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CLOSURE HAVING AIR PUMP MOUNTED THEREIN

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Fig. 1

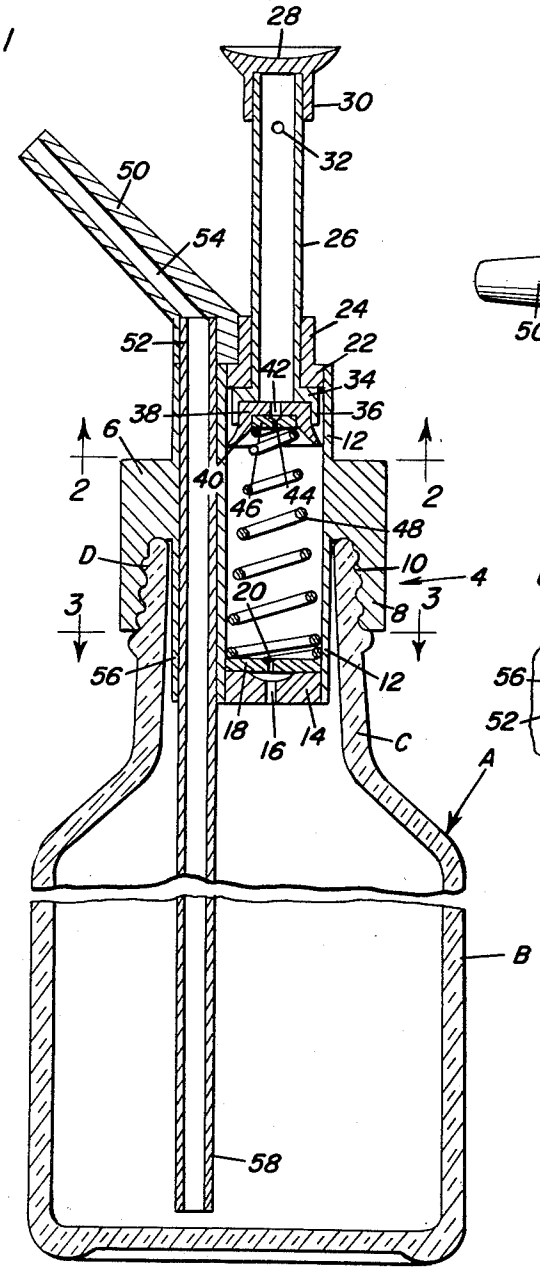
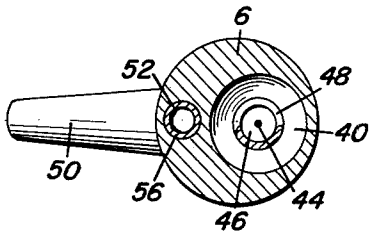


Fig. 2



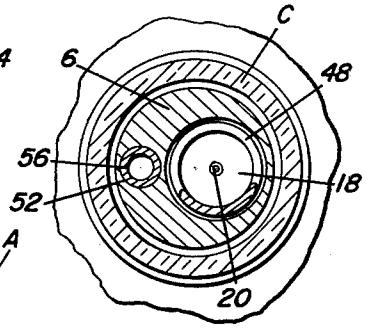


Fig. 3

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CLOSURE HAVING AIR PUMP MOUNTED THEREIN

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The present invention relates to a manually actuatable dispenser and cap combination wherein a novel valved dispenser for a ketchup bottle is provided.

It is a matter of common knowledge that bottle closing caps having pourers and valved dispensing pumps are not new. It follows that the object of the instant invention is to structurally, functionally and otherwise improve upon similarly constructed and performing bottle closures having varying types of valved dispensing means.

In carrying out the principles of the invention a screw cap is provided. The cap, in turn, has a simple but novel mechanical manually actuatable pressure pump embodied therein. There is also provided a contents lifting and discharge tube and this is connected communicatively with a nozzle or spout and the air pressure generated by the action of the pump imposes the necessary force upon or atop the contents of the bottle, ketchup for example, thus ejecting it slowly but under pressure through the spout.

More specifically, the invention features an improved pump, said pump having a cylinder and a spring biased and returned plunger. The plunger comprises a hollow stem with a knob at the top and a suitable air vent. By constructing the pump with novel features therein a highly improved and retarded pump action is attained.

Other objects, features and advantages will become more readily apparent from the following description and the accompanying illustrative drawing.

In the drawing, wherein like numerals are employed to designate like parts throughout the views:

FIG. 1 is a view in section and elevation showing a closure constructed in accordance with the invention and illustrating how the same is adapted to function on the discharge neck of a bottle, for example, a bottle adapted to contain ketchup or the like.

FIGS. 2 and 3 are horizontal sections on the lines 2—2 and 3—3, respectively, of FIG. 1, looking in the direction of the arrows.

With reference now to the over-all assemblage, that is the bottle with the closure attached is depicted in FIG. 1 where the letter A designates a container or bottle having a body portion B and a neck portion C with screwthreads arranged exteriorly thereon as at D.

The valved dispensing cap is denoted generally by the numeral 4 and the major part may be referred to as a screw cap. That is to say, the body 6 of the cap has a screwthreaded rim or skirt 8 with internal screwthreads 10 to screw on the threads D of the bottle neck. However, this cap is structurally distinct in that it has several distinctive features incorporated therein. For example, the simple mechanical pump, an integral component of the cap, comprises a generally centered or axially positioned open-ended cylinder 12. A plug 14 is suitably fitted into the bottom of the cylinder which latter projects and depends into the neck of the botile. There is a central recessed air discharge passage at 16. On the interior of the cylinder, that is the chamber portion there is a spring seated washer or bottom valve 18 having a central restricted orifice 20 in line with the slightly larger orifice or passage 16. These features 16 and 20 permit the air when it is being pumped to bleed slowly into the upper part of the chamber containing the ketchup (not shown). A similar top plug or member is plugged as at 22 into the extending or upstanding top of the cylinder and this plug has a neck 24 which provides a mounting and guide for the hollow stem 26 of the plunger. A suitable manually

depressed knob 28 is fixed on the top of the tubular stem by way of an attaching neck 30 and at this upper portion there is also an air venting port 32. The portion of the stem extending through the neck and into the chamber is formed into a head 34 with a rim 36 defining a rigid cup. This cup 36 has a second cup or gasket of packing material located therein. The cup portion of the gasket or piston is denoted at 38. The flaring flexible rim 40 has sliding or wiping contact with the interior of the cylinder and this cup 38 has a restricted air passage 42 registering with the hollow stem 26 and a smaller air passage 44 in the spring seated washer 46. This washer constitutes a top valve and is seated in the cup portion 38 and the cup portion 38 is seated telescopically in the first named cup made up of components 34 and 36. The end washer or valve 46 serves to accommodate the uppermost convolution or coil of a coil spring 48 which is confined in the interior of the pump cylinder 12. The lower convolution of the spring rests on the washer or bottom valve 18 and presses this washer firmly against the interior or upper recessed side of the bottom plug 14. The upwardly angled discharge nozzle or spout is denoted at 50 and it is mounted on the upper end of the upper end portion 52 of a delivery pipe or tube, the passage in the tube communicating with the passage 54 in the spout. The median portion of the tube is mounted in a bore 56 provided therefor and the lower end of the tube as at 58 is disposed in the ketchup bottle and terminates just above the bottom of the bottle.

The adoption and use of centrally apertured disks or washers 18 and 46 as valves; namely, a bottom valve 18 and a top valve 46 acted on by an intervening coil spring 48, is a highly desirable adaptation and arrangement in a hand-operated mechanical air pump. The top and bottom valves 46 and 18, respectively, are thus designed to open by air pressure and to close, when the air pressure is removed. The passage 16, recessed at its upper end, defines a pocket-like space between the top of the plug 14 and the underside of the washer or valve 18 which serves two purposes. First, it provides clearance or room for the bottom valve 18 to open; secondly, in the same manner that air in a diving bell prevents water from entering the bell (not shown), this space prevents ketchup from passing upwardly through the passage 16 and contacting and clogging the orifice 20 in the valve 18. The diameter of the uppermost convolution of the spring 48 provides clearance and does not interfere with the opening and closing of the top valve 46. These spring-loaded top and bottom valves make for a novel dispensing cap or closure which permits ejecting the contents of the bottle from a vertical or near vertical position (not feasible or practical with other differently constructed dispensing pumps). The valve arrangement shown also eliminates the problem of corrosion that would undoubtedly be encountered with spring-loaded ball check valves.

As already mentioned, it is believed that the specific pump which is embodied in the screw cap and which has the hollow stem and spring-loaded plunger features herein disclosed provides the desired slow delayed action that is necessary to properly eject and dispense ketchup from a bottle. In other words, a rigid type of a plunger if pounded on sharply as it might if used in public places, would tend to forcibly squirt the ketchup out. With this type of a spring included delayed action plunger with proper venting characteristics no such pouncing upon the knob will bring about undesirable dispensing results.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly all suitable modifications and

equivalent may be resorted to, falling within the scope of the invention as claimed.

What is claimed as new is as follows:

1. A dispensing closure for use on the discharge neck of a ketchup bottle or the like comprising a cap which may be readily attached to and detached from the bottle neck, said cap being provided at a top portion thereof with an outstanding discharge spout, an elongated contents lifting and delivery tube communicatively connected at its upper end to the intake of said spout and having a lower end portion that will descend through the contents of the bottle and assume an intake position close to the level of the bottom of the bottle, and a manually actuatable and controllable mechanical air pump embodied in and constituting an integral and complemental part of said cap, said pump comprising a cylinder, a plunger slidable in the cylinder and provided with a centrally ported piston reciprocable in said cylinder, said plunger having a hollow stem provided with an air vent and normally assuming an elevated ready-to-descend position, said stem being provided on its upper end with a presser knob, said piston embodying a cup having a ported washer seated in the cup portion therein and constituting a first valve, the bottom of said cylinder having a recessed air passage, a second washer located in the bottom portion of the cylinder and having an orifice registering with said passage and constituting a second valve, and a coil spring confined in the chamber of the cylinder and having its lower end resting upon said second valve and its upper end urged and pressing yieldingly against the first valve, said spring functioning to elevate the plunger and piston and to normally close said top valve and serving to automatically return the plunger to its normal elevated position after each downward stroke of the plunger has been completed.

2. A dispensing closure for use on the discharge neck of a ketchup bottle or the like comprising a cap which may be readily attached to said neck, said cap being provided at a top portion thereof with an outstanding discharge spout, an elongated contents lifting and delivery tube communicatively connected at its upper end to the intake of said spout and having a lower end portion which descends through the contents of the bottle and assumes an intake position close to the bottom of the bottle, and a manually actuatable mechanical air pump

embodied in and constituting an integral and complemental part of said cap, said pump comprising a cylinder, the lower end of said cylinder being closed except for a central air passage, the upper end of the air passage being recessed and defining a pocket-like space, a first washer in the chamber of said cylinder of a diameter corresponding to the cross-section of the chamber in the cylinder and resting atop the closed bottom of the cylinder and having a restricted air orifice therein aligned with said passage, the upper end of said cylinder having a guide, a plunger embodying a hollow stem slidable in said guide, the major portion of said stem extending normally above the guide and being provided with a venting port in constant communication with the atmosphere, the lower end of said stem extending slidingly into the chamber of the cylinder and having a piston slidingly contacting the walls of the chamber of the cylinder and provided with a port in communication with the hollow portion of said stem, a second washer constituting a valve and cooperating with the piston and having a restricted air orifice aligned with the port in the piston, and a coil spring in the chamber of the cylinder with an upper convolution engaging the last-named washer and a lower convolution engaging the first-named washer.

3. The structure defined in claim 2 and wherein the lower end of said plunger is provided with a cup, said piston embodying a cup-shaped portion seated in said cup, and said second-named washer being seated in the cup portion of the piston.

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