Sept. 29, 1959 F. L. BELLANDI 2,906,424

APPARATUS FOR FEEDING CONTAINERS AND LABELLING THE LATTER

Filed Feb. 7, 1958 2 Sheets-Sheet 1

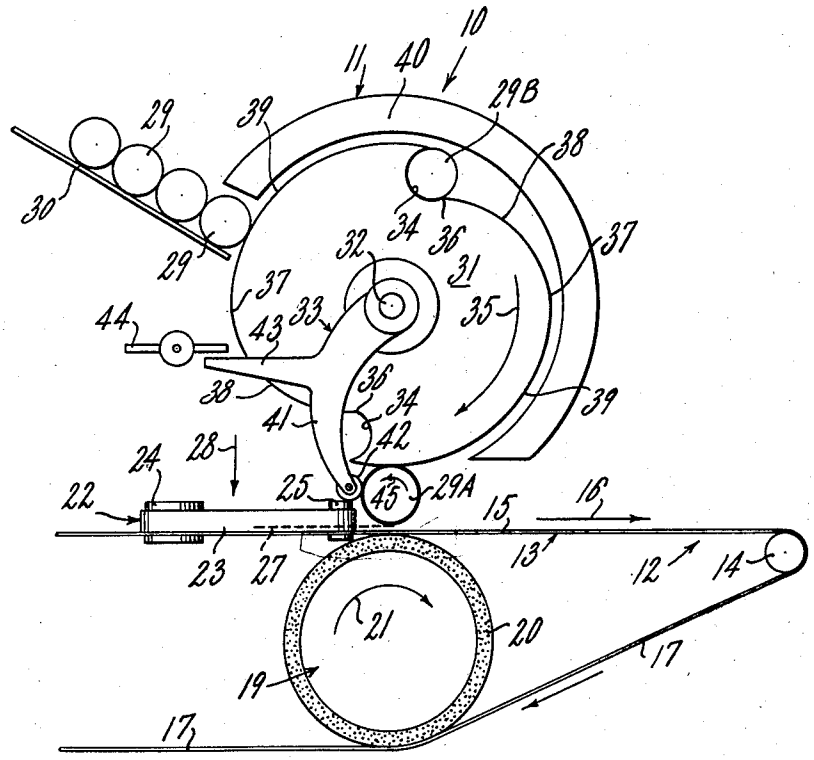


FIG. 1

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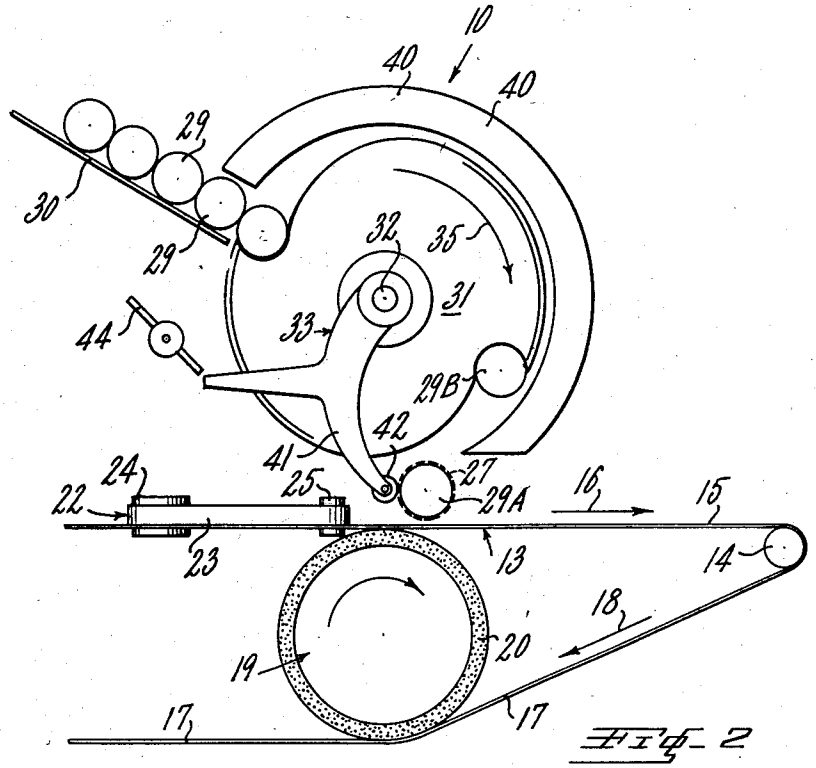


Fig. 2

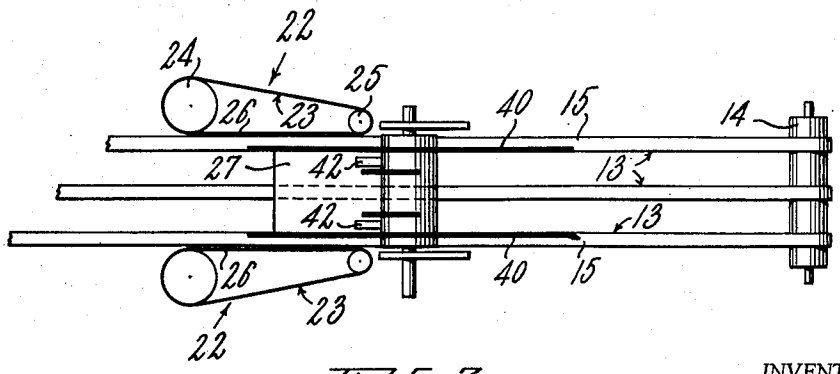


Fig. 3

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APPARATUS FOR FEEDING CONTAINERS AND LABELLING THE LATTER

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Application February 7, 1958, Serial No. 713,931
Claims priority, application Brazil February 8, 1957
11 Claims. (Cl. 216—9)

The present invention relates, in general, to automatic means or apparatus for supplying labels and containers, for applying adhesive or glue to the labels and for affixing the glued labels to the containers, and, in particular, to means for feeding the containers and for labelling the latter.

A primary object of the present invention is to provide means facilitating orientation and application of perfectly positioned labels to containers or cans at relatively high speed and without the necessity of utilizing complicated apparatus parts.

Another object of the present invention is to provide means affording a very economical labelling apparatus construction in which reciprocatory motion is practically eliminated so as to allow for the attainment of relatively high speeds in operation and timed relation from the supply of the labels to the application of the latter and subsequent discharge and storing of the labeled products.

A further object of this invention is to provide means contributing to an efficacious label applicator apparatus, which is of relatively simple construction, and comparatively inexpensive to manufacture and easy to operate.

A still further object of the invention is to provide means conducive to a highly efficient, trouble-free device of the aforesaid type for applying labels to cans or like containers or products.

Other objects and advantages of the invention will become apparent by reference to the following detailed description of a preferred embodiment thereof taken together with the illustrative drawings thereof.

In the drawings:

Figure 1 is a side elevational view of a label applicator pursuant to the present invention, illustrating the condition of the apparatus during application of a label to a container;

Figure 2 is a view similar to Figure 1 illustrating a labeled container in the stage of being delivered from the apparatus; and

Figure 3 is a top plan view of the apparatus with certain parts omitted for purposes of illustration.

Referring now to the drawings in detail, there is disclosed a label applicator **10** pursuant to the present invention. The applicator is one component of a labelling apparatus which includes, in addition, a label feed device and an adhesive applicator device for applying glue or the like to the labels fed from the feed device to the label applicator **10**. The label feed device and the adhesive applicator device are of conventional construction and therefore are not illustrated.

The label applicator **10** comprises a container feed means **11** and a conveyor **12**. The conveyor **12** is constituted by a plurality of endless belts **13** which extend about a pair of rollers, one of which is shown at **14**.

The belts are arranged side by side and are driven in conventional fashion and the upper runs **15** of the belts travel in the direction of arrow **16**, with the lower runs **17** travelling according to arrow **18**. A freely rotatable drum **19** is disposed between the upper and lower runs

15, **17** of the belts. The drum is covered circumferentially thereof with an extremely resilient layer **20** of suitable material, preferably soft rubber. The drum rotates in the direction of arrow **21**.

The upper run of the endless conveyor **12** is straddled by a pair of label guides **22**. Each guide **22** comprises an endless belt **23** mounted on a pair of rollers **24—25**, one of which is a drive roller and the other of which is a guide roller. The axes of rollers **24** and **25** are vertically disposed while the axes of the rollers of conveyor **12** are horizontally disposed, as shown with reference to roller **14**. Consequently, while the upper runs **15** of the conveyor belts **13** are disposed in a horizontal plane, the inner runs **26—26** of the guide belts **23** are disposed in a vertical plane. The guide belts **23** and the conveyor belts **13** all move at substantially the same speed.

The labels **27** (Fig. 3) are individually fed to the conveyor **12** by the label feed device (not illustrated). The labels **27** are deposited on the upper runs **15** for travel in the direction of arrow **16**. It will be understood that a suitable adhesive or glue has been previously applied by the glue applicator (not illustrated) to one surface of each label before the latter is delivered to the conveyor **12** and that the glued surface is located uppermost. In order to retain the label in a horizontal planar position on the conveyor **12** a current of air is directed downwardly (by any suitable source) onto the glued surface of the label, as indicated by arrow **28**. The guide belts **23** serve to keep the label in true or squared-up condition as it moves along the conveyor **12**, the adhesion of the label edges to the guide belts being prevented by the fact that the belts and the label move at the same rate of speed. Also, suitable provision (not illustrated) may be made to cleanse the guide belts of any surplus glue during the operation thereof.

The container feed means **11** transfers the containers or cans **29** individually and in timed relation from a container magazine or chute **30** to the conveyor **12** and ejects the containers after they have been labeled.

As shown, the feed means **11** comprises a cam **31** mounted for rotation by driven shaft **32** and a pair of forked or bell-crank levers **33** mounted for pivotal movement on driven shaft **32** and straddling the cam **31**. The cam **31** is provided at its peripheral surface with the can receiving recesses **34**. The cam rotates in the direction of the arrow **35**, and forwardly of each recess **34**, in said direction of rotation. The cam has a varying radius from a minimum at the point indicated by the reference numeral **36** to a maximum substantially at the points indicated by the reference numeral **37**. The peripheral surface portion between each minimum radius point **36** to the adjacent maximum radius point **37** is indicated by the reference numeral **38**. The remaining two peripheral surface portions, which are at a constant maximum radius, are indicated by the reference numeral **39**. It will be noted that each surface portion **39** extends from a point **37** to the recess **34** forwardly thereof in the direction of rotation of the cam. A pair of arcuate guides **40** are suitably mounted outwardly of the cam **31**.

At the free end of one arm **41** thereof, each lever **33** is provided with a roller **42** which overlies the upper run **15** of conveyor **12**. The other lever arm **43** extends into the path of movement of a continuously rotatable eccentric **44** which rotates in a clockwise direction viewing Figs. 1 and 3.

During the rotation of the cam **31**, the foremost can **29** is picked up or received in the cam recesses **34** as they arrive at the end or outlet of the chute **30**. The can is carried in the direction of the arrow **35** to the conveyor **12**, being retained in the recess by the guides **40**. As each recess **34** passes beyond the lower ends of the guides, the can carried thereby drops onto the

upper runs 15 of the conveyor belts. The can is immediately engaged by the adjacent surface portion 39 of the cam which presses the can against the upper belt runs 15 and the latter against the resilient coating 20 of the drum 19. Due to the rotary frictional engagement of the cam portion 39, moving in the direction of the arrow 35, at the upper periphery of the can and its engagement, at its lower periphery on the belt runs 15, which move in the direction of the arrow 16, the can shown at 29A rotates in the direction of the arrow 45. The cams 31 rotate at a speed sufficient to provide the can 29A with a perimetric speed slightly greater than the horizontal speed of the upper belt runs 15 so that the container is rotating at a peripheral speed greater than the horizontal speed of the label.

This results in keeping the container 29A in rotary abutment with the rollers 42 and assures the adherence of the glued surface of the label, which is moving on the conveyor in the direction of arrow 16, to the periphery of container 29A, without forming any wrinkles therein and without misaligning the label from its squared-up disposition relative to the container. Due to the pressure exerted by the cam portion 39 on the can 29A, the underlying label and the underlying belts 13, into the resilient layer 20 of the freely rotatable drum 19, the belts are pressed into the layer 20, the pressed portion thereof being in the shape of a segment of a circle so as to facilitate the adhesion of the label to the container 29A.

The can 29A is completely labeled before it is released by the cam portion 39. When said portion travels past the can 29A, the following cam portion 38 clears the can so that it is now freed from the cam. As soon as the can is freed, the arm 43 of the lever 33 is struck by the eccentric 44, as shown in Fig. 2, this causing the rollers 42 to move forwardly in a relatively sharp motion so as to propel the can along the conveyor runs 15, in the direction of the arrow 16, for discharging the can 29A from the device or apparatus 10.

The levers 33 immediately swing back to the position thereof illustrated in Fig. 1 so that the rollers 42 return to the illustrated position thereof in which they serve as aligning or positioning abutments for the next can 29B in order to square up the latter when discharged on the belts 13. It will be noted from Fig. 1, that can 29B is being carried toward the conveyor 12 while can 29A is being labeled.

It will be apparent that the operation of the previously mentioned label feed and glue applicator devices is synchronized with the operation of the device 10 so that a label 27 is always in position to be engaged by a can discharged onto the conveyor by the cam 31. The cams 31 operate to deliver cans 29 in synchronization with the arrival of the labels 27. In addition, as indicated, the cams 31 move the discharged can against the positioning rollers 42 and also provide the rotation of the discharged can in the direction of the arrow 45 to effect the labelling thereof, and in addition provide the pressure against the drum 19 to provide a perfect fixation of the label to the can. The portions 39 of the cams 31 can be threaded or provided with a friction layer, such as rubber, to provide the necessary frictional engagement with the periphery of the discharged can so as to greatly accelerate the rotation of the discharged can.

The recess portions 34 are preferably rounded to facilitate the movement of the discharged can toward the rollers 42 without misaligning the can.

In view of the foregoing, it will be apparent that pursuant to the present invention a round container is rotated or rolled onto the glued surface of a label which is retained in horizontal planar disposition, pressure being exerted by the can or container on the label to provide for the adhesion of the glued surface thereto.

It will be understood that the present invention is not limited to the mere details of construction and arrangement of the parts disclosed, since many modifications may be made by those skilled in the art without departing from the spirit and scope of the invention.

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent is:

1. A label applicator comprising means for conveying glued labels in a horizontal direction with the glued surfaces thereof uppermost, rotary means operable to intermittently convey rotary containers from a supply thereof to a position in engagement with the glued surface of a label, said rotary means having means to effect the rotation of the container along the glued surface of the label, said last mentioned means being a constant radius peripheral portion of said rotary means operable to engage the container periphery and to rotate the container, said rotary means having a peripheral portion of varying radius rearwardly of said constant-radius portion in the direction of rotation of said rotary means to effect the release of said container, and eccentric means operable in timed relation with said rotary means for propelling the released container away from said rotary means, said propelling means including means having provision to align the container during rotation thereof by said constant-radius portion.

2. A label applicator comprising means for conveying glued labels in a horizontal direction with the glued surfaces thereof uppermost, rotary means operable to intermittently convey rotary containers from a supply thereof to a position in engagement with the glued surface of a label, said rotary means having means to effect the rotation of the container along the glued surface of the label, said last mentioned means being a constant-radius peripheral portion of said rotary means operable to engage the container periphery and to rotate the container, said rotary means having a peripheral portion of varying radius rearwardly of said constant-radius portion in the direction of rotation of said rotary means to effect the release of said container, eccentric means operable in timed relation with said rotary means for propelling the released container away from said rotary means, said propelling means including means having provision to align the container during rotation thereof by said constant-radius portion, and means operable to project said aligning provision after release of the container by said constant-radius portion.

3. A label applicator comprising an endless conveyor having an upper horizontal run and a bottom run, a drum freely rotatable between said runs, a rotary device overlying said upper run and having means to convey a rotary container from a supply thereof to engage the glued surface of a label on said upper run, said rotary device having a constant-radius peripheral portion followed by a peripheral portion of decreasing radius, said constant-radius portion being operable to engage the periphery of said container to rotate the latter along the label and to press the latter against said upper run and the underlying drum.

4. A label applicator comprising an endless conveyor having an upper horizontal run and a bottom run, a drum freely rotatable between said runs, a rotary device overlying said upper run and having means to convey a rotary container from a supply thereof to engage the glued surface of a label on said upper run, said rotary device having a constant-radius peripheral portion followed by a peripheral portion of decreasing radius, said constant-radius portion being operable to engage the periphery of said container to rotate the latter along the label and to press the latter against said upper run and the underlying drum, said drum having a resilient periphery.

5. A label applicator comprising an endless conveyor having an upper horizontal run and a bottom run, a drum freely rotatable between said runs, a rotary device overlying said upper run and having means to convey a rotary container from a supply thereof to engage the glued surface of a label on said upper run, said rotary device

having a constant-radius peripheral portion followed by a peripheral portion of decreasing radius, said constant-radius portion being operable to engage the periphery of said container to rotate the latter along the label and to press the latter against said upper run and the underlying drum, said drum having a resilient periphery, and means operable upon the release of said container by said constant-radius portion and while said decreasing radius portion overlies the container to eject the container from its position underlying said rotary device.

6. A label applicator comprising an endless conveyor having an upper horizontal run and a bottom run, a drum freely rotatable between said runs, a rotary device overlying said upper run and having means to convey a rotary container from a supply thereof to engage the glued surface of a label on said upper run, said rotary device having a constant-radius peripheral portion followed by a peripheral portion of decreasing radius, said constant-radius portion being operable to engage the periphery of said container to rotate the latter along the label and to press the latter against said upper run and the underlying drum, said drum having a resilient periphery, and means operable upon the release of said container by said constant-radius portion and while said decreasing radius portion overlies the container to eject the container from its position underlying said rotary device, said last mentioned means comprising an eccentric operable in timed relation with said rotary device and a lever operated by said eccentric.

7. A label applicator comprising an endless conveyor having an upper horizontal run and a bottom run, a drum freely rotatable between said runs, a cam shaped rotary device overlying said upper run and having means to convey a rotary container from a supply thereof to engage the glued surface of a label on said upper run, said rotary device having a constant-radius peripheral portion followed by a peripheral portion of decreasing radius, said constant-radius portion being operable to engage the periphery of said container to rotate the latter pivotally mounted along the label and to press the latter against said upper run and the underlying drum, a bell crank lever having a first lever arm and a second lever arm, said first lever being engageable with said container, said drum having a resilient periphery, and means operable upon the release of said container by said constant-radius portion and while said decreasing radius portion overlies the container to eject the container from its position underlying said rotary device, said last mentioned means comprising an eccentric operable in timed relation with said rotary device, said second lever arm being engaged and operated by said eccentric, said first lever arm having provision to align the container during the rotation thereof by said rotary device.

8. A label applicator comprising an endless conveyor having an upper horizontal run and a bottom run, a drum freely rotatable between said runs, a rotary device overlying said upper run and having means to convey a rotary container from a supply thereof to engage the glued surface of a label on said upper run, said rotary device having a constant-radius peripheral portion followed by a peripheral portion of decreasing radius, said constant-radius portion being operable to engage the periphery of said container to rotate the latter along the label and to press the latter against said upper run and the underlying drum, said drum having a resilient periphery, and means operable upon the release of said container by said constant-radius portion and while said decreasing radius portion overlies the container to eject the container from its position underlying said rotary device, said last mentioned means comprising an eccentric operable in timed relation with said rotary device and a lever operated by said eccentric, said lever having provision to align the container during the rotation thereof by said rotary device, and means to align the label during movement thereof toward engagement with said container.

9. A label applicator comprising conveyor means for conveying glued labels in a horizontal direction with the glued surfaces thereof uppermost, and a cam feeding means operable to intermittently convey rotary containers from a supply thereof to a position in engagement with the glued surface of a label, said cam feeding means having means to effect the rotation of the container along the glued surface of the label, said last mentioned means being a constant-radius peripheral portion of said cam feeding means operable to engage the container periphery to rotate the container, said cam feeding means including portions of lesser diameter than said constant-radius peripheral portion for receiving a container and delivering of container to said conveyor means.

10. A label applicator comprising conveyor means for conveying glued labels in a horizontal direction with the glued surfaces thereof uppermost, rotary means operable to intermittently convey rotary containers from a supply thereof to a position in engagement with the glued surface of a label, said rotary means having means to effect the rotation of the container along the glued surface of the label, said last mentioned means being a constant-radius peripheral portion of said rotary means operable to engage the container periphery to rotate the container, said rotary means having a peripheral portion of lesser radius rearwardly of said constant-radius portion in the direction of rotation of said rotary means to effect the release of said container, and eccentrically operated means for ejecting said container along said conveyor means.

11. A label applicator comprising conveyor means for conveying glued labels in a horizontal direction with the glued surfaces thereof uppermost, a cam feeding means operable to intermittently convey rotary containers from a supply thereof to a position in engagement with the glued surface of a label, said cam feeding means having a constant-radius peripheral portion to effect the rotation of the container along the glued surface of the label by engaging the periphery of the container, said cam feeding means having a peripheral portion of lesser and varying radius rearwardly of said constant-radius portion in the direction of rotation of said cam feeding means to effect the release of said container, and eccentric means operable in timed relation with said cam feeding means for propelling the released container away from said rotary means.

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