

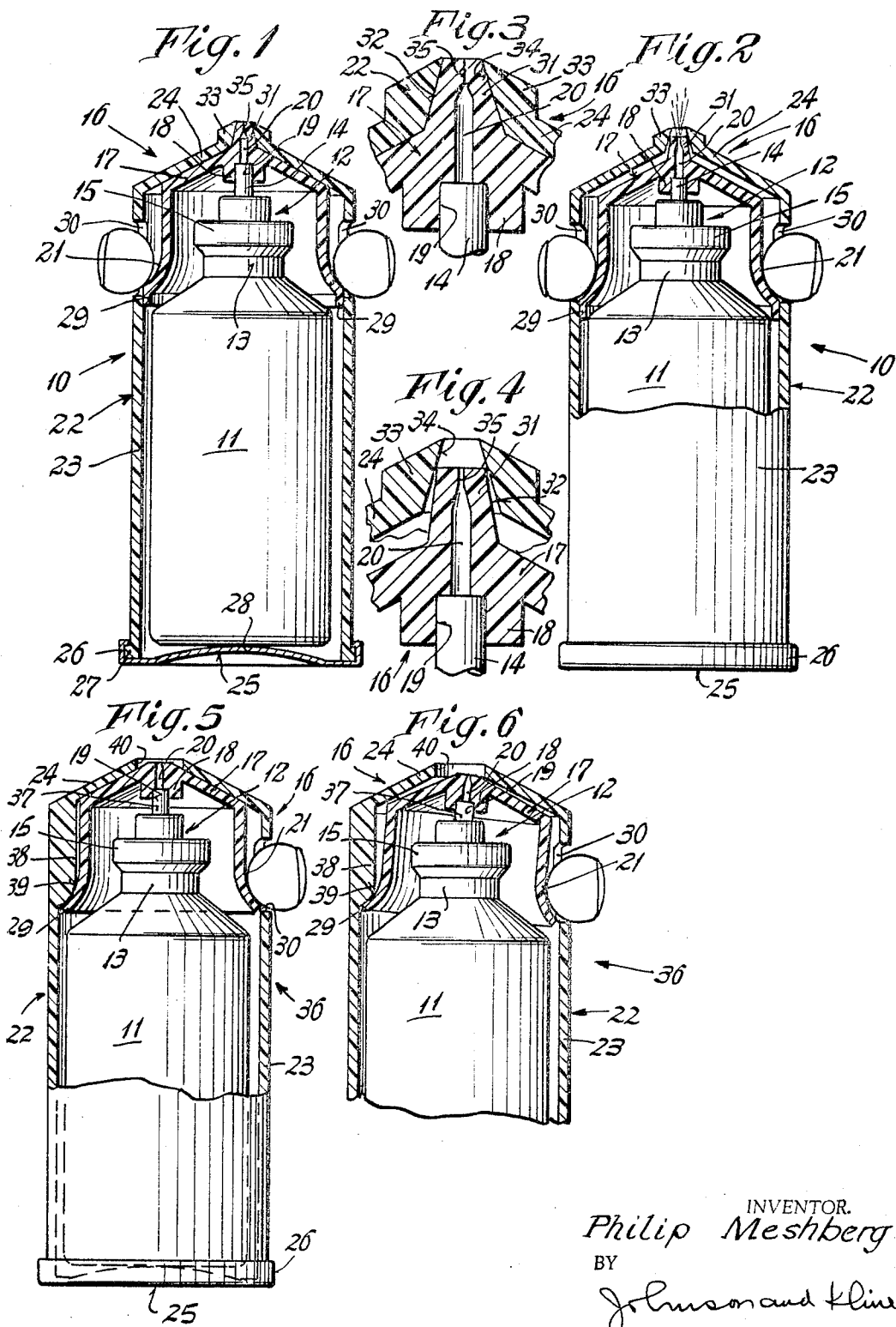
Sept. 13, 1966

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3,272,392

ACTUATOR AND CLOSURE FOR DISPENSING PACKAGE

Filed May 3, 1965



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3,272,392
ACTUATOR AND CLOSURE FOR DISPENSING PACKAGE

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 Filed May 3, 1965, Ser. No. 452,771
 17 Claims. (Cl. 222-162)

This invention relates to a dispensing package for materials under pressure. More specifically, it pertains to an actuator for the dispensing valve in such packages and to a closure therefor.

Dispensing packages of the type to which the instant invention relates have long been known and generally comprise a container having a material under pressure therein and a valve means mounted on the container for dispensing the material on the operation thereof, the valve means including a stem portion movable relative to the container for operating the valve and having a passage therein for passing the material. Most commonly, such dispensing packages have the valve means mounted on an end of the container for closing the same and including a stem portion which is either longitudinally reciprocable or tiltable relative to the container.

Dispensing packages of the foregoing type, while being well suited to many of the applications to which they are applied, such as dispensing foodstuffs, cosmetics, pharmaceuticals, paints, hair spray and the like, present a number of problems which severely limit the applications to which they may be put and create difficulties in existing applications.

One problem, for instance, results from the manner in which presently known dispensing packages are actuated to move the stem portion for operating the dispensing valve means. As presently practiced, most dispensing packages are actuated by gripping the material container in the hand and moving the stem portion, directly or through a button or the like mounted thereon, with the index finger in the desired manner relative to the container. While this method of actuating a dispensing package is well suited to many of the applications thereof, it has been found that, for many other applications, such as those requiring extended actuation of the stem portion or accurate control over the direction in which the material is dispensed, such method is tiring and often limits the amount of control that can be exercised.

Another problem with present dispensing packages relates to the residue of the dispensed material which remains in the passage in the stem portion when the dispensing operation is completed. It has been found, particularly with respect to pharmaceuticals, foodstuffs and viscous materials, that the continued exposure to the atmosphere of the residue of the material which remains in the passage causes the residue to harden and clog the passage or, as in the case of foodstuffs and pharmaceuticals, to spoil and possibly contaminate the material dispensed in the next dispensing operation.

The present invention overcomes the problems aforementioned and has as an important object thereof to provide an actuator for imparting the desired movement to a dispensing valve operator of a dispensing package, which actuator is operable from a position disposed adjacent to the container of such package to facilitate sustained actuation and control, and a closure for the dispensing passage in the dispensing valve, such closure automatically closing the passage to the atmosphere on completion of a dispensing operation.

It is also an object of the invention to provide a dispensing package for materials under pressure, wherein the actuator for moving the operator of the dispensing valve relative to the container is operable by the application of pressure thereagainst, in a direction substantially

transverse to the container, as might result from a normal manual gripping of the container.

It is also an object of the invention to provide an actuator operable to move a valve operator relative to a container of a dispensing package for operating a valve means, which includes a part connected to the operator against which pressure is applied in a direction substantially transverse to the container from a predetermined position relative thereto.

It is also an object of the invention to provide an actuator operable to move a stem portion in a predetermined manner relative to a container for operating a valve means mounted on the container, the actuator including a part fixedly positioned relative to the container and a part connected to the stem portion, the latter part being movable for moving the stem portion on the application thereagainst of pressure applied from a predetermined position relative to the first part.

Another object of the invention is to provide an actuator operable to move a stem portion in a predetermined manner relative to a container for operating a material dispensing valve mounted on an end of the container, the actuator including a part substantially enclosing at least the end of the container mounting the valve and predeterminedly positioned relative thereto and a part movably disposed in the first part and connected to the stem portion, the second part being movable relative to the first part for moving the stem portion on the application thereagainst of pressure applied from a predetermined location on said first part in a direction substantially transverse to the relative path of movement of the parts.

Still another object of the invention is to provide an actuator operable to move a valve stem in a predetermined manner relative to a container for operating a material dispensing valve mounted on an end of the container, the actuator including a part positioned to enclose at least the end of the container mounting the valve and a part movably disposed in the first part and connected to the valve stem, the second part having a camming surface thereon and being movable relative to the first part for moving the valve stem on the application of pressure against the camming surface from a predetermined location on the first part, the pressure being applied in a direction substantially transverse to the relative path of movement of the parts.

Yet another object is to provide a dispensing package for dispensing materials under pressure which includes an actuator for imparting the desired movement to a valve operator having a passage therein for passing the material to be dispensed, the actuator including means cooperable with the passage for communicating the latter to the atmosphere during a dispensing operation and for closing the passage to the atmosphere when the dispensing operation is completed.

It is further an object of the invention to provide a closure for the material dispensing orifice in the movable operator of a dispensing valve means, the closure being cooperable with the orifice, when the operator is moved to operate the valve means, for communicating the orifice to the atmosphere and for closing the same, when the operator is in inoperable position.

It is still further an object of the invention to provide a closure for the material dispensing passage in a movable operator of a dispensing valve means, the closure including a deformable portion having a passage therethrough mounted on the operator for movement therewith, the passage in the deformable portion communicating the passage in the operator to the atmosphere, when the latter is moved to operate the valve means, and being closed to seal the passage in the operator from the atmosphere, when the deformable portion is deformed by the operator being disposed in its inoperable position.

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 an elevational view, partially in section, illustrating a dispensing package, embodying the invention, prior to being actuated for dispensing material;

FIG. 2 is a side elevational view, similar to FIG. 1, showing the dispensing package being actuated to dispense the material therefrom;

FIG. 3 is an enlarged fragmentary view, in section, showing the passage closure aspect of the invention, embodied in the actuator of FIGS. 1 and 2, in passage closing position;

FIG. 4 is similar to FIG. 3, but shows the closure in dispensing position;

FIG. 5 is an elevational view, partially in section, of another form of dispensing package embodying the invention and prior to being actuated to dispense the material; and

FIG. 6 is a fragmentary view, similar to FIG. 5, showing the dispensing package thereof being actuated to dispense the material therefrom.

Referring now to the drawings, and FIGS. 1 to 4 in particular, a dispensing package 10 is shown embodying the concepts of the invention.

As illustrated, the dispensing package 10 includes the conventional container 11 and dispensing valve means 12, the latter being mounted on the container for dispensing the material therefrom on the operation thereof. While the concepts of the present invention are applicable to substantially all dispensing packages for dispensing material under pressure, so long as the dispensing operation is controlled by an operator movable relative to the material container, in the herein illustrated form of the invention the container 11 is of the bottle type for holding a material under pressure therein and includes a neck portion 13 in which the valve means 12 is mounted. The valve means is a conventional metering or non-metering device, having a projecting stem portion 14 movable relative to the container 11 for operating the valve means, and is mounted in the neck portion 13 of the container, as is well known in the art, by means of a mounting flange 15 crimped or rolled thereover. The stem portion or valve operator 14, which is formed with a passage therethrough (not shown) for passing the dispensed material, is here shown as being longitudinally movable relative to the container 11, but it should be understood that the concepts of the invention are not limited to this construction and apply equally as well to structures wherein the stem portion is tiltable or otherwise movable relative to the container.

The dispensing package 10, in addition to including the container 11 and valve means 12, as above described, also includes an actuator, generally indicated by the numeral 16, for imparting the desired movement to the valve operator or stem portion 14. The actuator 16, which may take a number of different forms within the concepts of the invention, includes essentially a part connected to the stem portion that is movable, on the application thereagainst of pressure applied from a predetermined location relative to and adjacent the container in a direction substantially transverse to its path of movement, for moving the stem portion as desired.

The actuator 16 shown in the drawings includes the essential part described above, as indicated at 17, the part being bell-shaped and formed with a boss 18 having a recess 19 therein for frictionally receiving the stem portion, whereby the part is connected thereto. The boss is also formed with a passage 20, to be more fully described hereinafter, which opens into the recess 19 for communicating the passage in the stem portion to the atmosphere. The outer surface of the part 17 is shaped to provide a camming surface 21 against which actuating pressure is

applied for moving the part in the direction of the container 11, the pressure being applied, as aforementioned, from a predetermined location relative to the container in a direction substantially transverse to the path of movement of the part.

In order to assure that actuating pressure is applied against the part 17 as required, the actuator 16 also includes a part 22 that is predeterminedly located relative to the container and preferably encloses at least the end thereof mounting the valve means 12. While the part 22 may be in the form of a collar encircling the container, a cover member wholly enclosing its end or in any other convenient form, in the herein illustrated embodiment it comprises a housing enclosing the entire container, valve means and part 17 of the actuator and includes a side wall 23 and end walls 24 and 25. The side wall 23 and end wall 24 are formed integral to provide a unitary housing structure and the end wall 25 is a separate member, to facilitate assembly of the dispensing package, and is connected to the side wall by snapping the flange 26 thereof over the rib 27 defining the end of the side wall. As shown, the end wall 25 is concave in cross-section, as indicated at 28, to engage the bottom of container 11 and prevent its movement theretoward during the dispensing operation. The part 17 of the actuator is movable within the part 22 for moving the stem portion 14 relative to the container and includes a depending rim or skirt 29 which slidably engages the side wall 23 of the housing part 22 for maintaining the axial alignment of the container and housing during the dispensing operation.

In the form of the invention shown, the actuator housing, or part 22 thereof, is formed with at least one opening 30 in the side wall 23 adjacent the camming surface 21 of the actuator part 17. The openings 30 are predeterminedly located to facilitate the application of pressure against the camming surface 21 in the desired manner and, as shown, are of a size to enable manual pressure to be applied therethrough against the camming surface. In other words, the openings are of a size to permit finger tips to be inserted therein for applying pressure directly against the camming surface, whereby the part 17 is cammed in the direction of the stem portion 14 for moving the stem portion and operating the valve means 12. It should be understood that, while the instant embodiment of the invention is shown in a form which permits finger tip pressure to be applied directly against the camming surface 21 of the part 17, it is well within the concept of the invention to utilize movable buttons mounted in the openings 30 or, for that matter, movable portions of the side wall 23, such as tongues struck therefrom, for providing the desired camming pressure against the surface 21.

It will be seen that by means of the construction above described a dispensing package is provided, having an actuator for the operator of the valve means which is operable by the pressure normally resulting from a gripping of the container as it is held in the hand, and that the problems inherent in prior actuating procedures are eliminated so that complete control may be exercised over the dispensing operation without actuation fatigue.

While the dispensing package heretofore described may include conventional passage means for communicating the passage in the valve stem portion to the atmosphere, in the herein illustrated embodiment of the invention, with particular reference to FIGS. 3 and 4, a construction is shown which provides, as part of the actuator, an automatic closure for the dispensing passage, when the dispensing operation is completed, for sealing the passage from the atmosphere so that the material residue therein is protected from the deleterious effect of the atmosphere.

The automatic closure is provided by forming the part 17 of the actuator with a deformable tip 31, the tip having an outer peripheral surface 32 tapered inwardly in a direction away from the valve stem portion 14. The part 22 of the actuator is formed with a boss 33 having a bore

34 therein, tapered, as shown, to receive and deform the tip 31 of actuator part 17. As previously noted, actuator part 17 is formed with a bore or passage 20 which communicates with the passage in the valve stem portion 14. The passage 20 extends through the deformable tip 31 thereby providing the means for communicating the passage in the stem portion to the atmosphere. In the preferred form of the invention, the portion of passage 20 which extends through the deformable tip 31 of actuator part 17 is in the nature of a slit, as shown at 35, which is adapted to be pressed closed when tip 31 is deformed, upon complete insertion in bore 32 of actuator part 22, and is adapted to be forced open under the pressure of the dispensed material, when deforming pressure is relaxed against tip 31, on withdrawal thereof from bore 32.

It will be seen, with reference specifically to FIG. 3, that in the normal non-dispensing position of the actuator, the tip 31 of the closure is seated in the bore 32 so that it is deformed and the passage 20, and more specifically the slit portion 35 thereof, is pressed closed, thus sealing the passage in the valve stem portion 14 from the atmosphere. When the actuator is operated to move the valve stem portion 14, as shown in FIG. 4, movement of part 17 of the actuator withdraws the tip 31 of the closure from bore 32 so that deforming pressure on the tip is relieved whereby the passage 20, and particularly the slit portion 35 thereof, is enabled to open under the pressure of the material being dispensed.

It should here be noted that, while the closure has been shown to include a slit defining the outer end of the passage 20, the passage 20 may take any form so long as it is capable of being closed on deformation of the deformable closure tip 31. It should also be noted that the closure concept embodied in the actuator 16 is not limited to this embodiment, but may be utilized as a separate and distinct element of a dispensing package, in the form of an attachment or integral part of such package.

Referring now to FIGS. 5 and 6 of the drawings, another form of the invention is shown embodied in a dispensing package 36 for dispensing materials under pressure, the parts thereof corresponding to the parts of the dispensing package 10 being similarly numbered.

As illustrated, the dispensing package 36 includes the container 11, valve means 12 and actuator 16, these parts being assembled and operating in substantially the same manner as discussed in connection with dispensing package 10. The valve means 12 of the dispensing package 36, however, differs from that discussed with respect to the dispensing package 10 in that it is provided with a projecting stem portion 37 that is tiltable relative to the container for operating the valve means, rather than being longitudinally movable relative thereto.

The actuator 16 of dispensing package 36, while being similar to the actuator of dispensing package 10, differs in its mode of operation and in certain features of construction. The actuator 16 of this embodiment of the invention includes the actuator parts 17 and 22, both of which correspond generally in character to the corresponding parts of the actuator shown in FIGS. 1 through 4. However, it is noted that here the part 22 is provided with an inwardly projecting rib 38 and is formed with only a single opening 30 through which pressure may be applied against the camming surface 21 of the actuator part 17. The rib 38, which is formed integral with the side wall 23 of actuator housing part 22 and extends inwardly of such part, is disposed directly opposite the opening 30 in the wall 23 so that its outer edge 39 engages the camming surface 21 and provides a fulcrum about which the part 17 is pivoted when pressure is applied against the camming surface by manual or similar means. As will be most clearly seen in FIG. 6, upon application of pressure against the camming surface 21 the part 17 pivots around the fulcrum 39 and thereby tilts the stem portion 37 to operate the valve means.

One further difference exists between the dispensing 75

package of FIGS. 5 and 6 and that of FIGS. 1 through 4 and this difference resides in the means provided for communicating the passage in the valve stem portion to the atmosphere. It will be seen that in this construction the part 17 is not provided with the deformable tip 31 and the passage 20 openly connects the passage in the stem portion to the atmosphere. The end wall 24 of the actuator part 22 is formed with an enlarged opening 40 which is aligned with the passage 20 of the part 17, the opening 40 enabling the material being dispensed to pass freely out of the dispensing package when the part 17 and the stem portion are tilted to operate the valve means.

While the actuator and the closure of the instant invention have been described above as forming an integral part of a dispensing package for dispensing materials under pressure, it will be apparent to those conversant with the art that the actuator and closure may form attachments for use in combination with conventional dispensing packages as desired.

Thus, among others, the several objects and advantages of the invention as aforementioned are achieved. 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. A dispensing package for materials under pressure comprising a container having a material under pressure therein; valve means mounted on the container for dispensing said material on the operation thereof, said valve means including a projecting stem portion movable relative to said container for operating said valve means and having a passage therein for passing said material; and actuating means operable to move said stem portion relative to said container for operating said valve means, said actuating means comprising a part connected to said stem portion, said part having means therein cooperating with said passage in said stem portion for communicating the latter outwardly of said dispensing package and being movable relative to said container on the application thereagainst of pressure applied from a position predeterminedly located relative to said container in a direction substantially transverse to the axis of said stem portion for operating said valve means.

2. A dispensing package for materials under pressure comprising a container having a material under pressure therein; valve means mounted on an end of the container for dispensing said material on the operation thereof, said valve means including a longitudinal projecting stem portion movable relative to said container for operating said valve means and having a passage therein for passing said material; and actuating means operable to move said stem portion relative to said container for operating said valve means, said actuating means including a part predeterminedly positioned relative to the end of the container mounting said valve means and a part connected to said stem portion, said second part having means therein cooperating with said passage in said stem portion for communicating the latter outwardly of said dispensing package and being movable relative to said first part on the application thereagainst of pressure applied from a fixed position relative to said first part in a direction substantially transverse to the longitudinal axis of said stem portion for operating said valve means.

3. A dispensing package for materials under pressure comprising a container having a material under pressure therein; valve means mounted on an end of the container for dispensing said material on the operation thereof, said valve means including a projecting stem portion movable relative to said container for operating said valve means and having a passage therein for passing said material; and actuating means operable to move said stem portion relative to said container for operating said valve means, said actuating means including a part substantially enclosing at least the end of the container mounting said valve means and a part connected to said stem por-

tion and movably disposed within said first part, said second part having means therein cooperating with said passage in said stem portion for communicating the latter outwardly of said dispensing package and being movable relative to said first part on the application thereagainst of pressure applied from a fixed position relative to said first part in a direction substantially transverse to the container for operating said valve means.

4. A dispensing package for materials under pressure comprising a container having a material under pressure therein; valve means mounted on an end of the container for dispensing said material on the operation thereof, said valve means including a projecting stem portion movable relative to said container for operating said valve means and having a passage therein for passing said material; and actuating means operable to move said stem portion relative to said container for operating said valve means, said actuating means including a part substantially enclosing the end of the container mounting said valve means and predeterminedly positioned relative thereto, and a part connected to said stem portion and movable within said first part, said second part having means therein cooperating with said passage in said stem portion for communicating the latter outwardly of said dispensing package and being movable relative to said first part on the application thereagainst of pressure applied from a predetermined position relative to said first part in a direction substantially transverse to the container for operating said valve means.

5. A dispensing package for materials under pressure comprising a container having a material under pressure therein; valve means mounted on an end of the container for dispensing said material on the operation thereof, said valve means including a projecting stem portion movable relative to said container for operating said valve means and having a passage therein for passing said material; and actuating means operable to move said stem portion relative to said container for operating said valve means, said actuating means including a housing substantially enclosing said container and valve means and having an opening therein adjacent said stem portion and connected to said stem portion and having cam means thereon adjacent a wall of said housing, said part having means therein cooperating with said passage in said stem portion for communicating the latter outwardly of said housing through said opening and being movable relative to said housing on the application of pressure applied from a fixed position relative to said wall of said housing against said cam means in a direction substantially transverse to the housing for operating said valve means.

6. A dispensing package as defined in claim 5, wherein the wall of said housing is formed with at least one opening therein adjacent said cam means and the pressure applied to said cam means is applied through said opening.

7. A dispensing package as defined in claim 5, wherein said wall of said housing extends substantially normal to the end thereof corresponding to the end of said container mounting said valve means and is formed with at least one opening therein through which finger pressure may be applied directly against said cam means for moving said part relative to said housing, whereby the stem portion is moved to operate the valve means.

8. A dispensing package for materials under pressure comprising a container having a material under pressure therein; valve means mounted on an end of the container for dispensing said material on the operation thereof, said valve means including a projecting stem portion longitudinally movable relative to said container for operating said valve means and having a passage therein for passing said material; and actuating means operable to move said stem portion longitudinally relative to said container for operating said valve means, said actuating means including a housing substantially enclosing said

container and valve means and having an opening therein adjacent said stem portion, and a part disposed in said housing and longitudinally movable therein relative to the axis of said housing, said part being connected to said stem portion and having cam means thereon adjacent a wall of said housing and being formed with an opening therein cooperating with said passage in said stem portion for communicating the latter outwardly of said housing through said opening therein, said part being movable relative to said housing on the application of pressure applied from a fixed position relative to said wall of said housing against said cam means in a direction substantially transverse to the axis of said housing for operating said valve means.

9. A dispensing package for materials under pressure comprising a container having a material under pressure therein; valve means mounted on an end of the container for dispensing said material on the operation thereof, said valve means including a projecting stem portion tiltable relative to said container for operating said valve means and having a passage therein for passing said material; and actuating means operable to tilt said stem portion relative to said container for operating said valve means, said actuating means including a housing enclosing at least the end of the container mounting said valve means, said housing being formed with an opening adjacent said stem portion and having a side wall surrounding at least a portion of the side wall of said container, and a part movably disposed in said housing and connected to said stem portion, said part having means therein cooperating with said passage in said stem portion for communicating the latter outwardly of said housing through said opening and being formed with a camming surface adjacent said side wall of said housing, said side wall of said housing being formed with at least one opening through which pressure can be applied directly against said camming surface in a direction transverse to the axis of said container and having means thereon engaging said camming surface for providing a fulcrum about which said part is pivoted when said pressure is applied to said camming surface through the opening in said side wall, whereby said stem portion is tilted to operate said valve means.

10. A dispensing package for materials under pressure comprising a container having a material under pressure therein; valve means mounted on an end of the container for dispensing said material on the operation thereof, said valve means including a projecting stem portion movable relative to said container for operating said valve means and having a passage therein for passing said material; and actuating means operable to move said stem portion relative to said container for operating said valve means, said actuating means including a part predeterminedly positioned relative to the end of the container mounting said valve means and a part connected to said stem portion and movable relative to said first part, said second part having deformable passage means therein cooperating with said passage in said stem portion for communicating the latter outwardly of said dispensing package to the atmosphere, said parts normally being in engagement so that said first part deforms and closes said deformable passage means of said second part to close said passage in said stem portion to the atmosphere, said second part being movable relative to said first part on the application thereagainst of pressure applied in a direction transverse to the relative path of movement of said parts for moving said stem portion relative to said container and operating said valve means, said first part disengaging said second part when the latter is moved relative thereto, whereby said passage means is enabled to open under the pressure of the material being dispensed.

11. A dispensing package for materials under pressure comprising a container having a material under pressure therein; valve means mounted on an end of the container for dispensing said material on the operation

thereof, said valve means including a projecting stem portion movable relative to said container for operating said valve means and having a passage therein for passing said material; and actuating means operable to move said stem portion relative to said container for operating said valve means, said actuating means including a part predeterminedly positioned to enclose at least the end of the container mounting said valve means and having an opening therein adjacent said stem portion, and a part connected to said stem portion and movable within said first part, said second part having deformable means normally disposed in said opening in said first part and deformed thereby, said deformable means having a passage therein cooperable with said passage in said stem portion for communicating the latter outwardly of said dispensing package through said opening in said first part, said passage in said deformable means being normally closed when said deformable means is disposed in said opening in said first part and deformed thereby to seal the passage in said stem portion from the atmosphere, said second part being movable relative to said first part on the application thereagainst of pressure applied in a direction transverse to the relative path of movement of said parts for moving said stem portion and operating said valve means, said movement of said second part withdrawing said deformable means from said opening in said first part, whereby said passage in said first part is enabled to open under the pressure of the material being dispensed.

12. A dispensing package for materials under pressure comprising a container having a material under pressure therein; valve means mounted on an end of the container for dispensing said material on the operation thereof, said valve means including a projecting stem portion movable relative to said container for operating said valve means and having a passage therein for passing said material; and actuating means operable to move said stem portion relative to said container for operating said valve means, said actuating means including a part predeterminedly positioned to enclose at least the end of the container mounting said valve means and having an opening therethrough adjacent said stem portion, said opening being tapered inwardly in a direction away from said stem portion, and a part connected to said stem portion and movable within said first part, said second part being formed with a deformable projecting stud having an opening therethrough connecting with said passage in said stem portion for communicating the latter outwardly of said dispensing package through said opening in said first part, said stud having an outer peripheral surface tapered inwardly in a direction away from said stem portion to be normally received in said tapered opening in said first part and deformed thereby so that said opening in said stud is normally closed for sealing said passage in said stem portion from the atmosphere, said second part being movable relative to said first part in the direction of said stem portion on the application thereagainst of pressure applied from a predetermined position relative to said first part in a direction substantially transverse to the relative path of movement of said parts for moving said stem portion and operating said valve means, said movement of said second part at least partially withdrawing said deformable stud from said opening in said first part, whereby deforming pressure on said stud is relieved and the opening therein is enabled to open under the pressure of the material being dispensed.

13. A closure for a material dispensing package of the type including a container having a material under pressure therein and valve means mounted on the container for dispensing the material on the operation thereof, said valve means including a projecting stem portion movable relative to said container for operating the valve means and having a passage therein for passing said material; said closure comprising a part adapted to be connected to said container adjacent said valve means and a part adapted to be connected to said stem portion for movement

therewith, said second part having a deformable portion formed with a bore therethrough cooperable with the passage in said stem portion for communicating the latter to the atmosphere and normally being in engagement with said first part so that the deformable portion is deformed thereby for closing said bore and sealing said passage from the atmosphere, said parts being disengaged when said stem portion is moved relative to said container, whereby said deformable portion is relieved of deforming pressure thereagainst and said bore is enabled to open under the pressure of the material being dispensed.

14. A closure for a material dispensing package of the type including a container having a material under pressure therein and valve means mounted on the container for dispensing the material on the operation thereof, said valve means including a projecting stem portion movable relative to said container for operating the valve means and having a passage therein for passing said material; said closure comprising a part adapted to be connected to said container adjacent said valve means and a part adapted to be connected to said stem portion for movement therewith, said second part having a deformable portion formed with a bore therethrough cooperable with the passage in said stem portion for communicating the latter to the atmosphere, said first part having means normally in engagement with the deformable portion of said second part for deforming the same to close said bore and seal said passage from the atmosphere, said second part being movable with said stem portion when said valve means is operated to disengage said deformable portion from said deforming means of said first part, whereby said bore is enabled to open under the pressure of the material being dispensed.

15. A closure for a material dispensing package of the type including a container having a material under pressure therein and valve means mounted on an end of the container for dispensing the material on the operation thereof, said valve means including a projecting stem portion movable relative to said container for operating the valve means and having a passage therein for passing said material; said closure comprising a part adapted to be connected to said container and enclose at least the end thereof mounting said valve means, said part being formed with an opening therein adjacent said stem portion, and a part adapted to be connected to said stem portion for movement therewith, said second part being disposed within said first part and having a deformable portion formed with a bore therethrough cooperable with the passage in said stem portion for communicating the latter to the atmosphere, said deformable portion normally being disposed in said opening in said first part to be deformed thereby for closing said bore and sealing said passage from the atmosphere, said parts being relatively movable when said stem portion is moved relative to said container to operate said valve means, whereby said deformable portion is at least partially withdrawn from said opening in said first part so that said bore is enabled to open under the pressure of the material being dispensed.

16. A closure for a material dispensing package of the type including a container having a material under pressure therein and valve means mounted on an end of the container for dispensing the material on the operation thereof, said valve means including a projecting stem portion movable relative to said container for operating the valve means and having a passage therein for passing said material; said closure comprising a part adapted to enclose at least the end of said container mounting said valve means and be predeterminedly located with respect thereto, said part being formed with an opening adjacent said stem portion having a deforming means therein, and a part adapted to be connected to said stem portion for movement therewith, said second part being disposed within said first part and having a deformable portion formed with a bore therethrough cooperable with the passage in said stem portion for communicating the latter

to the atmosphere, said deformable portion normally being disposed in said opening in said first part so that the deformable portion is deformed by said deforming means for closing said bore and sealing said passage from the atmosphere, said second part being moved relative to said first part when said stem portion is moved to operate said valve means so that said deformable portion is at least partially withdrawn from said opening to disengage it from said deforming means, whereby said bore is enabled to open under the pressure of the material being dispensed.

17. A closure for a material dispensing package of the type including a container having a material under pressure therein and valve means mounted on an end of the container for dispensing the material on the operation thereof, said valve means including a projecting stem portion movable relative to said container for operating the valve means and having a passage therein for passing said material; said closure comprising a part adapted to be connected to said container for enclosing at least the end thereof mounting said valve means, said part being formed with an opening therethrough adjacent said stem portion, said opening being tapered inwardly in a direction away from said stem portion, and a part adapted to be connected to said stem portion for movement therewith, said second part being disposed within said first part and having a projecting deformable portion formed with a slit

therethrough cooperable with the passage in said stem portion for communicating the latter to the atmosphere, said deformable portion having an outer peripheral surface tapered inwardly in a direction away from said stem portion and being adapted to be normally disposed in said opening to that said tapered surface is in engagement with said tapered opening to be deformed thereby for closing said slit and sealing said passage from the atmosphere, said second part being moved relative to said first part when said stem portion is moved to operate said valve means so that said deformable portion is at least partially withdrawn from said opening to disengage said tapered surface from said tapered opening, whereby said slit is enabled to open under the pressure of the material being dispensed.

References Cited by the Examiner

UNITED STATES PATENTS

1,751,237	3/1930	Hoban.	
2,602,700	7/1952	Ryan	222-162
2,951,644	9/1960	Mahon et al.	222-162X
2,966,283	12/1960	Darvie	222-162X

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