Nov. 7, 1933. R. J. WYNNE ET AL 1,934,248

BOTTLE CAP EJECTOR

Filed June 15, 1931

FIG-1

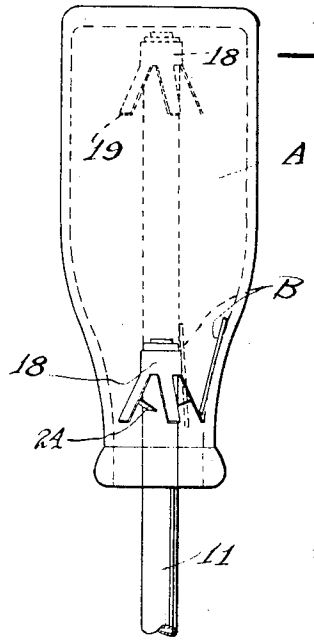


FIG-2

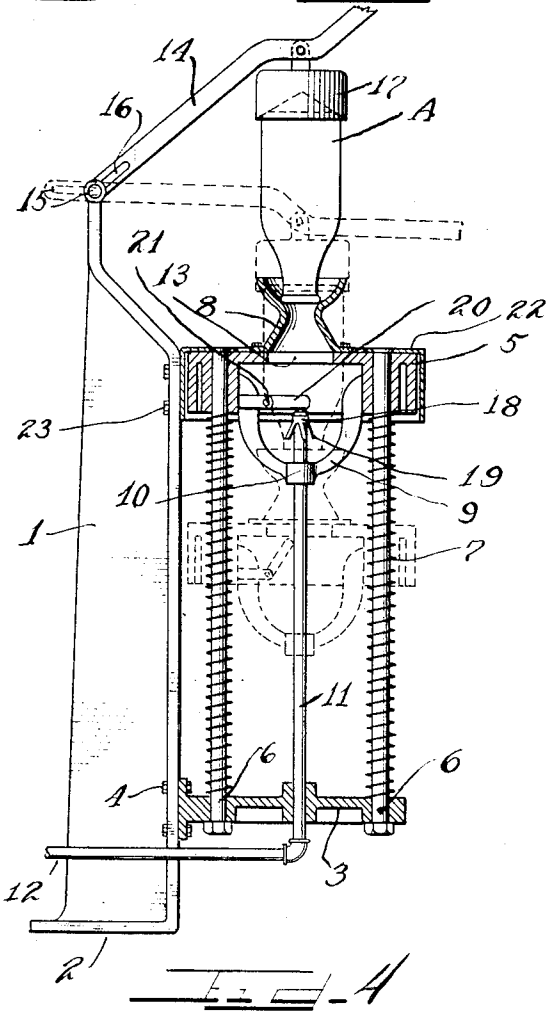


FIG-3

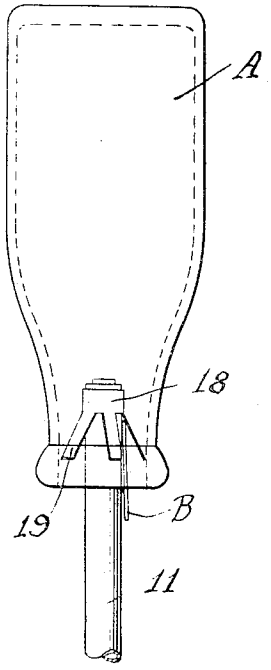
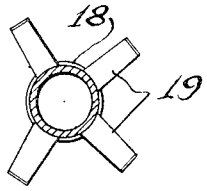


FIG-4



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BOTTLE CAP EJECTOR

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Application June 15, 1931. Serial No. 544,512

8 Claims. (Cl. 65—47)

The present invention relates to a bottle cap ejector and particularly to means for removing paper or similar caps from the interior of the bottles after the bottles have emptied.

An object of the present invention is to provide means for withdrawing bottle caps from the interiors of bottles.

Generally speaking, the invention contemplates means for imparting relative movement between a bottle and a member whereby the member is caused to enter the interior of the bottle and be retracted therefrom and which member carries means for engaging the bottle cap within the bottle and removing such cap from the bottle.

The invention further contemplates the movement of the bottle about the member, the member being in fixed position axially, and removing the bottle from over the member. It is, however, within the scope of the present invention to move the member axially and retain the bottle against movement for the cap-removing action.

The invention further contemplates the utilization of the cap-removing feature in connection with means for spraying or rinsing a bottle and also in connection with brush means for cleansing the interior of the bottle.

The above, other and further objects of the invention will be apparent from the following description, accompanying drawing and appended claims.

An exemplification of the present invention has been embodied in the accompanying drawing and the views thereof are as follows:

Figure 1 is a side elevation of an inverted milk bottle showing a fragmental portion of the member which enters the bottle, showing in dotted lines the maximum inward movement of the member or the maximum relative movement between the bottle and the member in one direction, and in full lines a bottle cap within the bottle and also the head of the member provided with one form for engaging and removing the bottle cap.

Figure 2 is a vertical sectional view through a typical form of apparatus embodying the present invention.

Figure 3 is a view similar to Figure 1 showing the member and the engaged bottle cap about to be removed through the bottle opening.

Figure 4 is an enlarged horizontal sectional view taken through the member underneath the illustrated form of head.

The ejector of the present invention may be embodied in connection with a simple apparatus utilized merely for the purpose of removing caps from the interiors of bottles, or it might be used in connection with a spraying or sterilizing unit as well as an interior brush cleansing unit as set forth in applicants' co-pending application Serial No. 542,239 filed June 5, 1931.

It is to be understood at the outset that the typical illustration of the present embodiment is not to be taken as a limitation of the invention but is merely illustrative of the invention.

The typical illustration chosen to exemplify the present invention is illustrated in connection with means for removing paper or similar caps from the interiors of milk bottles and the like.

The drawing will now be explained.

Figure 2 illustrates a standard 1 having a foot 2 which may be supported on a table, bench, ledge, shelf or the like in any convenient position. A fixed cross head 3 is fastened by means of bolts, rivets or the like 4 to the standard 1 near the lower edge of the same.

A yoke 5 is vertically slidable with respect to the fixed cross head 3. Rods 6 connect the cross-head 3 with the upper head 22 which latter head is bolted at 23 to the frame 1. Springs 7 surround the rods 6 for normally retaining the yoke 5 in its uppermost position, that is, the full line position illustrated in Figure 2. A bottle centering member 8 is secured to the upper surface of the yoke 5 and as illustrated includes a member of hour-glass shape. The yoke 5 carries a guide member 9 which has an enlarged central portion 10 centrally apertured to surround a pipe 11. The pipe 11 is in the illustrated form of the invention fixed in the cross head 3 against axial movement. A pipe 12 communicates with the pipe 11 for the purpose of supplying spraying, sterilizing or rinsing liquid to the interior of the bottle A when the same has been moved over the end of the pipe 11 as will be hereinafter more fully described.

The central portion of the yoke 5 is apertured at 13 so that the yoke may pass downwardly about the pipe 11.

The standard 1 is provided with a lever 14 which is connected to the standard 1 by a pivot pin 15, which pin engages a slot 16 in the lever, so that the lever may have endwise movement with respect to the standard as it is manipulated. The lever carries a cap member 17 for engagement over the bottom of an inverted bottle A to press the same downwardly over the pipe 11.

The upper end of the pipe or member 11 is provided with a head 18 which, in the present

instance, has a plurality of diverging fingers 19. The head 18 and its fingers 19 may be made of yieldable material such as spring steel or the like, so that the head may be compressed as it enters and leaves the bottle opening.

The centering member 8 is shaped similarly to an hour glass with the upper portion arranged to receive the crown of the bottle when the same is inserted in inverted position and centers the bottle in such member.

The member 9 has an arm 20 pivoted to it at 21. Normally, the arm 20 overlies the upper end of the pipe 11 to deflect the spray from the pipe.

The operation of the illustrated form of the device is as follows:

The operator places a bottle in inverted position in the position illustrated at A in Figure 2, with the crown against the centering member 8 and with the cup 17 against the bottom of the bottle. He then bears down on the lever 14 pushing the yoke 5, the centering member 8 and the bottle A downwardly so that the bottle A passes over the head 18 on the pipe 11 and over the fingers 19 thereon until in the position shown in dotted lines in Figure 1. The downward movement of the yoke 5 carries with it the arm 20 which thus assumes an upwardly inclined position against the side of the pipe 11 out of the path of the upper end of the pipe. The pipe 11 is connected to a source of liquid such as a rinsing solution or a sterilizing solution or a spraying solution of any desired kind. The liquid is forced through the pipe 11 and discharged through the upper end thereof into the interior of the bottle A thus cleansing the interior of the bottle.

It sometimes happens that used milk bottles which are subjected to the washing process have contained therein the paper cap utilized to close the bottle when it is filled.

When a bottle A with the cap B therein is inverted, the cap B will fall to the dotted-line position of Figure 1 or else close the opening to the bottle. Movement of the bottle A over the pipe 11, when the bottle A is applied over the pipe 11, the head 18 of the pipe enters the bottle dislodging the cap B to the dotted line position of Figure 1, so that the cap then remains in this position until the bottle and pipe are separated. When reverse movement takes place, which it does when pressure on the lever 14 is released and the yoke 5 returned to normal position by the spring 7, the head 18 is withdrawn from the bottle and in such movement one of the fingers 19 engages the cap B and pulls it out of the bottle as shown in full lines in Figure 3. Should it so happen that when the bottle is moved over the pipe 11 the cap rests on top of the head of the pipe, then as soon as the spray solution is started by pump action from a supply tank, the cap will become dislodged and fall to the dotted line position B of Figure 1 ready to be engaged by one of the fingers 19 of the head on the pipe.

Instead of moving the bottle A over the pipe 11, as herein described, the parts might be so arranged as to move the part 11 axially into the bottle, in which case the bottle A would be fixed against axial movement.

Should it so happen that a bottle cap has become dried or bent to such extent that it readily passes through the opening in the bottle and lies on top of the head 18 of the pipe, then at the next operation, when the bottle is moved over the pipe, the head would become dislodged in contacting the crown of the next bottle.

The gist of the present invention resides in the provision of means which enter the bottle interior and hooks the bottle cap that may be within the bottle for removal purposes.

A web 24 might be used as connection between the pipe 11 and finger 19 to prevent a bottle cap from sticking under the finger.

The invention has been described herein more or less precisely as to details, yet it is to be understood that changes may be made in the arrangement and proportion of parts and equivalents may be substituted without departing from the spirit and scope of the invention.

The invention is claimed as follows:

1. A bottle cap extractor including, in combination, means comprising a rigid member for entering a bottle, a plurality of resilient fingers on said means and extending backwardly from the entering end thereof and diverging therefrom for hooking engagement with a bottle cap within said bottle for removing a cap from the bottle, the spread of the free ends of said fingers being greater than the diameter of the bottle mouth, the fingers being compressed on entering and leaving the bottle.

2. A bottle cap extractor including in combination, means including a rigid member relatively movable with respect to said bottle for entering the bottle, and a head on said rigid means having divergent fingers thereon for engaging a bottle cap within said bottle, said fingers being yieldable and compressible on entry into and withdrawal from said bottle, said fingers being divergent rearwardly from said head.

3. A bottle cap extractor including in combination, means for supporting a bottle in inverted position, rigid means carrying an expansible head, said bottle and said last means being relatively movable whereby said head may be caused to enter said bottle, said head having a plurality of downwardly divergent fingers thereon for engaging a cap within said bottle and removing said cap from the bottle when the bottle and said means are separated.

4. A bottle cap extractor including in combination, means for supporting and centering a bottle in inverted position, a pipe having a head thereon, said pipe and said bottle being relatively movable whereby said head of said pipe may enter said bottle, and a plurality of resilient fingers secured to said pipe adjacent said head and divergent rearwardly from said head, the free ends of said fingers being normally spread a greater amount than the diameter of the bottle mouth, said fingers being compressed on entering and leaving said bottle mouth, the free ends thereof expanding within the bottle against the inside thereof for engaging a cap within the bottle and removing said cap by hooking action when said bottle and pipe are separated.

5. A bottle cap extractor including a member adapted to enter a bottle, said member having a plurality of fingers thereon divergent backwardly from the entering end thereof and the free ends of which fingers are spread normally a greater distance than the bottle opening, said fingers being compressed when introduced into and removed from a bottle, the fingers engageable with a bottle cap within said bottle for removing a cap from the bottle when said member is withdrawn.

6. An extractor for removing flat or substantially flat caps from the interiors of empty bot-

tles, comprising a rigid member insertable in the bottle, said member carrying outwardly divergent and angularly spaced spring fingers for hooking engagement with a bottle cap within a bottle for removing the cap from the bottle, said fingers being divergent rearwardly from the entering end of said member, and the free ends of said fingers being spread a greater distance than the mouth of the bottle, said fingers being compressed on entering and leaving the bottle mouth.

7. An extractor for removing flat or substantially flat caps from the interiors of empty bottles, comprising a rigid member insertable in a bottle, said member having a head portion provided with a plurality of spring fingers which are divergent laterally and angularly from a common point with respect to the longitudinal axis of said member, said fingers being divergent rearwardly from the entering end of said member and engageable with a bottle cap within said bottle with hooking action, said fingers being compressed for bottle entry by engagement with the bottle neck by the fingers as the head portion of said member is inserted in the bottle opening.

8. A bottle cap extractor including in combination, means for supporting and centering a bottle in inverted position, a pipe having a liquid discharge orifice at its end, said pipe and bottle being relatively movable whereby said pipe end may enter said bottle, a plurality of spring fingers secured to said pipe adjacent said pipe end and divergent along said pipe in a direction away from said pipe end for hooking engagement with a cap within said bottle, said fingers removing a cap from a bottle by hooking engagement of the cap when said bottle and pipe are separated, the spread of the free ends of said fingers being greater than the diameter of the bottle mouth and said fingers being compressed on entry into and withdrawal from said bottle, and means for discharging liquid through said pipe orifice when said pipe end is within a bottle whereby said liquid may drive a bottle cap toward the bottle mouth and into position to be hooked by a finger for withdrawal.

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