DISPENSING CONTAINER HAVING A FLEXIBLE WALLED FOLLOWER

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2 Sheets-Sheet 2
This invention relates to improvements in dispensing devices and particularly dispensing devices for viscous substances. A dispenser of this type provides an easy and sanitary means for dispensing various substances, such as peanut butter, syrup, honey, grease, putty, liquid wax and other things.

This invention presents an improvement over the dispensers of this type heretofore disclosed.

The principal object of this invention is to provide a simple and economical device for dispensing the contents of a container by means of fluid pressure.

Another object of this invention is to provide in a dispensing device whose contents are expelled by means of fluid pressure, a construction which allows a more even or smoother flow of the contents thereof, regardless of whether the container is full or nearly empty.

Another object is to provide a dispenser which more completely empties the contents within the dispenser.

A further object is to provide in a dispenser of this type a collapsible bag whose resistance to stretching remains constant as it is being stretched after a certain deformation has been reached.

Still another object of this invention is to provide in a dispensing device operated by fluid pressure, a simple and economical collapsible bag whose shape and resistance to collapse allows a more uniform and smoother flow of contents therefrom.

This device comprises a container having a collapsible bag therein and means for keeping the bottom of said bag near the bottom of said container or downwardly at all times.

The invention also consists in the parts and in the arrangements and combination of parts hereinafter described and claimed. In the accompanying drawings which form part of this specification and wherein like symbols refer to like parts wherever they occur,

Fig. 1 is a perspective view of this new dispensing device,

Fig. 2 is a vertical cross-sectional view taken along the line 2—2 in Fig. 1.

Fig. 3 is a vertical cross-sectional view taken along the line 3—3 in Fig. 2, the dotted lines showing the bag in its fully collapsed position.

Fig. 4 is a perspective view of the collapsible bag with a wire therein.

Fig. 5 is an enlarged fragmentary cross-sectional view taken along the line 5—5 in Fig. 1.

Fig. 6 is a vertical cross-sectional view of a modified form of this device in which the bottom of the collapsible bag is held near the bottom of the container by means of a clamp.

Fig. 7 is a vertical cross-sectional view of another modified form of this device in which the bottom of the collapsible bag is held near the bottom of the container by means of a wire secured to the outside of said collapsible bag.

Fig. 8 is a vertical cross-sectional view of still another modified form of this device in which the sides of the collapsible bag are adhesively secured to the inside of the container.

Fig. 9 is an enlarged fragmentary cross-sectional view taken along the line 9—9 in Fig. 6.

Fig. 10 is an enlarged fragmentary cross-sectional view taken along the line 10—10 in Fig. 7, and

Fig. 11 is a horizontal cross-sectional view taken along the line 11—11 in Fig. 8.

This dispenser comprises a cylindrical container 1 having a cylindrical wall 2, and end portion or bottom 3 with a filling valve or check valve 4 therein and an end portion or top 5 with a shut-off or exit valve 6 therein. A collapsible bag 7 is located within said cylindrical container 1 and has its upper edge 8 crimped in place at the junction of the top portion 5 and said cylindrical wall 2 of the container 1. With this arrangement the top of the collapsible bag 7 also serves as a gasket at the junction of said cylindrical wall 2 and said end portion or top 5 of the cylindrical container 1. A rigid U-shaped restraining member 9 formed of stiff wire is located within said collapsible bag 7 with its bridge portion bearing against the bottom of the bag and its arms extending along opposite side portions thereof and engaging the inner surface of the top of the container. This restraining member serves to keep the bottom of said collapsible bag 7 downwardly at all times. The wire restraining member 9 prevents upward movement of the bottom of said collapsible bag 7, prevents undesirable pockets from forming in side portions of the collapsible bag 7, and prevents portions of said collapsible bag 7 from moving over the exit valve 6 to a position in blocking relation thereto.

With the exit valve 6 closed and the collapsible bag 7, with the wire 9 therein, filled with the desired substance, the cylindrical container 1 is charged to any suitable pressure through the check valve 4 in the bottom portion 3 thereof. The pressure to which the container is subjected depends upon size and shape of the container, the size and shape of the collapsible bag therein, and the viscosity of the substance to be dispensed.
Fluid pressure can also be obtained by using a liquid with a high vapor pressure. This liquid can be poured into the top of the container prior to filling the collapsible bag therein, thereby, thus eliminating the need for the check valve 4.

The collapsible bag 1 is made preferably of one or more thicknesses of material which initially resists stretching but stretches readily after once being deformed and does not resume its original shape, but the stretching force has been removed. A collapsible bag made from a material having these properties is less susceptible of having undestructible pockets form therein, which pockets might form regardless of the wire 9 in said collapsible bag 7 if a material which can be readily stretched is used. One material which gives satisfactory results is polyethylene of uniform thickness.

The collapsible bag 7 is shaped preferably so that the fluid pressure acts in a manner to cause the contents of said collapsible bag 7 to be completely expelled therefrom. The collapsible bag 7 is also shaped so that the ratio of the volume for pressure fluid to the volume of contents in the collapsible bag is large enough so that a relatively low fluid pressure may be used. This large ratio results in smaller fluid pressure losses due to the contents of the collapsible bag 7 being expelled than would be possible if a smaller ratio were used. A substantially wedge shaped collapsible bag 7 gives good results.

Such a collapsible bag 7 prevents a premature closing at the top thereof prior to a collapse of the lower portion thereby insuring a complete discharge of the contents therein.

If the rigid material or wire 9 has a tendency to break through the collapsible bag 7, the diameter of wire 9 may be increased or extra thicknesses may be added to the bag.

There are means other than a wire 9 within the collapsible bag 7 for keeping the bottom of said collapsible bag 7 near the bottom of said cylindrical container 1 at all times. Figures 6 and 9 show a modified form of this device comprising a hollow cylindrical container 1 having a collapsible bag 7 therein whose bottom is held downwardly by means of a clamp 10. Obviously, smaller clamps or hooks may be used and may be secured to the cylindrical wall and/or the check valve 4 and/or the bottom portion 3 of said cylindrical container 1.

Fig. 7 shows another modified form of this device in which the wire restraining member 9 is disposed outside of the collapsible bag 7 in straddling relation thereto with the lower end of the bag wrapped about its bridge portion.

Fig. 8 shows still another modification in which the sides of the collapsible bag 7 are adhesively secured to the inside of the cylindrical wall 2 and/or the bottom portion 3 of the cylindrical container 1.

Obviously, the hereinbefore described dispensing device admits of considerable modification without departing from the invention. Therefore, we do not wish to be limited to the precise arrangements shown and described.

What we claim is:

1. A dispensing device comprising a container of rigid material having a body and a top and a bottom, said top being provided with an outlet, the container being also provided with a pressure-fluid inlet, a collapsible material-holding bag in said container closed at its sides and bottom and having an open upper end surrounding said outlet for discharge of material from the bag through the outlet, there being space about the bag within said container constituting a pressure-fluid chamber, and a restraining member for said bag having a portion engaging the lower end of the bag and preventing movement of the bag away from the bottom of the container when the bag is collapsed transversely by pressure of fluid in said chamber.

2. A dispensing device comprising a container of stiff material having a body and a top and a bottom, said top being provided with an outlet, the container being also provided with a pressure-fluid inlet, a collapsible material-holding bag in said container closed at its sides and bottom and having an open upper end surrounding said outlet for discharge of material from the bag through the outlet, there being space about the bag within said container constituting a pressure-fluid chamber, and a U-shaped restraining member for said bag having its bridge portion engaging the bottom of the bag and its arms extending upwardly along side portions of the bag, said restraining member at all times preventing upward movement of the bag away from the bottom of the container and allowing portions of walls of the bag between arms of the restraining member to move towards each other during collapsing of the bag by pressure of fluid in the chamber.

3. The structure of claim 2 wherein marginal edge portions of the top are secured to the upper end of the body by a folded joint and upper end portions of the bag are engaged in the joint and form a sealing gasket for the joint.

4. The subject matter of claim 2 wherein the U-shaped restraining member is disposed entirely within the bag with its bridge portion extending along the bottom of the bag and its arms extending upwardly along opposite sides of the bag and at their upper ends having abutting engagement with the under surface of the top of the container.

5. The structure of claim 2 wherein the U-shaped restraining member is disposed in straddling relation to the bag with the lower end of the bag wrapped about its bridge portion and its arms extending upwardly along opposite sides of the bag and terminating in abutting relation to diametrically opposed marginal portions of the top of the container.

6. The structure of claim 1 wherein the restraining member consists of a clamp gripping the bottom of the bag and anchored to the bottom of the container.

7. The structure of claim 1 wherein the bag is formed of thin plastic sheet material which initially resists stretching but stretches readily after once being deformed and does not return to its original shape after stretching force has been discontinued.

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