W. A. SHIMP.

BOTTLE CAPPER.

APPLICATION FILED JAN. 31, 1916.

1,277,494.

Patented Sept. 3, 1918.

2 SHEETS—SHEET 1.

Fig. 1

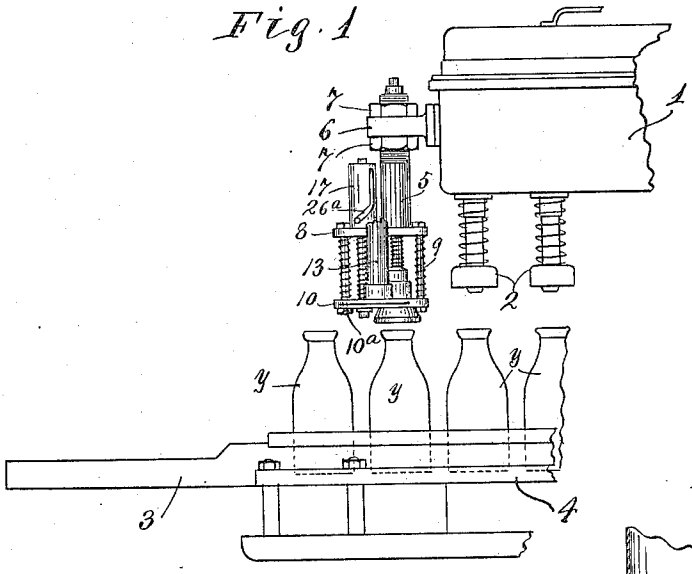


Fig. 3

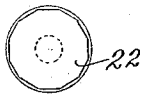


Fig. 2

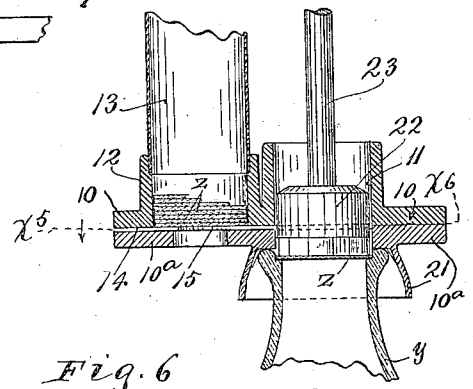


Fig. 4

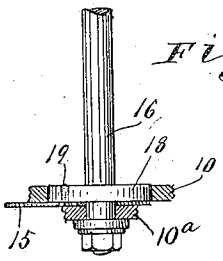


Fig. 5

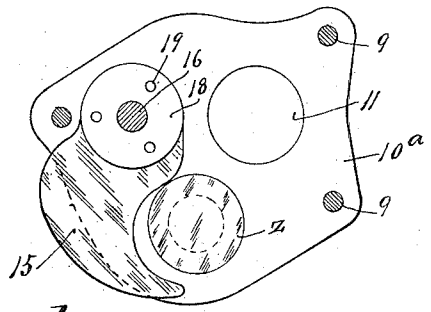
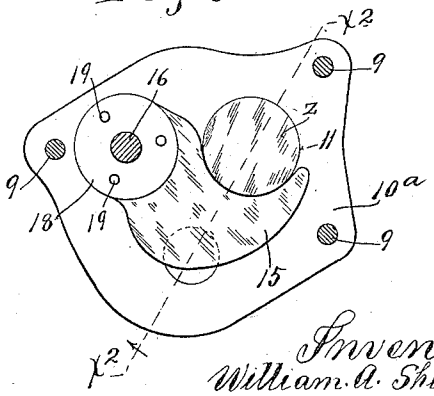


Fig. 6



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2 SHEETS—SHEET 2.

Fig. 7

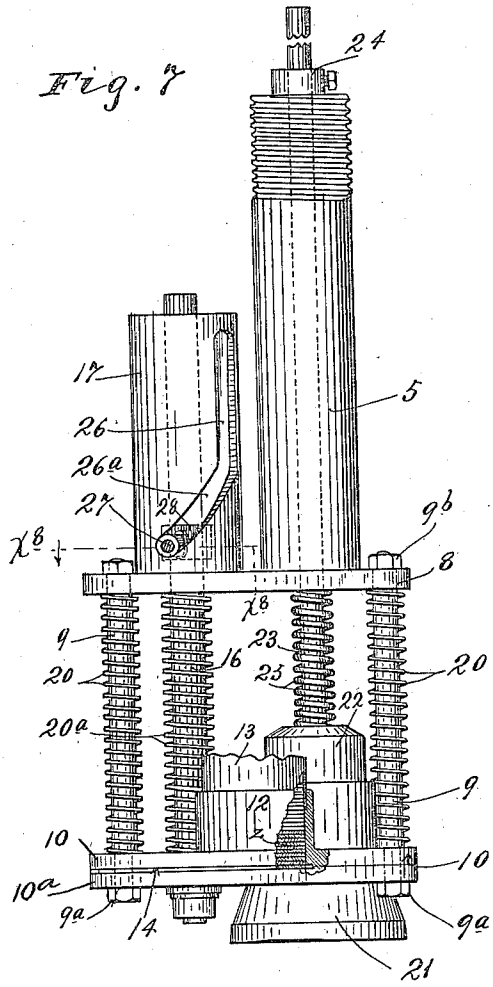
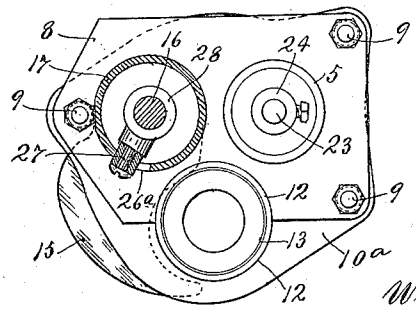


Fig. 8



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UNITED STATES PATENT OFFICE.

WILLIAM A. SHIMP, OF MINNEAPOLIS, MINNESOTA.

BOTTLE-CAPPER.

1,277,494. Specification of Letters Patent. Patented Sept. 3, 1918.

Application filed January 31, 1916. Serial No. 75,267.

To all whom it may concern:

Be it known that I, WILLIAM A. SHIMP, a citizen of the United States, residing at Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Bottle-Cappers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to bottle capping machines of the type wherein paper caps are pressed into seats formed in the necks of the bottles, and generally stated, consists of the novel devices and combinations of devices hereinafter described and defined in the claims.

More definitely stated, the invention relates to capper heads for such bottling machines and the chief novelty is an improved means for delivering the disk-like caps from the cap magazine to the cap applying plunger.

In the accompanying drawings which illustrate the invention, like characters indicate like parts throughout the several views.

Referring to the drawings:

Figure 1 is a side elevation showing the improved capper head applied to a filling and capping machine, some of the parts of which are broken away;

Fig. 2 is a vertical section cut through the capper head in a plane that intersects the axes of the plunger seat and cap magazine, some parts being broken away;

Fig. 3 is a bottom plan view of the cap applying plunger;

Fig. 4 is a fragmentary view chiefly in vertical section, showing the manner in which the cap delivery blade is connected to its operating shaft;

Figs. 5 and 6 are detail views in plan showing parts located chiefly below the line marked x^5 x^6 on Fig. 2 and illustrating the manner in which the delivery blade carries the cap from the bottom of the magazine to a position under the plunger;

Fig. 7 is a side elevation showing the capper removed from the machine and on a larger scale than in Fig. 1, some parts being broken away and some parts being sectioned; and

Fig. 8 is a section on the line x^8 x^8 of Fig. 7, with some of the parts left in full plan view.

Of the parts of the combined filling and capping machine illustrated, the numeral 1 indicates the relatively fixed elevated filler tank, the numeral 2 the filling valves which depend from said tank, the numeral 3, the forwarding rack for supporting the bottles Y, and the numeral 4, the vertically movable table which supports the forwarding rack. In a machine of the character illustrated, as is well known, the forwarding rack 3 and its bottles will be intermittently raised to present the bottles, in succession, to the filling valves, which latter open automatically when the bottles are pressed against it, and the bottles are progressively moved forward, step by step, and after they are filled, are delivered to the capping device of the so-called capper head.

The capper head, as is customary, is preferably supported from the filling tank 1, but it involves radically new and improved features of construction, the preferred arrangement of which will now be described.

A heavy sleeve 5, threaded at its upper end, is passed through a heavy lug 6 rigid on the tank 1, and is adjustably secured thereto by upper and lower clamping nuts 7. At its lower end, the sleeve 5 has a horizontally extended plate 8. Loosely secured to the plate 8 at their upper ends, is a plurality, as shown three, parallel depending guide bolts 9, which, at their lower ends, are rigidly secured to a lower or face plate 10. This lower plate 10, in axial line with the supporting sleeve 5, is provided with a cylindrical plunger seat 11, and offset therefrom with a cylindrical flange 12, which latter constitutes the lower port of a cap magazine and receives and detachably holds a cap tube 13. The lower plate 10 is preferably made up of two plate members rigidly secured together, but with the lower plate section 10^a spaced from the upper plate section 10 at 14 to afford a shallow horizontally extended working passage for a thin cap delivery blade 15. This cap delivery blade 15 (see particularly Figs. 5 and 6) has a sort of a hook shape form, and at one end is rigidly secured to the lower end of an upright shaft 16, the lower end of which is journaled in the plate 10 and the upper

end of which is extended through the upper plate 8 and works within a tubular housing 17 rigidly secured on said upper blade 8. As best shown in Fig. 4, the shaft 16 is provided with an outstanding annular flange 18 to which the blade 15 is detachably secured by screws 19. Gravity will tend to hold the plate 10 downward as far as permitted by the heads 9^a and nuts 9^b of the guide bolts 9, but this is preferably further insured by coiled springs 20 placed around the said bolts and compressed between the said plates 8 and 10.

By reference to Fig. 2 it will be noted that the plunger seat 11 is extended completely through the lower plate 10, and that the latter is provided, in axial alinement therewith, with a depending bottle alining flange 21.

The plunger for applying the caps Z to the bottles, comprises a head 22 and a stem 23, which latter works axially through the supporting sleeve 5, and above said sleeve is provided with an adjustable stop collar 24 that limits the extreme movement of the said head 22 below the upper plate 8. The said plunger is yieldingly pressed down by a heavy coiled spring 25 applied around the stem 23 and compressed between the said head, and the upper plate 8. The main body portion of the plunger head 22 quite closely fits its seat 11, but the lower peripheral portion thereof, is slightly reduced and made polygonal, as best shown in Figs. 2 and 3. I found that a plunger head made in this way will better adapt itself to the necks of bottles that vary somewhat in diameter and by producing the polygonal kink or bend in the edge of the cap, will cause the cap to fill the mouth or cap seat in a relatively large bottle neck, and in a relatively small neck, will have a chance to displace the bent edge portions of the cap, and, hence, will not break the bottle neck.

The tubular housing 17 is formed with a cam slot, the upper portion 26 of which is vertical, and the lower portion 26^a of which is oblique. The shaft 16 of the delivery blade 15 is provided with a radial projection that works in the cam slot $26—26^a$. This projection is preferably in the form of a roller-equipped stud 27 secured to a sleeve 28, which, in turn, is rigidly secured to the shaft 26 (see particularly Fig. 8). By reference to Figs. 5 and 6 it will be noted that the axis of the shaft 16 is equidistant from the axes of the magazine 12 and of the plunger seat 11, and that the concave edge of the delivery blade 15 is of such shape as to position the engaged cap Z with its axis alined, first with the axis of the magazine and then with the axis of the plunger seat 11.

Normally, the lower plate 10 will be depressed to its limit, as shown in Figs. 1 and 7. As shown, the coiled spring 20^a is placed around the shaft 16 and compressed between the plates 8 and 10. This spring is not necessary to the operation of the delivery blade 15 and simply reinforces the actions of the springs 20 in yieldingly pressing the plate 10 downward. Normally, the cam stud or projection 27 of the shaft 16 is at the lower extremity of the oblique portion 26^a of the cam slot, and the delivery blade 15 will be in its retracted or normal position shown in Fig. 5. When, by an upward movement of the table 4 and rack 3, a bottle is pressed within the alining flange 21 and against the lower plate 10, the said lower plate, and, of course, the cap magazine and delivery plate 15 which are carried thereby, will be moved upward; and, as the cam stud 27 travels in the oblique portion 26 of the cam groove or channel, it will cause the delivery blade 15 to move from the position shown in Fig. 5 into the position shown in Fig. 6, and thereby position the lowermost cap of the magazine stack within the plunger seat 11 and directly under the plunger 22. Further upward movement of the plate 10 will cause the cam stud 27 to travel in the vertical portion 26 of the cam groove, and hence, will hold the delivery blade 15 stationary during that part of the movement. However, that part of the upward movement which causes the cam stud to travel in the said vertical portion of the cam groove, causes the plunger 22 to press the positioned cap into the mouth of the bottle neck. The spring 25 must, of course, have sufficient strength to properly force the cap into the bottle, but it will, nevertheless, yield under less force than would be required to break the bottle, and hence, will compensate for varying lengths of the bottles. When the table 4 and rack 3 are lowered, the lower plate 10 and parts carried thereby will be dropped back to their normal positions and the delivery blade 15 will, of course, be restored to its normal position, ready to take the lowermost cap from the magazine on the next subsequent action.

Under the above described movements of the delivery blade 15, that surface of the lower plate 10 which is at the bottom of the shallow clearance passage 14, serves as a face plate over which the caps are delivered from the magazine to the plunger seat. The delivery of the caps is accomplished in a very simple and reliable manner and without in anywise distorting the caps. As shown, the capping device or head is attached to a relatively fixed support and the bottles are mounted on a vertically movable support, but as is evident, this arrangement might be reversed, so far as the action of the capping device, itself, is concerned. I have described a device that has been put into actual

use and found highly efficient, but it will, of course, be understood that the same may be modified within the scope of my invention.

What I claim is:

1. In a bottle capping device, the combination with relatively movable upper and lower members and yielding means tending to separate the same, of an open bottomed cap magazine secured to said lower member, said lower member having a plunger seat offset from said magazine, a face plate secured to said lower member but slightly spaced from a portion thereof and from the lower end of said magazine and from the lower extremity of said plunger seat to afford a horizontal blade passage, said face plate having a plunger passage alined with said plunger seat, a plunger yieldingly anchored to said upper member with its lower end in the plunger seat of said lower member but normally above said plunger passage, a thin delivery blade provided with an upwardly extended shaft mounting the same for pivotal movement to deliver the caps from the bottom of said magazine into alinement with said plunger seat and plunger passage, and a spiral cam-acting connection between said upper member and the shaft of said delivery blade operating to oscillate said delivery blade when one of said first noted members is moved toward the other.

2. In a bottle capping device, the combination with relatively movable upper and lower members and yielding means tending to separate the same, of an open bottomed cap magazine secured to said lower member, said lower member having a plunger seat offset from said magazine, a face plate secured to said lower member but slightly spaced from a portion thereof and from the lower end of said magazine and from the lower extremity of said plunger seat to afford a horizontal blade passage, said face plate having a plunger passage alined with said plunger seat, a plunger yieldingly anchored to said upper member with its lower end in the plunger seat of said lower member but normally above said plunger passage, a thin delivery blade provided with an upwardly extended shaft mounting the same for pivotal movement to deliver the caps from the bottom of said magazine into alinement with said plunger seat and plunger passage, and a tubular housing rigid on said upper member surrounding the upper portion of the shaft of said delivery blade and provided with a slot, a portion of which is vertical and a portion of which is oblique, and said blade shaft having a projecting cam pin working in said slot to oscillate said delivery blade when one of the said first noted members is moved toward the other.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM A. SHIMP.

Witnesses:

HARRY D. KILGORE,

F. D. MERCHANT.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."