

March 30, 1943.

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2,315,349

LABEL WIPING MECHANISM

Filed June 17, 1941

4 Sheets-Sheet 1

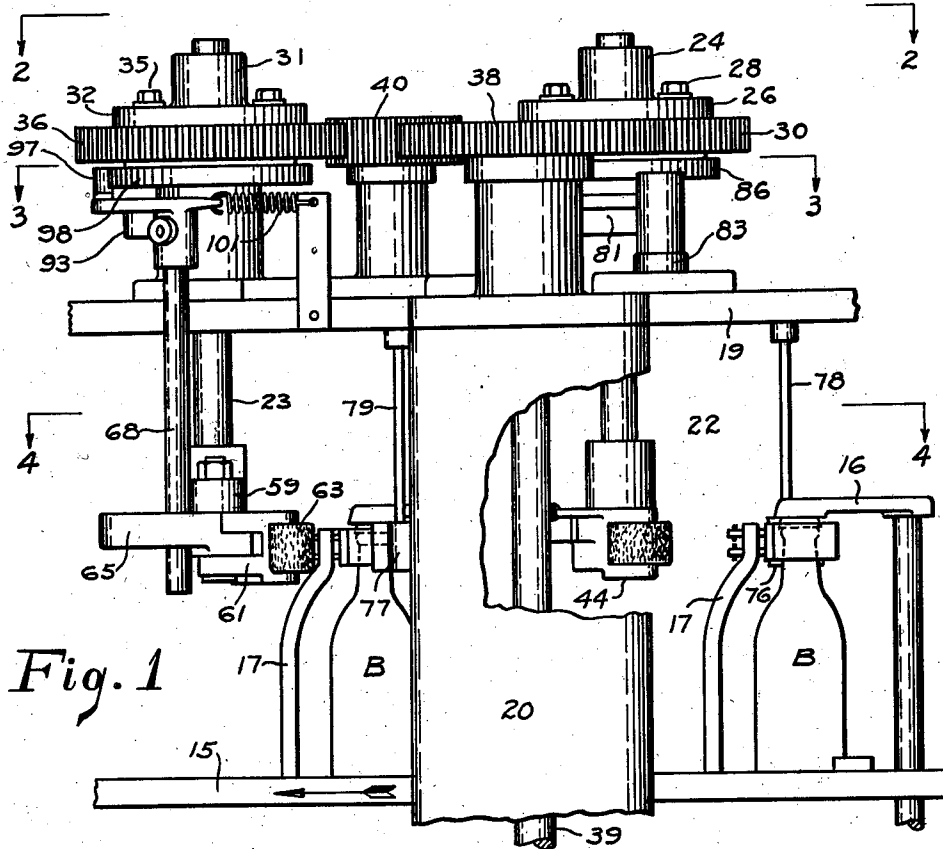


Fig. 1

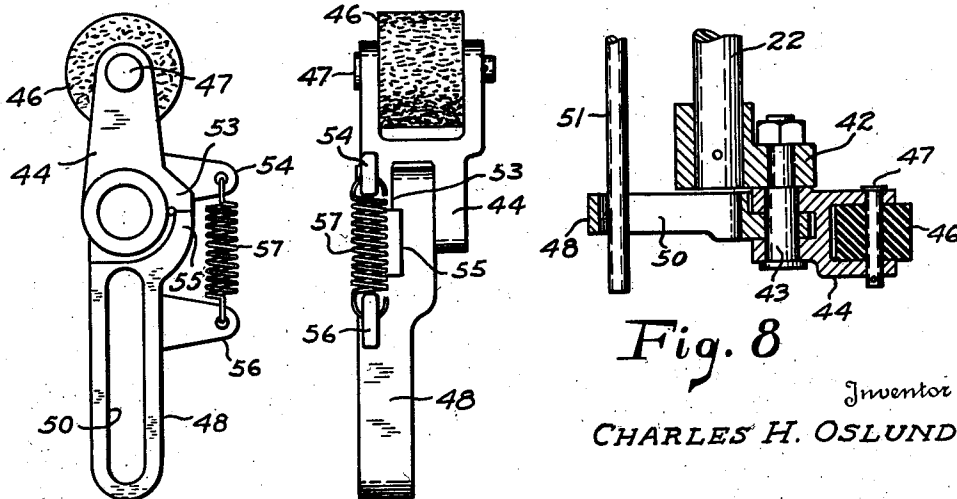


Fig. 8

Fig. 9

Fig. 10

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4 Sheets-Sheet 2

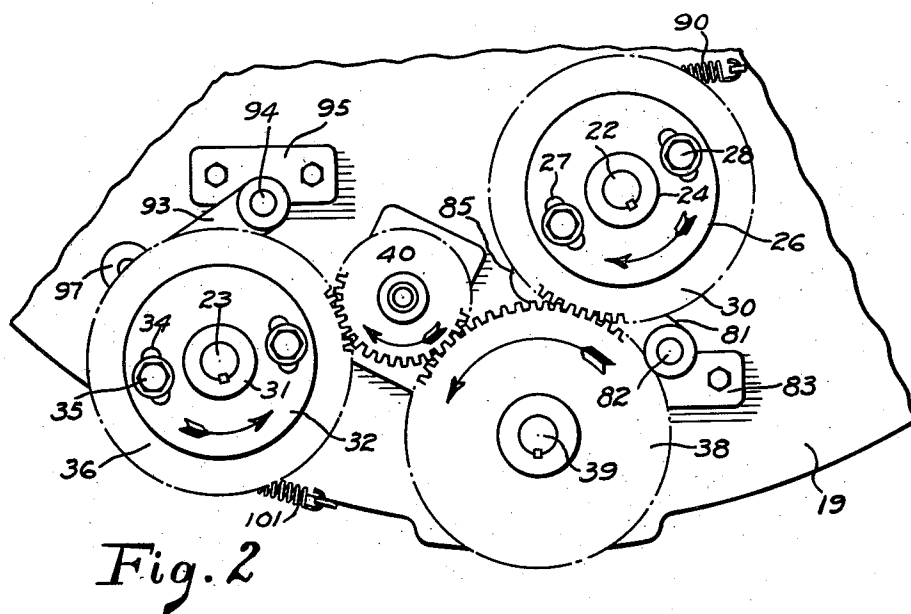


Fig. 2

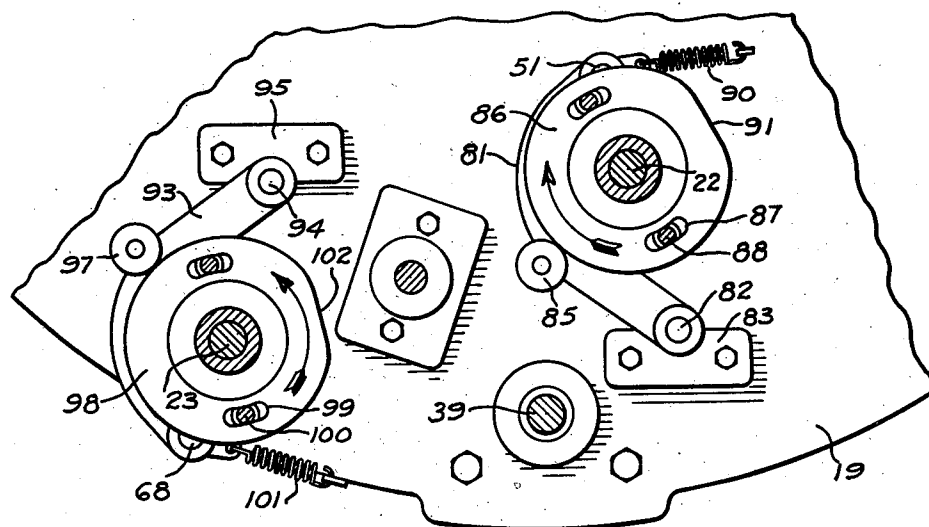


Fig. 3

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4 Sheets-Sheet 3

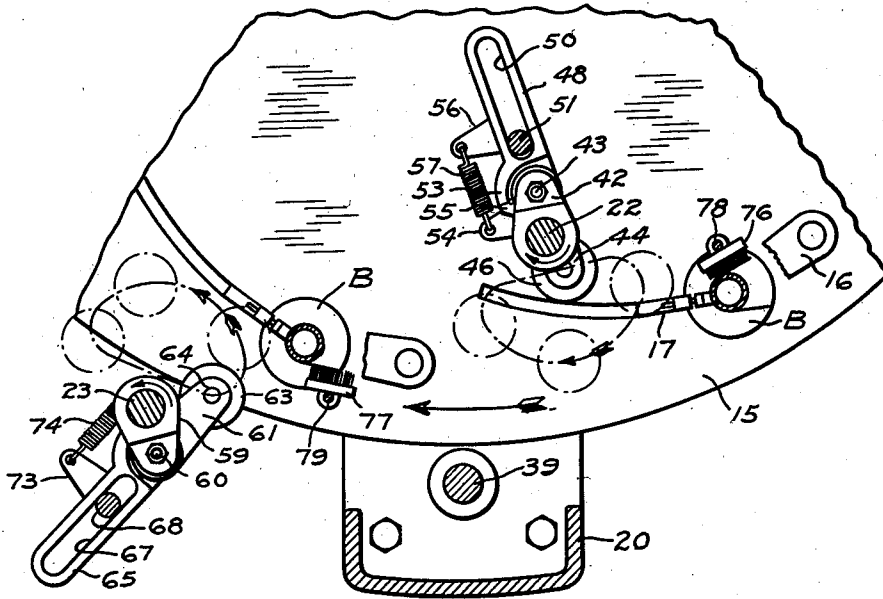


Fig. 4

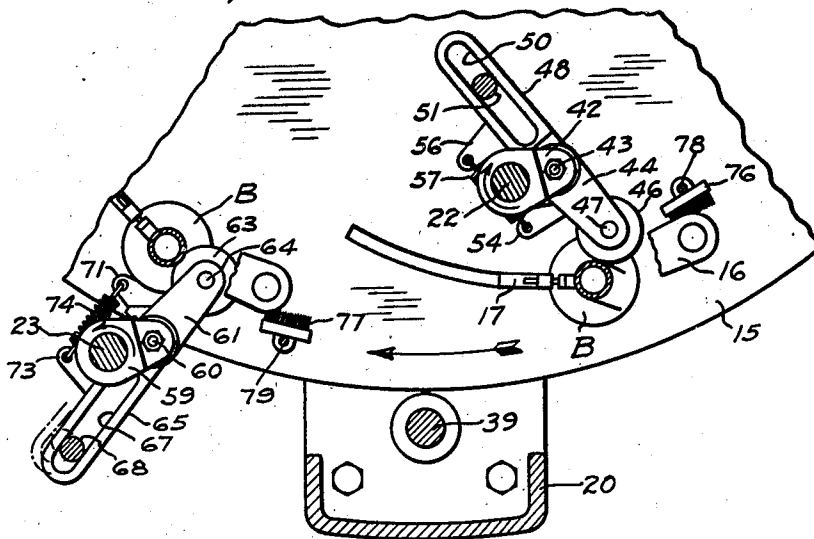


Fig. 5

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4 Sheets-Sheet 4

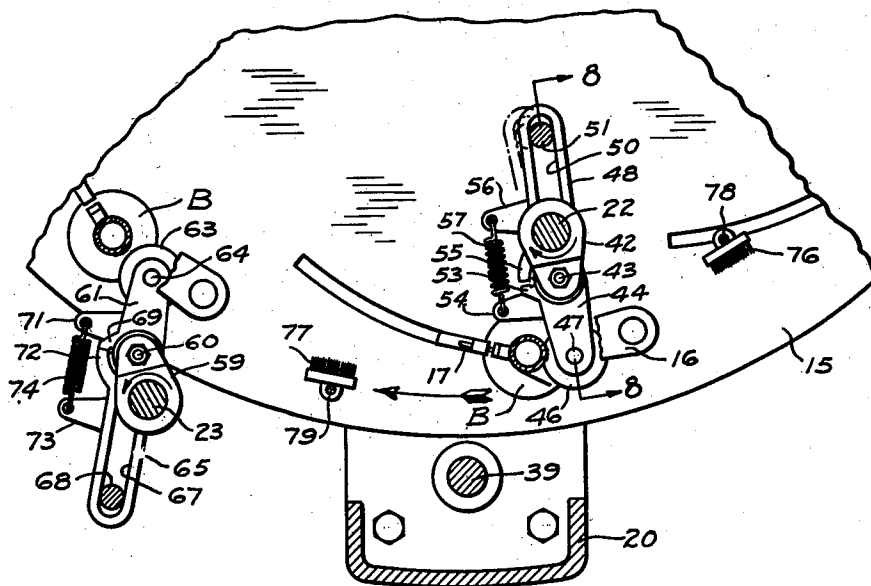


Fig. 6

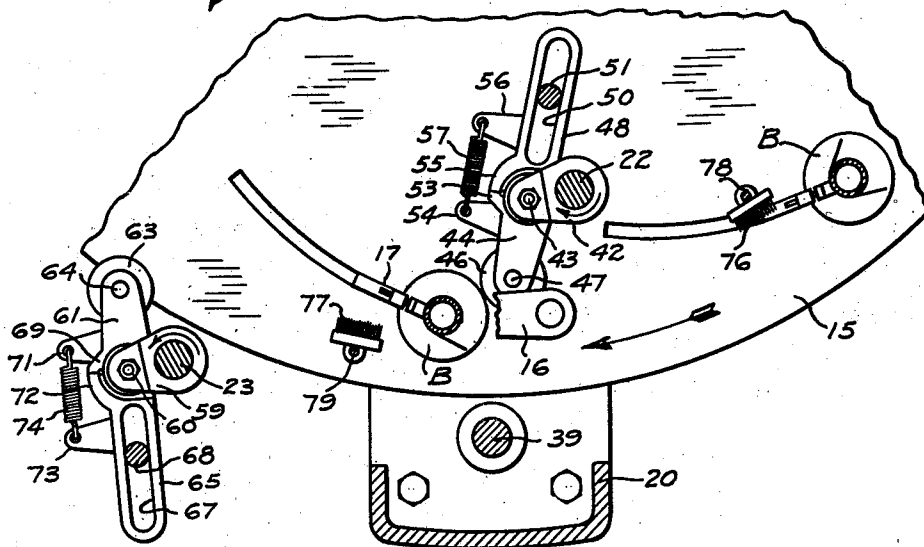


Fig. 7

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LABEL WIPING MECHANISM

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14 Claims. (Cl. 216—54)

This invention relates to label wiping mechanisms, and more particularly to a mechanism forming part of a labeling machine and arranged to wipe labels smoothly and firmly around the articles to be labeled.

My invention is well adapted for use in a labeling machine of the rotary type, which comprises a rotary table on which the articles, such as glass bottles, are supported during the labeling operation. Machines of this type are provided with picker mechanisms which apply the adhesive coated labels to the front of the moving bottles, and if the labels are comparatively short they may be wiped by causing the bottles to pass between stationary brushes or similar devices. If however the labels are long, and particularly if their ends must overlap at the rear of the bottles, it is necessary to provide other means to obtain the desired results. It is a common practice to wrap thin metal foils about the upper ends of bottles, and the invention is particularly suitable for this purpose. The term "label" in the specification and claims is used in a broad sense to include such foils.

It has been proposed heretofore to utilize rollers to press the labels into position, and various mechanisms have been employed to actuate such rollers. Great difficulties have been encountered in obtaining a smooth wiping action, particularly at high operating speeds. In some cases there is a tendency to lift the end of the label away from the bottle as the roller leaves the same, instead of pressing it firmly into the desired position. Many of the prior mechanisms require cams which are difficult and expensive to manufacture with the necessary accuracy.

It is accordingly one object of the invention to provide a comparatively simple and inexpensive label wiping mechanism, and particularly to provide such mechanism in combination with a labeling machine of the rotary type.

It is a further object of the invention to provide a mechanism which will wrap labels firmly and smoothly about articles such as glass bottles, and which will overlap the ends of the labels when they are of sufficient length.

It is a further object of the invention to provide a label wiping mechanism which will operate smoothly and efficiently at high speeds.

It is a further object of the invention to provide a label wiping mechanism which will not require cams of a complicated and expensive nature.

With these and other objects in view, as will be apparent to those skilled in the art, the invention resides in the combination of parts set forth in the specification and covered by the claims appended hereto.

Referring to the drawings illustrating one embodiment of the invention and in which like reference numerals indicate like parts:

Fig. 1 is an elevation of a portion of a rotary labeling machine, partially broken away for clearness of illustration;

Fig. 2 is a top plan view, as indicated by the line 2—2 of Fig. 1;

Fig. 3 is a section taken on the line 3—3 of Fig. 1;

Fig. 4 is a section taken on the line 4—4 of Fig. 1;

Figs. 5, 6 and 7 are views similar to Fig. 4, showing the positions of the various parts at quarter-cycle intervals;

Fig. 8 is a section on the line 8—8 of Fig. 6;

Fig. 9 is a top plan view of a roller-supporting arm; and

Fig. 10 is a side elevation of the arm shown in Fig. 9.

The embodiment illustrated comprises a horizontal table 15 arranged to be rotated about a vertical axis in a clockwise direction, preferably at a constant speed, and adapted to support a series of articles to be labeled, such as the glass bottles B. The bottles are placed upon the table and removed therefrom by any suitable mechanism. At each bottle station there is provided a vertically reciprocable top grip 16 and the usual label gripper 17, all of well-known construction. The bottles receive the labels from a suitable picker mechanism, and they approach the label wiping mechanism in a single arcuate line of travel. The particular table illustrated is provided with eight equally spaced bottle stations, so that successive stations are forty-five degrees apart.

A stationary platform 19 is spaced above the table, this platform being supported upon the upper end of a vertical column 20 located close to the periphery of the table and suitably secured to the base of the machine. These parts form a framework for the support of a novel mechanism which wipes the labels smoothly and firmly around the bottles as they pass beneath the platform. The embodiment illustrated is particularly concerned with the wiping of foils around the necks of the bottles, although the invention is adapted for use with other types of labels.

The wiping mechanism includes two vertical rotatable shafts 22 and 23 which extend upwardly through the platform 19 on opposite sides of the "bottle line," i. e. the path along which the bottles travel. The shaft 22 is located on the inner side of the bottle line, and the shaft 23 is located on the outer side of the bottle line. Furthermore, the inner shaft 22 is located appreciably in advance of the outer shaft 23, with respect to the direction of bottle travel. A hub 24 is keyed to the upper portion of the shaft 22, this hub having a flange 26 formed with two arcuate slots 27 (Fig. 2) through which screws 28 extend downwardly into a gear 30 beneath the flange. A similar hub 31 is keyed to the up-

per portion of the shaft 23, this hub likewise having a flange 32 formed with two arcuate slots 34 through which screws 35 extend downwardly into a gear 36 beneath the flange. A gear 38 is keyed to the upper end of a vertical rotatable drive shaft 39 and meshes with the gear 30. An idler gear 40 connects the gears 36 and 38. The gears 30 and 36 are of the same diameter and consequently rotate at the same speed, but by reason of the idler 40 they rotate in opposite directions. The shaft 39 is driven in a counter-clockwise direction and in timed relationship with the table 15 by any suitable means, the speed ratio being such that the shafts 22 and 23 will rotate once for each cycle. For example, with eight bottle stations on the table, the shafts 22 and 23 will rotate eight times as fast as the table. The inner shaft 22 rotates in the same direction as the table, whereas the outer shaft 23 rotates in a direction opposite to that of the table.

The shafts 22 and 23 carry label-wiping devices on their lower ends and impart a new and highly advantageous motion to these devices. For this purpose a crank 42 is secured to the lower end of the shaft 22, this crank having a downwardly projecting crank pin 43 on which an arm 44 is pivotally mounted. One end of this arm is bifurcated to receive a label-wiping device in the form of a roller 46 which is rotatably secured to the arm by means of a vertical pin 47. This roller is preferably made of soft rubber or other yieldable material. The other end of the arm forms a tail piece 48 which is so guided as to control the path of travel of the roller as the crank pin 43 revolves. In the embodiment illustrated this tail piece is provided with a longitudinal slot 50 into which the lower portion of a vertical rod 51 extends. With this construction the tail piece can both slide and pivot on the rod. The tail piece 48 may be integral with the remainder of the arm 44, but these parts are preferably formed separately and pivotally connected by means of the crank pin 43. As shown particularly in Figs. 9 and 10, the main portion of the arm 44 is provided with a lug 53 and with a projecting finger 54, while the tail piece 48 is provided with a lug 55 and with a projecting finger 56. At assembly the fingers 54 and 56 are connected by a coiled tension spring 57, which holds the lugs 53 and 55 in contact except at such times as there is sufficient lateral pressure against the roller 46 to cause the spring 57 to yield.

A similar construction is provided at the lower end of the shaft 23. This shaft carries a crank 59 having a downwardly projecting crank pin 60 on which an arm 61 is pivotally mounted. One end of this arm is bifurcated to receive a soft rubber roller 63 which is rotatably mounted on a vertical pin 64. The other end of the arm forms a tail piece 65 having a longitudinal slot 67 therein to receive the lower portion of a vertical rod 68, whereby the tail piece is both slidably and pivotally connected to the rod. The tail piece 65 is preferably formed separately from the remainder of the arm, and the two parts are pivotally connected by means of the crank pin 60. As shown particularly in Fig. 7, the main portion of the arm 61 is provided with a lug 69 and with a projecting finger 71, and the tail piece 65 is provided with a lug 72 and with a projecting finger 73. The fingers 71 and 73 are connected by a coiled tension spring 74, which holds the lugs 69 and 72 in contact unless the lateral

pressure against the roller 63 is sufficient to overcome the force of the spring. It will be noted that the arms 44 and 61 are of opposite hand, for the reason that they are located on opposite sides of the bottle line.

The labels are preferably wiped smoothly against the sides of the bottle necks before they are engaged by the rollers 46 and 63. For this purpose a brush 76 is mounted at the inner side of the bottle line, in advance of the roller 46, and a brush 77 is mounted at the outer side of the bottle line, in advance of the roller 63. The brushes are supported on the lower ends of vertical rods 78 and 79 respectively, these rods being secured at their upper ends to the platform 19. As each bottle passes the brush 76, the inner portion of the label will be wiped against the inner side of the bottle. Likewise, as the bottle passes the brush 77, the outer portion of the label will be wiped against the outer side of the bottle. It will be understood, of course, that these stationary brushes cannot be used to wipe the labels around the rear surfaces of the bottles, this being the function of the wiping rollers 46 and 63.

If the vertical rods 51 and 68 are held stationary at all times, the machine can be operated and under some circumstances the operation will be highly satisfactory. However, the rollers 46 and 63 are given a rotating motion by their frictional engagement with the labels and the bottles during the movement of the rollers toward the "bottle line," and this rotating motion tends to continue by reason of inertia. Consequently, if the rollers are moved away from the bottle line while still in contact with the labels, there will be a slipping of the rollers relative to the labels, and the direction of this slipping will be such as to tend to move the free end of the label out of its proper position. This problem is further complicated by the necessity for moving the rollers very rapidly away from the bottle line in order to avoid interference with the on-coming supporting rods for the top grips 16. In order to meet these requirements, I preferably modify the motion of the rollers slightly by imparting a lateral movement to the rods 51 and 68. In the embodiment illustrated, this movement is such as to bring about a firm pressure of the rollers against the end portions of the labels, and then a slight separation of the rollers from the labels before the rollers begin to move away from the bottle line.

In the preferred construction, the rod 51 extends upwardly through a slot (not shown) in the platform 19, and the upper end of the rod is secured to one end of a horizontal lever 81 (Fig. 3), the other end of this lever being mounted on a vertical fulcrum pin 82 carried by a bracket 83 on the top of the platform. Intermediate its length, the lever is provided with a cam roller 85 which engages the periphery of a cam 86. This cam is formed with the slots 87 through which screws 88 extend upwardly to hold the cam securely against the lower surface of the gear 30 thereabove. A coiled tension spring 90 is connected to the free end of the lever and maintains a firm contact between the roller 85 and the peripheral surface of the cam. This peripheral surface is for the most part concentric with the shaft 22 and consequently provides a long dwell, but there is a small flat or depressed portion 91 which is so located as to bring about an improved mode of operation, as will be hereinafter described. The rod 68 is actuated by a similar mechanism; the upper portion of the rod

being secured to one end of a horizontal lever 93, the other end of the lever being pivoted on a vertical pin 94 mounted in a bracket 95 on the top of the platform 19. A cam roller 97 is mounted on the intermediate portion of the lever and engages the periphery of a cam 98, this cam having two slots 99 therein through which screws 100 extend upwardly into the gear 36 to hold the cam securely against the same. A coiled tension spring 101 is connected to the free end of the lever and holds the roller 97 firmly against the cam. The cam surface is largely concentric with the shaft 23, but a small flat or depressed portion 102 is provided.

The operation of the invention will now be apparent from the above disclosure. The bottles will be placed upon the rotating table 15 by suitable mechanism, the top grips 16 will descend and clamp the bottles firmly to the table, the labels will be applied to the front of the bottles by suitable picker mechanism, and the label grippers 17 will move rearwardly to hold the labels in place, all in accordance with well-known and established practice in this art. The shaft 39 will serve to rotate the shafts 22 and 23 through the medium of the gearing shown in Fig. 2, thereby revolving the crank pins 43 and 60. This will impart a peculiar motion to the arms 44 and 61, this motion being controlled by the guide rods 51 and 68, which in turn are moved laterally at each cycle by means of the cams 86 and 98. As a result, the wiping rollers 46 and 63 travel in the generally oval paths indicated by the broken lines in Fig. 4. These paths may be described as closed circuits elongated in the general direction of the bottle travel. The roller 46 at the right hand side of the bottle line will travel in a clockwise direction in its circuit, whereas the roller 63 at the left hand side of the bottle line will travel in a counterclockwise direction.

Still referring to Fig. 4, it will be seen that as each bottle passes the first stationary brush 76 the inner portion of the label will be wiped against the bottle and will extend directly to the rear as the bottle approaches the first wiping roller 46. Then, as shown in Fig. 5, the roller will move outwardly into contact with the label and around to the rear of the bottle, pressing the label firmly against the bottle. As the roller approaches a position in the rear of the bottle, the flat portion 91 of the cam 86 will reach the cam roller 85, the spring 90 will swing the lever 81 about its pivot 82, and the guide rod 51 will move slightly to the rear. This will cause the tail piece 48 to occupy momentarily the position shown in full lines in Fig. 6, rather than the position indicated by the broken lines, as would otherwise occur if the rod 51 were stationary. As a result, the roller 46 will be held more firmly against the label, the spring 57 yielding to control the pressure. Furthermore, as the flat portion of the cam leaves the cam roller, the rod 51 will be moved suddenly forward again to its previous position, and there will be a slight separation of the wiping roller 46 from the bottle before this roller begins its inward movement away from the bottle line. In Fig. 7 the crank 42 has completed three-fourths of a revolution from the position shown in Fig. 4, and the wiping roller 46 has traveled inwardly nearly enough to allow the top grip to pass on the outside thereof.

After each bottle leaves the first wiping roller it travels past the second stationary brush 77, which causes the outer portion of the label to be

wiped against the bottle and extend rearwardly therefrom, as shown in Fig. 4. Thereupon the wiping roller 63 moves inwardly against the label and around to the rear of the bottle, as shown in Fig. 5. At this time, the flat portion 102 of the cam 98 will reach the cam roller 97, the spring 101 will swing the lever 93 about its pivot 94, and the guide rod 68 will move slightly to the rear. This will cause the tail piece 65 to occupy momentarily the position shown in full lines in Fig. 5 rather than the position indicated by the broken lines, as would otherwise occur if the rod 51 were stationary. Consequently, the roller 63 will exert a firmer pressure against the label, under the control of the yielding spring 74. As the flat portion of the cam leaves the cam roller, the rod 68 will suddenly move forward again to its original position, and the wiping roller 63 will separate slightly from the bottle before starting its outward movement away from the bottle line. Thus there is no tendency to reverse the rotation of the wiping roller about its pin 64, or to loosen the label from the bottle. The outward movement of the wiping roller continues as shown in Figs. 6 and 7, the crank arm 59 finally completing one revolution to return the parts to the positions shown in Fig. 4 as the next bottle approaches.

This mechanism provides a very smooth wiping action, even at unusually high operating speeds. The labels are firmly pressed into position, and there is no lifting or sliding of the ends of the labels. The cams 86 and 98 are circular except for the small flat portions, and they are very simple and inexpensive to manufacture. The timing of each cam can be adjusted by loosening the screws 88 or 100, as the case may be, and turning the cam relative to its corresponding gear 30 or 36. Similarly, the position of each crank arm can be adjusted by loosening the screws 28 or 35, as the case may be, and turning the corresponding hub 24 or 31 relative to its corresponding gear 30 or 36. The mechanism is thoroughly dependable and well adapted for its intended purpose.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. A label wiping mechanism comprising means to move articles to be labeled along a definite line of travel, two rotatable elements on opposite sides of the said line of travel, a member eccentrically pivoted to each element, a label wiping device carried by each member, and means to guide the movements of the said members as the said elements rotate.

2. A label wiping mechanism comprising elements rotatable about substantially parallel axes, means to rotate the said elements in opposite directions, a member eccentrically pivoted to each element, a label wiping device carried by each member, means to guide the movements of the said members as the elements rotate, and means to move articles to be labeled along a path between the said devices.

3. A label wiping mechanism comprising elements rotatable about substantially parallel axes, means to rotate the said elements in opposite directions, a member eccentrically pivoted to each element, a label wiping device carried by each member, a guide device slidably and pivotally connected to each member, cam mechanism to move the guide devices, and means to move articles to be labeled along a path between the wiping devices.

4. A label wiping mechanism comprising a horizontal rotatable table arranged to support articles to be labeled and move them along a definite arcuate path of travel, two elements rotatable about upright axes on opposite sides of the said path, means to rotate the inner element in the same direction as the table and the outer element in the opposite direction, a member eccentrically pivoted to each element, a label wiping roller carried by each member, and means to guide the movements of the said members as the said elements rotate.

5. A label wiping mechanism comprising a horizontal rotatable table arranged to support articles to be labeled and move them along a definite arcuate path of travel, two cranks rotatable about upright axes on opposite sides of the said path, means to rotate the inner crank in the same direction as the table and the outer crank in the opposite direction, an arm mounted on each crank, a label wiping roller carried by each arm, and means to guide the movements of the arms as the cranks rotate.

6. A label wiping mechanism comprising a horizontal rotatable table arranged to support articles to be labeled and move them along a definite arcuate path of travel, two upright shafts on opposite sides of the said path, means to rotate the inner shaft in the same direction as the table and the outer shaft in the opposite direction, a crank on the lower end of each shaft, an arm mounted on each crank, a label wiping roller carried by each arm, and means to guide the movements of the arms as the cranks rotate.

7. A label wiping mechanism comprising a horizontal rotatable table arranged to support articles to be labeled and move them along a definite arcuate path of travel, two upright shafts on opposite sides of the said path, means to rotate the inner shaft in the same direction as the table and the outer shaft in the opposite direction, a crank on the lower end of each shaft, an arm mounted on each crank and provided with a tail piece, a label wiping roller carried by each arm, and means engaging each tail piece to guide the movements of the arms as the cranks rotate.

8. A label wiping mechanism comprising a horizontal rotatable table arranged to support articles to be labeled and move them along a definite arcuate path of travel, two upright shafts on opposite sides of the said path, means to rotate the inner shaft in the same direction as the table and the outer shaft in the opposite direction, a crank on the lower end of each shaft, an arm mounted on each crank and provided with a tail piece, a label wiping roller carried by each arm, and guide means slidably and pivotally connected to each tail piece.

9. A label wiping mechanism comprising a horizontal rotatable table arranged to support articles to be labeled and move them along a definite arcuate path of travel, two upright shafts on opposite sides of the said path, means to rotate the inner shaft in the same direction as the table and the outer shaft in the opposite direction, a crank on the lower end of each shaft having a downwardly extending crank pin, an arm mounted on each crank pin, each arm having two parts which are pivotally connected to each other by the crank pin, a spring yieldably holding the two parts of each arm in a definite relationship, a label wiping roller carried by one part of each arm, and guide means slidably and pivotally connected to the other part of each arm.

10. A label wiping mechanism comprising a

horizontal rotatable table arranged to support articles to be labeled and move them along a definite arcuate path of travel, two upright shafts on opposite sides of the said path, means to rotate the inner shaft in the same direction as the table and the outer shaft in the opposite direction, a crank on the lower end of each shaft having a downwardly extending crank pin, an arm mounted on each crank pin, each arm being provided with a tail piece, a label wiping roller mounted on each arm, movable guide means connected to each tail piece, and cams on the said shafts arranged to actuate the respective guide means.

11. A label wiping mechanism comprising a horizontal rotatable table arranged to support articles to be labeled and move them along a definite arcuate path of travel, two upright shafts on opposite sides of the said path, means to rotate the inner shaft in the same direction as the table and the outer shaft in the opposite direction, a crank on the lower end of each shaft having a downwardly extending crank pin, an arm mounted on each crank pin, each arm being provided with a tail piece, a label wiping roller mounted on each arm, an upright rod adjacent each tail piece, the tail pieces being slidably and pivotally connected to the rods, and cams on the said shafts and arranged to move the rods laterally.

12. A label wiping mechanism comprising a horizontal rotatable table arranged to support articles to be labeled and move them along a definite arcuate path of travel, two upright shafts on opposite sides of the said path, means to rotate the inner shaft in the same direction as the table and the outer shaft in the opposite direction, a crank on the lower end of each shaft having a downwardly extending crank pin, an arm mounted on each crank pin, each arm being provided with a tail piece, a label wiping roller mounted on each arm, an upright rod adjacent each tail piece, the tail pieces being slidably and pivotally connected to the rods, cam levers connected to the upper portions of the rods to support the same, the levers being arranged to swing substantially horizontally, and cams mounted on the said shafts and arranged to swing the levers.

13. A label wiping mechanism comprising a horizontal rotatable table arranged to support articles to be labeled and move them along a definite arcuate path of travel, two upright shafts on opposite sides of the said path, means to rotate the inner shaft in the same direction as the table and the outer shaft in the opposite direction, a crank on the lower end of each shaft having a downwardly extending crank pin, an arm mounted on each crank pin, each arm being provided with a tail piece having a slot therein, a label wiping roller mounted on each arm, an upright rod adjacent each tail piece and arranged with its lower portion in the corresponding slot, and cams on the said shafts and arranged to move the rods laterally.

14. A label wiping mechanism comprising means to move articles to be labeled along a definite line of travel, a pair of label wiping rollers at opposite sides of the said line of travel and movable in separate generally oval paths elongated in the general direction of article travel, means to move the roller at the right hand side of the said line in a clockwise direction along its path, and means to move the roller at the left hand side of the said line in a counterclockwise direction along its path.

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