

Dec. 30, 1969

W. J. WEBER

3,486,442

PRINTING ON CONTAINER CLOSURES

Filed Dec. 20, 1967

2 Sheets-Sheet 1

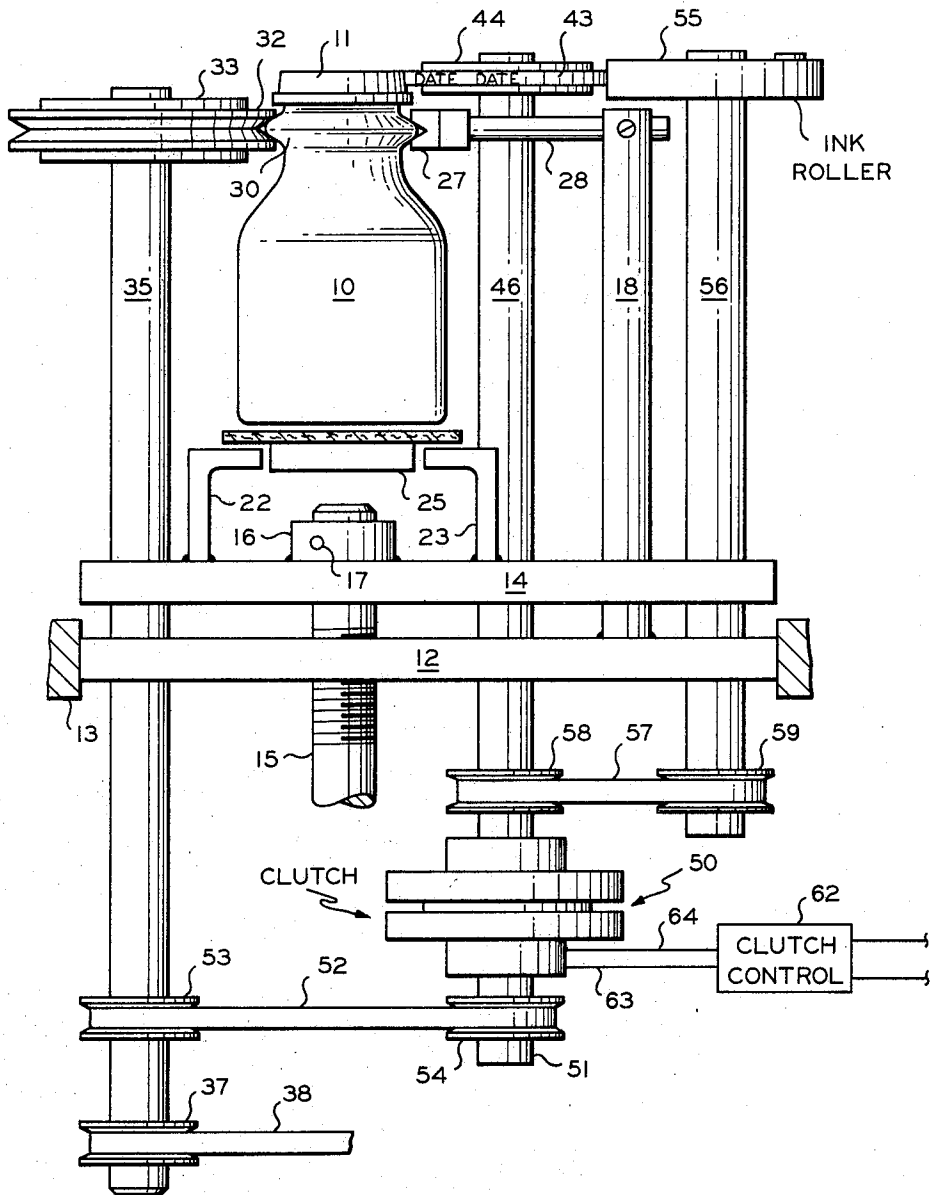


FIG. 1

INVENTOR.
W. J. WEBER

BY *Young & Quigg*

ATTORNEYS

Dec. 30, 1969

W. J. WEBER

3,486,442

PRINTING ON CONTAINER CLOSURES

Filed Dec. 20, 1967

2 Sheets-Sheet 2.

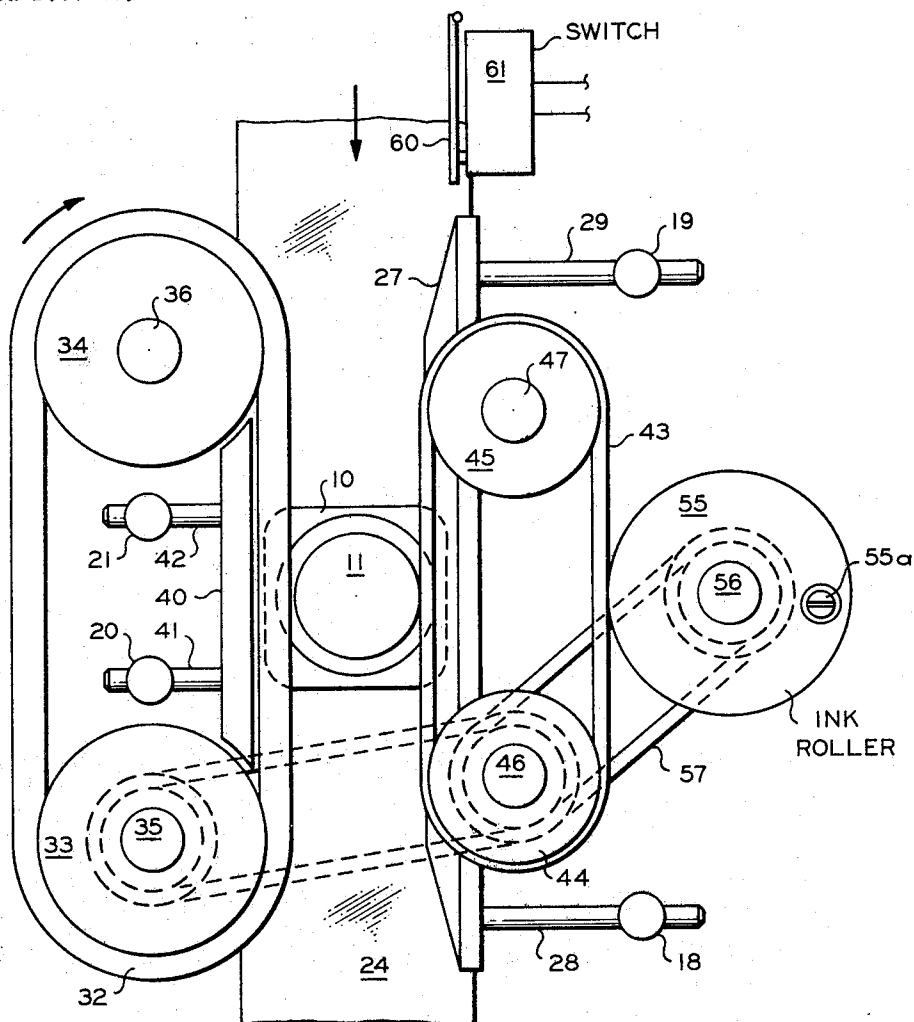


FIG. 2

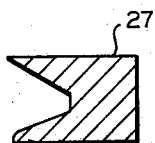


FIG. 3

INVENTOR.
W. J. WEBER

BY Young + Quigg

ATTORNEYS

1

2

3,486,442

PRINTING ON CONTAINER CLOSURES

William J. Weber, Fulton, N.Y., assignor to Phillips Petroleum Company, a corporation of Delaware
Filed Dec. 20, 1967, Ser. No. 692,224
Int. Cl. B41f 17/18

U.S. Cl. 101—40

7 Claims

ABSTRACT OF THE DISCLOSURE

Apparatus is provided for printing on closures which are secured to the tops of containers. A shoulder on the container is moved into engagement with a stationary guide member having an elongated recess and is rotated along the guide member. This causes the closure member to engage a printing mechanism which is positioned adjacent the stationary guide member.

This invention relates to printing on closures after they have been secured to bottles or other containers.

It is often desirable to print dates or other information on closures. For example, in the dairy industry it is common practice to print the date of filling or the filling location on lids for milk bottles. In order to reduce inventories of pre-printed closures and to avoid errors resulting from use of improper closures, it is desirable to print identification data on the closure at the time the closure is placed on the bottle. Heretofore, this has been a difficult operation because the bottles move along the filling line at a relatively high speed. Attempts to print on the moving bottles have often resulted in smearing of the ink.

In accordance with the present invention, novel apparatus is provided which is capable of printing on closures for containers which have outwardly extending shoulders. A first stationary guide member is positioned with respect to the conveyor line such that the shoulder on the container is adapted to enter an elongated recess in the guide member. A movable guide member is positioned opposite the stationary guide member to engage the container and force the shoulder into the recess of the stationary guide member. The movable guide member also rotates the container as it moves along the stationary guide member so as to move the closure member into engagement with a printing device. Apparatus is also provided for inking the printing device periodically as the containers are moved into the printing location on the conveyor.

Accordingly, it is an object of this invention to provide apparatus for printing on closure members which are affixed to containers.

Another object is to provide apparatus which is useful in printing identification data on caps for milk bottles.

Other objects, advantages and features of the invention should become apparent from the following detailed description in conjunction with the accompanying drawing in which:

FIGURE 1 is an end view of the printing apparatus of this invention. FIGURE 2 is a top view of the apparatus of FIGURE 1. FIGURE 3 is a cross sectional view of the stationary guide.

Referring now to the drawing in detail and to FIGURES 1 and 2 in particular, there is shown a milk bottle 10 which has a cap 11 positioned thereon. The apparatus of this invention is employed to print a date or other identification data on the edge of cap 11 after the milk bottle has been filled and the cap attached. This printing apparatus is supported by a stationary plate 12 which is secured to a suitable frame 13. A second plate 14 is positioned above plate 12 so as to be free to move vertically with respect to plate 12. This movement can be accomplished by means of a rod 15 which is threaded to

plate 12 and which extends through plate 14 into a sleeve 16, the latter being rigidly secured to plate 14. The upper end of rod 15 is provided with an annular recess into which is inserted a pin 17. This permits the rod to rotate inside the sleeve, but prevents vertical movement between the two members. Thus, rotation of rod 15 serves to raise or lower plate 14 with respect to plate 12. Plate 14 slides on vertical support rods 18, 19, 20 and 21 which are secured at their lower ends to plate 12.

Support members 22 and 23 are secured to and extend upwardly from plate 14. These members serve to position a conveyor belt 24 which is moved by a chain 25, the latter being actuated by a suitable drive mechanism, not shown, to move the bottles past the closure printing apparatus. An elongated stationary guide member 27 is positioned above and extends parallel to conveyor belt 24. Guide member 27 is retained in this position by horizontal support rods 28 and 29, the latter being secured to vertical rods 18 and 19, respectively. Guide member 27 is provided with a recess which is adapted to receive a shoulder 30 on bottle 10. While the exact shape of this recess can vary, depending on the shape of the shoulder on the bottle, a typical recess cross section is illustrated in FIGURE 3. The ends of guide member 27 are tapered to receive the incoming bottle. The guide member is positioned above conveyor belt 24 a distance such that shoulder 30 partially enters the recess when the bottle is moved by the conveyor belt past the entrance end of the guide member. Rotatable rod 15 serves to permit the elevation of conveyor belt 24 to be adjusted to accommodate bottles of different heights.

A movable belt 32 extends about pulleys 33 and 34 which are positioned such that belt 32 is parallel to and opposite guide member 27. Belt 32 is provided with a recess which also engages shoulder 30 of bottle 10 to provide a movable guide member. Pulleys 33 and 34 are mounted on a drive shaft 35 and a support rod 36, respectively. Shaft 35 extends through plate 12 and has a drive pulley 37 mounted thereon. A belt 38 extends from pulley 37 to a suitable drive motor, not shown. Rotation of pulley 37 thus rotates drive shaft 35, pulley 33 and belt 32. A back-up member 40 is positioned behind belt 32 to retain the belt in engagement with shoulder 30. Plate 40 is secured in this position by support rods 41 and 42 which are attached to respective rods 20 and 21.

Stationary guide member 27 is of a configuration and is positioned such that bottle 10 is lifted slightly above conveyor 24 when belt 32 forces shoulder 30 into the recess of guide member 27. Belt 32 also serves to rotate bottle 10 along guide member 27. At the end of guide member 27 the bottle is lowered to conveyor belt 24 and is removed from the printing mechanism.

A second belt 43 extends around pulleys 44 and 45, which are positioned such that belt 43 engages the edge of cap 11. Belt 43 carries printing type to impress the desired markings on cap 11. Pulleys 44 and 45 are mounted on respective rotatable shafts 46 and 47, the former being rotatable. Shaft 46 is connected by a clutch 50 to a drive shaft 51, and a belt 52 extends between pulleys 53 and 54 which are secured to respective shafts 35 and 51. Thus, pulley 44 and belt 43 are rotated when clutch 50 is energized. An ink roller 55 engages belt 43 to ink the type. This ink roller is secured to a shaft 56 which is driven from shaft 46 by means of a belt 57 which extends between pulleys 58 and 59. Ink roller 55 advantageously can be a hollow roller which is filled periodically with ink through opening 55a, although other types of inking rollers can be used.

In the operation of the printing mechanism of this invention, printing belt 43 normally is stationary when a bottle is rotated along guide 27. Belt 43 can be provided with continuous type or with a plurality of individual sets

3

of types spaced from one another, depending to some extent on the information to be printed. A rotatable arm 60 is mounted adjacent the conveyor belt so as to close a switch 61 when engaged by a bottle on the conveyor belt. Suitable guide means, not shown, are provided adjacent the conveyor belt to force the incoming bottles into engagement with arm 60. Switch 61 is connected to a clutch control device 62 illustrated in FIGURE 1. This clutch control can comprise a source of electrical energy and a relay which is actuated when switch 61 is closed. Output leads 63 and 64 extend from clutch control 62 to electromagnetic clutch 50, the latter being provided with suitable slip rings, not shown, which engage leads 63 and 64. In this manner, clutch 50 is energized and belt 43 is moved and inked each time a bottle enters the printing mechanism. In normal operation, the bottles are spaced on the conveyor such that belt 43 remains stationary during the actual printing operation. Other bottle detecting means, such as a lamp and photocell, can be employed in place of switch 61.

In view of the foregoing description, it can be seen that efficient printing apparatus is provided by this invention. The bottles or other containers are securely retained by the guide means such that a positive engagement is made with the printing type. This printing mechanism is particularly useful in conjunction with high speed filling lines normally found in dairies and similar plants. In order to simplify the drawing, various structural details have been omitted. For example, a number of supporting sleeves and brackets are employed to retain the various shafts and support rods and the conveyor belt in the positions illustrated.

While the invention has been described in conjunction with a presently preferred embodiment, it should be evident that it is not limited thereto.

What is claimed is:

1. Apparatus for use in printing on closures which are secured to the tops of containers, the latter having outwardly extending shoulders, which apparatus comprises:
 - a conveyor to transport such containers having closures secured thereto;
 - a stationary guide member having an elongated recess to receive the shoulder of a container, said stationary guide means extending parallel to said conveyor;
 - a movable guide member having a recess to receive the shoulder of a container, said movable guide means being positioned in spaced relationship with said stationary guide member so as to engage a container moved by said conveyor and force the shoulder of such container into the recess of said stationary guide member;
- means to actuate said movable guide member so that the shoulder of a container disposed between the two guide members is rotated along said stationary guide member; and

4

a printing means positioned with respect to said stationary guide member so that rotation of a container along said stationary guide member results in rotation of the closure on said container past and in engagement with said printing means.

2. The apparatus of claim 1 wherein said movable guide means comprising a belt having a recess in the outer surface thereof to engage the shoulder of a container, and means to position said belt so that a container is disposed between said stationary guide member and the recess in said belt.

3. The apparatus of claim 2 wherein said means to position said belt comprises first and second pulleys spaced from one another in a direction parallel to said conveyor, said belt extending around said pulleys, and support means positioned between said pulleys and adjacent said belt so as to retain said belt in engagement with a container disposed between said stationary guide means and said belt.

4. The apparatus of claim 1 wherein said conveyor comprises a movable belt adapted to have containers mounted thereon, and wherein said movable and stationary guide members are positioned with respect to said belt such that a container disposed between said guide members is lifted a short distance off said belt.

5. The apparatus of claim 4, further comprising means to effect relative movement between said conveyor belt and said guide members to accommodate containers of different heights.

6. The apparatus of claim 1 wherein said printing means comprises a belt having type mounted thereon, means positioning said belt such that said type is in engagement with the closure on a container when the container is disposed between said guide members, inking means, and means to move said belt periodically past said inking means to ink said type.

7. The apparatus of claim 6 wherein said means to move said belt comprises detecting means positioned adjacent said conveyor so as to be actuated by movement of a container on said conveyor past said detecting means, and means responsive to said detecting means to energize said means to move said belt.

References Cited

UNITED STATES PATENTS

2,346,174	4/1944	Malnar	101—4
2,703,047	3/1955	Scherer et al.	101—8
2,891,468	6/1959	Taylor et al.	101—5

ROBERT E. PULFREY, Primary Examiner

C. D. CROWDER, Assistant Examiner

U.S. Cl. X.R.

101—367