ABSTRACT

An actuator button is mounted in a housing to form an actuator assembly which is secured to a valved aerosol or other container. The actuator button is rotatable between non-dispensing and dispensing positions. With the actuator button in the non-dispensing position, cooperating portions of the actuator assembly form a locking means to positively prevent rotational movement of the actuator button and, simultaneously, blocking means prevent operation of the dispensing valve. While the locking means is disabled by disengaging the cooperating portions, the actuator button is simultaneously rotated free of the blocking means into the dispensing position for dispensing product from the container by operation of the valve as by depressing or tilting the actuator button. Limiting means restricts relative movement of the cooperating portions of the locking means to prevent permanent deformation thereof. A breakaway tab prevents disabling the locking means until the tab is removed. The actuator assembly is shaped to conceal the locking means to further prevent accidental operation of the valve by children. An alternative embodiment is adapted for use on large diameter containers.

20 Claims, 29 Drawing Figures
CHILDPROOF ACTUATOR ASSEMBLY

This invention is an improvement to the sleeve-type, slotted housing and actuator button disclosed in my earlier U.S. Pat. No. 3,484,023 issued Dec. 16, 1969.

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to the use of a sleeve-type, slotted housing and actuator button which together comprise an actuator assembly for mounting on and use with a valved dispenser and to the method of operating the same. More particularly the invention relates to a two-piece actuator assembly for use in combination with a valved aerosol container and its method of operation which permits selecting either a locked non-dispensing position or an unlocked dispensing position in such a manner that the actuator button is unlikely to be operated accidentally or by children.

2. Prior Art

Various means are known for preventing accidental operation of an aerosol or pump-type dispenser valve.

In my invention disclosed in U.S. Pat. No. 2,914,222 I disclosed (see FIG. 14) an aerosol package with a rotatable housing having a horizontal keyhole slot in one wall engaged by a fixed pin blocking the housing in the up position and preventing dispensing until the housing was turned to align an adjacent vertical slot with the pin whereupon the housing could be depressed to dispense product. I disclosed another, but similar, means in my U.S. Pat. No. 3,180,536 where the aerosol actuator is blocked in the up position by an actuator pin riding on a horizontal shoulder of the housing preventing dispensing (see FIG. 7) until the pin was rotated into alignment with an adjacent vertical recess in the housing whereupon the actuator could be depressed to dispense product. Additionally, Sagarin U.S. Pat. No. 3,050,219 and my U.S. Pat. No. 3,484,023 disclose additional variants which use the same principle, namely, an aerosol package whose actuator is blocked in the up position by a shoulder on a housing preventing dispensing until the blocked portion of the actuator is rotated free of the blocking shoulder. Thus, in all of the above disclosures, the blocking means is defeated by simply rotating the actuator, a task which is easily accomplished by children.

Lipman U.S. Pat. No. 3,185,355 discloses a pump-type actuator assembly for non-aerosol dispensers which uses a bayonet lug and slot arrangement employing the same principle as the aforesaid aerosol actuators except that the actuator is blocked in the down position rather than the up position.

Another means for preventing accidental operation of an aerosol is disclosed in Goldberg U.S. Pat. No. 3,249,260 which employs the standard aerosol actuator blocked in the up position by a shoulder on the housing preventing dispensing. However Goldberg adds a bead and groove means which forms a dent in the actuator against accidental movement out of the locked position. Goldberg's tongue-in-cheek use of the term 'lock' was purposeful because, as Goldberg himself discloses, his bead and groove only deters rotational movement of the actuator but does not prevent it. Again, nothing more than simple rotation of Goldberg's actuator defeats the bead and groove 'lock' means and unblocks the actuator, a task easily accomplished by children.

An aerosol actuator assembly similar to Goldberg's is also disclosed in Jordan et al. U.S. Pat. No. 3,608,791 showing the standard blocking means in combination with dentent means to 'lock' the actuator in the nondispensing position but, as also in Goldberg above, which dentent means is a mere frictional deterrence against rotation which is defeated by application of a slight rotational force.

Thus, none of the above prior art discloses a child-proof actuator assembly.

Applicant overcomes the deficiencies in the prior art by providing, not only a shoulder blocking the actuator in the up position against axial or tilting movement, but also, a true locking mechanism which physically prevents (as distinguished from deters) rotational movement of the actuator until the locking mechanism is first disengaged by action other than simple rotation. The locking mechanism is also concealed so that children cannot easily detect it. Thus applicant provides an actuator assembly which is truly childproof and which can be used safely with containers holding dangerous or toxic fluids.

SUMMARY OF THE INVENTION

The present invention is a two-piece actuator assembly for valved containers, such as aerosol or pump-type dispensers, and the method of operating the same. A housing is secured to the container, and an actuator is mounted in the housing in operable connection with the valve and rotatable between non-dispensing and dispensing positions. When the actuator is in the non-dispensing position, blocking means prevents axial or tilting movement of the actuator and, further, cooperable portions of the housing and actuator form a locking means preventing rotational movement of the actuator. One of the cooperable portions is movable radially (with respect to the actuator axis) between engaging and disengaging positions with respect to the other portion. Preferably the cooperable portions are a tongue and groove or similar means, one being carried by a flexible and resilient flap portion of the housing and the other being carried by the actuator. In the preferred mode, to rotate the actuator to the dispensing position the locking means must be first disabled by moving and holding the cooperable portions apart radially thereby disengaging the tongue and groove while the actuator is rotated free of the blocking means. Product is dispensed by axially depressing or by tilting the actuator.

Preferably, the disabling of the locking means is done with one hand while the rotation of the actuator free of the blocking means is done with the other hand in a coordinated simultaneous motion.

The blocking means utilizes one or more portions of the actuator overriding one or more shoulders on the housing.

Limiting means is provided to restrict the radial movement of the flap to prevent permanent deformation thereof. This means may take such forms as a dog-leg, a pin, or an extended skirt or other portion of the flap which abuts a housing portion after sufficient, but limited, radial movement.

Means to conceal the locking features are also included. Both the positive locking means and the concealing means combine to provide a genuine childproof assembly.
Additional features include a tamperproof tab, a removable dust cover, a one-handed re-locking feature and alternate embodiments for assemblies with cylindrical or inclined walls and assemblies for use with wide diameter containers.

It is an object of this invention to provide an actuator assembly for use on aerosol and pump-type dispensers and other valved containers where the valve is operated by axial, tilting or rotational movement.

It is an object of this invention to provide a two-piece childproof actuator assembly that is positively locked in the non-dispensing position and the actuator of which cannot be moved to the dispensing position until the locking means is first physically disengaged by a positive action other than simple rotation, such as, by moving the locking pieces radially apart relative to each other and holding them in that position while the actuator is simultaneously rotated to the dispensing position.

It is an object of this invention to conceal the locking means from untrained eyes to make it more difficult for children to determine that there is a locking means preventing rotation out of the non-dispensing position.

It is an object of this invention to provide, as one form of the invention, a resilient flap operated locking means that requires the use of two hands simultaneously in coordinated movement in order to unlock the actuator, and the use of only one hand in a simple easy motion to relock the actuator.

It is a further object of this invention to provide a tamperproof breakaway tab which serves as a ready indication to the purchaser that the package has been tampered with, or may have been used.

It is an object of this invention to provide a limiting means to prevent permanent deformation to the locking mechanism by exceeding its structural limits.

It is an object of this invention to provide a unique molded housing design that permits efficient molding operations.

Additional objects are set forth in the following description of the invention.

DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of the entire combination of one form of the invention showing the actuator button locked in the non-dispensing position. This embodiment has cylindrical sidewalls.

FIG. 2 is a perspective view of the embodiment of FIG. 1 showing the tamperproof tab being broken away and exposing the dog-leg embodiment of the limiting means.

FIG. 3 is a perspective view of the embodiment of FIG. 1 showing the flexible flap being moved radially outwardly until the dog leg limits further movement and being held there with one hand while the actuator button is simultaneously moved to the unlocked dispensing position by applying a rotational force to the control member. The lip concealing the tongue and groove is also shown.

FIG. 4 is an exploded perspective view of the valved aerosol container and the two-piece actuator assembly of the FIG. 1 embodiment.

FIG. 5 is a plan view of the embodiment of FIG. 1 showing the actuator button in the non-dispensing position with both the blocking means and locking means engaged and the tamperproof tab intact.

FIG. 6 is similar to FIG. 5 but with the actuator button in the dispensing position with both the blocking means and locking means disengaged and with the tamperproof tab removed.

FIG. 7 is a partial vertical section of the invention shown in FIG. 5 taken along the line 7—7 and clearly showing two blocking shoulders on the housing preventing axial or tilting movement of the actuator.

FIG. 8 is a partial vertical section of the invention shown in FIG. 6 taken along the line 8—8 and also showing in broken lines the actuator being operated by being axially depressed to dispense product.

FIGS. 9, 10, 11 and 12 are perspective views of an alternate embodiment of the invention adapted for use on wide diameter containers. FIG. 12, especially shows the preferred two-handed operation required to move the actuator button from the locked to the unlocked position.

FIG. 13 is a perspective view of the entire combination showing an alternate embodiment with the actuator in the non-dispensing position. In this form of the invention the walls are tapered and the locking means is nicely concealed.

FIG. 14 is a perspective view of the embodiment of FIG. 13 with the actuator in the dispensing position.

FIG. 15 is an exploded perspective view of the embodiment of FIG. 13.

FIG. 16 is a plan view of FIG. 13 showing a single shoulder blocking means.

FIG. 17 is a partial vertical section of FIG. 16 along the line 17—17 showing the single shoulder blocking means, removable overcap, inclined walls and pin-type limiting means.

FIG. 18 is a plan view of the embodiment of FIG. 16 showing the resilient flap being flexed radially outwardly to disengage the locking means.

FIG. 19 is a plan view of FIG. 14 showing the actuator in the dispensing position.

FIG. 20 is a partial vertical section of FIG. 19 taken along the line 20—20.

FIGS. 21 and 22 are partial sections showing the tongue and groove locking means and pin-type limiting means of the embodiment of FIG. 13.

FIG. 23 is similar to FIG. 21 but showing an alternate embodiment of the limiting means as an extended skirt of the flexible flap.

FIG. 24 is similar to FIG. 23 but showing an alternate embodiment of the locking means when the housing and actuator have vertical walls.

FIG. 25 is a plan view of an alternate embodiment showing a multiple shoulder blocking means.

FIG. 26 is a partial vertical section of FIG. 25 along the line 26—26.

FIGS. 27 and 28 are plan views of an alternate embodiment showing the actuator in non-dispensing and dispensing positions respectively.

FIG. 29 is a partial vertical section of the embodiment of FIG. 28 taken along the line 29—29 and showing in broken lines the actuator being operated by tilting.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

FIGS. 1 to 8 show one form of the present invention comprising a combination two-piece actuator assembly with cylindrical walls and shown generally as 10 in FIG.
for use with an aerosol container 11 having a conventional valve assembly shown generally as 12 in FIG. 4 secured to and sealing the top thereof. The actuator assembly comprises a sleeved, slotted housing shown generally as 20 in FIG. 4 and generally T-shaped actuator button shown generally as 50 in FIG. 4. The valve assembly includes a conventional valve for controlling the dispensing of the contents of the container. The stem portion 13 of the valve protrudes through and extends above the valve assembly 12 of the container 11. In the preferred embodiment the container is pressurized with a propellant and contains a material to be dispensed under fluid pressure. However, the invention is also adaptable for use with hand operated, pump-type dispensers, or othervalved containers.

The housing 20 is fixedly secured to the top of the aerosol container. The interior of the housing is provided with a central bore 14 (FIG. 4) and a plurality of notched ribs 15 (as best seen in FIG. 7) around its inner circumference each of which provides a spacer portion 16 and shoulder portion 17 such that the housing snaps down over the rim 18 of the valve assembly and is thereby frictionally secured to the top of the container with the shoulders 17 of the ribs 15 resting against the top of the rim 18. The housing is molded of any conventional thermoplastic material.

The actuator button 50 is a generally T-shaped member which is mounted slidably within the central bore 14 of the housing and is also rotatable around the common longitudinal vertical axis of the container 11 and housing 20. The actuator button (as best seen in FIG. 7) is provided with a central hub 51 which fits over the valve stem 13 protruding above the aerosol container. The hub 51 has an entrance orifice 52 and a shoulder means 53 for actuating the valve 13. The actuator button is also provided with a discharge end 54 having a discharge orifice or nozzle 55 at one end and a control member 56 at the other end of the T. A passageway 57 through the hub of the actuator button connects valve 13 and entrance orifice 52 with the discharge nozzle 55 for dispensing the product to the atmosphere. The control end 56 of the actuator button is a portion which projects slightly beyond the vertical wall 26 of the housing 20 in such a manner that the operator can rotate the actuator button between the locked and unlocked positions by simply applying a horizontal, rotational or twisting force to the control member 56 to rotate it about the longitudinal vertical axis of the actuator button. The control end of the actuator button is serrated 58 to provide a non-slip surface for applying the rotational force. The actuator button is molded of any conventional thermoplastic material. In the discharge end of the actuator button 50 and to one side of the discharge nozzle 55 is located a vertical groove or slot 59 which is designed to receive the tongue or key 27 of the flexible flap 23 of the housing to comprise a latch means for positively locking the actuator button 50 in the locked position as is more fully described below. The vertical edge 60 (FIG. 6) of the discharge end of the actuator button 50 on the other side of the discharge nozzle 55 is rounded to cooperate with tongue 27 as more fully described below.

The housing 20 has two slotted openings or recesses shown generally as 21, 22 in FIG. 4. The slot 21 is on one side of the housing and coacts with the discharge end 54 of the actuator button 50. The other slot 22 is on the other side of the housing and coacts with the control end 56 of the actuator button. A flexible flap 23 extends circumferentially across a portion of the slot 21. The flap 23 (best shown in FIG. 3) is attached at one end 24 and free at the other end 25 and is flexible radially inwardly and outwardly with respect to the vertical axis of the actuator button and housing. Flap 23 is really an extension of the wall 26 of the housing. Adjacent the free end 25 of the flap is a tongue or key 27 which extends radially inwardly and is designed to be received by the slot or groove 59 of the actuator button 50 in the locked position. At the lower end of the tongue 27 is limiting means, such as, a dog leg 28 (best seen in FIGS. 2 and 3) which extends below the lower edge of the flap 23 and into the opening of the slot 21.

The dog leg 28 acts as a limiting member such that when the operator places his fingernail against the end of the flap 23 and moves it radically outwardly (as best seen in FIG. 3), the dog leg 28 abuts against the inside of wall 29 of the housing 20 preventing further outward movement and, thus, preventing the operator from inadvertently permanently deforming, springing or snapping off the flap 23 at its attached end 24 by exceeding the flex limits of the flap. The flap 23 has natural resilience and will spring back to its normal position when released for engagement with groove 59. The tongue 27 is located a short distance from the free end 25 of the flap so as to provide a ledge 30 (FIG. 6) against which the operator can place his fingernail in order to move the flap radically outwardly. The side wall surface 31 of the tongue 27 nearest the free end 25 of the flap is slanted toward the locked position in such a manner that it, in cooperation with the rounded corner 60 of the actuator, gives minimum resistance to the movement of the actuator from the unlocked dispensing position to the locked non-dispensing position.

A portion of the slot 22 is provided with a blocking shoulder portion 32 (FIGS. 5 and 6) which acts as a blocking means preventing axial movement of the actuator button in the locked position. Also a second blocking shoulder may be provided at the discharge end of the actuator button as at 33 in FIGS. 6 and 7 further assuring against axial movement of the actuator. It is preferred that both blocking shoulders 32, 33 be used, although one shoulder is acceptable. Adjacent to blocking shoulder 32 of slot 22 is a slot portion 34 (FIGS. 5 and 6) which is longitudinally elongated so as to permit actuating the valve by axial movement of the actuator button.

The locked position shown in FIG. 5 is the non-dispensing position and is defined by the actuator button being rotated clockwise in the present embodiment until it abuts against the edge 35 (FIG. 5) of the slot 21. In this position the locking means is engaged, i.e., the tongue 27 of the flap 23 is received by the groove 59 of the actuator button 50 positively preventing rotational movement of the button and locking the button in this non-dispensing position. In this position the flexible flap 23 covers the discharge nozzle. Also while in the locked position the discharge and control ends 54, 56 of the actuator button override the blocking shoulders 32, 33 of the housing preventing against axial movement of the actuator button to operate the valve.

The unlocked position best shown in FIG. 6 is the dispensing position and is defined by the actuator button being rotated counterclockwise in the present embodiment until it abuts against the edge 36 of slot 21. Dis-
charge nozzle 55 is unobstructed by the flexible flap 23 and the projecting control end 56 of the actuator button 34 is vertically aligned with the longitudinally elongated portion 34 of the slot 22. In this position actuator 50 has been rotated free of the blocking shoulders 32, 33. In this position an axial inward force applied by the operator to the top of the actuator button (as best seen in FIG. 8) depresses the actuator button, operates the valve stem 13 and causes the pressurized container 11 to discharge its contents through the discharge passageway 57 in the hub 51 and out the discharge nozzle 55 of the actuator button. When the operator releases the button, the valve is spring loaded to return to the up position closing the valve.

The actuator button cannot be rotated out of the locked position to the unlocked position by the operator until the locking mechanism is first disabled. As best shown in FIG. 3, this is done by the operator placing his fingernail against the ledge 30 of the flexible flap 23 and moving the flap radially outwardly until the dog leg 28 abuts against the vertical wall 29 of the housing. In this position the tongue 27 of the flap is disengaged from the groove 59 of the actuator button thereby unlocking the actuator and permitting it to be rotated counterclockwise free of blocking shoulders 32, 33 to the unlocked dispensing position by the operator applying a rotational force to the control end 56 of the actuator button. The actuator button can be easily returned from the unlocked to the normally engaged or locked position by a one-handed motion of the operator by simply applying an opposite clockwise rotational force to the control end 56 of the actuator button. This easy movement is facilitated by the slanted edge 31 of the tongue 27 cooperating with the rounded edge 60 of the actuator button. The co-action of the slanted and rounded edges together with the radially outward flexing motion of the flap 23 permits minimum resistance to returning the actuator button to the locked position at which point, when the tongue and groove are aligned, and due to the natural resilience of the flap, the tongue 27 automatically snaps into and engages the groove 59 of the actuator button in a self-locking action.

The actuator button is provided with a lip 61 (FIG. 4) which overhangs at least the groove 59 of the actuator button and the tongue 27 of the flap 23 when the locking means is engaged. Consequently, the lip 61 conceals the tongue and groove locking mechanism so that it is not readily apparent to the operator that the actuator button is locked and must be first unlocked prior to use. The lip 61 optionally may also extend over the flap 23 further camouflaging the fact that 23 is a flap which is movable radially.

It is apparent that this mode of the invention preferably requires a coordinated and intentional movement to simultaneously release the locking mechanism with one hand and twist the actuator button from the locked to the unlocked position with the other hand before the contents of the container can be dispensed by a further downward movement of the actuator button. That coordinated action together with the concealing of the locking means provide a combination actuator and sleeved housing which is truly childproof in that young children are incapable without assistance, of detecting the locking means and of making the coordinated movement necessary to unlock the actuator button for dispensing.

In the embodiment described the locked position is reached by clockwise rotation of the actuator button within the housing and the unlocked position, by counterclockwise rotation. Obviously the design may be reversed so that the described positions are reversed without departing from the invention disclosed herein.

In the slot 21 of the housing between the free end 25 of the flexible flap 23 and the adjacent wall 37 (FIGS. 4, 5) of the housing is located a tamperproof tab 38 which is connected on one side to the flexible flap 23 and on the other side to the adjacent wall 37 of the housing. The connections are by thin breakaway ribs 39, 40 respectively. This tab is easily broken away by the consumer after purchase and prior to its first use by him (FIG. 2). If the tab 38 is broken prior to purchase, it is an indication to the consumer that the package has been tampered with or used. Further, so long as tab 38 is intact, it prevents relative movement between the tongue and groove. Thus it prevents disabling or unlocking the latch mechanism until the tab 38 is removed.

The sleeved housing 20 has a stepped portion or horizontal ledge 41 around its entire circumference. As shown in FIGS. 4, 5 and 7 the flap 23 is offset radially inwardly from the adjacent underlying housing wall portion 29. The purpose for this stepped design is to provide an open area directly beneath the flexible flap 23. This design permits greater efficiency and simplicity in the design of tooling which molds the housing.

FIGS. 9 to 12

FIGS. 9, 10, 11 and 12 show an alternative embodiment designed especially for large diameter containers.

The construction and operation is essentially similar to the preferred embodiments described above. The housing 120 is wider and frictionally snaps onto the container 111 at rim 118. The actuator button 150 is slidably and rotatable within the central bore of the housing 120. The locking means preventing rotational movement of the actuator is the groove 159 carried by the actuator button engaged by tongue 127 carried by the flexible flap 123. With the actuator in the locked position, shoulder 132 prevents axial movement of the actuator button. Axially elongated slot 134 allows the actuator button to be depressed to dispense product. In this embodiment the control end 156 of the actuator button preferably does not (but it may, if desired) extend outwardly of the wall of housing 120, but is shorter and requires the operator to reach into slot 122 with the finger of one hand to apply the rotational force to control end 156 while the other hand is used to move the flap 123 radially outwardly to unlock tongue 127 and groove 159 as shown clearly in FIG. 12. The limiting means in this embodiment is enlarged portion 190 of the housing which serves as an abutment preventing radial outward movement of the flap 123 beyond the point of permanent deformation.

FIGS. 13 to 29

The embodiments shown in FIGS. 13 to 29 are similar to the embodiments discussed above and for simplicity of description, corresponding numbers are assigned to corresponding parts.

Housing 220 is mounted on container 211. Actuator 250 is mounted in operable connection with the valve
stem 213 and is rotatable between a non-dispensing and dispensing position. In the non-dispensing position blocking means prevent operation of the valve. The blocking means comprises shoulder 232 (FIGS. 16-18) in a single shoulder version or shoulders 332 and 333 (FIGS. 25, 26) or 432, 433 (FIGS. 27, 28) in two shoulder versions. The blocking means prevent operation of the valve axially as in the version shown in FIGS. 25, 26 or by tilting as in the version shown in FIGS. 27, 28.

Also in the non-dispensing position a locking means positively prevents rotational movement of the actuator (FIGS. 13, 16, 21, 25 and 27). The locking means comprises cooperative portions of the housing and actuator, one of which is radially movable between engaging and disengaging positions with respect to the other. As seen in FIG. 14 and in exploded section FIGS. 21 and 22 the cooperative portions are wedge or tongue 227 carried by flexible flap 223 and groove 259 carried by actuator 250. When the cooperative portions 227, 259 are moved radially apart, as such as when the flap 223 is moved radially outwardly and held in that position as shown in FIGS. 18 and 22 the locking means is disabled and actuator 250 can be rotated free of blocking shoulder 232 or 332, 333 or 432, 433 to the dispensing position (FIGS. 14, 19, 28) for dispensing product from the container by axially depressing the valve stem 213 (FIG. 20) or by tilting the valve stem 413 (FIG. 29).

The non-dispensing position cooperative portions forming the locking means can take various forms such as tongue and groove, bead and detent, wedge and detent and the like. The cooperative portions can be interchanged between the housing and the actuator. Further the portion of the locking means which is moved radially to disengage it from the other portion, can be either a housing portion or an actuator portion. That is, the flap 223 can be either an extension of the housing wall 226 as shown or it could be made as a flexible flap portion of the actuator which must be moved to disengage it from a fixed cooperative portion of the housing. Further, flexible flap 223 and cooperative portions 227, 259 need not be located on the discharge side of the actuator assembly as shown, but rather, may be located in the control end of the actuator assembly.

In the preferred mode, the actuator 250 is capable of being moved from the non-dispensing position (FIG. 17) to the dispensing position (FIG. 19) only by the simultaneous coordinated action of disabling the locking means while rotating the actuator free of the blocking means. The invention is not limited, however, to only two-handed or simultaneous operations as the disabling step and rotating step could also be sequentially performed with one hand.

The limiting means may take various forms as for example the pin 228 extending below flap 223 and designed to coact with housing wall 229 (clearly shown in FIGS. 14, 21, 22). An alternative mode includes an extended skirt 528 along the full length of flexible flap 523 and designed to coact with housing wall 529 (shown in FIG. 23).

The walls of the housing and actuator may be inclined as shown clearly in FIGS. 13, 15, 21 or vertical as shown in FIG. 24. Inclined walls not only give a modern, aesthetic, tapered appearance to the closure assembly, but also naturally conceals the tongue and groove locking portions against detection. One untrained in operating the closure assembly, will have difficulty seeing the cooperative portions comprising the locking means unless he looks directly into the space between the inclined walls (see FIG. 21) and even then it is unlikely to be detected. Similarly, FIG. 24 shows how well the tongue of the flap can be concealed in the groove of the actuator even in the straight wall version of the invention.

The tapered version of FIG. 13 also comes with a tamperproof tab 238 in the slot 221 (FIG. 15) and connected by thin breakaway ribs 239, 240 to prevent relative movement between the cooperative portions 227, 259 until the tab is removed.

The actuator assembly of this invention is also provided with a frictionally secured, removable dust cover 600 (FIG. 17) which keeps the assembly free from outside contamination during periods of non-use. The dust cover 600 snaps onto a ridge 601 (FIGS. 13, 17) on the housing and is frictionally held thereon.

It is noted that the embodiment of FIGS. 13, 19, as in the embodiment of FIG. 6, is designed for an easy one-handed motion in returning the actuator 250 from the unlocked to the locked position, the edge 231 of the tongue being slanted, the edge 260 of the actuator being rounded and the flap 223 being resilient so that as the actuator is being rotated toward the locked position, flap 223 flexes outwardly and edge 231 rides past edge 260 until the actuator is fully seated on the blocking shoulder 232 whereupon tongue 227 automatically snaps into and engages groove 259 (FIG. 16) locking the actuator against rotational movement.

I claim:
1. In combination with a container, a dispensing valve assembly secured to the container, and an actuator assembly including a housing member mounted on the container, an actuator member mounted in the housing in operable connection with the valve, the actuator being rotatable about the longitudinal axis of the container between a non-dispensing position and a dispensing position, blocking means for preventing operation of the valve when the actuator is in the non-dispensing position, and means for deterring rotational movement of the actuator when the actuator is in the non-dispensing position, wherein the improvement comprises:

A. the deterring means being a locking means for preventing rotational movement of the actuator when the actuator is in the non-dispensing position, the locking means having cooperative portions one of which is a resilient flap portion of the housing member radially movable between engaging and disengaging positions with respect to the other, whereby when the locking means is disabled by moving the one portion to the disengaging position, the actuator can be rotated free of the blocking means to the dispensing position for dispensing product by operating the actuator valve, and when rotated to the non-dispensing position the resilience of said flap will cause said locking means to engage.

2. An actuator assembly for use in dispensing product from a valved container comprising:
A. an actuator button having
1. a nozzle, 2. a control member, 3. a passageway for connecting the nozzle and the valve of the container, and

B. a housing having
1. a central longitudinal bore, 2. a first slot, 3. a second slot, 4. a blocking portion and 5. a flap having a free end and an attached end a. the flap extending partially across the first slot, and b. the free end being flexible radially with respect to the longitudinal axis of the housing, and

C. tongue and groove locking means located on co-operative portions of the flap and the actuator button,

D. the actuator button being mounted within the bore of the housing and being rotatable between 1. a first position defined by the tongue being in the groove and the actuator button overriding the blocking portion of the housing for preventing accidental movement of the actuator button and

2. a second position being defined by the nozzle being aligned with the unobstructed portion of the first slot and the control member being aligned with the second slot for dispensing product from the container whereby to move the actuator from the first to the second position the locking means must first be disabled.

3. The actuator assembly of claim 2 wherein the actuator button is rotatable from the first position to the second position only upon the simultaneous release of the locking means by moving the flap radially outwardly with one hand while a rotational force is applied to the control member with the other hand.

4. The actuator assembly of claim 2 wherein the tongue is a flap portion and the groove is an actuator button portion.

5. The actuator assembly of claim 4 wherein the actuator assembly of claim 4 wherein the actuator button being slanted toward the first position and a cooperating portion of the actuator button located toward the first position being rounded whereby the flexible flap, the slanted side wall and rounded corner cooperate to provide minimum resistance to the movement of the actuator button from the second to the first position which can be accomplished by the operator applying a rotational force to the control member with one hand.

6. The actuator assembly of claim 4 wherein the tongue is spaced a short distance from the free end of the flap to provide a ledge against which the operator may place his fingernail for moving the flap radially outwardly to disengage the tongue from the groove.

7. The actuator assembly of claim 4 wherein the tongue is shaped with the side wall away from the first position being slanted toward the first position and a cooperating corner of the actuator button located toward the first position being rounded whereby the flexible flap, the slanted side wall and rounded corner cooperate to provide minimum resistance to the movement of the actuator button from the second to the first position which can be accomplished by the operator applying a rotational force to the control member with one hand.

8. The actuator assembly of claim 2 wherein the control member extends radially beyond the housing and is serrated to provide an easily accessible, non-slip surface for application of rotational forces.

9. The actuator assembly of claim 2 wherein the walls of the actuator assembly are inclined and conceal the locking means.

10. The actuator assembly of claim 2 wherein the housing further comprises a breakaway tab connected by thin breakaway ribs to the free end of the flap on one side and to the wall of the housing on the other side preventing disabling the locking means until the breakaway tab is removed.

11. In combination with a dispenser valve assembly secured to the container, and an actuator assembly including a housing mounted on the container, an actuator mounted in the housing in operable connection with the valve, the actuator being rotatable about the longitudinal axis of the container between a non-dispensing position and a dispensing position, blocking means for preventing operation of the valve when the actuator is in the non-dispensing position, and a means for deterring rotational movement of the actuator when the actuator is in the non-dispensing position, wherein the improvement comprises:

A. the deterring means being a locking mechanism for preventing rotational movement of the actuator when the actuator is in the non-dispensing position, the locking mechanism having a flexible flap portion which is part of the housing movable between engaging and disengaging positions with respect to the actuator, said flexible flap being resilient so as to snap into an engaging position when said actuator is in a non-dispensing position whereby when the locking mechanism is disabled by moving the flap to its disengaging position, the actuator can be rotated free of the locking means to the dispensing position for dispensing product by operating the actuator and valve.

12. The combination of claim 11 wherein the locking mechanism further comprises cooperate wedge and groove portions of the actuator assembly, one of the cooperating portions being carried by a housing portion and the other being carried by an actuator portion and wherein one of the carrying portions is the flexible flap so that the locking mechanism is disabled by flexing the flap to disengage the cooperating portions.

13. An actuator assembly adapted to dispense product from a valved container comprising
A. a housing mounted on the container, B. an actuator mounted in the housing in operable connection with the valve, the actuator being rotatable about the longitudinal axis of the container between a non-dispensing position and a dispensing position, C. blocking means for preventing operation of the valve when the actuator is in the non-dispensing position, D. tongue and groove locking means comprising cooperating portions of the housing and actuator which together prevent rotational movement of the actuator when the actuator is in the non-dispensing position.
13. The tongue portion being a radially flexible flap housing portion movable between engaging and disengaging positions with the groove and actuator portion, said flap being resilient so that when the cooperable portions are aligned, the flap snaps the portions together in a self-locking action, whereby when the tongue portion is moved radially apart from the groove portion, the locking means is disabled and the actuator can be rotated free of the blocking means to the dispensing position for dispensing product from the container by operating the valve, and wherein the actuator is capable of being moved to a position to dispense product only by the simultaneous action of disabling the locking means by moving the cooperable portions apart radially while freeing the actuator from the blocking means by rotating the actuator.

14. The actuator assembly of claim 13 wherein the cooperable portions are a wedge and detent.

15. The actuator assembly of claim 13 wherein the flexible flap is a housing portion which is offset radially inwardly from the adjacent underlying portion of the housing and thereby overlies an open area of the housing.

16. The actuator assembly of claim 13 further comprising means for concealing the cooperable portions in the engaged position.

17. The actuator assembly of claim 13 further comprising limiting means for preventing radial movement of the one portion beyond the point where the flexible flap is permanently deformed.

18. The actuator assembly of claim 17 wherein the limiting means is an extended portion of the flap for engaging a portion of the housing.

19. The actuator assembly of claim 13 further comprising the housing having a slot, and a breakaway tab in the slot and connected to the adjacent portions thereof by thin ribs to prevent relative movement between the cooperable portions until the tab is removed.

20. The actuator assembly of claim 19 further comprising a removable cover frictionally secured to the housing for keeping the assembly free of outside contamination during periods of non-use.

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