United States Patent

Hein

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[54] AEROSOL CAN WITH PROPELLANT ACTUATED SLIDE PISTON

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[52] **U.S. Cl.** **222/145**, 222/193, 239/308

[51] **Int. Cl.** **B67d 5/54**

[58] **Field of Search** 222/402.1, 402.18, 134, 145, 222/193, 394, 402.12–402.25; 239/304, 308, 307; 137/111, 114

[56] **References Cited**

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3,289,949	12/1966	Roth	222/394 X
3,575,317	4/1971	Prussin et al.	222/135 X

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[57] **ABSTRACT**

An isolation-type aerosol dispenser for a fluid product, which includes a slidable piston, movable in a chamber between a dispensing and a non-dispensing position. The piston and chamber are adapted for regulating communication between a product container and a venturi-type, discharge nozzle of the dispenser, according to the movement of the piston. The product container communicates with the discharge nozzle only when the piston is in the dispensing position in the chamber. During dispensing, flow of aerosol propellant to the discharge nozzle is conducted to the chamber and causes the piston to be moved to the dispensing position. The piston and chamber are also adapted to vent the product container only when the piston is in the dispensing position.

17 Claims, 4 Drawing Figures

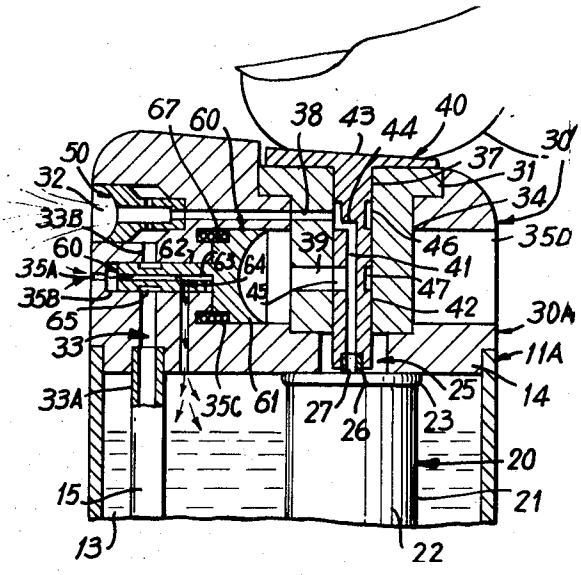


FIG. 1

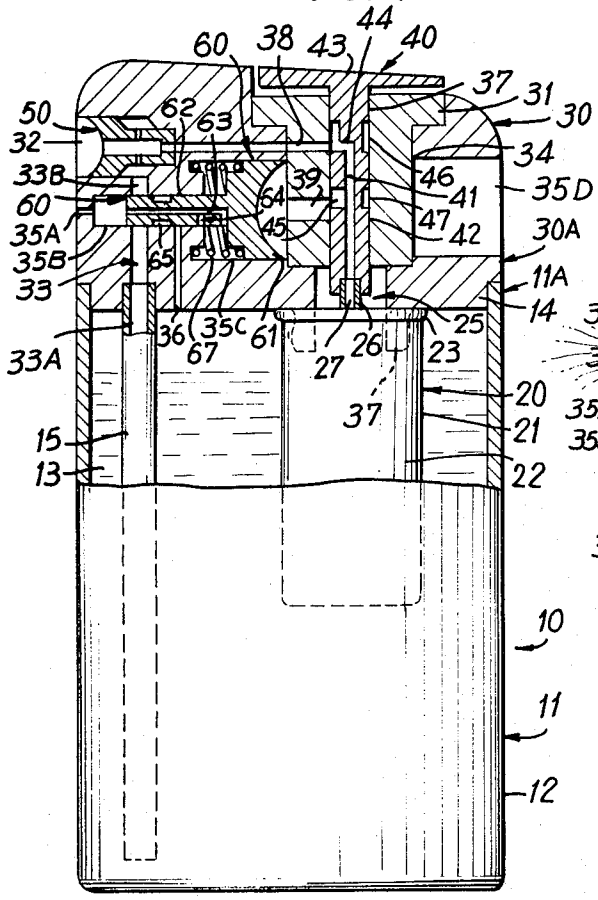


FIG. 2

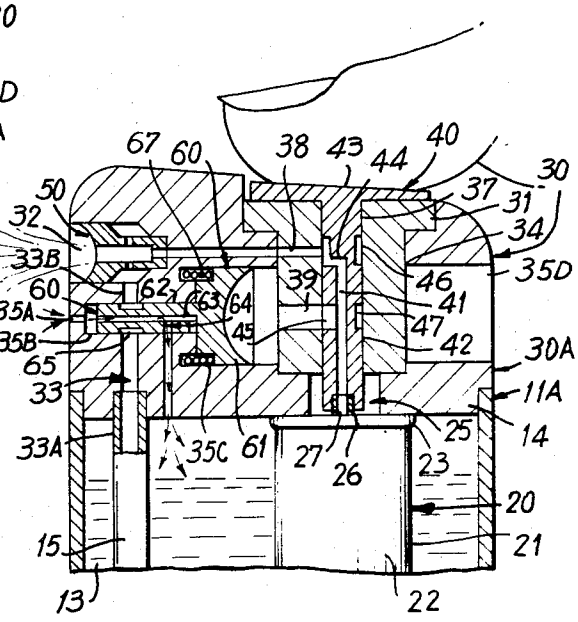


FIG. 3

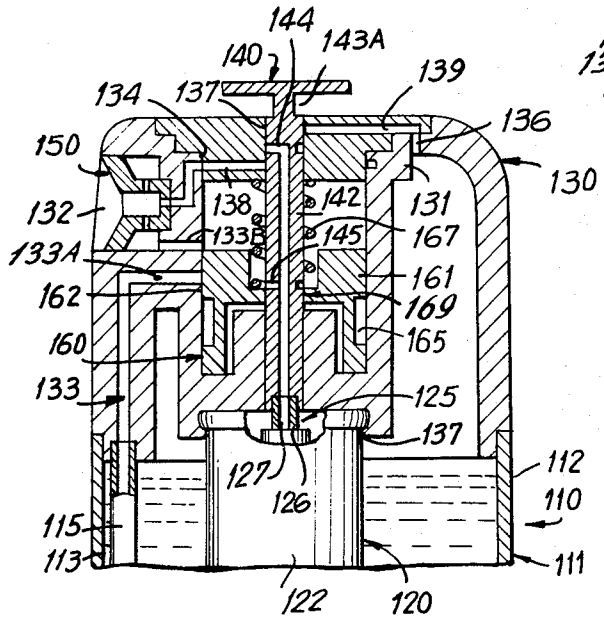
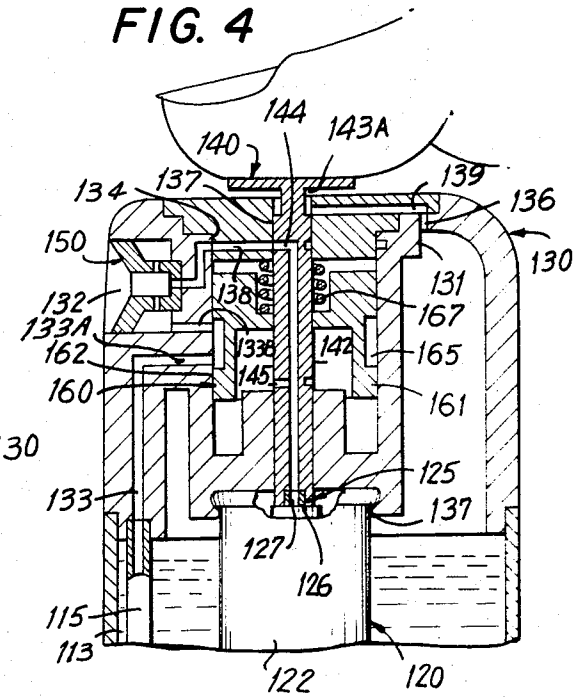


FIG. 4



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AEROSOL CAN WITH PROPELLANT ACTUATED SLIDE PISTON

BACKGROUND OF THE INVENTION

Isolation-type aerosol dispensers have become very popular with manufacturers of dispensers for liquid and powdered products. Such dispensers have typically included at least one, outer, product container and a single, propellant container, mounted within but isolated from the product container. See, generally, U.S. Pat. Nos. 2,689,150, 3,217,936, 3,272,389, 3,289,949, 3,323,686 and 3,326,469.

In such dispensers, the inner, propellant container has usually required a relatively rigid pressure-resistant construction, adapted to hold a gaseous or gasifiable propellant, such as freon, while the outer, product container has usually not required an especially rigid or pressure resistant construction. Because of this situation, isolation-type aerosol dispensers have offered several distinct packaging advantages, including:

allowing the outer, product container to be made of relatively light-weight and inexpensive materials;

placing the propellant container within the product container, where the propellant container is less liable to be punctured or to rupture from exposure to external heating; and

allowing the outer, product container to provide a more decorative and appealing appearance to the dispenser as a whole. See particularly, U.S. Pat. No. 2,689,150, showing a glass container for perfume, and U.S. Pat. No. 3,289,949, showing a plastic product container.

As to the operation of such dispensers, outflow of the propellant has been regulated by a high-pressure valve, connected to a digitaly operable push-button. This valve has usually been adapted to conduct the rapid outflow of propellant gas to a "venturi-type" discharge nozzle, in communication with both a discharge port of the dispenser and the product container. As the propellant rushes through the discharge nozzle, the product has been sucked out of the product container and into the discharge nozzle. From the discharge nozzle, the product has been conveyed out of the dispenser by the propellant, through the discharge port. Atomization of the product in the discharge nozzle has usually been achieved, thereby creating a spray or mist discharge from the discharge port.

Several problems have arisen, however, in regulating communication between the product container and the discharge nozzle. Specifically, there has been a need to prevent such communication when the dispenser is not being dispensed in order to prevent the product from evaporating to the atmosphere or leaking out of the dispenser, through the discharge port. There has also been a need to prevent degradation of the product caused by its contacting air flowing into the product container, through the discharge port. There has been a further problem in providing the product container with communication to the atmosphere when the dispenser is being dispensed, to prevent a vacuum from building-up in the product container due to the removal of product therefrom, as dispensing proceeds. Such a vacuum, if allowed to build-up, has tended to resist the sucking action of the venturi, during dispensing, causing the dispenser to become ineffective.

One solution to all these problems has involved the use of a deflectable rubber gasket, flexed by movement of the push-button so as to vent the product container to the atmosphere and to provide communication between the discharge nozzle and the product container only when the valve is actuated for dispensing. This solution has not proven entirely satisfactory due to the relative difficulty in assembling the gasket-pushbutton combination and in assuring an effective air-tight seal of the product container when the pushbutton is in its non-dispensing position.

SUMMARY OF THE INVENTION

In order to overcome the deficiencies in prior, isolation-type aerosol dispensers and to provide therein communication, only during dispensing, between a product container and a discharge nozzle, as indicated in the Background of the Invention, this invention relates to an improved isolation-type aerosol dispenser, having a conventional product reservoir, propellant reservoir, discharge nozzle, pushbutton, valve and flow line means between the valve and the discharge nozzle, the improvement which includes:

a second interruptible flow line means between the discharge nozzle and the product reservoir;

a third interruptible flow line means between the product reservoir and the exterior of the dispenser;

portions of the second and third flow line means being movable relative to the dispenser between a first position wherein these flow line means provide communication and a second position wherein these flow lines do not provide communication; and

means, connected to the second and third flow line means and to the valve, for translating and transmitting flow of propellant from the propellant reservoir into movement of the moveable portions of the second and third flow line means from the second positions to the first positions thereof.

Numerous other advantages of the invention will be apparent as it is better understood from the following description, which, taken in connection with the accompanying drawings, discloses a preferred embodiment thereof.

DESCRIPTION OF THE DRAWING

FIG. **1** is a schematic, sectioned view of an isolation-type aerosol dispenser of the instant invention, a container for the propellant being shown in elevation. As shown, the product is not being dispensed, a container for the product being sealed from the atmosphere.

FIG. **2** is a fragmentary, schematic, sectioned view of the aerosol dispenser shown in FIG. **1**. As shown, the product is being dispensed from the product container, through the discharge nozzle of the dispenser, to the atmosphere. At the same time, the product container is being vented continuously during dispensing.

FIG. **3** is a fragmentary, schematic sectioned view similar to FIG. **1**, of a modified, isolation-type aerosol dispenser of the instant invention, the propellant container being shown in elevation.

FIG. **4**, similar to FIG. **2**, shows the modified aerosol dispenser, during dispensing.

DESCRIPTION OF THE PREFERRED EMBODIMENT

As a preferred or exemplary embodiment of the instant invention, FIG. **1** shows an isolation-type aerosol dispenser, generally **10**. The dispenser **10** is provided with a product reservoir, generally **11**, a propellant reservoir, generally **20**, a high-pressure valve, generally **25**, a head generally **30**, a digitally operable pushbutton, generally **40**, and a discharge nozzle, generally **50**. The dispenser **10** of the instant invention is also provided with a slidable piston arrangement, generally **60**, which is adapted to place the product reservoir **11** in communication with both the discharge nozzle **50** and with the exterior of the dispenser **10**, only during dispensing.

The product reservoir **11** includes a product container **12** adapted to hold a liquid or powder product **13** to be dispensed. The product container **12** is generally cylindrical and is made of a relatively frangible material such as plastic, light-weight metal or glass. The product container **12** includes an opening **14** at the top thereof which is obturated by the head **30**. The product reservoir **11** is further provided with a dip tube **15** which extends beneath the top surface of the product **13** in the product container **12**.

The propellant reservoir **20** includes a sealed propellant container **21** adapted to hold the propellant **22**. Whereas the product container **12** can be made from a relatively frangible material, the propellant container **21** is made of a rigid, relatively unbreakable material such as steel. The propellant **22** is a gaseous or gasifiable substance such as carbonic acid or fluorochlorinated hydrocarbon, such as freon. The propellant

container 21 is generally cylindrical and is provided with a conventional annular crimped seam 23 about the top thereof. See for example, the seam in U.S. Pat. No. 3,217,936. The crimped seam construction 23 is well suited for snap-on attachment of the propellant container 21 to the head 30. As described below, of course, the principal purpose of the crimped seam 23 is to secure a top member to a side wall member to form the sealed propellant container 21.

The valve means 25 is a conventional, vertically actuatable, high-pressure, aerosol valve, which includes a depressible stem member 26 with an axial channel 27 therethrough, as shown, for example, in U.S. Pat. No. 3,217,936 and which conveniently is mounted on the propellant container 21 in a conventional manner. The valve 25 is adapted to place the interior of the propellant container 21 in communication with the axial bore 27 of the stem member 26 when the stem member 26 is depressed and to prevent such communication when the stem member 26 is not being depressed.

The head 30 is formed as a single piece, as by molding from a moldable material such as plastic or metal. The head 30 obturates the product reservoir 11 and holds the propellant reservoir 20 within the product reservoir 11. The bottom portions 30A of the head 30 are adapted to sealingly fit in the top portions 11A of the product reservoir 11 and to adhesively, frictionally or by other suitable means hold the two securely together.

For mounting the propellant reservoir 20, the head 30 is provided with an annular lip 37, projecting downwardly from the head into the product reservoir 11 and adapted to snap-fit under the double seam 23 at the top of the propellant container 21. As indicated in the drawing, the lip 37 may be located so as to fit either internally or externally of the crimped seam 23, which it cradles.

The head 30 is also provided with a plurality of bores 32-36 adapted to hold respectively the discharge nozzle 50, the dip tube 15, a housing for the pushbutton 40, the piston arrangement 60, and a plug 31, all as indicated herein below. The bores are connected with each other so as to conduct the flow of propellant 22 and product 13 during dispensing between the elements mounted in the head. The instant invention resides in the manner in which the elements of the dispenser, held in the head 30, cooperate under the influence of the product 13 and propellant 22 streams, flowing through the head during dispensing. Therefore, the exact flow of these materials 13 and 22 through the head 30, as well as the location and cooperation of the bores 32–36 of the head and elements mounted therein will be hereinafter described in detail.

The discharge nozzle 50 is imbedded in a first bore 32 in the head 30. As shown in FIGS. 1 and 2, the first bore 32 is horizontally aligned in the head 30 and communicates with the exterior of the head. The discharge nozzle 50 is frictionally, mechanically or adhesively held in the first bore 32, somewhat inwardly of the exterior of the head 30.

The dip tube 15 is imbedded in a second bore, generally 33, in the head 30. The dip tube may be frictionally or otherwise held in the second bore 33. In the preferred embodiment, the dip tube is mounted directly beneath and normal to discharge nozzle 50, which is horizontally mounted in the first bore 32. The second bore 33 connects the dip tube 15 with the first bore 32 at the discharge nozzle 50, the first bore 32 being perpendicular to the second bore 33 in the preferred embodiment.

The second bore 33 is divided into two portions 33A and 33B by a fourth bore, 35A–35D, which will be hereinafter described. A lower second bore 33A is connected to the dip tube 15, and an upper second bore 33B is connected to the discharge nozzle 50. Communication between the two second bore portions 33A and 33B and hence between the product reservoir 11 and the discharge nozzle 50 is interrupted by the fourth bore in a manner which will also be hereinafter more fully described.

The pushbutton 40 is slidably mounted in a vertical channel 37 of a conventional plug 31. The plug 31 may be made of rubber, metal or plastic and is imbedded in a vertical third bore 34 in the head 30. The plug 31 may be frictionally, adhesively or mechanically held in the third bore 34. The third bore 34 and the plug channel 37, located therein, provide communication between the stem 26 of the valve 25 and the overhead exterior of the head 30. The purpose of the plug 31 is to generally obturate the fourth bore and to selectively obturate the third bore 34 in the assembled head 30.

The pushbutton 40 is provided with a vertically aligned, axial channel 41 which extends upwardly from the bottom of the stem 42 of the pushbutton 40 towards the pushplate 43 of the pushbutton 40. The bottom portions of the pushbutton stem 42 cover the valve stem 26, the valve stem 26 being imbedded in the pushbutton axial channel 41 and the pushbutton axial channel 41 being in communication with the valve stem axial channel 27. Thereby, the sole flow line in communication with the stem 26 of the valve 25 is the pushbutton axial channel 41.

The pushbutton stem 42 is also provided with a pair of horizontal channels providing dual communication between the pushbutton axial channel 41 and the exterior of the pushbutton stem 42. As shown in FIG. 1, the pushbutton horizontal channels are located one 44 atop the other 45. The plug 31 is also provided with a pair of horizontal channels 38, 39 providing communication between the plug channel 37 and the exterior of the plug 31.

As shown in FIG. 2, the plug channels 38, 39 are also located one 38 atop the other 39, and when dispensing the container, the upper plug channel 38 in communication with the upper pushbutton horizontal channel 44 and with the first head bore 32, in which bore 32 the discharge nozzle 50 is imbedded. As further shown, in FIG. 2, during dispensing, the pushbutton 40 is depressed, thereby depressing the valve stem 26, causing the propellant to travel outwardly of the propellant container 21 towards the discharge nozzle 50, along the following path constituting a first flow line:

through valve stem channel 27;
through pushbutton axial channel 41;
through the upper pushbutton horizontal channel 44;
through the upper plug channel 38; and
through the first bore 32.

The head 30 is also provided with a horizontal, fourth bore 35A–35D which extends laterally throughout the diameter of the head 30 and communicates at its ends with the exterior of the head 30. As shown in FIGS. 1 and 2, the fourth bore consists of four sections of varying, cross-sectional area. From left to right, the four sections of the fourth bore are: a first section 35A, having a relatively small cross-sectional area; and communicating with the exterior of the head 30, a second section 35B having an area larger than the first section 35A; a third section 35C having an area larger than the second section 35B; and a fourth section 35D having an area at least as large as the third section 35C and communicating with the exterior of the head.

As further shown, the second section 35B of the fourth bore communicates with the second bore 33, has a cross-sectional area at least equivalent to the cross-sectional area of the second bore 33, and is perpendicular thereto. The third section 35C and the fourth section 35D of the fourth bore are separated by and are perpendicular to the third bore 34.

As still further shown, the lower, pushbutton horizontal channel 45 communicates with the lower, plug horizontal channel 39 and with the third section 35C of the fourth bore when the dispenser 10 is dispensing, and the plug 31 obturates communication between the third and fourth sections 35C and 35D of the fourth bore.

Positioned within the fourth bore is the piston arrangement 60 which is adapted to move within the fourth bore and to obturate communication between the first section 35A and the third section 35C of the fourth bore and also to obturate communication through the second bore 33. The piston arrangement 60 consists of: a piston head 61, slidably positioned in the third section 35C; a piston stem 62, attached to the piston

head 61 and movable between the second and third sections 35B, 35C; and a spring 67, horizontally biassed in the third section 35C between the head 30 and the piston head 61 so as to urge the piston 60 towards the third bore 34 and the plug 31. The cross-sectional areas of the piston stem 62 and head 61 substantially conform to the cross-sectional areas of respectively, the second section 35B and the third section 35C of the fourth bore. Thereby the piston stem 62 and the piston head 61 obturate respectively the second and third sections 35B and 35C, and the second bore 33 is obturated by the piston stem 62.

The piston stem 62 is provided with an axial channel 63, extending from the free end of the stem 62, adjacent the first section 35A of the fourth bore, towards the piston head 61. The piston stem is further provided with a vertically extending channel 64 in communication with the piston stem, axial channel 63 and with the exterior of the piston stem 62.

A fifth bore 36 is provided in the head 30. The fifth bore 36 provides communication between the second section 35B of the fourth bore and the product reservoir 11. As shown in FIGS. 1 and 2, the fifth bore 36 and the piston stem, vertical channel 64 are adapted to be in communication only when the dispenser is dispensing.

Annular grooves 46 and 47 are provided in the stem member 42 of the pushbutton 40, an upper groove 46 located about the upper pushbutton horizontal channel 44 and a lower groove 47 located about the lower pushbutton horizontal channel 45. The purpose of pushbutton stem grooves 46 and 47 is to fully transmit flow of propellant from pushbutton axial channel 41 to the upper and lower plug horizontal channels 38 and 39 without the need for precise, rotational registration of the pushbutton horizontal channels 44, 45 with the plug channels 38, 39.

An annular groove 65 is also provided in the piston stem 62 and is located medially and somewhat towards the free end of the piston stem 62. As shown in FIG. 1, when not dispensing, the portions of the piston stem 62 to the left of the piston stem groove 65 obturate the second bore 33, the cross-sectional area of the piston stem 62 substantially conforming to the cross-sectional area of the second section 35B of the fourth bore. As shown in FIG. 2, when dispensing, the annular groove 65 in the piston stem 62 is vertically aligned with the upper and lower portions 33B and 33A of the second bore 33, divided by the fourth bore, and communication is provided along a path constituting a second flow line between these two portions 33B and 33A by circumvention of the piston stem 62 along the piston stem groove 65.

The action of the cooperating members in the head 30, particularly the piston arrangement 60, is seen by comparing FIGS. 1 and 2. During dispensing, the propellant 20 travels outwardly of the dispenser 10 through the first flow line to the discharge nozzle 50, as previously set forth. The propellant also travels towards the fourth bore, through the lower horizontal channels 45, 39. The pressure from the propellant 20 impinging on the piston head 61 causes the piston arrangement 60 to be urged away from the third bore 34 and the plug 31, causing the second bore 33 to be opened for communication between the dip tube 15 and the discharge nozzle 50 around the piston stem groove 65, which constitutes a movable portion of the second flow line. This movement of the piston arrangement 60 further provides communication between the product reservoir 11 and the exterior of the head 30 along the following path, constituting a third flow line: through the first and second sections 35A and 35B of the fourth bore; through the piston stem channels 63 and 64 which constitute a movable portion of the third flow line; and through the fifth bore 36. In this manner, flow of propellant is translated and transmitted into movement of the piston arrangement to provide communication between the product container and both the discharge nozzle and the exterior of the dispenser.

Thus, as shown in FIG. 2, it is seen that during actuation of the valve 25 by the pushbutton 40, continuously regulating the flow of the propellant by releasing propellant from its container 20, the following is occurring:

propellant 22 is rushing through the discharge nozzle 50, causing a partial vacuum to be maintained in the second bore 33 of the head 30;

communication between the product reservoir 11 and the discharge nozzle 50 is being maintained, causing the product 13 to be forced into the discharge nozzle 50 through the second bore 33; and

communication between the atmosphere and the product container 12 is being maintained, causing air to be sucked into the product container to prevent the build-up of a partial vacuum therein.

Further, as shown in FIG. 1, when actuation of the pushbutton 40 is ceased:

propellant 22 no longer flows from the propellant container 21, causing the piston arrangement 60 to be urged towards the third bore 34 and the plug 31 by the spring 67;

the second bore 33 is obturated by the piston stem 62, preventing communication between the discharge nozzle 50 and the dip tube 15; and

the fifth bore 36 is obturated by the piston stem 62, preventing communication between the product container 12 and the atmosphere.

It should be noted for the sake of completeness that in the preferred embodiment, the discharge nozzle 50 is a well-known venturi-type ejector, shown schematically in the drawing and in U.S. Pat. No. 3,289,949, and the piston arrangement 60 is formed as a unitary piston stem 62 and piston head 61. It should also be noted that all of the members 31, 40, 50, 60 imbedded in the head 30 of the preferred embodiment have a circular cross-section for ease of assembly and operation. It should be still further noted that the purpose of the enlarged fourth section 35D of the fourth bore is to allow for easy insertion of the piston arrangement 60 into the fourth bore.

It should also be noted that the relative terms of directions, such as left, right, vertical and horizontal, as used above refer to the drawing and are not intended as limitations upon the instant invention.

In FIGS. 3 and 4, a modified isolation-type aerosol dispenser 110 is shown which embodies the instant invention. For the sake of understanding and brevity, each analogous element of the modified dispenser 110 will be referred to with a number higher by 100 than was used to refer to the corresponding element of the same function in the original dispenser. Also, any difference in function between analogous elements will be hereinafter specifically noted.

As shown in FIGS. 3 and 4, the modified dispenser 110 is provided with: a high pressure valve 125; a product reservoir 111; a propellant reservoir 120; a discharge nozzle 150; a pushbutton 140; and a head 130, having a plurality of bores 132–136, therein, all of which were sufficiently described with respect to the original dispenser 10. Also, a dip tube 115 is imbedded in the second bore 133 of the head 130 and extends into a product container 112. The second bore 133 is provided with two, disconnected parallel, horizontal portions 133A and 133B, one atop the other, that communicate with a third bore 134. The lower, second bore portion 133A is connected to the dip tube 115, and the upper, second bore portion 133B is connected to the discharge nozzle 150, which is imbedded in the first bore 132.

When the dispenser 110 is not dispensing, as shown in FIG. 3, communication between the second bore portions 133A and 133B is obturated by the upper portion of a piston arrangement 160, that is vertically movable in the third bore 134. The upper portion of the piston arrangement 160 includes a peripheral surface 162, which extends toward a relatively large, annular groove 165 located in the lower portion of the piston 160. The annular peripheral surface 162 and the groove 165 perform the same function as the piston stem 62 and groove 65 therein in the original dispenser 10; the groove 165 providing communication between the discharge nozzle 150 and the product reservoir 111 only during dispensing.

As further shown in FIGS. 3 and 4, the pushbutton **140** is slidably mounted in a plug **131**, which is imbedded in the third bore **134** in the head **130**. The stem **142** of the pushbutton **140** is provided with an upper horizontal channel **144** to connect the pushbutton axial channel **141** with the first bore **132** and the discharge nozzle **150** through a lower plug channel **138**, during dispensing. Thus, when dispensing, the propellant **122** follows substantially a similar path to the discharge nozzle **150** as the propellant **22** follows in the original dispenser **10**.

Also shown in FIGS. 3 and 4 is a lower horizontal channel **145** in the pushbutton stem **142**. In the modified dispenser **110**, however, this lower pushbutton **145** directly communicates with the third bore **134**, in which the piston arrangement **160** is movably mounted rather than with a fourth bore as in the original dispenser **10**. The modified piston arrangement **160**, consisting of the piston head **161**, the piston peripheral surface **162**, and the spring **167**, are slidably inserted in the third bore **134**. The piston arrangement **160** is oriented for vertical movement, the spring **167** being biassed against the plug **131** and the pushbutton **140** being axially inserted through a bore **169** in the piston arrangement to allow for relative vertical sliding movement between these two members **140** and **160**. Thereby, during dispensing, when the pushbutton **140** is actuated, the propellant **122** flows through the lower horizontal pushbutton channel **145** and urges the piston arrangement **160** upwards toward the plug **131**. The effect of the upward movement of the piston arrangement **160**, during dispensing is to align the annular groove **165** in the piston arrangement **160** with both horizontal second bore portions **133A** and **133B** so that the discharge nozzle **150** is in communication with the product container **112**, through the annular groove **165**.

Still further shown in FIGS. 3 and 4 is a fifth bore **136** in the head **130** which communicates with a horizontal, channel **139** in the plug **131**, which in turn communicates with an upper annular groove **143A**, in the pushbutton stem **142**, which groove is located directly beneath the pushplate **143**. Unlike the original dispenser **10**, wherein the upper plug channel **38** is used for conducting propellant to the discharge nozzle **50**, the modified upper plug channel **139** is used for venting the product reservoir **111** to the atmosphere. When the pushplate **143** is depressed for dispensing, the product reservoir **111** is vented through: the fifth bore **136**, the upper plug channel **139**, and the upper pushbutton groove **143A**.

Thus, the modified dispenser **110** provides the isolation-type aerosol dispenser of the instant invention which features communication between the product reservoir and the discharge nozzle and between the product reservoir and the atmosphere only during dispensing, when the aerosol propellant effectuates regulated movement of a slidable piston arrangement.

It is thought that the invention and many of its attendant advantages will be understood from the foregoing description and it will be apparent that various changes may be made in the form, construction and arrangement of the parts without departing from the spirit and scope of the invention or sacrificing all of its material advantages, the form hereinbefore described being merely a preferred embodiment thereof.

I claim:

1. In an isolation-type aerosol dispenser, having a product reservoir; a propellant reservoir, a discharge nozzle; a pushbutton; valve means connected to said propellant reservoir and actuatable by said pushbutton for regulating the flow of propellant from said propellant reservoir; and means establishing a first flow line from said valve means to said discharge nozzle, the improvement comprising:

means establishing an interruptible second flow line, connecting said discharge nozzle to said product reservoir, a portion of said second flow line means being movable relative to said dispenser between a first location, wherein said discharge nozzle is in communication with said product reservoir, and a second location, wherein said discharge nozzle is not in communication with said product reservoir; and

first means, in communication with said first flow line means and connected to said movable portion of said second flow line means, for translating and transmitting flow of said propellant, from said propellant reservoir, into movement of said movable portion of said second flow line means from said second location to said first location.

2. An aerosol dispenser, as recited in claim **1**, wherein said first translating and transmitting means comprises:

a chamber;

means establishing a flow line from said valve means to said chamber;

a piston located in said chamber, adapted to move between a first piston position and a second piston position in said chamber as said valve means releases propellant from said propellant reservoir; and

second means, connected to said piston and to said movable portion of said second flow line means, for translating and transmitting movement of said piston from said first piston position to said second piston position into movement of said movable portion of said second flow line means from said second location to said first location.

3. An aerosol dispenser, as recited in claim **2**, wherein said piston includes said second translating and transmitting means and comprises a head member and a stem member;

said head member being in communication with said flow line from said valve means to said chamber;

a first portion of said stem member being cut away to define a first channel, said first channel constituting said movable portion of said second flow line means, movable from said second location to said first location of said second flow line means as said piston is moved from said first piston position to said second piston position.

4. An aerosol dispenser, as recited in claim **3**, wherein said first channel includes an annular channel portion about the circumference of said stem member, said stem member being movable perpendicularly with respect to stationary portions of said second flow line means adjacent said movable portion of said second flow line means.

5. An aerosol dispenser, as recited in claim **3**, wherein said piston further includes a spring member, biased against said head portion and adapted to oppose movement of said piston from said first piston position to said second piston position.

6. In an isolation-type aerosol dispenser, having a product reservoir; a propellant reservoir; a discharge nozzle; a pushbutton; valve means connected to said propellant reservoir and actuatable by said pushbutton for regulating the flow of propellant from said propellant reservoir; and means establishing a first flow line from said valve means to said discharge nozzle, the improvement comprising:

means establishing an interruptible second flow line, connecting said discharge nozzle to said product reservoir, a portion of said second flow line means being movable relative to said dispenser between a first location, wherein said discharge nozzle is in communication with said product reservoir, and a second location, wherein said discharge nozzle is not in communication with said product reservoir;

means establishing an interruptible third flow line, connecting said product reservoir to the exterior of said dispenser, a portion of said third flow line means being movable relative to said dispenser between a first location, wherein said product reservoir and said exterior of said dispenser are in communications, and a second location, wherein said product reservoir is not in communication with the exterior of said dispenser; and

first means, in communication with said first flow line means and connected to said movable portions of said second and said third flow line means for translating and transmitting flow of said propellant, from said propellant reservoir, into movement of said movable portions of said second and said third flow line means from said second locations to said first locations.

7. An aerosol dispenser as defined in claim 6 wherein said first translating and transmitting means comprises:

a chamber;

means establishing a flow line from said valve means to said chamber;

a piston located in said chamber, adapted to move between a first piston position and a second piston position in said chamber when said valve means releases propellant from said propellant reservoir; and

second means, connected to said piston and to said movable portions of said second and third flow line means, for translating and transmitting movement of said piston from said first piston position to said second piston position into movement of said second and third flow line means from said second locations to said first locations.

8. An aerosol dispenser, as recited in claim 7, wherein said piston includes said second translating and transmitting means and comprises a head member and a stem member;

said head member being in communication with said flow line from said valve means to said chamber;

a first portion of said stem member being cut away to define a first channel, said first channel constituting said movable portion of said second flow line means, movable from said second location to said first location of said second flow line means as said piston is moved from said first piston position to said second piston position.

9. An aerosol dispenser, as recited in claim 8, wherein said first channel includes an annular channel portion about the circumference of said stem member, said stem member being movable perpendicularly with respect to stationary portions of said second flow line means adjacent said movable portion of said second flow line means.

10. An aerosol dispenser, as recited in claim 8, wherein said piston further includes a spring member, biased against said head portion and adapted to oppose movement of said piston from said first piston position to said second piston position.

11. An aerosol dispenser, as recited in claim 8, wherein a second portion of said stem member is cut away to define a second channel, said second channel constituting said movable portion of said third flow line means, movable from said second location to said first location of said third flow line means as said piston is moved from said first piston position to said second piston position.

12. An aerosol dispenser, as recited in claim 11, wherein said second channel includes a first portion extending axially through said stem member and a second portion extending radially through said stem member connecting said first portion of said second channel and the surface of the stem member.

13. In an isolation-type aerosol dispenser, having a product reservoir; a propellant reservoir, a discharge nozzle; a pushbutton; valve means connected to said propellant reservoir and actuatable by said pushbutton for regulating the flow of propellant from said propellant reservoir; and means establishing a first flow line from said valve means to said discharge nozzle, the improvement comprising:

means establishing an interruptible second flow line, connecting said product reservoir to the exterior of said dispenser, a portion of said second flow line means being movable relative to said dispenser between a first location, wherein said product reservoir and said exterior of said dispenser are in communication, and a second location, wherein said product reservoir is not in communication with the exterior of said dispenser; and

first means, in communication with said first flow line means and connected to said movable portion of said second means, for translating and transmitting flow of said propellant, from said propellant reservoir, into movement of said movable portion of said second flow line means from said second location to said first location.

14. An aerosol dispenser, as recited in claim 13 wherein said first translating and transmitting means comprises:

a chamber;

means establishing a flow line from said valve means to said chamber;

a piston located in said chamber, adapted to move between a first piston position and a second piston position in said chamber as said valve means releases propellant from said propellant reservoir; and

second means, connected to said piston and to said movable portion of said second flow line means, for translating and transmitting movement of said piston from said first piston position to said second piston position into movement of said movable portion of said second flow line means from said second location to said first location.

15. An aerosol dispenser, as recited in claim 14, wherein said piston includes said second translating and transmitting means and comprises a head member and a stem member;

said head member being communication with said flow line from said valve means to said chamber;

a first portion of said stem member being cut away to define a first channel, said first channel constituting said movable portion of said second flow line means, movable from said second location to said first location of said third flow line means as said piston is moved from said first piston position to said second piston position.

16. An aerosol dispenser, as recited in claim 15, wherein said first channel includes a first portion extending axially along said stem member and a second portion extending radially through said stem member, connecting said first portion of said first channel and the surface of said stem member.

17. An aerosol dispenser, as recited in claim 15, wherein said piston further includes a spring member, biassed against said head member and adapted to oppose movement of said piston from said first piston position to said second piston position.

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