March 6, 1934. E. T. FRANZEN ET AL 1,949,960

BOTTLE CAPPING MACHINE

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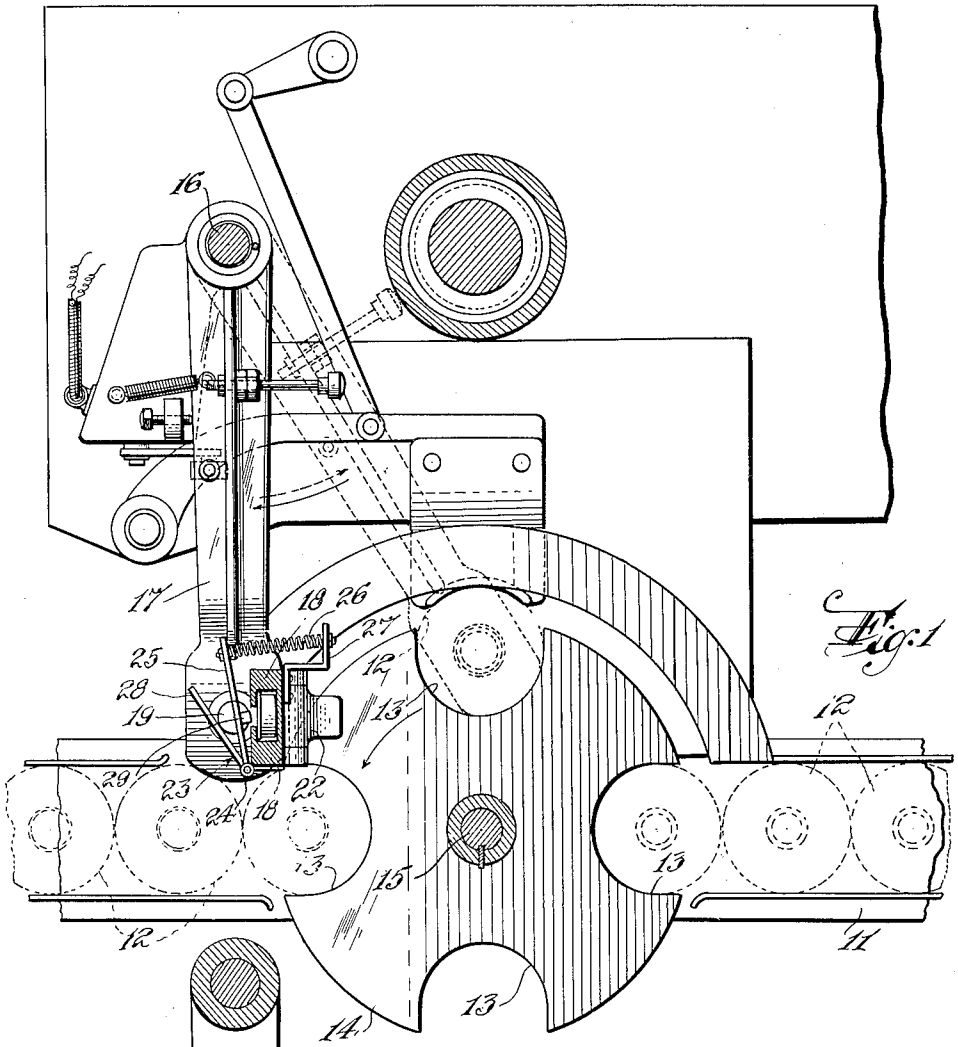


Fig. 1

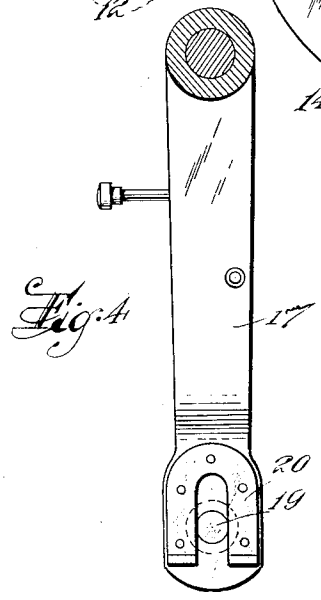


Fig. 4

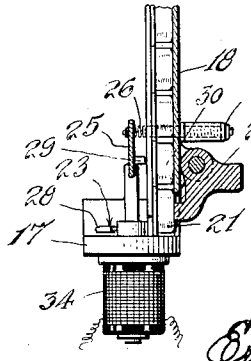


Fig. 10

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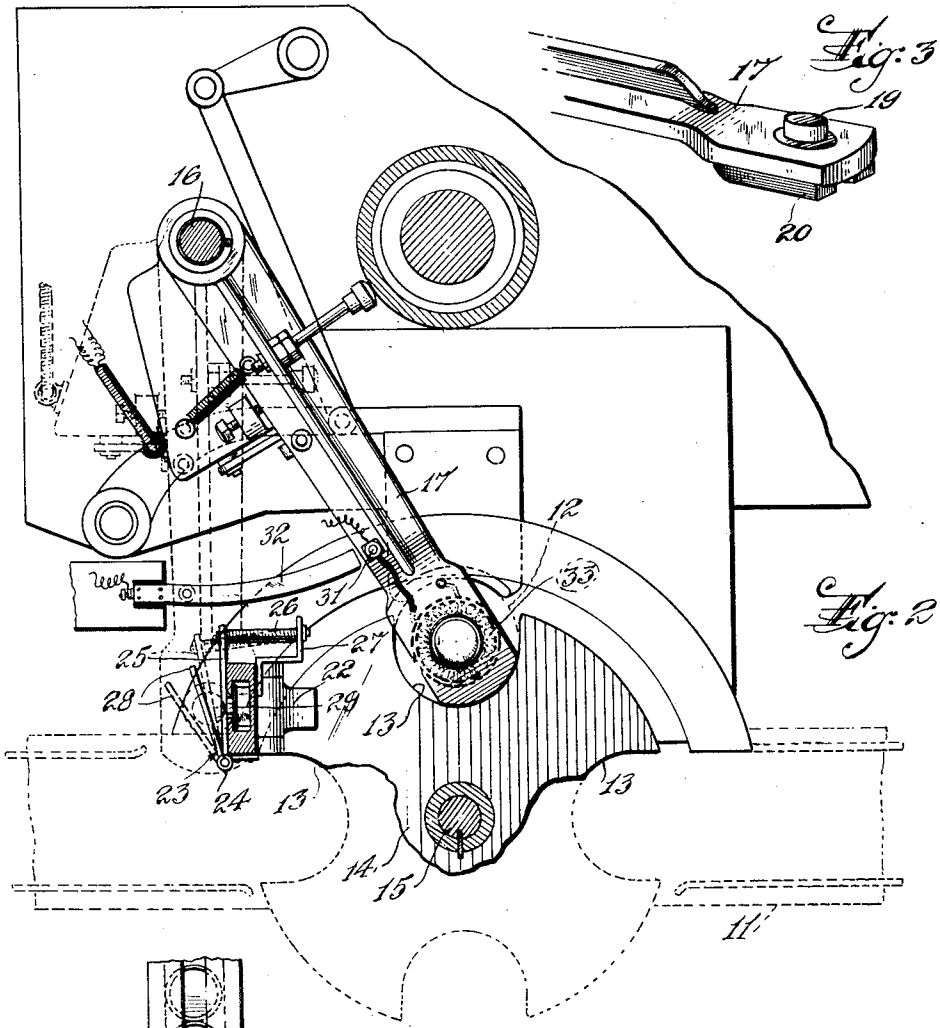


Fig. 3

Fig. 2

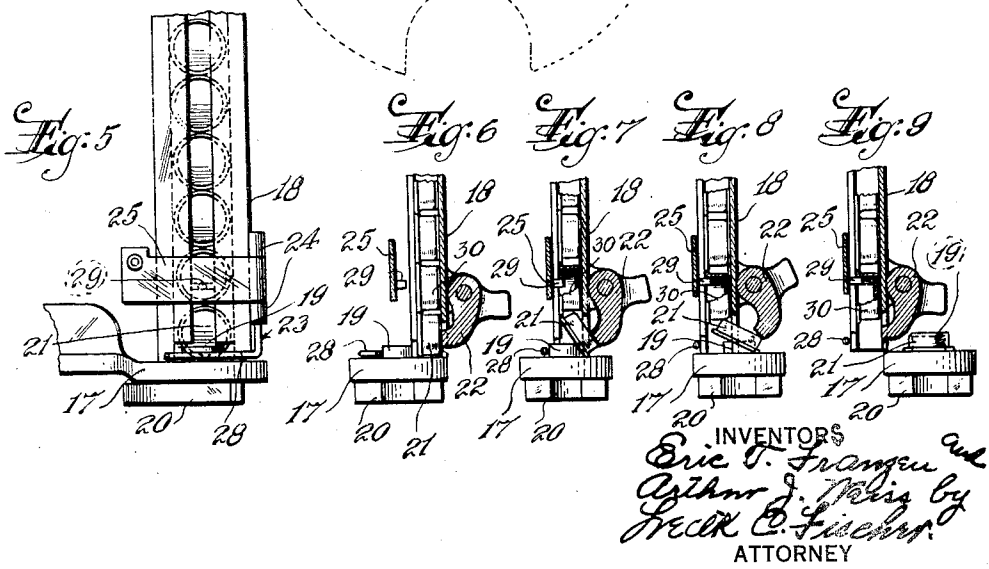


Fig. 5 Fig. 6 Fig. 7 Fig. 8 Fig. 9

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BOTTLE CAPPING MACHINE

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Application December 6, 1932, Serial No. 645,912

5 Claims. (Cl. 226—88.1)

This invention relates to bottle capping machines, and more particularly to improvements which enable a cap to be positively held during the capping operations, and for speeding the operations of said machines.

In capping machines of a well known type, the bottles to be capped are placed on a conveyor belt and automatically diverted into a position to receive a cap. The caps are usually fed through a chute onto an oscillating arm, which moves from the chute to a position beneath a capholder and above the bottle to be capped. At the latter position the cap is picked up by the capholder and then forced into position on the bottle.

These machines, heretofore, have been objectionable in that the caps often fall off of the arm during its movement from the chute to the capholder. Obviously, the frequent dislodgment of the caps on the arm seriously impedes and slows up the operation of the machine.

It is therefore, an object of this invention to provide, in a bottle capping machine, an arm having means thereon for positively holding a cap until it has been properly removed by the capholder.

A further object of the invention is the provision of an arm in a bottle capping machine having magnetic means for positively holding caps thereon.

A further object is the provision of magnetic means for positively holding a cap on an arm of a bottle capping machine, the magnetic means being periodically de-energized at a predetermined point to enable the cap to be easily removed from the arm.

These and other objects which will later appear, are accomplished by the simple and practical construction and arrangement of parts hereinafter described and exhibited in the accompanying drawings, forming part hereof, and in which:

Fig. 1 is a plan view of a section of a bottle capping machine, embodying our invention,

Fig. 2 is a similar view embodying another form of our invention,

Fig. 3 is a perspective view of the end of a cap carrying arm having a permanent magnet attached thereto,

Fig. 4 is a bottom view of the arm shown in Figs. 1 and 3,

Fig. 5 is an elevational view of a cap conveying chute and the cap carrying arm,

Figs. 6, 7, 8 and 9 are end views of the arm and cap conveying chute, showing the various positions assumed by the parts during the operation of depositing a cap on the arm, and,

Fig. 10 is an end view of a cap carrying arm showing the use of an electromagnet instead of a permanent magnet.

Referring to the drawings, in Fig. 1 is shown a conveyor 11 which feeds bottles 12 into notches 13 in a plate 14 attached to the shaft 15 which is rotated and periodically stopped to place one of the bottles beneath a capholder (not shown) as is common and well known in machines of this type.

Attached to a shaft 16 is a cap carrying arm 17 which is periodically oscillated from a position below a cap conveying chute 18 shown in section to a position below a cap, and above a bottle, (see dotted lines in Fig. 1).

Referring to Fig. 3, the arm 17 is shown to have on its upper surface a button 19 of slightly less diameter than the cap to be carried, and to the undersurface of the arm is attached a permanent magnet 20, the arm 17 being made of brass, or a similar non-magnetic material. Referring to Fig. 6, it will be seen that initially the lowermost cap 21 in the chute 18 is positioned to one side of the button 19. As the arm 17 is moved in a counter-clockwise direction (see Figs. 1, 7) a weighted dog 22 pivotally mounted on the back wall of the chute 18 bears against the cap 21 to tilt the cap to the position shown in Fig. 8, at which time the force of the magnet 20 snaps the cap into the position shown in Fig. 9, where it will be positively held until removed by the capholder (not shown).

Fixed to a rod 23, which is pivotally mounted in bearings 24 attached to the side of the chute 18, is a plate 25, the free end of which is connected to a tension spring 26, the latter being attached to a bracket 27 mounted also on the chute 18.

The lower end of the rod 23 has a right angular bent portion 28 which engages the button 19 on the side opposite to the cap 21, see Fig. 1, when the arm 17 is in the position shown in Figs. 1 and 6. The pressure of the button on the bent portion 28 causes rotation of the plate 25 in a counterclockwise direction (see Fig. 1) against the action of the tension spring 26. As the cap 21 is being tilted by the dog 22, the arm 17 is being moved counterclockwise as above explained and the force on the bent portion 28 gradually decreases, which allows the plate 25 to be pulled against the face of the cap conveying chute 18; and a pin 29 on the plate 25 enters the next adjacent cap 30 and holds the latter in a raised out-of-the-way position until the cap 21 has been properly seated on the arm 17 and until

the arm 17 again returns to the position as shown in Figs. 1 and 6.

In Fig. 2, the arm 17 is provided on its underside with an electromagnet which is energized to hold the cap on the button 19 until the arm is beneath the capholder, at which time the electric circuit through the electromagnet is broken to enable the cap to be easily removed from the arm.

As shown in Fig. 2, the arm 17 is provided with a brush 31 which engages an arcuate contact strip 32, the latter being connected to one terminal of a source of current, while the brush 31 is connected to the solenoid 33 of an electromagnet, which in turn is connected to the other terminal of a source of current. As will be seen, when the brush 31 disengages the contact strip 32, the circuit will be broken through the solenoid 33 and the electromagnet will be deenergized so that no resistance will be offered to the removal of a cap from the button 19.

In Fig. 10 is shown an arm 17 having mounted on its underside an electromagnet 34, the solenoid of which is permanently connected to the terminals of the source of electric current. In the form shown in Fig. 10, and the form shown in Fig. 3, it is necessary to remove the cap against the forces exerted by the magnets.

From the above description it will be seen that there has been provided a simple and effective device for positively holding caps in position on an arm during the operation of conveying the cap from a chute to the position where it is to be placed on a bottle. Our device obviously will enable the speed of operation of a capping machine to be increased, and in actual practice we have obtained an increase of 50% by means of our device.

The foregoing disclosure is to be regarded as descriptive and illustrative only, and not as restrictive or limitative of the invention, of which obviously an embodiment may be constructed including many modifications without departing from the general scope herein indicated and denoted in the appended claims.

Having thus described our invention, what we claim as new and desire to secure by Letters Patent, is:

1. In a bottle capping machine, a cap carrying arm having a cap receiving button on its upper side of less diameter than the cap to be carried, and a magnet mounted on the underside of the arm, said arm being made of a non-magnetic material.

2. In a bottle capping machine, a cap carrying arm of non-magnetic material, cap receiving means on the upper side of the arm to receive a cap, and magnetic means carried by said arm to hold a cap in position on the arm.

3. In a bottle capping machine, a cap carrying arm, a button on the upper side of the arm to receive a cap, said button being of less diameter than the cap to be carried, and magnetic means carried by said arm to hold a cap in position on the button.

4. In a bottle capping machine, an oscillatable cap-carrying arm made of non-magnetic material, and having a cap-receiving button on its upper surface, a cap conveying chute, means carried by said chute and cooperating with the moving arm to partially position a cap on said button, and a magnet mounted on the arm to positively position a cap on the button and to prevent dislodgment of the cap during movement of said arm.

5. In a bottle capping machine, a cap carrying arm, cap receiving means on the upper side of the arm to receive a cap, and magnetic means carried by said arm to hold a cap in position on the arm.

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