

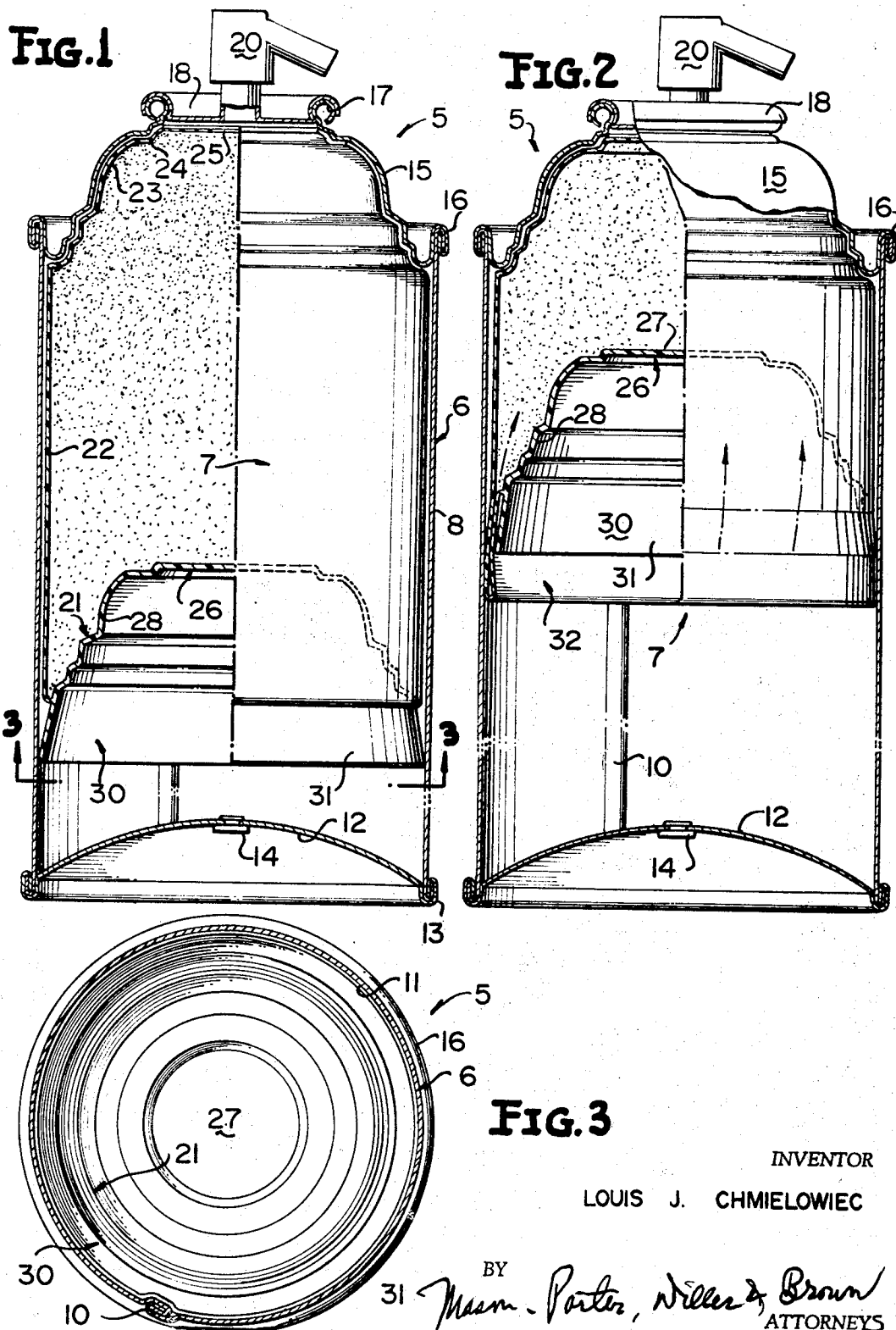
Oct. 29, 1968

L. J. CHMIELOWIEC

3,407,974

DISPENSING CONTAINER HAVING PISTON-BAG STRUCTURE

Filed Feb. 8, 1966



INVENTOR

LOUIS J. CHMIELOWIEC

BY

Max. Porter, Miller & Brown
ATTORNEYS

1

3,407,974

DISPENSING CONTAINER HAVING PISTON-BAG STRUCTURE

Louis J. Chmielowiec, South Holland, Ill., assignor to Continental Can Company, Inc., New York, N.Y., a corporation of New York

Filed Feb. 8, 1966, Ser. No. 525,998
13 Claims. (Cl. 222—386.5)

This invention relates to a novel dispensing container, and is particularly directed to a novel "aerosol-type" dispensing container provided with an internal piston-bag structure which includes means for maintaining the structure in axial alignment relative to a dispenser body and effects optimum product-dispensing of a product under the influence of a pressurized propellant.

Dispensing containers are known which include a container body, a bag-like structure internally of the container body containing a dispensable product, and a dispensing mechanism for controlling the dispensing of the product.

In most cases, such known dispensing containers are "charged" by introducing a pressurized fluid media, such as compressed air, into a chamber of the dispensing container between the bag and a portion of the container body. Upon the actuation of the valve mechanism, a predetermined quantity of the dispensable product is dispensed under the influence of the compressed air or other propellant acting against a portion of the bag, and in most cases, causing the displacement of a portion of the bag toward the valve or dispensing mechanism.

While such known dispensing containers are, for the most part, quite efficient, various disadvantages and deficiencies are well known and are overcome by a novel dispensing container constructed in accordance with this invention. For example, conventional dispensing containers of the type just described generally include no means which assure the uniform application of dispensing forces against the bag resulting in a different amount of product being dispensed during each dispensing operation. As a further result of the non-uniform application of forces to such conventional bags, the bags tend to fold or wrinkle resulting in the entrapment of portions of the product and a corresponding reduction in the total quantity of product which can be dispensed from known dispensing containers.

Therefore, it is a primary object of this invention to provide a novel dispensing container which overcomes the above, and numerous other disadvantages in known dispensing containers, the novel dispensing container including a container body, a piston-bag structure in the container body, means for dispensing a product from the piston-bag structure through an open top end portion, the piston-bag structure including a bottom end portion being closed by a bottom panel, and means integrally joined to the bottom panel and directed radially outwardly and downwardly therefrom for maintaining the bottom panel in axial alignment with the container body during the movement of the bottom end portion from a position normally adjacent a bottom closure of the container body toward a top closure of the latter whereby an accurate quantity of a product packaged in the piston-bag structure is dispensed during each dispensing operation.

A further object of this invention is to provide a novel dispensing container of the type immediately heretofore described in which the last-mentioned means is a peripheral skirt having a free terminal edge normally contacting an inner surface of the container body in a normal position of the bottom end portion adjacent the bottom closure, and a pressurized propellant between the bottom panel and the bottom closure forcefully urging the peripheral skirt radially outwardly into intimate contact with the container body inner surface.

2

A further object of this invention is to provide a novel dispensing container of the type heretofore described in which the peripheral skirt effects a wiping action against a portion of the piston-bag structure during a dispensing operation, and the bottom panel and a top closure of the container body are complementary contoured whereby optimum product-dispensing quantitywise is effected during each dispensing operation and continued until total product dispensing is completed.

With the above, and other objects in view that will hereinafter appear, the nature of the invention will be more clearly understood by reference to the following detailed description, the appended claims and the several views illustrated in the accompanying drawing.

In the drawing:

FIGURE 1 is a longitudinal sectional view partly in side elevation of a novel dispensing container constructed in accordance with this invention, and illustrates a piston-bag structure secured internally of a container body in the normal position thereof prior to a dispensing operation.

FIGURE 2 is a longitudinal sectional view partly in side elevation of the dispensing container of FIGURE 1, and illustrates an intermediate position of the piston-bag structure after a quantity of the product has been dispensed.

FIGURE 3 is a transverse sectional view taken generally along line 3—3 of FIGURE 1, and illustrates a peripheral skirt of the piston-bag structure conforming to the configuration of the container body and a longitudinal seam of the latter.

A novel dispensing container constructed in accordance with this invention is generally referred to by the reference numeral 5, and includes a container 6 and a piston-bag structure 7.

The container 6 includes a container body 8 of a generally tubular cylindrical configuration. The container body 8 is preferably constructed from a planar blank (not shown) of metallic material and formed to the tubular configuration thereof by conventional means (not shown), such as a conventional body-making machine. The container body 8 includes a conventional soldered longitudinal seam or side seam 10 which projects radially inwardly beyond the generally uniformly cylindrical interior surface 11 of the container body 8, as is best illustrated in FIGURE 3 of the drawing.

The container body 8 is closed at a lower end (unnumbered) by a concave closure 12 secured to the body 8 by a conventional double seam 13. A grommet 14 formed of rubber, plastic or similar material is secured to the bottom closure 12 in a conventional manner. A changing needle (not shown) is inserted through the grommet 14 to introduce a suitable propellant, such as pressurized air, into the interior of the container 6 in a well known manner.

A dome-shaped top closure 15 is secured to an upper end (unnumbered) of the container body 8 by means of a conventional double seam 16. The dome-shaped closure 15 terminates in a radially outwardly and downwardly turned curl 17 to which is attached a conventional fitment 18 carrying a conventional dispensing or valve mechanism 20.

The piston-bag structure 7 includes a bottom end portion, generally referred to by the reference numeral 21, a central or medial portion 22, and a top end portion 23 secured by a band of adhesive 24 to the dome-shaped closure 15 of the container 6. The top or upper portion 23 of the piston-bag structure 7 is provided with a circular opening 25 which places the interior of the structure 7 in communication with the valve mechanism 20.

The bottom end portion 21 of the piston-bag structure

7 includes a bottom panel 26 defined by a generally circular central portion 27 (FIGURE 3) and an integral annular portion 28. The bottom portion 21 is contoured substantially identically to the dome-shaped configuration of the top closure 15 to permit the bottom end portion 21 to be received within the volume defined by the dome-shaped closure 15 thereby assuring substantially complete emptying of the piston-bag structure 7.

The bottom end portion 21 is provided with means, generally referred to by the reference numeral 30, in the form of a peripheral skirt directed radially outwardly and downwardly toward the bottom closure 12 of the container 6 and terminating in a peripheral edge portion 31. The maximum outside diameter of the peripheral skirt 30 is substantially equal to or slightly greater than the internal diameter of the container body 8. Due to this dimensional relationship between the peripheral skirt 30 and the container body 8, the peripheral skirt 30 maintains the bottom end portion 21 of the piston-bag structure 7 in axial alignment with the container body 8 prior to a dispensing operation (FIGURE 1) at which time the inherent flexibility of the peripheral skirt 30 and radially outwardly directed forces of the propellant acting against the skirt 30 urge the skirt 30 into intimate sealing and guiding contact with the inner surface 11 of the container body 8. It is to be particularly noted that the peripheral skirt 30 conforms to the configuration of the longitudinal seam 10 (FIGURE 3) thereby preventing the propellant from leaking past the peripheral edge portion 31 of the peripheral skirt 30 into an annular area (unnumbered above the skirt 30 which would otherwise tend to wrinkle the medial portion 22 of the piston-bag structure 7. In addition, it should be noted that in the absence of the peripheral skirt 30, the annular area between the medial portion 22 and the container body 8 would necessarily be filled with propellant thereby increasing the quantity of propellant introduced into the container 6 as compared to a container of like size but provided with the peripheral skirt 30.

Another function of the peripheral skirt 30 is to effect a "wiping action" as the bottom end portion 21 is urged upwardly from the position illustrated in FIGURE 1 of the drawing. As the bottom end portion 21 moves upwardly a portion 32 (FIGURE 2) of the central portion 22 begins to fold upon itself causing the peripheral skirt 30 to deflect slightly radially inwardly about its entire periphery. Any portion of the packaged product (not shown) which would otherwise tend to accumulate in the folded portion 32 as the same progressively folds during dispensing operations is "wiped" or squeezed upwardly, as is indicated by the unnumbered headed broken arrows in FIGURE 2 of the drawing by the force of the peripheral skirt 30 bearing against the folded portion 32. In this manner very little of the product is entrapped in the folded portion 32 of the structure 7 and coupled with the complementary configuration of the end portion 21 and the dome-shaped top closure 15, a maximum quantity of the product is dispensed by the dispensing container 5.

The piston-bag structure 7 may be formed of different material but is preferably constructed from plastic material, such as polyethylene. The medial or central portion 22 and the upper end portion 23 of the piston-bag structure are relatively thin to permit the folding thereof, as is graphically illustrated by the folded portion 32 in FIGURE 2 of the drawing. The peripheral skirt 30 is somewhat thicker than the portions 22, 23 to prevent the peripheral skirt from being completely forced against the interior surface 11 of the container body 8. The thickest portion of the piston-bag structure is the end portion 21, including the portions 26, 28, which assures that the end portion 21 will not deform under the forces of the propellant and will thereby mate with the dome-shaped top closure 15 at the time the dispensing container 5 is being completely emptied.

Although the invention has been described in relation to a seamed container body, it is within the scope of the invention to utilize the piston-bag structure 7 in other than seamed container bodies. For example, the piston-bag structure 7 could be incorporated in a drawn or extruded container body which would be devoid of the seam 10, yet the piston-bag structure would be equally operative therein.

From the foregoing, it will be seen that novel and advantageous provisions have been made for carrying out the desired end. However, attention is again directed to the fact that additional variations may be made in this invention without departing from the spirit and scope thereof as defined in the appended claims.

I claim:

1. A dispensing container comprising a container body of a generally tubular configuration, said container body being closed at a bottom end thereof, a piston-bag structure in said container body, said piston-bag structure being of an integral one-piece polymeric plastic material construction, said piston-bag structure having top and bottom end portions, said top end portion having a generally tubular wall defining a product-receiving chamber, said bottom end portion being closed by a bottom panel, and resilient means integrally joined to said bottom end portion and directed radially outwardly and downwardly toward said bottom end for maintaining said bottom panel in axial alignment with said body during the movement of said bottom end portion from a position normally adjacent said bottom end toward a position remote therefrom.

2. The dispensing container as defined in claim 1 wherein said last-mentioned means is a peripheral skirt having a free terminal edge normally contacting an inner surface of said container body in a normal position of said bottom end portion adjacent said bottom end.

3. The dispensing container as defined in claim 1 wherein said container body includes a longitudinal seam, and said last-mentioned means is a peripheral skirt normally contacting an inner surface of said container body and conforming to the configuration of said longitudinal seam in the normal position of said bottom end portion adjacent said bottom end.

4. The dispensing container as defined in claim 1 wherein said last-mentioned means is a peripheral skirt having a predetermined thickness, said piston-bag structure having a top end portion, said bottom panel and said top end portion also being of a predetermined thickness, and said peripheral skirt being thicker than the thickness of said top end portion but thinner than the thickness of said bottom panel.

5. The dispensing container as defined in claim 1 wherein said last-mentioned means is a peripheral skirt having a free terminal edge normally contacting an inner surface of said container body in a normal position of said bottom end portion adjacent said bottom closure, a dispensable product in said piston-bag structure, and a pressurized propellant between said bottom panel and said bottom end forcefully urging said peripheral skirt radially outwardly into intimate contact with said container body inner surface.

6. The dispensing container as defined in claim 2 wherein said body also includes a top closure, said top closure includes an end panel of a generally dome-shaped configuration and said bottom panel is contoured substantially identically to the dome-shaped configuration of said top closure end panel whereby optimum product-dispensing quantitywise is effected upon the receipt of said bottom end panel within said top closure.

7. The dispensing container as defined in claim 2 wherein said peripheral skirt is constructed of flexible material, said piston-bag structure includes a top end portion and a central portion between said top and bottom end portions, said central portion being folded upon itself in an intermediate position of said bottom end por-

5

tion, and said peripheral skirt effecting a wiping action against said folded central portion during the movement of said bottom end portion away from said bottom end whereby optimum product-dispensing quantitywise is effected during a dispensing operation.

8. The dispensing container as defined in claim 7 wherein said container body is constructed of metallic material and includes a longitudinal seam, and said peripheral skirt normally contacts an inner surface of said container body and conforms to the configuration of said longitudinal seam in the normal position of said bottom end portion adjacent said bottom end.

9. The dispensing container as defined in claim 7 wherein said body also includes a top closure, said top closure includes an end panel of a generally dome-shaped configuration and said bottom panel is contoured substantially identically to the dome-shaped configuration of said top closure end panel whereby optimum product-dispensing quantitywise is effected upon the receipt of said bottom end panel within said top closure.

10. The dispensing container as defined in claim 9 wherein said peripheral skirt is of a predetermined thickness less than the thickness of said bottom panel but greater than the thickness of said top end portion.

11. The dispensing container as defined in claim 1 wherein said body also includes a top closure, said top closure includes an end panel of a generally dome-shaped configuration and said bottom panel is contoured substan-

6

tially identically to the dome-shaped configuration of said top closure end panel whereby optimum product-dispensing quantitywise is effected upon the receipt of said bottom end panel within said top closure.

12. The dispensing container as defined in claim 1 wherein a chamber is defined by the piston-bag structure, the container body and the bottom end, a pressurized propellant is housed in said chamber, and said bottom end is closed by sealing means for preventing the escape of the propellant outwardly of said chamber through said bottom end.

13. The dispensing container as defined in claim 1 wherein said last-mentioned means is a peripheral skirt having a free terminal edge normally contacting an inner surface of said container body in a normal position of said bottom end portion adjacent said bottom end, and said peripheral skirt is constructed from relatively flexible polymeric material.

References Cited

UNITED STATES PATENTS

2,505,798	5/1950	Skinner	222—286.5
2,853,209	9/1958	McArdle	222—107
3,273,762	9/1966	O'Neill	222—389

STANLEY H. TOLLBERG, *Primary Examiner*.