No. 888,772. PATENTED MAY 26, 1908.

S. WILKINSON.

BOTTLE CAPPING MACHINE.

APPLICATION FILED MAY 24, 1907.

2 SHEETS—SHEET 1.

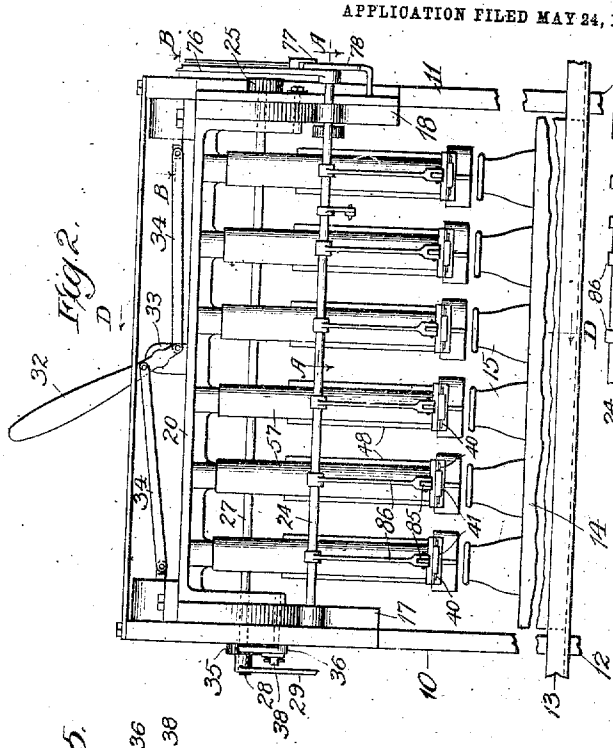


Fig. 2.

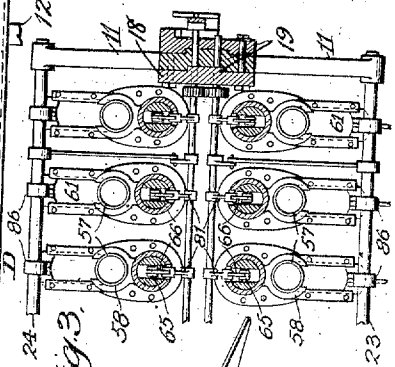


Fig. 3.

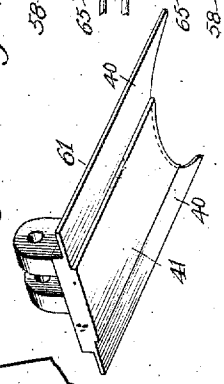


Fig. 6.

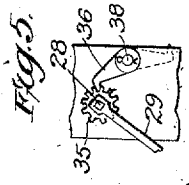


Fig. 5.



Fig. 1.

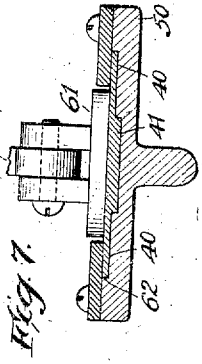


Fig. 7.

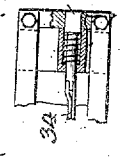


Fig. 4.

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Fig. 8.

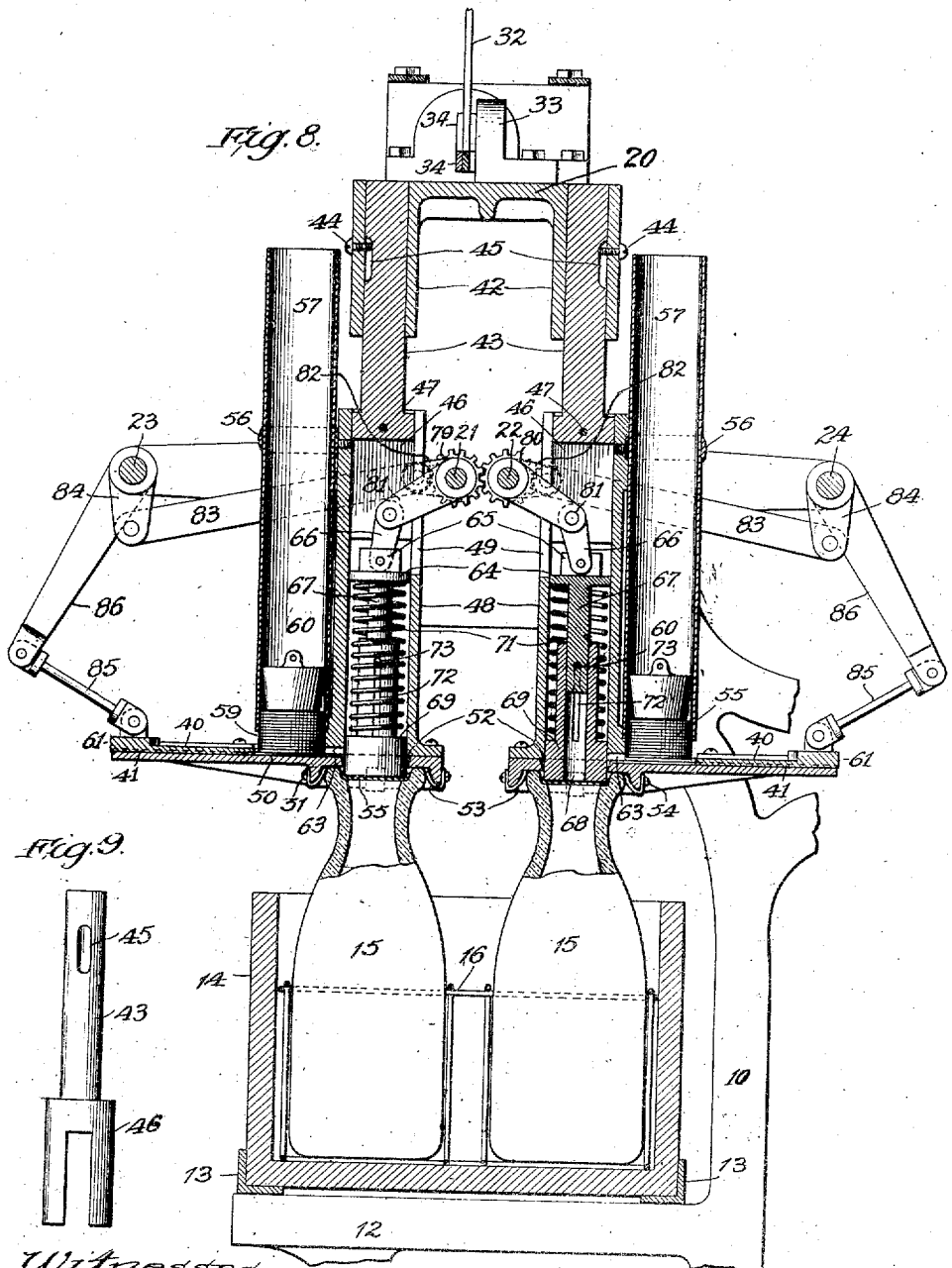



Fig. 9.




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# UNITED STATES PATENT OFFICE.

STANLEY WILKINSON, OF CHICAGO, ILLINOIS.

## BOTTLE-CAPPING MACHINE.

No. 888,772. Specification of Letters Patent. Patented May 26, 1908.

Application filed May 24, 1907. Serial No. 375,416.

*To all whom it may concern:*

Be it known that I, STANLEY WILKINSON, a citizen of the United States, and resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Bottle-Capping Machines, of which the following is a full, clear, and exact specification.

My invention is concerned with a novel bottle-capping machine, and is designed to simplify and improve upon the construction of such similar machines as have been heretofore devised.

One important feature of my invention consists in the employment of a novel pusher for forcing the caps, one by one, from the supply tube to the position beneath the plunger which forces them into the bottle.

Other novel features will be described at length in the body of the specification, and particularly pointed out in the claims thereof.

To illustrate my invention, I annex hereto two sheets of drawings, in which the same reference characters are used to designate identical parts in all the figures, of which,—

Figure 1 is a side elevation of the machine, with the lower portion of the framework, as well as a part of the operating handle, broken away; Fig. 2 is a front elevation of the same, with the legs and a portion of the bottle-carrying box broken away; Fig. 3 is a top plan view of one end of the machine, in section on the line A—A of Fig. 2; Fig. 4 is a detail in section on the line B—B of Fig. 2; Fig. 5 is a detail showing the detent mechanism for preventing the bottle-capping mechanism from being accidentally lowered; Fig. 6 is a perspective view, on an enlarged scale, showing one of my improved pushers; Fig. 7 is a detail of the same in its guides, in section on the line C—C of Fig. 1; Fig. 8 is a view in section, on an enlarged scale, on the line D—D of Fig. 2; and Fig. 9 is a detached view of one of the shanks supporting the bottle-capping mechanism.

As will be seen from Figs. 1 and 2, the framework of the machine is made up of two end castings 10 and 11, which are provided with the bracket portions 12, upon which are secured the angle irons 13 which form the receiving member, in the form of a guide for the box 14, in which the bottles 15 are assembled by the dozen, in two rows of six each, their position in the box being determined with considerable accuracy by the spacing wires 16, shown in Fig. 8. In use, the bottles are placed in the boxes 14, and are first passed to the filling machine, whence they are slid along on a runway connecting with the supporting member 13, upon which they are shoved with the bottles in register with the capping mechanism proper to be described.

It is desirable to use a single machine for bottles of different capacities, such as half pints, pints and quarts, all of which have necks of the same size, and consequently can be capped by the same mechanism, although they are of different heights. To adjust the apparatus for the bottles of different heights, I adjust the bottle-capping mechanism, instead of the receiving member 13, as that would interfere with its connections with the permanent runways by which the boxes containing the bottles are passed from one piece of apparatus to another. To this end, I provide an auxiliary frame carrying the capping mechanisms proper, which auxiliary frame is adapted to be vertically adjusted in the main frame. This auxiliary frame is composed of the two end pieces 17 and 18, which are mounted to slide in the guideways 19 formed in the end castings 10 and 11, as seen in Fig. 3. The end pieces 17 and 18 are rigidly connected by the frame or cross piece 20, and are further connected by the four rock shafts 21, 22, 23 and 24, which are best shown in Fig. 8, the various transverse elements giving sufficient rigidity to the auxiliary frame so that it can be readily adjusted up and down by any suitable means, such, for instance, as the pinion 25 meshing with the rack 26 formed on the frame 11. The pinion 25 is secured upon the shaft 27, which is journaled in the end pieces 17 and 18 of the auxiliary frame, and is provided with the squared end 28, to which a crank 29 is applied for rotating it. I preferably provide, say, three different positions of adjustment to which the auxiliary frame may be brought, and when it is thus positioned, the spring-pressed plungers 30, which are mounted in suitable housings carried by the ends 17 and 18 of the auxiliary frame, as shown in detail in Fig. 4, coöperate with the recesses 31 which are provided in the end castings 10 and 11, as seen in Fig. 1, to secure the auxiliary frame in the position of adjustment chosen to accommodate the particular size of bottles to be filled. To quickly release the plungers preparatory to

readjusting the apparatus, I provide the handle 32, which is pivoted to a standard 33 projecting upward from the cross piece 20, and which is provided with the links 34 pivotally connected to the ends of the plungers 30, so that as the lever 32 is swung the plungers will be withdrawn. To prevent the possibility of the auxiliary frame falling in case the lever 32 were maliciously or unintentionally manipulated without the handle 29 being applied to the shaft 27, I secure on the other end of the shaft 27 from the one carrying the pinion 25, the pinion or ratchet 35, with which coöperates a dog 36 which is pivoted upon the end 17 of the auxiliary frame, and it will be understood that the end castings 10 and 11 are provided at each end with slots 37, one of which is shown in Fig. 1, to accommodate the vertical movement of the shaft 27 and of the pintle 38, upon which the dog 36 is pivoted. When the machine is to be readjusted for another position, of course, it will be understood that the dog 36 is thrown off into the dotted-line position of Fig. 5, the handle 29 is applied, and after the handle 32 has been moved to release the plungers, the handle 29 is swung to rotate the shaft 27 to the desired position of adjustment, and when this is reached the plungers 30 are allowed to fly into engagement with the adjacent recesses 31 to secure the auxiliary frame in the proper position for coöperation with the bottles of the particular height for which the adjustment is made.

There is one of the capping mechanisms proper for each bottle, there being twelve in all in the specific machine illustrated, and the details thereof are best shown in Figs. 3, 6, 7, 8 and 9, where it will be seen that the frame 20 is provided with the downwardly extending sleeves 42, in which slide shanks 43 to the extent permitted by the retaining screws 44 passing through the sleeves 42 and into the slots 45 formed in the shanks. These shanks have the reduced portion sliding in the sleeves 42, as well as the yoke portion 46, which is slotted to permit of the entrance of the actuating mechanism to be described. The shanks 43 have secured thereto, as by the pins 47, the plunger tubes 48, which consist of the elongated tubes having the slots 49 in the inner sides thereof in register with the slots in the yokes 46 of the shanks 43. These tubes have secured at their lower ends the base members 50, which have the annular flanges 51 on the under sides thereof, adapted to receive the mouths of the bottles. In order to accurately position the mouths of the bottles relative to the apertures 52 in the base members through which the caps pass, I preferably provide the four equi-distant springs 53, which are of the shape clearly shown in Fig. 8. These springs are secured, as by the screws 54, to the outer wall of the flange 51, and have their ends bent about the flange and projecting upwardly and inwardly therein. The apertures 52 have their sides flaring upwardly so as to automatically position the caps 55 as they are gripped therein by the mechanism to be described.

The tubes 48 are preferably provided with the spring clips 56, which serve to support the upper ends of the cap supply tubes 57, the lower ends of which are supported in the annular bosses 58 formed on the bottoms of the tubes 48. These bosses are preferably cut away at their outer sides, and a corresponding portion of the tube is also cut away, as at 59, so as to expose the lowermost of the caps, so that their position and operation can be readily observed, and so that it can also be noticed when they are about exhausted. The caps are preferably pressed downwards in the tubes by the weights 60, so that as the slides 61, which reciprocate in the ways 62, are operated, one of the caps will be forced at a time through the passage 63 formed between the tube 48 and the base member 50 supported thereby. As clearly shown in Fig. 6, I provided on the under side of the slide 61 the strengthening flange or rib 41, which is used in order to give the necessary strength to the pusher, so that there is no possibility of its bending if its movement should be resisted by reason of the caps being stuck in the tubes. I have found by experience that if a slide be employed which is no thicker throughout than the thickness of the cap, and there is any resistance to its movement, there is a possibility of its being bent and of the machine clogging. By strengthening the slide in the manner shown, I am still enabled to retain the surfaces 40 at the proper level beneath the top of the slide, for the lowermost cap to rest on, and still have sufficient strength in the slide to cut or force its way through any caps that may be caught. This rib 41 on the slide prevents any possibility of the caps crowding underneath the slides, which I found was likely to occur with a uniformly thin slide.

The plunger is preferably made sectional, and consists of the head 64 having the ears 65 between which the link 66 is pivoted on its upper surface, and having the stem 67 projecting downward from the center thereof. This stem 67 reciprocates in the bore 68 of the lower portion 69 of the plunger. This lower portion preferably has a head of a diameter to substantially fill the tube 48, and the reduced portion 70 of a lesser diameter, the helically-coiled expanding-spring 71 being interposed between the head 64 of the upper portion, and the offset between the head and the reduced portion of the lower portion of the plunger. The reduced portion 70 is slotted, as at 72, and the pin 73 passed through the stem 67 secures the two parts together, with the possible telescoping move-

ment resulting from the construction described.

The actuating mechanism for the apparatus is preferably composed of the two shafts 21 and 22, and the connections to be described. The shaft 21 extends through a slot 74 in the end casting 11, and is journaled in bearings in the end pieces 17 and 18. A handle 76 is secured to the shaft, and it is normally held in the operative position of the parts by any suitable means, such as a spring pressed plunger, indicated at 77, carried by the handle and coöperating with a notch, not shown, in the segmental bearing 78 supported from the end piece 18. The two shafts 22 and 21 are compelled to rock in unison by reason of the pinions 79 and 80 secured thereto and meshing with each other. The shafts 21 and 22 have secured thereon, opposite each of the tubes 48, the arms 81, which project through the slots 49 into the tubes 48, and are pivoted to the links 66, so that as the shafts 21 and 22 are rocked the plungers will be raised and lowered. The shaft 22 has connected thereto, by means of the arms 82, the link 83 connected to an arm 84 of the rock shaft 24, so that as the shaft 22 is rocked, the shaft 24 will also be rocked, and the shaft 21 has similar connections with the shaft 23, so that it is rocked in the same direction. The slides 61 have pivoted thereto the links 85, which are preferably adjustable in length by a threaded connection (not shown), and are pivoted to the arms 86 secured to the rock shafts 23 and 24, respectively.

The operation of the complete apparatus is as follows: The machine is first adjusted to the particular sized bottles to be capped, and a box having the filled bottles therein being shoved in place beneath the machine, the handle 76 is rocked from the position shown in Fig. 1, and as it is thus rocked, the shafts 21 and 22 are rocked in the proper direction to lower the links 66, and consequently the plungers. During the first part of the downward movement of the plungers, the ends of the forks 46 of the shanks 43 rest on the head 64, and the entire apparatus descends until the base pieces 50, and more especially the flanges 51, rest upon the tops of the bottles, after which the continued movement of the plungers causes them to descend independently of the tubes 48, with the result that they engage the caps 55, which have been positioned by the slides 61 during their inward movement. Their continued downward movement forces the caps through the apertures 52 and onto the seats in the mouths of the bottles, and the yielding connections between the head proper of the plunger and the actuating portion permit it not only to seat the cap very firmly, but also to allow for any possible variation in the heights of bottles having the same capacity. As the movement of the handle is reversed, the plungers first ascend without moving the tubes 48, until the heads 64 engage the shoulders formed by the bottoms of the forks 46, after which the capping mechanism as a whole is raised. During the upward movement of the parts, the toggle lever connections 85 and 86, operated by the rocking of the shafts 23 and 24, force the slides 61 inward to push fresh caps into position ready for the next operation.

While I have herein shown and described my invention as provided with means for adjusting the machine embodying it, for use in capping bottles of different sizes, such as half pints, pints and quarts, I do not herein claim this adjusting feature of my invention, as the generic claims for that feature are found in my application No. 353,347, filed January 21, 1907.

While I have shown and described my invention as embodied in the form which I at present consider best adapted to carry out its purposes, it will be understood that it is capable of modifications, and that I do not desire to be limited in the interpretation of the following claims except as may be necessitated by the state of the prior art.

What I claim as new, and desire to secure by Letters Patent of the United States, is:

1. In a device of the class described, the combination with the frame, of the plunger tube movable therein, the cap-supplying mechanism moving with the tube, the plunger for seating the cap, a rock shaft, connections between the rock shaft and the plunger for operating the latter, a second rock shaft, connections between said second rock shaft and the cap-supplying mechanism to operate the latter, connections between the first rock shaft and the second rock shaft, and means for rocking the first shaft.

2. In a device of the class described, the combination with the frame, of the two rows of bottle-capping mechanisms adapted to slide therein, the cap-supplying mechanisms connected to and moving with the bottle-capping mechanisms, the two parallel rock shafts extending along the bottle-capping mechanisms outside thereof, the two parallel rock shafts extending between the rows of bottle-capping mechanisms, connections between the outer shafts and the cap-supplying mechanisms, connections between the inner shafts and the bottle-capping mechanisms, and means for rocking the shafts.

3. In a device of the class described, the combination with the frame, of the two rows of bottle-capping mechanisms adapted to slide therein, the cap-supplying mechanisms connected to and moving with the bottle-capping mechanisms, the two parallel rock shafts extending along the bottle-capping mechanism outside thereof, the two parallel rock shafts extending between the rows of

bottle-capping-mechanisms, connections between the outer shafts and the cap-supplying mechanisms, connections between the inner shafts and the bottle-capping mechanisms, arm and link connections between the inner and the outer shafts, gear-pinion connections between the inner shafts, and means for rocking one of said shafts.

4. In a device of the class described, the combination with the frame, of the two rows of bottle-capping mechanisms adapted to slide therein, the cap-supplying tubes associated therewith, the slides adapted to reciprocate beneath said tubes, parallel rock shafts extending between said rows, connections between said rock shafts and the bottle-capping mechanisms to operate the latter by the rocking of the shafts, the pair of parallel rock shafts extending along the bottle-capping mechanisms outside thereof, toggle-joint connections between said outer shafts and the slides, and means for rocking said shafts.

5. In a device of the class described, the combination with the frame, of the shank sliding therein, the tube extending below the shank, the plunger loosely sliding therein during a portion of its movement, the cap-supplying mechanism, and means for giving the plunger a longer movement than its play in the sleeve to first raise the plunger, then the plunger and sleeve, and to lower the sleeve and plunger, and finally to lower the plunger alone.

6. In a device of the class described, the combination with the frame, of the slotted shank sliding therein, the slotted tube extending below the shank, the plunger loosely sliding in the tube for a portion of its movement, the cap-supplying mechanism, a rock arm extending into the slot in the tube and connected to the plunger, a rock shaft to which the rock arm is connected, connections between said shaft and the cap-supplying mechanism, and lost-motion connections between said plunger and the tube, for the purpose described.

7. In a device of the class described, the combination with the frame, of the shank sliding therein, the tube extending below the shank, the plunger loosely sliding therein for a portion of its movement, the cap-supplying mechanism, lost-motion connections between the plunger and the tube, and means for reciprocating the plunger, said plunger consisting of two telescopic parts and a spring interposed between said parts.

8. In a device of the class described, the combination with the frame, of the shank sliding therein, the tube extending below the shank, the plunger loosely sliding therein for a portion of its movement, the cap-supplying mechanism, lost-motion connections between the plunger and the tube; and means for reciprocating the plunger, said plunger consisting of the upper head and stem, the lower head and sleeve in which the stem reciprocates, connections between the stem and the sleeve, and a helically-coiled expanding-spring interposed between the two heads.

9. In a bottle-capping machine, the combination with the cap supply tube, of the pusher adapted to reciprocate across one end thereof to discharge the caps one by one, said pusher having its edges of a thickness less than that of the cap, and a strengthening rib at the center on the outer face thereof, suitable guides for the thin edges of the pusher preventing any vertical movement thereof, and means for reciprocating the pusher.

In witness whereof I have hereunto set my hand and affixed my seal, this 10th day of May, A. D. 1907.

STANLEY WILKINSON. [L. S.]

Witnesses:

JOHN HOWARD MCELROY,

M. S. REEDER.