N. M. LA PORTE.

CLOSURE APPLYING MECHANISM.

APPLICATION FILED JULY 28, 1911.

Patented May 16, 1916.

1,183,084.

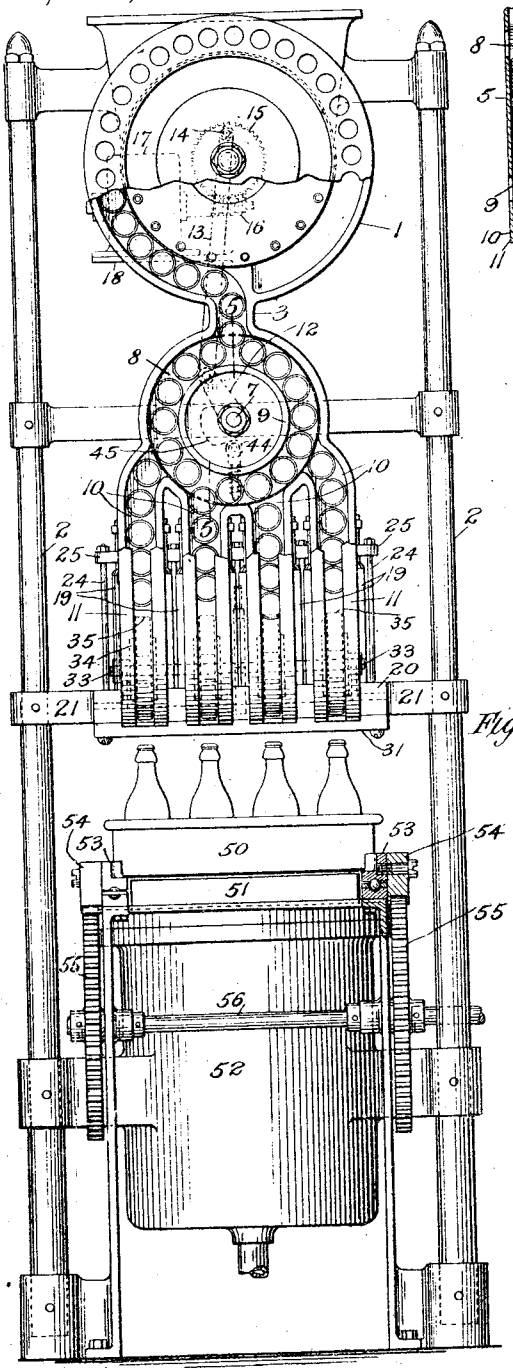


Fig. 1.

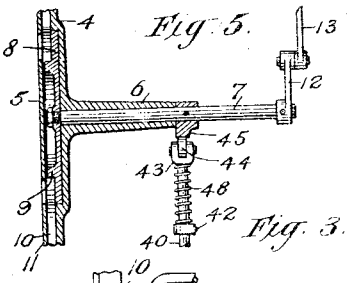


Fig. 5.

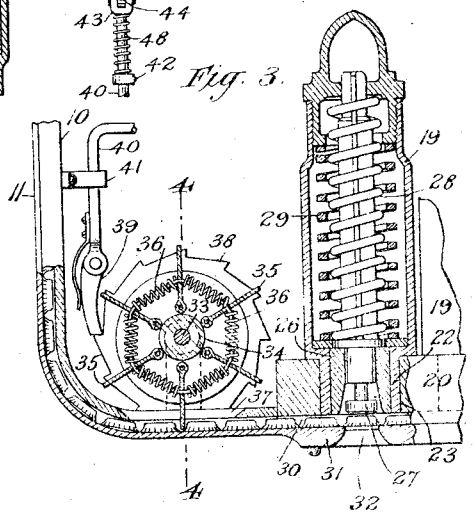


Fig. 3.

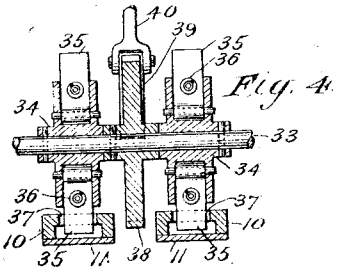


Fig. 4.

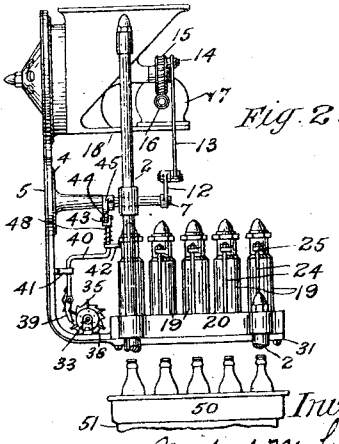


Fig. 2.

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UNITED STATES PATENT OFFICE.

NORBERT M. LA PORTE, OF BALTIMORE, MARYLAND, ASSIGNOR TO THE CROWN CORK AND SEAL COMPANY OF BALTIMORE CITY, OF BALTIMORE, MARYLAND, A CORPORATION OF MARYLAND.

CLOSURE-APPLYING MECHANISM.

1,183,084. Specification of Letters Patent. Patented May 16, 1916.

Application filed July 28, 1911. Serial No. 641,171.

To all whom it may concern:

Be it known that I, NORBERT M. LA PORTE, a citizen of the United States, residing at Baltimore, State of Maryland, have invented certain new and useful Improvements in Closure-Applying Mechanism, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

This invention relates to certain improvements in machines for applying closures to containers.

One of the objects of the invention is to produce an improved machine for applying closures to containers, such, for instance, as bottles, which is adapted to simultaneously apply closures to a plurality or group of containers.

A further object of the invention is to produce an improved mechanism for forwarding closures from a source of supply, such, for instance, as a selecting hopper commonly employed in such machines through a plurality of feeding channels or chutes, the mechanism including means for distributing the closures in such a manner as to insure that all the channels or chutes shall be properly supplied with closures.

A further object of the invention is to produce an improved mechanism for effecting with certainty the feed of closures through a chute or chutes, the closures being supplied to the chute from a suitable source of supply.

With these and other objects not specifically referred to in view, the invention consists in certain constructions and in certain parts, improvements and combinations as will be hereinafter fully described and then specifically pointed out.

Referring to the accompanying drawings: Figure 1 is an end view of so much of a machine for applying closures to bottles as is necessary to an understanding of the invention. Fig. 2 is a view illustrating the arrangement of a group of closure applying heads which may be employed, the view also illustrating certain mechanism for advancing the closures through the feeding chutes which may be employed for carrying the invention into effect. Fig. 3 is a detail sectional view, on an enlarged scale, of one of the crowning heads shown in Fig. 2 and a part of the feeding mechanism. Fig. 4 is a section on the line 4—4 of Fig. 3. Fig. 5 is a detail view of distributing mechanism which may be employed.

Machines embodying the invention will usually include a source of supply for the closures to be applied which receives the closures in a mass. The machine which has been selected to illustrate a concrete embodiment of the invention is intended to apply the well-known crown corks to bottles, and in this machine the closures are supplied from a selecting hopper, indicated at 1, this hopper being carried on standards or columns 2 forming a part of the machine frame. Selecting hoppers of the type illustrated are well-known in the art, and as the particular construction of hopper has no special reference to the invention which forms the subject-matter of this application a specific description of it will not be given. It may be remarked, however, that the hopper shown is fully illustrated and described as to the details of its construction in United States Patent No. 643,973, to Painter and Hawkins, dated Feb. 20, 1900.

In machines which embody the invention in its best form, the closures will be supplied by the hopper to a plurality of chutes by which they are forwarded to the applying devices, and in order to insure a full supply to each chute a distributing mechanism will be employed between the chute and the hopper. While the distributing mechanism may vary in its construction in the particular machine shown the hopper delivers the closures through a short neck 3 into a casing consisting of front and back plates 4, 5. The front plate 4 is formed to provide a long bearing 6 through which extends an operating shaft 7, this shaft carrying on its inner end and within the casing a plate 8 provided with a circular rib 9. The space between the circular rib 9 and the outer wall of the casing is of a size to receive and maintain crown corks as they are delivered through the neck 3 into the casing. In the particular machine shown the casing has communicating with it four chutes 10, these chutes being provided with slotted covers 11. When a distributing

mechanism of the character illustrated is employed the distributing disk will, in the best constructions, be given an oscillating movement. While this may be effected in any suitable manner, the shaft 7 is provided with a crank arm 12 to which is secured a connecting rod 13, this rod being in turn secured to a crank pin 14 on a worm gear 15 suitably supported in the machine. This worm gear is driven from a worm 16 on the shaft of a small motor generally indicated at 17 and supported on a bracket 18 extending from the hopper structure. As the crowns fall into the channel formed by the rib 9 and the walls of the casing, they will be swept around by the forward movements of the disk or plate and caused to drop into one or the other of the channels 10. If any channel 10 is full the crowns will drop into a neighboring channel which has space for them. The movement of the distributing disk is sufficient to prevent any wedging or collecting of the crowns in the distributer and at the same time if the channels are all full the disk can move under the crowns without forcing a movement of them until there is space in one or more of the chutes for more crowns. In other words, when the crowns are free to be moved by the movement of the disk, they will move, and when they are prevented from moving there is no jamming action of the disk which would injure the crowns.

When as in the machine illustrated the construction is of such a character as to simultaneously apply the closures to a plurality or group of containers, the applying devices, in machines which embody the invention in its best form, will be arranged in rows. In the particular construction illustrated, there are four rows of closure applying devices each row containing five independent applying devices. While the construction of these applying devices and the means for supporting them may be varied, in the machine illustrated each applying device includes a casing 19, these casings being mounted in a supporting block 20 carried on a cross-bar 21 which is supported on the columns 2. The casings are provided with reduced lower ends 22 engaging in openings 23 formed in the upper part of the block 20. The reduced ends enter the openings and the shoulders formed by them rest on the top of the block. The casings are further held in position by tie bolts 24 which pass through ears 25 formed on the casings and are screwed into threaded recesses in the top of the block 20. This construction enables the casing together with the parts which it carries to be removed from the machine so that if any part of any one of the capping devices becomes defective it can be immediately removed and a new one substituted. Each casing contains, in the particular machine shown, a bending die or throat 26 and a holding plunger 27. The holding plunger is held to its duty by a spring 28 and the throat or bending die by a spring 29. The construction of these cap applying devices is fully shown and described and the novel features thereof claimed in an application filed Aug. 6, 1910, Ser. No. 575,922, and a further description of them in this application is unnecessary. It may be remarked, however, that all the devices for effecting the applying of the closures are contained within the casing, so that any capping device may be removed in its entirety by removing the casing.

When the invention is embodied in a machine which employs a plurality of rows of closure applying devices, channels should be provided for insuring a proper supply of closures to each capping device. While the construction of these channels may be varied, the block 20 is provided with a series of grooves 30 which extend across the under side of the block, these channels being of a width to receive the crowns. The channels are completed by a cover plate 31 secured by screws or in any other suitable manner to the bottom of the block 20. The channels are provided with openings for receiving the mouths of the containers which openings should be less in diameter than the diameter of the closures. One of the openings referred to is illustrated in Fig. 3, and marked 32, the relative sizes of the opening and crown cork being indicated in this figure. The edges of the openings may be chamfered off, as indicated, to permit the mouth of the container to readily enter it. With this construction the crowns may be fed through the channel for each row of applying devices, the crown cork passing across the container or receiving opening of each applying device without falling through. In the machine illustrated there are four channels and these channels register with the delivery ends of the chutes 10.

In machines which embody the invention in its best form means will be provided for positively forwarding the closures through the channels for the applying devices. In the particular machine illustrated, the chutes 10 have substantially vertically and substantially horizontally arranged parts, the horizontally arranged parts registering with the channels as before described. In machines embodying the invention in which this construction of channel is employed, the means for positively forwarding the closures may be arranged to coöperate with the horizontal parts of the chutes. The construction of the feeding mechanism employed for thus forwarding the closures may be varied within wide limits. In the particular construction illustrated there is provided a shaft 33 suitably supported in the machine, this

shaft carrying a plurality of hubs 34 which may be secured to the shaft in any suitable way, as by pins. Each of the hubs has pivoted thereto a plurality of fingers 35, coil springs 36 being interposed between the fingers. As the shaft rotates the fingers extend through openings 37 in the tops of the horizontally arranged parts of the chutes, it being understood that there is one hub and set of fingers for each chute. The springs 36 allow the fingers to yield so that in case any channel is full of closures or there is any jamming in the channel, the fingers will yield and not injure the crown corks.

The shaft may be operated in any suitable manner. In the particular construction shown it is provided, intermediate its ends, with a ratchet wheel 38 engaged by a spring controlled pawl 39 on a bent operating arm 40 supported in two ears 41, 42, the ear 41 extending from one of the chutes and the ear 42 from one of the crowning heads. The bent operating arm 40 is provided at its upper end with a yoke 43 in which is mounted a roll 44 which is in the path of a cam 45 mounted on the shaft 7. A spring 48 which bears on the ear 42 and on the under side of the yoke returns the roll after it has been actuated by the cam to advance the ratchet wheel one tooth.

It is, of course, obvious that a relative movement must be effected between the means for supporting the containers and the cap applying devices in order to apply the closures thereto. While this relative movement may be effected in any suitable manner, in the particular construction illustrated the containers are forwarded in trays 50 over a table 51 connected to a fluid operated piston, not shown, the piston chamber or cylinder being indicated at 52. The trays are moved into position above the piston by a carriage consisting of side frames 53. When a carriage such as this is employed it may be operated in any suitable manner. As shown, the side frames of the carriage carry racks 54 which are engaged by gears 55 on a cross shaft 56. Any suitable form of driving mechanism not shown may be employed for actuating the gear carrying shaft referred to.

As has been indicated, changes and variations may be made in the construction by which the invention claimed is carried into effect. The invention claimed is not, therefore, to be limited to the specific construction herein illustrated and described.

What is claimed is:—

1. The combination with a plurality of rows of closure applying devices, of a plurality of closure channels one for each row, and means for supplying closures to the channels.

2. The combination, with a source of closure supply, of a plurality of chutes for the closures, and a feeding mechanism for all the chutes, said feeding mechanism comprising a plurality of feeding fingers arranged to engage crowns in each chute, each finger being mounted for yielding movement in both directions along the line of travel of the crowns, and means for operating all of the fingers to feed the crowns.

3. The combination with a selecting hopper for containing closures, of a plurality of chutes for the closures, and an oscillating distributing mechanism intermediate the selecting mechanism of the hopper and the chutes.

4. The combination with a source of closure supply, of a plurality of chutes for the closures, a distributing chamber in communication with the source of supply and below it, a distributing disk in the chamber, and means for giving the disk an oscillating motion.

5. The combination with a closure selecting hopper, of a plurality of chutes for closures, a distributing mechanism intermediate the selecting mechanism of the hopper and the chutes, and a feeding mechanism cooperating with the chutes.

6. The combination with a selecting hopper, of a plurality of feeding chutes having vertically and horizontally arranged parts, a distributing mechanism intermediate the feeding chutes and the selecting mechanism of the hopper, and a feeding mechanism cooperating with the horizontally arranged parts of the chutes.

7. The combination with a selecting hopper, of a plurality of closure feeding chutes, a distributing mechanism intermediate the chutes and the selecting mechanism of the hopper, and a feeding mechanism coöperating with the chutes and having a yielding engagement with the closures therein.

8. The combination with a selecting hopper, of a plurality of closure feeding chutes, a distributing mechanism intermediate the selecting mechanism of the hopper and the chutes and a feeding mechanism coöperating with the chutes, said mechanism including a plurality of yieldingly mounted feeding fingers arranged to engage the closures in the chutes.

9. The combination with a selecting hopper for closures, of a plurality of feeding chutes, distributing mechanism intermediate the chutes and the selecting mechanism of the hopper, a feeding mechanism coöperating with the chutes, rows of closure applying heads, and a plurality of closure channels one for each row, said channels communicating with the chutes.

10. The combination with a closure feeding chute, of a shaft, a plurality of feeding fingers yieldingly connected with the shaft, and means for operating the shaft.

11. The combination with a closure feeding chute, of a shaft, a plurality of feeding fingers yieldingly connected with the shaft, and means for giving the shaft a step by step movement.

12. The combination with a plurality of rows of closure applying devices, of a channel for each row, a plurality of feeding chutes communicating with the channels, a shaft, a plurality of sets of fingers yieldingly connected to the shaft, and means for operating the shaft.

13. The combination with a plurality of rows of closure applying devices, of a channel for each row, a plurality of feeding chutes communicating with the channels, a shaft, a plurality of sets of fingers yieldingly connected to the shaft, and means for giving the shaft a step by step movement.

14. In a closure applying mechanism, the combination with a support, of a plurality of casings, closure applying devices in each casing, an independent closure supply for each casing, and means for detachably connecting the casings to the support.

15. In a closure applying mechanism, the combination with a support, of a plurality of casings arranged in rows, closure applying devices in the casings, an independent closure supply for each row, and means for detachably connecting each casing to the support.

16. In a closure applying mechanism, the combination with a row of closure applying devices, of a closure channel extending beneath the row, and means for supplying closures to the channel.

17. In a closure applying mechanism, the combination with a plurality of rows of closure applying devices, of a plurality of channels extending beneath the rows, each of said channels having a container receiving opening smaller than the closure.

18. In a closure applying mechanism, the combination with a supporting block having a closure supplying channel formed therein, of a plurality of container receiving openings formed therein said openings being smaller than the closure, and a plurality of closure applying devices detachably connected to the supporting block.

19. In a closure applying mechanism, the combination with a supporting block having a plurality of closure receiving channels formed therethrough, of a plurality of rows of closure applying devices each of said applying devices being detachably connected to the block, the block having a plurality of rows of container receiving openings which communicate with the channels formed therein, said openings being smaller in diameter than the closures.

In testimony whereof, I have hereunto set my hand, in the presence of two subscribing witnesses.

NORBERT M. LAPORTE.

Witnesses:
W. H. KENNEDY,
E. VANDERHOEF.