

Sept. 22, 1931.

E. S. DARNER

1,824,660

BOTTLE CAPPING MACHINE

Filed Oct. 1, 1930

2 Sheets-Sheet 1

Fig. 1.

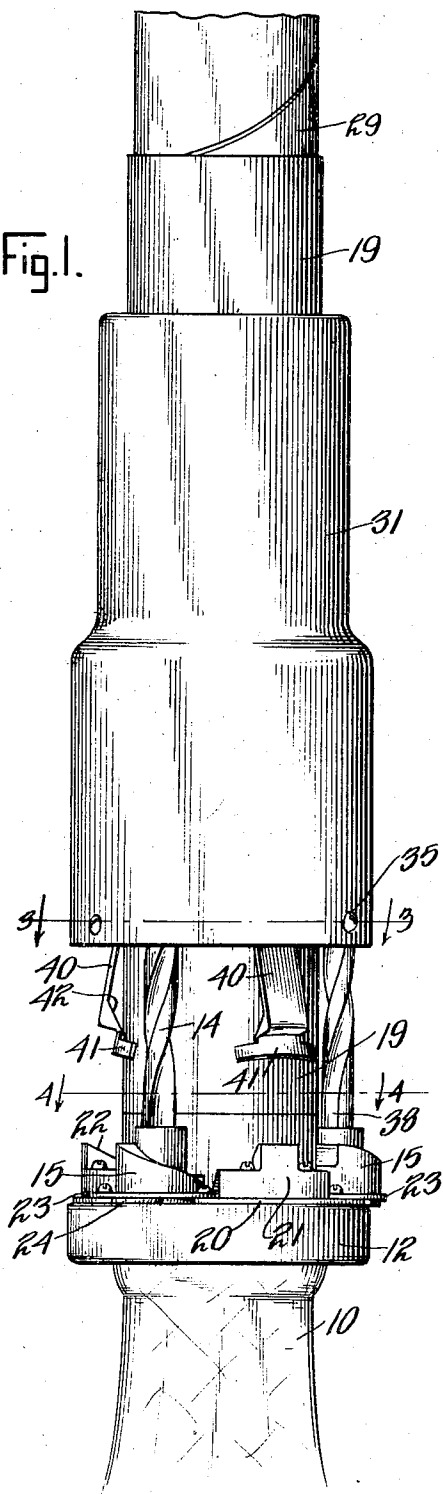
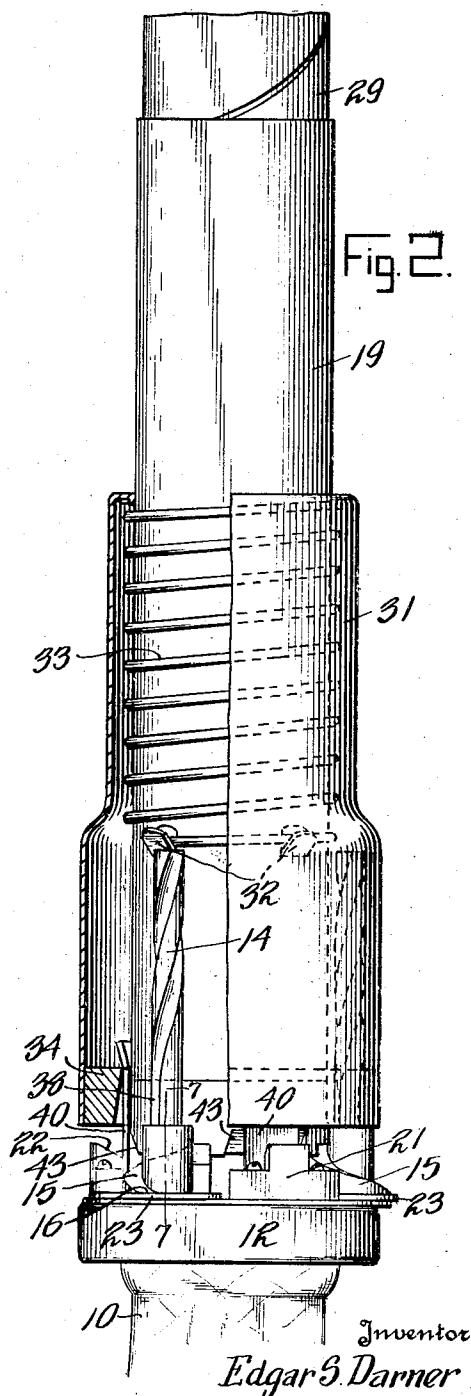


Fig. 2.



Inventor
Edgar S. Darner

334

Edgar S. Darner

Attorney

Sept. 22, 1931.

E. S. DARNER

1,824,660

BOTTLE CAPPING MACHINE

Filed Oct. 1, 1930

2 Sheets-Sheet 2

Fig. 3.

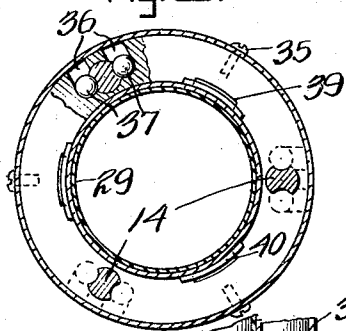


Fig. 4.

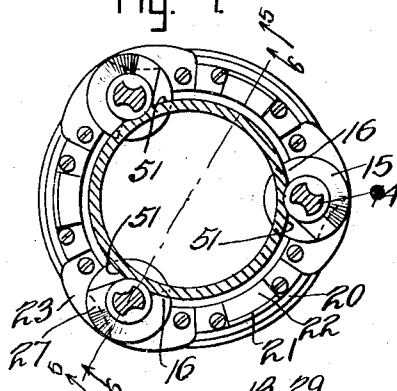


Fig. 5.

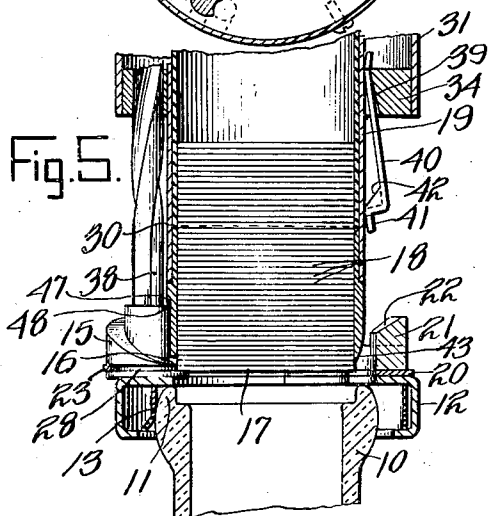


Fig. 6.

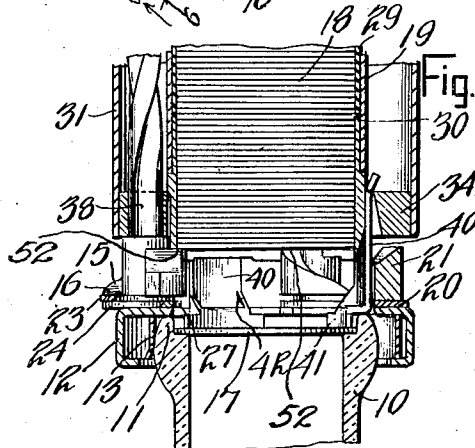


Fig. 7.

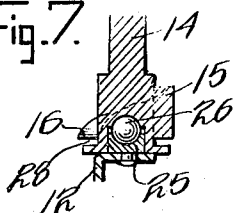
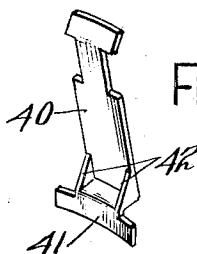


Fig. 8.



Inventor
Edgar S. Darner

W. B. Ford
Attorney

UNITED STATES PATENT OFFICE

EDGAR STOUTER DARNER, OF HAGERSTOWN, MARYLAND

BOTTLE CAPPING MACHINE

Application filed October 1, 1930. Serial No. 435,771.

This invention relates to mechanism for capping bottles and is designed particularly with a view to its use in capping milk bottles.

An object of the invention is to provide a machine for this purpose which will be simple, speedy and accurate in operation.

Other objects and advantages will become apparent as the description proceeds.

Referring to the accompanying drawings, which are made a part hereof and on which similar reference characters indicate similar parts,

Figure 1 is a view in elevation with the parts in elevated position,

Figure 2, a view partly in elevation and partly in section with certain elements in the lowermost position,

Figure 3, a section on line 3—3 of Figure 1,

Figure 4, a section on line 4—4 of Figure 1,

Figure 5, a vertical section showing the bottle cap releasing means in position for raising the caps,

Figure 6, a vertical section showing the caps raised to their uppermost position and showing the cap in position on the bottle,

Figure 7, a section on line 7—7 of Figure 2, and

Figure 8, a detail of one of the pushers.

In the drawings numeral 10 indicates a milk bottle of conventional shape having a flared top 11. 12 indicates a ring which fits over the top of the milk bottle and which is centered and held in position by means of springs 13. Mounted upon the ring 12 is a series of spiral rods 14 which carry cams 15 on their lower ends which cams have sharp edges as shown at 16 for separating the lowermost bottle cap 17 from the stack of caps 18 which are contained in a cylindrical tube 19. Spaced around the top of the ring 12 and secured to it are plates 20 upon which plates are mounted blocks 21 having sloping interior portions 22 for a purpose which will later appear. If desired the plates 20 and the blocks 21 may be made integral with the ring 12. Mounted upon and closing the space between the ends of plates 20 are plates 23. These plates are notched on their inner side to receive a spindle on the lower end of the spiral 14 and a disk 24 is secured to or made

integral with the cam 15. The cam is held against vertical movement by the plate 23. A block 25 having a ball 26 seated in a socket therein provides a ball bearing for the cams. The plate 24 has a cut-out portion at 27 to permit the bottle caps to pass down into and be seated in the mouth of the bottle. A space 28 is provided between the lower end of the cam and the plate 24 and the plate 23 engages in this space on the outer side and on its inner side the space receives the edge of the bottle cap 17, as shown in Figure 5.

The tube 19 has a shoulder portion shown at 30 in which a cardboard or other tube 29 containing the bottle caps rests. The inner diameters of the tube 29 and the tube 19 at shoulder portion 30 are the same, namely, slightly greater than that of the diameter of the bottle caps. Surrounding the tube 19 is an operating sleeve 31. The tube 19 is provided with a number of lugs 32, preferably formed by punching out a portion of the metal of the tube and a coil spring 33 is seated on these lugs, and has its upper end pressing against an inner flange on the operating sleeve 31. Within the lower end of the sleeve 31 is fitted a ring 34, the ring being preferably secured in the sleeve by means of screws 35. The ring 34 has a number of axial bores 36 in its rim to receive the ends of the spiral screws 14. The sides of the holes 36 are cut out to receive balls 37 which engage in the spirals in the screws 14 to rotate these screws when the sleeve 31 is moved vertically. The spiral groove in the members 14 terminates at its lower end in a straight groove at 38 so that when the ring 34 reaches a certain point in its downward travel further movement will not rotate the spirals 14 but will hold them in the position to which they have been moved. This is the position in which the cut out portion 27 is just beneath the bottle cap so that the cap may drop upon the bottle. Positioned in notches 39 in the inner portion of the ring 34 are a number of pushing plungers 40, the plungers being preferably held in the notches by means of heads 45 which engage the inner face of the ring 34 and shoulder portions 46 against which the lower side of the ring 34 rests. The plungers 40 have their

lower portions 41 in the shape of an arc which portion is set in and is adapted to engage the surface of a bottle cap. The inner portion of these plungers is provided with a camlike surface at 42 which is engaged by the lower edge of the tube 19 to move these plungers outwardly as the sleeve 31 is raised. A portion of the lower edge of the tube 19 is preferably formed with a beveled edge, as shown at 43 on which edge the cam surface 42 of the plungers rides.

In operation a tube 29 of bottle caps is inserted within the tube 19 and pushed down so that its lower end rests upon the shoulder 30. The ring 12 is then positioned on the top of a bottle and the sleeve 31 is pressed down. As this moves downwardly the balls 37 acting in the grooves in the spirals 14 rotate these together with the cams 15 on their lower ends. As the cams rotate the edges 16 engage between the lowermost bottle cap and the one next above it to separate the two, the lowermost cap being held in the notch 28 and resting upon the plate 24. The remaining caps in the tube together with tube are caused to move upwardly by the upper cam surface of the cam 15. When the cams have been rotated to the position at which the cut-out portion 27 registers just below the bottle cap the plungers 40 will strike the sloping edge 22 of the members 21, move inwardly, and at this time the balls 37 will have reached the straight groove 38 of the spirals 14. The spirals will therefore no longer be rotated and downward movement of the sleeve 31 will cause the plungers 40 to press the bottle cap down into the neck of the bottle as shown in Figure 6. Upon releasing the sleeve 31 the spring 33 will raise it to its elevated position and as it moves upwardly the balls 37 will rotate the spiral in the reverse direction to allow the bottle caps and tube 19 to drop down to the point at which they rest on the plate 24. A shoulder 47 on the tube 19 also rests on the shoulder 48 on the spirals 14. The above operation may be manually performed and by means of this device bottles may be manually capped very rapidly. The device, of course, is not limited to its use in hand operated bottle capping operations but may be adapted for use with machines by means of which the simple mechanical movements necessary may all be easily carried out.

It will be obvious to those skilled in the art that various changes may be made in my device without departing from the spirit of the invention and therefore I do not limit myself to what is shown in the drawings and described in the specification, but only as indicated in the appended claims.

Having thus fully described my said invention, what I claim as new and desire to secure by Letters Patent, is:

1. A bottle capping machine comprising a ring adapted to seat upon the top of the bottle,

centering means for said ring, a tube adapted to hold bottle caps supported by said ring, spiral rods carried by said ring, a sleeve slidably mounted on said rods, cap holding and delivering means carried by said ring, and means operable to push a cap upon a bottle when the same has been released by the said delivering means, substantially as set forth.

2. In a bottle capping machine having a tube for receiving bottle caps, means for supporting and selectively releasing bottle caps one by one comprising rotary cams having edges adapted to move between the lowermost cap and the one next above it to separate said cap from the stack of caps, each cam having a surface for raising the remaining caps and tube, and means for pushing the separated cap into the neck of the bottle, substantially as set forth.

3. A bottle capping machine comprising a ring adapted to seat upon a bottle, a tube supported by said ring, a sleeve surrounding said tube, a plurality of spiral rods carried by said ring said rods having cams on their lower ends with means thereon for separating the lowermost bottle cap from the remainder of a stack of caps, spirals on said rods to elevate the stack of caps and tube after the outermost cap is separated therefrom, and a series of pushers carried by the said sleeve for pressing the separated cap into the neck of the bottle, substantially as set forth.

4. A bottle capping machine comprising a ring adapted to seat upon a bottle, a tube carried by said ring, a sleeve surrounding said tube, a plurality of spiral rods carried by said ring said rods having cams on their lower ends with means thereon for separating the lowermost bottle cap from the remainder of a stack of caps, spirals on said rods to elevate the stack of caps and tube after the outermost cap is separated therefrom, and a series of pushers carried by the said sleeve for pressing the separated cap into the neck of the bottle, and balls carried by said sleeve adapted to set in grooves in the spirals to rotate them to cause the cam to separate the lowermost bottle cap and to elevate the remainder, substantially as set forth.

5. A milk bottle capper comprising a tube for carrying bottle caps, a plurality of pushers for pressing the cap into the neck of the bottle, a rotating plate upon which the caps rest, means for separating a cap from the supply of caps in the tube and for lifting the remaining caps and tube, said rotating plate serving to retain the separated cap until the supply of caps has been lifted away to permit the pushers to enter between the supply of caps and the separated cap, and to press the separated cap into the neck of the bottle, substantially as set forth.

6. A milk bottle capper comprising a tube

for holding a supply of caps, a sleeve mounted upon said tube, said sleeve carrying a plurality of pushers for pressing the cap into the neck of the bottle, cap retaining and separating means, said last named means serving to lift the caps and tube after one is separated from the supply of caps, said separating means having means for supporting the caps in the tube, substantially as set forth.

7. A milk bottle capper comprising a tube for holding a supply of caps, a sleeve mounted upon said tube, said sleeve carrying a plurality of pushers for pressing the cap into the neck of the bottle, cap retaining and separating means, said last named means serving to lift the caps and tube after one is separated from the supply of caps, said separating means having means for supporting the caps in the tube, said tube having a beveled lower end adapted to cooperate with cam surfaces on the pushers to extend them radially as the sleeve returns to uppermost position, substantially as set forth.

8. A bottle capping machine comprising a ring adapted to be positioned on the neck of a bottle, said ring carrying a plurality of rotary bottle cap retaining and releasing means, a tube for holding bottle caps supported by said ring, a sleeve mounted upon said tube, said sleeve having a ring positioned in its lower end, said ring engaging said bottle cap retaining means and having means for rotating them, said bottle cap retaining means having means associated therewith for limiting upward movement of the said sleeve, substantially as set forth.

9. A bottle capping machine comprising a ring adapted to be positioned on the neck of a bottle, a tube containing a supply of bottle caps supported by said ring to stand vertically upon the milk bottle, means for separating a cap and means for depositing it into the neck of a bottle and for pressing it into position, the separating means serving also to lift the remaining caps and tube to hold them out of the way, substantially as set forth.

In witness whereof, I have hereunto set my hand at Hagerstown, Maryland, this 30th day of September, A. D. nineteen hundred and thirty.

EDGAR STOUFFER DARNER.