

Nov. 17, 1964

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3,157,314

REFILLABLE DISPENSER WITH FLEXIBLE OUTER CASING

Filed Jan. 12, 1961

3 Sheets-Sheet 1

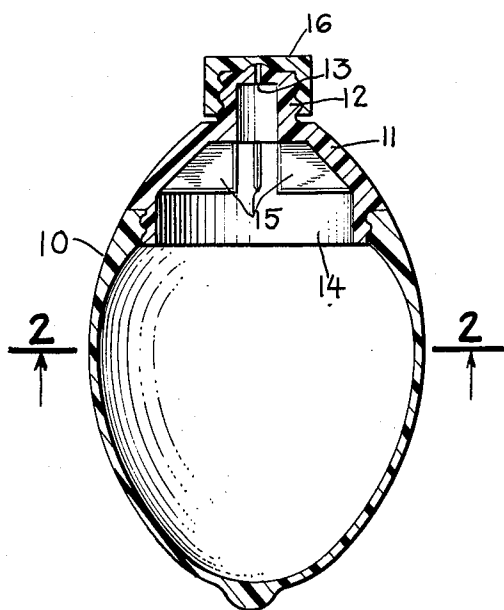


Fig. 1

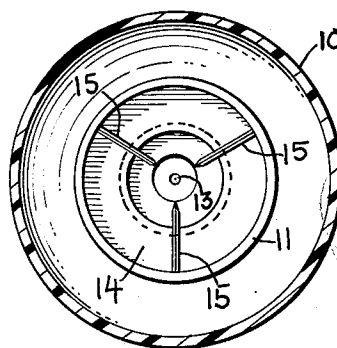


Fig. 2

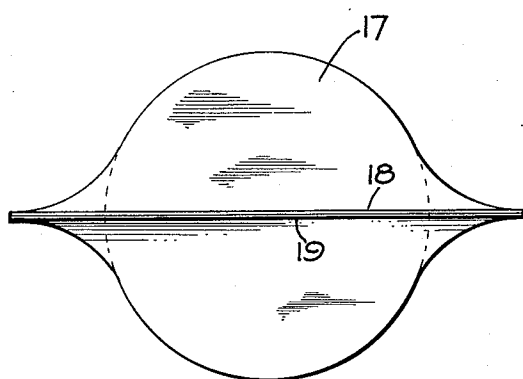


Fig. 3

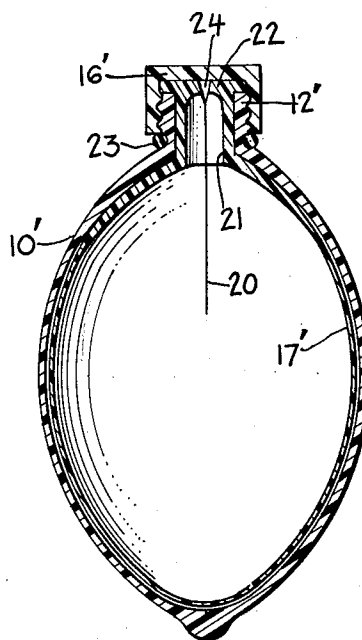


Fig. 4

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3 Sheets-Sheet 2

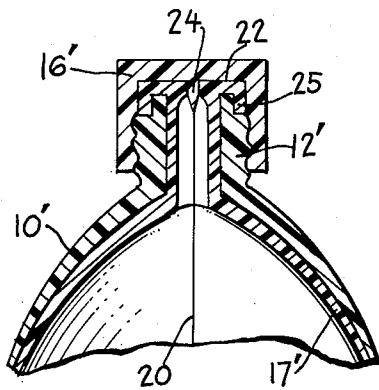


Fig. 5

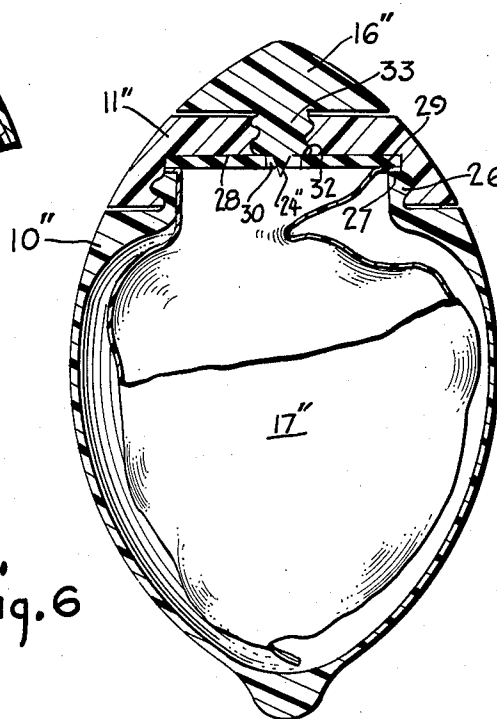


Fig. 6

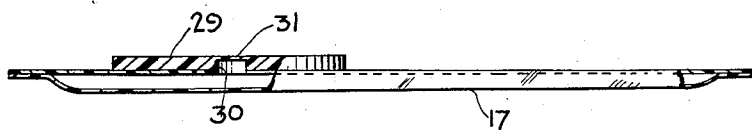


Fig. 7

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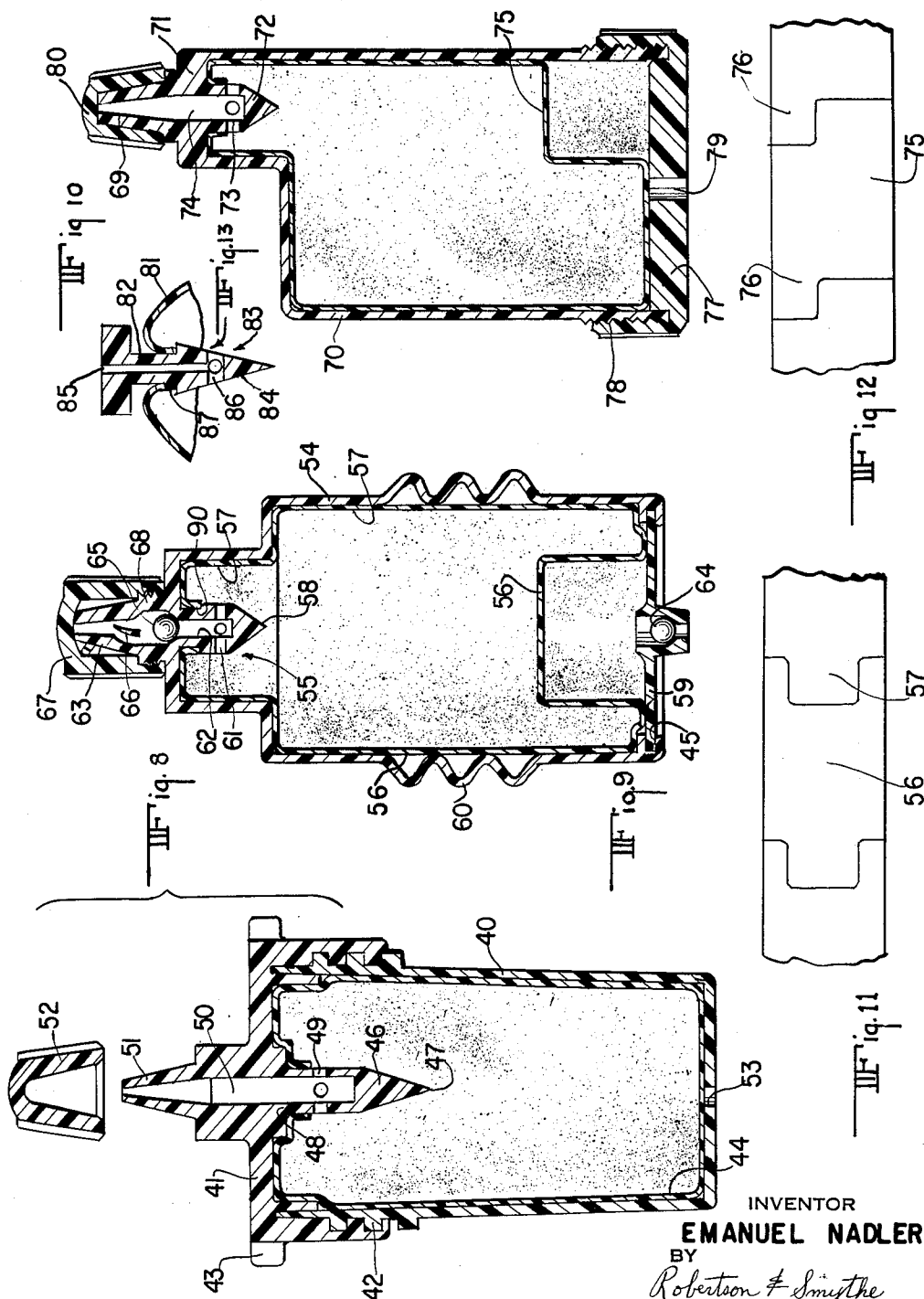
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REFILLABLE DISPENSER WITH FLEXIBLE OUTER CASING

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3 Sheets-Sheet 3



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REFILLABLE DISPENSER WITH FLEXIBLE OUTER CASING

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Filed Jan. 12, 1961, Ser. No. 82,191

1 Claim. (Cl. 222-83)

This invention relates to dispensers and particularly to compressible packages for dispensing liquid juices. This application is a continuation-in-part of my co-pending application Serial No. 748,983, filed July 16, 1958, now abandoned.

A relatively new dispenser has been developed for dispensing juices, such as lemon and lime, which are used for flavoring various food and drink products and for dispensing viscous materials such as honey. Such dispensers have been widely accepted for both commercial and home use, and are normally molded from a flexible plastic material, such as polyethylene, in the shape of the fruit whose juice is contained in the dispenser or in a shape which suggests the material contained therein. The dispenser is provided with an opening of small diameter which can be closed by a conventional threaded cap formed from a hard plastic material. Thus, the user merely removes the cap, compresses the side walls of the flexible casing to thereby dispense the material contained in the casing.

Although these dispensers have proven successful, their formation is fairly costly due to the fact that they are shaped during molding and they are not refillable, thereby limiting their use to the supply of material originally contained therein. They also are not practical for semi-viscous materials, such as marmalade, which must be spooned, or ladled into the dispenser, such being impossible through the small dispensing opening.

Applicant has conceived of a formed dispenser for a variety of materials in which the relatively costly formed outer casing may be refilled and re-used repeatedly.

It is an object of this invention, therefore, to provide a dispenser in which the formed outer casing may be refilled with the material to be dispensed and re-used.

It is another object of this invention to provide a dispenser utilizing a flexible sealed, disposable bag containing the material to be dispensed which is inserted in the outer casing of the dispenser and which is punctured by a cutting element associated with the dispenser after the bag has been inserted in the casing.

It is a further object of this invention to provide a dispenser for dispensing material from the interior of a disposable bag contained in a flexible outer casing without the material in the bag coming into contact with the interior of the casing.

According to the invention the dispenser includes a flexible outer casing having an opening therethrough. A disposable sealed flexible bag containing the material to be dispensed is placed within the outer casing through the opening. In order to puncture the bag after it is in the casing, cutting means are provided which are associated with the dispenser so that the material in the bag will be dispensed through the opening in the casing when the sides of the casing are compressed.

According to a further aspect of the invention, a closure means is provided, which may be formed in two

parts, and the cutting means is attached to one of the two parts of the closure means.

According to a further aspect of the invention, the disposable bag has a formed portion which co-operates with abutting means on the interior of the casing to hold the bag in a predetermined position relative to the casing. The bag is then punctured by the cutting element on the closure means when the closure means is moved in a closing direction.

According to a still further aspect of the invention, the outer casing is provided with a check valve so that air may be admitted between the outer casing and the flexible bag therein, to assist in collapsing the bag and in forcing its contents out through the opening in the casing when the sides of the casing are compressed.

The foregoing and other objects, features and advantages hereof will become apparent from the following description and drawings which are merely exemplary.

In the drawings:

FIG. 1 is a side elevational view in cross-section of one form of dispenser of the invention;

FIG. 2 is a transverse cross-sectional view taken along the line 2-2 of FIG. 1 looking in the direction of the arrows;

FIG. 3 is a plan view of one type of disposable bag which may be used with the dispenser of FIGS. 1 and 2;

FIG. 4 is a side elevational view in cross-section of another type of dispenser according to the invention;

FIG. 5 is an enlarged front elevational view in cross-section of a portion of a modified type of dispenser according to the invention;

FIG. 6 is a side elevational view in cross-section of a further modification of the dispenser of the invention;

FIG. 7 is a side view of one type of disposable bag which may be used with the dispenser of FIG. 6, said disposable bag being shown in its empty condition and with parts broken away in the interest of clarity;

FIG. 8 is a side elevational view in cross-section of a form of the dispenser in which the puncturing element is adapted to be sealed to the inner flexible bag;

FIG. 9 is a side elevational view in cross-section of a form of the dispenser having corrugations in the outer casing;

FIG. 10 is a side elevational view in cross-section of a form of the dispenser having the opening to the outer casing offset to one side;

FIGS. 11 and 12 are side elevational views of various forms of the inner flexible bag during fabrication; and

FIG. 13 is a side elevational view in cross-section showing the engagement of the inner flexible bag with the puncturing element.

Dispensers according to the principles of the invention may be used for freely flowing fluids, such as juices, semi-viscous materials, such as honey, viscous materials, heavy solid containing materials, such as marmalade, powders, and the like. The drawings illustrate a dispenser shaped in the form of a lemon or lime merely for convenient illustration of the invention.

The form of the dispenser of the invention illustrated in FIGS. 1-3 includes an outer flexible casing 10 made of polyethylene, or other similar flexible material, and having an enlarged opening at its upper end. The interior side wall of the casing adjacent the opening is preferably threaded to receive the threaded portion of a partial

closure member 11. Partial closure member 11 may be formed of a hard thermo-setting resin and includes an exteriorly threaded neck portion 12 having a small opening 13 therein. A passage 14 is formed inside of partial closure member 11 to provide communication between opening 13 and the interior of casing 10. Cutting blades 15 are embedded in the interior surface of partial closure member 11 and extend into passage 14. The cutting blades can be made of a suitable metal and held in place by the molded plastic or they can themselves be formed of plastic and molded as an integral part of member 11. As shown in FIG. 2, three such cutting members are preferably used and are located approximately 120° apart. Of course, the number of cutting members may be varied as desired. A cap 16 having internal threading is adapted to be screwed onto neck portion 12 to close off opening 13. The outer casing 10 and the partial closure member 11 preferably have a combined exterior form of a shape suggesting the material contained in the dispenser, such as a lemon or lime, in the form shown in the drawings.

A disposable sealed bag 17 containing the fluid or material to be dispensed is inserted through the opening in outer casing 10 into the interior thereof when partial closure member 11 and cap or closure member 16 are removed from the casing. This bag is preferably made of a flexible material, such as polyethylene, and may be heat-sealed, as along seams 18 and 19.

When the bag is in position on the outer casing 10, the partial closure member 11 and cap 16 are screwed into casing 10 to close the opening therein. If the bag is made of a size which substantially fills the interior of casing 10 and extends through the opening therein the closing action of partial closure member 11 will cause blades 15 to contact bag 17 and cut or tear a portion thereof, causing some of the contents thereof to go into casing 10. Alternatively, the bag may be made somewhat smaller so that it is not punctured until the sides of casing 10 are compressed to force the bag upwardly against blades 15. This can occur while cap 16 is on or off of the dispenser. Therefore, it is clear that when cap 16 is removed from partial closure member 11 and the sides of casing 10 are compressed, the materials or fluid within bag 17 will be dispensed through opening 13. Since in the modification of FIGS. 1-3, some of the materials in the bag will flow against the interior wall of casing 10, it is desirable to provide a thin coating of an impervious material, such as saran, which may be applied by spraying or the like.

In the modification shown in FIG. 4, the outer casing 10' is itself formed in the desired shape and no partial closure member is provided. Outer casing 10' has an elongated slit 20 through which the bag 17' can be inserted. Bag 17' is completely sealed and is formed with a neck portion 21 which fits against neck portion 12' of the casing. Also formed on bag 17' is a flat flanged top portion 22 which rests on the top surface of neck 12'. After bag 17' has been inserted in casing 10' and positioned relative thereto, a plastic or metal lock ring 23 is snapped around the lower portion of neck 12' to hold casing 10' in its shaped position, i.e., holding slit 20 substantially closed. The cap 16' has a downwardly extending, sharp projection 24, so that when cap or closure member 16' is screwed onto neck 12' projection or cutting means 24 will puncture the flat portion 22 of bag 17'. Thus, when cap 16' is removed and the walls of outer casing 10' are compressed the material or fluid inside bag 17' will be dispensed through the opening formed in portion 22 by cutting means 24.

If it is desired to omit the ring 23, bag 17' can be formed with a downwardly extending annular flange 25 at the outer edge of portion 22, as shown in FIG. 5, which flange will co-operate with an annular portion on neck 12' to hold outer casing 10' in a position where slit 20 is substantially closed after the bag has been inserted. Flange 25 can also be made to extend to the base of

the neck and be formed with exterior threading thereon.

In a further modified form of a dispenser according to my invention, as shown in FIGS. 6 and 7, the outer casing 10'' has an upwardly extending annular flange 26 adjacent the opening in the casing and spaced inwardly from the exterior surface of the casing. This flange is externally threaded and includes an annular ledge 27 at its top surface. A partial closure member 11'' having internal threading to co-operate with the external threading on flange 26 includes a flat internal surface 28 spaced about surface 27 when partial closure member 11'' is screwed onto casing 10''. Surface 28 is the end surface of a countersunk hole, in effect, even though it is preferably molded as a part of partial closure member 11''.

One form of bag which may be used in the FIG. 6 modification is shown in unfilled condition in FIG. 7 and includes a hard disc 29 having an opening 30 at its center. This opening is sealed off by a thin membrane 31. Alternatively, the disc may be sealed to a complete bag so that the portion of the bag extending across the opening in the disc takes the place of the membrane. When partial closure member 11'' is removed from casing 10'' the disposable bag 17'' is inserted through the opening in casing 10'' formed by annular flange 26, so that disc 29 rests on upper surface 27 of flange 26. Partial closure member 11'' is then screwed onto casing 10'' until surface 28 contacts the upper surface of disc 29. Thus, disc 29 is securely held in position between surface 27 and surface 28. Cap or closure member 16'' includes an integrally molded, downwardly extending, externally threaded neck portion 33 which screws into threaded opening 32 in partial closure member 11''. Extending downwardly from neck 33 is a sharp projection or cutting means 24'' which punctures membrane 31 when cap 16'' is screwed into partial closure member 11''.

Thus, when the cap 16'' is removed and the walls of casing 10'' are compressed, the material in bag 17'' will be dispensed through the opening formed by cutting means 24''. In the FIG. 6 modification, casing 10'', partial closure member 11'' and cap member 16'' are shaped so that they combine to form an article having an exterior shape suggesting the material contained in the dispenser, such as the shape of a lemon or lime in the form shown, whose juice is being dispensed by the dispenser.

In the modifications shown in FIGS. 4-7, the material in the disposable bag does not come into contact with the inner wall of casing 10' and 10'', thereby eliminating any need for coating said internal wall with an impervious material.

In the description of the various modifications, similar parts have been given the same reference numerals with the addition of a prime in the FIGS. 4 and 5 modifications, and a double prime in the FIGS. 6 and 7 modifications.

The dispenser shown in FIG. 8 includes outer casing 40 and cover 41 which is attached to it by means of threads 42. Cover 41 may contain lugs 43 disposed about its periphery to facilitate gripping the cover. Flexible bag 44 containing the material to be dispensed is located within outer casing 40. Cover 41 contains puncturing element 46 which extends into the interior portion of the outer casing when the cover is in place. The extremity of the puncturing element may be formed with a sharp point 47 to facilitate the puncturing of the inner flexible bag. As the puncturing element penetrates the flexible bag, the bag material is forced upwardly along the puncturing element until it assumes a final position adjacent to shoulder 48. Due to the resiliency of the flexible bag and the shoulder arrangement of the puncturing element, a tight seal is formed between the bag and the puncturing element, so that the contents of the bag cannot enter into the interior portion of the outer casing. Upon compressing the outer casing, the contents of the bag are forced through openings 49 into passage 50, which ex-

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tends to nozzle 51 of the dispenser. Cap 52 may be included to seal off the nozzle after the dispenser has been used. To prevent air being entrapped in the outer casing and making the compressing of the outer casing more difficult, the bottom portion of the casing may be provided with air vent 53.

As shown in the form of FIG. 9, the dispenser includes outer casing 54 having an extension 55 at its top portion. Inner flexible bag 56 is shaped to conform with the inside diameter and extension of the outer casing. When the bag is inserted into the outer casing, end portion 57 of the bag enters the extension into which puncturing element 58 extends.

The outer casing is closed after the insertion of the flexible bag by means of bottom plate 59 which is retained in groove 45 adjacent to the inside diameter of the casing at its bottom end. To enable outer casing 54 to be compressed sufficiently to force portion 57 of the bag against puncturing element 58, the casing may be provided with circumferential corrugations 60 which enable the casing to be collapsed along its longitudinal axis. Thus, by urging bottom plate 59 toward the top portion of the dispenser, the casing will deform in a manner similar to that of a bellows and urge the inner bag upwardly against the puncturing element.

Puncturing element 58 includes openings 61 leading to passage 62 to conduct the contents in an outward direction through nozzle 63. To ensure that the entire contents of inner flexible bag 56 may be dispensed, bottom plate 59 may be provided with ball check valve 64 which permits air to enter the interior of the casing but not escape. Similarly, ball check valve 65 may be located adjacent to passage 62 to permit the outward flow of the material within the bag but to block reverse flow of either the material or the atmosphere. Rib 66 disposed within the inner portion of nozzle 63 stops the upward motion of the ball check valve 65 to prevent it from jamming within the nozzle.

By virtue of the corrugations in the outer casing, the casing may be collapsed by the application of hand pressure to its bottom portion. With the inner bag compressed, its contents flow outwardly through nozzle 63. Under this condition, ball check valve 64 is closed, thereby trapping air within the outer casing between it and the inner flexible bag. Upon removing the hand pressure, the resiliency of the outer casing causes it to snap back to its original form, during which action check valve 65 closes and check valve 64 opens. The opening of valve 64 permits air to enter the inner portion of the outer casing. In this way, as the contents of the bag are dispensed, the bag is collapsed further and further in an upward direction to insure that the contents may be completely discharged.

With many materials to be dispensed, it is essential, in order to preserve their purity and to prevent their deterioration, that the material be guarded against prolonged exposure to the atmosphere. To achieve this, puncturing element 58 is provided with a grooved portion 90 which engages the flexible bag adjacent to the opening produced by the puncturing element. The tight seal which results prevents leakage of the contents into the casing. Sealing of the nozzle is effected by the application of cap 67 which may be engaged to the nozzle by threads 68.

The sealing and the engagement of inner flexible bag 56 with respect to the necked portion 82 of puncturing element 83 is shown in detail in FIG. 13. Necked portion 82 serves as a base for pointed portion 84 of the puncturing element. Discharge passage 85 extends into the pointed portion where it intersects openings 86. As the pointed portion is forced against the continuous surface of bag 81, the bag material is locally deformed inwardly toward the interior of the bag. Where the bag is formed of elastic material such as plastic, the material will stretch at the point of contact with pointed portion

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84. With continued application of force by the pointed portion, the tensile properties of the bag are overcome and the pointed portion penetrates and breaks the surface of the bag. As the pointed portion is advanced further into bag 81, the stretched material travels along the pointed portion until it passes onto necked portion 82. In this manner, the punctured bag is in the form of a collar surrounding necked portion 82.

As shown in FIG. 13, ends 87 of the punctured bag surrounding necked portion 82 are stretched and have a thin cross-section which increases away from the ends of the collar. Due to the elastic properties of the bag material, it is seen that a tight engagement of the bag with respect to the necked portion is effected. Upon the application of force to the bag, the resulting internal pressure acts with respect to the collar of punctured bag material as shown by the arrows in FIG. 13. In this manner, the internal pressure within the bag serves to increase the seal of the bag about the necked portion. When the contents of the bag have been substantially exhausted, the bag may be conveniently removed from the casing without spilling the remaining drops since the engagement of the bag about the necked portion is of sufficient strength to support the bag upon removal. The necked portion, in conjunction with the elastic properties of the bag material, insure that the bag will not slip from the puncturing element as the puncturing element and bag are withdrawn from the casing.

In FIG. 10 there is shown another form of the dispenser in which nozzle 69 is offset to the side of outer casing 70. The offset nozzle extends from extension 71 adjacent the top side portion of the casing. Puncturing element 72 extends into the interior of the extension. Openings 73 and passage 74 serve to conduct the contents of the inner flexible bag 75 to the opening of the nozzle. To insure that bag 75 engages the puncturing element, the bag may be formed with an end portion 76 corresponding to the extension of the casing. As shown in FIG. 11, the flexible bag may be formed with end portions 57 to conform with the casing having end portions 55.

As shown in FIG. 12, the flexible bag having end portion 76 may be formed from a continuous strip of plastic material. In another form, the plastic material may be previously arranged in a tubular shape from which the bags are heat-sealed and cut.

Bottom cover 77, which is secured to the casing by threads 78, is removed to install the bag within the casing. The cover may be provided with air vent 79. In order to maintain an airtight enclosure for the contents of the bag, the dispenser may be sealed with cap 80 mounted upon nozzle 69.

As is clear from the above description, applicant has provided a dispenser in which the external casing can be formed in any desired configuration and be used after the original dispensed material is exhausted, by the mere replacement of the exhausted bag with a new, inexpensively made, filled bag. The puncturing means of the dispenser is adapted to engage the flexible bag adjacent its punctured area to form an effective and enduring seal and at the same time establishing an attachment capable of securing the bag to the puncturing means to facilitate the bag's removal from the casing.

It is to be understood that the described exemplary embodiment are merely intended for the purpose of illustration, and that the principles of the invention are not intended to be limited thereto, except as defined in the appended claim.

What is claimed is:

A refillable dispenser including a flexible outer casing having end walls at least one of which is removable, a disposable sealed flexible bag containing the material to be dispensed located within said outer casing, said flexible outer casing and said flexible bag being readily compressible when normal manual pressure is applied thereto, puncturing means integral with and immovable rela-

tive to one of said end walls, said puncturing means extending into said casing and having a passage extending therethrough, said puncturing means also having a conical portion adapted to pierce a hole in said flexible bag and a neck portion in back of, and of lesser diameter than the base of said conical portion, the portion of said flexible bag surrounding the pierced hole sealingly embracing said neck portion so that said flexible bag is held in sealing relation thereto, and means within said puncturing means for controlling the outward flow of the material within the bag.

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