United States Patent [19]

Tavernier

[11] 3,735,731

[45] May 29, 1973

[54] **LABEL GUMMING AND DISPENSING DEVICE**

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[73] Assignee: **Societe Nouvelle Baele-Gangloff,** Villeurbanne, France

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[21] Appl. No.: **192,967**

[30] **Foreign Application Priority Data**

Oct. 30, 1970 France.....7039895

[52] **U.S. Cl.** **118/220,** 118/231, 118/236, 101/232, 156/568, 156/571

[51] **Int. Cl.**.....**B05c 1/02**

[58] **Field of Search**.....118/231, 236, 220, 118/240; 156/568, 571; 101/232

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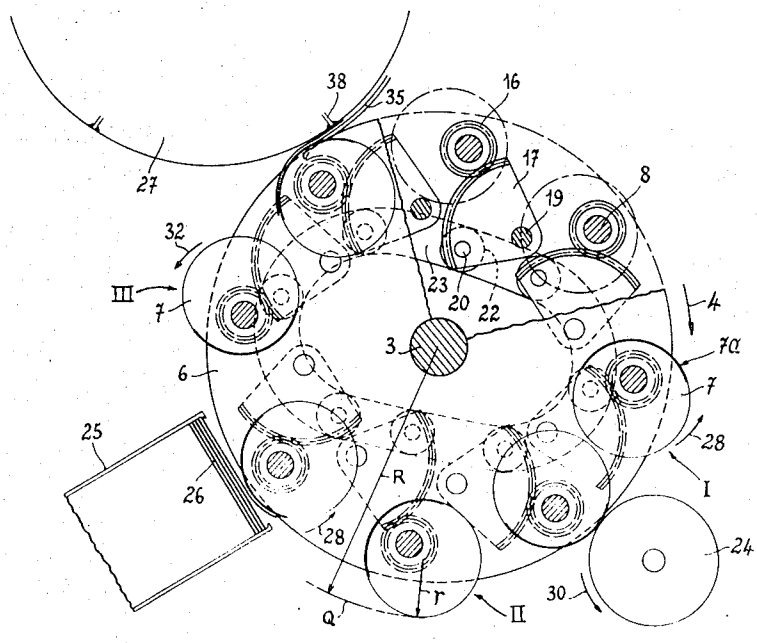
Primary Examiner—John P. McIntosh

Attorney—Eric H. Waters, John G. Schwartz and J. Harold Nissen

[57] **ABSTRACT**

This device for gumming and dispensing labels comprises a rotary support carrying label-pick-up members, and adapted to cause said pick-up members to register in succession with a gumming cylinder, a fixed magazine containing the labels to be gummed, and a drum adapted to transfer these labels to the articles to be labelled, wherein said label pick-up members consist of cylinders or cylinder portions having a radius considerably smaller than that of the path described by their outermost generatrix during the rotation of said support, the axis of rotation of said cylinders or cylinder portions being off-set in relation to their longitudinal axis by a value determined to permit the rolling of said pick-up member on the gumming cylinder and on the first label of said magazine without slipping, said pick-up members being connected to means adapted to impart thereto a pivotal movement in either direction in relation to their rotary support, as they move past the different peripheral stations for gumming, picking-up and transferring said labels. (FIG. 1).

2 Claims, 17 Drawing Figures



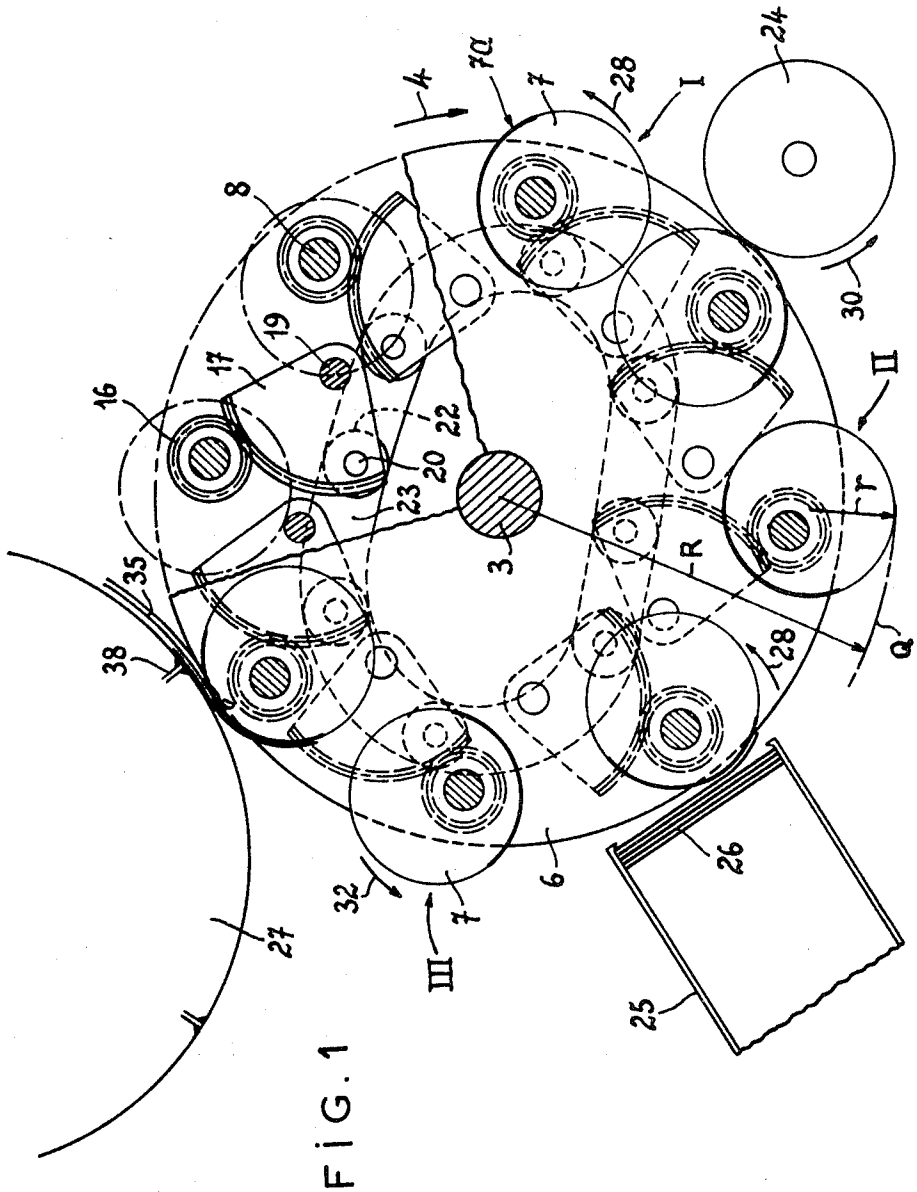


FIG. 1

FIG. 2

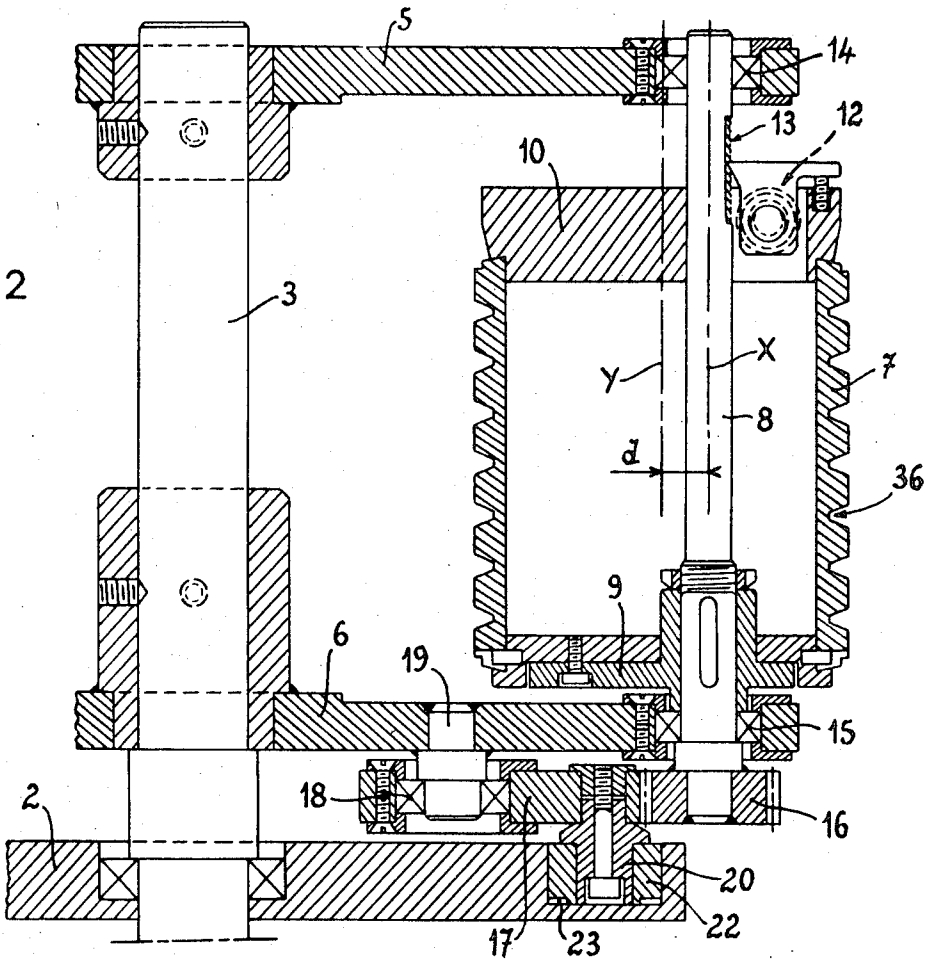


FIG.7

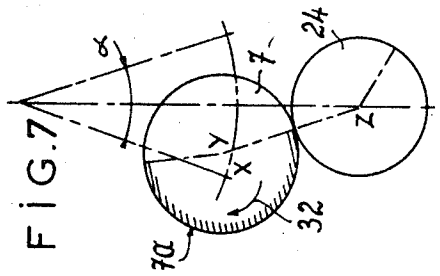


FIG.6

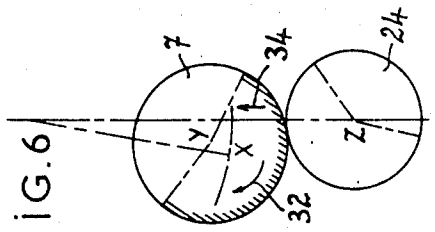


FIG.5

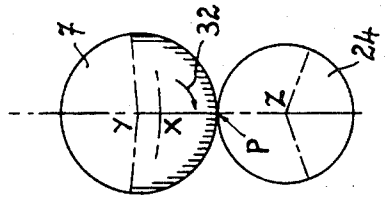


FIG.4

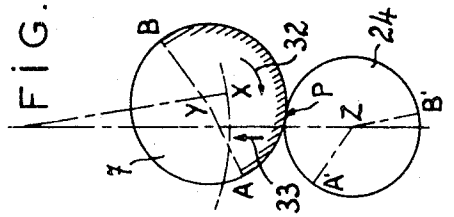


FIG.3

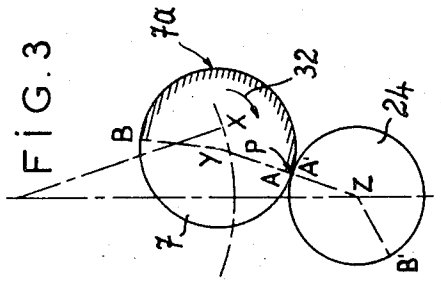


FIG.12

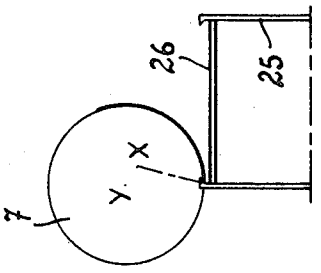


FIG.11

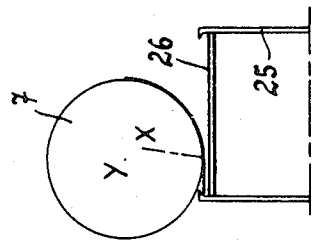


FIG.10

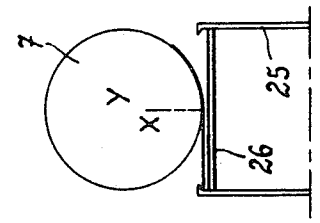


FIG.9

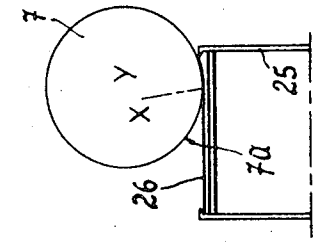
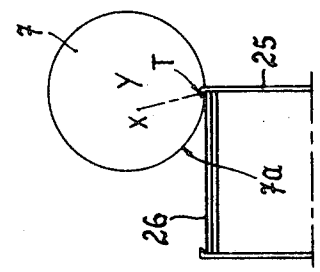


FIG.8



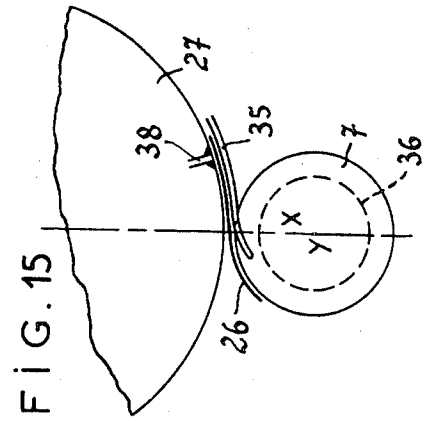


FIG. 15

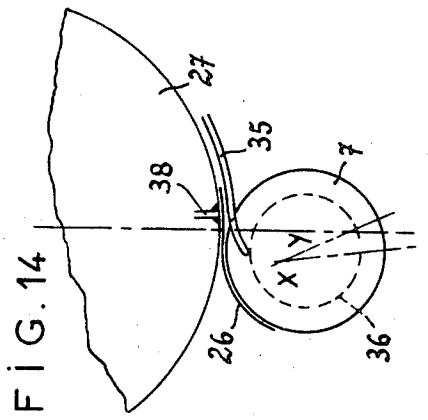


FIG. 14

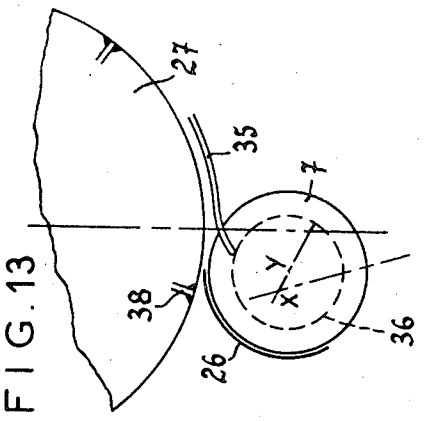


FIG. 13

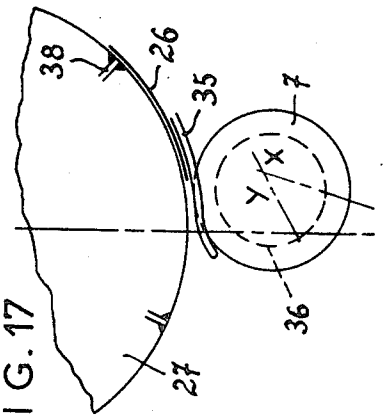


FIG. 17

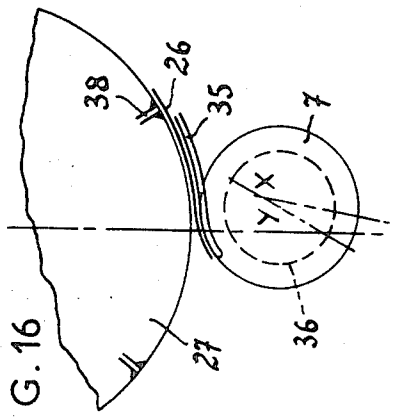


FIG. 16

LABEL GUMMING AND DISPENSING DEVICE

FIELD OF THE INVENTION

The present invention relates to devices for gumming and dispensing labels.

Devices of this character are currently used for picking up each one of stacked labels contained in a magazine, gumming and delivering these labels to a dispensing station so as to direct and apply them onto the articles to be labelled.

This invention is concerned more particularly with device of this type which are used in conjunction with bottle-filling machines, notably devices based on the principle of the so-called rotary labelling.

DESCRIPTION OF THE PRIOR ART

A known device of this type consists of a rotary support on which cylindrical label pick-up means are rotatably mounted. Thus, during the support rotation each pick-up member rolls in succession on a gumming strip so as to become loaded with liquid adhesive, then on the first label of a fixed reserve of labels so as to pick up this label and deliver same to a transfer unit.

This known device is objectionable from the dual point of view of gumming efficiency and label pick-up efficiency. In fact, since each pick-up member describes a circular path about the axis of rotation of its support and has a radius or curvature smaller than that of this path, it is positively precluded to gum this member by means of a cylinder since it would have only a linear contact with this cylinder. Therefore, a gumming strip or belt must be used while so arranging each pick up member that it can move radially on its support and roll on said strip or belt. However, this arrangement cannot ensure a regular gum coating because the pressure exerted by the pick-up members on the gumming strip or belt varies during the gumming operation.

Similarly, to permit the removal of the gummed label and avoid giving a concave surface thereto, the pick up members must be capable of moving radially under the control of return springs. Also in this case the pressure exerted by the pick-up member on the label varies as a function of the angular position of this member.

The means implemented for producing the necessary radial movement of each pick up member lead to undesired complication of the construction of the device, with a consequent increase in cost, and more particularly these pick-up members have a considerable inertia preventing a high-rate operation of the device.

In addition, the rate of operation of a device of this character is also limited by the time necessary for allowing the liquid adhesive substance to dry, since high-production rate devices require the use of quick-setting adhesives which cannot be contemplated in the present instance, due to the presence of a gumming strip or belt operating satisfactorily only with slow-setting adhesives.

Under these conditions, this device is ill suited for modern filling machines operating at rates as high as 40,000 labels per hour and requiring a perfect trouble-free labelling.

In another known device the rotary support carries cylindrical sectors which, being fulcrumed close to the edges of said support, have a radius, of curvature equal to that of the path described by said sectors. Each pick-up member is connected to means adapted, before the label pick-up movement proper, to impart to this member a pivoting movement with a certain time lead in relation to the rotational movement of the support and, when it actually engages the label, a pivoting movement having a certain time lag.

Since the pick-up members have a developed width corresponding to the label width, these members are relatively cumbersome, considering their pivotal movement in relation to the rotary support. Therefore, their number is necessarily reduced on said rotary support.

Although this last-mentioned device is capable of operating at a rate appreciably higher than that of the previously described device, this rate is still moderate in relation to the desired rates of operation. To avoid this difficulty, two or more devices of this type must be disposed around a label transfer member; however, the resulting assembly is more complicated, expensive and cumbersome.

SUMMARY OF THE INVENTION

The present invention provides a device of the type broadly described hereinabove which is of more compact construction and capable of operating at very high rates.

This device is characterized in that the pick-up members cylinders or cylindrical sectors have a radius considerably smaller than that of the path described by their outermost generatrix during the rotation of the support, that the axis of rotation of these pick-up members is off-set in relation to their longitudinal axis by a predetermined value so that they can roll without slipping on the gumming cylinder and on the first label of the label magazine, said pick-up members being operatively connected to means capable of imparting thereto a pivotal movement in two directions in relation to their rotary support, as they move past the various peripheral stations for gumming, picking-up and transferring the labels.

According to a preferred form of embodiment of this invention the pick-up members are associated with means adapted to retard their pivoting movement in relation to the rotary support, before their engagement with the gumming cylinder, and to accelerate said pivoting movement when they actually engage said cylinder.

With this arrangement, each pick-up member rolls without slipping on the surface of the gumming cylinder and is coated throughout its useful surface with a regular film of adhesive.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a plan view from above, with parts in section, of the device;

FIG. 2 is a fragmentary side elevational and sectional view showing on a larger scale one of the pick-up members and the means for securing and driving same;

FIGS. 3 to 7 are diagrammatic views showing on a smaller scale some of the various positions of a pick-up member during the gumming thereof;

FIGS. 8 to 12 are views similar to FIGS. 3 to 7, showing some of the various positions assumed by one of the pick-up members when picking up a label; and

FIGS. 13 to 17 are views similar to the preceding ones showing some of the various positions assumed by a pick-up member when depositing the label carried thereby onto a transfer drum.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The device according to this invention comprises a fixed disk **2** and a vertical shaft **3** extending through its center. The lower portion of this shaft **3** is connected to means (not shown) adapted to impart thereto a movement of rotation in the direction of the arrow **4** of FIG. **1**, the upper portion of the shaft having rigidly secured thereto, for example by means of set screws, a pair of spaced disks, namely an upper disk **5** and a lower disk **6** acting as rotary supporting members. These disks **5, 6** carry the label pick-up members proper consisting, according to the present invention, of cylinders **7** having a radius of curvature *r* definitely smaller than the radius R of the path Q described by their outermost generatrices in relation to the longitudinal axis of shaft **3** during the rotation of disks **5** and **6.** Moreover, as shown more in detail in FIG. **2,** each cylinder **7** is rigid with a vertical shaft **8** of which the longitudinal axis X is off-set by a value *d* in relation to the longitudinal axis Y of said cylinder.

In fact, each cylinder **7** comprises a flange **9** keyed to shaft **8** and adapted to position and center the lower portion of a cylinder-forming socket of which the upper portion is retained an positioned by a crown **10** surrounding said shaft **8.** This crown **10** is provided with locking means **12** comprising teeth **13** for rapidly connecting or disconnecting this crown **10** in relation to shaft **8,** notably for replacing the cylinder-forming socket with a similar socket of different dimensions, as a function of the type of label to be used.

Shaft **8** is mounted for loose rotation in disks **5** and **6,** by means of ball-bearings **14, 15** and carries a pinion **16** keyed to its lower end and projecting beneath the disk **6.** This pinion **16** is in constant meshing engagement with a toothed segment **17** mounted for loose rotation by means of another ball-bearings **18** on a pin **19** projecting likewise from the underface of disk **6** in which said pin is secured. Finally, the toothed segment **17** is rigid with a stud **20** carrying a roller **22** adapted to rotate freely thereon. This roller **22** engages a continuous groove **23** formed in disk **2,** the lateral walls of this groove acting as cam means to said roller.

Of course, the device according to this invention is operated in combination with a gumming cylinder **24,** a fixed magazine or reserve **25** containing labels **26** and a transfer drum **27** adapted to pick-up the labels separately, as delivered thereto by each pick-up member, in order to apply this label to one of the articles to be labelled, notably bottles.

From the foregoing it is clear that each pick-up member is adapted to pivot in relation to disks **5** and **6,** in one or the other direction, according to the contour of cam groove **23** engaged by said roller **22.**

Thus, when the shaft **3** is driven for continuous rotation in the direction of the arrow **4** of FIG. **1,** the pick-up member moving towards the gumming cylinder **24** is caused to pivot in the direction of the arrow **28** until it assumes the position designated by the Roman figure "I" in FIG. **1.** It will be seen that this pivoting movement causes the operative or useful portion **7***a* of the pick-up member, shown by a thicker line in FIG. **1** and by a hatched portion in FIGS. **3** to **7.** When the pick-up member engages at P the gumming cylinder **24** driven for continuous rotation in the direction of the arrow **30** of FIG. **1,** this pick-up member **7** is caused to pivot in the direction of the arrow **32** as shown in FIG. **3.** During this pivotal movement the two members assume the positions illustrated in FIGS. **3** to **7.**

In these Figures, the operative or useful portion **7***a* of pick-up member **7** is bounded by radii YA and YB, and the corresponding peripheral surface of gumming cylinder **24** engaged by cylinder **7** is bounded by the radii ZA' and ZB', the reference letter Z designating the axis of rotation of the gumming cylinder **24.**

Thus, the pick-up cylinder **7** is caused to pivot according to a law governed by the corresponding roller **22** travelling in the fixed groove **23** and controlling the movement of the toothed segment **17** meshing with the pinion **16** rigid with shaft **8.** As a consequence of this pivotal movement and considering the position of the axis of revolution Y of cylinder **7** in relation to its axis of rotation X, and therefore the reduction in the radius XP, that portion of cylinder **7** which engages the point P of gumming cylinder **24** is caused to recede gradually. In other words, the movement of cylinder **7** in the direction of the arrow **32** is compensated by its displacement in the direction of the arrow **33** of FIG. **4,** so that a contact is constantly maintained between the two cylinders.

Due to the combination of these two movements, the point P moves gradually to the position shown in FIG. **5,** which corresponds to the moment whereat the axes X, Y and Z are coplanar. From this pointand considering the increment in radius XP, the movement of pick-up cylinder **7** in the direction of the arrow **32** is compensated by its movement in the direction of the arrow **34** of FIG. **6.** Under these conditions, it is clear that throughout the passage of the useful surface **7***a* of cylinder **7** past the gumming cylinder **24** these two cylinders remain in mutual contact and that, by properly selecting the law governing the pivotal movement of cylinder **7** about the axis X, the pick-up cylinder **7** will roll without slipping on the gumming cylinder **24.**

It will be noted that to gum the useful surface **7***a* of pick-up cylinder **7** as defined by the center angle AYB, the rotary support has pivoted only thorugh a very small angle a, not through the same angle AYB, as observed in case the pick-up member consists of a cylindrical segment having the same radius as the circular path Q of the support on which it is pivotally mounted.

When the pick-up cylinder **7** is no more in contact with the gumming cylinder **24,** it continues its pivotal movement in the direction of the arrow **32** until its useful or operative portion **7***a* has a certain lead, as shown at II in FIG. **1.** Then, when the cylinder **7** engages with the rear or trailing edge of its useful or operative area **7***a* the first label **26** contained in the magazine **25,** it is rotatably driven about the axis X in the direction of the arrow **28** and occupies in succession the positions illustrated in FIGS. **8** to **12.** Let us designate with the reference letter T, in these Figures, the point of contact or tangency of cylinder **7** with label **26,** it will be seen that the radius XT decreases gradually to its value shown in FIG. **10** which corresponds to the difference between the radius of curvature R of cylinder **7** and the off-set distance *d,* and then increases again, also gradually. As a result this off-set enables the useful portion **7***a* of cylinder **7** to roll without slipping on the label **26** although the latter is not flat, so as to pick-up the label under the best possible conditions.

When the cylinder **7** has picket up the label **26** and as it travels with its rotary support revolving in the di-

rection of the arrow **4**, it still pivots in the direction of the arrow **28** about the axis X and this pivotal movement is discontinued only when the cylinder has attained the position III of FIG. **1**. Then the cylinder **7** is pivoted in the opposite direction, i.e. in the direction of the arrow **32**, and moves past the transfer drum **27** and through the various positions shown in FIGS. **13** to **17**.

These Figures show the manner in which the guide combs **35** engage the circular grooves **36** formed in cylinder **7**, pick up the gummed label **26** carried by this cylinder and direct same to the transfer drum **27**. These Figures further show that also in this case the pivotal movement of cylinder **7** about its axis X is so adjusted that the label is transferred under the best possible conditions.

When the label ends leaves the pick-up cylinder **7** it is retained on the transfer drum **27** by a suction device **28**, i.e. an orifice connected to a source of pneumatic vacuum. Of course, any known and suitable means, such as clamps or pliers, may be used for subsequently picking up the label and applying same to an article to be labelled, notably a bottle. However, these means are not shown and described herein as they are no part of this invention.

Finally, when the pick-up cylinder **7** is moved away from the transfer drum **27**, the cam groove **23** is caused to move the roller follower **22** laterally, so that through the meshing engagement of toothed segment **17** and pinion **16** the shaft **8** is caused to pivot in the direction of the arrow **28** and restores the aforesaid cylinder to the position shown at I in FIG. **1**. In other words, the leading edge of its useful or operative surface **7***a* has a certain lead and is ready to engage the gumming cylinder **24**.

From the foregoing it is clear that the device according to the present invention is capable of performing a labelling operation in a reliable, trouble-free manner and under the best possible conditions of operation. Moreover, due to the relatively small dimensions of pick-up cylinders **7** and also to the reduced space necessary to permit their pivotal movements, it is possible to provide a greater number of these cylinders on a same rotary support, for example **8**, and therefore to increase the production rate of the device. On the other hand, as the mass of each cylinder **7** is considerably lower than that of the segments utilized in conventional machines of the same type, its inertia is reduced appreciably and more frequent and sudden reversals of its direction of motion can be produced, thus affording higher rotational speeds of the rotary support, and therefore still higher rates of operation.

Finally, although the pick-up members have been described and illustrated herein as having a substantially or general cylindrical configuration, it will readily appear to those skilled in the art that this choice was dictated only by reasons of convenience to facilitate the understanding of the principle of operation of the device, for other shapes may be used without departing from the scope of the invention; thus, these pick-up members may have the shape of a cylindrical segment corresponding in peripheral length to the length of the label to be applied.

What is claimed as new is:

1. Device for gumming and dispensing labels, of the type comprising a rotary support carrying label pick-up members and adapted to cause said pick-up members to register in succession with a gumming cylinder, a fixed magazine containing the labels to be gummed, and a drum adapted to transfer these labels to the articles to be labelled, wherein said label pick-up members consist of cylinders or cylinder portions having a radius considerably smaller than that of the path described by their outermost generatrix during the rotation of said support, the axis of rotation of said cylinders or cylinder portions being off-set in relation to their longitudinal axis by a value determined to permit the rolling of said pick-up member on the gumming cylinder and on the first label of said magazine without slipping, said pick-up members being connected to means adapted to impart thereto a pivotal movement in either direction in relation to their rotary support, as they move past the different peripheral stations for gumming, picking-up and transferring said labels.

2. Device as set forth in claim **1**, wherein said pick-up members are associated with means capable of retarding their pivotal movement in relation to said rotary support, before they engage said gumming cylinder, and of accelerating their pivotal movement when they engage said gumming cylinder.

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