

[54] BAG-TYPE FLUID AND PASTE DISPENSER

1,303,845 5/1919 Blair 222/387 X

[76] Inventor: Milton J. Cohen, 9201 Persimmon Tree Rd., Potomac, Md. 20854

1,971,450 8/1934 Heitmuller et al. 222/387 X
3,157,314 11/1964 Nadler 222/215 X

[22] Filed: Aug. 13, 1973

FOREIGN PATENTS OR APPLICATIONS

1,034,500 4/1953 France 222/325

[21] Appl. No.: 387,704

Primary Examiner—James B. Marbert

Assistant Examiner—James M. Slattery

[52] U.S. Cl. 222/105, 222/387, 222/326

[51] Int. Cl. B65d 35/56

[58] Field of Search 222/387, 325, 326, 340,
222/105, 386.5, 81, 80, 89, 92, 107, 82, 215,
135, 90, 95, 93, 386

[57] ABSTRACT

In a bag-type fluid or paste dispenser in which the content material is contained within a flexible bag having one end communicating with a dispensing valve while the bag is pressurized by means of a releasable spring.

[56] References Cited

UNITED STATES PATENTS

960,081 5/1910 Fearon et al. 222/386 X

10 Claims, 3 Drawing Figures

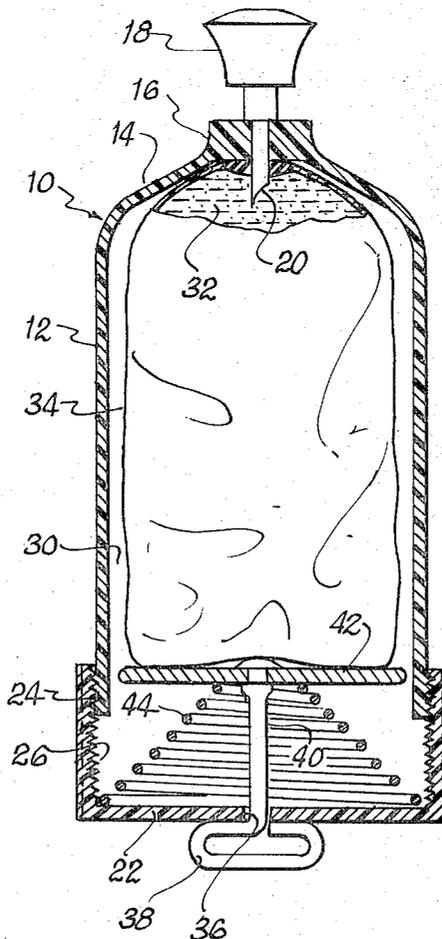


FIG. 1

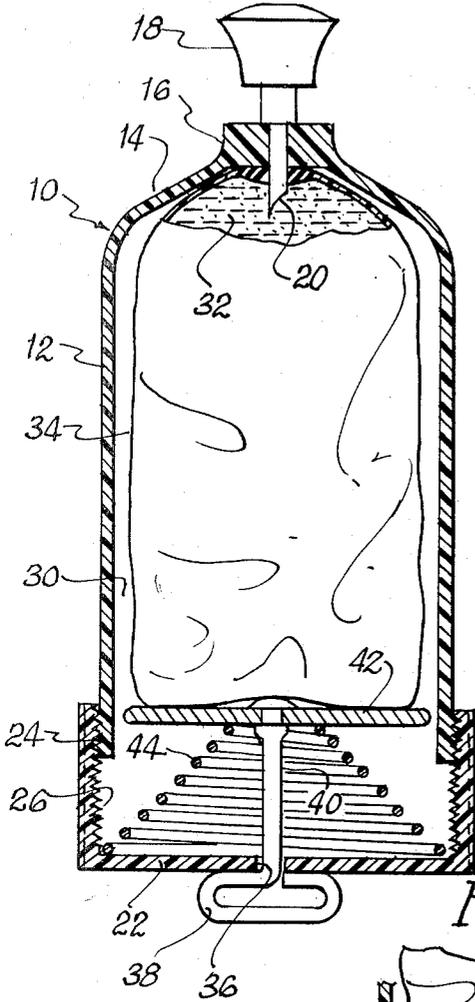


FIG. 2

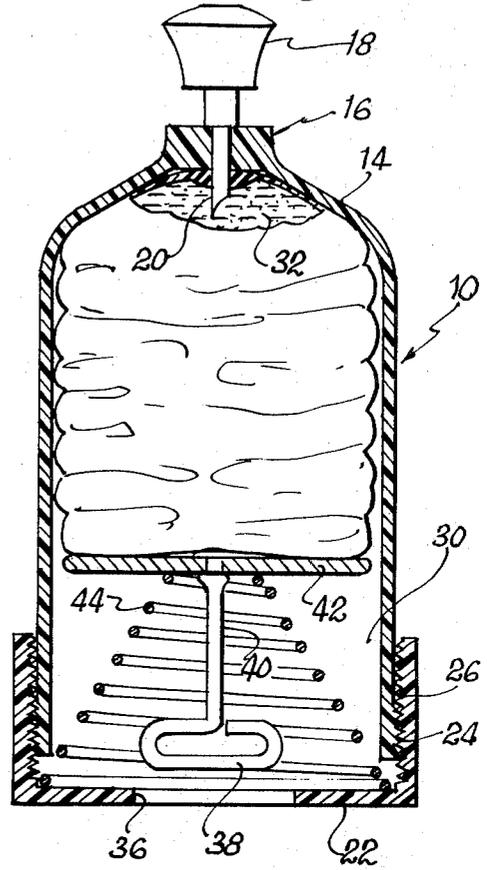
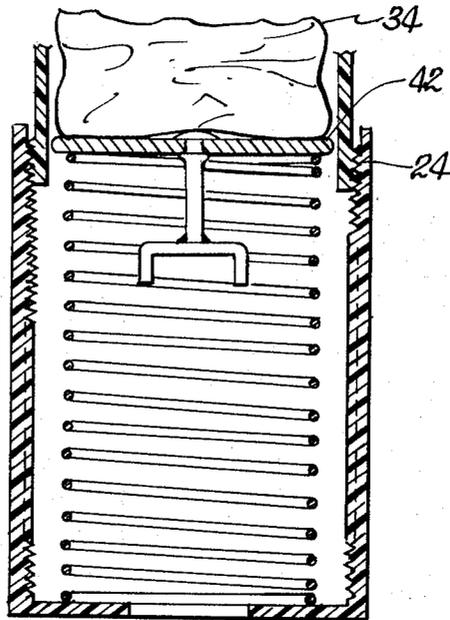


FIG. 3



BAG-TYPE FLUID AND PASTE DISPENSER

This invention relates to a non-aerosol type fluid or paste dispenser, which makes use of mechanical pressure generated by a flexible bag for ejection of the paste or fluid in response to release by a manually operable valve.

In the aforementioned copending application, description is made of a rigid dispensing container having a flexible diaphragm secured at its periphery to the open upper end of the container. The container is subsequently sealed by a closure fitted with a dispensing valve. The diaphragm is stretched to substantially line the inner wall of the container and it is retained in the stretched condition by a latching means provided in the bottom wall of the container, releasably to grip an element projecting from the bottom side of the diaphragm when the diaphragm is in stretched position.

Fluid or paste material, to be dispensed from the container, is introduced into the interior of the stretched diaphragm through the open upper end of the container, in an amount substantially to fill the container. Thereafter, the cover is mounted in sealed relation to close the upper end of the container, to complete the dispensing package in which the fluid or paste to be dispensed is housed in sealed relation within the container but without subjecting the material to pressure.

The filled container can be stored, shipped, or displayed in the pressureless state thereby to avoid loss due to leakage, marring the appearance of the container due to leakage of content material, or danger of explosion due to internal pressures.

When it is desired to place the container into operation for dispensing content material, the latch is operated from the outside to release its grip on the diaphragm thereby to release the stretched diaphragm for normal return to its relaxed position. Thus the diaphragm becomes effective to impose pressure on the fluid or paste contained therein whereby such fluid or paste is ejected from the container in response to the operation of the valve and in amounts controlled thereby.

It is an object of this invention to produce a non-aerosol fluid and paste dispenser of the type described, which operates under pressure but in which mechanically adjustable means are employed for generation of pressure on the fluid or paste material sufficient to achieve the desired rate of ejection in response to valve operation, in which the pressure on the fluid or paste can be selectively regenerated as the amount of fluid or paste material in the container diminishes thereby to maintain dispensing pressure, and in which the fluid or paste material is provided in pre-loaded cartridges which can be used to re-load the dispensing container, as by replacing an empty cartridge with a new filler.

These and other objects and advantages of this invention will hereinafter appear, and for purposes of illustration, but not of limitation, an embodiment of the invention is shown in the accompanying drawing in which

FIG. 1 is a schematic sectional elevational view of the pre-loaded container, embodying the features of this invention, in the pressureless state;

FIG. 2 is a sectional elevational view, similar to that of FIG. 1, showing the elements in their dispensing position; and

FIG. 3 is an enlarged sectional elevational view of the bottom end portion of the container showing the modification for adjustment of spring pressure.

Referring now to the drawing for a detailed description of the invention, the numeral 10 indicates an elongate housing formed of rigid material, such as metal, plastics, or laminates formed of paper, metal, or plastics. The housing is formed with an elongate body portion 12 of square, rectangular, oval, and preferably of rounded shape, with a top wall 14 that tapers inwardly to form a neck portion 16 fitted with a pressure-release valve 18 of conventional construction. The dispensing valve is provided with a tubular member in the form of a hollow needle 20 which extends downwardly into the interior of the container for a distance to project below the top wall portion 14.

The bottom side of the container 10 is open, with the bottom end portion being provided with means for releasably securing the bottom wall 22 in position of use to close the open bottom side of the housing. When formed of the preferred rounded shape, this can be accomplished by providing screw threads 24 on the outer wall of the bottom end portion for threaded engagement with the internally threaded cylindrical section 26 extending substantially perpendicularly from the periphery of the bottom wall 22 of the container. The cylindrical section 26 may be of short dimension to secure the bottom wall immediately adjacent the bottom end of the container, but it is preferred to form the cylindrical section of considerable length, as illustrated in FIG. 2, for adjustment of the bottom wall in the direction toward and away from the housing thereby to vary the length of the confined space 30 within the housing, for purposes which will hereinafter be described.

The fluid or paste 32, to be dispensed, is provided with a collapsible bag 34, such as formed of a flexible elastomeric or plastic material, or an accordion formed of metal, treated paper, plastic, or laminate, in which the bag walls are substantially impervious to the transmission of fluid or paste, or liquid or vaporized components thereof. The material of which the bag is formed is not significant as long as it has the desired characteristics described and is not deleterious to the fluid or paste to be dispensed therefrom. For example, the bag 34 can be formed of tin, or tin-plate, polyethylene, polypropylene, polytetrafluoroethylene, polyvinyl acetate and the like, or of a rubber-like material, such as natural or synthetic rubber, as represented by a homopolymer or copolymer of butadiene with styrene, acrylonitrile, polyester, EPM, and EPDM rubbers, and the like.

The bag 34 is dimensioned to have a cross section corresponding to the cross section of the interior of the body portion 12 of the housing 10, and a length that corresponds to the length between the top and bottom sides of the housing so as to enable the bag 34 to be slidably inserted in fitting relation within the housing.

The separable bottom wall 22 is formed with a key slot 36 extending through the central portion thereof. The key slot is dimensioned to enable a key 38 on the end of an elongate shaft 40 to extend therethrough, with the key being dimensioned to pass freely through the slot 36 when in one position of adjustment, and to have portions which project beyond the edges of the slot 36 when turned to another position of adjustment, thereby to prevent passage of the key therethrough.

A rigid flat plate 42 is secured to the end of the rod 40 opposite the key, with the plate being dimensioned to correspond with the interior cross section of the housing to enable endwise displacement of the plate within the housing, as in a piston-cylinder arrangement. Disposed between the plate 42 and the bottom wall 22, means are provided constantly to urge the plate 42 in the direction away from the bottom wall. For this purpose, it is desirable to make use of a tension spring 44 having one end bearing against the bottom side of the plate 42 while the other end bears against the top side of the bottom wall 22.

In assembly, the plate 42 is turned to align the key 38 with the keyway slot 36 and the plate is depressed until the key 38 clears the keyway slot 36. Thereafter, the key is turned to locking position to latch the plate with the coil spring in the highly compressed state.

The bag 34, pre-filled with the fluid or paste material 32, is then inserted into the housing through the open bottom side. As the bag seats fully within the housing, the dispensing tube 20 pierces the upper end of the bag for entry into the interior in communication with the container material.

Thereafter, the bottom wall is screwed onto the bottom end of the housing to complete the loaded container with the coil spring still locked in its compressed state. In this condition, the loaded container can be packaged for storage, distribution, or display without pressure on the content material to be dispensed.

Activation of the dispenser is simply achieved by turning to release the key 38 from latching position. When the key is turned into alignment with the key slot 36 for passage therethrough, into the interior of the housing, the spring 44 is released to urge the plate 42 against the under side of the bag 34 under spring pressure. This places the fluid or paste material within the collapsible bag under pressure so that, in response to operation of the dispensing valve 18, fluid or paste will be forced through the tubular member 20 and through the valve 18 for ejection from the container. Thus the dispensing operation is thereafter valve-controlled.

In the modification, shown in FIG. 3, wherein use is made of a bottom wall with a lengthened cylindrical section 26, the device is initially operated with the bottom wall 22 in the extended position. As material in the bag is used up, the bag collapses in response to spring pressure to the extent that less pressure is applied as the spring 44 is extended. To compensate for this loss in pressure, the bottom wall can be turned to screw the bottom wall for displacement in the direction toward the bottom side of the housing, thereby to reduce the space between the bottom wall 22 and the plate 42 with corresponding increase in spring pressure. This can be repeated as the need arises, until the bottom wall has reached its upward position of adjustment.

If the container is not used as a single-use container, it can be re-loaded simply by unscrewing the bottom wall, removing the empty bag, and replacing it with a new bag or filler. The plate 42 is compressed and turned to align the key 38 with the key slot 36 and the key is turned as it clears the keyway to lock the plate in latching position. The bottom wall is then screwed back onto the housing to complete the assembly with the bag still free of pressure. For use, the key is unlatched for passage through the keyway and the spring 44 is thus released to press the plate 42 against the bot-

tom side of the filler for dispensing in response to valve operation.

It will be understood that other means can be employed for releasably latching the bottom wall onto the housing and for releasably latching the plate in the retracted, spring-compressing position.

Similarly, means such as described in my U.S. Pat. No. 3,413,974 may be used for pre-loading the tubular needle 20 to hold the needle free of the bag until released but which, upon release, pierces the bag for communication with the content material in the interior thereof.

It will be understood that changes may be made in the details of construction, arrangement, and operation without departing from the spirit of the invention, especially as defined in the following claims.

I claim:

1. In a bag-type fluid and paste dispenser comprising a deformable bag and a fluid or paste material to be dispensed within said bag, a rigid housing dimensioned to enclose the filled bag therein, said housing being open at the bottom and closed at the top, a dispensing valve in the top, a hollow needle extending from the dispensing valve into the interior of the housing in position to pierce the bag when the latter is inserted therein, a bottom wall removably connected to the housing to close the open bottom end of the housing, a disc plate dimensioned for axial displacement within the housing between retracted and extended positions of adjustment, means for releasably latching the disc plate in retracted position, means constantly urging said disc plate toward the extended position and means for axial adjustment of the bottom wall in a direction toward or away from the top wall to maintain or increase the force of said urging means on said disc plate thereby to compensate for loss in force on the disc plate as material in the bag is dispensed.

2. A dispenser as claimed in claim 1 in which the housing is of cylindrical shape and the bag is of cylindrical shape.

3. A dispenser as claimed in claim 1 in which the means removably securing the bottom wall to the housing to close the open bottom end comprises screw threads on the adjacent surfaces of the housing and a cylindrical section extending from the periphery of the bottom wall for threaded engagement therebetween.

4. A dispenser as claimed in claim 1 in which the disc plate comprises a rigid plate having a cross section corresponding to the cross section of the housing.

5. A dispenser as claimed in claim 1 in which the means for releasably latching the disc plate in retracted position comprises a key, an elongate rod connected at one end to the disc plate and the other end to the key, and a key slot through the bottom wall of the housing dimensioned to enable passage of the key therethrough when in one position and to block passage of the key therethrough when in another position.

6. A dispenser as claimed in claim 1 in which the means constantly urging the disc plate toward extended position comprises a coil spring disposed between the disc plate and the bottom wall of the housing.

7. A dispenser as claimed in claim 1 in which means for adjustment of the bottom wall relative to the top wall comprises an elongated threaded section in either or both the adjacent walls of the cylindrical section and the bottom wall of the housing.

5

6

8. A dispenser as claimed in claim 1 in which the bag is formed of a deformable material which is impervious to the liquid or fluid.

9. A dispenser as claimed in claim 8 in which the bag is formed of an elastic material.

10. A dispenser as claimed in claim 8 in which the bag is formed of a material which is foldable in the lengthwise direction.

5

* * * * *

10

15

20

25

30

35

40

45

50

55

60

65