Oct. 27, 1970 R. R. DELLA VITA ETAL 3,536,560

LABELLING MACHINE FOR BOTTLES OR THE LIKE, COMPRISING BODIES OF VARIOUS SHAPES OR DIMENSIONS

Filed April 12, 1967 2 Sheets-Sheet 1

Fig. 1.

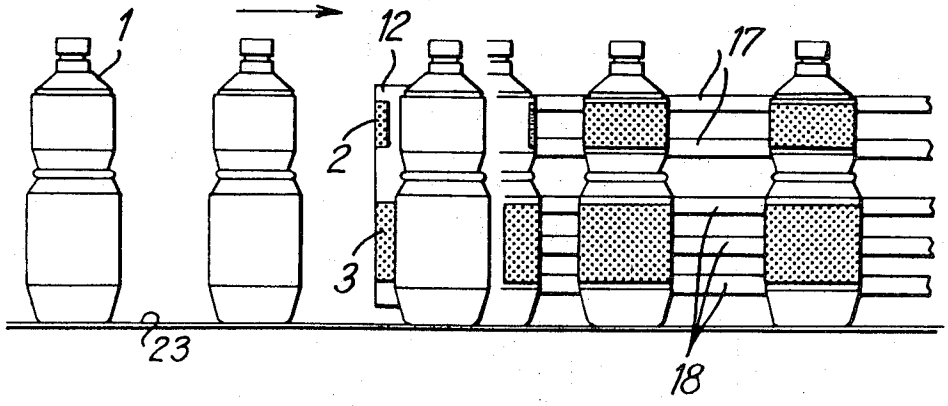


Fig. 2.

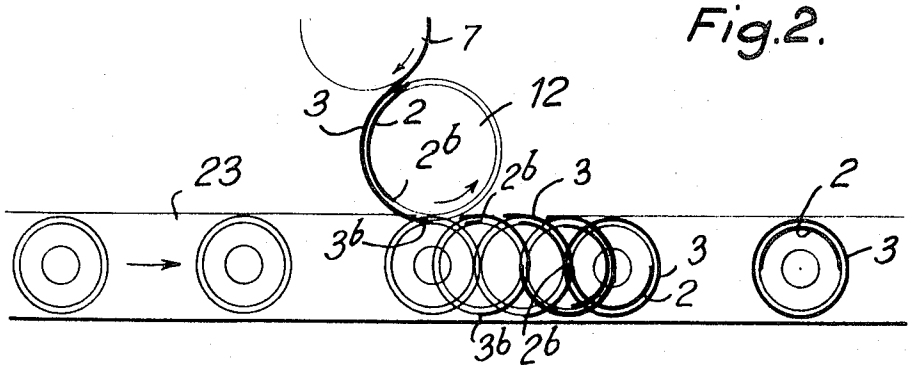
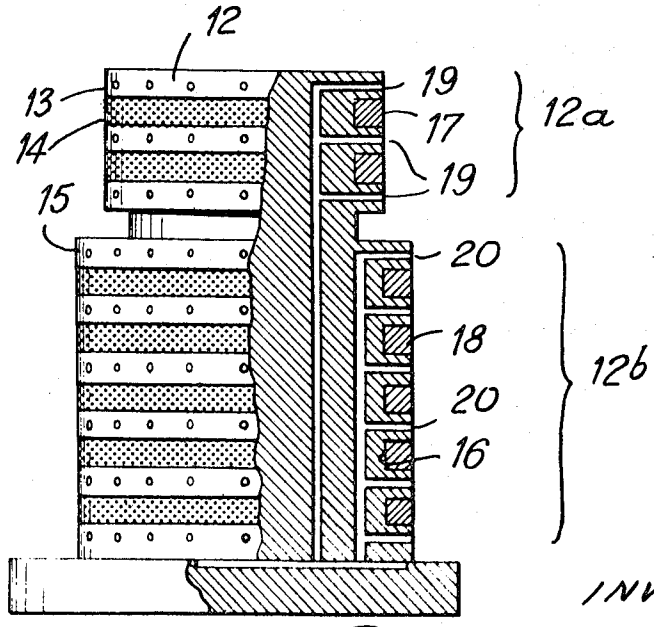


Fig. 5.



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Fig. 4.

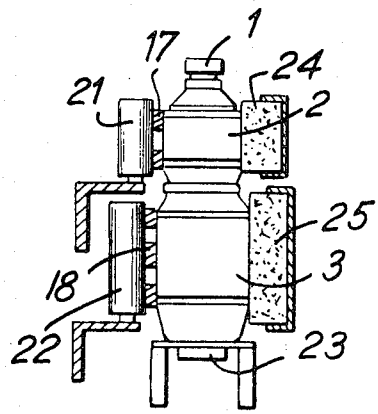
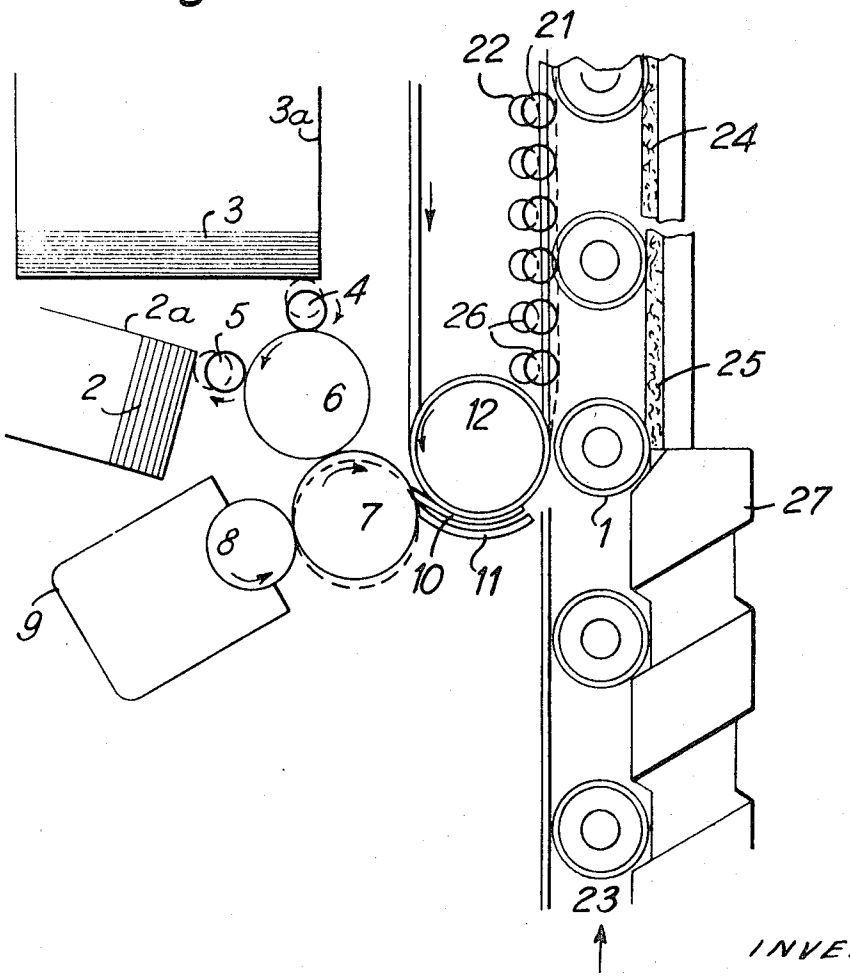


Fig. 3.



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LABELLING MACHINE FOR BOTTLES OR THE LIKE, COMPRISING BODIES OF VARIOUS SHAPES OR DIMENSIONS

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Claims priority, application France, Apr. 20, 1966, 58,348
Int. Cl. B65c 3/16, 3/18, 9/34
U.S. Cl. 156—455 7 Claims

ABSTRACT OF THE DISCLOSURE

A labelling machine for use with receptacles having portions of differing shapes and/or diameters. The machine comprises label magazines, picker units which extract labels from the magazines and transfer the labels through an intermediate roll to a paste applying unit. The labels are, in turn, transferred from the paste applying unit to turrets having alternate ridges and grooves, said ridges being provided with suction holes for holding the labels on the turret. Sets of smoothing belts are received in the grooves which carry the labels from the turrets and by means of guide rolls and a counter brace system, the labels are applied to the receptacles. The receptacles are introduced between the belts and the opposing counter brace system by means of a screw conveyor.

BRIEF DESCRIPTION OF THE INVENTION

More and more today, fancy shaped receptacles are placed on the market, which are distinguished from conventional receptacles in that they frequently present a body having different dimensions and shapes.

The machine of the invention makes it possible to place at least two labels on such receptacles.

For example, a machine of this type can place two labels on a receptacle having two cylindrical bodies of distinct diameters, e.g., a lower body of a certain diameter and an upper body of lesser diameter.

This possibility is not limitative, however, since it will be appreciated from what follows that such a machine may just as well place two labels on a receptacle presenting a plurality of truncated conical parts, the said labels being placed on the said parts even if they are oriented differently with reference to each other.

There are labelling machines in the prior art which have between the pasting device and the device that smooths the label on the receptacle, a cylindrical turret that holds the label by suction, said turret being brought into tangential contact with the receptacle along a generatrix.

The machine of the invention comprises an assembly that takes labels from label magazines, a pasting assembly that applies paste to the labels before putting them on a turret, and a smoothing assembly disposed beyond the turret to smooth and apply the label on the receptacle. Disposed between the exit from the pasting assembly and the entrance to the smoothing assembly there are two turrets of different diameters which respectively pick up the paste-coated labels by suction and which are capable of transferring at least one label to each of the parts of the receptacle though the parts differ in diameter. Means are provided so that the transfer of the labels by the turrets to the parts of the receptacles is effected at unequal speeds that exactly correspond to the respective linear rates of rotation of the parts of the receptacle having the different diameters.

In one possible embodiment of the invention, the turrets are separate and have parallel axes.

In a preferred embodiment of the invention, the turrets are integral, mounted coaxially one on the other, driven at the same angular velocity, but they have different diameters.

According to a special feature of this preferred embodiment, the turrets present a succession of superposed grooves and ridges, and the means of transferring the labels from the two parts of the turret to the smoothing assembly comprise belts enclosed in the grooves of the turrets.

To hold the labels on the turrets, the ridges of the latter, on either side of the belt seats, are furnished with suction holes that open on the surface of the ridges. These holes are connected by a suitable circuit to a vacuum producing circuit.

According to another characteristic of the invention, the sets of belts which transfer the labels to the specific parts of the body of the receptacle are brought into contact with the said parts by a spatial shifting of the line of tension, said shift being effected by guide rolls thrusting the belts into contact with the corresponding parts of the receptacle which respectively have different diameters.

According to another characteristic of the invention, a counter brace is provided which is designed to compensate for the difference in the linear speeds of the parts of the receptacle having the different diameters.

The compensation for the difference in the linear speeds is attained according to one embodiment by the combination of a sponge pad provided at the lower part of the counter brace that corresponds to the part of the receptacle that is of greater diameter, and a set of belts provided on the upper part of the counter brace, the said belt passing opposite the receptacles at an equal linear speed, but in the direction opposed to that of the smoothing belts located at the upper part of the label transfer devices. According to a modification, the counter bracing system for the receptacle could comprise two sets of belts with different linear speeds, but which speeds are equal to and in the opposite direction respectively of that of the two sets of smoothing belts that face them on the other side of the receptacle conveyor.

According to another modification, the counter brace system comprises two sets of straight elastic pads, where the two cylindrical parts of the receptacles have relatively close but different diameters.

According to another characteristic of the invention, the guide rolls at the head of the smoothing assembly may also be notched, and like the turrets may present grooves and ribs, the grooves comprising seats for the smoothing belts while the ribs have at their surfaces suction holes. This arrangement makes it possible to transfer and properly position a label on a first part to the receptacle when the label has dimensions much smaller than those of a label to be applied to a second part of the receptacle.

According to another feature of the invention, the guide rolls that apply the smoothing belts to one of the parts of the receptacle to be labelled are independent of the guide rolls that apply the smoothing belts to the other part of the receptacle. The said guide rolls can be advanced toward or drawn back from the axis of the conveyor path for the receptacles, to define a position of the smoothing belts that conforms to the respective diameter of the receptacles.

According to another modification, the straight elastic pads or the belts of the counter brace system are replaced by free smoothing rolls in order to prevent the label from slipping on the part of the receptacle that has the lesser diameter.

According to another characteristic, the receptacle is

thrust into the entrance of the smoothing assembly, between the sets of smoothing belts, and the counter brace system, by a feed screw that does not break contact with the receptacle until the axis of the latter has passed before the axis of the turret, this result being obtained by thrust of the posterior lip of the screw, through an increase in the length of the pitch of the feed screw at the end of its active portion.

Other features and advantages of the invention will become evident in the course of the following description, with reference to the attached drawings presented as nonlimitative examples. This description will make it clearly understandable, how the present invention can be reduced to practice, the features that are presented through the drawings and also the text being of course part of the invention.

FIG. 1 is a view in elevation, showing the receptacles on the conveyor as well as the start of the labelling and smoothing operation;

FIG. 2 is a corresponding top view;

FIG. 3 is a top view of the different stations of the machine;

FIG. 4 is an elevation showing a receptacle to be labelled, gripped between the smoothing belts on the one hand and the elastic counter brace system on the other; and

FIG. 5 shows in elevation the turret having two diameters corresponding respectively to each of the labels to be placed on the receptacle.

DETAILED DESCRIPTION OF THE INVENTION

In the embodiment shown in the attached drawings, numeral 1 represents a receptacle whose body comprises two cylindrical parts of different diameter, the upper part being of smaller diameter than the lower part.

At 2 and 3 there are seen the labels to be applied respectively on the upper and lower parts of the said receptacle. Labels 2 are extracted from magazine 2*a* while labels 3 are taken from magazine 3*a*. Labels 3 are extracted from their magazine by a picker roll 4 which vibrates and has a reciprocating motion, while labels 2 are extracted by a picker roll 5 of the same type as roll 4. The transfer of the labels takes place via an intermediate roll 6 to a paster roll 7, which is in contact with a roll 8 introduced into paste container 9. Solid and dashed lines show respectively the positions of pasting roll 7 when there is a label on the transfer roll and when there is no label, according to a known mechanism previously patented by the applicant. These labels are taken up by combs 10 and 11 of conventional type, which remove them from the pasting roll and transfer them to turret 12.

Turret 12, shown in detail in FIG. 5, is in two parts 12*a* and 12*b* having different diameters and corresponding respectively to the diameters of the upper and lower parts of the receptacle to be labelled. The two parts 12*a* and 12*b* present ribs and grooves 13 and 14 for the upper part, and 15 and 16 for the lower part. In grooves 14 and 16 are seated respectively the sets of belts 17 and 18, designated smoothing belts, whose speed of passage corresponds exactly to the linear peripheral speeds of the upper and lower parts of the receptacle to be labelled, without slippage between the said belts and the corresponding cylindrical parts of the receptacle, which slippage would cause the labels to become rumpled.

To hold labels 2 and 3 respectively on the upper and lower parts of the turret, there are suction holes 19 and 20 which open respectively on the peripheral surface of ribs 13 and 15 of the two parts of the turret. These holes are connected by suitable passages to a conventional vacuum system. To compensate for the difference of diameter between the upper and lower parts of turret 12 and to transfer the labels to the receptacle, belts 17 and 18 are driven respectively by independent guide rolls 21 and 22 which can move toward or away from the axis of conveyor 23 in order to have a well defined position of application that corresponds to the different diameters of the cylindrical parts of the receptacle.

On the other side of conveyor 23, opposite the sets of belts 17 and 18, there is a counter brace system constituted by straight sponse pads such as 24 and 25. The said sponge pads can be used simultaneously where the difference in the diameter between the upper and lower parts of the receptacle is not very great. On the contrary, when the difference in diameters is relatively large, the compensation for the difference of peripheral linear speeds of the upper and lower parts of the receptacle cannot be attained except by arranging two sets of belts, or one set of belts on the upper part and a sponge pad on the lower, the said sets of belts being driven at an equal linear velocity but in a direction opposite that of smoothing belts 17 and 18.

The upper sponge pad 24 may also be replaced by free smoothing rolls, in order to prevent the label from slipping on the upper part of the receptacle.

In the case of a large label 3 and a small label 2 that is distinctly shorter in the direction of horizontal development, the first guide rolls 26 of upper belts 17 may have suction holes to cause the small label 2 to follow on the said belts 17 until it can roll onto the receptacle with the normal displacement existing between the generatrixes of the start of pasting of the upper and lower labels, since the axes of symmetry of the labels must coincide.

In FIG. 2, the different phases of rolling the labels 2 and 3 on the upper and lower parts of the receptacle are shown in heavy lines, the start of label 2 being at 2*b* and the start of label 3 at 3*b*. It is assumed in FIG. 2 that large label 3 goes all the way around the receptacle.

In FIG. 3, it is seen that the receptacles are thrust in the conveyor path by a feed screw 27 which introduces each receptacle positively and without a dead period into the passage delimited by the smoothing belts, and the opposing counter brace system. This accompanying of the receptacle and its introduction into the smoothing track is attained by the thrust of the posterior lips of the feed screw. The length of the pitch of the feed screw in its final active portion can be advantageously increased for this effect. When contact with the receptacle is broken, the said receptacle has already entered the smoothing track by a length corresponding to a part of its diameter. The arrangement avoids the difficulty of other known labelling machines which leave the receptacle free for a certain interval, simply moved by the conveyor. Such an arrangement also affords great precision of distribution of the receptacles at the entrance to the smoothing system with respect to the label distribution, and it also allows great precision in selection of the start of the label placement.

With a machine of the invention, it is possible also to effect front-and-back labelling of one or both cylindrical parts of the receptacle.

It is also possible to label a conical portion of a rectpacle by rolling, on condition that turret 12 have guide grooves for belts with a well defined diameter so that on the turret the same taper can be reproduced that characterizes the receptacle. In this case, however, the guide rolls should advance or withdraw the smoothing belts in the path of the conveyor with an inclination that corresponds to the tangent of application of the label on the receptacle.

What is claimed is:

1. A labelling machine for a receptacle having different shapes and portions of differing diameters, said machine comprising label pickers for extracting labels from label magazines, turrets, a pasting assembly for pasting the labels before depositing them on said turrets, and a smoothing assembly beyond said turrets to smooth and apply the labels to the receptacle, said turrets being positioned between a discharge portion of the pasting assembly and an entrance to the smoothing assembly, there being two turrets of different diameters for picking up pasted labels by suction, said turrets being able to trans-

fer respectively, at least one label to each of the portions of the receptacle having the different diameters with the turret of the lesser diameter effecting the transfer to the portion of the receptacle having the lesser diameter and the turret of the greater diameter effecting the transfer to the portion of the receptacle having the greater diameter, means being provided for the transfer of the labels from the turrets to the receptacle parts at differing speeds corresponding precisely to the respective linear rates of rotation of the parts of the receptacle having the different diameters as the receptacle rotates during the transfer of the labels.

2. The machine of claim 1, wherein the turrets are integral, being mounted coaxially with reference to each other and driven at equal angular velocity.

3. The machine of claim 2, wherein the turrets are provided with a succession of grooves and ribs and means comprising sets of belts enclosed in the grooves of the turrets, for transfer of labels from the two turrets to the smoothing assembly.

4. The machine of claim 3, wherein to maintain the labels on the turrets, the ribs of said turrets, on either side of the grooves for the belts are furnished with suction holes opening on the surface of the ribs and connected by a suitable circuit to a vacuum system.

5. The machine of claim 4, wherein the sets of belts for transferring the labels to the specific portions of the body receptacle are brought into contact with the said portions of the receptacle by a shifting of their spatial line of tension, said shift being attained by guide rolls which thrust the belts into contact with the corresponding portions of the receptacle that have the different diameters.

6. The machine of claim 5, wherein a counter application device is provided, designed to compensate for the differences in the linear velocity of the portions of the receptacle having the different diameters, said device comprising two sets of straight elastic pads, when the machine is used with receptacles in which the two diameters of the portions of the receptacle are relatively close.

7. The machine of claim 6, wherein the receptacle is thrust into the entrance of the smoothing assembly, between the sets of smoothing belts and the counter brace system, by a feed screw which does not break contact with the receptacle until after the axis thereof has passed in front of the axis of the turrets, said receptacle being thrust by the posterior lip of the screw, through an increase in the length of the pitch of the feed screw at the end of its active portion.

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U.S. Cl. X.R.

156—560, 568

UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,536,560 October 27, 1970

Romuald René Della Vite

It is certified that error appears in the above identified patent and that said Letters Patent are hereby corrected as shown below:

In the heading to the drawings, sheets 1 and 2, "R. R. DELLA VITA ETAL" , each occurrence, should read -- R. R. DELLA VITE --.

Signed and sealed this 30th day of March 1971.

(SEAL)
Attest:

EDWARD M.FLETCHER,JR.
Attesting Officer

WILLIAM E. SCHUYLER, JR.
Commissioner of Patents