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PISTON FOR AEROSOL CAN

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FIG. 1

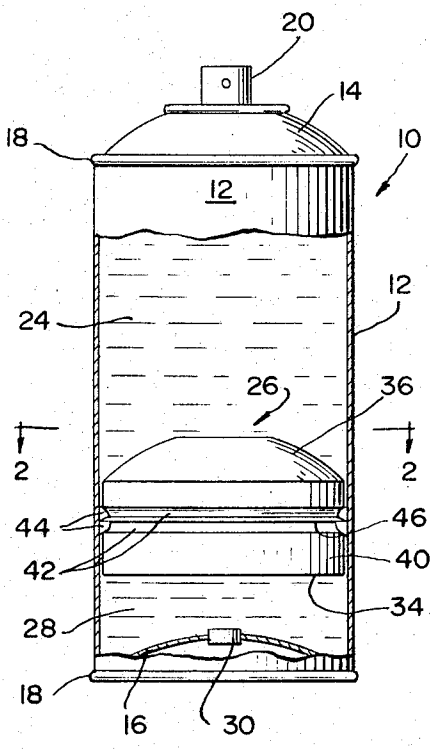


FIG. 2

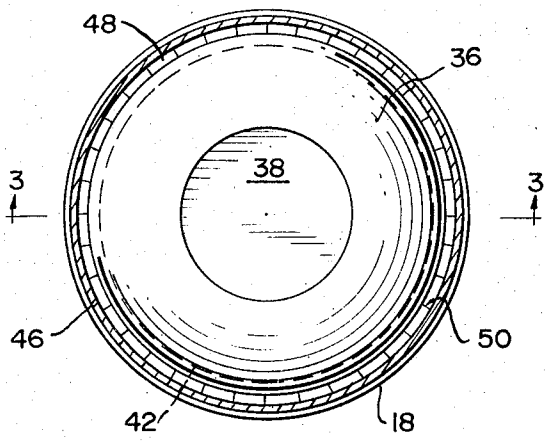
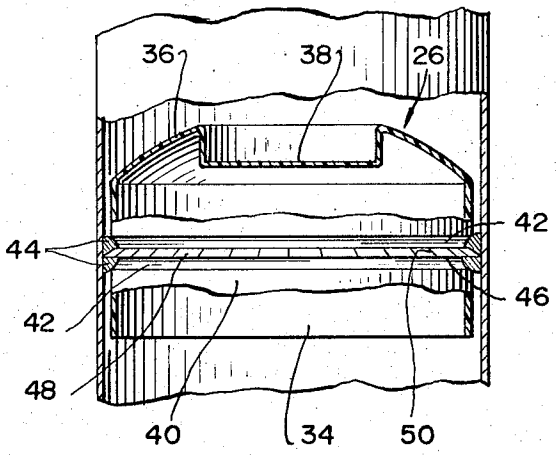


FIG. 3



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PISTON FOR AEROSOL CAN

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ABSTRACT OF THE DISCLOSURE

A piston in a dispenser type container is provided with one or more grooves, each of the grooves having an outwardly extending segmented lip contacting the body wall of the container. One function of the piston is to separate product from the propellant by providing a seal. To insure a continuous seal between the piston and the container body wall, which may be dented or have a rough side-seam, a stretchable, rubber-like sealing compound is applied to the segmented lip and the grooves, and the lip is encapsulated with the compound. The segments of the lip ride over the dents and the seam while the compound, being continuous on the entire lip, stretches to prevent leaks from occurring between the segments.

This invention relates to a piston slidable within a container adapted to dispense product therefrom and, more particularly, to a piston adapted to dispense a product located on one side thereof in a container upon the movement of the piston under the force of a propellant located on the opposite side of said piston and to provide a seal separating the product and the propellant.

In a container, commonly known as an aerosol container, a piston located therein, divides the container into two compartments: one for the product to be dispensed, and the other for the propellant, such as liquefied gas or the like. The purpose of the piston is not only to move the product toward a dispensing valve upon the action of the propellant on the piston when the dispensing valve is opened, but also to provide a seal thereby preventing the intermixing of the product with the propellant.

It is a well known fact that pistons in straight-sided, drawn cylindrical aerosol containers keep the product and the propellant separated effectively, but only when the product to be dispensed is viscous in nature. This is due to the characteristic of a viscous product whereby the product is able to enter into a portion of the remaining space between the piston wall and the body wall of the container, the space being in the immediate vicinity of the product storage area within the container, and thus form a seal.

However, when the product to be dispensed is not viscous, or when its viscosity is very low, an effective seal cannot be attained with the type of piston used heretofore.

Likewise, when the container body has a side seam, or when its body has been dented, the seam or the dents distort the normally smooth interior surface of the container body wall found in the drawn containers, making a provision of an effective seal between the piston wall and the container body wall virtually impossible with the type of piston used heretofore.

Thus, there exists a need for a piston which provides an effective seal between the product and the propellant used to dispense the product regardless of the viscosity of the product.

The principal object of the present invention is to provide a piston for an aerosol type container which provides an effective seal thereby separating the product and the propellant regardless of the viscosity of the product.

Another object of this invention is to provide a piston for a container of the aerosol type which piston is relatively simple to manufacture and is inexpensive.

Still another object of this invention is to provide a piston which retains a seal between the body wall of the piston and the body wall of the container thereby separating the product and the propellant while the piston is travelling within the container, regardless of any uneven spots or indentations in the body wall of the container.

Yet another object of this invention is to provide a piston which supplies an effective seal separating the product and the propellant held within a container and permits the use of a liquified propellant.

Further objects and advantages will become apparent from the following detailed description taken in connection with the accompanying drawing in which:

FIG. 1 is an elevational view partly in section showing the piston of the present invention located within an aerosol type container;

FIG. 2 is a sectional view on an enlarged scale taken generally along the line 2—2 of FIG. 1; and

FIG. 3 is a sectional view on an enlarged scale taken generally along the line 3—3 of FIG. 2.

While this invention is susceptible of embodiment in many different forms, there is shown in the drawing and will herein be described in detail an embodiment of the invention with the understanding that the present disclosure is to be considered as an exemplification of the principals of the invention and is not intended to limit the invention to the embodiment illustrated. The scope of the invention will be pointed out in the appended claim.

Generally, the piston of the present invention is freely slidable within the container. It has one open end, or bottom, and one closed end, or top. The closed end is conical and is integrally formed with the body wall of the piston, the configuration of which corresponds to the configuration of the body wall of the container. At least one groove is formed in the wall of the piston, said groove being adapted to contain sealing compound which is inert to the propellant and to the product. Further, the groove is provided with a lip which extends outwardly from the wall of the piston and contacts the interior of the container body wall. The lip is divided into a plurality of segments by slits made in the lip to allow limited independent motion of the segments on the wall of the container. Rubber-like sealing compound is then added to the groove and over the segmented lip to act as a sealant separating the product and the propellant. The piston of the present invention functions efficiently in an aerosol type container and allows low viscosity product to be effectively packed therein while efficiently keeping the product and the propellant apart. The segments of the lip, covered with a compound, are able to move independently on the container body wall while maintaining a seal over the irregularities of the seam or dents, as the piston slides within the container during the product dispensing operation. Further, the use of the piston of this invention permits the utilization of liquified propellant which is advantageous in maintaining constant pressure within the container.

Referring now to the drawing, FIG. 1 shows an aerosol type container, generally designated 10. In the exemplary embodiment illustrated, the container 10 has a cylindrical body wall 12 with the upper and lower ends 14 and 16 respectively. While the container 10, illustrated herein, is of a three-piece construction, wherein the upper end 14 and the lower end 16 are attached to the body wall 12 by conventional means well known in the container manufacturing art, it must be understood that the container 10 may be of a two-piece construction wherein one end is integrally formed with the body wall such as by impact extrusion, drawing, or by other suitable means.

The upper end 14 is secured to the body wall 12 at 18 by conventional means for securing end closures to the body wall, the same means being used to secure the bottom end 16 to the body wall 12. A conventional aerosol dispensing valve 20 is mounted in the usual manner in the upper end 14 of the container 10. The construction of the aforesaid valve is well known in the art and, therefore, no detailed discussion of said valve will be provided herein as the same forms no part of this invention.

Enclosed within the upper portion of the body wall 12 there is a product 24 which is to be dispensed through the valve 20. Located in the proximity of the bottom end 16, and extending across the container body, there is a hollow piston 26, made of plastic or other suitable material, and inserted into the container 10 prior to the closing of one of the ends thereof. Beneath and within the hollow piston 26, and separated from the product 24, there is contained a propellant 28, such as liquified gas. In the center of the end 16, a plug 30 is provided through which the propellant 28 is introduced into the container 10.

The actuation of the dispensing valve 20 causes the forces acting on the piston 26 to become unbalanced in such a way that the piston is moved in the direction of the dispensing valve 20. This movement of the piston forces the product 24 to move toward the valve 20 and to be dispensed therethrough.

Referring now to FIG. 3, the piston 26 is shown to be open at one end, as indicated at 34. At the other end, the piston 26 is formed with a substantially conical end surface 36. In the illustrated embodiment, the open end 34 represents the bottom of the piston 26, while the surface 36 is the top thereof. The end surface 36 is provided with an indentation 38 which surrounds a portion (not shown) of the dispensing valve 20 extending into the container when the piston 26 is in its uppermost position within the container 10. The end surface 36 is integrally formed with a cylindrical body wall 40 of the piston 26. An annular groove, or grooves, 42, adapted to contain a rubber-like stretchable sealing compound 44 to be applied thereto, is formed in the body wall 40. The compounds such as polybutylene, neoprene, polyisobutylene, polyisoprene and silicone rubber provide effective seals. The groove 42 has an outwardly extending downwardly positioned lip 46 which is oriented away from the body wall 40 of the piston 26 and contacts the interior surface of the container body wall 12, as best seen in FIG. 1. The lip 46 is integrally formed with the wall of the piston 26 and extends outwardly from the groove 42. The sealing compound 44 is applied to the lip 46 to provide an effective seal between the lip 46 and the container body wall 12 thereby keeping the product 24 separated from the propellant 28.

Since the body wall 12 of the container 10 may be formed with a conventional side seam (not shown), or become dented during use, the surface of the body wall 12 may become uneven so that the lip 46 of the piston

26 would not be in complete contact with the wall 12, and thus, destroy the seal so that the product 24 and the propellant 28 could become mixed.

To overcome this situation, the lip 46 is divided into a plurality of segments 48 which are formed by slitting the lip, as shown at 50 of FIG. 2. The provision of the segments 48 in the lip 46 permits limited independent movement of said segments on the interior surface of the container body wall 12 when the piston 26 travels within the container 10. The individual segments 48 insure a complete seal at all times regardless of the smoothness of the wall 12, as the individual segments ride over the dents and the seam distortions without affecting the other segments which are in contact with the smooth portions of the body wall 12. The stretchable sealing compound is placed on the segmented lip 46 and encapsulates the same. When segment 48 rides over dents or the like in the body wall of the container, the sealing compound at said segment stretches accordingly, retaining contact with the body wall of the container and preventing occurrence of leaks between segments. Thus, a seal is preserved and the intermixing of the product 24 with the propellant 28 prevented.

What is claimed is:

1. In a dispenser type container for carrying a product to be dispensed and a propellant, a piston operably slidable within said container and dividing said container into a compartment for the product and a compartment for the propellant, said piston having a substantially cylindrical body wall integrally formed with a substantially conical surface at one end thereof to provide a cup-like object having one open end, at least one annular groove formed in said body wall of said piston and having a lip extending outwardly therefrom contacting the interior surface of the body wall of said container, said lip is divided into a plurality of segments for allowing limited independent motion thereof on said body wall of said container when said piston slides within said container and a stretchable sealing compound applied to said groove and said lip for providing a seal along the line of contact between said lip and said interior surface of said body wall of said container thereby preventing the mixing of the product with the propellant carried within said container.

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