Feb. 6, 1940. N. CORSI 2,189,628

BOTTLE CAPPING MACHINE

Filed Oct. 17, 1938

Fig. 1.

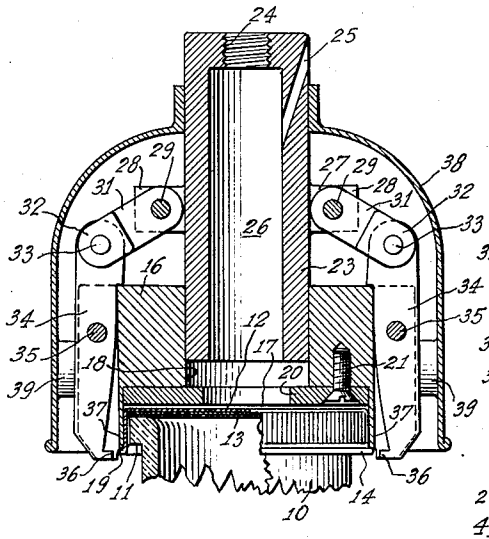


Fig. 2.

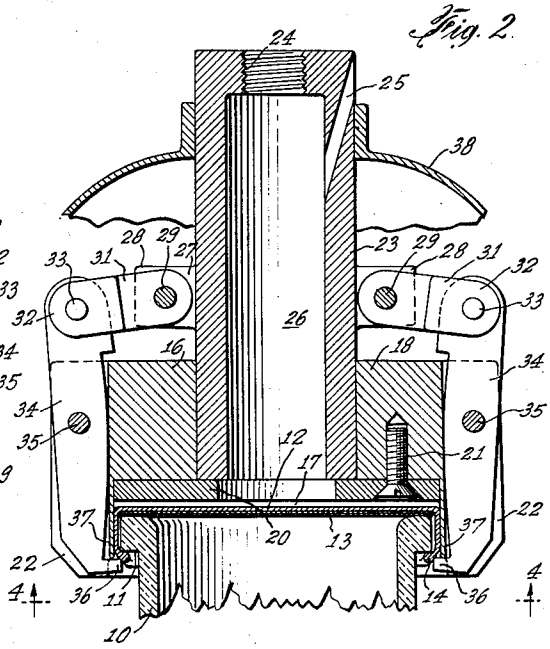


Fig. 3.

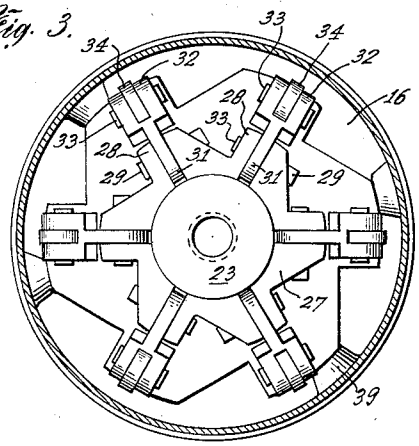
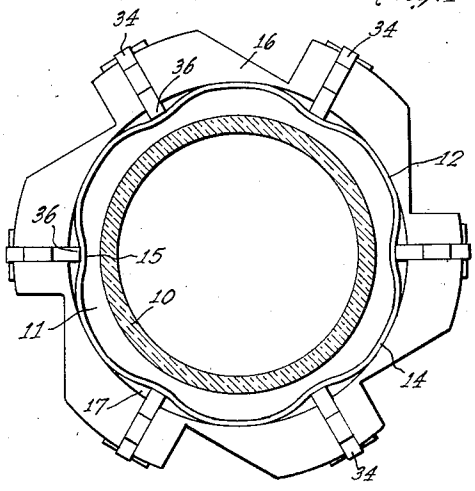


Fig. 4.



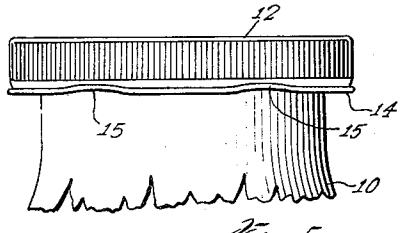


Fig. 5.

INVENTOR.
Nicholas Corsi

BY
Benjamin Webster
ATTORNEY.

Patented Feb. 6, 1940 2,189,628

UNITED STATES PATENT OFFICE

2,189,628

BOTTLE CAPPING MACHINE

Nicholas Corsi, Brooklyn, N. Y., assignor to Ajax Bottle Cap Corp., Brooklyn, N. Y.

Application October 17, 1938, Serial No. 235,405

2 Claims. (Cl. 226—86)

This invention relates to bottle capping machines and more especially to a machine for crimping parts of the bottom flange of a metal cap under the top annular rim of the bottle which has a periphery substantially half of a rectangle and provides a flat annular top and a parallel flat annular face below the top connected by a section of a cylinder. The caps are in the form of a section of a cylinder taken parallel to and including one end of the cylinder, with the bottom rim of the metal cap curved outwardly, upwardly, and inwardly to project slightly beyond the cylinder. The invention relates especially to a mechanism for engaging this outward rim at a plurality of positions circumferentially and pressing indentations or crimps under the annular rim of the bottle. Inside the top of the metal cap is placed a thin disk of paper having a coating of rubber on the bottom thereof which tightly engages the top of the bottle and is held securely thereon when the metal cap is tightly crimped down on the top of the bottle. The improvement is a chuck which is designed to be mounted on the lower end of a vertically reciprocating shaft which is directly over a support or stand for the bottle so that when the bottle is in position on the stand, the shaft is exactly centered over the bottle. There are a variety of bottle capping machines which operate with a vertically reciprocating shaft and this improvement may be attached to any of these machines, some of which are motor actuated and others either manually or pedally operated.

Various features of the improved chuck are a main body member having a bottom central cylindrical aperture substantially the same in diameter as the metal cap and having at the bottom an annular groove for receiving the bottom outward rim of the metal cap so that the metal cap fits snugly up in the cavity, but the top of the cavity is higher than the metal cap so that a space is left over the cap which prevents the chuck from engaging the top of the cap and thereby eliminates any danger of shattering the bottle when the chuck is brought down into position around the metal cap. Radially disposed on the chuck on horizontal pivot pins, are a plurality of levers of the first-class, which have arms rising above the chuck and which have arms extending substantially to the bottom of the chuck. The lower end of each arm is positioned so that its lower end engages the bottom rim of the metal cap and when it moves inwardly it presses the rim under the outer rim of the top of the bottle, but it does not directly press on the glass but always presses on the metal below the glass so that danger of shattering the glass is completely eliminated. The chuck is formed below the pivot between the lever arm and the cavity in the chuck with a stop surface which assures that the toe of the lever will not move inwardly beyond the predetermined point so that a uniform crimp is always obtained and danger of contacting the neck of the bottle is eliminated. The levers are positively moved in both directions by means of a toggle arrangement. A hollow shaft is mounted to reciprocate vertically in a central bore in the top of the chuck. An annular plate may be inserted in the top of the lower cavity of the chuck and forms a stop to prevent the hollow shaft from downward movement beyond a predetermined point. Lugs disposed radially in line with each lever on the sides of the hollow shaft are connected with each lever by means of links, each ling being pivoted to the outer end of the lug and also pivoted to the top of the lever. It is clear that the downward movement of the hollow shaft makes a positive toggle action which forces the toe of the lower arm of the lever positively into engagement with the lower annular rim of the metal cap to form a crimp and it is also clear that when the hollow shaft is raised, the toe of the lever is removed from the crimp in the rim of the cap permitting the removal of the sealed bottle and the insertion of a fresh bottle and cap into the lower cavity of the chuck. A cover or canopy may be mounted on the chuck, but centrally apertured for the shaft, to keep dust or dirt out of the movable parts. A hole may be provided in the upper part of the hollow shaft which permits the insertion of a stick or rod, which may be pushed down to engage and remove a metal cap in case the latter should become stuck or wedged in the cavity of the chuck. The invention provides a very powerful and precise crimping action, safeguards in every way the cracking of the bottle and procures a tight seal on the top of every bottle. The mechanism is very simple in construction and in operation.

Referring to the drawing:

Figure 1 is a vertical section showing the open position of the crimping levers.

Figure 2 is an enlarged vertical section showing the closed or crimping position of the levers.

Figure 3 is a top plan view of Figure 1 with the cap removed.

Figure 4 is a bottom plan view of Figure 2 taken on the line 4—4 of Figure 2.

Figure 5 is a side elevation of the top of a bottle or jar with the cap crimped or sealed thereon.

A jar or bottle 10 is moulded with a top annular rim 11, the outer projection of which, in vertical section, is in the form of one-half a rectangle. A metal cap 12 in the form of a section of a cylinder including one end thereof, has on the outer edge knurling, or serrations for assisting in removing the cap from the jar. Inside the top of the cap is placed a paper disk 13 entirely covering the inside top of the cap and having a rubber coating for engaging the top of the jar 10 and tightly sealing the cap thereon. The lower outer edge of the cap 12 is provided with an outward and upward curl forming an outwardly projecting rim 14 at the bottom of the cap which is made of a metal bendable in the operation of a bottle capping machine to form crimps 15 which turn inward and upward under the top rim 11 of the jar 10. In the form shown the cap is provided with six crimps 15 equidistantly disposed, which assure a tight seal of the cap on the jar.

The machine for sealing the caps 12 on the jars 10 comprises a chuck 16 having formed centrally in the bottom thereof a cylindrical cavity 17 of the same size as the cap 12. The cavity 17 connects with the top of the chuck 16 by means of a central bore 18 and the bottom of the cavity 17 is provided at the lower outer edge with an annular groove or recess 19 which is exactly the same size as the lower rim 14 on the bottom of the cap 12. An annular disk 20 exactly fits up in the top of the cavity 17 and is secured therein by screws 21 which enter screw-threaded bores in the chuck 16. The size of this disk 20 is such that it projects inwardly into the bore 18 to provide a stop around the bottom of the bore 18 but to leave a central aperture for access to the top of a cap 12. In the chuck 16 are provided six radially disposed vertical slots 22. A hollow vertical shaft 23 exactly fits the bore 18 in the chuck and is adapted to reciprocate therein, and the shaft 23 is provided with a screw-threaded central bore 24 at the top thereof for attaching the shaft 23 to the bottom of the vertically reciprocating shaft of a bottle capping machine. An aperture 25 may be provided in the side wall of the hollow shaft 23 for the insertion of a wire or rod, which may be used to dislodge a cap 12 stuck in the cavity 17. The hollow bore 26 of the shaft serves for a recess for the bottom of the vertically reciprocating rod of a bottle capping machine or for introducing a rod or wire through the aperture 25.

An annular collar 27 is secured on the outside of the shaft 23 above the chuck 16 which supports six radially disposed lugs 28 each having a vertical slot which mounts a transverse pivot pin 29. The slots in the lugs 28 are in the same vertical plane as the slots 22 in the lower portion of the chuck 16. Links 31 have their inner ends pivoted on the pins 29 and have at their outer ends vertically slotted yokes 32. Pins 33 horizontally positioned in the vertical slots of the yokes 32, pivotally support at the upper end levers 34 which are mounted for radial rocking motion on pins 35 transversely positioned in the slots 22. At the end of the lower arm of each lever 34 is an inwardly projecting toe 36 which is adapted to engage the lower rim 14 of the cap 12, as shown in Figure 1, and push it in under the rim 11 of the jar 10 to form the crimps 15, as shown in Figures 2 and 4. The lower inner ends of the slots 22 are provided with stops 37 which engage the lower inner edge of the levers 34 in the innermost crimping position and prevent the toes 36 from pushing the metal rim 14 in so far as to injure the glass of the jar 10. A cap 38 may be mounted on lugs 39 at the side of the chuck 16 and exclude dirt from the moving parts of the machine.

The mode of operation.—A bottle 10 which is mounted on a stand in a bottle capping machine is centrally positioned under the vertically reciprocating shaft of the bottle capping machine, which also mounts the shaft 23, as shown in Figure 1, of my improved crimping device, and the crimping device, including the chuck 16, is lowered on to the top of the cap 12 to the position shown in Figure 1. As the shaft 23 is lowered further to the position shown in Figure 2, the links 31 are pushed down and provide a toggle action on the upper arms of the levers 34 thereby forcing the toes 36 inward against the rim 14 of the cap 12 to provide the crimps 15, as shown in Figures 2, 4 and 5. As the shaft 23 is again lifted the chuck returns to the position shown in Figure 1 and is also raised as much more as may be required for the facile removal of a bottle having a crimped cap thereon, which is shown in Figure 5, and the machine is then ready for the insertion of another bottle as shown in Figure 1. The operation is very rapid and the bottle capping machine may be operated by a motor, or by a manual or pedal control, as desired.

Having shown and described one form of my invention and realizing that in view of my disclosure modifications will readily occur to those skilled in the art, I do not limit myself except as in the appended claims.

I claim:

1. A bottle capping machine comprising in combination, a chuck, a central cylindrical cavity in the bottom of the chuck for the insertion of a bottle cover with a metal cap to be fastened on top of the bottle, a plurality of levers pivoted on the chuck and having arms movable radially toward and away from the center of the cavity, means for moving the said arms into engagement with the rim of the metal cap and also out of engagement with the metal cap, a centrally mounted vertically reciprocating shaft in the top of the chuck, links connecting said shaft and the tops of the levers, the bore of said shaft connecting with the cavity in the bottom of said chuck, and an annular plate centrally apertured but having an inner wall engageable as a stop with the bottom of the hollow member.

2. In a bottle capping machine for crimping a metal cap on a bottle provided with an outer top rim comprising a chuck having a central bottom cavity for receiving the metal cap, the cavity having a height greater than that of the metal cap, the bottom of the cavity terminating in an annular groove adapted to receive the lower rim of the metal cap, and a plurality of levers pivoted on the chuck and having toes mounted to engage the lower edge of the metal rim below the annular rim at the top of the glass bottle and push said rim under said annular rim of the bottle, the toes having an extended upper surface adapted to push the metal closely under the lower edge of the glass rim.

NICHOLAS CORSI.