

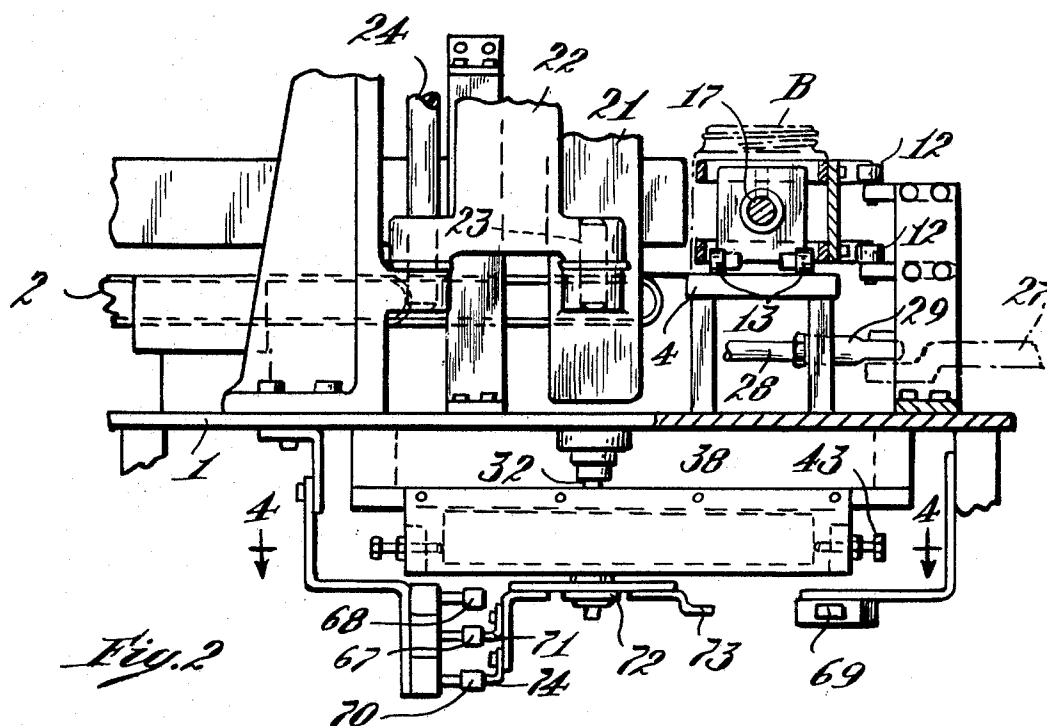
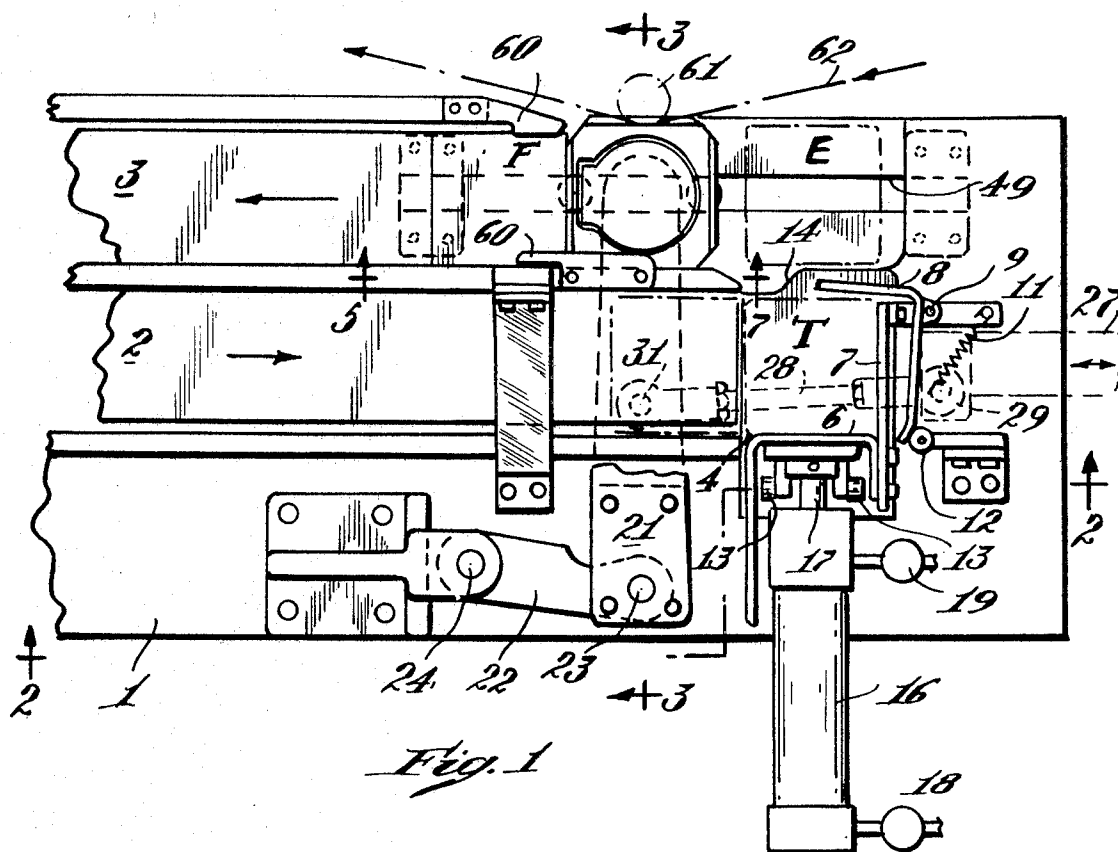
Aug. 18, 1970 W. SPOKOWSKI ET AL 3,524,786
RECIPROCATING LABELING APPARATUS FOR CONTAINERS
HAVING A PLURALITY OF SIDES
Filed July 3, 1968 4 Sheets-Sheet 1

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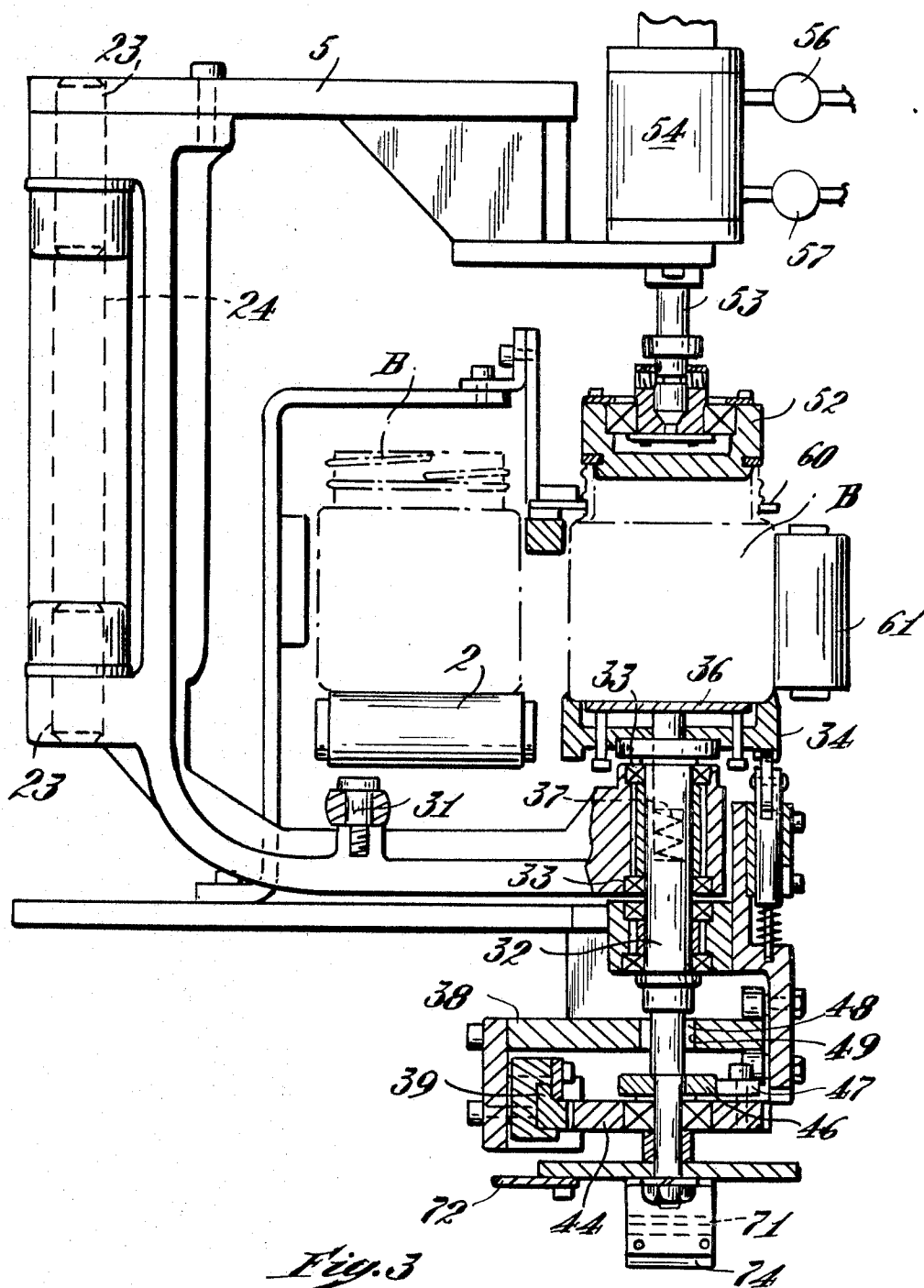
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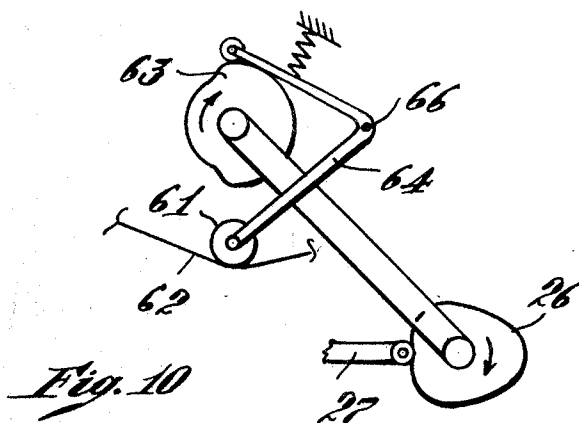
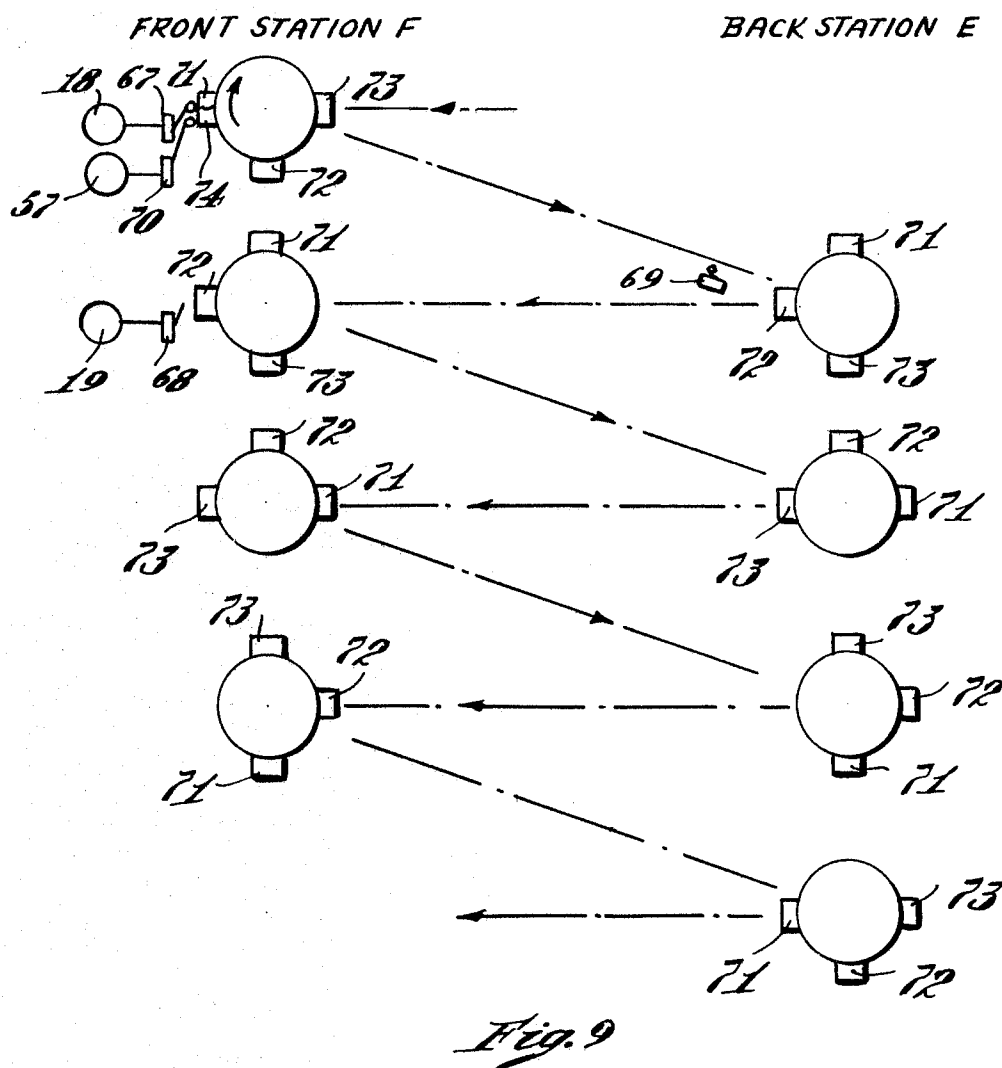


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RECIPROCATING LABELING APPARATUS FOR CONTAINERS HAVING A PLURALITY OF SIDES
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9 Claims

ABSTRACT OF THE DISCLOSURE

For labeling articles such as bottles having a plurality of sides, apparatus comprising an applicator, a rotary support for the articles, means for recurrently moving the support past the applicator, means for turning the support between the passes to present a different side of the article to the applicator during each pass, and means for ejecting the article after the last side has been labeled.

Objects of the invention are to provide apparatus which labels a plurality of sides of a multisided article with a single applicator in a single cycle of operation, which is simple and economical in construction and which is automatic in operation.

According to this invention the apparatus comprises an applicator for applying labels to the articles, a support for the articles, means for recurrently moving the support along a predetermined path past the applicator to apply a label to one side of an article during each pass, and means for turning the article between the passes to present a different side of the article to the applicator during each pass. Said moving means may comprise an oscillator which moves the support in back-and-forth strokes along said path between advanced and retracted position a predetermined number of times during each cycle, and the apparatus may have means for actuating the turning means on the backward stroke after the article has passed the applicator, said turning means comprising a floating rack which turns the article on the back stroke and idles on the forward stroke.

Preferably, the apparatus comprises holding means movable back and forth between operative and idle positions for holding an article on the support, and control means for moving the holding means to idle position when the support reaches said advanced position the last time in each cycle and moving the holding means to operative position when the support returns to retracted position the first time in each cycle, and means for placing an article on the support when it returns to retracted position the first time in each cycle, said control means being responsive to said turning means.

In the preferred embodiment the apparatus has means preventing contact between applicator and article during each back stroke, said last means comprising a retractor for retracting the applicator from the path of the article, and means for conjointly actuating said oscillator and retractor.

For the purpose of illustration a typical embodiment of the invention is shown in the accompanying drawings in which

FIG. 1 is a plan view;

FIG. 2 is a front view partly in section;

FIG. 3 is a section on line 3—3 of FIG. 1;

FIG. 4 is a section on line 4—4 of FIG. 2;

FIGS. 5 to 7 are detail views from lines 5 to 7 of FIG. 1 showing successive stages of ejection;

FIG. 8 is a plan view of the ejection or front station;

FIG. 9 is a diagrammatic view showing successive stages of one cycle of operation; and

FIG. 10 is a plan view of the applicator retractor.

The particular embodiment of the invention chosen for the purpose of illustration comprises a support 1 on which is mounted a conveyor 2 for delivering square bottles B to a transfer station T where they are transferred to a back station E and a conveyor belt 3 for carrying the bottles from the back station to a front station F (FIG. 1). At the transfer station is a platform 4 upon which the bottles are pushed by the belt 2 (FIG. 2). Each bottle is pushed from the transfer station T to the back station E by a carriage comprising a front 6, a side 7 and a gripper 8 pivotally mounted on the side at 9. The gripper is urged counterclockwise (FIG. 1) by a spring 11. When the carriage is at the transfer station the gripper is held in retracted position by stops 12 engaging the forward end of the gripper but as soon as the carriage starts from the transfer station the spring causes the gripper to grip the bottle and hold it in position on the carriage. The carriage has rollers 13 rolling on the platform 4. The platform terminates at the line 14 (FIG. 1) but the rollers are at the front 6 of the carriage so that they do not roll off the platform. The carriage is actuated by an air cylinder 16 having a piston rod 17 attached to the carriage, the cylinder having valves 18 and 19 for advancing and retracting the carriage respectively.

For labeling each of its four sides a square bottle is oscillated back and forth between the back position E and the front position F four times by an oscillator comprising a yoke 21 pivotally connected to one end of a link 22 at 23, the other end of the link being pivotally connected to the support 1 at 24. The oscillator is moved back and forth by a cam 26 (FIG. 10), a slide 27 and a link 28 pivotally connected to the slide at 29 and to the yoke at 31.

In the free end of the lower arm of the yoke a shaft 32 is journaled at 33 (FIG. 3). The upper end of the shaft carries a cup 34 in which a bottle seats. In the cup is a plate 36 urged upwardly by spring 37 to assist in ejecting the bottle. Fast to the bottom of the support 1 is a frame 38 in which a rack 39 is mounted on rollers 41 to slide back and forth between adjustable stops 42 and 43 (FIGS. 2 and 4). Meshing with the rack is a pinion 44 freely rotatable on shaft 32. Fast to shaft 32 is a ratchet wheel 46 and fast to the pinion is a spring-pressed pawl 47 engaging the ratchet wheel. When the free end of the yoke swings counterclockwise (FIG. 1) to move a bottle from the back station E to the front station F the pinion 44 and ratchet 46 are prevented from turning by pawl 47 so that the rack 39 is moved from stop 43 to stop 42 (FIGS. 2 and 4). When the yoke swings clockwise to move the bottle from the front station to the back station the rack moves with the pinion without turning the pinion until the rack engages stop 43 after which the rack turns the pinion 90° during the latter portion of the rearward stroke of the yoke. During the back-and-forth swinging of the yoke the movement of the cup 34 is kept in a straight line by a roller 48 on shaft 32 riding in a slot 49 in the frame 38 (FIGS. 1 and 3).

The top 51 of the yoke carries a plunger 52 which fits the mouth of a bottle to hold the bottle in the cup 34 while the yoke oscillates back and forth. The plunger is actuated by a piston rod 53 and an air cylinder 54 which has valves 56 and 57 to advance and retract the plunger respectively.

At the front station F is a slidable plate 58 upon which the bottles are pushed for ejection. The plate is pushed toward the back station E by a spring 59 (FIG. 8). When the oscillator swings counterclockwise it pushes the plate against the action of the spring and on the last stroke of each cycle when the bottle is released

from the plunger 52 (as hereinafter described) the bottle remains on the plate and is pushed to the exit belt 3 by the next bottle in the succeeding cycle. The position of the parts is shown in FIG. 5 when the oscillator first contacts the plate, in FIG. 6 when the oscillator reaches its extreme forward position at the front station F, and in FIGS. 7 and 8 after the oscillator has started back toward the back station E and the bottle has been left on the plate 58. The bottle is held on the plate frictionally by grippers 60 (FIGS. 1 and 8).

The labels are applied to the sides of the bottles by a heated applicator roll 61 from a tape 62 on which the labels are printed with thermoplastic ink (FIGS. 1 and 10). The tape 62 is advanced at the same speed as the bottle as disclosed in the patents to Flood 2,981,432 and 3,111,446. As the oscillator moves a bottle from the back station E to the front station F the applicator roll transfers a label to one side of the bottle. As the oscillator moves a bottle from the front station F to the back station E the applicator roll is retracted by a cam 63 acting on the roll through a spring-pressed arm 64 pivoted at 66 to prevent the bottle from contacting the tape. As shown in FIG. 10 the cams 26 and 63 are interconnected so that each makes one revolution per cycle. In FIG. 10 the parts are shown in the position they occupy when the oscillator is at the back station E.

The aforesaid valves 18, 19, 56, 57 are controlled by microswitches 67, 68, 69, 70, respectively (FIGS. 2 and 9) and the switches are actuated by lugs 71, 72, 73, 74 on the lower end of shaft 32 (FIGS. 2, 3, 4 and 9).

FIG. 9 is a diagram of the oscillation of the bottle holder back and forth between the front station F and the back station E during one cycle of labeling the four sides of a square bottle, the sloping lines indicating backward movement during which the bottle is turned 90° and the horizontal lines indicating forward movement during which the labels are applied. Starting at the upper left corner of the figure with the oscillator at the front station F on the last forward stroke of a cycle, the lugs 71 and 74 trip the switches 67 and 70 to actuate the valves 18 and 57. Valve 57 retracts the plunger 52 to release the bottle for ejection (FIG. 3) and valve 18 advances the carriage 6-8 to push another bottle from the transfer station T to the back station E (FIG. 1). As the oscillator moves back to the back station the bottle is turned 90° as above described and as it approaches the back station lug 73 engages switch 69 to actuate valve 56 to insert the plunger 52 (FIG. 3) into the new bottle at the back station. When the oscillator then reaches the front station F lug 72 engages switch 68 to actuate valve 19 to retract carriage 6-8 (FIG. 1). During each of the four back strokes of the oscillator (indicated by the sloping lines in FIG. 9) the bottle is turned 90° and during the four forward strokes labels are applied to the four sides of the bottle successively. When the oscillator reaches the front station again a new cycle begins automatically, the oscillator swinging back and forth continually until the machine is stopped.

We claim:

1. For labeling articles having a plurality of sides, apparatus comprising an applicator for applying labels to the articles, a support for the articles, means for recurrently moving the support along a predetermined path past the applicator to apply a label to one side of an article during each pass, and means for turning the article between the passes to present a different side of the article to the applicator during each pass, said moving means comprising an oscillator which moves the support in back-and-forth strokes along said path between advanced and retracted positions a predetermined number of times during each cycle.

2. Apparatus according to claim 1 further characterized by means for actuating the turning means on the backward stroke after the article has passed the applicator.

3. Apparatus according to claim 1 wherein said turning means comprises a floating rack which turns the article on the back stroke and idles on the forward stroke.

4. Apparatus according to claim 1 further characterized by holding means movable back and forth between operative and idle positions for holding an article on the support, and control means for moving the holding means to idle position when the support reaches said advanced position the last time in each cycle and moving the holding means to operative position when the support returns to retracted position the first time in each cycle.

5. Apparatus according to claim 4 wherein said control means is responsive to said turning means.

6. Apparatus according to claim 4 further characterized by means for placing an article on the support when it returns to retracted position the first time in each cycle.

7. Apparatus according to claim 1 further characterized by means preventing contact between applicator and article during each back stroke.

8. Apparatus according to claim 7 wherein said last means comprises a retractor for retracting the applicator from the path of the article.

9. Apparatus according to claim 8 further characterized by means for conjointly actuating said reciprocator and retractor.

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