

March 12, 1940.

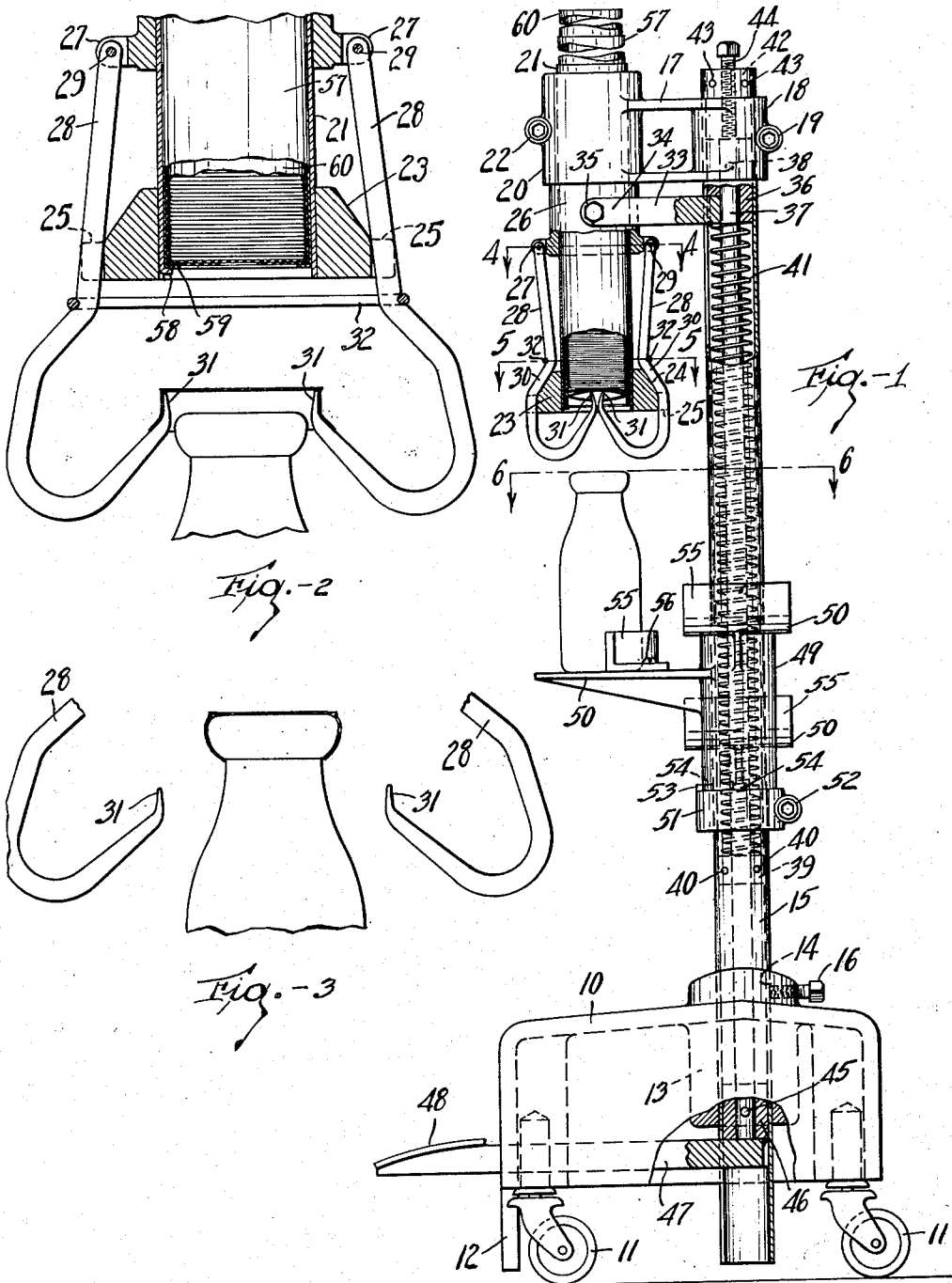
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2,193,128

MILK BOTTLE CAPPER

Filed July 3, 1935

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

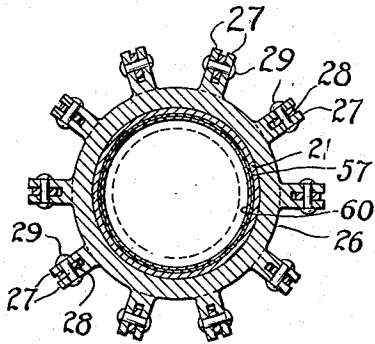


Fig.-4

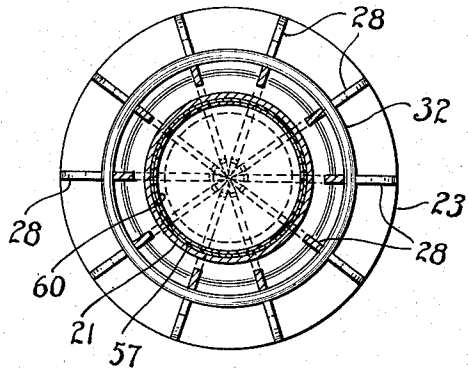


Fig.-5

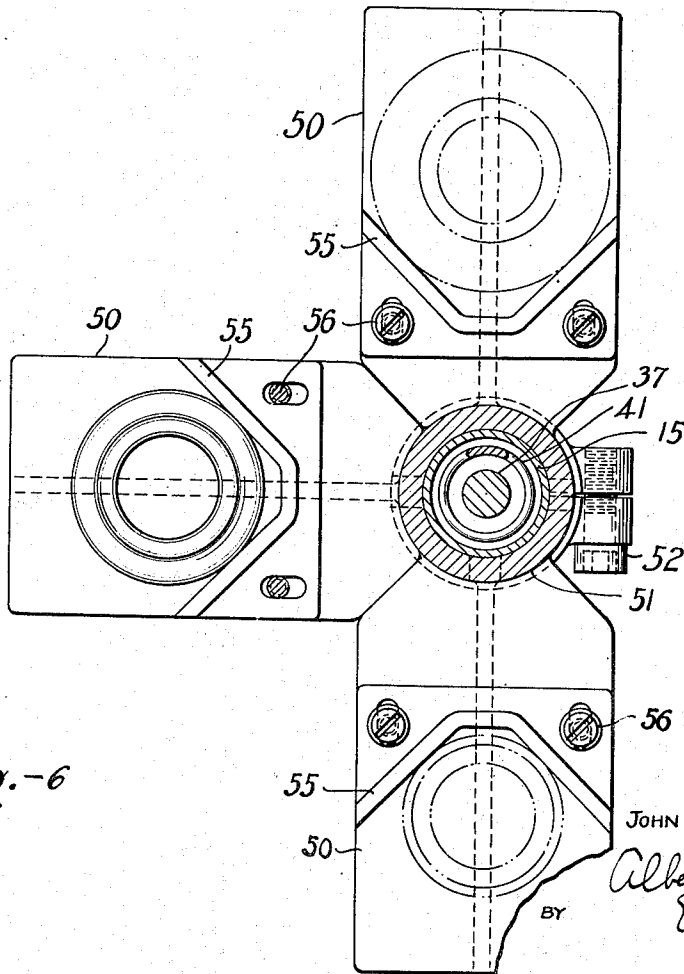


Fig.-6

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MILK BOTTLE CAPPER

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Application July 3, 1935, Serial No. 29,693

4 Claims. (Cl. 226—81)

This invention relates to improvements in bottle capping machines and more particularly to a machine for applying caps of yieldable or elastic material to milk bottles, such as is disclosed in my copending application Serial No. 14,248, filed April 2, 1935, and has for its primary object to provide such a machine which is simple in construction, efficient in operation and inexpensive to manufacture.

Another object of the present invention is to provide a cap applying mechanism adapted to receive a cap, stretch the same so that it will pass over the mouth of the bottle and then release the same, the elasticity of the cap causing it to contract about the neck of the bottle and to be securely held in place thereon.

A further object of the invention is to provide means for receiving and supporting a plurality of such caps whereby they may be withdrawn one at a time and applied to the bottle or receptacle.

A still further object of the invention is to provide adjustable means for receiving and supporting uncapped bottles of various sizes.

With the objects above indicated and other objects hereinafter explained in view, my invention consists in the construction and combination of elements hereinafter described and claimed.

Referring to the drawings,

Figure 1 is a side elevational view of a bottle capping machine embodying the present invention, portions thereof being in section so as to more clearly illustrate the construction, the cap engaging fingers being shown in their initial or uppermost position;

Figure 2 is a fragmentary sectional view on an enlarged scale showing the cap engaging fingers in a different position;

Figure 3 is a fragmentary sectional view on an enlarged scale showing the cap engaging fingers in still another or lowermost position in which the cap has been applied to the bottle;

Figure 4 is a transverse sectional view taken on line 4—4 in Figure 1;

Figure 5 is a transverse sectional view taken on line 5—5 in Figure 1;

Figure 6 is a transverse sectional view taken on line 6—6 in Figure 1.

In the drawings, a bottle capping machine embodying the present invention is illustrated and while the machine is manually operated, it should be understood that other means may be employed, and that I am not, therefore, to be so limited in its use.

The present machine comprises a base 10 made of cast iron and having casters 11 attached at its corners by which the device is supported and movable to any desired location for use. The front of the base 10 has depending extensions 12 spaced apart for a purpose to be later described and the upper portion has a vertical extension 13 formed integral therewith which is provided with an opening 14 extending there-through. A tube or pipe 15 preferably of brass and of the desired length has its lower end slidably mounted in the opening 14 of the base and is secured in adjusted position by a set screw 16, the tube extending upwardly in a substantially vertical position.

A bracket 17 is mounted at the upper end of the tube 15 and has a portion 18 which receives the upper end of the tube and which is provided with a cap screw 19 for securing the bracket in place against disengagement. The bracket 17 is further provided with a portion 20 which receives the upper end of a tube 21 and is rigidly secured thereto by a cap screw 22. The lower end of this tube 21 extends downwardly and is exteriorly screw-threaded to receive a cam member 23. The cam member has an outwardly extending, circumferential cam surface 24 and a plurality of radially disposed slots 25 equally spaced about the peripheral portion beyond the cam surface. The parts heretofore described all constitute the stationary part of the machine.

A sleeve 26 is slidably mounted on the tube 21 and is normally positioned beneath the portion 20 on the bracket 17. The lower portion of the sleeve 26 is provided with pairs of spaced lugs 27 radially disposed and formed integral therewith. The space between each pair of lugs should register with a corresponding slot 25 in the cam member 23 so as to receive a plurality of fingers 28. The upper ends of the fingers 28 are pivotally connected at 29 to adjacent lugs 27, while adjacent the lower ends offset portions 30 are provided which engage the cam surface 24 for actuation thereby. The free ends of the fingers 28 are bent into U-shape with the ends 31 disposed adjacent the axis of the tube 21 and projecting inwardly slightly beyond the lower end thereof for a purpose to be later described. An elastic band or spring 32 encircles the fingers 28 and tends to maintain the latter in yieldably contracted position.

A fork member 33 has bifurcated ends 34 disposed upon opposite sides of the sleeve 26 which are secured thereto by cap screws 35. The opposite end of the fork member 33 extends through

a longitudinal slot provided in the tube 15 and has a circular enlargement 36 slidably mounted in the tube 15. A rod 37 is positioned within the tube 15 and has its upper end connected to the circular enlargement 36 by a pin 38, the lower end of the rod extending through a plug 39 secured within the tube 15 by pins 40. A coil spring 41 encircles the rod 37 and has its upper end abutting the under side of the circular enlargement 36, while its lower end abuts the upper side of the plug 39. The tension in the spring therefore tends to exert an upward force upon the circular enlargement 36 and thus maintains the fork 33 in its uppermost position. A plug 42 is secured within the upper end of the tube 15 by pins 43 and has an axial screw-threaded opening to receive a screw-threaded bolt 44, the inner end of which engages the upper side of the circular enlargement 36. The bolt 44 may be adjusted so as to limit the upward movement of the fork 33.

The lower end of the rod 37 is secured by a pin 45 to a circular enlargement 46 slidably mounted in the tube 15. A member 47 is secured to the enlargement 46 and projects laterally through an opening provided in the lower portion of the tube 15. The free end of the member 47 projects beyond the base 10 and is disposed between the extensions 12, a foot tread 48 being rigidly secured thereto by means of which the rod 37 is moved longitudinally within the tube 15 for a purpose to be later described.

Any suitable means for supporting the uncapped bottle may be employed, but with the present type I prefer to provide a sleeve 49 which is slidably mounted on the tube 15. This sleeve 49 has laterally extending supports or shelves 50, three of which are herein shown, arranged in different horizontal planes and spaced approximately 90° apart. The supports are arranged at different levels to accommodate the reception of bottles of different heights, the sleeve 49 being movable about its axis so as to position the desired supports directly beneath the fingers 28. A collar 51 fits around the tube 15 below the sleeve 49 and is secured thereto in adjustable position by a set screw 52. The collar 51 has a lug 53 upon its upper side which is adapted to fit within corresponding recesses 54 provided in the sleeve 49 directly beneath each support 50 so as to prevent relative angular movement when the proper support has been selected. The supports 50 are each provided with bottle stops 55 adjustably secured thereto by bolts 56, which stops are adapted to engage the bottle and position the same properly beneath the fingers 28 during the capping operation.

A magazine tube 57, preferably of brass, slidably fits within the tube 21 and is limited in its downward movement by a tongue 58 provided on the lower end of the tube 21. The lower end of the tube 57 has an intumed annular flange 59 adapted to engage the caps and prevent their accidental discharge from the tube 57. While the caps might possibly be placed directly within the tube 57 for application to the bottles, the caps will ordinarily be shipped in tubular containers of cardboard or similar material, already stacked in proper relation, and it is therefore intended that the container 60 be inserted into the tube 57, the open end engaging the flange 59 and the caps arranged with the skirt portion on the under side as shown in Figures 1, 2 and 3.

In the operation of the machine after a tube full of elastic caps have been loaded into the

magazine tube 57, the lowermost cap assumes the position shown in Figures 1, 2 and 3, that is with the top portion of the cap transversely and directly above the bottle while the skirt portion of the cap extends downwardly at an angle with the opening disposed below the adjacent ends 31 of the fingers 28.

The foot pedal 48 is then depressed, which causes the sleeve 26 to be moved downwardly. The fingers 28 being pivotally connected to the sleeve 26 are likewise moved axially and outwardly by engagement with the cam surface 24. This causes the ends 31 of the fingers 28 to expand into engagement with the skirt portion of the cap sufficiently to cause the cap to be pulled from the tube 57. Further downward axial movement causes the fingers 28 to be moved outwardly sufficiently to stretch the skirt portion of the cap so that the skirt will pass over the mouth of the bottle and the top of the cap engage the mouth of the bottle. Further movement causes the ends 31 of the fingers 28 to move beyond the skirt portion of the cap, thereby releasing the same. The elasticity of the skirt portion of the cap causes it to contract and securely engage the bead around the mouth of the bottle. By releasing the pressure on the foot pedal, the sleeve 26 is returned to its initial uppermost position by the tension of the spring 41 and is in a position for the next application of a cap in the manner heretofore explained. The capped bottle is then removed from the support and an uncapped bottle placed thereon for the next operation.

In applying the cap to the bottle, care should be exercised to see that practically no tension is present in the top portion of the cap as this tends to defeat the purpose as described in my copending application heretofore referred to, but that sufficient tension should be provided in the skirt portion so as to securely grip the bead on the bottle and thereby secure the same, the tension preferably being greatest adjacent the opening in the cap and decreasing outwardly toward the peripheral edge of the top portion.

While I have described the preferred embodiments of the invention, it is to be understood that I am not to be limited thereto inasmuch as changes and modifications may be resorted to without departing from the spirit of the invention as defined in the appended claims.

What is claimed is:

1. In bottle capping apparatus, in combination, a container for bottle caps, a plurality of circularly arranged expanding and contracting fingers for withdrawing caps therefrom, means for expanding said fingers, and resilient means encircling said fingers for contracting same.
2. In bottle capping apparatus, in combination, a container for bottle caps, a plurality of circularly arranged expanding and contracting fingers for withdrawing caps therefrom, cam means engageable by said fingers for expanding same, and resilient means encircling said fingers for contracting same.
3. A bottle capping machine comprising means for supporting an uncapped bottle or receptacle, a tubular member adapted to receive caps arranged in superimposed relation, a member slidably mounted on said tubular member, a plurality of circularly arranged fingers positioned upon the outside of said tubular member and pivotally connected at one end to said slidable member and movable therewith, the opposite ends of said fingers extending inwardly adjacent the axis of said

tubular member and being adapted for engagement with the adjacent cap, cam means secured on the outside of said tubular member and engageable with said fingers to cause the latter to expand and contract radially upon movement of said slidable member, resilient means operatively connected to said slidable member for normally maintaining the latter in inoperative position, and means for positively moving said slidable member into operative position against the tension of said resilient means.

4. A container capping machine for applying caps formed of elastic material including a plu-

rality of movable members having cap engaging portions arranged radially about the axis of the container, means cooperable with said members remote from their cap engaging portions to cause said members to engage the cap and move radially outwardly to stretch the cap, and during such radial movement effect relative axial movement of said members and cap and the container to place the cap over the mouth and about the neck of the container, and subsequently release the cap.

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