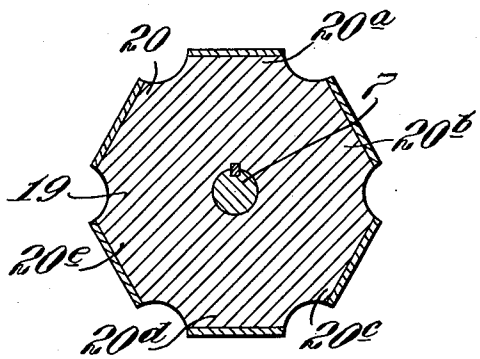


Fig. 4

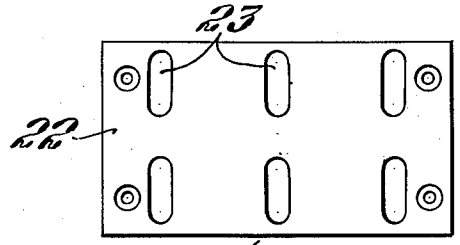


Fig. 5

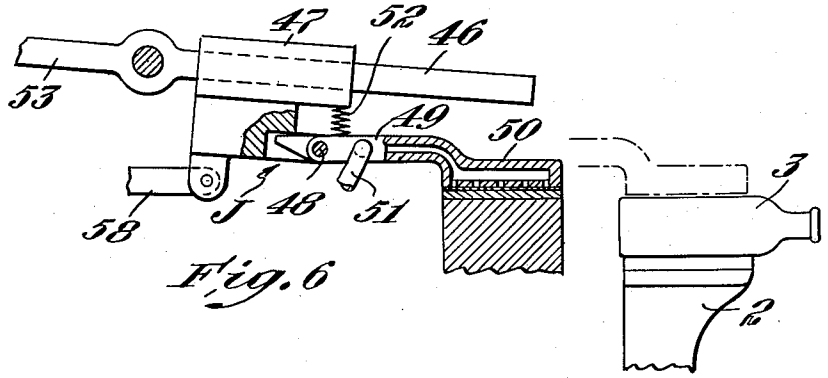


Fig. 6

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UNITED STATES PATENT OFFICE

2,503,799

LABEL TRANSFER MEANS FOR LABELING MACHINES

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Application April 9, 1948, Serial No. 20,025

14 Claims. (Cl. 216—55)

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This invention pertains to label-affixing machines, in particular to a machine of the semi-automatic type in which the article to be labeled is placed in a label-receiving position by hand, and concerns more especially improved means for transferring labels from a magazine to an article to be labeled.

The usual procedure in applying labels mechanically is to withdraw ungummed labels one by one from a magazine, then to transfer the label to the label-applying station where the article to be labeled is properly supported, applying gum to one face of the label while the latter is in transit, and pressing the gummed surface of the label into contact with the article.

The certain removal by mechanical means of labels one by one from a magazine constitutes a problem which is not too easily solved; the application of gum to one face of the label during transit without daubing the other face of the label or waste of gum presents another problem; while the accurate positioning of the gummed surface of the label relatively to the article designed to receive it involves additional difficulties. Moreover, to satisfy demands of users, the machine must be capable of repeating its operative cycle at very frequent intervals, for example at the rate of approximately 65 times a minute, or in other words as fast as a skilled operator can present articles one after another in position to receive the labels.

Picker devices for removing labels from the magazine are of various types, but suction pickers and adhesive pickers are those most commonly employed. Of these two types the adhesive picker is the more reliable as a means for removing labels from the magazine, but the use of this type of picker involves certain disadvantages, particularly the difficulty, when using this type of picker of providing a uniform coating of gum over the entire surface of the label. After removal of the label from the magazine the label may be conveyed or transferred with a high degree of certainty from one point to another by a suction carrier or transfer device, but a suction picker is not altogether reliable for picking labels from the magazine.

The attempt to solve the several problems involved in machine labeling has resulted in the production of machines which are complicated and costly and which are ofttimes subject to breakdown in operation with attendant delay and other annoyances.

The principal object of the present invention is to provide a machine of the above type wherein

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an adhesive type picker is used for removing the label from the magazine, but with provision for insuring uniform distribution of adhesive over the surface of the label. A further object is to provide mechanism wherein a label removed from the magazine by an adhesive type picker is delivered by a suction carrier to the labeling station but with provision for preventing contact of the suction carrier with the adhesive coating on the picker. 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 diagrammatic side elevation, partly in section, of so much of a labeling machine embodying the present invention as is necessary to illustrate the novel features;

Fig. 2 is a diagrammatic vertical section to much larger scale substantially on the line 2—2 of Fig. 1;

Fig. 3 is a vertical section through the shaft of the label-supporting drum showing the ratchet wheel and brake drum associated with said shaft;

Fig. 4 is a fragmentary section on the line 4—4 of Fig. 3;

Fig. 5 is a plan view of one of the picker plates carried by the drum;

Fig. 6 is a fragmentary elevation, partly in section, showing the suction picker in position to remove a label from the drum;

Fig. 7 is a fragmentary front elevation illustrating the control handle latch; and

Fig. 8 is a fragmentary elevation, to larger scale than Fig. 2, showing details of the magazine control.

Referring to the drawings, the numeral 1 designates the frame of the machine. The general construction of the machine may be similar to that illustrated in the patent to Holm 2,257,055, September 23, 1941, which discloses a machine of the semi-automatic type. At the front of the machine there is arranged an article support 2 upon which is placed the article 3, for example a bottle which is to receive the label. Directly above the article support there is arranged a fixed guide 4 in which slides the stem of a label presser 5, the stem being moved up and down at the proper intervals by means of a lever 6 (pivotally supported by a shaft W) and a link 6^a, the latter receiving its motion from a suitably contoured cam on a drive shaft S journaled in the base of the machine.

In accordance with the present invention a shaft 7 (Fig. 3) is arranged to turn about a horizontal axis extending from front to rear of the

machine, the shaft being mounted to turn in fixed journal bearings 8, carried by the frame and being turned step by step intermittently by means of a ratchet wheel 9 (Fig. 2) fixed to the shaft and a pawl 10 which engages the teeth of the ratchet wheel. This pawl, as shown in Fig. 2, is pivotally connected to the forward end of a rod 11 which slides in a guide 12 and which is urged forwardly by means of a spring 13. The rear end of the rod is pivoted to one arm of a bell crank lever whose other arm has a cam follower roll 14 engaged by a cam 15 fixed to a power driven shaft 16. The cam 15 provides the driving force for turning the shaft 7, while the spring 13 advances the pawl 10 in a forward direction to engage the next successive tooth of the ratchet wheel. As illustrated, the shaft 7 is provided with a brake drum 17 (Fig. 3) which is embraced by a brake band 18 which opposes frictional resistance to the turning of the shaft 17 so that the shaft comes to rest instantly when the pawl 10 ceases its rearward movement. Any other customary and appropriate means for holding the shaft 7 fixed in the position to which it is turned by the pawl may be substituted for the brake drum and band, if desired. Likewise instead of a pawl and ratchet drive any other customary intermittent drive may be employed such for example as the well-known Geneva movement.

Fixed to the forward end of the shaft 7 is a drum 19 which is provided with a plurality of symmetrically disposed outstanding bosses 20, 20a, 20b, 20c, 20d and 20e. As illustrated there are six of these bosses, the outer flat faces of which are related like the faces of a regular hexagon. The axial thickness of the drum is sufficient to accommodate labels of the maximum length which are to be applied and the circumferential width of the face of each of the bosses is such as to accommodate a label of the maximum width which is to be applied.

Preferably picker plates 22 (Fig. 5) independent of the bosses 20, etc., are secured to the bosses, for example by means of screws or bolts or in any other appropriate way. These picker plates 22 may be of any suitable material, for example metal, plastic, vulcanized rubber or the like and each plate has a substantially flat outer surface for contact with a label. As illustrated in Fig. 5, these plates have elongate slots 23 designed to accommodate the label-retaining legs or fingers at the delivery end of the label magazine. Such slots are customarily employed in adhesive type pickers, as illustrated for example in the patent to Holm 1,901,101, March 14, 1933.

The labels are supplied from a magazine 23 (Fig. 2). The label-retaining and advancing elements of this magazine may be of conventional type, for example as illustrated in the patent to Woodland 1,027,959, May 28, 1912 and constitute no essential part of the present invention. As illustrated, the magazine is mounted in a carrier 24 arranged to slide in fixed guides 25, the magazine being arranged to move in a path which is perpendicular to the face of the picker plate 22 on the boss 20b of the drum 19 when the drum is arranged as shown in Fig. 2. The magazine is urged downwardly in this direction by a spring 26, but is held upwardly away from the picker plate 22, except at the instant at which a label is to be transferred to the picker face. For this purpose the magazine carrier may be provided with a lug 27 which is engaged by the arm 28 of a lever which has a second arm 29, preferably resilient, provided at its end with a cam-engaging element 30. This element 30 normally engages a circumferential dwell portion of a cam 31 mounted on a driven shaft 32, the cam having an active portion which, when opposed to the follower member 30, permits the spring 26 to move the magazine downwardly, thereby to engage the lowest label with the picker plate 22.

Adhesive is supplied from a tank or box 33 within which is arranged a pickup roll 34 mounted on a driven shaft 35. This pickup roll delivers adhesive to a roller 36 having frictional engagement with the roll 34, a scraper 37 being provided to remove excessive adhesive from the roll 34. A shaft 38 provides a fulcrum for an elongate lever arm 38a which forms a guide for a sleeve 39 which is urged outwardly along said arm 38a by a spring (not shown) and which carries a gum-applying roll 40 at its lower end. The lever arm 38a has a rearward extension 41 which is pivotally connected to the upper end of a link 42 whose lower end is connected to one arm of a lever provided with a cam follower roll which engages a cam groove in a cam 43 mounted on a driven shaft 44. The cam groove in this cam 43 is so shaped as at the proper interval to swing the lever arm 38a upwardly so as to carry the gum-applying roll 40 across the entire width of the exposed face of the picker plate 22 mounted on the boss 20c when the parts are positioned as shown in Fig. 2. While this mode of applying gum to the picker plate is desirable it is to be understood that other customary devices conventional to the labeling machine art may be employed for delivering adhesive to the picker plate 22.

Referring to Fig. 1, a shaft 45 supports a lever whose forward elongate arm 46 constitutes a guide on which slides a sleeve 47 (Figs. 1 and 9). Pivoted to this sleeve 47 at the point 48, so as to rock about a horizontal axis, is an arm 49 which supports the suction carrier 50 at its forward end. This suction carrier may be of conventional type customary in the labeling machine art, for example such as illustrated in the patent to Holm 2,242,974, May 20, 1941, having suction openings in its lower face which communicate with an interior cavity which is connected, for example by a flexible tube 51, to a suction pump or other source of low pressure, (not shown) with an intervening control valve (not shown) such as common in the labeling machine art whereby suction is established and terminated at the proper intervals at the suction orifices in the carrier 50. Preferably the arm 49 which supports the carrier 50 is so pivoted, for example by means of a jackknife joint J that it cannot swing downwardly below a predetermined position. A spring 52 may be arranged to urge the arm 49 downwardly. An actuating arm 53 is connected to the guide member 46, the actuating arm being provided with a cam follower roll 55 at its rear end which engages a cam 56 mounted on a driven shaft 57. A spring 54 holds the roll 55 in contact with the cam and at the same time urges the arm 46 in a clockwise direction such as to move the suction carrier 50 downwardly.

The sleeve 47, which slides on the guide 46, is connected by means of a link 58 to the upper end of a long lever arm 59 fulcrumed at 60 and having a cam follower roll 61 which engages a cam groove in a cam mounted on the shaft S.

As illustrated in Fig. 2, a jet nozzle 64 is arranged to deliver a jet of water, steam or other cleaning fluid against the exposed surface of the picker plate 22 mounted on the boss 20e of the drum 19 when the parts occupy the position

shown in Fig. 2. A drip pan 65 is arranged beneath the drum 19 so as to collect the fluid which drips from the drum, the pan being provided with a drain pipe 66 leading to a suitable delivery point.

In starting the machine it is desirable to rotate the drum 19 so as to apply a primary coating of adhesive to the picker plates, but without danger of applying adhesive to the suction carrier, before initiating the delivery of labels from the magazine. To this end a vertically movable rod 68 (Fig. 1) is arranged with its lower end directly above the rear end portion of the lever 53. The upper end of the rod 68 is pivotally secured to the rear arm 69 of a lever conveniently pivoted on the shaft W, the lever having a forwardly extending arm 70 provided at its forward end with a hinged or flexible extension 70a provided with a handle 71 located conveniently for the operator. A fixed detent 72 (Fig. 7) carried by a part of the frame, may be engaged with the extension 70a when the handle is raised to its highest position, thus retaining the handle in this elevated position until the extension 70a is manually released from the detent. In order to prevent advance of the magazine during this primary rotation of the drum, the lever 29 which controls the motions of the magazine is provided with a second arm 77 (Fig. 8) which is forked at its rear end and straddles the lower end of a vertical rod 79 having an enlargement 78 designed to engage the arm 77. The rod 79 is connected, as shown in Fig. 1, to the lever arm 70 at a convenient point. When the handle 71 is raised, the arm 77 is elevated, thus holding the magazine in elevated position until the handle 71 is again lowered.

When the handle 71 is elevated the rod 68 moves downwardly to depress the rear end of lever arm 53, thus holding the suction carrier in elevated position so that it cannot contact one of the picker plates. The drum may now be turned as many times as desired to insure a coating of adhesive on the several picker plates without danger of daubing the suction carrier and before any label is presented to the suction pickers. When the picker plates have received the initial coating of adhesive, the handle 71 is lowered and the normal cycle of operation begins, this cycle being substantially as follows. It is assumed that labels have been placed in the magazine 23 and are normally retained therein by the customary means as above suggested. Assuming that the parts are in the position of Fig. 2, and that the surface of the picker plate 22 carried by the boss 20b of the drum 19 has received its initial coating of adhesive, the cam 31 permits the spring 26 to move the magazine downwardly, thus contacting the lowermost label in the magazine with the sticky surface of the picker plate 22. The cam 31 thereupon immediately retracts the magazine, leaving this lower label stuck to the picker plate. Thereupon the drum 19 is turned one-sixth of a revolution by the pawl 10, thus moving the label to the transfer position, that is to say to the position of that picker plate 22 which is carried by the boss 20a of the drum, as shown in Fig. 2. Assuming that a label is on the picker plate, the label is brought to rest at the transfer position and as it comes to rest the suction carrier 50, which has previously been moved rearwardly by the action of the lever 59 is moved directly downward by the spring 54 (as permitted by the cam 56) so as to place the lower surface of the carrier 50 in contact with the exposed upper surface of the label. Suction is now established at the suction carrier such as to cause the label to adhere preferentially to the surface of the suction carrier. The arm 59 now moves the sleeve 47 forwardly in a path substantially parallel to the plane of the picker plate, thus sliding the label off of the picker plate and spreading the adhesive smoothly and uniformly over the label. This movement of the carrier continues until it is directly over the bottle 3 mounted on the rest 2, as shown in broken lines in Fig. 1. The cam 56 is so shaped that at this instant the suction carrier is permitted to drop so as to place the adhesively coated surface of the label in contact with the bottle. The suction is now broken at the suction carrier by the action of the controlling valve, and the cam 56 immediately lifts the suction carrier from the label and the arm 59 returns the suction carrier to its rearward position in readiness to descend upon the next label presented by the drum 19. As the drum continues to rotate step by step, the picker plate 22 from which the label has been removed at the transfer station arrives at the position 20e (Fig. 2) and is subjected to a cleansing spray from the nozzle 26. After an idle stop at the position 20d, it moves to the position 20e where the picker plate is engaged by the roller 40 which swings back and forth across the surface of the picker plate at the position 20e, thus applying a substantially uniform coating of adhesive to the exposed surface of the plate. At the next step the coated surface of the plate is registered with the magazine, thus completing the cycle of operations. After the label has been placed on the article 3, the presser 5 moves downwardly in the customary way so as to smooth out wrinkles and insure perfect adhesion, the operation of the presser being customary and well known.

While one desirable embodiment of the invention has herein been disclosed by way of example together with suggested variations, it is to be understood that the invention is broadly inclusive of any and all changes and substitutions and rearrangements of parts such as fall within the scope of the appended claims.

I claim:

1. Apparatus of the class described comprising an adhesive type picker, means for moving said picker along a closed path and for stopping it successively at a gum-receiving, a label-receiving and a transfer station respectively, means for applying gum to the picker at the first of said stations, means for adhering a label to the picker at the second of said stations, a suction carrier, means for engaging the suction carrier with the label on the picker at the transfer station, and means for moving the suction carrier to a label-applying station, said last means being so constructed and arranged as to move the carrier in a path parallel to the plane of the picker while separating the label from the picker, thereby to spread the adhesive uniformly.

2. Apparatus of the class described comprising a rotary support, a picker plate mounted upon the support to move in a closed path, gum-applying means, a magazine, and a reciprocating suction carrier, means for turning the support and for stopping it successively with the picker plate operatively related to the gum-applying means, to the magazine and to the suction carrier respectively, and means for actuating the several parts in timed relation.

3. Apparatus of the class described comprising

a rotary support, a picker plate mounted upon the support to move in a closed path, means for applying gum to the picker plate, a magazine movable toward and from the path of the picker plate, means for turning the support and for stopping it successively with the picker plate operatively related to the gum-applying means and to the magazine respectively, means for causing the gum-applying means to coat the picker plate with adhesive, and means operative to move the magazine toward the coated picker plate, thereby to adhere the endmost label in the magazine to the gum coating on the plate, a suction carrier engageable with the exposed surface of a label adherent to the picker plate, and means for moving the carrier in a path parallel to the plate thereby to slide the label from off of the plate.

4. Apparatus of the class described comprising a rotary support, a plurality of picker plates mounted upon the periphery of the support and in planes corresponding to the faces of a regular polyhedron, means operative to turn the support and to stop it successively at each of a plurality of positions, means operative to apply gum to a picker plate disposed in one of said positions, means for adhering a label to a picker plate at a succeeding position, and a suction carrier operative to engage and to slide a label edgewise from off a picker at a further successive position.

5. Apparatus of the class described comprising a rotary support, a plurality of picker plates mounted upon the periphery of the support and in planes corresponding to the faces of a regular polyhedron, means operative to turn the support and to stop it successively at each of a plurality of positions corresponding in number to the number of picker plates, means for applying adhesive to a picker plate stopped at one of said positions, means for adhering a label to a picker plate stopped at a following position, a suction carrier operative to remove a label from the picker plate at the next successive position, and means for cleaning the picker plate at another of said positions.

6. Apparatus of the class described comprising a rotary support, a plurality of picker plates mounted upon the periphery of the support and in planes corresponding to the faces of a regular polyhedron, gum-applying means, a magazine and a suction carrier all arranged circumferentially of the support, means operative to turn the support and for stopping it thereby to present a picker plate successively to the gum-applying means and to the magazine and in operative relation to the suction carrier.

7. Apparatus of the class described comprising a rotary support having mounted thereon a plurality of picker plates disposed in planes forming the faces of a regular polyhedron, means operative to turn the support step by step, means operative to apply adhesive to one picker plate while the support is stationary, means operative simultaneously to adhere a label to the plate next in advance, and suction means operative, simultaneously with the preceding operations, to remove a label from the plate next to the last named plate.

8. Apparatus of the class described comprising a rotary support, a plurality of picker plates carried by the support and arranged in planes which define the faces of a regular polyhedron, means for turning the support and for holding it stationary at a succession of points corresponding to the number of picker plates, means for adhering a label to each picker plate in succession, a suction carrier, means for moving the suction carrier into operative engagement with a label adhering to a picker plate, means for moving the suction carrier in a path parallel to the plane of the plate thereby to separate the label from the picker plate and simultaneously to spread the adhesive uniformly over the label, means operative to move the carrier to deposit the label upon the article designed to receive it, and means to move the suction carrier upwardly away from the article.

9. Apparatus of the class described comprising a support for an article to be labeled, a suction carrier for delivering a label to an article resting on the support, means for moving the carrier in an approximately horizontal path to a point above the article to be labeled, means to move the carrier downwardly to contact a label with the article, means to move the carrier upwardly away from the label and thence rearwardly to a transfer station, means to move the carrier downwardly at the transfer station, and an adhesive type picker operative to present a label for engagement with the suction carrier as the latter moves downwardly at the transfer station.

10. Apparatus of the class described comprising a support for an article to be labeled, a suction carrier for delivering a label to an article resting on the support, means for moving the carrier in an approximately horizontal path to a point above the article to be labeled, means to move the carrier downwardly to contact a label with the article, means to move the carrier upwardly away from the article and thence rearwardly to a transfer station, means to move the carrier downwardly at the transfer station, a rotary support arranged to turn about an axis substantially parallel to the horizontal path of the carrier, a plurality of picker plates mounted on the rotary support, means for adhering a label to each of said picker plates in succession, and means for turning the support intermittently to bring successive picker plates to the transfer station.

11. Apparatus of the class described comprising a support for an article to be labeled, a suction carrier for delivering a label to an article resting on the support, means for moving the carrier in an approximately horizontal path to a point above the article to be labeled, means to move the carrier downwardly to contact a label with the article, means to move the carrier upwardly away from the label and thence rearwardly to a transfer station, means to move the carrier downwardly at the transfer station, a rotary support arranged to turn about a substantially horizontal axis parallel to the horizontal path of travel of the carrier, a plurality of picker plates mounted upon the support and disposed in planes which form the faces of a regular polyhedron, means for turning the support intermittently thereby successively to dispose said picker plates at the transfer station, a magazine for delivering labels to the picker plates, means operative to coat each picker plate with adhesive as it approaches the magazine, and means operative to move the magazine to contact the endmost label therein with the adhesive coating on the picker plate.

12. Apparatus of the kind wherein an article to be labeled rests upon a support at a labeling station and wherein an adhesive type picker supports a label at a transfer station, characterized in having a suction carrier for transferring a label from the picker to the article designed to receive it, and means operative to move the suc-

tion carrier downwardly at the transfer station into operative contact with a label on the picker, then in a path substantially parallel to the plane of the label, with the label adhering to it, from the transfer station to the labeling station, then downward to apply the label to the article, then upwardly to a point above the level of the picker and back to the transfer station, and means for supplying a label to the picker.

13. Apparatus of the kind wherein an article to be labeled rests upon a support at a labeling station and wherein an adhesive type picker supports a label at a transfer station, characterized in having a suction carrier for transferring a label from the picker to the article designed to receive it, and means operative to move the suction carrier downwardly at the transfer station into operative contact with a label on the picker, then in a path substantially parallel to the plane of the label, with the label adhering to it, from the transfer station to the labeling station, then downward to apply the label to the article, then upwardly to a point above the level of the picker and back to the transfer station, a rotary support provided with a series of adhesive type pickers, and means to move the support intermittently thereby to dispose successive pickers at the transfer station.

14. Apparatus of the class described comprising

a rotary support, said support having six peripheral faces disposed in planes constituting the faces of a regular hexihedron, a picker plate secured to each of said faces, means for turning the support step by step through an arc of 60° at each step, means for applying adhesive to that picker plate which is located below the plane of the axis of the support and which is inclined at an angle of 60° to the horizontal, a magazine for labels and means whereby a label is delivered from the magazine to that picker plate which is located above the level of the axis of the support and which makes an angle of 60° with the horizontal, and a suction carrier arranged to contact a label on that picker plate which is horizontal and above the axis of the support, and means for moving said carrier in a plane parallel to the plane of the picker plate with the label adherent thereto so as to separate the label from the picker.

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