

Feb. 11, 1969

L. D. STIRLING

3,426,948

FOAM ACTUATOR

Filed March 1, 1967

Sheet 1 of 2

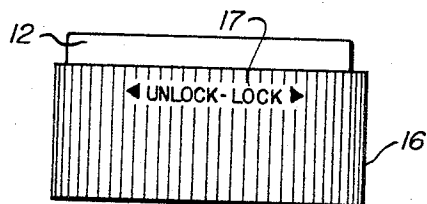


FIG. 1

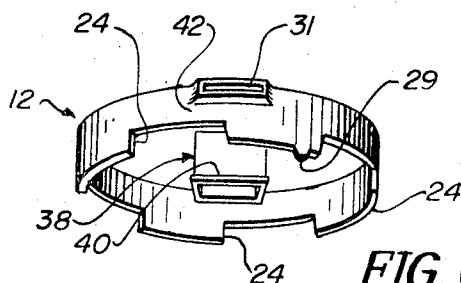


FIG. 6

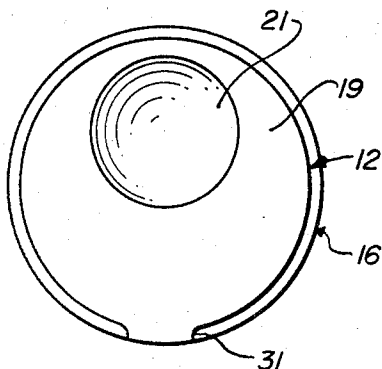


FIG. 2

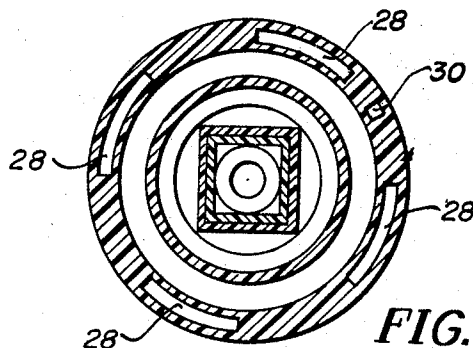


FIG. 5

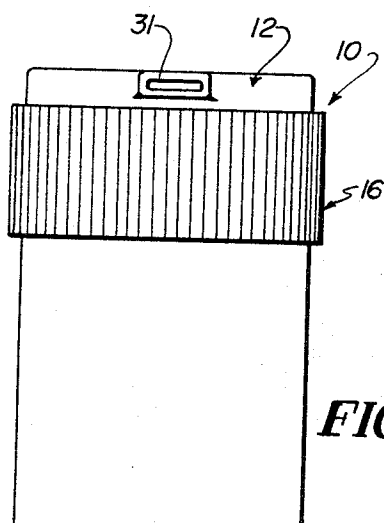


FIG. 3

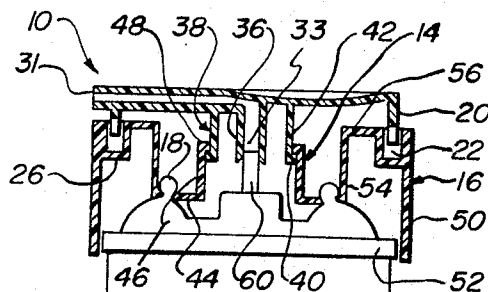


FIG. 4

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Sheet 2 of 2

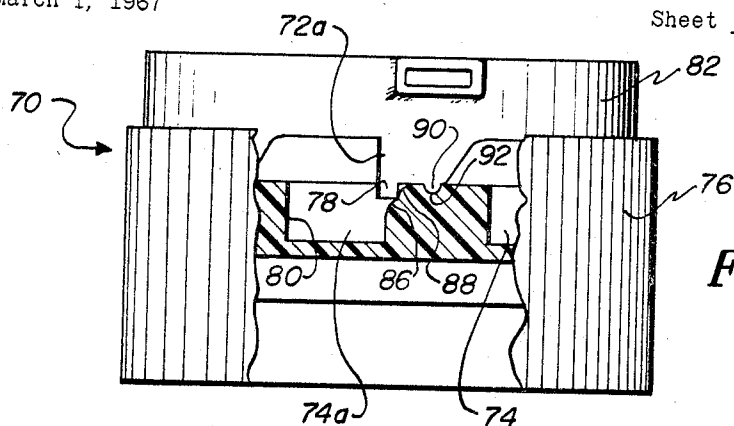


FIG. 7

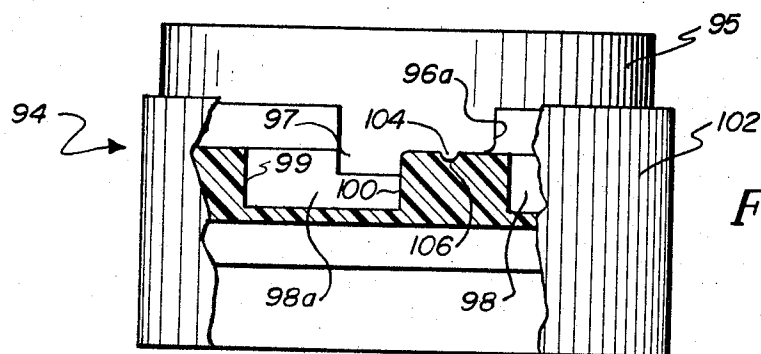


FIG. 8

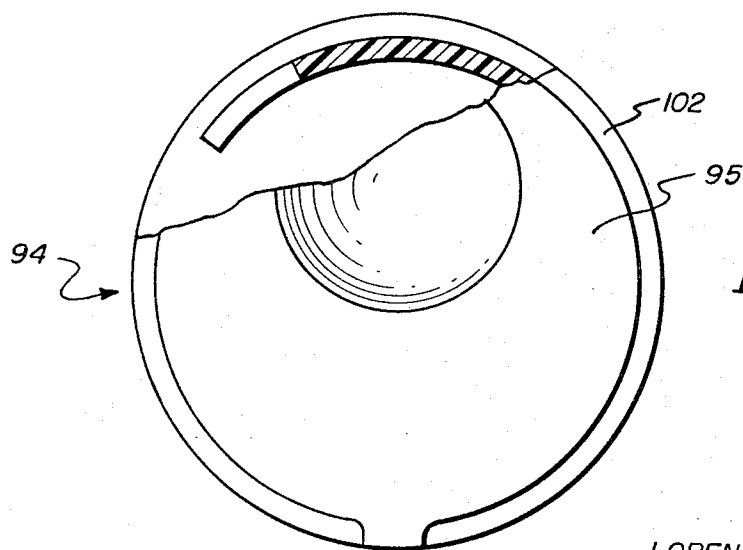


FIG. 9

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FOAM ACTUATOR

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Int. Cl. B67d 5/32; B65d 83/00

6 Claims

ABSTRACT OF THE DISCLOSURE

An actuator having a valve button, a valve button lock and a valve collar which are affixed together and to an aerosol can in a fashion such that the valve button cannot be accidentally or intentionally operated to dispense the product until the valve collar is rotated to place the actuator in an operative condition.

This invention relates to aerosol valves, and more particularly, to an actuator for an aerosol valve having a construction so that the valve cannot be intentionally or accidentally operated, until the actuator is placed in an operative condition.

Actuators of the above-described type are particularly desirable since aerosol products are generally displayed on shelves and counters in stores. Children, and even adults, will often times dispense some of the products just for curiosity sake, or for numerous other reasons. In doing so, the products are generally made unsaleable since other purchasers observe that it has been used, and therefore will not buy it. If the actuator has to be placed in an operative position before the product can be dispensed, this will usually deter small children, since they generally cannot figure out how the valve works. Adults generally will not take the time to do so. In any case, actuators of this type reduce loss considerably.

Aerosol products are often accidentally dispensed, by reason of the aerosol valve being operated during shipment, or while being packaged. In this case, also, the product generally cannot be sold.

Many types of actuators have been devised, however, each of them has been generally unsatisfactory for one reason or another. Accordingly, it is an object of the present invention to provide improved actuators for aerosol valves. It is a further object to provide an improved actuator for aerosol valves which is constructed so that it must be placed in an operative condition before the product can be dispensed.

It is a still further object to provide improved actuators of the above described type which can be easily fabricated, and easily assembled and affixed to an aerosol can.

Still another object is to provide improved actuators of the above-described type which are constructed in a fashion such as to present an attractive, low, compact appearance and which when affixed to an aerosol can, conceals the aerosol valve thereof so that the assembled product has an attractive appearance.

It is a still further object to provide improved actuators of the above-described type which may be positioned to an inoperative position after being used, so that it cannot be accidentally operated.

Other objects of the invention will in part be obvious and will in part appear hereinafter.

The above objectives are accomplished with an actuator which generally comprises a valve button, a valve button lock and a valve collar. The valve button lock is affixed to the valve housing, and the valve button seats on the valve stem of the aerosol valve and lockingly engages with the valve button lock to affix them together so that both are affixed to the aerosol can. The valve collar is adapted to

be rotatably affixed about the rim of the aerosol can and has an annular recessed groove about its upper peripheral edge in which the valve button seats and in which is formed a number of cutout slots. The valve button has a corresponding number of depending stop lugs which prevent it from being actuated to operate the aerosol valve, until the valve button is rotated to align the stop lugs with the cutout slots in the valve collar.

The invention accordingly comprises the features of construction, combination of elements, and arrangement of parts which will be exemplified in the construction hereinafter set forth, and the scope of the invention will be indicated in the claims.

For a fuller understanding of the nature and objects of the invention, reference should be had to the following detailed description taken in connection with the accompanying drawings in which:

FIG. 1 is a side plane view of the actuator of the present invention, illustrated in an inverted position;

FIG. 2 is a top plan view of the actuator of FIG. 1;

FIG. 3 is a side plan view, illustrating the actuator affixed to an aerosol can;

FIG. 4 is a sectional view of the actuator, affixed to an aerosol can;

FIG. 5 is a sectional view, taken along lines 5-5 of FIG. 4;

FIG. 6 is a perspective view of the valve button of the actuator;

FIG. 7 is a front plan view of the actuator, partially cut away to illustrate an alternative construction providing a positive stop alignment between the stop lugs and the cutout slots; and

FIGS. 8 and 9 are front plan and top views, respectively, of the actuator, partially cut away to illustrate said another alternative construction providing for a positive stop alignment.

Similar reference characters refer to similar parts throughout the several views of the drawings.

Referring now to the drawings, an actuator 10 exemplary of the present invention is shown having a valve button 12, a valve button lock 14 and a valve collar 16. The valve button lock 14 lockingly engages with the rim 18 of the valve housing, and the valve button 12 lockingly engages with it to secure the two pieces of the actuator to one another. The outer peripheral side wall 20 of the valve button 12 seats within an annular groove 22 formed in the valve collar 16 and supports the valve collar 16 in a rotatable fashion atop the aerosol can. The peripheral side wall 20 of the valve button 12 is formed so as to provide a number of downwardly depending stop lugs 24 (FIG. 6) which normally slidably ride on or just above the bottom wall 26 of the groove 22, as illustrated in FIG. 4. The bottom wall 26 has a corresponding number of cutout slots 28 (FIG. 5) formed in it which are adapted to receive the stop lugs 24.

Normally, when the actuator 10 is affixed to the aerosol can, the stop lugs 24 engage the bottom wall 26 of the groove 22 in the valve collar 16 so that the valve button 12 cannot be intentionally or accidentally depressed to operate the aerosol valve. A small, depending finger 29 on one of the stop lugs 24 engages in an aperture 30 in the bottom wall 26, to releasably lock the valve button 12 in this inoperative position.

In order to operate the actuator 10, the valve collar 16 must be rotated until the stop lugs 24 are positioned in alignment over the slots 28 in the bottom wall 26. In this position, the stop lugs 24 will pass through the slots 28 in the bottom wall 26 so that the valve button 12 can be depressed to operate the valve stem to dispense the contained product.

More specifically, the actuator 10 is molded, preferably of plastic, and includes a valve button 12, a valve button

lock 14 and a valve collar 16. The valve button 12 is circular and has a diameter so as to substantially correspond with the diameter of an aerosol can. Its top wall 19 has a downwardly extending peripheral side wall 20. The top wall 19 also has a recessed finger cavity or diaphragm 21 formed in it, for assisting in operating the actuator 10 to depress the valve stem 60. The side wall 20 is cut away, or extended, so as to provide a number of stop lugs 24 in radially spaced relation about it. A spout 31 is integrally formed with the valve button beneath the top wall 19 and extends outwardly at a point about the peripheral surface of its side wall 20. A dispensing orifice 34 extends through the spout 31 and is in communication with a valve stem cavity 33 formed in a centrally positioned projection 36 which extends downwardly from the under surface of the valve button. A locking member 38 which is preferably square-shaped or rectangular-shaped also depends downwardly from the under surface of the valve button 12 about the projection 36, and has an outwardly projecting lip 40 at the lower edge of each of its walls 42, for lockingly engaging with the valve button lock 14.

The valve button lock 14 is preferably square-shaped or rectangular-shaped like the locking member 38 and is of substantially the same size so that the valve button 12 is prevented from rotating along with the valve collar 16 when the latter is rotated, for reasons set forth more fully below. The valve button lock 14 has a rim or flange 44 about the lower end of its side walls 46 and an outwardly extending lip 48 interiorly on each of the upper edges of the side walls 46 which are adapted to lockingly engage the lips 40 beneath them to secure the valve button 12 and the valve button lock 14 together. The flange 44 is adapted to lockingly engage with the rim 18 of the valve housing to secure the valve button lock to the aerosol can. The flange 44 is preferably circular in shape so as to lockingly engage about the entire rim of the can so as to provide a more secure engagement.

The valve collar 16 is circular in shape and in one embodiment, slightly larger in diameter than the aerosol can so that its outer side wall 50 forms a skirt about the upper rim or edge 52 of the can. In a second embodiment, the diameter may be smaller than the rim 52.

In both embodiments, the valve collar 16 also has an inner side wall 54 which is connected, in spaced relation, to the outer side wall 50 by means of a bridging wall 56. In the first embodiment, the inner wall 54 locks, but rotates about the outer periphery of rim 48 of the valve housing. In the second embodiment (see FIG. 4), the valve collar locks, but rotates about crown 90 of the aerosol can.

The bridging wall 56 has an annular groove 22 formed in it which substantially corresponds in width to the thickness of the side wall 20 of the valve button 12 so that the side wall 20 is slidable therein or, more particularly, so that the valve collar 16 is rotatable about the aerosol can with the side wall 20 engaged in the groove 22. The bottom wall 26 of the groove 22 has cutout slots 28 formed in it which correspond in number, size and angular alignment to the stop lugs 24 on the valve button 12.

One way to assemble the actuator 10 and affix it to an aerosol can is to first affix the valve button lock about the aerosol valve by snap fitting its flange into engagement with the rim 18 of the valve housing. Next, the side wall 20 of the valve button 12 is fitted into the groove 22 in the valve collar 16, and the valve button and valve collar affixed to each other by lockingly engaging the lips 48 and 40 on the side walls of the valve button lock 14 and the locking member 38, respectively. In doing so, the valve stem 60 is fitted into the valve stem cavity 33 in the projection 36. Then the collar 16 is affixed to the can via rim 18 of the valve housing or crown 90 of the can.

Normally, when the actuator 10 is affixed to the aerosol can, the stop lugs 24 engage the bottom wall 26 of the groove 22 in the valve collar so that the valve button

cannot be depressed to operate the aerosol valve. Accordingly, the aerosol valve cannot be intentionally or accidentally operated to dispense the contained product. To lock the actuator in this inoperative position, the small finger 29 formed on the lower edge of one of the stop lugs 24 seats in the correspondingly shaped locking recess 30 formed in the bottom wall 26 of the valve collar 16, to releasably lock the valve collar 16 against rotation.

To operate the actuator 10, the valve collar 16 is rotated with respect to the valve button 12 until the stop lugs 24 are aligned over the slots 28. In this position, the stop lugs 24 will pass through the slots 28 so that the valve button 12 can be depressed to operate the valve stem 60. When the desired amount of the product is dispensed, the valve collar 16 can be rotated in the opposite direction to again lock the actuator in an inoperative position. Appropriate indicia such as the lock-unlock indicia 17 indicating the direction to rotate the valve collar 16 is advantageously provided, for obvious reasons. Also, alignment indicia (not shown) can be provided to indicate when the stop lugs 24 and the slots 28 are aligned.

In FIG. 7, there is shown an actuator 70 which is like the actuator 10 but one of its stop lugs 72a and one of its slots 74a are modified so as to provide a positive stop alignment whereby its valve collar 76 can be rotated only a predetermined number of degrees. The stop alignment feature also provides an indication that the stop lugs 72 are aligned over the slots 74. The modified stop lug 72a has an extended portion 78 comprising approximately one-quarter of its width which is adapted to extend into the slot 74a when the actuator is assembled and to abut against the side edge 80 of the slot 74a when the valve collar 76 is rotated. Each of the other stop lugs 72 are positioned so as to be aligned over one of the slots 74 when the extended portion 78 abuts the side edge 80 of the slot 74a. Accordingly, a positive stop alignment, which provides an indication when the stop lugs 72 and the slots 74 are properly aligned so that the valve button 82 can be depressed to operate the valve stem of an aerosol valve, is provided.

The side edge and upper edge opposite the side edge 80 is contoured to provide two connecting, substantially semi-circular shaped runners 86 and 88. These runners cooperate with the extended portion 78 and the finger 90 to position the valve button 82 and the valve collar 76 so that the actuator is locked in an inoperative position. It can be seen that as the valve collar 76 is rotated counter-clockwise, the finger 90 engages and rides along the contour of the runner 88, until it seats in the locking recess 92. The edge of the extended portion 78 engages and rides along the contour of the runner 86, until the finger 90 in the locking recess 92. This action of the extended portion 78 helps to lift or tilt the valve button 82 and/or lower the valve collar 76 so that the finger 90 can be more easily seated in the locking recess 92 and to prevent damage to the finger 90 due to excessive pressure exerted upon it.

In FIGS. 8 and 9, there is shown still another actuator 94 which is modified to provide a positive stop alignment arrangement to both assure and provide an indication that the stop lugs and the slots are properly aligned so that its valve button 95 can be depressed. The actuator 94 is like the actuators 10 and 70 but, in this case, its stop lug 96a is substantially larger than any of its other stop lugs 96 and is formed with an extended portion 97 which is adapted to extend into the slot 98a when the actuator is assembled so as to abut the side edges 99 and 100 of the slot 98a when its valve collar 102 is rotated, in either direction. The stop lug 96a also has a finger 104 formed on it which seats in a locking recess 106 when the extended portion 97 is engaged against the side edge 100 to releasably lock the actuator in an inoperative position.

The slot 98a is formed so as to have a width sufficient to permit the stop lug 96a to be depressed into it, when

the valve button 95 is actuated. The other stop lugs 96, of course, are positioned so as to be aligned over the other slots 98 so that they also permit the valve button to be actuated.

In operating the actuator 94, the valve collar 102 is rotated, in the manner described above, until the edge of the extended portion 97 of the stop lug 96a abuts the side edge 99. Further rotation of the valve collar is prevented, indicating that the stop lugs 96 and the slots 98 are aligned so that the valve button 95 can be depressed to operate the valve stem of an aerosol valve. When the desired amount of product has been dispensed, the valve collar 102 is rotated in the opposite direction until the edge of the extended portion 97 abuts against the side edge 100. Further rotation is prevented and, simultaneously the finger 104 seats in the locking recess 106 to releasibly lock the actuator in an inoperative position.

As indicated above, the actuators are preferably fabricated of plastic. Since the valve buttons, the valve button locks and the valve collars all are of simple construction and configuration, they can be easily molded. Also, the valve buttons and the valve collars can be fabricated of the same or different colored plastics so as to provide an actuator having an attractive appearance.

It will thus be seen that the objects set forth above, among those made apparent from the preceding description, are efficiently attained and, since certain changes may be made in the above construction without departing from the scope of the invention, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

It is also to be understood that the following claims are intended to cover all of the generic and specific features of the invention herein described, and all statements of the scope of the invention, which, as a matter of language, might be said to fall therebetween.

Now that the invention has been described, what is claimed as new and desired to be secured by Letters Patent is:

1. An actuator for a valve having a valve stem comprising: a valve button lock; a non-rotatable valve button having a peripheral side wall overlying and fixedly secured to said valve button lock, a valve stem cavity formed therein, a dispensing orifice communicating with said valve stem cavity, said valve stem being extended through said valve button lock and into and retained within said valve stem cavity of said valve button; a rotatable valve collar having an outer wall forming a skirt and a top wall having an annular groove formed in it and means on said collar to rotatably lock said collar to said valve; at least one cutout in a bottom wall of said groove, said side wall of said valve button being slidably retained within said annular groove, stop means depending from said side wall on said valve button which normally engage with said bottom wall of said groove in said valve collar to prevent said valve button from being depressed to operate said valve stem, said stop means being adapted to pass through said cutout when said valve collar is rotated to align said cutout with said stop means to thereby allow said valve button to be depressed to operate said valve stem.

2. The actuator of claim 1 further including lock means on said side wall of said valve button and in said groove in said valve collar for releasibly locking said actuator in said inoperative position.

3. The actuator of claim 1 wherein said stop means comprises a plurality of depending stop lugs in spaced relation about the peripheral side wall of said valve button and said cutouts comprise a corresponding number and spaced slots in said bottom wall of said groove in said valve collar, one of said stop lugs having an extended portion thereon which is adapted to engage one side wall of the associated one of said slots, whereby said valve collar can be rotated only until said extended portion engages said one side wall to provide an indication that said plurality of depending stop lugs each are aligned over respective ones of said slots so that said valve button can be depressed.

4. The actuator of claim 3 further including a locking finger depending from one of said stop lugs, a locking aperture in said bottom wall of said groove in said valve collar, said locking finger being engageable in said locking aperture to releasibly lock said actuator in an inoperative position.

5. The actuator of claim 4 wherein said extended portion extends into said associated one of said slots and is abutted against the opposite side wall thereof when said locking finger is engaged within said locking aperture.

6. An actuator for a valve having a valve stem comprising: a valve button lock, said lock having polygonal-shaped side walls with a projecting locking lip formed about the upper edge of said walls and a flange about the lower edge of each of said walls adapted to lockingly engage with the valve housing rim of an aerosol can; a valve button with a valve stem cavity formed therein, said button having a peripheral side wall and downwardly projecting members corresponding with said side walls of said valve button lock and having a projecting locking lip about their lower edge which lockingly engages with said locking lip on said valve button lock to affix said valve button and said valve button lock together, a dispensing orifice communicating with said valve stem cavity, said valve stem being extended through said valve button lock and into and retained within said valve stem cavity of said valve button; a rotatable valve collar having an outer wall forming a skirt and a top wall having an annular groove formed in it and means on said collar to rotatably lock said collar to said valve; at least one cutout in a bottom wall of said groove, said side wall of said valve button being slidably retained within said annular groove, stop means depending from said side wall on said valve button which normally engage with said bottom wall of said groove in said valve collar to prevent said valve button from being depressed to operate said valve stem, said stop means being adapted to pass through said cutout when said valve collar is rotated to align said cutout with said stop means to thereby allow said valve button to be depressed to operate said valve stem.

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