Sept. 13, 1966 P. H. SAGARIN 3,272,394

ACTUATOR CAP FOR SMALL FLUID DISPENSERS

Filed Oct. 7, 1964

Fig. 1

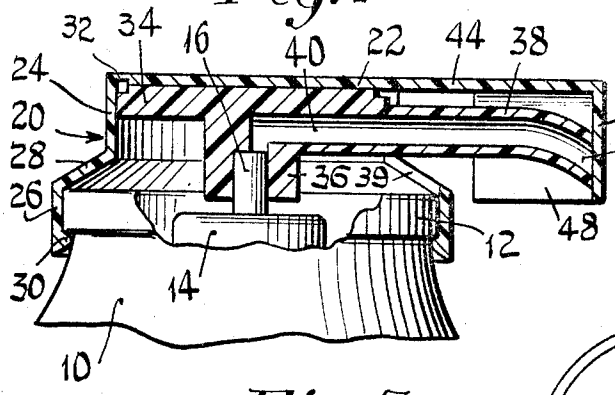


Fig. 2

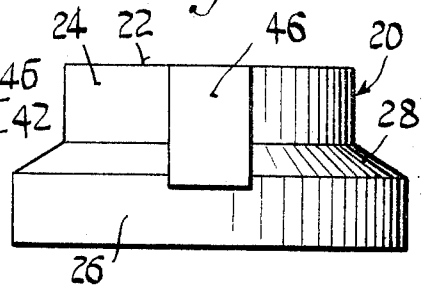


Fig. 6

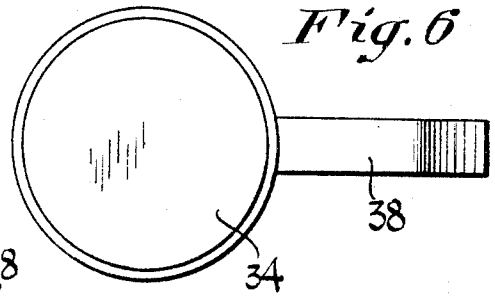


Fig. 3

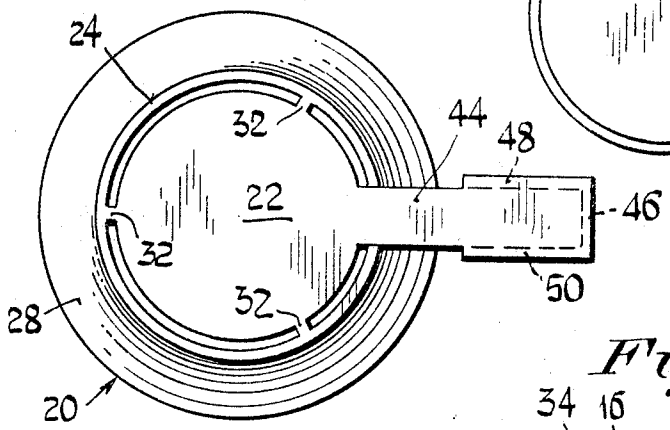


Fig. 5

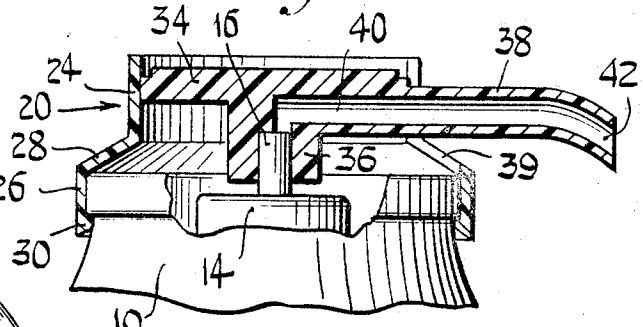
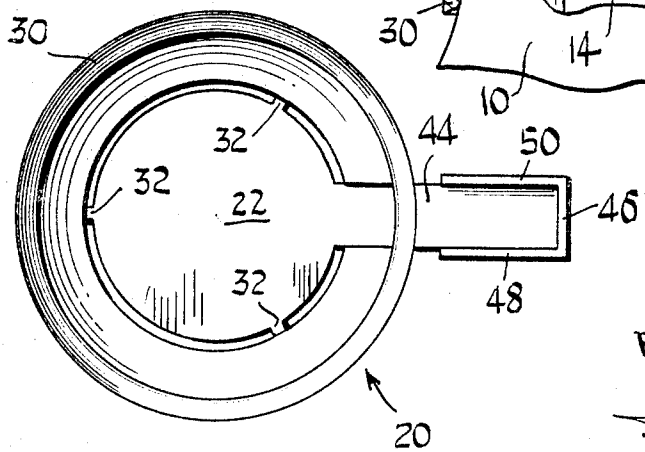


Fig. 4



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United States Patent Office 3,272,394 Patented Sept. 13, 1966

3,272,394

ACTUATOR CAP FOR SMALL FLUID DISPENSERS

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Filed Oct. 7, 1964, Ser. No. 402,225
8 Claims. (Cl. 222—182)

This invention relates to small hand-held fluid dispensing devices, and more particularly to guarded or protected actuator caps and closures for the same.

Actuator caps for aerosol and other dispensers, whether these latter are of the pressurized or of the pump type, commonly comprise a stationary cap body constituting an outer member, and a movable depress button disposed within the cap body and generally carried by a hollow valve stem or hollow plunger rod of the dispenser, such button having a discharge spout directed laterally to discharge beyond one side wall of the cap body. When the depress button is pushed downward or inward it effects a discharge of the substance from the container, such discharge passing outward through the spout. In the case of pressurized containers, the depressing of the button opens a valve to permit the pressurized contents to be discharged. In pump-type dispensers the downward or inward and reverse movements of the button operate a piston which effects a pumping of the container contents, to produce the desired discharge.

Various proposals have been made to prevent inadvertent actuation of the depress button, whether the dispenser is of the pressurized or of the pump type. In my copending application, Serial No. 360,394 filed April 16, 1964 and entitled, "Actuator Top for Aerosol Devices," I disclose a guarded or shielded depress button in a cap construction illustrated in conjunction with a pressurized container. To prevent inadvertent actuation of the button there is provided a removable cover piece which is so arranged that it must be broken off or away from the stationary cap body to permit normal operation of the depress button for effecting the desired discharge. The cover piece is discarded after it has been broken off, since the purpose served is that of preventing operation or discharge of the dispenser prior to its reaching the consumer.

The present invention embraces an actuator cap for small dispensers, which also utilizes a break-away, throw-away protective cover piece, such piece however being provided in conjunction with a depress button having a long discharge spout with an end opening and the piece being so arranged that it not only prevents inadvertent operation of the depress button but also simultaneously constitutes a cover for the discharge opening of the spout.

Accordingly, one object of the invention is to provide a novel and improved actuator cap for small dispensers of the type having a laterally projecting discharge spout, wherein inadvertent operation of the depress button is prevented by means which simultaneously covers the discharge opening of the spout, all in the form of a simple break-away, throw-away cover piece intended to be normally removed by the consumer.

Another object of the invention is to provide an improved actuator cap construction in accordance with the foregoing, wherein relatively few parts are involved, such parts being capable of fabrication by an economical molding process, of plastic materials.

Yet another object of the invention is to provide an improved actuator cap as outlined, wherein the throw-away or disposable protective cover piece is molded simultaneously with one of the other salient parts of the cap construction, preferably the stationary (outer) cap body member. With such arrangement, the cap construction initially comprises but two separate economically molded plastic pieces which are assembled or interfitted and mounted on the container of the dispenser, to operate the discharge mechanism thereof.

A feature of the invention resides in the provision of an improved actuator cap as above characterized, wherein the two molded pieces (including the disposable cover member) may be easily and quickly assembled to each other and thereafter to the remainder of the dispenser, all with a minimum of difficulty and time being involved.

Another feature of the invention resides in the provision of an actuator cap as set forth above, wherein the removal of the protective piece to effect exposure of the spout opening and of the depress button, may be easily and quickly effected with a minimum amount of know-how and skill.

The cap construction as set forth herein involves thin frangible webs connecting the removable cover piece to the cap body, and another feature of the invention resides in the provision of such frangible webs or strips which are so located with respect to a finger grip portion of the cover piece as to enable the piece to be most easily torn off while at the same time it is normally securely retained in place for shipment, display, nominal handling, etc.

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 an axial or vertical sectional view of an improved actuator cap having a removable and discardable protective cover piece as provided by the invention.

FIG. 2 is a front elevational view of the cap construction of FIG. 1, shown as mounted on the upper portion of a dispensing-type container of the pressurized kind.

FIG. 3 is a top plan view of the cap construction of FIGS. 1 and 2.

FIG. 4 is a bottom plan view of the cap construction.

FIG. 5 is a vertical sectional view like that of FIG. 1 but showing the protective cover piece as having been removed and discarded.

FIG. 6 is a top plan view of the depress button and discharge spout of the cap construction.

Referring first to FIG. 1, there is illustrated the upper portion of a pressurized container **10**, such container having a top end closure provided with a crimping annular shoulder **12** and with a raised central portion **14**, said end closure movably mounting a vertically reciprocable hollow valve stem **16**. This type of container construction is conventional in the art, and accordingly further details thereof are not given herein.

In accordance with the invention there is provided on the container **10** an improved protective-type actuator cap construction, comprising a stationary tubular body **20** having integral therewith a readily removable, discardable protective and cover piece **22**. Preferably the cap body **20** and the cover piece **22** are molded as a single unitary integral piece, in a single molding operation. Many of the various plastic substances commonly used for actuator caps will be found suitable for fabricating the cap

body 20 and cover piece 22. Polyethylene formulations, for example, are well known and widely used for actuator caps.

The cap body 20 has an upper portion 24 of small diameter, connected with a lower portion 26 of larger diameter by a short conical section 28 as clearly shown in the figures. On the lower edge of the lower portion 26 an internal detent bead 30 is provided, to clamp under the crimped shoulder 12 of the top closure assemblage of the container 10, as will be readily understood.

Referring to FIG. 3, the protective cover 22 has a generally circular main body portion which is connected to the top edge of the upper portion 24 of the cap body 20 by a plurality (here shown as 3 in number) of thin, frangible webs 32. The webs 32 are so arranged that the protective piece 22 may be readily torn away from the cap body 20 upon exerting sufficient upward force in a manner which may now be understood.

Below the protective cover piece 22 there is disposed in the central cavity of the cap body a depress button 34 of generally circular configuration, such button constituting a piece which is separate from the cap body 20 and cover piece 22 and having a depending hollow central hub 36 which frictionally receives the upper portion of the valve stem 16, as seen in FIGS. 1 and 5.

The depress button 34 has a laterally extending spout 38 of hollow construction, providing a discharge channel 14 which communicates with the bore of the hub 36 to receive the aerosol substance discharged through the hollow valve stem 16 when the latter is depressed or shifted downward in response to downward pressure on the button. A discharge opening 42 is provided on the spout 38 at the extremity thereof, as seen in FIGS. 1 and 5.

A slot or notch 39 is provided in the upper wall portion 24 of the cap body as well as in the conical section 28 thereof, to provide clearance for the spout 38, as may be readily seen in FIGS. 1 and 5.

By the present invention, the protective cover piece 22 is provided with a cover or finger tab 44 extending horizontally from one edge of the body portion, such tab being arranged to cover over the end opening 42 of the spout 38. For this purpose, the cover tab 44 is provided with a depending enclosure comprising an end wall 46 and side walls 48, 50. The depending portion or enclosure 46, 48, 50 surrounds the outer tip portion of the spout 38 and closes over the end opening 42 thereof in the manner well illustrated in FIG. 1. Moreover, in accordance with the invention, the enclosure of the cover tab 44 is so arranged as to conveniently function as a finger grip, by which the cover piece may be removed at such time that this is desired. The consumer or user merely grasps the depending enclosure portion or extremity 46, 48, 50 of the cover tab 44 and pulls the same upward, away from the spout 38. Continued upward force will cause a rupture of the two nearest frangible webs 32, and thereafter the last or remaining web 32 will break as the cover piece is continued to be pulled away.

It will be noted that the two frangible webs 32 which are nearest to the cover tab 44 are still spaced an appreciable distance from such tab. This arrangement facilitates the breaking of the webs, inasmuch as the webs connect with relatively rigid or sturdy edges of the body portion of the cover piece 22, and this is in contrast to any construction where the webs 32 might be located directly at or close to the flexible cover tab 44. By connecting the web 32 to more mechanically resistant portions of the cover piece, the webs will fracture more readily and the removal of the cover tab 44 involves pulling upward the edge or periphery of the body portion connected to the tab. Such connected periphery is free to move, and the cover tab 44 experiences mainly a tensile stress whereby it is not likely to tear away even though of lesser strength than the body portion of the cover piece. This is one of the features of the improved cap of the present invention.

Considering FIG. 1 it will now be understood that the overlying protective cover piece 22 prevents inadvertent operation of the depress button 34, and that the cover tab 44 of such piece in closing over the end opening 42 of the spout 58 prevents foreign matter, dirt, etc., from becoming lodged in the spout. Moreover, it tends to prevent leakage of the contained substance if a slight discharge should take place for some reason or other.

The protective cover piece and closure portion thereof thus provides a maximum degree of protection to the cap construction prior to the device being placed in use by the consumer. The frangible webs 32 are sufficiently strong to prevent incidental actuation of the button 34, yet they may be readily ruptured at the time that the cover piece is to be removed.

The cap construction is seen to involve relatively few parts, which may be readily and economically molded. Moreover, the assembling of the depress button 34 and spout 38 thereof to the cap body 20 may be easily and quickly effected, after which the assembled parts may be readily installed on the aerosol container.

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

I claim:

1. An actuator cap for a dispenser, comprising in combination:
   (a) a depress button having a finger-engageable top surface, said button having a discharge spout projecting from one side, and said button being adapted for connection to the valve of the dispenser to actuate the same and effect a discharge of the dispenser contents,
   (b) a stationary tubular cap body surrounding the depress button and arranged to provide access to the finger-engageable surface of the button, and
   (c) manually removable means adapted to be discarded, comprising a cover piece fixedly carried by the cap body and overlying the button and the discharge spout of the latter to prevent free flow therefrom, said means including a laterally projecting finger tab having substantially the same configuration as the discharge spout and overlying the spout but being unattached thereto, said tab being free for movement upward and away from the spout for the purpose of removing the cover piece, said means further including frangible webs which join the cover piece and cap body together and which may be readily broken to release the cover piece upon applying a sufficiently strong upward removing force to the finger tab.

2. An actuator cap as in claim 1, wherein:
   (a) the cap body, cover piece and webs are molded as a single integral piece of plastic substance, and
   (b) the depress button is molded as a piece separate from the cap body, of plastic substance.

3. An actuator cap as in claim 1, wherein:
   (a) the cap body has a central cavity in which the finger-engageable surface of the button is disposed,
   (b) said removable cover piece being disposed in the upper portion of said cavity, above said engageable surfaces, said finger tab having a depending portion extending over the spout opening and providing a finger grip.

4. An actuator cap as in claim 3, wherein:
   (a) the top edge of the cap body is continuous and circular,
   (b) said button being circular and having a marginal portion which is coextensive with a circular edge of the cap body,
   (c) said cover piece including a circular configuration commensurate in size with the button,
   (d) said finger tab extending radially outward from

the circular configuration of the cover piece and overlying the entire length of said spout.

5. An actuator cap as in claim 1, wherein:

(a) the finger tab has a depending extremity which closes over the end opening of the spout.

6. An actuator cap as in claim 1, wherein:

(a) the finger piece includes a main body portion with which the finger tab is connected,

(b) said finger tab having a finger grip at its extremity,

(c) said frangible webs joining the main body portion of the cover piece to the cap body at points spaced from the juncture of the finger tab and main body portion.

7. An actuator cap is in claim 1, wherein:

(a) the said finger grip comprises a depending enclosure surrounding the extremity of the spout.

8. An actuator cap as in claim 1, wherein:

(a) the said cap body has a cut in a side wall, in which the spout and finger tab are disposed.

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