March 19, 1974 D. R. GAMROTH 3,798,109

APPARATUS FOR APPLYING CUT LABELS TO OBJECTS

Filed April 17, 1972 7 Sheets-Sheet 1

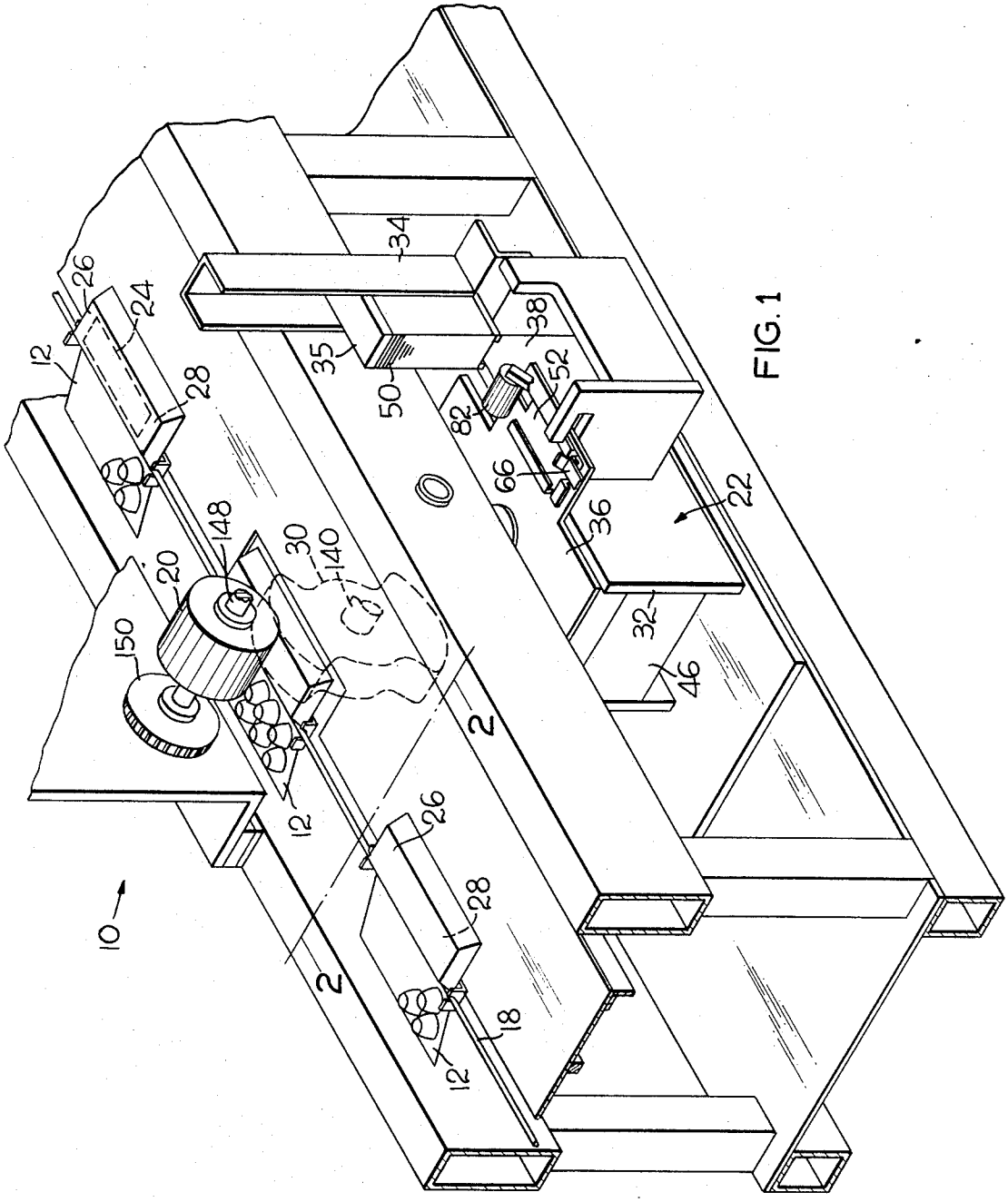


FIG. 1

APPARATUS FOR APPLYING CUT LABELS TO OBJECTS

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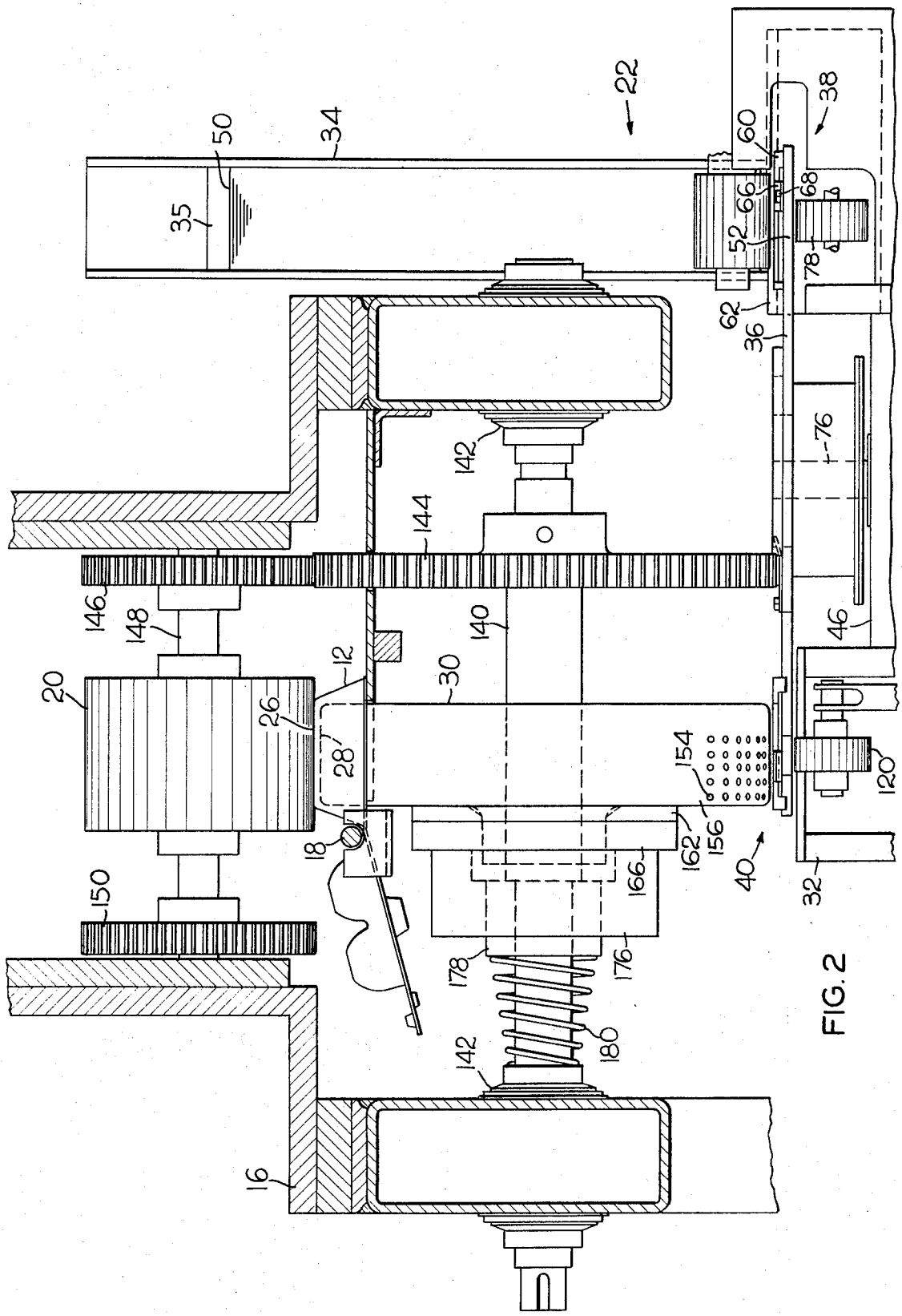


FIG. 2

APPARATUS FOR APPLYING CUT LABELS TO OBJECTS

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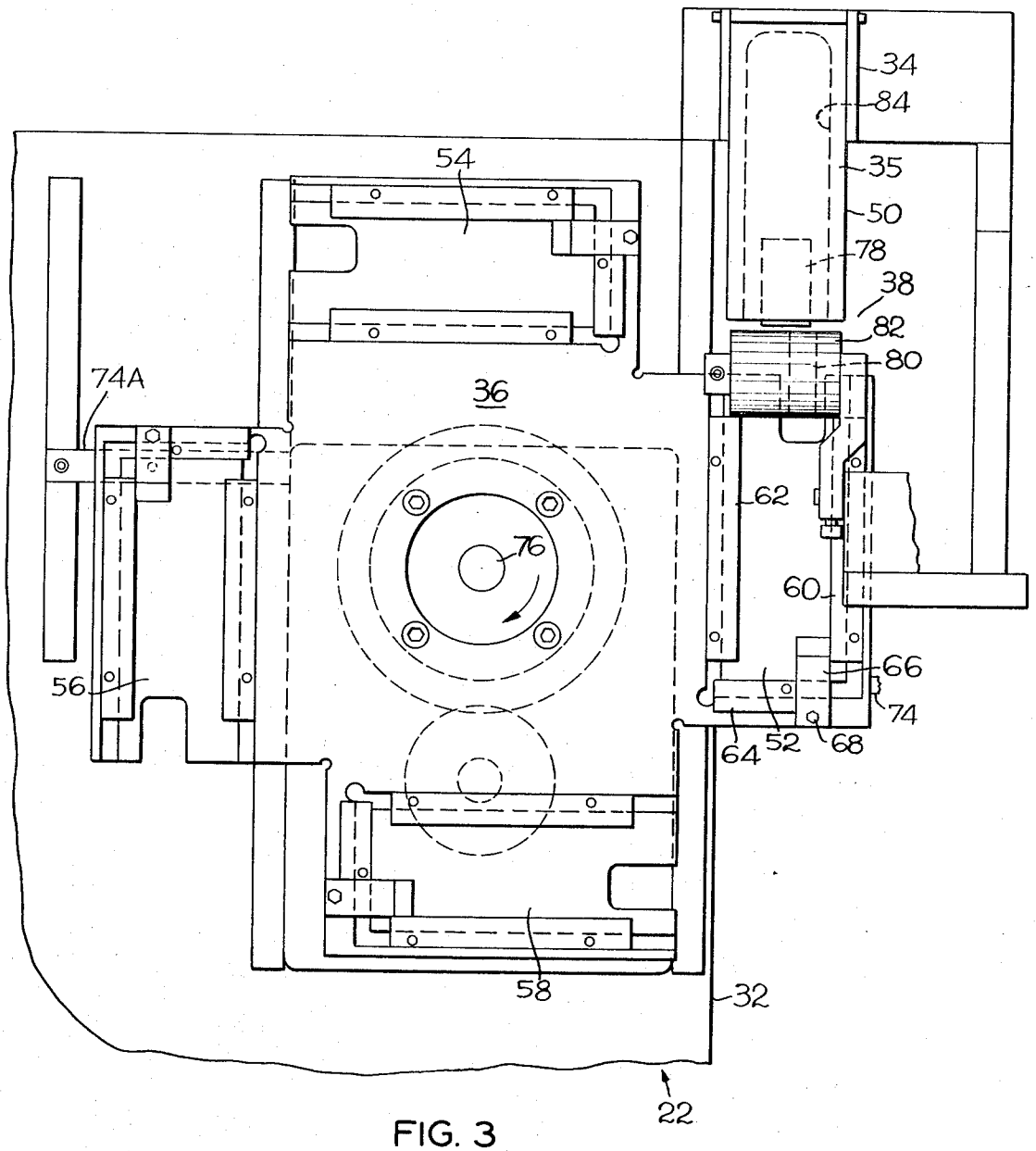


FIG. 3

APPARATUS FOR APPLYING CUT LABELS TO OBJECTS

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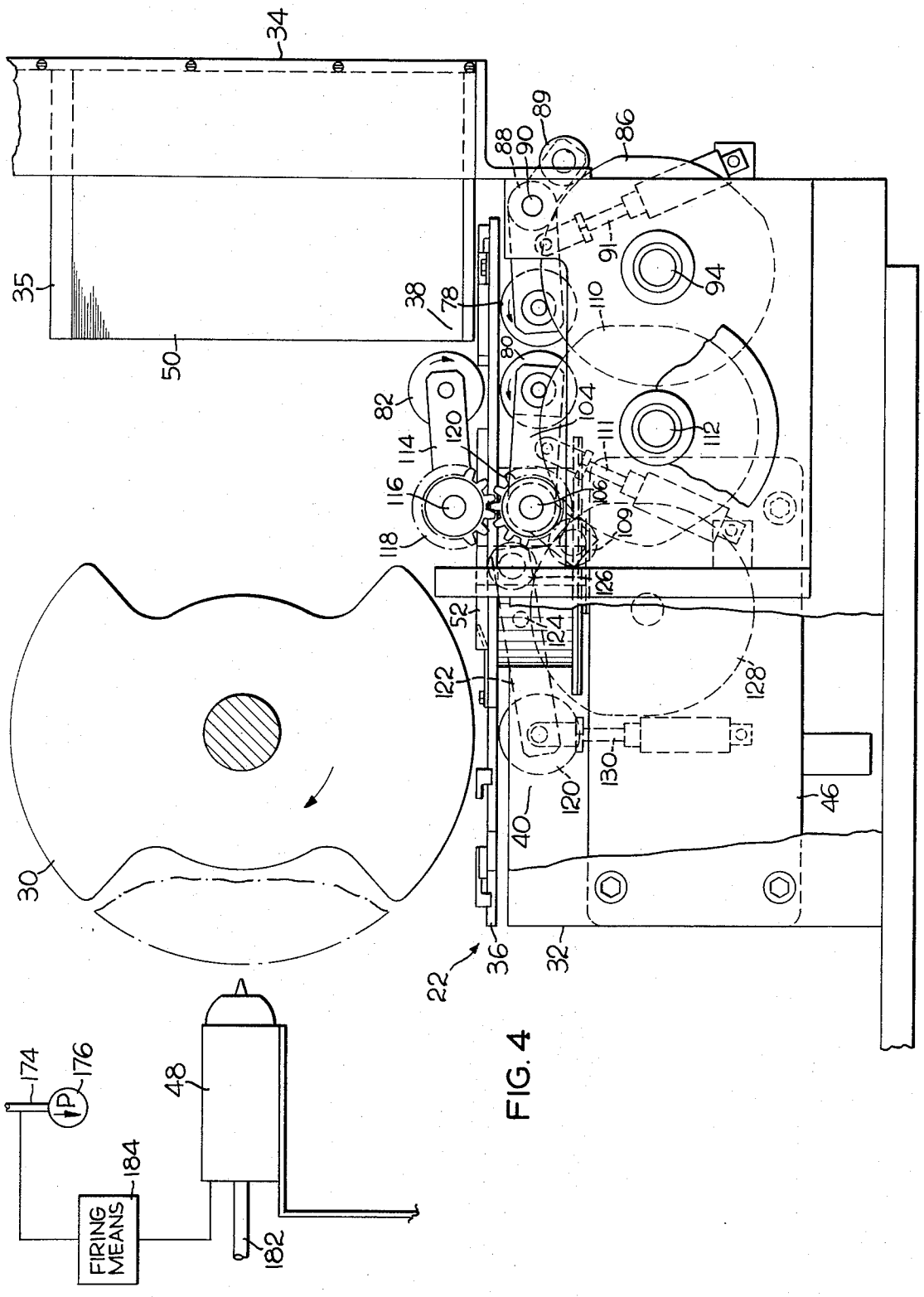


FIG. 4

APPARATUS FOR APPLYING CUT LABELS TO OBJECTS

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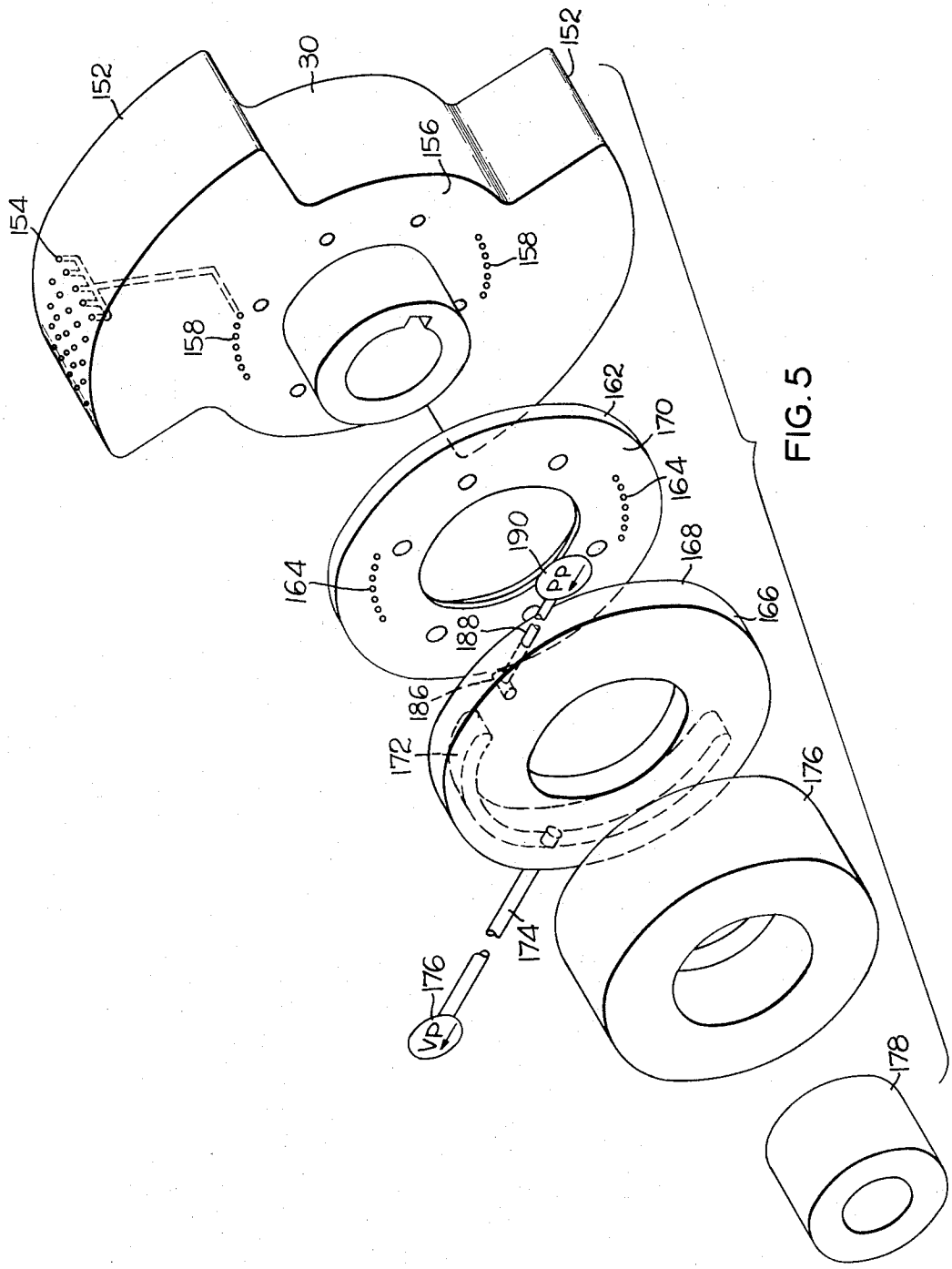


FIG. 5

APPARATUS FOR APPLYING CUT LABELS TO OBJECTS

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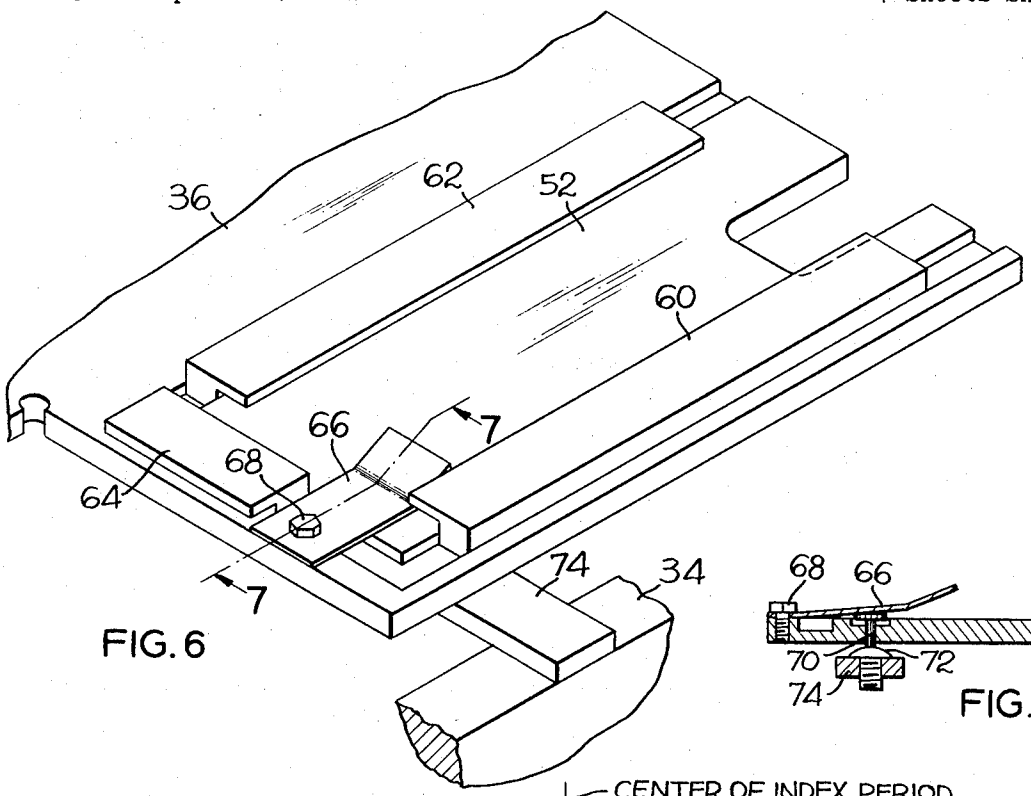


FIG. 6

FIG. 7

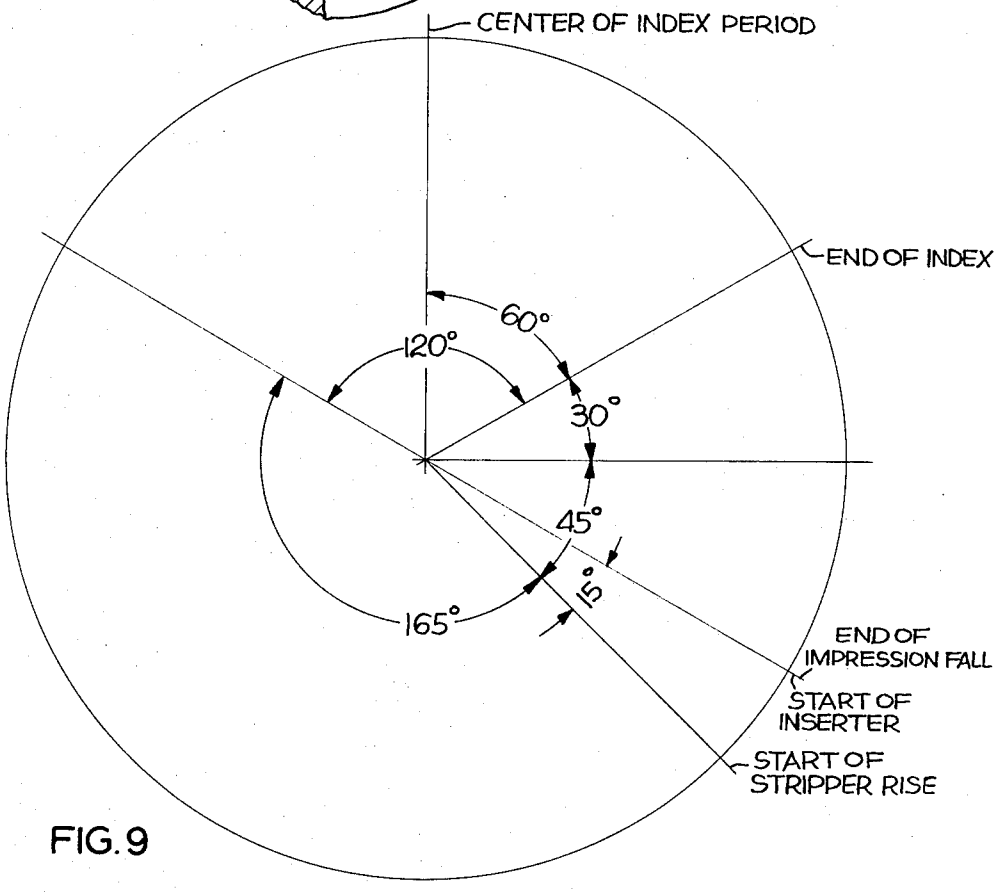


FIG. 9

APPARATUS FOR APPLYING CUT LABELS TO OBJECTS

Filed April 17, 1972 7 Sheets-Sheet 7

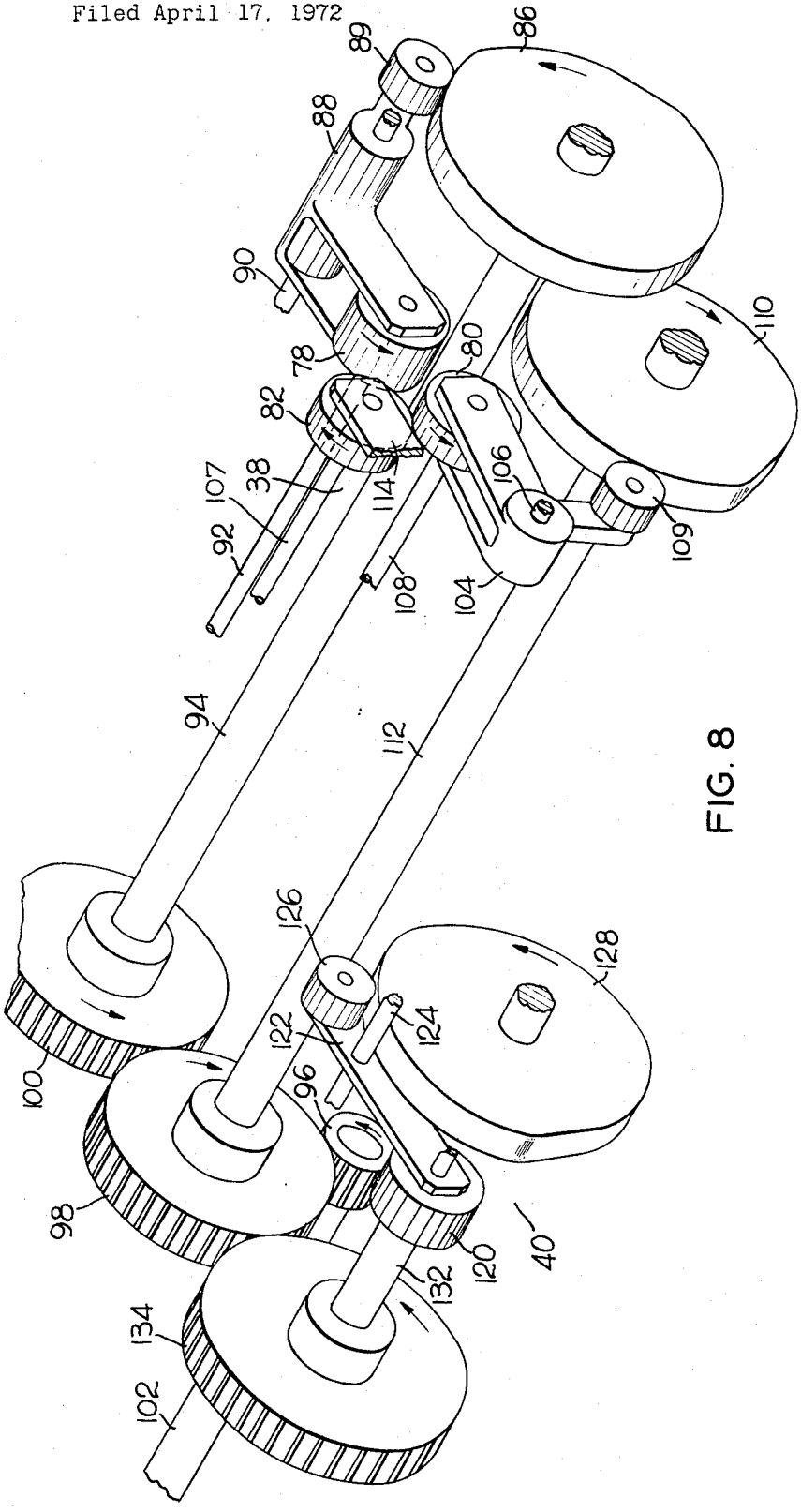


FIG. 8

United States Patent Office 3,798,109 Patented Mar. 19, 1974

3,798,109

APPARATUS FOR APPLYING CUT LABELS TO OBJECTS

Donald R. Gamroth, New Berlin, Wis., assignor to Condes Corporation, Milwaukee, Wis.

Filed Apr. 17, 1972, Ser. No. 244,406
Int. Cl. B65c 9/10
U.S. Cl. 156—568 11 Claims

ABSTRACT OF THE DISCLOSURE

Apparatus is shown for gluing cut labels to the inside under-surface of a container while printing is simultaneously being applied to an opposite outside upper surface by a printing roller. The apparatus comprises a vertical magazine containing a stack of cut labels; a rotating indexing table; stripper and insertion means for removing labels one-at-a-time from the magazine and for placing them on the table while the table is in one position; and impression roll means for removing a label from the table after the table has rotated to another position and for applying the label to the inside surface of the container. As the label is being moved by the impression roll, glue is automatically sprayed on a portion of the reverse side thereof.

BACKGROUND OF THE INVENTION

Field of use

This invention relates generally to apparatus or machinery for applying labels to objects such as containers. In particular, it relates to such apparatus for applying magazine-stored, cut labels to the inside surfaces of containers.

Description of the prior art

It is common practice for retailers to use containers or cartons which carry printed product information on the outside and have looseleaf items, such as instruction sheets, coupons or the like, inserted in the container along with the product. Normally, the product information on the outside takes the form of printing or labeling which is applied to the carton during or after final stages of manufacture of the carton. The loose-leaf information was normally inserted by hand by the retailer's personnel engaged in packaging the product in the carton. While such an arrangement permitted maximum flexibility as regards to type of loose-leaf information that could be inserted, the procedure of hand-stuffing was time consuming, tedious and costly.

The prior art discloses a wide variety of apparatus or machinery for applying cut-stock or roll-stock labels, of both the glue and pressure-sensitive type, to objects or articles such as containers as the objects are moved along a path by a conveyor. However, most prior art apparatus is designed to apply labels to the exterior of the articles and to do so as a separate processing operation. While such prior art labelling apparatus is satisfactory for its intended use, it is not suited for the application of labels while other processes, such as printing or labeling, are being carried out simultaneously on another portion of the container.

For example, certain types of egg cartons are fabricated of relatively fragile foam-stype plastic and have an integrally-formed body and hinged cover. Prior to delivery to a specific retailer, these cartons are passed through a printing machine which applies printed information to the outside surface of the cover by means of a printing roll. It is desirable, because of trade practices, to be able to affix labels, coupons, or the like to an inside surface of the container (usually inside the cover) and to carry out this operation simultaneously with application of printing

to the outside. It is also desirable, in some cases to attach the labels (whether single sheet or folded) by gluing in such a manner that they can be removed substantially intact by the customer. Unfortunately, the construction of the printing machine which applies the printed information to the carton, the manner in which the cartons are passed through the printing machine and the fragility of the cartons, precludes the use of existing labeling apparatus for this particular application. It is desirable, therefore, to provide improved labeling apparatus which overcomes these difficulties and has other advantages, as will hereinafter appear.

SUMMARY OF THE INVENTION

Apparatus in accordance with the present invention is particularly well-adapted for applying magazine-stored cut labels to an inside surface of objects, such as containers, which are moving along a path in another machine and being simultaneously subjected therein to another operation, such as application of printing to an outside surface by means of a printing roll.

In a preferred embodiment, apparatus in accordance with the invention comprises a magazine containing a stack of cut labels. Individual labels are removed from the bottom of the magazine by a cam-operated stripper roll which lifts to engage the bottom label in the magazine and transfers the label between the nip of a pair of cam-operated insertion rolls. The label is conveyed by the insertion rolls into one of four label recepticals on a horizontally rotatable index table, which indexes or rotates in 90 degree steps. Upon completion of two indexes the label receptical containing the label is positioned directly below the printing roll, for example, of the machine through which the containers are moving. In this position the label is raised by a cam-operated lifting roll and brought into contact with the periphery of a rotating impression roll which, through valving means therein, applies a vacuum to hold the label in position thereon. Rotation of the impression roll conveys the label from the index table to the inside surface of the container to which it is to be applied. During transfer of the label on the impression roll, a hot-melt adhesive gun extrudes a pattern of adhesive onto the label so that it will adhere to the container when brought into contact therewith. If for any reason, a label is missing or improperly positioned on the impression roll, vacuum responsive means are provided to prevent the adhesive gun from extruding adhesive directly onto the impression roll. When the label is in proper position with respect to the container, the vacuum holding the label on the impression roll is removed and positive air pressure assists in releasing the label from the impression roll and in drying or setting the hot glue so that the label sticks to the container.

Apparatus in accordance with the invention is adaptable for the application of labels to objects other than containers and also to objects which are not simultaneously being printed or otherwise treated on another surface. Furthermore, apparatus in accordance with the invention is adapted to apply labels which are pretreated with pressure-sensitive adhesive. Also, apparatus in accordance with the invention is adapted to apply labels at slow or high rates of speed (i.e. on the order of 200 or more labels per minute) and is especially well-suited for use with other processing machinery which imposes space and operating limitations that preclude the use of conventional labeling apparatus.

DRAWINGS

FIG. 1 is a perspective view of a printing machine combined with labeling apparatus in accordance with the invention;

FIG. 2 is an enlarged view taken on line 2—2 of FIG. 1 showing a container passing between the print roll of the printing machine and the impression roll of the labeling apparatus;

FIG. 3 is a top plan view of the labeling apparatus;

FIG. 4 is an elevation view of the right side of the labeling apparatus;

FIG. 5 is an exploded view of the impression roll of the apparatus;

FIG. 6 is an enlarged perspective view of a receptacle on the index table of the apparatus;

FIG. 7 is a view taken on line 7—7 of FIG. 6;

FIG. 8 is a perspective view of the cam and roller arrangement in the apparatus; and

FIG. 9 is a diagram showing the timing of the cams and rollers of the apparatus during one cycle of operation.

DESCRIPTION OF A PREFERRED EMBODIMENT

FIG. 1 shows a machine **10**, such as a printing machine, for performing an operation or process, such as a printing, on a series of objects such as a container **12** which are being moved along a path through the machine. Machine **10** generally comprises a frame **16**, conveyor means **18** for moving the containers, a printing roll **20** and is understood to comprise means to effect operation of the conveyor and the printing roll at some predetermined, preferably adjustable rate of speed. Labeling apparatus **22** in accordance with the invention is mounted on frame **16** of machine **10** beneath conveyor means **18** and printing roll **20** and is adapted to apply a label **24** on each container **12**. As FIGS. 1 and 2 show, container **12** takes the form of an egg carton having an integrally formed cover and printing is applied to the outside surface **26** of the cover by printing roll **20** while label **24** is simultaneously applied to the inside surface **28** of the cover by an impression roll **30** which is part of labeling apparatus **22**.

As FIGS 1, 2, 3 and 4 show, labeling apparatus **22** generally comprises a framework or supporting structure **32** on which a label magazine **34**, a rotatable indexing table **36**, label stripping and insertion means **38**, and label transferring means **40** are mounted. Framework **32** also understood to support an electric motor and a power transmission unit driven thereby (not shown) which drives a gear box drive **46** for indexing table **36**, and suitable gearing and cams hereinafter more particularly described.

As FIG. 4 shows, an adhesive application means **48**, such as a hot glue gun, is disposed adjacent the impression roll **30**. Means **38** and **40**, gear box drive **46** for index table **36** and impression roll **30**, as explained, are supplied with operating power or are driven by an electric motor through a power transmission unit (not shown).

In operation, the label stripping and insertion means **38** remove a label from the bottom of a stack **50** of labels in magazine **34** and insert it into a first label receptacle **52** on table **36**, which is shown in detail in FIG. 6. Table **36** then rotates one step (90° clockwise with respect to FIG. 3) and another label is inserted in the second receptacle **54**. The table then rotates another step, and while a third label is being inserted in the third receptacle **56**, the label transferring means **49** and impression roll **30** remove the first label from first receptacle **52** and apply it to a container **12**. During transfer of the label, adhesive application means **48** applies adhesive to a predetermined zone on the back of the label.

As FIGS. 1, 2, 3 and 4 show, label magazine **34** is located exteriorly of printing machine **10** so as to be accessible for manual loading. A weight **35** such as a flat metal plate is disposed therein to maintain downward feed pressure on the stack of labels **50**.

As FIG. 3 best shows, table **36** comprises four identical label receptacles **52**, **54**, **56** and **58**, one on each side thereof.

As FIG. 6 shows, receptacle **52**, which is typical of the other three receptacles, comprises a pair of longitudinally slotted sides or guides **60** and **62** and an end stop **64** and is open at its forward end, i.e., the end which is presented to magazine **34**. Receptacle **52** is provided with releasable label trap means in the form of a spring-steel tab **66** which is secured to table **36** by a bolt or screw **68** and is normally biased against the table surface (or a label in the receptacle) but which, as FIG. 7 shows, can be biased upwardly to released position by a movable pin **70** when the latter engages an abutment **72** brackets **74** or **74A** on framework **32** when receptacle is presented to magazine **34** or to impression roll **30**. The receptacles and their associates trap means prevent the labels from being flung from table **36** as it rotates and also ensure correct positioning of the labels when they are presented to the label transferring means **40**.

Table **36** is rotatable in 90° steps or increments (clockwise with respect to FIG. 3) by means of table drive mechanism **46**. Drive mechanism **46** comprises an output shaft **76** (FIGS. 2 and 3) to which table **36** is rigidly secured. As will hereinafter be explained, table movement is synchronized with operations of the label stripping and insertion means **36** and the label transfer means **40** so that during one complete (360°) revolution of table **36**, four label insertions and four label removal operations are carried out sequentially.

Referring to FIGS. 1, 2, 3, 4 and 8, label stripping and insertion means **38** comprises a stripping roll **78**, an insertion roll **80**, and driven roll **82** for cooperation with the stripping roll. Stripping roll **78** and insertion roll **80** rotate or are driven in the counterclockwise direction with respect to FIGS. 4 and 8 and driven roll **82** rotates in the opposite direction.

As FIGS. 4 and 8 show, stripping roll **78** is disposed directly below a slot or opening **84** in the bottom of magazine **34** (FIG. 3) and is movable upwardly by means of a stripping roll cam **86** into frictional engagement with the bottom label in the magazine to effect removal of the label by sliding it forward through the open front of the magazine. Stripping roll **78** is mounted for rotation on a cam follower member **88** which is pivotably mounted on a shaft **90** rigidly secured to framework **32**. Cam follower member **88** comprises a cam follower roll **89** which engages a stripping roll cam **86**. As FIG. 4 shows, biasing means in the form of an air operated ram **91** are connected between cam follower member **88** and frame **32** to maintain roll **89** in constant tracking engagement with cam **86**. Stripping roll **78** is driven by a universal drive shaft **92** which is understood to be connected to the power transmission unit (not shown). Stripping roll **78** is cam operated to move into and out of engagement with the bottom of the stack of labels **50** in magazine **34** by stripping roll cam **86**. Cam **86** is secured on a shaft **94** which is journalled for rotation on framework **32**. Shaft **94** is driven through a gear train comprising gears **96**, **98** and **100**. Gear **96** is connected to a drive shaft **102** which is understood to be connected to the power transmission unit (not shown).

Insertion roll **80** is disposed adjacent the stripping roll and just below the receiving end of a label receptacle when the latter is in label-receiving position. Driven roll **82** is disposed adjacent and above insertion roll **80** and moves into and out of engagement therewith to form an intermittent nip which takes a label brought forward from magazine **34** by stripping roll **78** and transfers it into a receptacle. Insertion roll **80** is mounted for rotation on a cam follower member **104** which is pivotably mounted on a shaft **106** which is rigidly secured to framework **32**. The rolls **80** and **82** are driven by universal drive shafts **108** and **107** which are connected to the power transmission unit (not shown). Cam follower member **104** of insertion roll **80** is cam operated to oscillate or move into and out of engagement with idler roll **32** by an insertion roll cam **110**. Cam follower member **104**

comprises a cam follower roll **109** which engages insertion roll cam **110**. As FIG. 4 shows, biasing means in the form of an air operated ram **111** are connected between cam follower member **104** and frame **32** to maintain roll **109** in constant tracking engagement with cam **110**. Cam **110** is secured on a shaft **112** which is journaled for rotation on framework **32**. Shaft **112** is driven through a gear train comprising gears **98** and **96**. As FIG. 4 shows, roll **82**, which is a driven roll, is mounted for rotation on one end of an idler roll arm **114**. The other end of idler roll arm **114** is secured to a shaft **116** which journaled for rotation on framework **32** and driven by a gear **118** secured thereon. Gear **118** meshes with a driven gear **120** which is adapted to rotate or oscillate in forward and reverse directions so as to effect rising and falling motion of roll arm **114** and roll **82** thereon in synchronism with oscillatory movement of insertion roll **80** effected by insertion roll cam **110**.

Referring to FIGS. 2, 4 and 8, the means **40** for removing a label from a receptacle and for applying it to a container **12** comprise impression roll **30** and a lift roll **120** for cooperation therewith. Lift roll **120**, which is not a driven roll, is disposed directly below impression roll **30** and below the slot in the receptacle when the latter is in label removal position. Lift roll **120** is mounted for rotation on a lift roll cam follower member **122** which is pivotably mounted on a shaft **124** on frame **32**. Cam follower **122** comprises a cam follower roll **126** which is engaged by a lift roll cam **128**. As FIG. 4 shows, biasing means in the form of an air operated ram **130** are connected between cam follower member **122** and frame **32** to maintain roll **126** in constant tracking engagement with cam **128**. Lift roll **120** is movable upwardly be means of lift roll cam **128** against a label in a receptacle to move the label into contact with the peripheral surface of impression roll **30** where is then held by vacuum. Lift roll cam **128** it mounted on a shaft **132** and is driven through a gear train comprising gears **124**, **98** and **96**.

Referring to FIGS. 2 and 5, impression roll **30** is rigidly mounted on a shaft **140** which is journaled for rotation in bearings **142** on framework **16** and driven (counterclockwise with respect to FIG. 6) by a gear **144** rigidly mounted on shaft **140**. Gear **144** is in constant mesh with a gear **146** which is rigidly mounted on a shaft **148** on which printing roll **20** is mounted. Shaft **148** and shaft **140** are driven in synchronism by a drive gear **150** on shaft **148**.

A vacuum system is provided to hold each label on the periphery of impression roll **30** as it is being transported from a label receptacle on index table **36** to a container **12** to which it is applied. As FIG. 5 shows, impression roll **30** has two spaced apart peripheral surfaces **152** with a plurality of circumferentially arranged holes **154** in each surface **152**. Impression roll **30** also has a side surface **156** with a plurality or radially arranged holes **158** arranged in two sets therein. Each side hole **158** is in communication with a row of holes **154** through a passageway such as **160** in roll **30**, as shown in FIG. 5. A bearing plate **162**, having holes **164** aligned with and corresponding to holes **158**, is secured to side **156** of impression roll **30**. The holes **154** and **158** and passages **158** are part of a vacuum means or system for maintaining labels on the impression roll. The vacuum means further comprises a stationary valve member or plate **166** which is stationarily mounted on shaft **140**. A side surface **168** of plate **166** lies adjacent a side surface **170** of bearing plate **162**. Side surface **168** of valve member or plate **166** has a semi-circular chamber **172** formed therein which is adapted to communicate in progression with the holes **164** in side surface **170** of bearing plate **162** as impression roll **30** rotates. Chamber **172** is connected to a vacuum line **174**. The vacuum means or system further comprises a vacuum pump **176** connected to line **174** to maintain a pressure less than atmospheric in chamber **172**. A first collar **176** bears against plate **166** and a second collar **178** is biased against collar **176** by a spring **180** to maintain a vacuum seal in chamber **172**.

Adhesive application means, such as glue gun **48**, are provided for applying a pattern of adhesive, such as hot glue, to a predetermined zone on a label as it is transported by impression roll **30**. Glue gun **48** is stationarily mounted closely adjacent the peripheral surface of impression roll **30** and is connected to a source of glue by a supply line **182**. Means **184** are provided to effect periodic firing or operation of gun **48** in synchronism with rotation of impression roll **30** and once for each label at an appropriate region thereon. The means **184** to effect operation of gun **48** are connected to vacuum line **174** and are responsive to pressure imbalance in the vacuum system for impression roll **30** caused by a missing or improperly applied label and prevent gun **48** from firing on extruding glue when such a condition is sensed. In this manner, undesirable application of glue directly to impression roll **30** is prevented.

It is to be understood that impression roll **30** can be used to apply cut labels which are already provided with o pressure-sensitive adhesive which is brought into play when the label is pressed against an object to be labeled by impression roll. If such labels are used, it is unnecessary to employ the adhesive application gun **48** and its associated components.

As FIG. 5 further shows, a positive air pressure system is provided to effect release of each label on the periphery of impression roll **30** as it is being applied to container **12**. The positive air pressure system comprises a pressure port **186** in stationary valve member plate **166** which is spaced about 15° from the upper end of chamber **172**. Pressure port **186** is connected by a pressure line **188** to a pressure pump **190**. Pressure port **186** communicates in progression with the holes **164** in side surface **170** of bearing plate **162** as impression roll **30** rotates beyond the point where it is desirable to maintain a vacuum at the holes **154**. More specifically, while a vacuum at ports **154** on roll **30** is desirable while a label is being transported by roll **30**, it is desirable to substitute pressure for the vacuum when the label is in gluing position with respect to a container so that the label is positively removed from roll **30** and more easily glued to the container. Application of pressurized air at the ports **154** also causes some cooling of the label and assists in drying or setting the hot glue at the same time that the label is being applied to the container.

OPERATION

Assume that the cartons **12** are being moved along path through printing machine **10** by conveyor means **18** and that printing roll **20** is applying printing to the outside surface **26** of the carton covers. Also assume that a stack of labels **50** have been loaded in magazine **34** and that labeling apparatus **22** is in operation and that the following components are functioning: stripper roll **78** and its stripper cam **86**; insertion rolls **80** and **82** and insertion cam **110**; lifting roll cam **128** and impression roll **30**; and index table **36**.

During the course of one cycle of operation the following action occurs. Stripper cam **86** rotates to lift stripper roll **78** so that the latter engages the bottom label in the stack **50** in magazine **34** and conveys this first label toward the insertion roll **80** and driven roll **82**. As this occurs, the gears **118** and **120** and insertion cam **110** cause insertion roll **80** and driven roll **82** to come together in a raised position and form a nip which grips the first label. The first label is then conveyed between the nip of insertion roll **80** and driven roll **82** into label receptacle **52** on index table **36** which is in the first or label receiving position. It is to be noted that when receptacle **52** is in first position, abutment member **72** on bracket **74** beneath index table **36** causes movable member **70** and tab device **66** to be cammed upwardly so that the first label can be inserted between the gripping device and the upper surface of

receptacle 52. After the first label is clear of stripper roll 78, stripper cam 86 causes stripper roll 78 to move downwardly in readiness for its next stripping operation. Similarly, when the first label is inserted in receptacle 52 and clear of insertion roll 80 and driven roll 72, the two latter rolls separate.

With the first label in receptable 52 and the rolls 78, 80 and 82 retracted, index table 36 indexes or moves 90° (clockwise with respect to FIG. 3) and the above-described operations are repeated to place a second label in the next receptacle 54 which has moved into first position. After completion of this second label insertion, table 36 again indexes or moves clockwise 90° to move receptacle 52 containing the first label into a position directly below impression roll 30 and to move receptacle 56 into first position. Abutment member 72 on bracket 74A beneath receptacle 52 cams tab device 66 upwardly to release the first label.

Lifter roll cam 128 then causes lifter roll 120 to lift the first label from receptacle 52 and place it into contact with the periphery 152 om impression roll 30 which is rotating (clockwise) with respect to FIG. 4). The vacuum condition at the holes 154 in the periphery 152 of impression roll 30 holds the first label on the impression roll as the latter rotates to convey the label from receptacle 52 on index table 36 to the inside surface 28 of the cover of carton 12. As hereinbefore explained, the rows of holes 154 in impression roll 30 are depressurized in succession or progressively so as to maintain a consistent low pressure condition in the vacuum system. It is to be noted that lifter roll cam 128 moves lifter roll 120 upwardly in synchronism with upward movement of stripper roll 78 and that index table 36 is stationary during such upward movement. Lifter roll cam 128, however, effects downward movement of lifter roll 120 only after insertion roll 80 and idler roll 82 move apart. FIGURE 9 schematically shows the relative positions of various components during the course of one cycle of operation.

During transfer of the first label by impression roll 30, glue gun 48 extrudes or applies a pattern of adhesive onto a desired portion of the label so that the label adheres to a carton 12 when brought into contact therewith. It is to be noted that rotation of impression roll 30 is synchronized with that of printing roll 20 of printing machine 10 so that the printing and the label are applied simultaneously to directly opposite surfaces. In this manner each roll 20 and 30 serves as a back-up or support for the action of the other.

If for any reason, a label is missing from or improperly carried on impression roll 30, the pressure responsive element in firing means 184 senses an abnormal pressure condition or pressure imbalance in vacuum line 174 and operates to prevent glue gun 48 from firing to apply adhesive and, consequently, adhesive is not accidentally applied directly to impression roll 30.

When the first label is transferred by impression roll 30 to gluing position on carton 12, pressure port 186 (supplied with pressurized air from pressure pump 190) successively relieves the vacuum condition in the holes 154 in the periphery 152 of impression roll 30 and not only allows the label to be mode easily release from roll 30 but actually assists in such release. Furthermore, the pressurized air cools the label and the hot glue thereon as the label is being pressed against carton 12 to ensure that it is firmly applied.

It is to be understood that after each indexing or step of movement of index table 36, an empty label receptacle is presented to magazine 34 for insertion of a label and a full label receptacle is presented to impression roll 30. The speed of operation of labeling apparatus 22 is adjustable from very slow speed to high speeds on the order of 200 or more labeling operations per minute. Of course, speed of operation of the labeling apparatus must be synchronized with the speed of operation of printing machine 10 when used in conjunction therewith.

It is to be understood that apparatus in accordance with the invention is adaptable for the application of labels to objects other than containers and also to objects which are not simultaneously being printed or otherwise treated on another surface. Furthermore, the apparatus is adapted to apply labels which are pretreated with pressure-sensitive adhesive and in which case glue gun 48 would not be employed. Also, the apparatus could be used with processing machinery other than printing machinery which imposes space and operating limitations that preclude the use of conventional labeling apparatus.

RÉSUMÉ

Labels are manually loaded into the magazine 34 of the labeling apparatus 22. Roll 78 controlled by cam 86 lifts to engage the bottom label in the magazine and conveys label to rolls 80 and 82 which are controlled by cam 110 and gears 116 and 120. The label is conveyed between the nip of the rolls 80 and 82 into a label receptacle such as 52 on the index table 36. Rolls 78, 80 and 82 are retracted by cams 86 and 110 and this allows the index table to rotate 90°. The above operations are repeated each time the table indexes. Upon completion of the second index the first label is now positioned immediately below impression roll 30. Roll 120 is cammed controlled by cam 128 to lift the label to contact impression roll 30 which, through valving means associated within roll 30, applies vacuum to hold the label in position on impression roll 30. Rotation of impression roll 30 conveys the label from the index table 36 to the inside surface 28 of the lid of a carton 12. While the label is on impression roll 30, a hot melt adhesive gun 48 extrudes a pattern of adhesive onto the label so that it can be attached to the inside of the lid of the carton by the adhesive. It for any reason a label is missing or improperly positioned on impression roll 30, vacuum unbalance sensing means prevent adhesive gun 48 from firing to thus prevent adhesive from being directly applied to the impression roll. When the label is being applied to carton 12, the vacuum is relieved and positive pressure is applied to assist in removal of the label from roll 30 and to effect cooling of hot glue on the label to ensure good adhesion.

I claim:

1. Apparatus for applying cut labels to objects moving along a path comprising:

a magazine containing a stack of cut labels;

a rotatable index table;

first means comprising a stripper roll for removing a label from said magazine and further comprising insertion roll means including a pair of separable insertion rolls for placing said label on said table;

means for rotating said table to move a label thereon to a predetermined position with respect to said path; and

second means including a rotatable impression roll and a lifting roll cooperable with said impression roll for removing a label from said table at said predetermined position and for applying said label to said object, said stripper roll, said insertion rolls and said lifting roll being cam operated and having their movement coordinated with rotation of said index table.

2. Apparatus according to claim 1 wherein said index table is stationary when said stripper roll and said insertion rolls are placing a label on said table and when said impression roll and said lifting roll are removing a label from said table.

3. Apparatus for applying cut labels to objects moving along a path comprising:

a magazine containing a stack of cut labels;

a rotatable index table rotatable in steps to a plurality of positions;

at least one label holding means on said table, including a receptacle, and a releasable member biased to hold said label in said receptacle,

first means for removing a label from said magazine and placing it in said receptacle on said table when said table is in one position;

means for rotating said table from said one position to another position to move a label thereon to another position;

means including a second member for moving said releasable member to a released position for effecting release of said member when said table is moved to said other position, and

second means including an impression roll for removing a label form said receptacle on said table at said other position and for applying said label to said object.

4. Apparatus for applying cut labels to objects moving along a path comprising:

a magazine containing a stack of cut labels;

a table;

first means for removing a label from said magazine and placing it on said table;

and second means comprising an impression roll for removing a label from said table and for applying it to said object and further comprising vacuum means for maintaining said label on said impression roll during transport, said impression roll having a peripheral surface with a plurality of circumferentially arranged holes therein and also having a side surface with a plurality of radially arranged holes therein, each hole on said peripheral surface being in communication with at least one hole on said side surface,

said vacuum means further comprising a valve member relatively movable with respect to said impression roll and having a side surface adjacent said one side surface of said impression roll, said side surface on said valve member having a chamber formed therein adapted to communicate in progression with said holes in said side surface of said impression roll as said impression roll and valve member move with respect to each other; and wherein said vacuum means further comprise means to maintain a pressure less than atomspheric in said chamber.

5. Apparatus according according to claim **4** including adhesive applying means for applying adhesive to said label during transport by said impression roll, and means to prevent operation of said adhesive applying means in the event said vacuum means senses that a label is improperly disposed on said impression roll.

6. Apparatus according to claim **4** including pressurization means for releasing said label from said impression roll when said label is in position to be applied to said object.

7. Apparatus according to claim **6** wherein said pressurization means comprises a pressure port in said side surface of said valve member spaced from said chamber and adapted to communicate in progression with said holes in said side surface of said impression roll, and wherein said pressurization means further comprises means to maintain pressure greater than atmospheric at said pressure port.

8. In combination:

conveying means for conveying objects along a path;

means, including a treatment roll, for applying a treatment to one surface of said objects at a predetermined location on said path;

and labeling apparatus for simultaneously applying labels to another surface of said objects at said predetermined location on said path simultaneously with said treatment comprising:

a magazine containing a stack of cut labels disposed alongside said conveying means;

a movable index table;

first means for removing a label from said magazine and placing it on said table;

means for moving said table to move said label to a position aligned with said predetremined location on said path;

and second means including an impression roll for removing said label from its aligned position and for applying said label to an object,

said impression roll cooperating with said treatment roll to maintain said object while said treatment and labeling simultaneously occur.

9. A combination according to claim **8** wherein said treatment is printing and said treatment roll is a printing roll.

10. A combination according to claim **9** wherein said object is a container and said one surface thereof is an outside surface and said other surface thereof is an opposite inside surface.

11. A combination according to claim **10** including ahesive aplying means for applying adhesive to said label while the latter is being transported by said impression roll.

References Cited

UNITED STATES PATENTS

3,450,586	6/1969	Caulford et al.	156—568 X
3,524,788	8/1970	Whitecar	156—568 X
3,591,168	7/1971	Zodrow	156—568 X

EDWARD G. WHITBY, Primary Examiner

U.S. Cl. X.R.

156—385, Dig. 8.28, Dig. 8.30, Dig. 8.31, Dig. 8.35, Dig. 8.39