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CONTAINER LABELING APPARATUS WITH GASEOUS AIRJET MEANS

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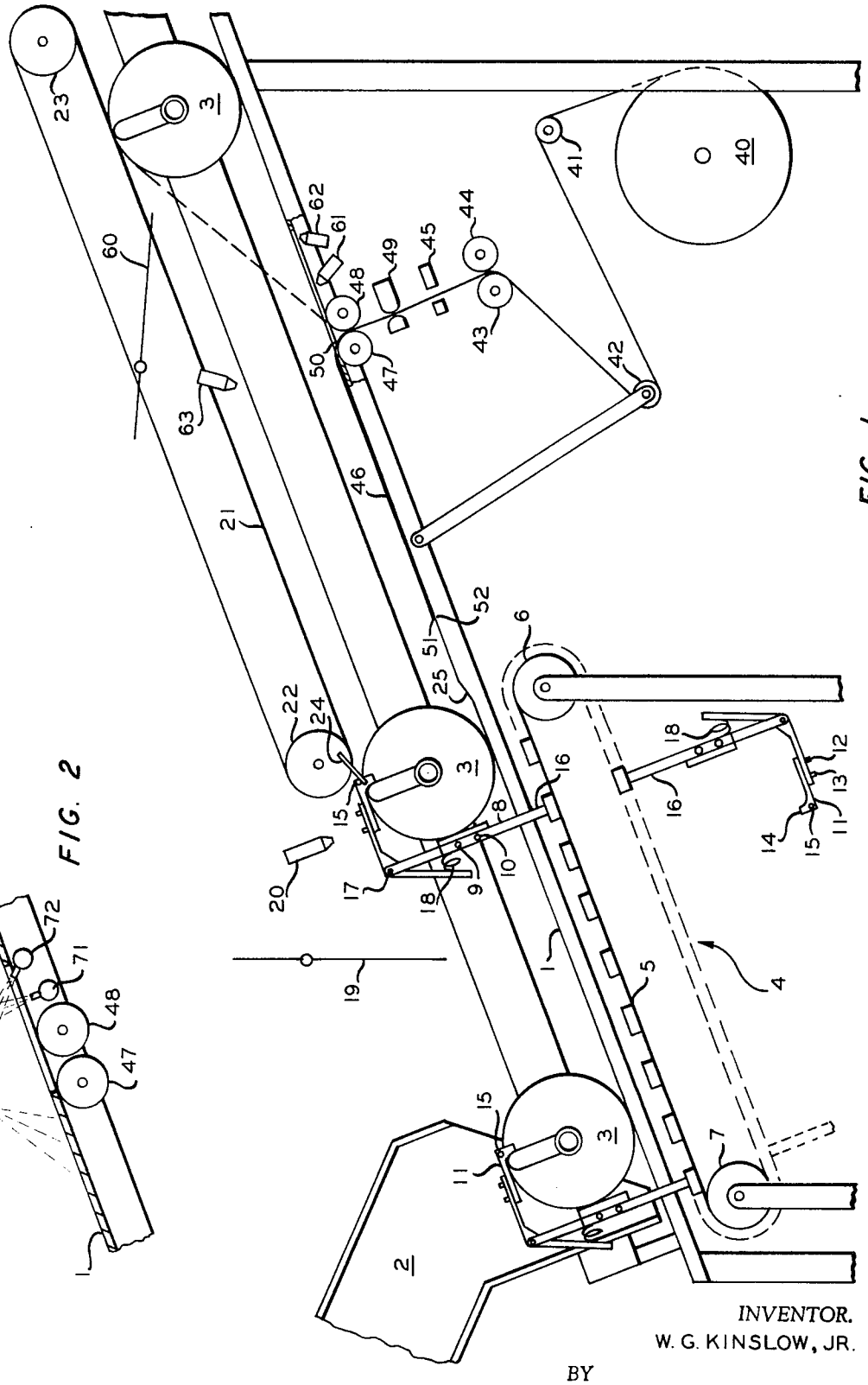


FIG. 1

FIG. 2

INVENTOR.
W. G. KINSLOW, JR.

BY

Young & Quigg
ATTORNEYS

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CONTAINER LABELING APPARATUS WITH GASEOUS AIRJET MEANS

William G. Kinslow, Jr., Kansas City, Mo., assignor to Phillips Petroleum Company

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ABSTRACT OF THE DISCLOSURE

A method and apparatus are disclosed in which an end of a continuous label is affixed to a container and the container is advanced from a first position at a point at which the label on the container is severed from the continuous label. The severed end of the continuous label is made to assume the first position by means of a gaseous jet.

This invention relates to container labeling method and apparatus.

In one of its more specific aspects, this invention relates to a method and apparatus involving a reorientation of a continuous label for its subsequent application to a container after its separation from the container previously labeled.

According to the method of this invention, there is provided in the method of applying a label circumferential to a container in which a first end of a continuous label is adhered to the container from a first position, the container and label are advanced from the first position while the label is caused to encircle at least a portion of the container, the label encircling the can is severed from the continuous label and the severed end of the continuous label is returned to the first position by impinging upon it at least one gaseous stream.

According to the apparatus of this invention there is provided in a container labeling machine comprising in combination means for applying one end of a continuous label to a container from a first position, means for advancing the container and the end of the label from the first position while encircling the container with the label and means for severing the label encircling the container from the continuous label, the improvement comprising at least one gaseous ejection means adapted to impinge upon the continuous label proximate its severed end to cause the severed end of the continuous label to assume the first position.

Accordingly, it is an object of this invention to provide high-speed labeling apparatus for containers.

It is another object of this invention to provide a novel method of orientating and positioning labels applied to containers.

The apparatus and method of this invention will be more easily understood when explained in conjunction with the attached drawings which illustrate two embodiments of the apparatus of this invention to which neither the method nor the apparatus of this invention are to be considered as being limited.

FIG. 1 illustrates the apparatus of this invention in elevation.

FIG. 2 illustrates a second embodiment of the apparatus of this invention in elevation.

Referring now to FIG. 1, it will be seen that the apparatus comprises a series of individual but interrelated stations whose operations, in combination, continuously introduce a container to be labeled into the machine, orient the container prior to labeling, apply a first adhesive to the oriented container, bring the adhesive-applied area of the container into contact with one end of the label, advance the container while encircling the container with the label, applying a second application of adhesive to the container, position a second end of the label on the container, sever the continuous label from the container, and reposition the severed end of the continuous label for contact with the next advancing container.

In FIG. 1, containers 3 are continuously introduced onto table 1 from hopper 2, container 3 being fed from hopper 2 by means well known in the art.

Table 1, at this point, will preferably be comprised of two horizontally positioned angles in spaced relationship forming a track along which the containers advance. These angles will be in spaced relationship as dictated by the height of the container.

Positioned beneath table 1 can be a container orientation mechanism 4. This mechanism consists of an endless belt 5 rotatably positioned on sprockets 6 and 7 and carrying on it a plurality of slide bars, shown generally as 8. This continuous belt is operated by drive means which drive the various moving parts of the assembly, or by individual drive means. It is understood throughout this discussion that where drive means are required, suitable drive means to supply that motion are supplied, whether from a single common source or from a source common to all requirements.

Belt 5 is adapted with a plurality of slide bars 8 which are fixed in spaced relationship along the length of belt 5 at their base. Slide bar 8 is adapted at its upper end with retainer arm 11 which is extendable or retractable by adjustment of bolts 12 and 13. Slide bar 8 has vertical sections 16 that are of telescopic construction which permit periodic adjustment of the height of retainer arm 11 by means of bolts 9 and 10. Retainer arm 11 has a downwardly projecting end 14 and projecting pin 15. Arm 11 is pivotally mounted on vertical section 16 by means of pin 17, retainer arm 11 being spring loaded by means of spring 18 to be normally retained in a position horizontal to table 1. It will be seen that the adjustment which can be made to slide bar 8 in both its vertical and horizontal directions such that containers of various sizes can be handled at different times.

Upon the deposition of container 3 upon table 1, slide bar 8 moves into contact with container 3, container 3 continuing to roll after its contact with slide bar 8 until some portion thereof, for example, a handle, comes in contact with end 14. At this point further rotational movement of container 3 along table 1 is prevented and thereafter while in contact with slide bar 8, container 3 is pushed along table 1 without rotation.

The positioning of slide bar 8 in respect to the width of the table will be such that end 14 projects downwardly to contact some portion of the container such that all containers advanced through the labeling apparatus are similarly indexed. For example, if the container is one having a cylindrical center section and an inwardly tapering section from which there extends a protrusion, such as a handle, slide bar 8 will be positioned to one side of the center of table 1 to contact and position the container with respect to the protrusion. If, on the other hand, the container is one having a protrusion positioned in its upper end and located radially from its longitudinal axis, by moving the slide bar to the side of the table, indexing positioning can be established between that protrusion and the slide bar. For this reason, belt 5 is preferably of a squirrel-cage type construction, the bars extending between two sets of sprockets, one set proximate each of the edges of the table, thus enabling the positioning of the slide bar along the bars of the belt at any point across the width of the table.

In this respect, it will be appreciated that orientation of the container may be accomplished in the described man-

ner, if desired, there being instances in which the orientation step is omitted.

Having come into contact with slide bar **8** and being oriented, container **3** is advanced along table **1** into contact with actuator **19** which controls the emission of adhesive from gun **20**.

Actuator **19** and adhesive gun **20** are conventional within the art, actuator **19** operating upon contact with container **3** to operate gun **20** from a fully closed position, through an open position into a fully closed position. Regardless of the length of time during which gun **20** is maintained operable by actuator **19**, and regardless of the dwell angle of the container within the adhesive application zone, inasmuch as container **3** is maintained in a rotatably stationary position, there will be introduced onto the surface of the container **3** a quantity of adhesive in that desired configuration as required to adhere to the surface of the container the edge of that label with which the adhesive is subsequently contacted.

Having had deposited on its surface the desired quantity of adhesive from whatever means employed, slide bar **8** further advances container **3** into contact with belt **21**.

Continuous belt **21** is carried on pulleys **22** and **23**. It is preferably continuous across the width of table **1** to provide a maximum area of contact with container **3**. Simultaneously with container **3** contacting belt **21**, pin **15** of retainer arm **11** of slide bar **8** engages inclined plane **24**. As a result, retainer arm **11** pivots around pin **17**, is elevated and is disengaged from container **3**. After disengagement, pin **15** moves over the end of inclined plane **24** and is returned to its spring-loader position by means of spring **18**.

Having been released from slide bar **8** and having come into contact with belt **21**, container **3** rotates as it travels along the length of table **1**. At this point of contact with flexible belt **21**, or immediately thereafter, the elevation of the surface of table **1** is advantageously raised at that point **25** with the result that container **3** tends to be more firmly pressed downwardly on table **1** for the purpose of facilitating the adherence of the subsequently-contacted label. From point **25**, table **1** will be preferably continuous across its width except for those points at which introductions are made from beneath the table as hereinafter discussed. The providing of a relatively continuous table surface onward from point **25** facilitates the application of the label to the container in a uniform manner.

The apparatus of this invention is suitable for application of labels of any material including paper, plastic, etc. It is particularly suitable for the application of an indexed and perforated polymeric film label which is fed onto the table, preferably from the underside of the table, from a continuous roll through conventional label dispensing apparatus.

In the present instance, for example, a high-density polyethylene film label is perforated and index marked. It is fed from conventional label dispensing apparatus which includes roll **40** of the film, suitable idlers **41**, **42**, rollers **43** and **44**, and electric eye mount **45** which, by means of an electric eye contained therein in conjunction with the indexing of the label, controls the extent to which the label **46** is advanced onto table **1** by rolls **47** and **48** as controlled by brake **49**.

In the position in which contact is first made between container **3** and label **46**, label **46** extends from its entry point **50** of table **1**, along table **1**, in the direction of the container, the forward end **52** of the label being positioned at point **51** on table **1** such that upon rotation of container **3** along table **1**, that adhesive on the surface of container **3** comes in contact with substantially the end **52** of label **46**. Accordingly, by the steps of prepositioning the container and prepositioning the end of the label, it is possible to position label **46** to any desired orientation in respect to the surface of the container.

Having contacted end **52** of label **46**, this contact having been made under that compression exerted by belt **21**, end **52** of label **46** adheres to container **3** and as container **3** is advanced along table **1**, label **46** is caused to encircle the container, label **46** being progressively removed from the table as the container rolls.

At some point after container **3** is rolled past entry **50** and at which label **46** encircles, or partly encircles, a principal portion of container **3** and extends tangentially from container **3** to entry **50**, container **3** is caused to contact switch arm **60**. Engagement of the switch arm **60** is adapted to effect sequentially related operations.

Positioned beneath table **1** is at least one gas nozzle **61** and adhesive gun **62**. Positioned above table **1** is at least one gas nozzle **63**.

Nozzle **61** is adapted to discharge a jet of gas, preferably air, against the surface of label **46** at a point between entry **50** and container **3** at such a point and in such a quantity as to cause label **46**, if severed at point between entry point **50** and container **3** to rotate around point **50**, the severed end of the label passing through an arc tending to deposit that severed end **52** at point **51**, the first point at which the end of the continuous label was located.

Subsequent to the emission of the air from nozzle **61**, label brake **49** is operated. Its operation terminates the advancing of the label through entry **50** and causes that section of the label extending between entry **50** and container **3** to break at prepositioned perforations across its width. Due to the angular discharge of air from nozzle **61**, the label is caused to pivot around entry point **50** through the vertical position.

Upon passing through vertical position and as controlled preferably on a time cycle, air nozzle **63** is actuated to discharge a sufficient jet of air across the rotating label to force it into contact with table **1**, its newly severed end **52** again extending to point **51**. Upon being so positioned, the air jet from air nozzle **63** can be continued to hold the label in that position until subsequent contact between next container **3** and label end **52** at which time air nozzle **63** discontinues its emission until after air nozzle **61** has again been actuated. Under suitable conditions of returning end **52** to point **51**, nozzle **63** may not be necessary to retain end **52** in that position.

Approximately simultaneously with the operation of air nozzle **61**, adhesive spray **62** is operated to emit adhesive in an upwardly direction onto the surface of the container at any area on the container, assumed herein to be proximate that edge of the label previously adhered to the container. In this respect, it is preferable that this deposit of adhesive be made over some portion of the previously adhered edge of the label with the result that the final encirclement of the container results in some label overlap. Upon further rotation of container **3** on table **1**, the severed edge of the label is compressed against the last-deposited adhesive and the labeling of the container is completed.

Further travel along the table removes the labeled container to subsequent stations while the next advancing container is being subject to the same sequential operations.

The operations of gas nozzles **61** and **63** will be preferably adapted to discharge a stream of gas against a principal portion of the width of the label in contrast to discharging at a minimized area on the surface of the label. This is particularly important if the label possesses considerable flexibility, since this tends to avoid wrinkling of the label. Accordingly, it may be desirable to employ a plurality of nozzles in spaced relationship across the width of the table, the concerted action of the nozzles providing the desired positioning of the severed end of the continuous label.

Relatedly, the positioning of the end of severed label can be accomplished by a series of gas nozzles as shown in FIG. 2. For example, the severed end of the label can be permitted to fall to the surface of the table after which a first gas jet **71** is employed to raise the label through a

first portion of its arc of travel and a second angularly positioned jet **72** can be employed to rotate the label into the area of effectability of the downwardly discharging jet **73** which finally positions the label and holds it in that position for the initial contact with the container.

The method and apparatus of this invention is not to be limited to any manner or means of orienting the container to the label or of applying the adhesive to the container and feeding and indexing the label to the table. Any suitable means can be employed for these operations. For example, as regards the adhesive application, brushes can be employed, these being suitably brought into contact with the container at points which subsequently coincide with specific points on the surface of the label.

It will be appreciated that a single apparatus of the type described can be employed for applying labels to a variety of sizes of container. In this respect, as will be evident from the above discussion, certain operations must be performed at specific points within the process in order to coincide with certain other operations which relatedly must be performed at dimensionally related points in the process. However, the determination and interrelationship of these operations are well within the ability of one skilled in the art.

It will be evident from the above that other modifications can be made to the method and apparatus of this invention. Such, however, are considered as being within the skill of the art.

What is claimed is:

1. In a container labeling apparatus having in combination means for applying one end of a continuous label to a container at a first position, means for advancing said container and the end of said label from said first position while encircling at least a portion of said container with said label and means for severing the encircling label from said continuous label, the improvement comprising gaseous ejection means adapted to eject upon the continuous label proximate its severed end to cause said severed end to assume said first position, after which said container is moved into contact with said label at said first position.

2. The apparatus as defined in claim **1** in which gaseous ejection means comprise at least one gaseous nozzle

adapted to discharge in impinging relationship proximate said severed end.

3. The apparatus as defined in claim **1** in which gaseous ejection means comprise at least two nozzles adapted to discharge in impinging relationship against said severed end.

4. The apparatus as defined in claim **3** in which said two gaseous ejection means comprise a first nozzle adapted to eject from a locus beneath the plane along which said container is advanced and a second nozzle adapted to eject from a locus above the plane along which said container is advanced.

5. The apparatus as defined in claim **1** which said gaseous ejection means comprise a first nozzle adapted to raise said label from the plane along which said container is advanced, a second nozzle adapted to rotate said label and a third nozzle adapted to position said label at said first position.

6. The apparatus of claim **1** in which said gaseous ejection means is adapted to eject air.

7. The apparatus of claim **1** in which said gaseous ejection means comprises a plurality of nozzles positioned in spaced relationship across the width of said label.

8. The apparatus of claim **7** in which said nozzles are adapted to eject gas against a principal portion of the width of said label.

9. The apparatus of claim **5** in which said third nozzle is adapted to maintain the severed end of said label at said first position until said end is contacted by said container.

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CARL D. QUARFORTH, Primary Examiner

P. A. NELSON, Assistant Examiner

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