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AEROSOL VALVE ACTUATOR WITH MEANS TO PREVENT
ITS ACCIDENTAL ACTUATION

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2 Sheets-Sheet 1

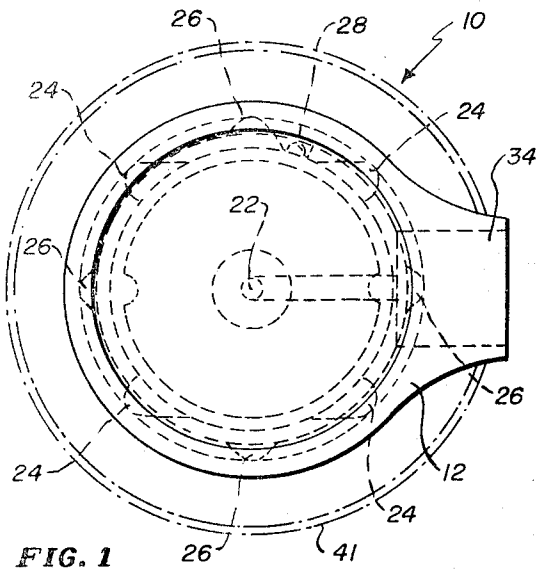


FIG. 1

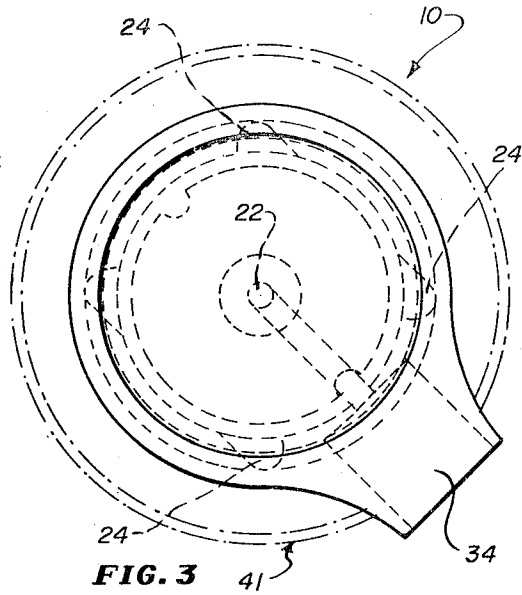


FIG. 3

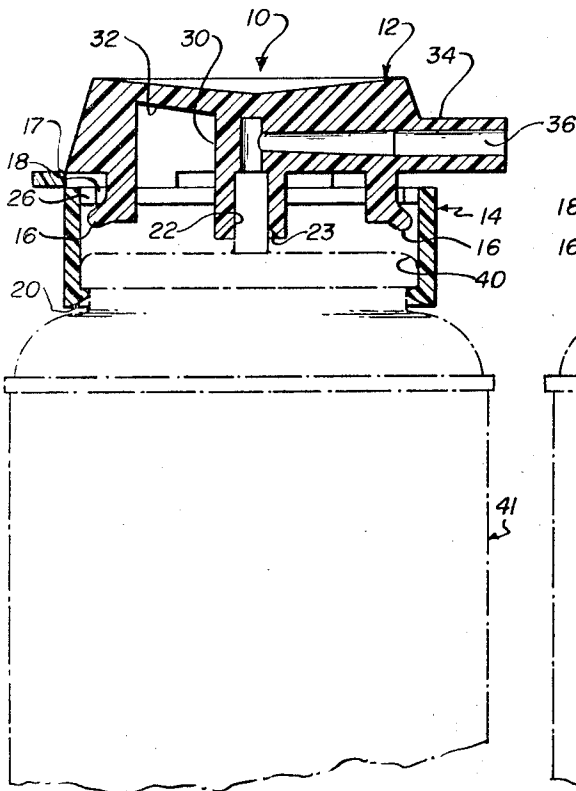


FIG. 2

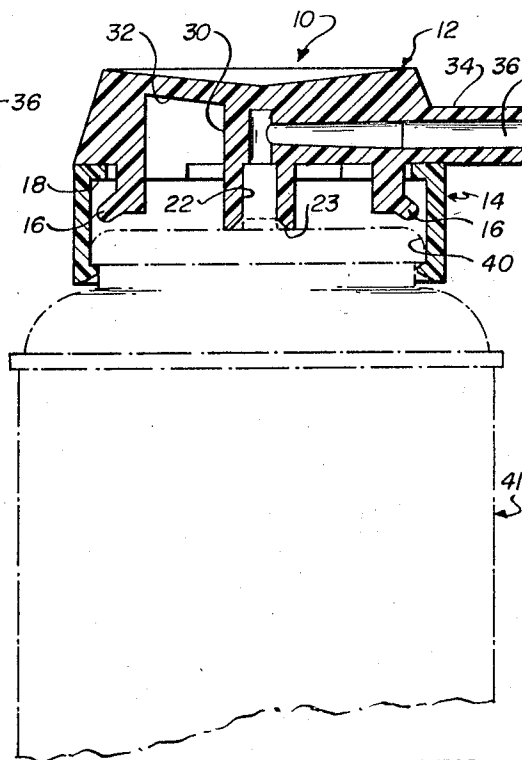


FIG. 4

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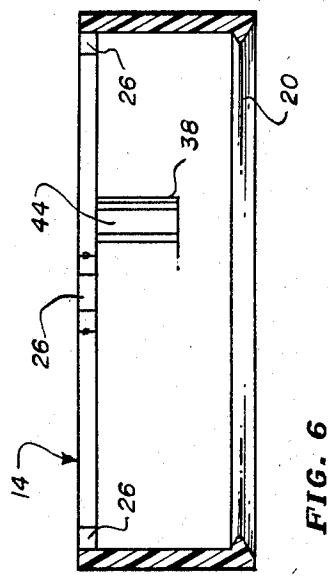
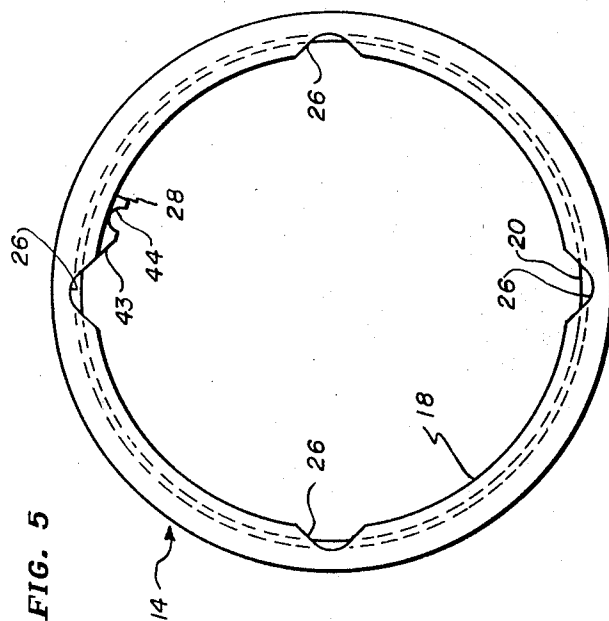
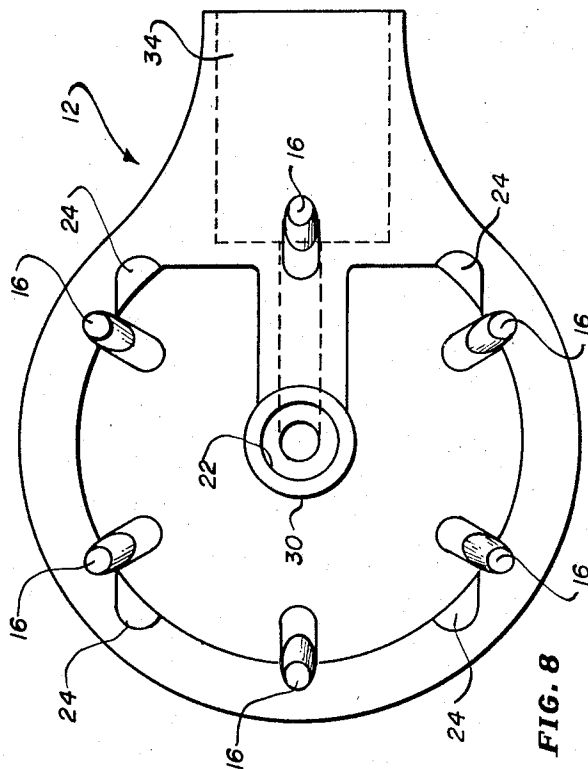
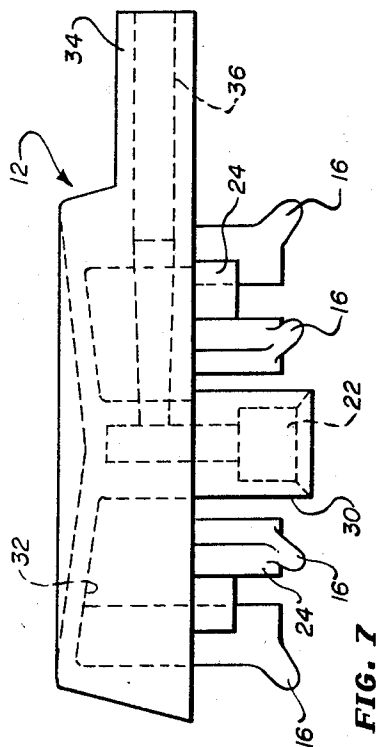
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AEROSOL VALVE ACTUATOR WITH MEANS TO PREVENT ITS ACCIDENTAL ACTUATION

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4 Claims. (Cl. 222—39)

This invention relates to actuators for 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 often adults, will oftentimes dispense some of the product just for curiosity's sake, or for numerous other reasons. In doing so, the product is 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 smaller 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 two piece actuators of the above described type which can be fabricated as an integral unit.

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.

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.

The above objectives are accomplished with an actuator which generally comprises a valve button and a valve button lock which can be molded as an integral unit, and are affixed to one another by means of downwardly depending fingers on the valve button which lockingly engage the valve button lock. A number of stop lugs formed on the valve button prevent it from being actuated to operate the aerosol valve, until the valve button is rotated to align the stop lugs with correspondingly shaped cut-outs in the valve button lock. The valve button lock is also adapted to be affixed to an aerosol can.

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 top plan view of an actuator, in its inoperative position;

FIG. 2 is a view illustrating the actuator affixed to an aerosol can, with the actuator in its inoperative position and sectionized;

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FIG. 3 is a top plan view of the actuator in its operative position;

FIG. 4 is a view like FIGURE 2, illustrating the actuator in its operative position;

FIG. 5 is a top plan view of the valve button lock;

FIG. 6 is a sectional view of the valve button lock;

FIG. 7 is a side plan view of the valve button; and

FIG. 8 is a bottom plan view of the valve button.

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 and a valve button lock 14, affixed to one another by a number of downwardly depending fingers 16 integrally formed with the valve button 12 and adapted to engage the underside of an annular rim 18 about the top of the valve button lock 14. The actuator 10 is molded as two pieces, of a plastic or similar material, simultaneously, in a single mold. In affixing the actuator 10 to an aerosol can, the valve button lock is secured to the rim of the mounting cup of the aerosol valve set in the crown top of the can, by means of an annular depending lip 20 formed on its underside which is adapted to snap-fit over the rim. The valve stem of the aerosol valve extends through the valve button lock, and is seated within a valve stem cavity 22 formed in the valve button, as shown in FIGS. 2 and 4.

Normally, in this position, a number of stop lugs 24 formed on the underside of the valve button 12 (FIG. 8) engage the topside of the annular rim 18. The stop lugs 24 are of sufficient length to prevent the valve button 12 from being depressed to actuate the valve stem. The actuator 10, therefore, cannot be operated accidentally or intentionally, while the actuator is in this position.

In order to operate the actuator 10, the valve button 12 must be rotated until the stop lugs 24 are positioned in alignment over a corresponding number of similarly shaped cut-outs 26 in the annular rim 18. A lock 28 (FIG. 5) engages one of the fingers 16 to indicate proper alignment, and prevents the valve button 12 from being rotated further, without exerting considerable force. In this position, the stop lugs 24 will pass through the cut-outs 26 in the rim 18 so that the valve button 12 can be depressed to operate the valve stem to dispense the contained product.

More specifically, the actuator 10 includes a valve button 12 and a valve button lock 14 which are simultaneously molded, as two pieces. When the two pieces are removed from the mold, they are affixed to one another by the downwardly depending fingers 16 integrally formed with the valve button on its underside which are adapted to engage the annular rim 18 of the valve button lock 14, and by the tamperproof tabs 17, molded integral with the button 12 and lock 14. The valve button may be circular in shape, as illustrated, so as to substantially correspond with the size and shape of an aerosol can, but it could as well be numerous other shapes. A projection 30 having a valve stem cavity 22 formed therein extends from the under surface 32 of the valve button 12. The side wall of the valve stem cavity 22 may be beveled, as at 23, to assist in inserting a valve stem in it. A spout 34 is integrally formed and extends outwardly at a point about the peripheral surface of the valve button 12, and a dispensing orifice 36 extends through it to the valve stem cavity 22.

The fingers 16 are integrally formed in spaced relation and depend downwardly from the lower surface 38 of the valve button 12. In the illustrated case, six fingers are used, however, generally three or more fingers will serve to affix the valve button to the valve button lock. The stop lugs 24 also are integrally formed in spaced relation and depend downwardly from the lower surface

38. At least four stop lugs 24, as illustrated, are preferably used, so as to eliminate tilting of the valve button 12, thereby making it more stable. The fingers 16 are of sufficient length to extend below the rim 18 of the valve button lock 14, and of sufficient rigidity to prevent them from being easily snapped past the rim 18, so that the valve button is securely fixed to the valve button lock. The fingers 16 may, if desired, have sufficient flexibility so that the valve button can be removed, by forcing the fingers 16 past the rim 18. The stop lugs 24, as previously indicated, are of sufficient length so that when seated upon the rim 18, the valve button cannot be operated to actuate the aerosol valve.

The valve button lock 14 is generally cylindrical in shape and of a size which generally corresponds to that of the valve button 12. The annular rim 18 extends inwardly about the top edge of the valve button lock 14 and is of sufficient size so that the fingers 16 have a substantial surface to engage. The annular lip 20 extends inwardly about the lower edge of the valve button and is flexible so that it may be snap fitted about the rim 40 (FIG. 2) of the mounting cup of the aerosol valve set in the crown top of an aerosol can 41. The cut-outs 26 are formed in the rim 18 and correspondingly positioned so that the stop lugs 24 can pass through them, when the valve button 12 is rotated. The lock 28 comprises a projection integrally formed on the inner peripheral surface of the valve button lock 14. The side wall 43 of the lock 28 is tapered toward a semi-circular shaped recess 44. With this construction, when the valve button 12 is rotated, a finger can slide up the tapered wall 43 and will snap into the recess 44. The button 12 is locked in this position, and an audible click may be heard, indicating that the valve button is properly positioned for operation.

In affixing the actuator 10 to an aerosol can, the valve button lock 14 is secured to the can by engaging the lip 20 with the rim 40 of the mounting cup, as shown in FIG. 2. It may be noted that the lip 20 could also be formed as fingers which would snap-fit about the rim. Likewise, the actuator could be made with a diameter equal to the outer rim of the can and made to snap on it in similar fashion. Or else a false outer rim could be built into the structure for aesthetic purposes. Simultaneously, the valve stem 50 of the aerosol valve is inserted into the valve stem cavity 22 and is seated therein so that the stop lugs 24 engage the rim 18 of the valve button lock 14.

When affixed to an aerosol can in the above described manner, the actuator 10 cannot be initially operated because of tabs 17, nor subsequently, when in inoperative position because the stop lugs 24 will engage rim 18 if an attempt is made to depress the valve button. This prevents the product from being intentionally or accidentally dispensed.

In order to render the actuator 10 operative, the tamper-proof tabs 17 must be severed and the valve button 12 must be rotated to align the stop lugs 24 with the cut-outs 26, as shown in FIGS. 3 and 4. Proper alignment is indicated when a finger 16 is engaged in the recess 44 of the lock 28. An audible click may be heard also. When the valve button is now depressed, the stop lugs 24 will pass through the cut-outs 26 in the rim 18 of the valve button lock 14, thereby permitting the valve stem to be depressed to operate the aerosol valve to dispense the product.

By rotating the valve button 12 to a position where the stop lugs 24 will engage the rim 18, the actuator 10 will be again inoperable. Therefore, even after the actuator has been once used, it can be positioned to prevent operation.

It may be noted that with the stop lugs 24 and the cut-outs 26 positioned as shown in FIG. 1, the valve button must be rotated 45° to render the actuator 10 operative. It will be noted, from FIGURE 8 of the drawings, that the stops 24 are out of alignment with respect to the fin-

gers 16, so that, as the button is rotated to align the stops 24 with the out-outs 26 on the rim, some of the fingers 16 will be in engagement with the underside of the rim in all rotative positions of the button with respect to the rim. By repositioning the stop lugs 24, the required degree of rotation may be varied.

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 having an annular rim which has a plurality of cut-outs therein; a valve button overlying said valve button lock having a plurality of fingers depending therefrom which engage said rim to fixedly secure said valve button 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 retained within said valve stem cavity, stop means depending from said valve button which normally engage with said rim to prevent said valve button from being depressed to operate said valve stem, said stop means being adapted to pass through said cut-outs when said valve button is rotated to align said stop means with said cut-outs to thereby allow said valve button to be depressed to operate said valve stem, said fingers differing in number and alignment with respect to said stop means, so that some of the fingers will be in contact with the underside of said rim for all 1-9 rotative positions of said button.

2. An actuator for a valve having a valve stem comprising: a hollow cylindrical shaped valve button lock having an inwardly extending annular rim about its top edge which has a plurality of cut-outs therein; a valve button overlying said valve button lock having a plurality of fingers depending therefrom which are adapted to engage said rim to fixedly secure said valve button 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 retained within said valve stem cavity, stop means depending from said valve button which normally engage with said rim to prevent said valve button from being depressed to operate said valve stem, said stop means being adapted to pass through said cut-outs when said valve button is rotated to align said stop means with said cut-outs to thereby allow said valve button to be depressed to operate said valve stem; and lock means integrally formed within said valve button lock which is engageable by one of said fingers to indicate when said valve button is properly rotated to align said stop means with said cut-outs, said lock means comprising a projection on the wall of said valve button lock having a tapered side wall and a recess in a top wall effectively terminating said tapered side wall.

3. An actuator for a valve having a valve stem comprising a valve button lock having a valve button fixedly secured thereto, said valve button and said valve button lock being simultaneously molded as an integral unit, said valve button lock having a hollow cylindrical shape and an inwardly extending annular rim about its top edge which has a plurality of cut-outs therein; said valve button overlying said valve button lock having a plurality of

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fingers depending therefrom which are adapted to engage said rim to fixedly secure said valve button 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 retained within said valve stem cavity, stop means depending from said valve button which normally engage with said rim to prevent said valve button from being depressed to operate said valve stem, said stop means being adapted to pass through said cut-outs when said valve button is rotated to align said stop means with said cut-outs to thereby allow said valve button to be depressed to operate said valve stem; and lock means integrally formed within said valve button lock which is engageable by one of said fingers to indicate when said valve button is properly rotated to align said stop means with said cut-outs, said lock means comprising a projection on the wall of said valve button lock having a tapered side wall and a recess in a top wall effectively terminating said tapered side wall.

4. An actuator for an aerosol can having an aerosol valve with a valve stem comprising: a valve button lock having an annular rim about its top edge which has a plurality of cut-outs therein and gripping means about its lower edge which is adapted to fixedly secure said valve button lock to said aerosol can; a valve button overlying said valve button lock having a plurality of fingers depending therefrom which are adapted to engage said rim to

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fixedly secure said valve button 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 retained within said valve stem cavity, stop means depending from said valve button which normally engage with said rim to prevent said valve button from being depressed to operate said valve stem, said stop means being adapted to pass through said cut-outs when said valve button is rotated to align said stop means with said cut-outs to thereby allow said valve button to be depressed to operate said valve stem, and lock means on said valve button lock which is engageable by one of said fingers to indicate when said valve button is properly rotated to align said stop means with said cut-outs.

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