Aug. 17, 1943. G. W. HALL 2,327,262

BOTTLE CAPPER

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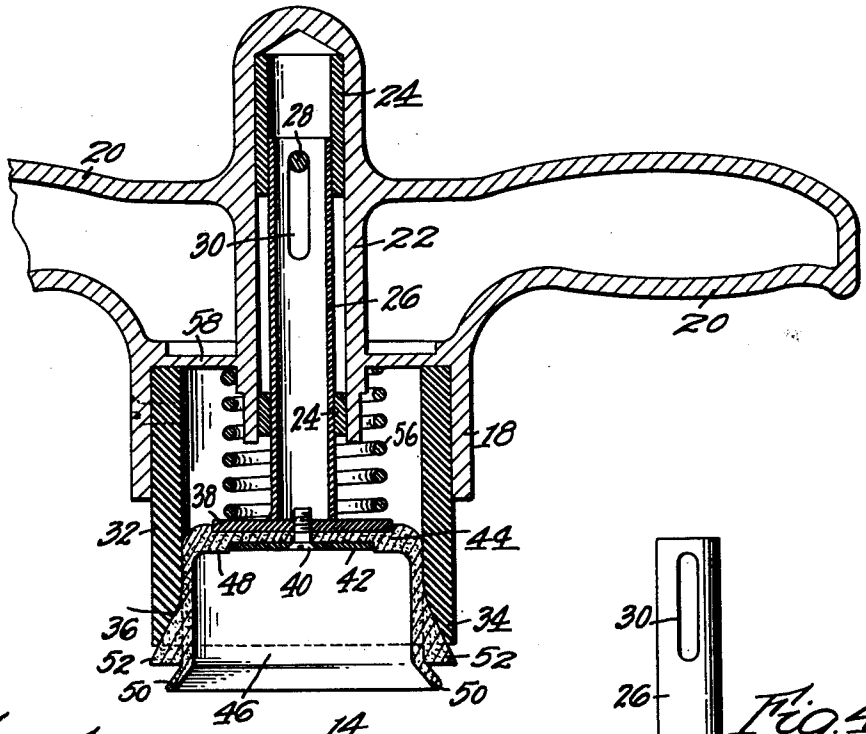
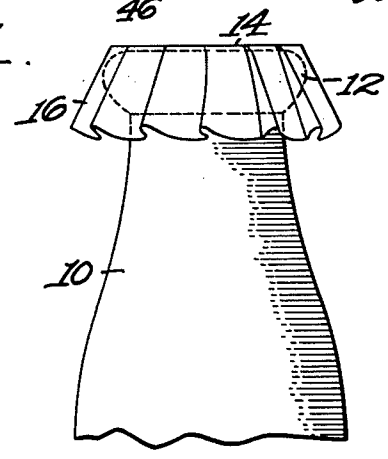


Fig. 1.



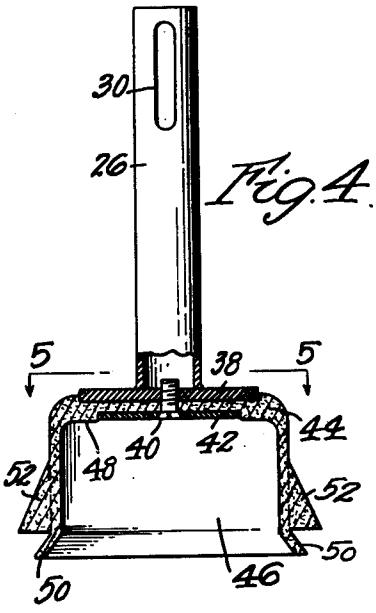


Fig. 4.

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Fig. 2.

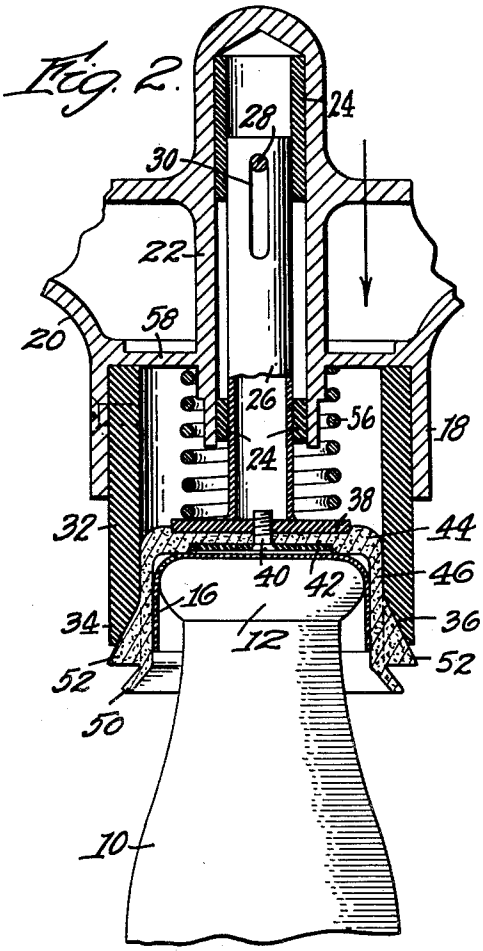


Fig. 3.

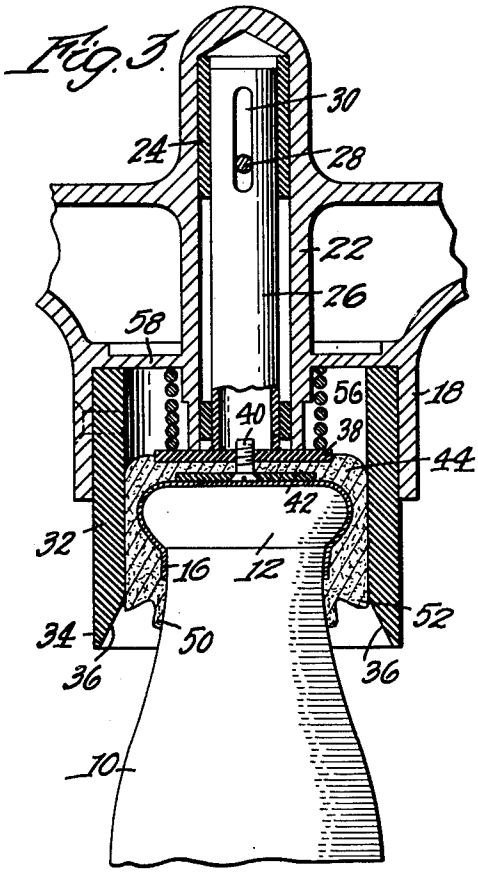
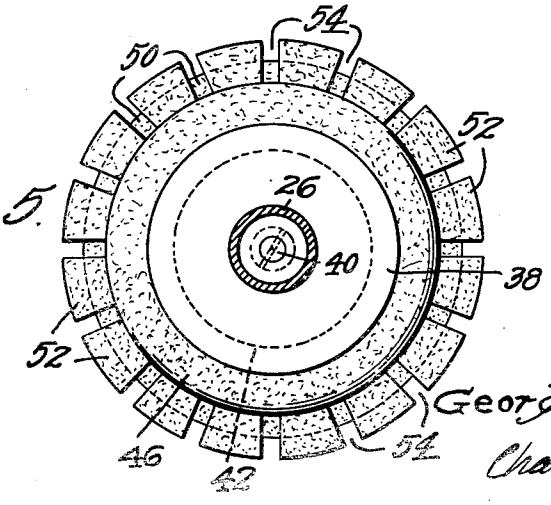


Fig. 5.



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BOTTLE CAPPER

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Application April 7, 1941, Serial No. 387,218

10 Claims. (Cl. 226—85)

This invention relates to bottle cappers and particularly to devices for capping milk bottles.

Objects of the invention include the provision of a portable, hand-manipulated bottle capper having resilient, deformable means adapted to apply bottle caps closely and tightly to the pouring lips of bottles, in such a manner as to insure that the caps will conform to the shape of and intimately contact the pouring lips or other projections of bottles to be capped; the provision of a bottle capper having a resilient element adapted to encompass a hood cap, and means to deform the element and therefore the cap into close contact with a bottle neck; the provision of a resilient, deformable cup and mechanical means to deform the cup into compressive relation with a hood cap to apply the same in closely sealed condition to a bottle neck; and the provision of a rubber-like cup fitting a bottle cap, a casing capable of a relative motion with respect to the cup, and cooperating means on the casing and cup to deform the latter inwardly to apply or seal the bottle cap to a bottle neck at its pouring lip upon such relative motion.

Other objects and advantages of the invention will appear hereinafter.

Reference is to be had to the accompanying drawings, in which

Fig. 1 is a vertical sectional view of a preferred form of the invention in which it is shown as a hand-operated device located above a bottle arranged with a hood cap in position to be operated upon;

Fig. 2 is a view similar to Fig. 1, but showing the first step in the capping operation;

Fig. 3 is a view similar to Fig. 1, but showing the cup compressing the hood of a cap into sealing contact with the bottle;

Fig. 4 is a view partly in section showing the cup and its plunger; and

Fig. 5 is a section on line 5—5 of Fig. 4 on an enlarged scale.

The embodiment of the invention as disclosed in the drawings relates to a device particularly adapted for capping milk bottles with hood caps. These caps may be of the type shown, and may have flutes or serrations in the hood, or they may be plain. Wires, annular rings, or any other sealing means may be utilized to hold the cap hoods in place once the bottle is capped, the means used being immaterial to this invention.

Referring to Fig. 1, there is illustrated a milk bottle 10 of any desired type having a pouring lip 12. A hood cap 14 is placed over the lip, this cap having a flared skirt 16. Obviously, the cap must be fixed in sealing relation to the bottle neck, covering the opening, with the hood being used to secure the cap in place by contact with the bottle under the pouring lip, as illustrated in Fig. 3, and the tool comprising the present invention is to be used for this purpose. The closer the hood cap can be pressed to the bottle, the better its security and function in preventing dirt from getting between the cap and the bottle.

The tool comprises a hollow cylindrical casing 18 having a pair of diametrically radially extending handles 20 secured thereto or integral therewith. Centrally of the casing there is provided a narrower cylindrical casing 22 fixed to the handles and depending into the casing 18, and having a closed end exterior of the tool and an open end terminating within casing 18. A pair of spaced bushings 24 are fitted to the inner wall of casing 22 to slidingly mount a plunger 26. Casing 22 has an interiorly projecting pin 28 fixed therein, this pin being adapted particularly to act as a stop for relative motion of the casing 22 and plunger 26, cooperating to this end with a slot 30 in the plunger.

As illustrated, a hollow cylindrical sleeve 32 is secured interiorly of casing 18 and extends downwardly and outwardly thereof. This sleeve may be made integral with the casing, if desired, and may be formed in extension of the walls thereof. In any case, the sleeve terminates in a continuous edge 34 which is beveled or tapered as at 36 on its interior surface, so that the lip narrows outwardly as it extends farther from casing 18, the exterior surface being straight. The tapered surface is used in the manner of a cam, as will be later described.

The lower end of plunger 26 is fixed to a disc 38 as by welding or other convenient means and is provided with a central tapped hole for reception of a flat head screw 40 countersunk in a corresponding but smaller disc 42. Discs 38 and 42 are adapted to clamp between them the bottom 44 of a resilient, deformable cup 46, made of rubber, natural or synthetic, or the like deformable, resilient material. Bottom 44 is notched on each side to receive the discs, it being noted that the interior surface of the cup bottom extends downwardly beyond disc 42, as at 48. The resilient cup is generally cylindrical and preferably has an inside diameter large enough to admit the largest size commercial bottle neck. There is a flared guide lip 50 at the periphery of the open end of the cup, this lip being desirably continuous.

On the exterior surface of the cup, there are a plurality of radially extending projections 52 of

the same material as the cup proper, and these projections are spaced by slots 54. The bottoms of the slots are in continuation of the exterior cylindrical surface of the cup. Projections 52 taper outwardly from the exterior surface of the cup in the direction of lip 50, and to substantially the same degree as the taper 36 on sleeve 34. A coil spring 56 surrounds plunger 26 and the lower part of casing 22, bearing at one end on disc 38 and at the other end against a plate or grate 58 adjacent one end of casing 18. This spring constantly urges cup 46 outwardly of sleeve 32, but allows relative retraction of the cup within the sleeve.

The operation of the device is consecutively illustrated in Figs. 1, 2, and 3. In Fig. 1, the capper is shown in normal condition and ready to be applied to the bottle having hood cap 14 in place over the pouring opening. As the capper descends, the guide lip 60 on the cup engages the flared hood 16 of the cap and thus aids in centering the relation of cap and tool, and partly compresses the hood about the bottle neck and pouring lip. When the shoulders 48 contact and press the cap at the pouring lip, they will give sufficiently to allow disc 42 to impinge the cap, see Fig. 2. In this condition, the skirt 16 will be pressed to a substantial vertical position and spring 56 prevents the cup from any retraction due to the pressure on the cap hood. More pressure being applied to the handles, however, the sleeve 32 starts to slide down over the cup, and the tapered surface 36 begins to press the projections 52 inwardly. Slots 54 allow puckering or buckling of the cup while it is being compressed to accommodate projections 52. Final position of the parts is shown in Fig. 3, wherein the cup is telescoped into the casing and is thereby forced to conform exactly to the shape of the pouring lip and bottle neck and thus tightly press the hood to the same shape. The caps themselves may contain means to retain the pressed shape of the hoods, or extraneous sealing devices may be used for this purpose. When pressure is released from the handles and the operator raises them, spring 56 holds the cup down on top of the bottle until pin 28 reaches the top of slot 30. At this point the resiliency of the cup will have returned it to normal position, as projections 52 will be disengaged from the tapered surface 36, and the tool can be removed.

It will be seen from the above that the rubber-like cup will tightly seal hood caps in close and intimate contact with pouring lips of varied configurations, and that different sizes of bottles and caps can be accommodated by the improved bottle capper. Also, the present capper provides for uniform, radial pressure at all points on the cap hood.

Having thus described my invention and the advantages thereof, I do not wish to be limited to the details herein disclosed, otherwise than as set forth in the claims, but what I claim is:

1. In a bottle capping device, a cylindrical casing open at one end, a substantially cylindrical deformable element in said casing and mounted for sliding movement therein at said open end, resilient projections on the exterior surface of said element, said projections normally extending radially outwardly beyond the inner surface of said casing at its open end and adapted for engagement with said casing at its open end to compress said element upon such movement, said element being straight sided interiorly for reception of the bottle.

2. In a bottle capping device, a cylindrical casing open at one end to form a circular free edge thereon, a substantially cylindrical rubber-like deformable element in said casing at said open end and normally extending in part therefrom, rubber-like projections on the extending part of said element, said projections being adapted to extend in part beyond the open end of the casing, said casing and element being capable of relative telescoping movement, said projections lying in the path of the free edge of said casing to be engaged and inwardly compressed thereby upon such movement, and means interior of the casing for preventing escape of said element from said casing.

3. A bottle capping device as recited in claim 2 wherein said casing has outwardly diverging cam surfaces at its open end.

4. A bottle capping device as recited in claim 2 wherein said projections taper outwardly.

5. In a bottle capping device, a casing, a plunger in said casing adapted for relative movement with respect thereto, said casing having an open end forming a free edge, a substantially cylindrical rubber-like element in said casing adjacent said open end, said element being connected to said plunger, resilient means tending to urge said element outwardly of the casing, the free edge of the latter substantially radially compressing said element upon movement thereof against the action of said resilient means, and means preventing excess outward movement of said plunger.

6. In a bottle capping device, a casing having an open end, a cylindrical rubber-like deformable element having straight sides fitting said casing and adapted for straight axial sliding movement with respect thereto, said element having a position wherein it extends in part from said casing, rubber-like projections extending from said element and at least partially beyond the open end of the casing in position to be compressed radially inwardly upon sliding movement of said element in a direction toward the interior of said casing.

7. A bottle capper comprising a cylindrical hollow casing having one end open to form a free edge, a hollow cylindrical rubber cup having exterior side walls substantially mating with but axially slidable with respect to the interior wall of the cylindrical casing, said cup having a free edge normally extending outwardly of the casing at its open end, and a flaring skirt substantially triangular in cross-section and located about the free edge of the cup, said skirt being thickest at its area closest to the free edge of the cup, means to cause telescopic sliding action of the cup to a point within the casing, the free edge of the casing acting to radially inwardly compress the flaring skirt during said telescopic action.

8. A bottle capper comprising a cylindrical hollow casing having an open end forming a continuous circular free edge, a cam surface at said free edge, said cam surface including a beveled area tapering radially outwardly of said casing from the interior wall thereof, a rubber cup-like element having a straight cylindrical outer wall surface corresponding to the inner wall of the casing and arranged for telescopic sliding movement therewithin, said cup-like element having a circular free edge defining an open end corresponding to the open end of the casing, said cup

free edge normally extending outwardly axially from the open end of the casing, a flaring skirt on the exterior of the cup-like element adjacent its edge, said skirt gradually thickening in a direction towards the edge of the cup to conform to said cam surface, and means to telescope said cup-like element within the casing, whereby said cam surface acts to press said skirt radially inwardly.

9. A bottle capper as recited in claim 8 including a flared lip at the edge of the cup-like element, said skirt being spaced from the edge of the lip.

10. A bottle capper as recited in claim 8 wherein the interior wall surface of the cup-like element is smooth and straight, and said skirt is located wholly on the exterior wall surface thereof.

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