

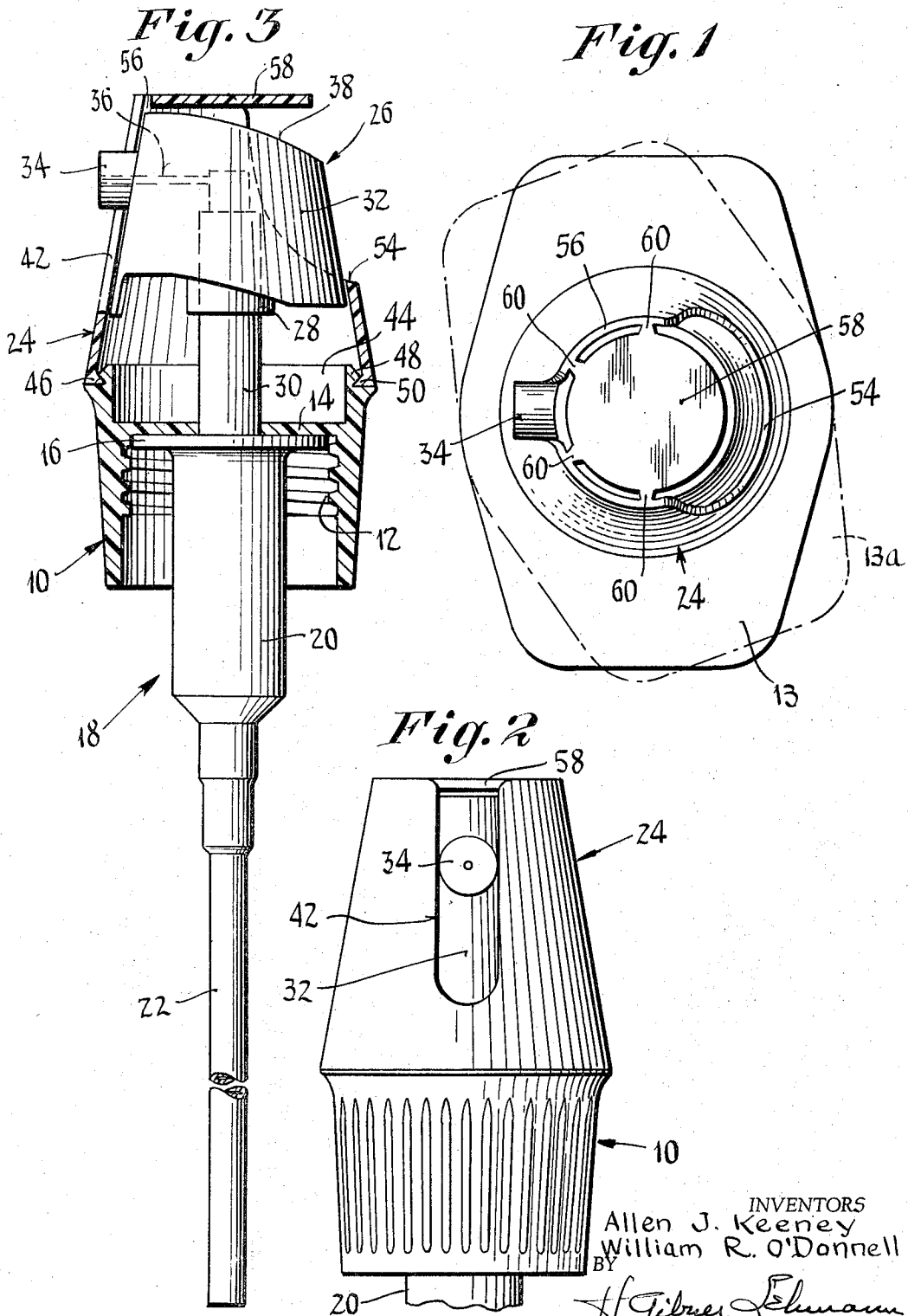
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ACTUATOR CAP FOR DISPENSERS

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ACTUATOR CAP FOR DISPENSERS

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This invention relates to actuator caps for small liquid dispensers, and more particularly to caps which are mounted or secured in place by means of screw threads.

Most dispensing or actuator caps have a directional characteristic in that the dispensing orifice or spout is located at one side of the cap structure and generally comprises a protruding or projecting member. Where such caps are mounted on a circular or cylindrical container, or one which is essentially so, it sometimes does not matter where the spout or orifice is disposed, unless for some reason it is desired that the spout be pointed away from a label or marking area of the container.

In situation where the container is not perfectly circular but instead has flat sides, as for example where an oval or oblong cross section is involved, we have found it to be desirable to orient the nozzle or spout so that it is symmetrically disposed with respect to the non-circular configuration of the container. Some containers of this type may be more conveniently held when disposed with a flat side against the palm. Other containers may have a shape such that the user naturally will hold it in one given position rather than haphazardly as might occur if it is picked up by chance without respect to its configuration.

With containers of this type which are non-circular or which are more comfortable when held in a given position, it becomes desirable to have the orifice or spout point away from the user. In those circumstances where the actuator cap is of the type having screw threads to effect its mounting or securement to the container, the ultimate orientation of the orifice or spout may be one of chance, and may not be readily predetermined for the best purposes of the user.

The above drawback and disadvantage of screw-type directional actuator caps is obviated by the present invention, and one object of the invention is to provide an improved actuator cap of the type having a screw thread mounting, wherein the spout or nozzle may be directed or adjustably positioned in any desired direction or orientation with respect to the shape of the container, after the cap has been securely mounted or screwed into place.

Another object of the invention is to provide an improved adjustable-nozzle type actuator cap as above set forth, which is relatively simple in its construction, comprising few parts which may be readily molded or fabricated of plastic substance.

Still another object of the invention is to provide an improved actuator cap in accordance with the foregoing, wherein the actuator button is provided with a protective cover, both button and cover being mounted on a cap body in such a manner that they may be adjustably turned after securement of the cap body to the container, thereby to effect the desired orientation of the nozzle or spout.

A feature of the invention resides in the provision of an improved actuator cap as characterized, which discourages tampering with the actuator or discharge of the contents of the container except by an authorized person or ultimate user.

Another feature of the invention resides in the provision of an improved actuator cap as set forth, which is

reliable and effective in its operation while representing the lowest possible fabricating cost.

Other features of the invention reside in the provision of an improved actuator cap which may be readily rotatably adjusted or positioned in the simplest possible manner, without difficulty even by an unskilled person or user, and a cap which may be attached to and removed from the container in the easiest possible manner, as well as one wherein the parts may be readily assembled quickly and effectively.

Other features and advantages will hereinafter appear.

In the drawings accompanying this specification, similar characters of reference are used to designate like components throughout the several views, in which:

FIG. 1 is a top plan view of the improved actuator cap as provided by the invention, mounted on a container of non-circular configuration. An alternative position of the container is indicated by the broken outline in this figure.

FIG. 2 is a front elevational view of the improved actuator cap, and

FIG. 3 is an axial sectional view of the actuator cap.

As shown, the actuator comprises a cap and dispensing pump assemblage which is intended to be removably mounted on a container of the type having a threaded neck. Such containers are in the form of glass or plastic bottles, being well known in the art.

The actuator cap assemblage comprises a cap body piece designated generally by the numeral 10, having internal screw threads 12 arranged for engagement with the usual threaded neck of a bottle. The cap body piece 10 has an internal annular flange 14 against which there is fitted a cooperable annular flange and gasket 16 of a pump assemblage designated generally by the numeral 18.

The pump assemblage 18 comprises a plastic housing 20 in which there is a cylinder and piston or plunger (not shown), said housing having a depending dip or siphon tube 22 arranged to extend into the container to the bottom thereof. The pump assemblage 18 may be of any usual type, one suitable for use in the present actuator cap assemblage being that described in detail in the patent of O'Donnell and Steiman, No. 3,159,316, dated December 1, 1964, and entitled, "Atomizer Pump."

When the actuator assemblage is mounted on the container, the body piece 10 will be screwed down tightly so that the top lip of the container opening engages the annular flange 16 of the pump assemblage 18, thereby to provide a seal which prevents leakage of the container contents. For such arrangement, the body piece 10 may have various different rotative positions on the container, depending on the disposition of the internal screw threads 12 as well as the disposition of the cooperable external screw threads on the container neck. The exact rotative position of the body piece 10 is thus a matter of chance, being haphazard and not easily predetermined. Even slight variations in the threads, and manufacturing tolerances will change the ultimate rotative position of the body piece 10 for the reason that the thread arrangement operates on the principle of a slight taper or wedge, and small departures in dimensions will result in large changes in the rotative position of the cap.

In accordance with the present invention there is provided on the body piece 10 an operable button having at one side a discharge orifice, which button is both vertically movable and turnably or rotatably movable on the body piece 10, as well as a cover piece which encloses the button and is also mounted on the body piece 10, said cover piece providing clearance for the side discharge orifice of the button and being frictionally held by the body piece in such a manner that it may be rotatably adjusted together with the button to enable these two to

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be turned so as to orient them with respect to the container and body piece 10. Aside from the adjustable rotative movement, the cover piece does not have any other movement but instead is rigidly and securely mounted on the body piece 10.

Referring to FIGS. 2 and 3, the cover piece is indicated generally by the numeral 24, and the operable button is indicated at 26. The button 26 has a depending hollow central boss 28 which is secured to a vertically movable plunger shank 30 of the pump assemblage 18. The flange 16, cylinder 20 and shank 30 constitute a means for movably mounting the button 26 on the cap body piece 10, as will be understood.

The button 26 comprises a conical body 32 having a projecting side orifice or nozzle 34, the latter communicating with a discharge passage 36 in the button whereby liquid passing up through the hollow plunger shank 30 may flow through the passage 36 and be ejected from the orifice 34, either in the form of a fine spray or else as a stream of viscous liquid substance. The button 32 has a sloping top surface 38 for engagement by the finger of the user, and it will be understood that (as is conventional) the pump assemblage 18 includes a plunger return spring (not shown) which normally maintains the shank 30 of the button 32 in the raised, non-discharging position of FIG. 3.

The cover piece 24 is also of conical configuration, having in one side wall a vertical slot 42 in which the nozzle 34 is guided, and with which it cooperates to prevent relative turning movement between the button and cover piece.

In accordance with this invention a friction mounting is provided on the cover piece 24 and cap body piece 10, which yieldably holds the cover piece and button 32 in different adjusted rotative positions with respect to the body piece, thereby to enable the cover piece and button to be rotatably adjusted with respect to the container on which the body piece is screwed. The friction mounting comprises interfitting rim portions 44 and 46 of the body and cover pieces, said rim portions having internal and external shoulders 48 and 50 respectively, which are respectively of smaller and larger diameters to provide an interlock between the cover and body piece while at the same time enabling an adjustable rotative movement of the cover piece to be effected with respect to the body piece.

The cover and body pieces 24, 10 as well as the button 32 are molded of resilient plastic substance such as polyethylene or similar formulations, and at least one of said interlocking pieces is sufficiently yieldable to enable a snap fit or assemblage of these to be effected. Preferably both the body piece 10 and cover piece 24 are resilient, whereby both rim portions yield a slight extent to enable the assembly of these to be easily effected.

Once the body and cover pieces are assembled they do not normally come apart but instead the cover piece provides a guide as well as a protective guard for the button 32, preventing inadvertent operation of the button and insuring that the nozzle or orifice thereof is always properly pointed or oriented.

At the time that the actuator assemblage is initially mounted on the container, the latter may be oriented with respect to the cover piece 24 and nozzle 34 by merely turning the cover piece in either direction while holding the container.

Referring to FIG. 1, the preferred position of the orifice 34 may be as indicated by the full line representation wherein the orifice is symmetrically disposed with respect to the broad or larger sides of the container 13. At the time of the initial mounting of the actuator cap assemblage, the relative position of the container 13 may be as indicated by the broken outline thereof, designated 13a. It is now merely necessary to grasp the cover piece 24 and turn it with respect to the container, to effect the

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desired orientation, such as that indicated by the full line representation.

Preferably the cover piece 24 is sufficiently high to prevent inadvertent actuation of the button 32, and also is arranged to prevent tampering, or discharge of the contents of the container. As seen in FIG. 3, the cover piece 24 has a cut-away rear wall 54 which provides an access opening to enable the user to reach and operate the button 32. Also, the cover piece 24 has a top edge portion 56 which is disposed higher than the top surface 38 of the button 32 whereby a broad surfaced exterior object cannot accidentally effect reciprocation or depressing movement of the button 32 to cause a discharge of the liquid substance to occur. Also, a discardable or throw-away disk 58 is provided on the top portion 56 of the cover piece 24, being connected to the latter by a plurality of narrow frangible webs 60. The tab 58 extends over the top surface 38 of the button, preventing the insertion of an operating finger. Thus, unauthorized or accidental operation of the button is prevented.

At the time of the first use, the tab 58 is grasped and torn away (being discarded), thereby revealing the top of the button 38, and the latter may now be readily actuated by applying the necessary finger pressure, in conjunction with the return spring (not shown) provided in the pump assemblage 18 of the actuator.

It will now be understood from the foregoing that we have provided a novel and improved actuator assemblage for small hand-held dispensers, wherein the disadvantage of screw threads by which a desired orientation of the orifice is defeated, is overcome in a simple and practical manner. After the mounting of the actuator assemblage, it is merely necessary to turn the cover piece 24 so as to bring the discharge orifice 34 to the desired position or orientation. Relatively few parts are required, and the fabrication and assemblage of the parts may be easily, quickly and economically effected.

The operation of the actuator is wholly reliable and foolproof, and the parts are so constituted as to have a long and useful life.

Variations and modifications may be made within the scope of the claims, and portions of the improvement may be used without others.

We claim:

1. An actuator for a dispensing device comprising, in combination:

- (a) a cap body piece having screw threads for engagement with a threaded container neck, and having an exterior peripheral surface for engagement by the fingers to enable the body piece to be manually screwed onto the container neck,
- (b) an operable dispensing button and means movably mounting the button on the cap body piece for both turning and axial movement,
- (c) said button having a discharge orifice at one side,
- (d) a cover piece enclosing said button, adapted to expose a portion of the button for finger engagement,
- (e) guide means on said button and cover piece, preventing relative turning therebetween while enabling relative axial movement to be had, and
- (f) a friction mounting on said cover piece and a portion of the cap body piece which is located entirely above the said finger-engageable peripheral surface thereof, yieldably holding the said cover piece and button in different adjusted rotative positions with respect to the body piece, thereby to enable the cover piece and button to be rotatably adjusted with respect to a container on which the body piece is screwed, all without enclosing said peripheral surface or interfering with the screwing on or unscrewing of said body piece.

2. An actuator as in claim 1, wherein:

- (a) the friction mounting comprises interfitting end rim portions of the cap body and cover piece,
- (b) said rim portions having external and internal

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shoulders which are respectively of smaller and larger diameters to provide an interlock and restrain relative axial movement.

3. An actuator as in claim 2, wherein:
 (a) the cap body and cover pieces are resilient, 5
 (b) said end rim portions being adapted to snap together to effect easy and quick assembly of the said pieces.
4. An actuator as in claim 1, wherein:
 (a) at least one of said pieces is resilient, 10
 (b) said friction mounting comprising a nap-fit between the cover and cap body pieces to enable these to be easily and quickly assembled.
5. An actuator as in claim 1, wherein:
 (a) the guide means comprises a slot in the cover piece, 15
 (b) said discharge orifice comprising a member projecting from the button and disposed in said slot for engagement with the sides thereof.
6. An actuator as in claim 1, wherein: 20
 (a) the cover piece includes a removable tab covering the end of the button, said tab being connected to the remainder of the cover piece by frangible webs whereby it can be readily removed to operate the button. 25
7. An actuator for a dispensing device comprising, in combination:
 (a) a cap body piece having screw threads for engagement with a threaded container neck,
 (b) an operable dispensing button movably mounted 30 on the cap body piece for both turning and axial movement,
 (c) said button having a discharge orifice at one side,
 (d) a cover piece enclosing said button, adapted to expose a portion of the button for finger engagement, 35
 (e) guide means on said button and cover piece, preventing relative turning therebetween while enabling relative axial movement to be had,

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- (f) a friction mounting on said cover piece and cap body piece yieldably holding the said cover piece and button in different adjusted rotative positions with respect to the body piece, thereby to enable the cover piece and button to be rotatably adjusted with respect to a container on which the body piece is screwed,
 (g) said guide means comprising a slot in the cover piece,
 (h) said discharge orifice comprising a member projecting from the button and disposed in said slot for engagement with the sides thereof,
 (i) said cover piece being conical,
 (j) said slot being disposed in a sloping wall of the cover piece,
 (k) said friction mounting comprising a rim portion of the cover piece, constituting the largest diameter thereof,
 (l) said button and orifice member being insertable in the cover piece through the said rim portion.
8. An actuator as in claim 7 wherein:
 (a) the button is conical and rests inside the cover piece,
 (b) said cover piece having a cut-away side wall to provide access to the button.

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