Feb. 6, 1968 W. B. HOFFLER 3,367,822

METHOD AND APPARATUS FOR LABELING CONTAINERS

Filed July 1, 1964 3 Sheets-Sheet 1

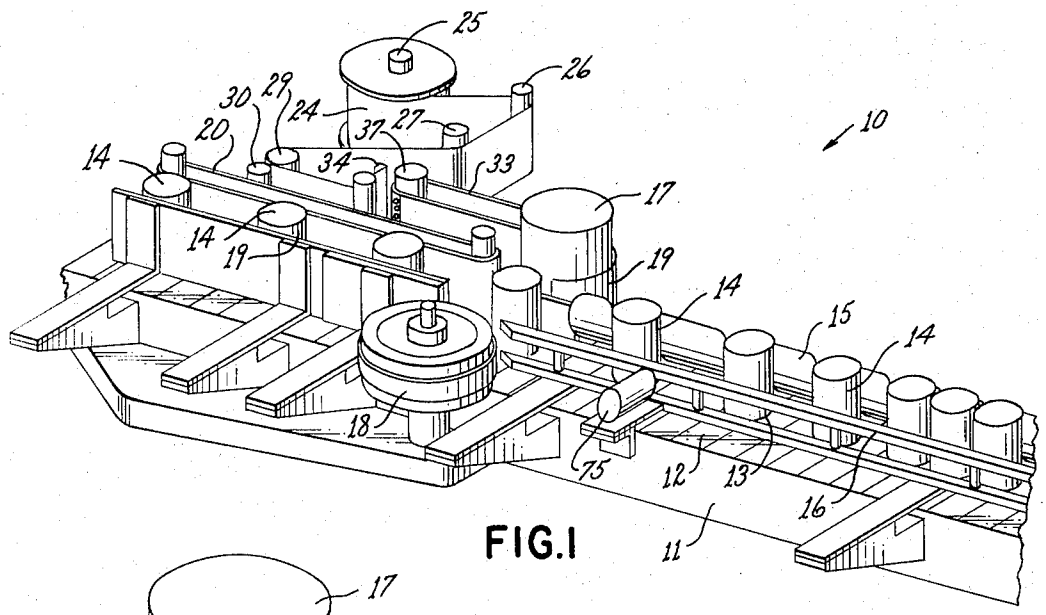


FIG.1

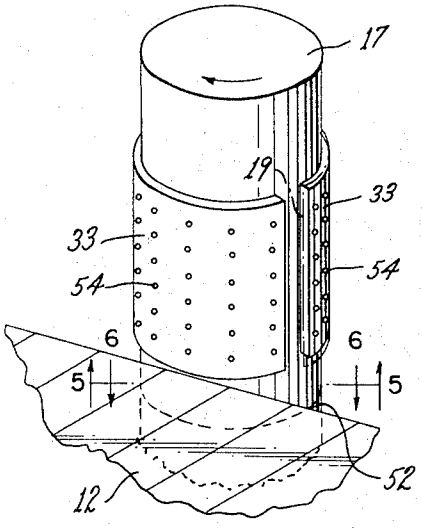


FIG.4

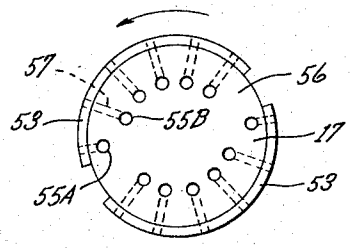


FIG.5

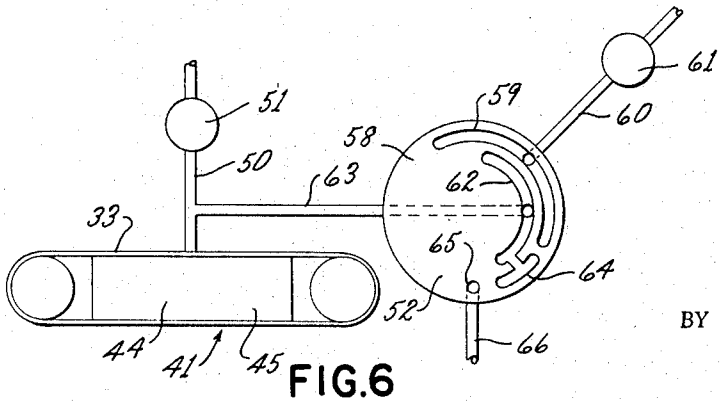


FIG.6

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METHOD AND APPARATUS FOR LABELING CONTAINERS

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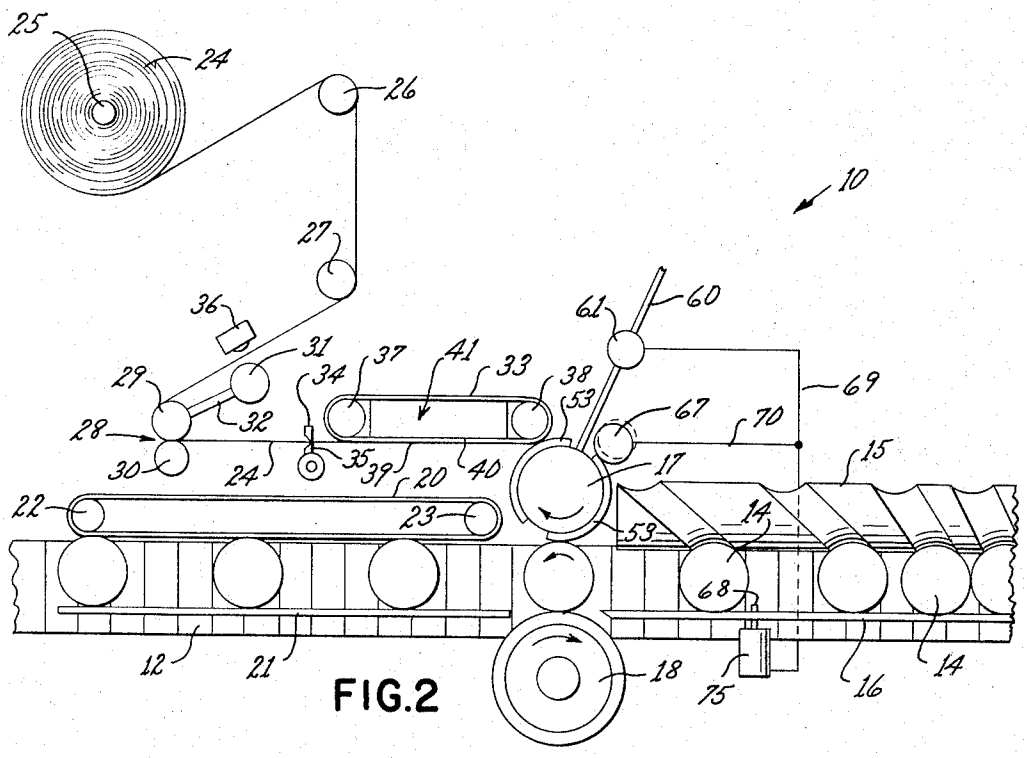


FIG.2

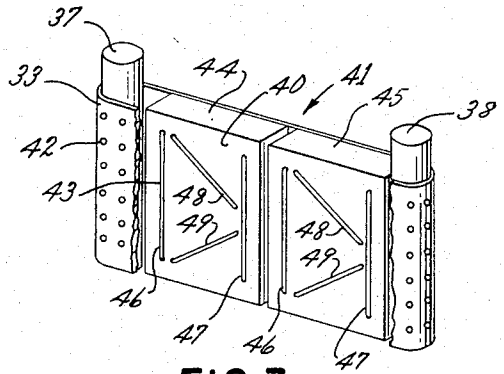


FIG.3

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Feb. 6, 1968 W. B. HOFFLER 3,367,822

METHOD AND APPARATUS FOR LABELING CONTAINERS

Filed July 1, 1964 3 Sheets-Sheet 3

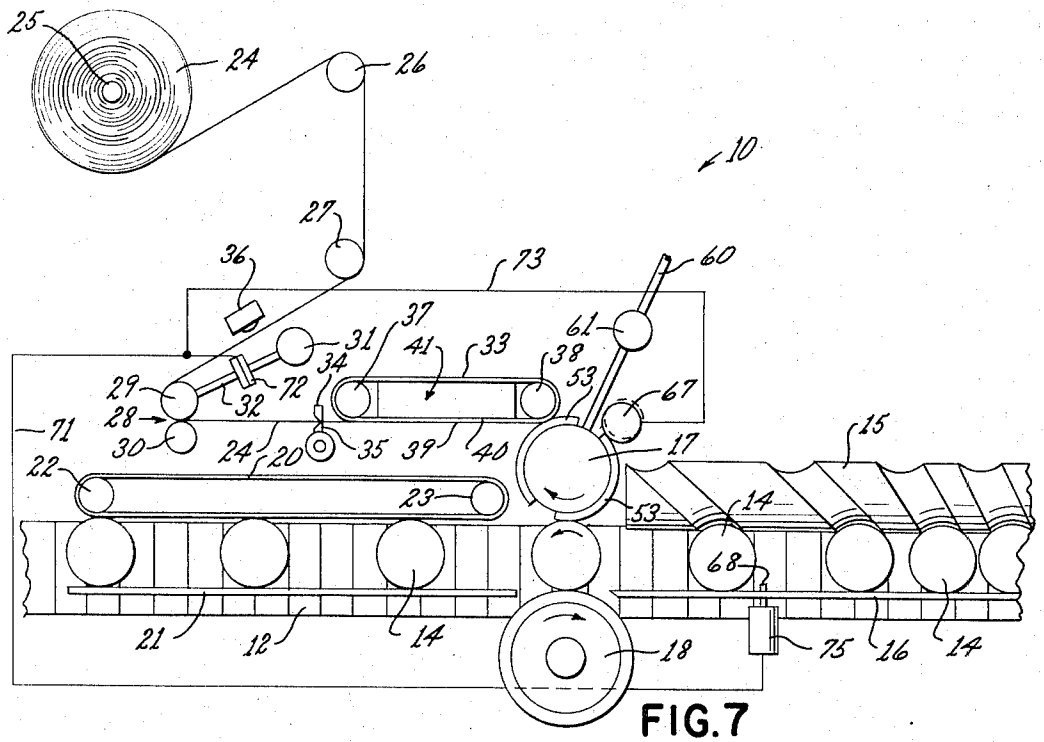


FIG.7

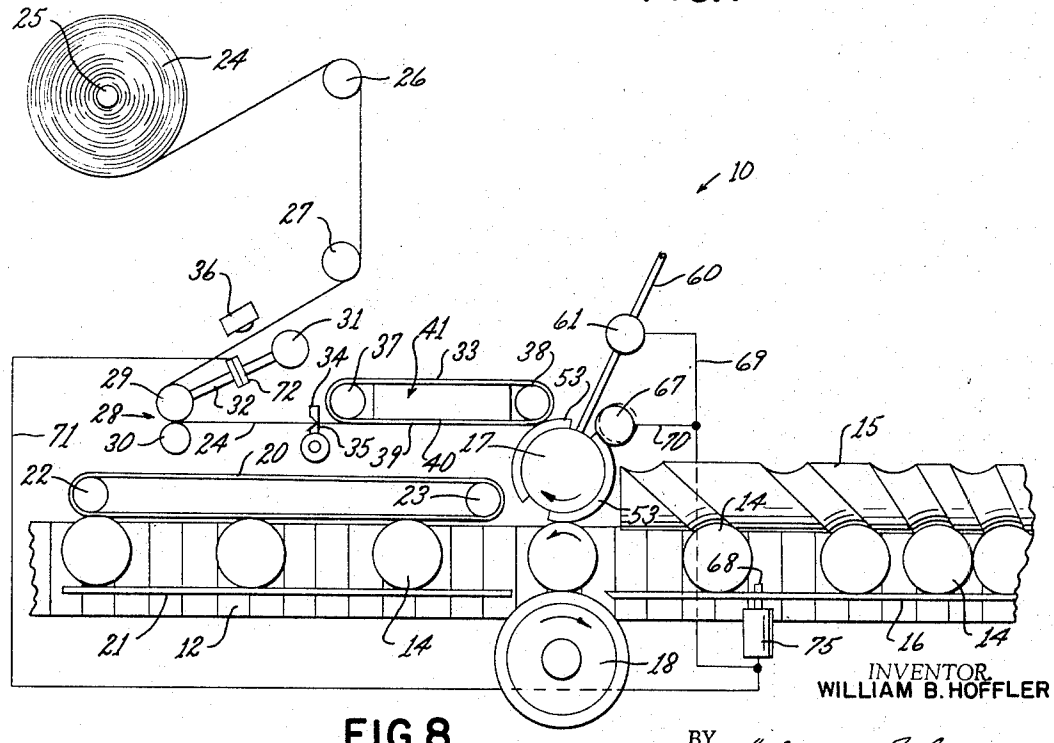


FIG.8

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3,367,822

METHOD AND APPARATUS FOR LABELING CONTAINERS

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Filed July 1, 1964, Ser. No. 379,696
32 Claims. (Cl. 156—264)

ABSTRACT OF THE DISCLOSURE

Container label material is fed in strip form from a roll to a cutting station. Individual labels are cut and transferred by a continuous vacuum belt from the cutting station to a rotatable vacuum drum disposed adjacent a labeling station of a conveyor line along which cylindrical containers to be labeled are moved in an upright position. The rotating vacuum drum carries the label past an adhesive applying roller and thence into engagement with the side of a container at the labeling station. The container is rotated relative to the rotating drum and in the opposite direction to wrap the label about the container wall. The inlet end of the conveyor line is provided with a helical screw type spacer which assures proper registry of a container with the vacuum drum at the labeling station. A container sensor disposed in the path of containers advancing toward the labeling station operates to control components of the apparatus such that a label is not carried by the drum to the labeling station unless a container is present at the labeling station.

This invention relates to an improved apparatus and method for applying labels and the like to containers and the like.

In particular, the apparatus and method of this invention provides means wherein the containers or the like can be serially fed along one path by a conveyor means or the like and individual labels can be formed from coiled label stock to be individually applied to the containers as they serially pass beyond a certain station of the apparatus.

In one embodiment of this invention, the means for forming the individual labels from the label stock is only actuated when a container is in a proper position in the conveying means whereby the label applying means will not be adapted to apply a label unless the container is in the proper position.

In another embodiment of this invention the label applying means is so constructed and arranged that the same will only pick up a label and apply the same when a container is in the proper position in the conveying means.

In still another embodiment of this invention both the label forming means and the label applying means are rendered inoperative unless a container is in the proper position on the conveying means.

Accordingly, it is an object of this invention to provide an improved apparatus for applying labels or the like to containers or the like, the apparatus of this invention having one or more of the novel features set forth above or hereinafter shown or described.

Another object of this invention is to provide an improved method for applying labels or the like to containers or the like, the method of this invention having one or more of the novel features set forth above or hereinafter shown or described.

Other objects, uses and advantages of this invention are apparent from a reading of this description which proceeds with reference to the accompanying drawings forming a part thereof and wherein:

FIGURE 1 is a schematic perspective view illustrating the improved method and apparatus of this invention.

FIGURE 2 is a schematic plan view of the apparatus illustrated in FIGURE 1.

FIGURE 3 is a broken away fragmentary perspective view illustrating the belt means of this invention.

FIGURE 4 is a fragmentary perspective view illustrating the drum means of this invention.

FIGURE 5 is a cross-sectional view taken substantially on line 5—5 of FIGURE 4.

FIGURE 6 is a view taken substantially on line 6—6 of FIGURE 4.

FIGURE 7 is a view similar to FIGURE 2 and illustrates another embodiment of this invention.

FIGURE 8 is a view similar to FIGURE 2 and illustrates still another embodiment of this invention.

While the various features of this invention are hereinafter described and illustrated as being particularly adaptable for applying labels to canned goods or the like, it is to be understood that the various features of this invention can be utilized singly or in any combination thereof to provide label applying means or the like for other devices or the like.

Referring now to FIGURES 1 and 2, the improve apparatus and method of this invention is generally indicated by the reference numeral **10** and includes a frame means **11** supporting a platform **12** to support the bottom walls **13** of a plurality of containers **14** or the like adapted to be fed from right to left through the apparatus **10** in a manner now to be described.

It can be seen in FIGURES 1 and 2 that a horizontally disposed rotatable feed screw **15** is provided and cooperates with side rail means **16** to serially feed the containers **14** from right to left along the platform **12** to a position wherein the containers **14** are further advanced by a rotating drum means **17** and a cooperating resilient roller means **18**, the containers **14** having labels **19** applied to the outer peripheral side walls thereof by the drum means **17** in a manner hereinafter described and being further advanced through the apparatus **10** by a continuous belt means **20** cooperating with the side rail means **21** in a manner hereinafter described.

The feed screw **15** is so constructed and arranged that the same spaces the containers **14** as they are moved through the apparatus **10** so that the containers **14** will be in the proper spaced positions to serially receive labels from the drum means **17** in a manner hereinafter described.

The continuous belt means **20** is looped around a pair of rollers **22** and **23** one of which or both are rotatably driven to drive the belt **20** in a clockwise direction in FIGURE 2 to advance the labeled containers **14** from the drum means **17** out of the apparatus **10** to the left in FIGURE 2.

A coil of continuous label stock **24** is mounted on a roller **25** and is fed partly around a pair of idler rollers **26** and **27** and through a nip **28** formed by a drive roller **29** and a cooperating roller **30**, the drive roller **29** being adapted to be rotated in a counterclockwise direction in FIGURE 2 by a suitable drive means **31** interconnected thereto by transmission means **32** and the cooperating roller **30** being spring biased toward the roller **29** by tension springs or the like.

Thus, as long as the drive roller **29** is rotated in a counterclockwise direction, the label stock **24** is advanced to the right in FIGURE 2 toward a pick-up continuous belt means **33** for a purpose hereinafter described.

As the label stock **24** is advanced toward the belt means **33**, the same passes between a stationary knife **34** and a rotary knife **35** which cooperates with the stationary knife **34** to serially cut the label stock **24** into individual

labels 19 as they are fed onto the pick-up belt means 33 in a manner hereinafter described.

In order to insure proper registry between the drive roller means 29 and the rotary knife 35, a suitable electric eye 36 is provided to automatically adjust the timing between the drive means 29 and the cutting means 35 so that the individual labels 19 being formed by the rotary knife 35 will have the informational media thereon in proper registration with the opposed ends thereof whereby the cut labels 19 will be uniform.

The continuous belt means 33 is looped around a pair of rollers 37 and 38 of which one or both are rotatably driven in the proper direction to drive the belt means 33 in a counterclockwise direction in FIGURE 2 whereby the front run 39 of the belt means 33 passes against side means 40 of manifold means 41 disposed within the opposed runs of the belt means 33.

As illustrated in FIGURE 3, the belt means 33 is provided with a plurality of perforations 42 which are adapted to register with slot means 43 formed in the side wall means 40 of the manifold means 41. In particular, the manifold means 41 comprises two chamber defining members 44 and 45 disposed in aligned relation and respectively having the chambers thereof interconnected to the exterior of the side wall means 40 by a pair of vertically disposed slots 46 and 47 and a pair of converging slots 48 and 49.

In this manner, while the belt means 33 has the run 39 thereof progressively moving from left to right across the surface means 40 of the manifold means 41, at least some of the perforations 42 will be in communication with the converging slot means 48 and 49 as well as the slot means 46 and 47.

As illustrated in FIGURE 6, the chambers of the manifolds 44 and 45 are adapted to be interconnected to a source of vacuum by a conduit means 50 having an on-off valve means 51 disposed therein. Thus, when the apparatus 10 is turned on, the valve means 51 is opened so that the manifold means 41 is always interconnected to the vacuum source by the conduit means 50 during the entire operation of the apparatus 10.

In this manner, it can be seen that as the individual labels 19 are serially cut by the rotary knife 35 from the advancing label stock 24, the cut labels 19 are held against the outside surface of the run 39 of the belt means 33 by air pressure and are transferred from the rotary knife 35 to the pick-up drum means 17 in a manner hereinafter described. However, if the drum means 17 is not actuated in a manner hereinafter described so that the drum means 17 can pick up the transferred labels 19, the labels 19 will be passed out of the apparatus 10 at a point defined by the nip between the drum means 17 and the roller 38.

The movement of the belt means 33 in a counterclockwise direction is at a rate faster than the rate of label stock feed through the rotary knife 35 so that the cut labels 19 will be disposed in spaced relation on the run 39 of the belt means 33. In this manner, the cut labels 19 can be serially picked off the belt means 33 by the drum means 17 in a manner hereinafter described.

Since the slots 48 and 49 of the manifold 44 converge toward each other, it can be seen that maximum vacuum is connected to the perforations 42 in the run 39 of the belt means 33 at the time the label 19 is being cut from the label stock 24 by the rotary knife 35 so that the cut label 19 will be firmly held to the run 39 of the belt means 33 by the air pressure.

The drum means 17 is adapted to rotate in a clockwise direction on a manifold housing 52 in any suitable manner, the drum means 17 having a pair of label pick-up shoes 53 secured thereto. The shoes 53 have a plurality of rows of perforations 54 interrupting the outer surface thereof, each row 54 being adapted to be interconnected to port means 55 in the bottom wall 56 of the drum means by passage means 57.

In particular, the leading row of perforations 54 of each shoe 53 is interconnected to a port 55A while the remaining rows of perforations thereof are interconnected to ports 55B which are disposed inboard of the leading port 55A in the manner illustrated in FIGURE 5.

The manifold 52 has an upper surface 58 provided with an outer slot means 59 interconnected to a source of vacuum by a conduit means 60, the conduit means 60 having a solenoid actuated valve means 61 disposed therein for a purpose hereinafter described.

An inner slot means 62 is provided in the end surface 58 of the manifold 52 and is interconnected to the vacuum source by a branch conduit 63 leading to the conduit 50 in the manner illustrated in FIGURE 6, the slot means 62 having a forward portion 64 disposed in spaced aligned relation with the outer slot means 59 thereof.

In addition, a port 65 is formed in the end surface 58 of the manifold 52 and is disposed in aligned relation with the leading ports 55A of the drum means 17, the port 65 being adapted to be interconnected to a source of air pressure by a conduit 66.

Thus, it can be seen that when the drum means 17 has the end surface 56 thereof disposed on the end surface 58 of the manifold 52 and is rotated in a clockwise direction, the leading port 55A of one of the shoes 53 comes into registration with the slot 59 of the manifold 52 so that the leading row of perforations 54 thereof are interconnected to a vacuum source, if the valve means 61 is operated in the manner hereinafter described, so that a label 19 being delivered to the drum means 17 by the belt means 33 will be picked off therefrom and be carried along with the shoe 53 by air pressure. As the drum means 17 is further rotated, the inward port means 55B thereof serially come into registration with the slot means 62 of the manifold 52 and are interconnected to the vacuum source by the conduits 63 and 50 whereby the label is firmly held against the shoe 53 and is rotated past an adhesive applicator roller 67 which moves inwardly from the dotted position illustrated in FIGURE 2 to the full line position illustrated in FIGURE 2 to apply adhesive to the outer surface of the label 19 being carried by the particular shoe 53.

As illustrated in dashed lines in FIGURE 4, the cut label 19 is slightly larger than its respective shoe 53 whereby no adhesive will be accidentally applied to exterior surface of that shoe 53 when the roller 67 is moved inwardly toward the drum 17.

As the label carrying shoe 53 continues to rotate in a clockwise direction, the same places the label 19 in contact with the side wall of a particular container or can 14 as the same is disposed in the position illustrated in FIGURE 2 so that the label 19 will be secured thereto by the adhesive applied to the label 19 by the applicator roller 67. However, it can be seen that when the leading port 55A of the drum means 17 advances in registration with the port 65 in the manifold 52, air pressure is directed to the leading row of perforations 54 of the shoe 53 to insure that the label 19 has the leading end thereof positively disconnected from the drum means 17 and applied to the container 14, the trailing port means 55B subsequently moving out of registration with the slot means 62 as the drums 17 continue to rotate in a clockwise direction so that the label 19 can be applied to the container 14.

Thus, as the drum means 17 rotates in a clockwise direction, the drum means 17 through the cooperation of the resilient roll 18 causes the container disposed therebetween to rotate in a counterclockwise direction in FIGURE 2 to have the label 19 completely applied around the same.

The thus labeled container 14 is then advanced out of the machine 19 by the belt means 20, the belt means 20 and rail means 21 cooperating together to continue to ro-

tate the labeled container **14** therebetween as it is advanced to the left to insure good adhesion of the label **19** to the container **14** before the labeled container **14** is dispensed from the apparatus **10** at the left end thereof.

In the embodiment illustrated in FIGURE 2, it can be seen that a suitable sensing mechanism **75** is carried by the apparatus **10** and has an actuating plunger **68** which is actuated each time a container **14** passes from right to left past the plunger **68**.

In this manner, the sensing mechanism **75** sends a signal through a cable means **69** to the solenoid operated valve means **61** in the conduit means **60** to cause the same to open to interconnect the vacuum source to the drum means **17**. In addition, the signal being sent by the sensing mechanism **75** is transmitted through the cable means **70** to the adhesive applicator roller mechanism **67** to cause the same to move from the dotted line position to the full line position to apply adhesive to the label **19** being picked up by the drum means **17** when the solenoid valve means **61** is operated.

In this manner, it can be seen that as the apparatus **10** is running and no cans or containers **14** are being advanced down the trackway **12**, the labels **19** will be individually cut from the advancing stock **24** and be carried by the belt means **33** to the drum means **17**. However, the drum means **17** will not pick up any of the labels **19** from the belt means **33** as the valve means **61** is closed whereby the labels are dispensed outwardly from the apparatus **10** from between the nip of the drum means **17** and the roller **38**.

Thus, the apparatus **10** can have the label stock **24** run therethrough without requiring the containers **14** to also be fed therethrough whereby the electric eye **36** can properly register the label stock **24** relative to the rotary knife **35**.

Accordingly, the operation of the device **10** as illustrated in FIGURE 2 is as follows.

When the apparatus **10** is turned on, the drive roller **29** continues to feed the label stock **24** to the right whereby the rotary knife **35** cuts the label stock **24** into individual labels **19** to be carried in aligned spaced relation by the belt means **33**. Each time a container **14** trips the plunger **68** of the sensing mechanism **75**, the solenoid valve **61** is operated to interconnect the vacuum source to the drum means **17** so that a label **19** on the belt means **33** will be picked up on one of the shoes **53** of the drum means **17** and have adhesive applied thereto by the actuated roller **67**. The picked up label **19** on the drum means **17** is then applied to the container **14** when the same reaches the drum means **17** in the manner previously described whereby the particular container **14** is labeled and passed out of the apparatus **10** by the belt means **20**.

Accordingly, the embodiment illustrated in FIGURE 2 causes the label stock **24** to be continuously fed therethrough and to be cut into individual labels **19** regardless of whether containers **14** are moving through the apparatus **10**, the drum means **17** only picking up the labels **19** from the belt means **53** when the containers **14** trip the plunger **68** of the sensing mechanism **75**.

However, the apparatus **10** of this invention could be modified so that the label feed means **29** will only feed the label stock **24** to the rotary cutter **35** when a container **14** is in the proper position therein to be subsequently labeled by the drum means **17** in the above manner.

In particular, the apparatus **10** illustrated in FIGURE 7 has all of the parts thereof substantially the same as the apparatus **10** illustrated in FIGURE 2 except that the sensing mechanism **75** does not operate the valve means **61**, the valve means **61** remaining open in the apparatus illustrated in FIGURE 7 during the entire operation of the apparatus **10**.

The sensing mechanism **75**, however, is adapted to send a signal through a cable means **71** to an electromagnetic clutch **72** disposed in the transmission means **32** each time the plunger **58** is actuated by a container **14** whereby the drive source **31** is not interconnected to the drive roller **29** unless the clutch **72** is energized by a signal being sent thereto by the sensing mechanism **75** each time a container **14** operates the plunger **68** thereof.

Thus, it can be seen that in the operation of the apparatus **10** illustrated in FIGURE 7, the label stock **24** will only be fed therethrough by the drive roller **29** when a container **14** is in the proper position so that by the time the container **14** reaches the drum means **17**, a label **19** has been cut from the advanced label stock **24**, transferred by the belt means **33** to the drum means **17** and then positioned by the drum means **17** in a proper manner to be applied to that particular container **14**, the signal from the operated sensing mechanism **75** also being fed by cable **73** to the applicator roller **67** to operate the same in the manner previously described.

If desired, the sensing mechanism **75** can be so constructed and arranged that the same performs two functions, i.e., to operate the clutch means **72** and to also operate the valve means **61** and applicator roller **67**.

As illustrated in FIGURE 8, the sensing mechanism **75** is adapted to send a signal through the cable means **71** to the clutch means **72** when a container trips the plunger **68** thereof. In addition, the sensing mechanism **75** is adapted to send a signal to the valve means **61** and applicator roller **67** through the cable means **69** and **70** whereby the apparatus **10** illustrated in FIGURE 8 will only feed the label stock **24** therethrough when a container is in proper position and the drum means **17** will only pick up that label **19** in the manner previously described.

While the apparatus **10** of this invention has been described as having an adhesive applying means **67**, it is to be understood that the apparatus **10** of this invention could be converted for heat sealing labels to the containers **14** by eliminating the roller means **67** and having the drum means **17** perform the heat sealing function as well as its pick up and applying functions.

Accordingly, it can be seen that this invention not only provides an improved apparatus for labeling containers or the like, but also this invention provides an improved method for labeling containers or the like.

While the form of the invention now preferred has been disclosed as required by the statutes, other forms may be used, all coming within the scope of the claims which follow.

What is claimed is:

1. In combination, conveyor means for serially feeding containers or the like in one path past a first station, continuous belt means for serially feeding individual labels to a second station, and drum means for serially picking up said labels at said second station and serially applying said picked up labels to said containers as said containers move past said first station, said drum means only picking up a label when a container is at said first station.

2. A combination as set forth in claim **1** wherein said belt means is perforated and has one run thereof passing against one side of a vacuum manifold whereby said labels are held against said one run by air pressure.

3. A combination as set forth in claim **2** wherein said manifold has a chamber interconnected to said one run of said belt means by slot means formed in said one side of said manifold.

4. A combination as set forth in claim **3** wherein said slot means comprises a first slot extending transversely to the direction of travel of said belt means and a second slot angularly disposed relative to the direction of travel of said belt means.

5. A combination as set forth in claim **1** wherein said drum means has vacuum pick-up means for holding said labels thereto.

6. A combination as set forth in claim **1** wherein an adhesive applicator roll means cooperates with said drum

means to apply adhesive to the labels carried by said drum means.

7. In combination, conveyor means for serially feeding containers or the like in one path past a first station, means for feeding a substantially continuous length of label stock to a second station by roll means, rotary cutting means for serially cutting said label stock at said second station into individual labels, continuous belt means for serially picking up said cut labels at said second station and delivering said labels to a third station, and drum means for serially picking up said labels at said third station and serially applying said picked up labels to said containers as said containers move past said first station, said drum means only picking up a label when a container is at said first station.

8. A combination as set forth in claim 7 wherein said belt means moves said cut labels from said second station to said third station in a direction opposite to the direction of movement of said containers.

9. A combination as set forth in claim 7 wherein said containers are rotated by said drum means as said drum means applies said labels.

10. A combination as set forth in claim 7 wherein said conveyor means includes a feeding screw.

11. A combination as set forth in claim 7 wherein said conveyor means includes a continuous belt means that engages the sides of said containers and rotates the same while feeding said containers in said path.

12. A combination as set forth in claim 7 wherein said belt means is moving at a rate faster than the rate that said label stock is being fed by said roll means whereby said cut labels are spaced in aligned relation on said belt means.

13. In combination, conveyor means for serially feeding containers or the like in one path past a first station, a coiled length of label stock, roll means for feeding said label stock from said coil thereof to a second station, rotary cutting means for serially cutting said label stock at said second station into individual labels, continuous belt means having vacuum pick-up means for serially picking up said cut labels at said second station and delivering said labels to a third station, and rotatable drum means having vacuum pick-up means for serially picking up said labels at said third station and applying said labels to said containers as said containers move past said first station, said drum means only picking up a label when a container is at said first station.

14. A combination as set forth in claim 13 wherein a sensing means senses the presence of a container at said first station and interconnects a vacuum source to said drum means to pick up a label at said third station.

15. A combination as set forth in claim 13 wherein a sensing means senses the presence of a container at said first station and interconnects a drive source to said roll means to feed said label stock to said second station.

16. A combination as set forth in claim 13 wherein a sensing means senses the presence of a container at said first station and interconnects a drive source to said roll means to feed said label stock to said second station so that a label can be cut therefrom, said sensing means also interconnecting a vacuum source to said drum means when sensing the presence of a container at said first station so that said label can be picked up by said drum means.

17. A method for labeling containers or the like comprising the steps of providing conveyor means for serially feeding said containers in one path past a first station, providing continuous belt means for serially feeding individual labels to a second station, and providing drum means for serially picking up said labels at said second station and serially applying said picked up labels to said containers as said containers move past said first station, said drum means only picking up a label when a container is at said first station.

18. A method as set forth in claim 17 and including the steps of perforating said belt means and disposing one run thereof against one side of a vacuum manifold whereby said labels are held against said one run by air pressure.

19. A method as set forth in claim 18 and including the step of providing slot means in said one side wall of said manifold to interconnect said belt means with a chamber of said manifold.

20. A method as set forth in claim 19 and including the steps of forming said slot means with a first slot extending transversely to the direction of travel of said belt means and with a second slot angularly disposed relative to the direction of travel of said belt means.

21. A method as set forth in claim 17 and including the step of providing a vacuum pick up means on said drum means for holding said labels thereto.

22. A method as set forth in claim 17 and including the step of providing an adhesive applicator roll means to cooperate with said drum means to apply adhesive to the labels carried by said drum means.

23. A method for labeling containers or the like comprising the steps of providing conveyor means for serially feeding said containers in one path past a first station, feeding a substantially continuous length of label stock to a second station, providing rotary cutting means for serially cutting said label stock at said second station into individual labels, providing continuous belt means for serially picking up said cut labels at said second station and delivering said picked up labels to a third station, and providing drum means for serially picking up said labels at said third station and serially applying said picked up labels to said containers as said containers move past said first station, said drum means only picking up a label when a container is at said first station.

24. A method as set forth in claim 23 and including the step of causing said belt means to move said cut labels from said second station to said third station in a direction opposite to the direction of movement of said container.

25. A method as set forth in claim 23 and including the steps of rotating said containers by said drum means as said drum means applies said labels.

26. A method as set forth in claim 23 and including the step of providing a feeding screw as part of said conveyor means.

27. A method as set forth in claim 23 and including the step of providing a continuous belt means for said conveyor means that engages the sides of said containers and rotates the same while feeding said containers in said path.

28. A method as set forth in claim 23 and including the step of moving said belt means at a rate faster than the rate that said label stock is being fed to said second station whereby said cut labels are spaced in aligned relation on said belt means.

29. A method for labeling containers or the like comprising the steps of providing conveyor means for serially feeding said containers in one path past a first station, providing a coiled length of label stock, providing roll means for feeding said label stock from said coil thereof to a second station, providing rotary cutting means for serially cutting said label stock at said second station into individual labels, providing continuous belt means having vacuum pick-up means for serially picking up said cut labels at said second station and delivering said labels to a third station, and providing a rotatable drum means having a vacuum pick-up means for serially picking up said labels at said third station and applying said labels to said containers as said containers move past said first station, said drum means only picking up a label when a container is at said first station.

30. A method as set forth in claim 29 and including the step of providing a sensing means that interconnects a vacuum source to said drum means to pick up a label at said third station when said sensing means senses the presence of a container at said first station.

31. A method as set forth in claim 29 and including the step of providing a sensing means that interconnects a drive source to said roll means to feed said label stock to said second station when said sensing means senses the presence of a container at said first station.

32. A method as set forth in claim 29 and including the step of providing a sensing means that interconnects a drive source to said roll means to feed said label stock to said second station so that a label can be cut therefrom and that interconnects a vacuum source to said drum means so that said label can be picked up by said drum means when said sensing means senses the presence of a container at said first station.

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