

Jan. 2, 1968

P. MESHBERG

3,361,301

ACTUATOR FOR MATERIAL DISPENSING PACKAGE

Filed May 17, 1966

Fig. 1

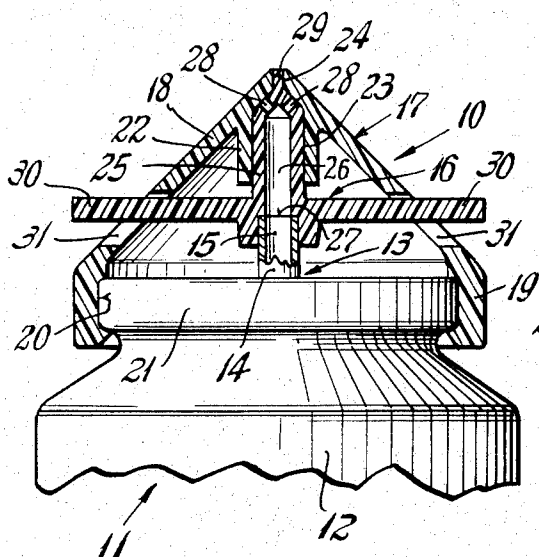


Fig. 2

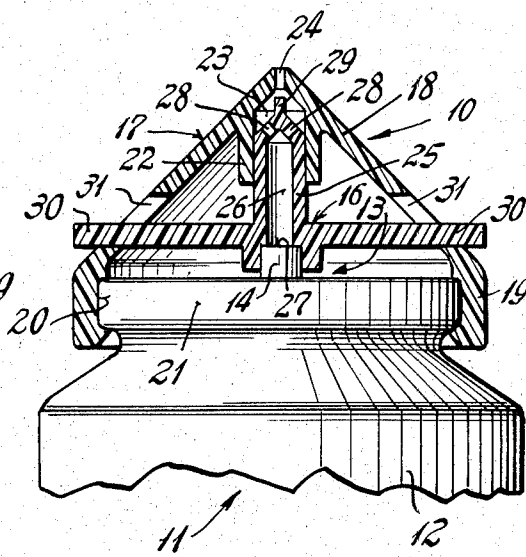


Fig. 3

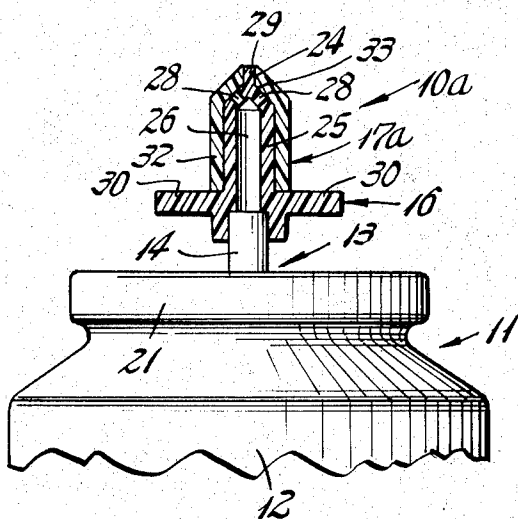
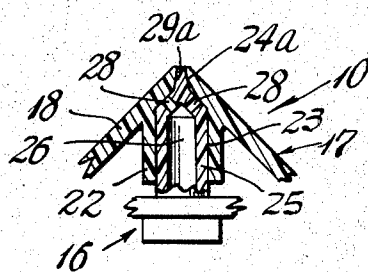


Fig. 4



INVENTOR.
Philip Meshberg
 BY
Johnson and Klue
 ATTORNEYS

1

3,361,301 ACTUATOR FOR MATERIAL DISPENSING PACKAGE

Philip Meshberg, 15 Stoneleigh Road,
Fairfield, Conn. 06430
Filed May 17, 1966, Ser. No. 550,769
10 Claims. (Cl. 222—149)

ABSTRACT OF THE DISCLOSURE

The actuator for the dispensing valve of an aerosol device, which actuator has a fixed portion provided with a discharge orifice which portion encloses a relatively movable actuating portion for operating the valve stem with the actuating portion having a projecting closure element to be disposed in or withdrawn from the dispensing aperture as an incident to the operation of the actuating portion with the closure element wiping out any residue in the discharge orifice as it moves into closing position therein to prevent clogging of said discharge orifice.

Heretofore, actuators for the operator or valve stem of a dispensing valve means in a dispensing package have been known which, in addition to imparting the desired movement to the operator, enclose and protect the operator and dispensing passage formed therein and provide a discharge orifice through which the material is eventually discharged to the atmosphere. While such prior actuators have functioned satisfactorily for the purpose for which they were intended, it has been found that, when used for dispensing certain products, there is a tendency for material residue to remain in the discharge orifice of the actuator and ultimately clog the same or become contaminated by continued exposure to air. This problem is particularly vexing where the material being dispensed is highly viscous and has a tendency to dry and harden on continued exposure to air and, when the material is a foodstuff or pharmaceutical, the problem of contamination is one which cannot be overlooked.

While the problems of clogging and contamination are not limited solely to the discharge orifice of the actuator, but also relate to the dispensing passage in the valve stem, as discussed in my copending application on means for purging the valve stem of material residue left therein, the present invention has as its primary object the provision of an actuator which has means for eliminating the accumulation of material residue in the discharge orifice of the actuator, thereby eliminating the resulting problem of clogging and/or contamination of the orifice.

It is also an object of the invention to provide an actuator for the movable operator of a valve means in a dispensing package, which has means for normally maintaining the discharge orifice closed to the atmosphere in the non-actuating position of the actuator.

Another object of the invention is to provide an actuator, for the movable operator of a material dispensing valve means, which includes means for wiping the discharge orifice thereof subsequent to each material dispensing operation for freeing the orifice of any material residue left therein.

Still another object of the invention is to provide an actuator having closure means for the discharge orifice

2

thereof, which is movable, on operating the actuator to dispense material through the operator of a valve means to which it is connected, for opening the discharge orifice to facilitate the flow of material therethrough and subsequent to the discharge of such material, for wiping the orifice to free it of material residue left therein as the closure returns to orifice closing position.

It is further an object of the invention to provide an actuator for the movable operator of a valve means having a material dispensing passage therethrough, which includes a relatively movable actuator portion and discharge portion, the actuator portion being connected to the operator for imparting operating movement thereto and the discharge portion being formed with a discharge orifice for communicating the material dispensing passage in the operator with the atmosphere, there being means carrier by the actuator portion for normally closing the discharge orifice and, on completion of a dispensing operation, for wiping the discharge orifice to free it of material residue left therein.

It is still further an object of the invention to provide an actuator for the movable operator of a valve means mounted on a container for controlling the discharge of material under pressure therefrom, the operator having passage means therein through which the material is discharged upon operation of the valve means; the actuator including an actuator portion mounted on and movable with the valve operator for imparting actuating movement thereto and a discharge portion rigidly mounted on the container and substantially enclosing the actuator portion and valve operator, the discharge portion being formed with an inwardly directed boss for slidably receiving the actuator portion and having a discharge orifice communicating the interior of the boss with the atmosphere, and the actuator portion being formed with an integral projection disposed inwardly of the boss and adapted to normally snugly fit within the discharge orifice for substantially completely filling and closing the same, the movement of the actuator portion relative to the discharge portion from non-actuating position to actuating position causing the projection to withdraw from the discharge orifice to permit the discharge of material therethrough and the return movement of the actuator to orifice closing position causing the projection to wipe the walls of the orifice, whereby any material residue left therein is removed.

Other objects and advantages of the invention will be apparent from the specification and claims, when considered in connection with the attached sheet of drawings, illustrating one form of the invention, wherein like characters represent like parts and in which:

FIGURE 1 is a fragmentary elevational view, partially in section, of a dispensing package mounting an actuator embodying the invention, the actuator being shown in non-actuated position;

FIG. 2 is similar to FIG. 1, but shows the actuator in actuated position;

FIG. 3 is a fragmentary elevational view, partially in section, of a dispensing package including a modified form of actuator in non-actuated position, according to the invention; and

FIG. 4 is a fragmentary elevational view of an actuator similar to that shown in FIG. 1, but showing a modified form of actuator discharge orifice closure.

Reference now to the drawings, in FIGS. 1 and 2 an actuator 10, embodying the concepts of the invention, is shown in combination with a conventional material dispensing package 11, the latter including a container 12 for holding under pressure the material to be dispensed and a valve means 13 operable for controlling the discharge of the material from the container.

The valve means 13, which may be of any known type and is mounted in the open end of the container 12, as is well understood in the art, includes an operating member 14, in the form of a valve stem, movable for operating the valve means. The valve stem, which is provided with a passage 15 through which the material is dispensed on operation of the valve means is, in the herein illustrated form of the invention, biased to project outwardly of the container into normal valve closed or non-dispensing position and is movable longitudinally inwardly of the container for operating the valve.

Heretofore, dispensing packages, such as that illustrated, have been provided with an actuating button or the like mounted on the valve stem for imparting the desired movement thereto and such actuating means have been formed with a passage or discharge orifice through which the passage 15 in the valve stem is communicated to the atmosphere to facilitate the discharge of material on operation of the valve means. While actuating buttons of the heretofore known types function reasonably well for the purpose for which they were intended, it is known that in some instances, particularly where the material being dispensed is highly viscous or has a tendency to dry on continued exposure to air, the material residue left in the discharge orifice of the actuator clogs the orifice or becomes contaminated, thus preventing subsequent operation of the dispensing package or contaminating the material thereafter dispensed.

The actuator 10, herein illustrated and embodying the invention, in addition to functioning in a manner similar to prior known actuator devices, has means for eliminating the problems encountered with such devices. As illustrated, the actuator 10, of this embodiment of the invention, includes an actuator portion 16, mounted on and movable with the valve stem 14, and a discharge portion 17, connected to the container 12 and substantially completely enclosing the actuator portion.

The discharge portion 17, which may take any desired form, as dictated by the application for which the dispensing package is intended, is here shown as a nasal applicator or the like and includes a nozzle or tip portion 18 of substantially conical form. The nozzle 18, which may be connected to the container 12 in any known manner, is here shown to include an integral depending skirt 19, having an internal annular groove 20 formed therein the skirt being adapted to be snapped over the rim 21 of the container neck, whereby the rim is received in the groove for retaining the nozzle in position. Formed integral with the nozzle 18 and directed inwardly thereof is a boss 22, defining a socket or bore 23, adapted to slidably receive the actuator portion 16, as will be hereinafter explained. A discharge orifice 24, comprising a passage of uniform diameter throughout its length, is formed in the nozzle and opens into the bore 23 of the boss for communicating the interior thereof to the atmosphere and providing an outlet through which the material is dispensed.

The actuator portion 16, which is movable relative to the discharge portion 17 and, as aforementioned, is mounted on the valve stem 14, includes a body portion 25 having a bore 26 formed therein for frictionally receiving the outer end of the valve stem, whereby the actuator portion is mounted thereon. A shoulder 27, formed by the reduced diameter of the outer end of the bore 26, predeterminedly positions the valve stem within the bore and provides a surface against which the valve stem may bear when the actuator portion is moved to actuate the valve means, as will be explained. The bore 26, which is open-

ly communicated with the passage 15 in the valve stem, in addition to facilitating the mounting of the actuator portion on the valve stem, also provides an extension of the passage 15 for the transmission of material during a dispensing operation. Passage means 28 are provided in the body 25 for communicating the bore 26 to the atmosphere through the discharge orifice 24 of the discharge portion 17. While the passage means may take any known form, in the herein illustrated embodiment of the invention they comprise a plurality of ports or orifices formed in the outer end of the body. As shown, the outer end of the body 25 is conical in shape to complement the inner surface of the discharge portion or nozzle 18 and the ports 28 are formed in the conical end portion of the body so that when the actuator 10 is in non-dispensing position, as shown in FIG. 1, the ports are closed by the inner surface of the discharge portion.

In accordance with the present invention, the body 25 of actuator portion 16 is provided at its outer end with an integral projection or stud 29 of uniform diameter throughout its length, forming an orifice closure member, which is adapted to fit snugly within the discharge orifice 24 of the discharge portion 17 when the actuator 10 is in non-dispensing position. In the non-dispensing position of the actuator, the projection 29 closes the discharge orifice and thereby closes the bore 26 and the passage 15 in the valve stem to the atmosphere. When the actuator is operated to dispensing position as shown in FIG. 2, the projection 29 is operably withdrawn from the discharge orifice to enable material to be discharged therethrough and, on return of the actuator to non-dispensing position, the projection reenters the discharge orifice to close the same. Reentry of the projection or closure member into the discharge orifice wipes the walls of the orifice to free them of any material residue left therein, thereby eliminating problems of orifice clogging or material contamination.

It will be understood, in accordance with the concepts of the invention, that only the actuator portion of the actuator 10 need be movable for imparting movement to the valve stem for operating the valve means, but there must be relative movement between the discharge portion and actuator portion for opening and closing the discharge orifice and wiping the same to free it of material residue. While any known means may be resorted to for relatively moving the portions, in the embodiment of the invention illustrated in FIGS. 1 and 2 the actuator portion 16 is moved relative to the fixed discharge portion. As shown, the body 25 is formed with integral opposed wings or extensions 30, which extend outwardly of the discharge portion 17 through slots 31 formed therein, such wings or extensions being manually engageable for imparting movement to the actuator portion, in relation to the fixed discharge portion.

In FIG. 1 the actuator 10 is shown in its normal non-dispensing position with the body 25 of the actuator portion seated within the bore 23 of boss 22 of the discharge portion and the projection 29 completely closing the discharge orifice 24. In order to operate the actuator, as shown in FIG. 2, the actuator portion is moved relative to the discharge portion, in the direction of the container 12, so that the body 25 is, at least partially, withdrawn from the bore 23 for opening the passage means 28 and operably removing the projection closure 29 from the discharge orifice 24. In this position the material being dispensed is discharged from the passage 15 in the valve stem through the bore 26 and ports 28 outwardly to the atmosphere through the opened discharge orifice 24. As previously noted, return movement of the actuator, from the discharge position of FIG. 2 to the non-discharge position of FIG. 1, produces a wiping of the discharge orifice by the closure member 29 whereby the orifice is cleaned and prepared for the next dispensing operation.

5

In FIG. 4, a modified form of actuator 10 is shown which conforms in all respects to that discussed with respect to FIGS. 1 and 2 except that the discharge orifice 24a and the closure member or projection 29a are tapered or conical in shape.

Referring now to FIG. 3, another form of actuator, indicated by numeral 10a is shown which is similar in concept to the actuator of FIGS. 1 and 2 but differs therefrom in that the discharge portion 17a is wholly mounted on the actuator portion 16 and has no connection with the container 12 or the valve means 13. In this form of the invention the discharge portion comprises a sleeve 32 slidably mounted on the body 25 of the actuator portion, the sleeve being formed with a tapered or conical outer end portion 33 through which the discharge orifice 24 is formed. The actuator 10a, while similar in construction and operation to the actuator 10, is operated by manually moving the discharge portion 17a relative to the actuator portion 16 for withdrawing the projection 29 from the discharge orifice 24. Simultaneously with the relative movement of the portions as described or following such relative movement, the actuator portion 16 is moved inwardly toward the container 12 by application of pressure against the extensions 30 for actuating the valve stem to operate the valve means and dispense the material. It will be understood that the relative movement of the portions, within the concepts of the invention may occur simultaneously with the actuation of the valve means operator or at some later time. Similarly, return movement of the portions to non-dispensing position, as shown in FIG. 3, for wiping the discharge orifice to free it of any material residue left therein and closing the same to the atmosphere may be accomplished simultaneously with the return of the actuator portion and valve stem to non-dispensing position or subsequent thereto.

Thus, among others, the several objects and advantages of the invention is aforementioned are achieved. It will be understood, that, while the invention has been described in connection with a package including a vertically extending reciprocal valve means operator, the concepts of the invention are not so limited. Obviously numerous changes in the structure may be resorted to without departing from the spirit of the invention as defined by the claims.

I claim:

1. An actuator for the movable operator of a valve means mounted on a container for controlling the discharge of material under pressure therefrom, said operator being formed with passage means through which the material is discharged to the atmosphere on operation of the valve means; said actuator comprising a longitudinally reciprocating actuating portion and a discharge portion, said portions being relatively movable between non-actuating position and actuating position, said actuating portion being adapted to be connected to said operator for imparting operating movement thereto and said discharge portion having means adapted to fix said portion to the container and being formed with a discharge orifice in line with the movement of the actuating portion and operatively connected with said passage means in said operator for communicating the same to the atmosphere, said actuating portion being formed with an orifice closure means adapted to fit snugly within said discharge orifice for substantially completely filling and closing the same in the non-actuating position of said portions and being operably withdrawn from said orifice as an incident to the relative movement of said portions to actuating position to facilitate the discharge of material therethrough, said orifice closure means, on relative movement of said portions back to non-actuating position, having wiping engagement with the walls of said discharge orifice, whereby any material residue left therein is removed.

6

2. An actuator as defined in claim 1, wherein said actuating portion is adapted to be mounted on and movable with said operator and said discharge portion substantially encloses said actuating portion and is in sliding engagement therewith, said actuating portion having means engageable outwardly of said discharge portion for imparting movement thereto, whereby said operator is moved for operating the valve means, and said actuating portion being formed with means cooperable with said passage means in said operator for communicating said passage means with said discharge orifice in at least the actuating position of said portions.

3. An actuator as defined in claim 1, wherein said actuating portion is adapted to be mounted on and movable with said operator for enclosing the passage means formed therein, and wherein said discharge portion comprises a cover member adapted to be fixedly mounted on the container for substantially completely enclosing said actuating portion and said operator, said discharge portion being formed with an inwardly directed boss for slidably and sealably receiving said actuating portion and having said discharge orifice opening into said boss, said actuating portion having means manually engageable outwardly of said cover member, whereby movement relative to said discharge portion may be imparted thereto for operably moving the operator for operating the valve means, and said actuating portion having port means connecting with said boss for communicating the passage means with said discharge orifice in at least the actuating position of said portions, said orifice closure means being in the form of a projection formed integral with the end of said actuating portion disposed inwardly of said boss, whereby relative movement of said portions moves said projection in and out of said discharge orifice for closing and opening the same.

4. A dispensing package for dispensing material from a container having material under pressure therein and valve means on the container for controlling the dispensing of the material therefrom, said valve means having means for yieldably holding the valve in a normally closed non-dispensing position and having a reciprocal valve stem having a passage therein through which material is dispensed when said stem is moved from the normally closed non-dispensing position, means for actuating said valve means to control the dispensing of material from the container comprising an actuating portion connected to the stem and a discharge portion fixed to the container and enclosing the actuating portion, said discharge portion being formed with a bore therein and having a discharge orifice communicating said bore to the atmosphere, said actuating portion having a body portion slidably and sealably positioned in said bore, said body portion having a passage communicating said passage in the stem with said bore through a port therein and having actuating means whereby the stem can be reciprocated from the non-dispensing position to a dispensing position, said body having closure means projecting therefrom and normally disposed in and closing the discharge orifice in the non-dispensing position, said closure means being removed from the orifice as an incident to the movement of the valve stem to the dispensing position whereupon material from the container passes through the passage in the valve stem through said port to said bore to be dispensed through the orifice, said closure means engaging and wiping the walls of the discharge orifice upon movement of the body portion and connected stem to the normally non-dispensing position whereby any material residue left in the bore and orifice is removed, said fixed discharge portion having means enabling the actuating means to be operated from the exterior thereof.

5. The invention as defined in claim 4 wherein the end of the body forms a plunger for pushing out residue in the bore as the body returns to non-dispensing position.

7

6. The invention as defined in claim 4 wherein the end of the body conforms to the shape of and engages the inner surface of the discharge portion when in normal position to seal the port therein.

7. The invention as defined in claim 4 wherein the top 5 portion of the discharge portion is conical and the discharge orifice is located at the apex of the cone.

8. The invention as defined in claim 4 wherein the discharge portion is fixed to the container by a releasable snap-on connection.

9. The invention as defined in claim 4 wherein the actuating means comprises lateral extensions on the actuating portion and located below the orifice.

8

10. The invention as defined in claim 4 wherein the last means comprises openings in the side of the fixed discharge portion adjacent said actuating means.

References Cited

UNITED STATES PATENTS

3,146,922	9/1964	Tuttle	-----	222—402.12
3,250,474	5/1966	McKernan	----	222—402.12 X

¹⁰ ROBERT B. REEVES, *Primary Examiner*.

F. HANDREN, *Assistant Examiner*.