May 8, 1934. W. W. OSLUND 1,958,111

LABEL WIPING MECHANISM

Filed April 22, 1933 4 Sheets-Sheet 1

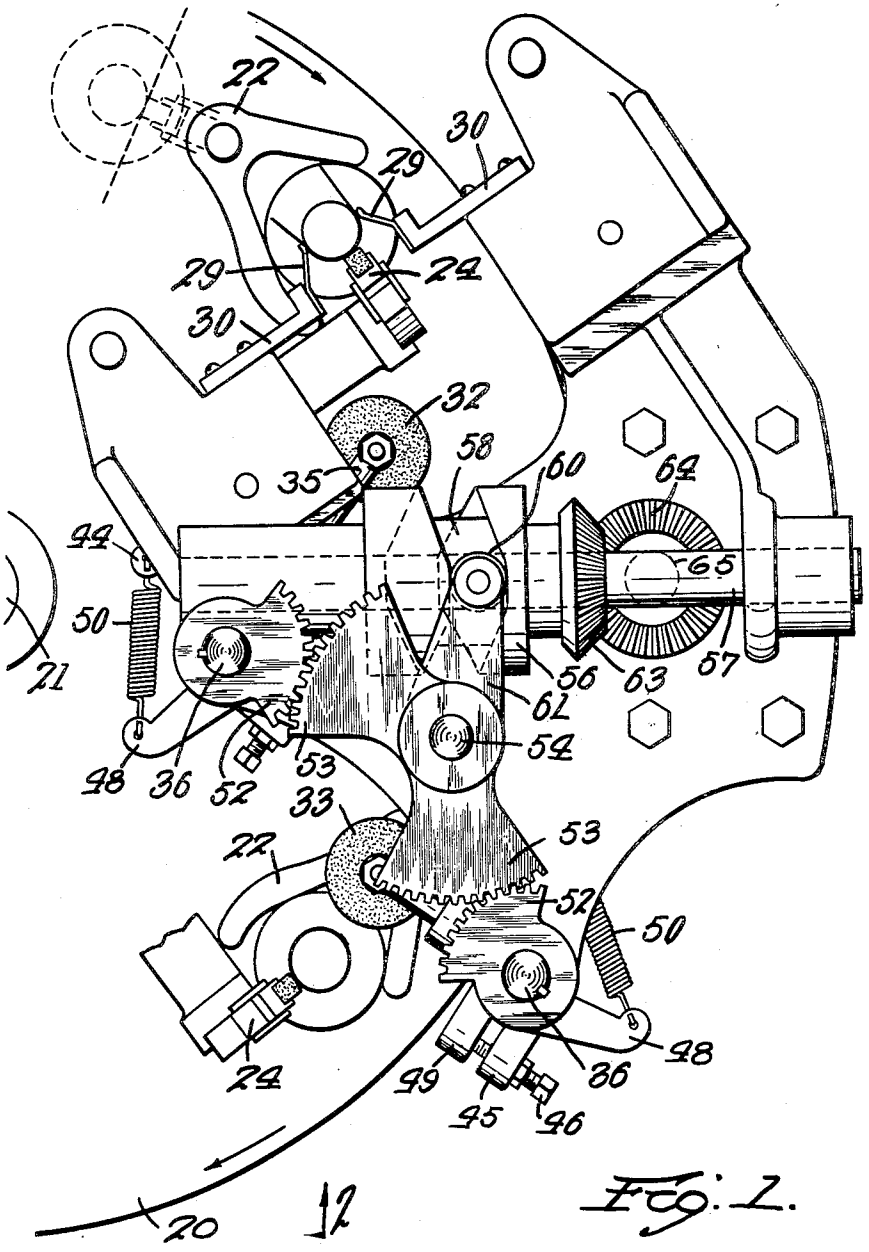


Fig. 1.

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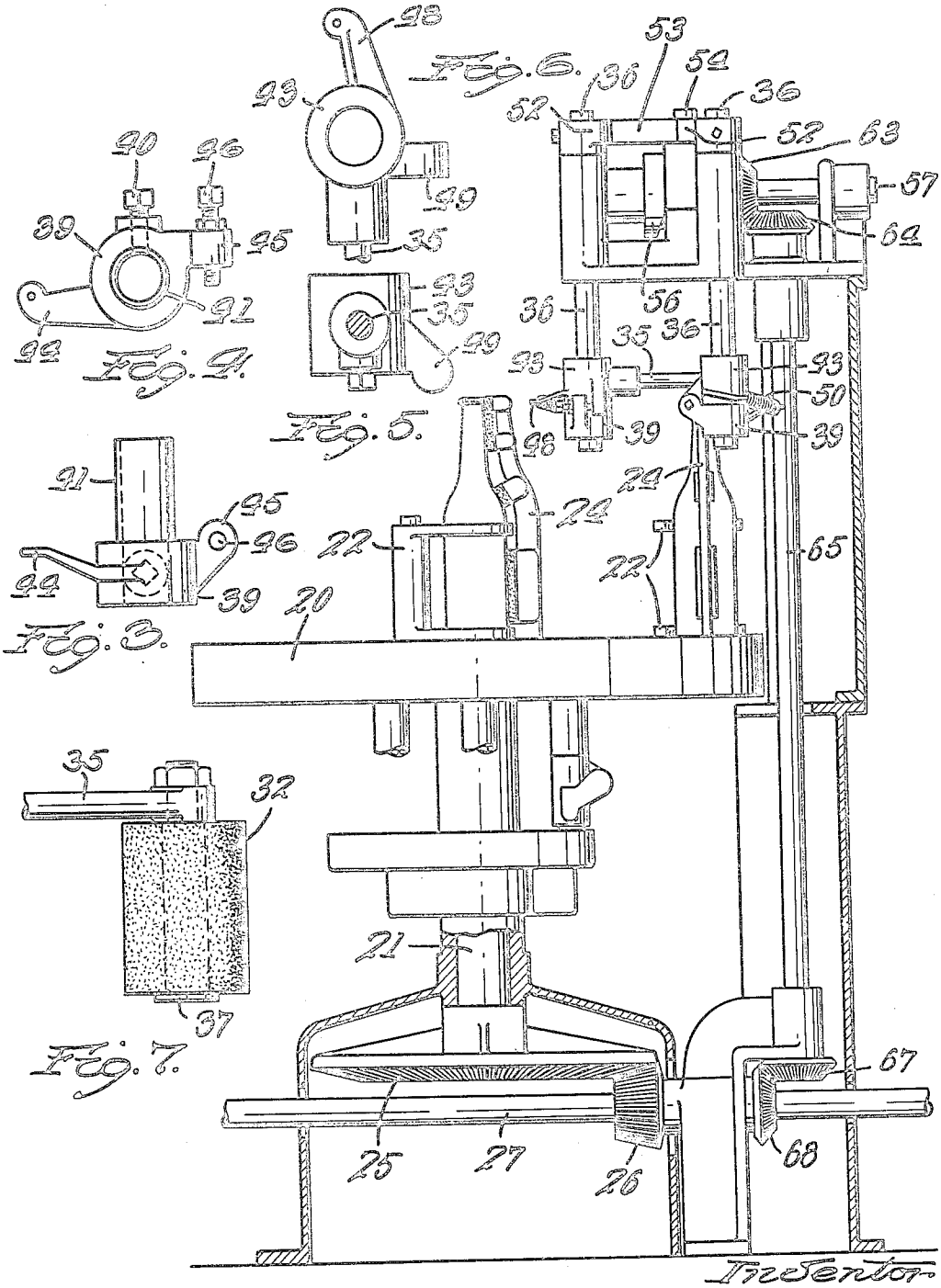


Fig. 6.

Fig. 4.

Fig. 5.

Fig. 3.

Fig. 7.

Fig. 2.

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LABEL WIPING MECHANISM

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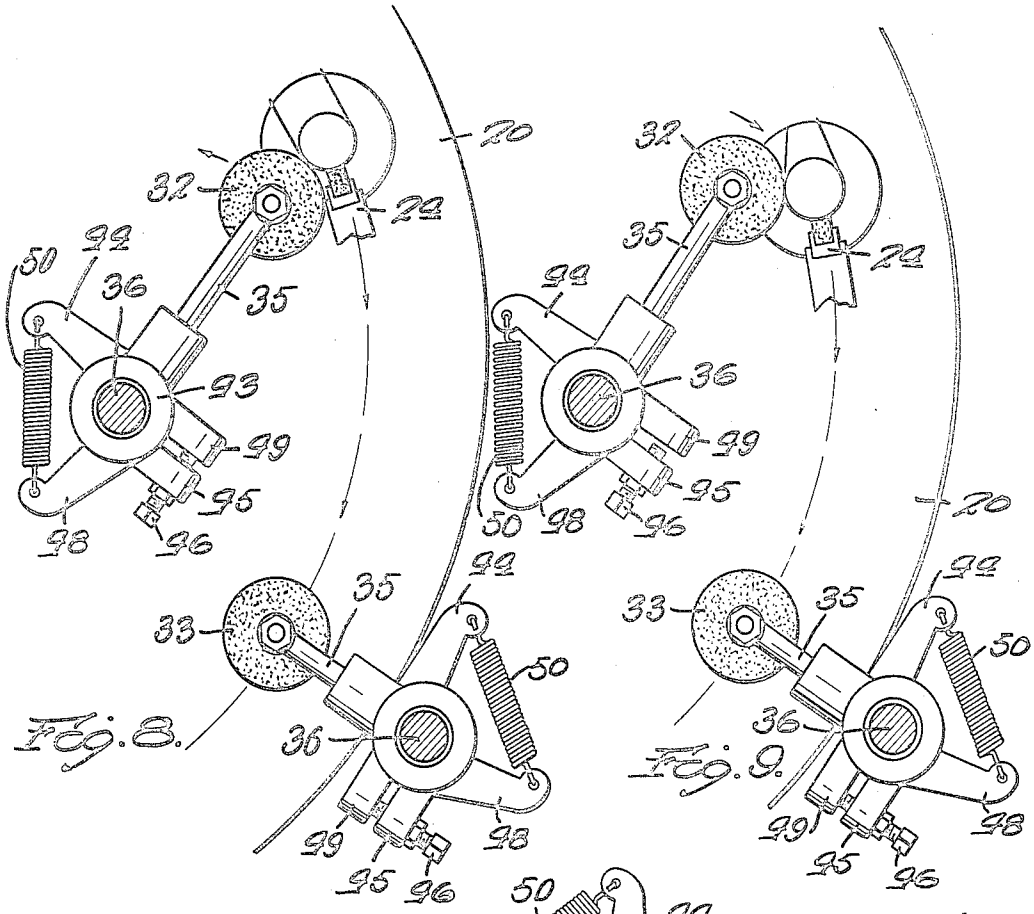


Fig. 8.

Fig. 9.

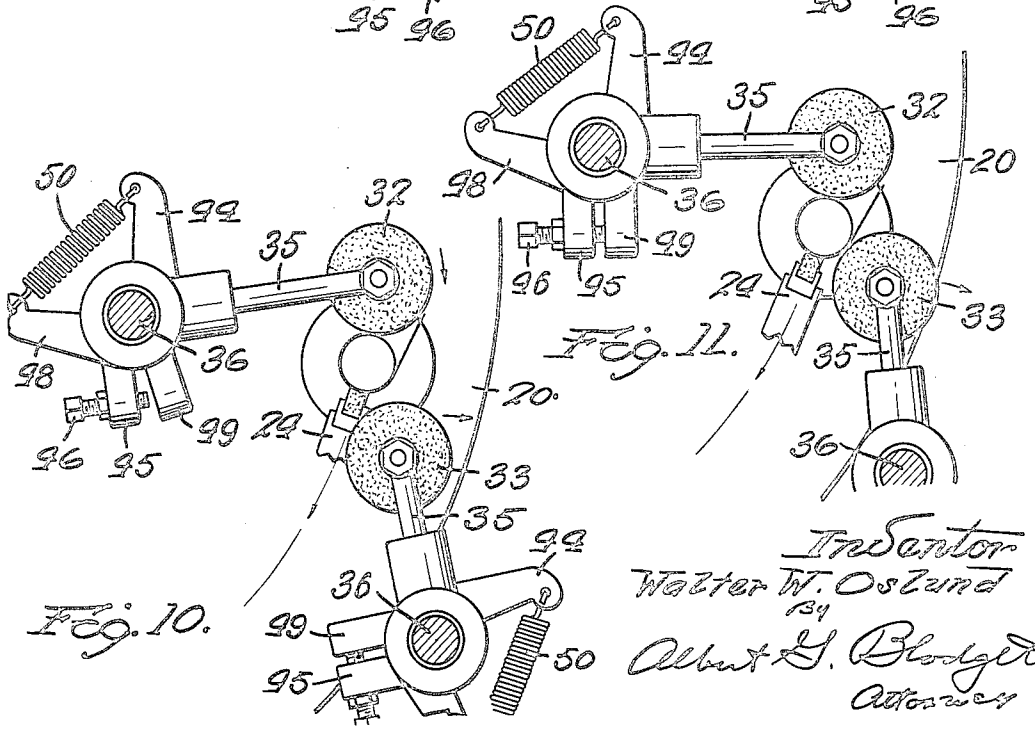


Fig. 10.

Fig. 11.

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LABEL WIPING MECHANISM

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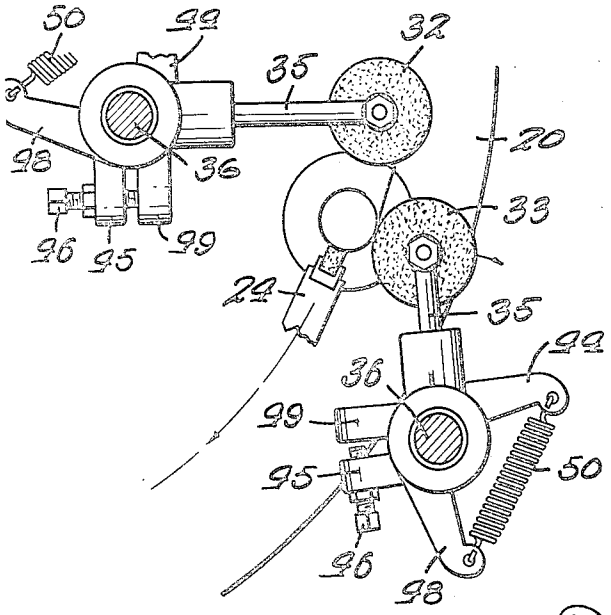
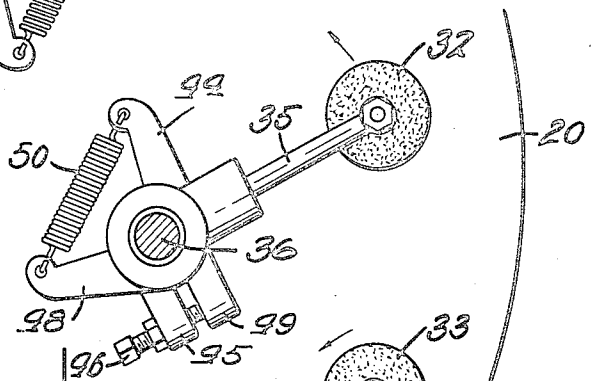


Fig. 12.



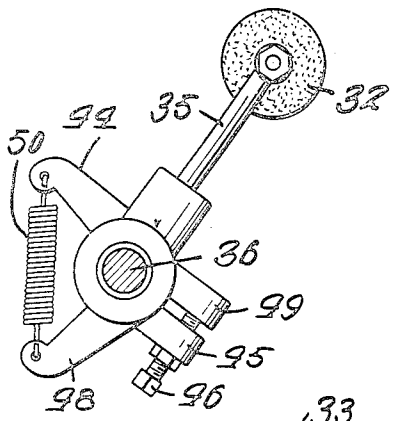
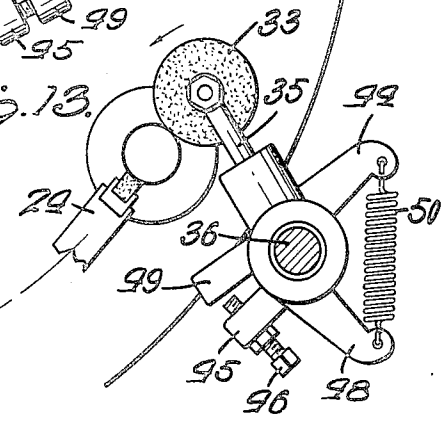


Fig. 13.



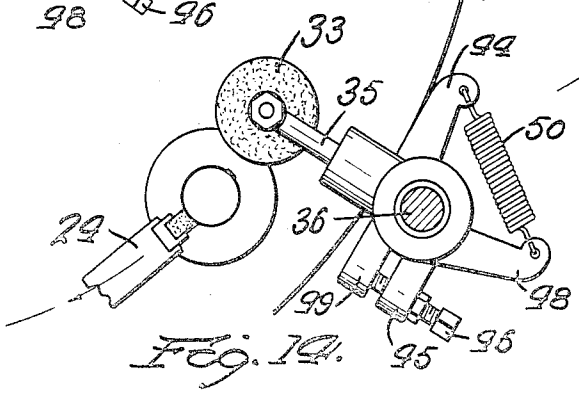


Fig. 14.

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LABEL WIPING MECHANISM

Walter W. Oslund, Holden, Mass.

Application April 22, 1933, Serial No. 667,315

15 Claims. (Cl. 216—59)

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 result. It is customary 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.

One construction which has been utilized in the past comprises a pair of vertical shafts located on opposite sides of the path of the bottles and each provided with three radial arms carrying rollers on their outer ends. The shafts are rotated at a constant speed in opposite directions, and the parts are so arranged that the rollers contact with the labels and wrap them around the bottles. Not only is this construction complicated and expensive, but it fails to wipe the labels smoothly into place. Since the rollers revolve at a uniform speed, it is not possible to maintain a uniform pressure on the label as the bottle travels past, so that the wiped label is not as smooth as is desirable. Furthermore, as each roller is about to move out of contact with the label, the relative movement of the parts changes, and there is a decided tendency for the roller to lift the label away from the bottle instead of pressing it smoothly into the desired position.

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.

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.

In accordance with my invention I provide means, such as a rotary table, for moving the bottles or other articles to be labeled in a definite path. Two wiping rollers are reciprocated near the path of the bottles in such a way that each roller serves to wipe one end portion of the label against the bottle. The rollers preferably reciprocate in circular arcs so located as to gradually approach the path of the bottles in the direction of bottle travel but from opposite sides. The rollers are preferably mounted on the ends of arms which extend outwardly from vertical shafts, and these shafts are oscillated to give the desired motion to the rollers. In the preferred construction a gear is fixed to each of the shafts, and both gears are actuated by a common driving gear which is oscillated by a suitable device such as a rotating cam.

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

Fig. 1 is a top plan view of a portion of a rotary labeling machine;

Fig. 2 is an elevation of the labeling machine, certain parts being broken away for clearness of illustration;

Fig. 3 is an elevation of a collar;

Fig. 4 is a plan view of the collar shown in Fig. 3;

Fig. 5 is an elevation of a hub;

Fig. 6 is a plan view of the hub shown in Fig. 5;

Fig. 7 is an elevation of a wiping roller and a portion of its supporting arm; and

Figs. 8, 9, 10, 11, 12, 13 and 14 are plan views with the operating parts removed showing successive steps in the wiping of a label about the neck of a bottle.

The embodiment illustrated in the drawings comprises a rotary table 20 mounted on a vertical shaft 21 and provided on its upper surface with bottle supporting brackets 22. Associated with the table are label grippers 24 of well-known construction. A bevel gear 25 is fixed to the lower end of the shaft 21, and this gear is driven by a bevel pinion 26 mounted on a horizontal shaft 27 which is driven by any suitable source of power. The table 20 is rotated in a clockwise direction as viewed in Fig. 1. The unlabeled bottles are placed in the brackets 22 by a suitable feeding mechanism (not shown), and a suitable picker mechanism (likewise not shown) serves to apply ad-

hesive coated labels to the front surfaces of the bottles in a well-known manner, whereupon the label grippers 24 move into contact with the central portions of the labels to hold them in place after the pickers are withdrawn.

In order to smooth out the end portions of the labels and direct them toward the rear of the bottles, I preferably provide two spaced flat blades 29 (Fig. 1) of brass or other suitable material. Brackets 30 serve to support these blades in such a position that the bottles will pass between them and the blades will contact with the labels to bend them rearwardly as indicated in the drawings.

The present invention is principally concerned with the provision of a suitable mechanism for wiping the labels smoothly and firmly around the bottles and overlapping the ends of the labels when necessary, all of this being accomplished while the bottles are being carried around in a circular path by the rotation of the table. The wiping mechanism illustrated comprises two wiping rollers 32 and 33, located on opposite sides of the path of the bottles. These rollers are shown as cylindrical in form, and they are preferably fashioned from sponge rubber or some similar yieldable material. The roller 32, which is located on the inner or concave side of the bottle path, is positioned in the rear of the roller 33, the latter being located on the outer or convex side of the bottle path.

In order to cause the rollers to travel around the moving bottle and press the label into contact therewith, I provide means for reciprocating the rollers in paths which gradually approach the path of the bottles in the direction of bottle travel but from opposite sides. The paths of the rollers are preferably circular arcs of small radius as compared with the bottle path. In the embodiment illustrated the path of the roller 32 is a circular arc substantially tangent to the bottle path on the inner side thereof, and the path of the roller 33 is a circular arc substantially tangent to the bottle path on the outer side thereof. Each roller when at the forward limit of its movement, relative to the direction of bottle travel, is located substantially on the center line of the bottle path, and when at the rearward limit of its movement it is located slightly to one side of the bottle path but sufficiently close thereto to contact with the bottle. Furthermore, the movement of the rollers is preferably so timed that when the roller 32 is at its forward limit the roller 33 will be at its rearward limit, and vice versa. Both rollers preferably dwell for an instant at their travel limits.

For the purpose of moving the rollers in the desired manner, I have mounted each roller on a horizontal arm 35 which projects radially from a vertical shaft 36. Each roller is pivotally attached to its respective arm by means of a bolt or stud 37, as shown in Fig. 7. The shafts 36 are located on opposite sides of the bottle path and at the centers of the circular arcs through which the rollers are moved, the outer shaft being in advance of the inner shaft in the direction of bottle travel. The arms 35 are preferably yieldable with respect to the shafts 36, and for this purpose I fix a collar 39 to the lower end of each shaft. The collars are held in place by set screws 40. Each collar is provided with an upwardly extending sleeve 41 on which an annular hub 43 is rotatably mounted, and each arm 35 is fixed to one of these hubs. Each collar 39 is formed with a projecting arm 44 and with a lug 45 provided with an adjustable screw 46, and each hub 43 is formed with a projecting arm 48 and with a lug 49. At assembly each arm 44 is connected by a coiled tension spring 50 to the arm 48 on the corresponding hub, and this spring serves to hold the lug 49 in contact with the screw 46. If sufficient force is applied to the arm 35, the spring 50 will yield and allow the arm to move relative to the shaft 36.

Means is provided for oscillating the shafts 36 simultaneously and in the same angular directions. In the illustrated embodiment this is accomplished by fixing a gear 52 (Fig. 1) to the upper end of each shaft, and providing a main gear 53 in mesh with both the gears 52. The main gear is pivotally supported by means of a vertical pin or stud 54. Since the gears 52 and 53 do not rotate, but merely oscillate about their axes, they are made segmental in form to provide teeth near the meshing points only, thus reducing the weight and cost of the parts. A suitable mechanism is provided for oscillating the main gear 53, and this is preferably brought about by means of a rotatable cam. In the drawings I have shown a barrel cam 56 mounted on a horizontal rotatable shaft 57 near the main gear 53 and provided with a circumferential cam groove 58. A cam follower or roller 60 is located in this groove, and this cam follower is mounted on an arm 61 projecting from the gear 53. The cam groove 58 is so shaped that the gear makes one complete oscillation for each rotation of the cam, and the gear preferably dwells for an instant at each limit of its movement.

The cam 56 is rotated at a definite speed relative to the speed of the table 20, so that the movements of the wiping rollers 32 and 33 will be synchronized with the movement of the bottles. For this purpose, I have mounted a bevel gear 63 on the shaft 57, and this gear meshes with a bevel gear 64 on the upper end of a vertical shaft 65. A bevel gear 67 (Fig. 2) is mounted on the lower end of the shaft 65 and meshes with a bevel gear 68 fixed to the shaft 27. If the table 20 is provided with four bottle supporting brackets 22, the various bevel gears will be so proportioned as to rotate the cam 56 at exactly four times the speed of the table.

The operation of the invention will now be apparent from the above disclosure. The shaft 27 is rotated by a suitable source of power, and rotates the table 20 and the barrel cam 56 through the medium of the connecting shafts and gears. The cam 56 oscillates the main gear 53, which in turn oscillates the gears 52 and the vertical shafts 36, thus causing the wiping rollers 32 and 33 to reciprocate in circular arcs. Each bottle, with the label held thereon by a label gripper 24, passes between the blades 29, which smooth out the end portions of the label and direct them rearwardly.

The bottle then moves into contact with the wiping roller 32, which at the moment of contact is stationary and at its rearward limit of travel, as shown in Fig. 8. At the same time the roller 33 is stationary and at its forward limit of travel. As the bottle moves forward it forces the roller 32 slightly to one side against the tension of the spring 50, as indicated in Fig. 9, and immediately thereafter the shafts 36 start to turn in a clockwise direction, thus moving the rollers 32 and 33 in circular arcs. As a result of this movement, the roller 32 travels around to the rear of the bottle and presses the adjacent end portion of the label smoothly against the bottle, as indicated in Fig. 10, a firm contact being insured by the tension of the spring 50. In Fig. 11 the rollers

have reached the opposite limits of their travel, and the bottle has moved into contact with the roller 33. Continued movement of the bottle forces the roller 33 slightly to one side against the tension of its spring, as indicated in Fig. 12, and immediately thereafter the shafts 36 start to turn in a counter-clockwise direction. The roller 33 travels around to the rear of the bottle, as indicated in Fig. 13, thus pressing the other end portion of the label against the bottle, and the parts then reach the positions shown in Fig. 14. In Fig. 14 the wiping rollers are stationary and at the end of their travel, the bottle has just moved out of contact with the roller 33, and the next bottle will arrive immediately, whereupon the cycle will be repeated.

My improved mechanism is simple and inexpensive to manufacture, as compared with prior constructions for the same purpose. Furthermore it can be operated at a higher speed and will wipe labels more smoothly and firmly than any prior arrangement of which I am aware. Since each wiping roller is momentarily stationary at the instant the bottle moves out of contact therewith, there is no tendency for the roller to reverse its movement relative to the bottle and thus lift the end of the label away from the bottle.

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 through a definite path at a constant speed, a pair of wiping rollers, and means independent of the articles to reciprocate the rollers in paths which gradually approach the path of the articles in the direction of article travel but from opposite sides.

2. A label wiping mechanism comprising means to move articles to be labeled through a definite path at a constant speed, a pair of wiping rollers, and means independent of the articles to reciprocate the rollers simultaneously in paths which gradually approach the path of the articles in the direction of article travel but from opposite sides, one roller being at its forward limit of travel when the other is at its rearward limit of travel, and vice versa.

3. A label wiping mechanism comprising means to move articles to be labeled through a definite path at a constant speed, a pair of wiping rollers, and means independent of the articles to reciprocate the rollers simultaneously in paths which gradually approach the path of the articles in the direction of article travel but from opposite sides, the path of one roller being in advance of the path of the other roller.

4. A label wiping mechanism comprising means to move articles to be labeled through a definite path at a constant speed, a pair of wiping rollers, and means independent of the articles to reciprocate the rollers in circular arcs which gradually approach the path of the articles in the direction of article travel but from opposite sides.

5. A label wiping mechanism comprising means to move articles to be labeled through a definite path, a pair of wiping rollers, and means independent of the articles to reciprocate the rollers in circular arcs in synchronism with the movement of the articles, said circular arcs being so located as to gradually approach the path of the articles in the direction of article travel but from opposite sides.

6. A label wiping mechanism comprising a rotary table to support articles to be labeled, a pair of wiping rollers, and means independent of the articles to reciprocate the rollers in circular arcs in synchronism with the movement of the articles, said circular arcs being so located as to gradually approach the path of the articles in the direction of article travel but from opposite sides.

7. A label wiping mechanism comprising means to move articles to be labeled through a definite path, a pair of wiping rollers, and means independent of the articles to reciprocate the rollers in circular arcs in synchronism with the movement of the articles, the centers of said arcs being on opposite sides of the path of the articles, and the arcs being so located as to gradually approach the path of the articles in the direction of article travel.

8. A label wiping mechanism comprising means to move articles to be labeled through a definite path, a pair of wiping rollers, and means independent of the articles to reciprocate the rollers simultaneously in circular arcs in synchronism with the movement of the articles, the centers of said arcs being on opposite sides of the path of the articles, and one center being in advance of the other in the direction of article travel.

9. A label wiping mechanism comprising two spaced substantially parallel shafts, means to move articles to be labeled between the shafts, an arm projecting from each shaft, a wiping roller mounted on each arm, and means to oscillate the shafts in synchronism with the movement of the articles and cause the rollers to reciprocate in circular arcs which gradually approach the path of the articles in the direction of article travel.

10. A label wiping mechanism comprising two spaced substantially parallel shafts, means to move articles to be labeled between the shafts, an arm projecting from each shaft, the arms being yieldably connected to the shafts, a wiping roller mounted on each arm, and means to oscillate the shafts in synchronism with the movement of the articles and cause the rollers to reciprocate in circular arcs which gradually approach the path of the articles in the direction of article travel.

11. A label wiping mechanism comprising two spaced substantially parallel shafts, means to move articles to be labeled between the shafts, an arm projecting from each shaft, a wiping roller mounted on each arm, and means including a rotatable cam to oscillate the shafts in synchronism with the movement of the articles and cause the rollers to reciprocate in circular arcs which gradually approach the path of the articles in the direction of article travel.

12. A label wiping mechanism comprising two spaced substantially parallel shafts, means to move articles to be labeled between the shafts, an arm projecting from each shaft, a wiping roller mounted on each arm, a gear fixed to each of the shafts, a main gear in mesh with both said gears, and means to oscillate the main gear in synchronism with the movement of the articles.

13. A label wiping mechanism comprising two spaced substantially parallel shafts, means to move articles to be labeled between the shafts, an arm projecting from each shaft, a wiping roller mounted on each arm, a gear fixed to each of the shafts, a main gear in mesh with both said gears, and means including a rotatable cam to oscillate the main gear in synchronism with the movement of the articles.

14. A label wiping mechanism comprising a rotary table to support articles to be labeled, two vertical shafts on opposite sides of the path of the articles, an arm projecting from each shaft, a wiping roller mounted on each arm, a gear fixed to each shaft, a main gear in mesh with both said gears, means including a rotatable cam to oscillate the main gear, and means to rotate the cam and the table at predetermined relative speeds.

15. A label wiping mechanism comprising a rotary table to support articles to be labeled, two vertical shafts on opposite sides of the path of the articles, an arm projecting from each shaft at the lower end thereof, a wiping roller mounted on each arm, a gear fixed to the upper end of each shaft, a main gear in mesh with both said gears, a barrel cam rotatable about a horizontal axis adjacent to the main gear, a cam follower associated with the cam and connected to the main gear to oscillate the gear as the cam is rotated, and means to rotate the cam and the table at predetermined relative speeds.

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