Nov. 24, 1964 W. R. O'DONNELL 3,158,292

ACTUATOR FOR AEROSOL DISPENSERS

Filed Dec. 27, 1962

Fig. 1

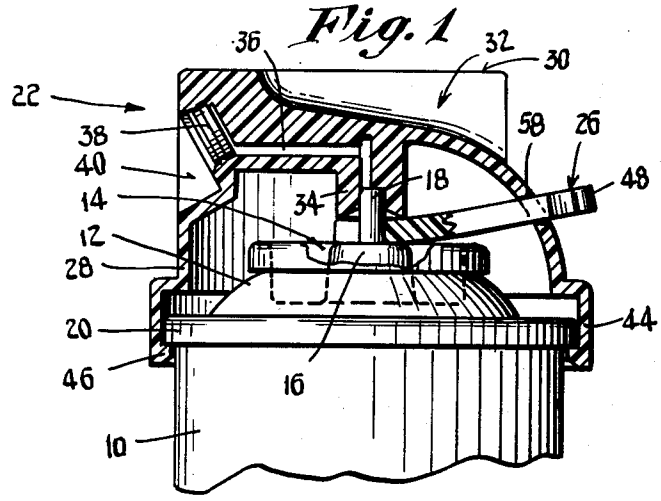


Fig. 2

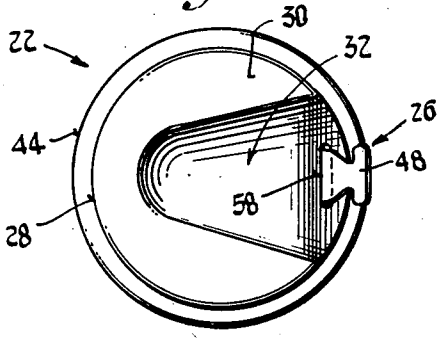


Fig. 3

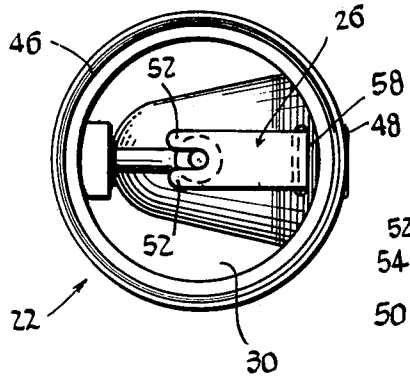


Fig. 4

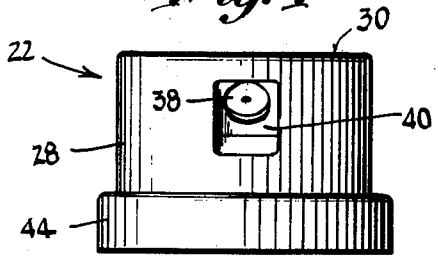


Fig. 5

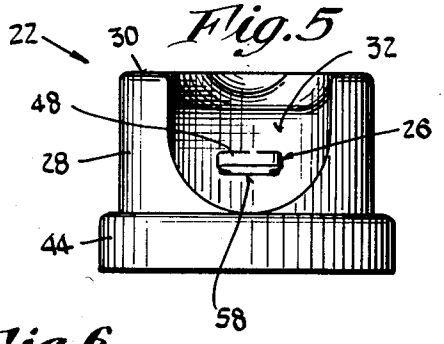
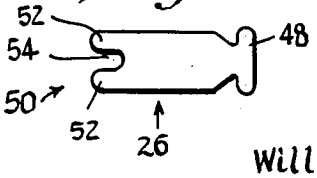


Fig. 6



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ACTUATOR FOR AEROSOL DISPENSERS

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8 Claims. (Cl. 222—153)

This invention relates to small aerosol dispensers of the kind intended to be held in the hand when in use, and more particularly to cap and actuator constructions for such dispensers.

Heretofore it has been common practice, in the field of small hand-held aerosol dispensers, to provide a protective cap on the container for the purpose of enclosing the push button actuator to prevent inadvertent operation of the latter during shipment, storage, display, etc. This protective cap has also served to provide the dispenser with a more presentable appearance, and with a finished look whereby it would constitute a more attractive package.

While this arrangement, which has been in widespread use, was generally satisfactory it had several drawbacks. The user was expected, each time that the dispenser was to be put into use, to remove the protective cap, necessitating that the latter be either held in the hand or else temporarily set down somewhere. The handling and placement of such a removable cap at times constituted an annoyance. Often the cap was misplaced or forgotten, and at other times because of its circular nature it would roll off a table or desk, requiring the user to pick it up from the floor.

Whereas it is not always essential, after the aerosol dispensing device has been purchased, to retain the protective cap and to replace it each time after use, the provision of such cap is important prior to the dispensing device being purchased by the consumer. The protection afforded by the cap is necessary during the shipment, storage, display and/or handling of the dispensing device, especially prior to the time of sale. However, even after the dispensing device has been purchased, the consumer tends to retain the protective cap and to go through the necessary handling operations of the same each time the dispensing device is placed into use, partly for the reason that without the cap in place the dispensing device has an unfinished and unattractive appearance.

The above arrangement involved two main operative components each of which represented a significant cost, since somewhat precise fits and tolerances are involved. This is in addition to the main objection concerning the inconvenience to which the user is put.

In an effort to overcome the necessity for removing and replacing a protective cap, other aerosol devices on the market employ a two-piece cap and actuator assemblage wherein the cap part is not removed but instead stays permanently in place on the container at all times. The construction is such that the cap component provides easy access to the actuator, and has relatively high guard portions surrounding the latter, by which there is avoided inadvertent operation. Such organization eliminates the annoyance of continually removing and replacing a protective cap, but there is still present the matter of appreciable fabrication costs, since it is required to provided two cooperable components of relatively large size and mass, each involving certain precise measurements and fits or tolerances. In consequence, relatively expensive mold equipment is necessary, in addition to the cost of the material.

The above drawbacks and disadvantages of prior aerosol dispensing devices are obviated by the present invention, and one object of the invention is to provide a novel and improved actuator assemblage for a hand-held aerosol device, wherein the actuator component and the protective cap component are constituted as one and the same piece with relatively immovable portions, and wherein there is avoided the necessity for the user to continually handle a protective cap component when the aerosol device is to be put into use, while at the same time protection is had against inadvertent or premature operation of the device.

The foregoing object is accomplished, in accordance with the invention, by the provision of a one-piece shell so arranged that it functions not only as the actuator for the dispensing device but also as the decorative and functional cover or cap of the device, such shell being especially arranged to accommodate a small locking piece which when in place positively prevents any actuation of the shell which might inadvertently discharge the contents of the dispenser. Thus, there is had the desired protection against inadvertent operation of the device, loss of the contents, etc. which is so necessary during shipment, storage, display and etc.

At the time that the dispensing device reaches the consumer, the procedure by which it is placed in operation involves merely pulling out or removing the small locking device, which may now be discarded since it is no longer necessary to the proper use or handling of the dispenser.

Such locking piece or member is especially small and economical to fabricate whereby it presents very little cost. Accordingly, it is in the class of a throw-away item, and may be discarded at the time that the dispenser is first placed in operation. Thereafter, the user need not be bothered with removing any protective device or finding a place or space on which to place it, or bothered with the inconvenience of replacing such device each time that the use is completed. Instead, there is now had an attractive package, embracing a relatively large cap-like actuator which provides the utmost convenience in discharging the contents of the dispenser in the desired manner.

The actuator-cap constitutes an attractive cover which conceals the purely functional components associated with the valve mechanism at the discharge end of the aerosol container. And convenience is had in the use of the dispensing device, since it is merely necessary to pick up the dispenser with one hand and apply finger pressure to the actuator-cap. In addition to the above, there is effected a reduced cost, since but a single large component is involved as compared with two larger components heretofore employed. The small throw-away locking piece represents such a small fractional part of the cost of the actuator assemblage as to be negligible.

Another object of the invention is to provide an improved combination actuator and cap assemblage for a hand-held aerosol dispensing device as above set forth, which is attractive in its appearance, capable of economical fabrication in relatively simple mold equipment, and effective and reliable in operation at all times.

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 sectional view of the improved actuator-cap assemblage as provided by the invention, shown in place on the upper portion of a pressurized aerosol dispenser.

FIG. 2 is a top plan view of the actuator-cap assemblage.

FIG. 3 is a bottom plan view of the actuator-cap assemblage.

FIG. 4 is a front elevational view of the assemblage.

FIG. 5 is a rear elevational view of the assemblage.

FIG. 6 is a top plan view of the locking piece or member utilized in the actuator-cap construction.

Referring first to FIG. 1, there is shown a pressurized aerosol container 10 having a closure and neck portion 12 of conventional construction, including a dispensing valve assemblage 14 of a usual type. The dispensing valve assemblage 14 includes a central hollow shoulder or boss 16, in which there is vertically movable a hollow or tubular valve stem 18. Since all of the foregoing construction is well known in the art, details of the same are not given herein.

As is readily understood, when the hollow valve stem 18 is depressed or shifted vertically downward, it enables the aerosol substance to be discharged from the container 10 through the hollow or bore of the stem. The container 10, as is usual, also has an upper peripheral shoulder or bead 20 constituted as a rolled seam, by which the neck or closure portion 12 is secured to the side walls of the container.

In accordance with the present invention there is provided in conjunction with the container structure above illustrated a novel and improved combination actuator and cap assemblage designated generally by the numeral 22, the said assemblage comprising essentially a hollow inverted shell structure which may be readily molded of a suitable plastic composition. The inverted shell structure 22 is adapted to be fitted to the hollow valve stem 18 and also to have a slidable bearing on the upper portion of the pressurized container 10.

The shell 22 is molded as a single unitary piece, and is adapted to accommodate a manually operable locking means which is removable therefrom to unlock the shell, said locking means comprising a member 26 which is arranged to engage a portion of the container 10 to effect the locking action and to prevent any depressing movement of the shell 22 until the piece is removed.

Referring to FIGS. 1–5, the shell 22 comprises a tubular side wall 28 and a transverse top wall 30, the latter including a relatively deep and wide, tapered finger notch or depression 32.

Depending from the central portion of the shell 22 is a tubular fitting 34 adapted to frictionally fit over the tubular valve stem 18 whereby the latter may be actuated or depressed in response to downward movement of the entire shell 22. A channel 36 is provided in the shell 22, leading from the hollow boss or fitting 34 to a discharge orifice member 38, the latter being shown as directed in a direction pointing partly downward and being hooded by virtue of its location in a side recess 40 of the shell.

It will now be understood that when the aerosol substance is discharged through the hollow stem 18 it will follow the channel 36 of the shell 22 and be discharged as a spray or stream from the orifice member 38.

In accordance with the invention, the shell 22 is provided with bearing means for engagement with the container 10, such bearing means comprising the lower side walls of the large bore of the shell, as defined by a lower rim or bearing portion 44 which encircles and slidably engages the peripheral shoulder 20 of the container. The shell 22 is thus guided by the engagement between the rim 44 and the container shoulder 20, whereby it is prevented from tilting but instead will have substantially vertical movement, in conjunction with the support provided by the vertically movable hollow valve stem 18.

For purposes of retention of the shell on the container, an internal bead 46 is provided on the bearing rim 44, such bead being engageable with the shoulder 20 of the container and normally preventing removal of the shell 22 except upon the exertion of an appreciable force.

In FIG. 1 the shell 22 is illustrated in the non-discharging position on the container 10. In accordance with the invention, the shell 22 is locked in such position by a manually operable means which, in the illustrated embodiment of the invention, comprises the flat locking strip 26. As seen in FIG. 6, the strip 26 has at one end a handle portion 48 and at its other end a fork 50 comprising two tines 52 separated by a space 54. The bifurcated portion 50 of the locking member 26 is adapted to be interposed between the fitting 24 of the shell and the shoulder 16 of the valve assemblage in such a manner that it effectively blocks the fitting, constituting an abutment therefor whereby all downward movement of the shell 22 is prevented.

As seen in FIGS. 1–3 the locking member 26 may extend through a side opening or slot 58 provided in the shell, such opening being preferably in a lower portion of the finger notch 32. The positioning and locking action of the member 26 is clearly seen in FIG. 1, wherein the bifurcated end 50 engages not only the fitting 34 and the shoulder 16 but also the tubular valve stem 18. It is clear that by the presence of such locking member there is effectively prevented any downward movement of the shell 22.

When it is desired to place the aerosol dispenser in use, the consumer merely grasps the finger engageable portion 48 of the locking member and removes the latter completely from the shell 22. There is thus removed the obstruction provided by the locking member, whereupon the shell and the valve stem 18 may now be depressed in response to downward movement applied to the shell, as by the forefinger resting in the finger notch 32. During such downward movement the shell 22 will be guided by the engagement of the rim portion 44 thereof with the shoulder 20 of the container. Upon removal of the finger pressure, the shell 22 and the valve stem 18 will raise, shutting off the flow of the aerosol substance, as will be readily understood.

It will now be seen that in accordance with the foregoing I have provided a novel and improved combination safety actuator-cap assemblage which eliminates the necessity for a separate cover or protective cap member per se. Instead, the shell 22 constitutes not only the actuator of the aerosol dispenser but also the cover thereof, and inadvertent operation of such actuator is prevented by the provision of the small locking member 26 which is constituted as a throw-away piece. It is a simple matter for the user to withdraw the locking member and to discard the same, whereupon the dispenser is in readiness for use at all times, and may be utilized with the utmost convenience and ease. The cost of the shell 22 is relatively low, since it may be economically molded in relatively simple mold equipment. The shell furthermore presents an attractive appearance at all times, whereby the functional parts of the dispenser are concealed and hidden from view.

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. A cap-actuator for an aerosol dispenser, comprising in combination:

(*a*) an inverted shell having a discharge orifice in its side wall, having a finger rest on its top surface for engagement by a finger for the purpose of depressing the shell, and having a side opening in a wall spaced from the said discharge orifice,

(*b*) a fitting fixedly carried within the shell, having a socket to engage the valve stem of an aerosol container for depressing the latter when the shell is shifted downward,

(*c*) discharge channel means in the shell, communicating with said socket and discharge orifice for directing to the discharge orifice aerosol substance which is being discharged from the valve stem,

(*d*) a pressurized aerosol container having a hollow valve stem engaged with the said fitting in the socket thereof,

(*e*) said shell having a lower rim portion provided with

an internal bearing bore engaged with the exterior side wall of the container, to guide the shell thereon for vertical sliding movement, said shell and an upper portion of the container located within the shell having spaced opposed surfaces adjacent the valve stem, between which a member may be inserted to occupy the said space,

(*f*) manually operable lock means carried by and engaged with the shell in the side opening thereof for preventing depressing movement of the same and of the valve stem, said means comprising a lock member occupying the space between the said opposed surfaces, said member being wholly removable from the shell to unlock the latter,

(*g*) said lock member being movable laterally of the shell when inserted in the side opening to engage the said upper portion of the container, for preventing the said depressing movement.

2. An actuator as in claim 1, wherein:

(*a*) the said locking member has a portion disposed below and against the said fitting, to provide a temporary obstruction for the latter when the shell is positioned on the aerosol container with the fitting engaged with the valve stem.

3. An actuator as in claim 2, wherein:

(*a*) the lock member has a notched end adapted to be readily grasped by the user when it is desired to remove the member.

4. An actuator as in claim 3, wherein:

(*a*) the lock member comprises a flat strip having a forked end engageable with the said fitting of the shell and with the valve stem.

5. An actuator as in claim 4, wherein:

(*a*) the shell has a deep finger-receiving notch in its top and side wall, and

(*b*) the lock member extends into the said notch.

6. An actuator and container combination as in claim 3, wherein:

(*a*) there is a shoulder carried by the container, surrounding the valve stem, and

(*b*) the lock member is interposed between the shell fitting and the said shoulder surrounding the valve stem.

7. A cap-actuator for an aerosol dispenser, comprising in combination:

(*a*) an inverted shell,

(*b*) a fitting carried in the shell to engage the valve stem of an aerosol container for depressing the latter when the shell is depressed,

(*c*) discharge channel means in the shell, for directing aerosol substance being discharged from the valve stem and said fitting,

(*d*) manually operable lock means carried by the shell for preventing depressing movement of the same and of the valve stem, said means being removable from the shell to unlock the latter,

(*e*) said lock means comprising a member adapted to engage a portion of the container to prevent the said depressing movement,

(*f*) a pressurized aerosol container and hollow depressible valve stem projecting from the top of the container,

(*g*) a shoulder carried by the container, surrounding the valve stem,

(*h*) said lock means being interposed between the valve stem fitting and the shoulder surrounding the valve stem,

(*i*) said lock member having a forked end engaged with the said shoulder, valve stem, and valve stem fitting.

8. An actuator and container combination as in claim 7, wherein:

(*a*) the lock member comprises an elongate flat strip extending through a side wall of the shell and having a finger grip at its exposed end.

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