June 22, 1971 K. DULLINGER 3,586,580

AUTOMATIC LABEL WRAPPER

Filed Aug. 25, 1967 3 Sheets-Sheet 1

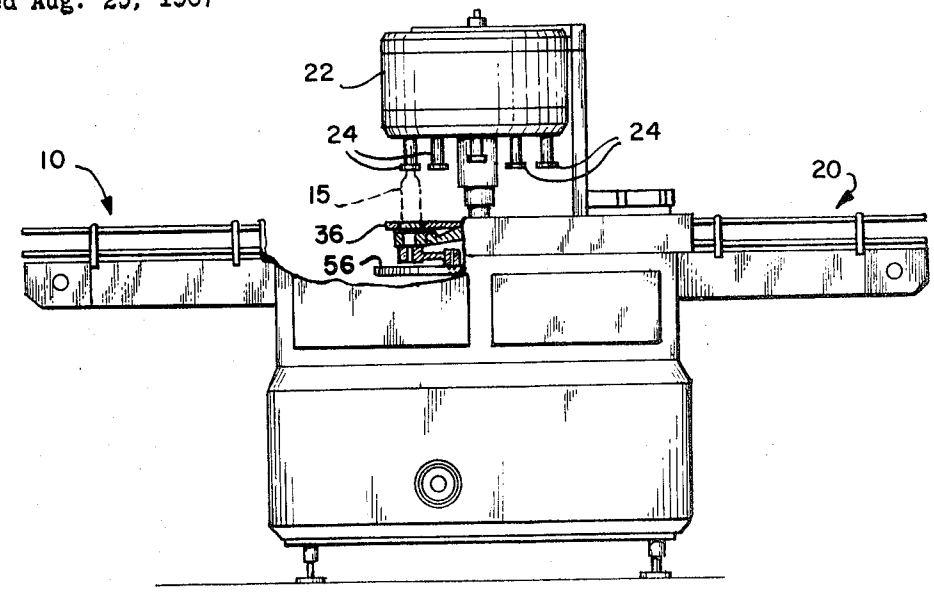


FIG. 1

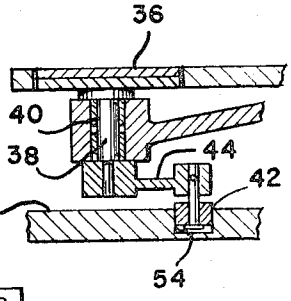


FIG. 7

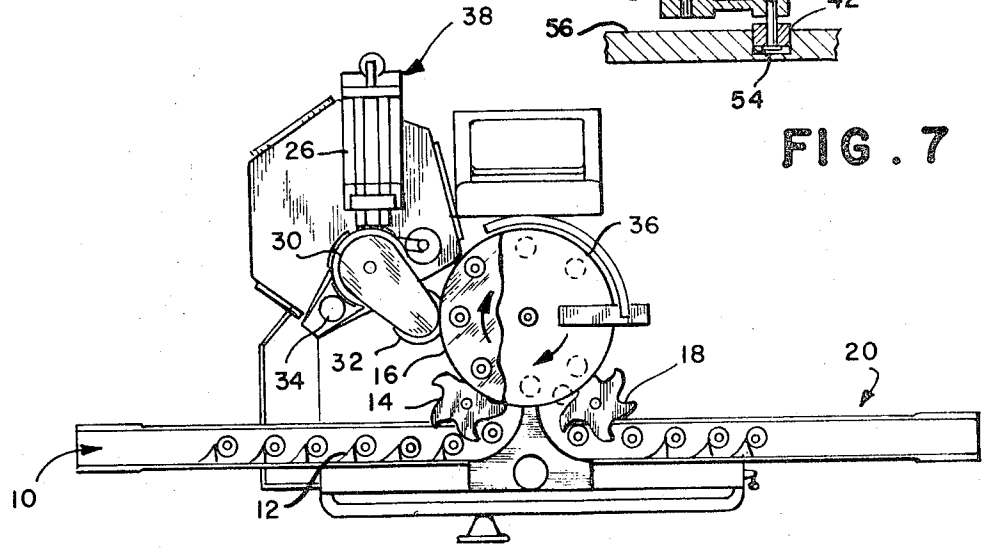


FIG. 2

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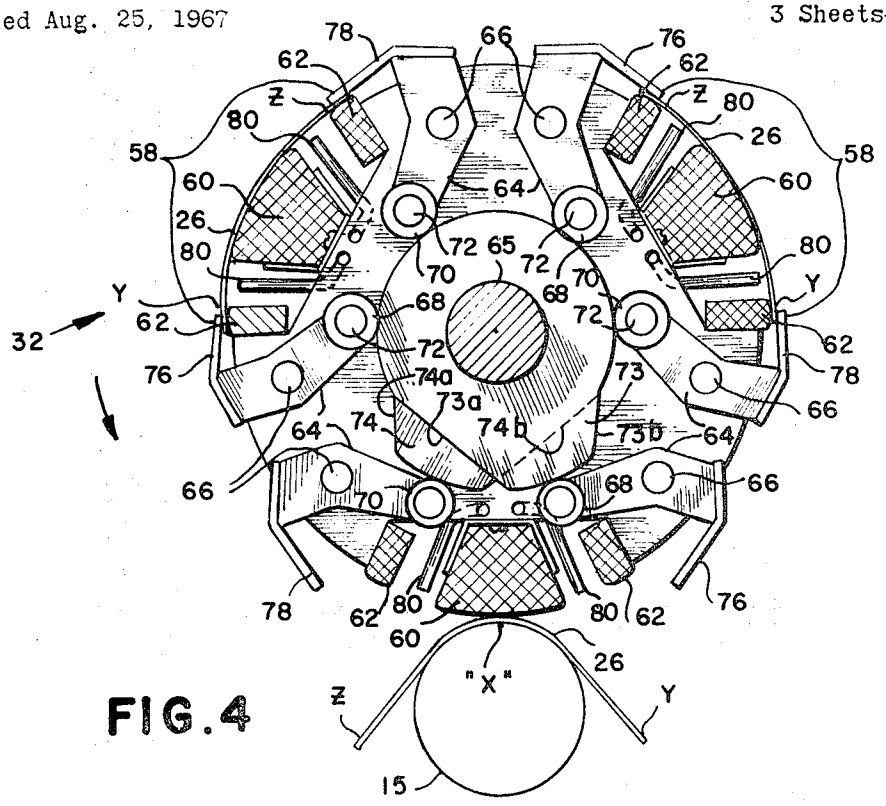


FIG. 4

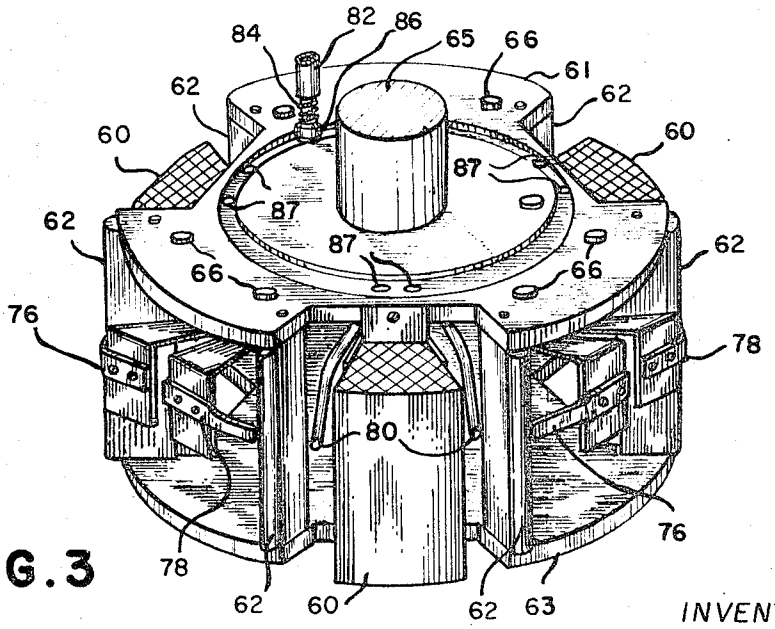


FIG. 3

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AUTOMATIC LABEL WRAPPER

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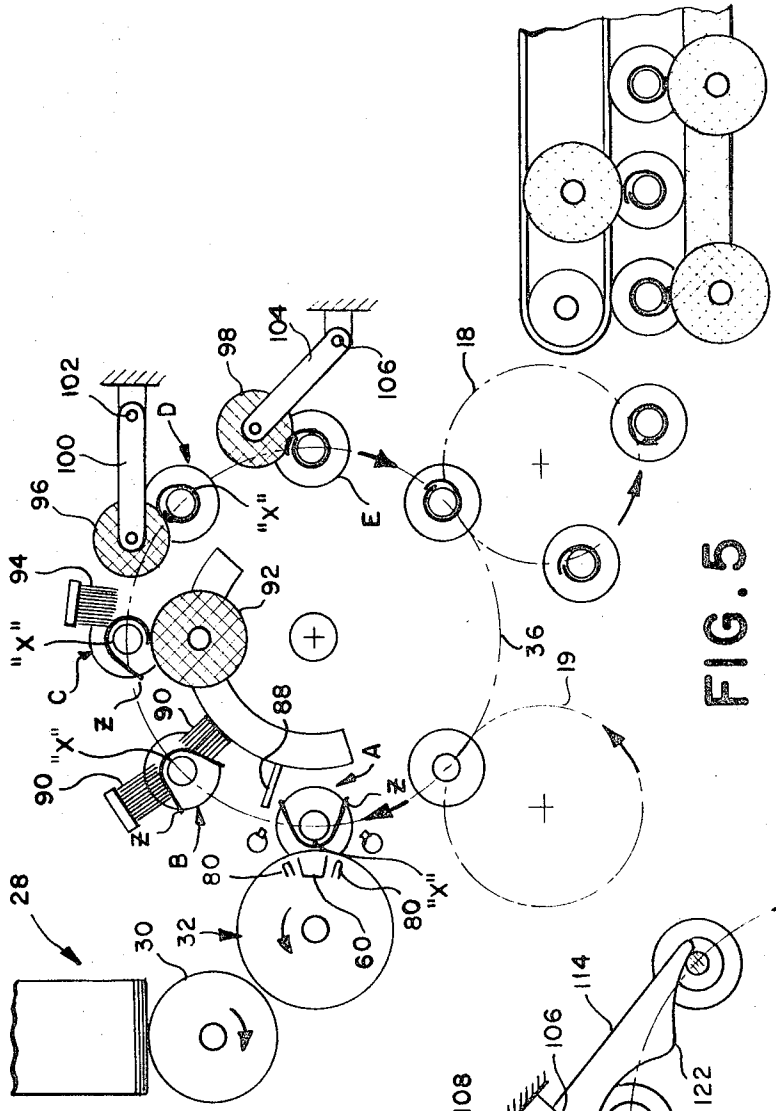


FIG. 5

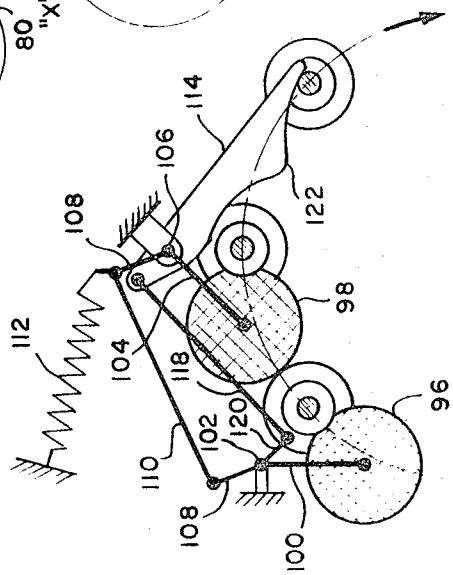


FIG. 6

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United States Patent Office 3,586,580 Patented June 22, 1971

3,586,580

AUTOMATIC LABEL WRAPPER

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Filed Aug. 25, 1967, Ser. No. 663,289
Int. Cl. B65c 9/04
U.S. Cl. 156—458 9 Claims

ABSTRACT OF THE DISCLOSURE

Disclosed herein is a label applying thrust and a label pressing arrangement for a continuously moving labeling machine. The label applying turret has a number of pairs of label clamps equally spaced about the periphery of the turret to grip the ends or wings of labels as the labels are fed to the label turret. The pressing arrangement includes a number of pressure rollers to press the labels against the bottles.

BACKGROUND OF THE INVENTION

Labels which are to be wrapped 180 or more degrees around a bottle or container, particularly the neck of a bottle, have been generally applied by intermittently moving type machines. The label is brought to a position at the front of the bottle and the wings of the label pushed around the bottle while the bottle is stationary. One of the wings of the label is clamped to the label applying turret and the other end is left free. If the label is to be wrapped around more than half of the bottle, it will have a tendency to tilt while on the turret due to its length and weight resulting in a misalignment of the label when it is applied to the bottle. Brushes or pressure rollers are used to brush the wings of the label around the bottle while the bottle remains in the stationary position. This type of a pressing system requires a complicated linkage in order to achieve a sufficient pressure for the ends or wings of the label to adhere to the bottle.

SUMMARY OF THE INVENTION

The present invention utilizes a label applying turret which rotates continuously in synchronism with the motion of a turntable on which the bottles are carried through the labeling machine. Pairs of label clamps are mounted on the periphery of the turret to grip both ends or wings of each label and to release the ends of the label as the label is brought into contact with the bottle. The action of each pair of clamps may be simultaneous or sequential, depending on the type of label which is being applied to the bottle. The ends or wings of the label, after being released from the clamps, are blown around the neck of the bottle by a jet of air from air tubes mounted on the turret. The bottles are carried by individual pallets on the turntable which are mounted to rotate on their own axes. The pallets are intermittently rotated in opposite directions about their own axes to individually turn the bottles to different positions as the bottles move through the pressure roller system. This system includes a number of pressing rollers positioned in the path of motion of the bottles to alternately press each wing of the label against the bottle.

Other objects and advantages will become apparent from the following detailed description when read in connection with the accompanying drawings in which:

FIG. 1 is a front view of a labeling machine partly broken away to show the turntable.

FIG. 2 is a top view of the labeling machine showing the direction of motion of the bottles with part of the head broken away.

FIG. 3 is a perspective view of the label applying turret.

FIG. 4 is a top view of the label turret with the top plate removed.

FIG. 5 is a schematic view of the linkage system for the pressure rollers.

FIG. 6 is a schematic view of the position of the bottles in the labeling machine.

FIG. 7 is a view in section of one of the pallets in the turntable.

Referring more specifically to FIGS. 1 and 2 of the drawings, a general arrangement for a labeling machine is shown having an infeed conveyor **10** with a screw type bottle separator **12** to space bottles **15** as they are fed to a star wheel **14**, a bottle conveyor turntable **16**, a second star wheel **18** and an outfeed conveyor **20**. A rotary head **22** is mounted to rotate with the turntable and has a number of inverted cups **24** that are cam actuated to engage the top of the bottles as they are fed into the turntable. Labels **26** are fed to the bottles **15** from a magazine **28** to a glue cylinder **30** where they are picked up by label applying turret **32** and applied to the bottle **15**. A glue roller **34** is used to apply glue to the glue cylinder as it rotates clockwise past the label magazine. Various types of glue cylinders and label magazines can be used to transfer the labels to the label turret. The drive means for the labeling machine, including the label feed mechanism, is of conventional design and does not form a part of the present invention.

The bottles **15** are moved by the infeed conveyor and spaced by the bottle separator **12** as they are fed to the star wheel. The star wheel moves the bottles onto individual pallets **36** recessed into corresponding sockets in the turntable **16** as shown in FIG. 7 cups **24** are dropped down on the top of the bottle to hold the bottle in position on the pallets. Eight pallets **36** are shown in the drawings, however, any number can be mounted on the turntable depending on its size. The pallets are secured to the upper ends of shafts **38** which are journalled in bearings **40** in the turntable. The pallets are rotated to various positions as the turntable rotates by a cam roller **42** secured to the end of arm **44** on the end of shaft **38**. The cam roller **42** is aligned in a groove **54** provided in stationary cam plate **56** located below the turntable. The groove **54** acts as a cam track and as the turntable rotates the cam roller will move through the track alternately rotating the pallet which supports the bottle. The movements of the bottle will be more fully described in connection with the passage of the bottle through the pressing arrangement.

The bottles, after being positioned on the pallets, initially move past label applying turret **32**. Referring to FIGS. 3 and 4, the label applier or turret shown has two spaced support discs or plates **61** and **63** mounted to rotate on a fixed support such as post **65**. Three label holding sections **58** are provided on the periphery of the turret with each label holding section including a flexible cushion **60** and two anvils **62**. Bell cranks **64** are pivotally mounted on pins **66** with the outer ends of the bell cranks to engage anvils **62**. Coil springs (not shown) are used to bias the bell cranks so that the clamp bars are **76**, **78** are pressed tightly against the anvils. Cam follows **68** and **70** are rotatably mounted on pins **72** on the other end of the bell cranks and are positioned to roll on the surface of adjustable cams **73** and **74**, respectively, which are mounted on post **65**. The support discs or plates are rotated in synchronism with the turntable **16** and as they rotate the cam rollers will roll around the periphery of cams **73** and **74** to move clamp bars **76** and **78** away from anvils **62**. The cams **73** and **74** can be adjusted by rotating them on post **65** to open the clamps either simultaneously or sequentially, depending on the type of label

being applied to the bottle. In FIG. 4, the clamps will be opened as the cam rollers roll up surfaces **73***a* and **74***a* and close from the rollers roll down surfaces **73***b* and **74***b*.

Two air discharge jets or tubes **80** are secured to plate **61** with one tube extending outward on each side of the cushion **60**. Air is supplied to the tubes **80** through an air tube **82** which has an outlet orifice **86** that is biased by spring **84** to ride on the surface of plate **61** in groove **85**. The inlet openings **87** to tubes **80** are located in groove **85** at a point where air will be supplied to the air discharge tubes **80** as the clamp bars **76, 78** open to release the wings or ends of the label. As the openings **87** move past outlet orifice **86**, a jet of air will be directed at the wings *y* and *z* of the label.

The label turrett **32** rotates in synchronism with the turntable **16** so that a flexible cushion **60** will be in a position to engage each bottle **15** that passes the label turret. A label will be picked up by the label clamps on the turret each time one of the sections **58** pass the glue cylinder. The center of the label will be aligned with the cushion **60** and the ends or wings *y* and *z* clamped against the anvil **62** by clamp bars **76** and **78**. The pressure of the cushion against the bottle will be sufficient to cause the center of the label to adhere to the bottle as the ends or wings are released. A jet of air from tubes **80** is initially used to blow the wings of the label along the sides of the bottle. The timing of the discharge of air from tubes **80** can be made to correspond to the opening and closing of the label clamps by locating opening **85** closer or farther away from each other.

Once the label has been released from the label cylinder, the bottle continues to move through the labeling machine where the pressing rollers will press the label tightly against the bottle. Referring to FIGS. 5 and 6, it will be noted that the center *x* of the label in position A is pointed radially outwardly. This is the position where the label is released from the label cylinder. The bottle will remain in this position as it is moved by the turntable **16** past the flexible pad **88**. This pad will wipe across the lead wing *y* pressing the wing *y* lightly against the bottle. The pallet **36** on which the bottle is carried is then rotated 90 degrees (clockwise in FIG. 5) by the cam action of groove **54** acting on cam roller **42**. The center *x* of the label will be turned in the direction of rotation of the turntable as seen at position B. The neck of the bottle passes through a pair of brushes **90** which press both wings *y* and *z* against the sides of the bottle. The bottle is again turned back (center clockwise in FIG. 5) to its original position by the counterrotation of the pallet **36** with center *x* again turned radially outward as at position C and the bottle is advanced past a flexible pressure roller **92** that rolls across wing *y* at the back of the bottle pressing the wing *y* firmly against the bottle. Brush **94** is positioned opposite the pressure roller **92** to wipe across the center of the label on the opposite side of the bottle. The bottle is finally again turned 90 degrees (clockwise in FIG. 5) with the center of the label *x* positioned forward as seen at positions D and E. Trailing wing *z* is pressed against the back of the bottle to an overlapping relation with wing *y* by a pair of pressure rollers **96** and **98**. This intermittent or alternate rotation of the pallet **36** will turn the neck of the bottle so that the wings of the label are wiped against the brushes **90, 94** and pressure rollers **92, 96** and **98**. The number of forward and backward or alternate rotations of the pallet **36** will depend to some extent on whether brushes or sponge rollers or both are used to wipe the label against the surface of the bottles. One such pressing system is described below.

Referring to FIG. 6 pressure rollers **96** and **98** are shown mounted on a linkage system that is designed to move these pressure rollers out of the path of motion of the bottles as the bottles move past the rollers and to cause the rollers to roll around the back of the bottle as they move to positions D and E. Roller **96** is secured to lever arm **100** which is pivotally mounted on a pin **102**.

Pressure roller **98** is secured to lever arm **104** which is pivotally mounted on pin **106**. Lever arms **100** and **104** are rigidly secured to connecting links **108** which are pivotally connected to link **110** so that the two lever arms **100** and **104** move in unison. A spring **112** is connected to one end of link **110** to bias the pressure rollers toward the bottles. The pressure rollers are moved away from the bottles by a cam arm **114** which is pivotally mounted on pin **106**. Link **118** is pivotally connected to the cam arm and to link **120** which is rigidly secured to lever arm **100**. Cam surface **122** on cam arm **114** is located in the path of travel of the bottles and as a bottle engages cam surface **122** the cam arm will be rotated counterclockwise about pin **106**. The rotation of the cam arm will force the pressure rollers away from the path of travel of the bottles. In FIG. 6 it will be noted that as the lead bottle moves past cam surface **122** spring **112** will force the rollers to roll around the back of the bottles and across the overlapped wings *y* and *z* of the label. This is important in order to assure that the label is firmly secured to the bottle. As the bottle leaves the cam surface, it moves to the outfeed star wheel which carries it to the outfeed conveyor where it is rolled past rollers **130**.

This type of pressing arrangement is particularly important for use with a label applying turret as described above. The labels which are carried by the turret will be wrapped around more than one half the circumference of the bottle. The wings or ends must be contacted by a pressure roller over their entire surface and the pressing arrangement described herein will accomplish this result while the bottles are being carried continuously by the turntable.

Although only one embodiment of the present invention has been shown and described, it should be apparent that various changes and modifications can be made herein without departing from the scope of the appended claims.

I claim:

1. A labeling machine for applying labels around the outside of a bottle, said machine comprising

a bottle conveyor having a rotatable pallet on which a bottle is mounted on the conveyor,

a label applier adjacent the conveyor to adhere the middle part of a label to a bottle on the conveyor,

pressing apparatus in the path of conveyor movement for wiping onto the bottle label wings which extend from said middle part, and

rotating means for rotating said pallet and the bottle thereon in opposite directions as the bottle moves past said pressing apparatus to wrap said label wings around the bottle.

2. The machine of claim **1** in which said bottle conveyor comprises a turntable, said rotating means comprising a fixed cam track adjacent the turntable, said pallet having a cam follower positioned to engage said cam track.

3. The machine of claim **1** in which the label applier comprises a rotary turret mounted adjacent the bottle conveyor, said turret having a peripherally exposed pad, label clamps at both sides of the pad to releasably retain a label on the pad and means for actuating said clamps in the course of transferring the label from the pad to the bottle.

4. The machine of claim **1** in which the means for actuating said clamps comprises a fixed cam, said label clamps having cam followers engaging said cam.

5. In a labeling machine for transferring labels from a label magazine to containers, said machine having a container conveyor, rotatable container supports on the conveyor, a rotary label applying turret adjacent the conveyor, said turret having a peripherally exposed pad and label clamps at both sides of the pad to releasably retain a label on the pad, means to rotate the turret in synchronism with the movement of the container conveyor to apply a middle part of the label to a container on the conveyor, means to actuate said clamps to thereafter re-

lease the label, label pressing apparatus adjacent the path of containers carried by the conveyor, means for oscillating said container supports first in one direction of rotation and then in the opposite direction of rotation to press wing portions of the label against the container as the containers move on said path.

6. The machine of claim 5 in which the rotary container supports comprise pallets and clamping caps between which the container is clamped, the means for oscillating said container supports comprising a grooved cam plate, said pallets having cam followers engaged in said groove.

7. The machine of claim 5 in which said label applying turret is further provided with two air jets, one for each label clamp and means for blowing air through said jets when the clamps release the label, thus to blow the label wings toward the container.

8. The machine of claim 5 in which the means to actuate said label clamps comprises bell cranks on corresponding ends of which the clamps are mounted, cam followers on the other corresponding ends of the bell cranks and cams against which said cam followers ride,

said cams being adjustable about the axis of turret rotation whereby the selectively adjust the clamps for simultaneous or sequential action.

9. The machine of claim 5 in which said pad is of flexible resilient material which exerts pressure on the label aginst the container.

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SAMUEL W. ENGLE, Primary Examiner

U.S. Cl. X.R.

156—481, 568

UNITED STATES PATENT OFFICE

CERTIFICATE OF CORRECTION

Patent No. 3,586,580 Dated June 22, 1971

Inventor(s) Karl Dullinger

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

In the first sentence of the Abstract of Disclosure, "thrust" should read----------turret----------

Column 2, Line 60, "are" between the words bar and 76 is not necessary

Column 2, Line 61, "Cam follows" should read---------Cam follower rollers----------

Column 3, Line 48, "center clockwise" should read-------- -------counter clockwise----------

Column 6, Line 2, "the" should read-------to----------

Column 6, Line 6, "aginst" should read------against-----

Signed and sealed this 15th day of February 1972.

(SEAL)
Attest:

EDWARD M.FLETCHER,JR.
Attesting Officer

ROBERT GOTTSCHALK
Commissioner of Patents

FORM PO-1050 (10-69)

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