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Soto

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[45] **Nov. 16, 1976**

[54] **FLEXIBLE PACKAGE WITH COUNTER-PRESSURE DISPENSER**

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[21] Appl. No.: **543,264**

[52] **U.S. Cl.** ..... **222/89;** 128/214 D; 128/DIG. 24; 215/11 E; 222/81

[51] **Int. Cl.²** **A61M 25/00**

[58] **Field of Search** ..... 222/80, 81, 541, 89; 215/11 E; 128/DIG. 24, 272, 214 D

[56] **References Cited**

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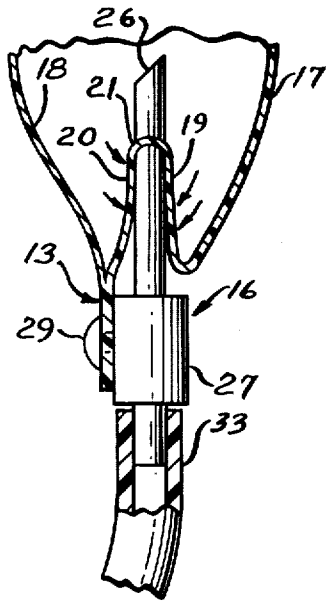
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Primary Examiner—Stanley H. Tollberg
Assistant Examiner—David A. Scherbel
Attorney, Agent, or Firm—Dawson, Tilton, Fallon & Lungmus

[57] **ABSTRACT**

A package includes a sealed collapsible container of puncturable film material with liquid contents. One portion of the container is formed into a pocket. The container is also provided with structure for attachable receiving a dispenser which is adapted to be secured to the receiving structure. The dispenser may be a cannula with an insert or penetration conduit. When the insert conduit is placed in the pocket and forced to penetrate the innermost portion thereof, the body of the dispenser is secured to the receiving structure of the container. Pressure may be applied to the container and contents to dispense the contents through the attached cannula; and this pressure forces the inner folds of the gusset into progressive sealing engagement with the insert conduit of the cannula to prevent spillage or seepage of the liquid contents.

8 Claims, 8 Drawing Figures



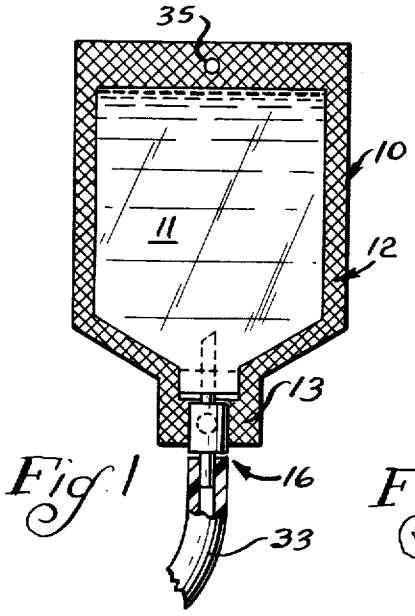


Fig. 1

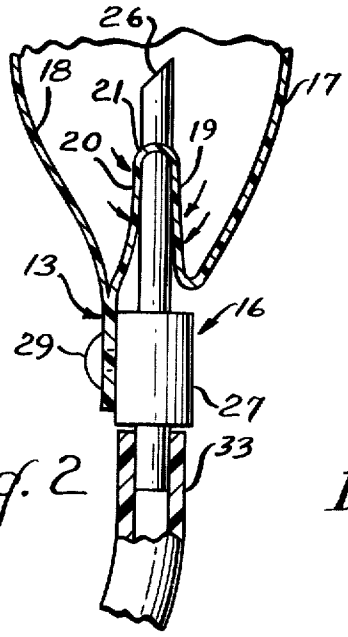


Fig. 2

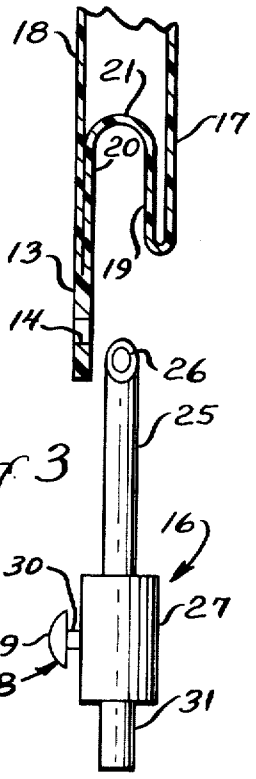


Fig. 3

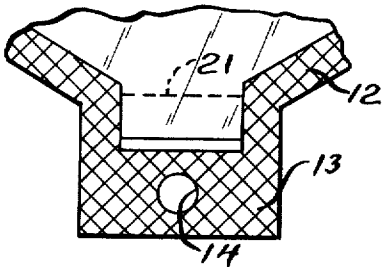


Fig. 4

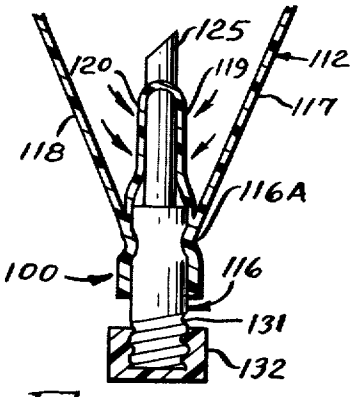


Fig. 5

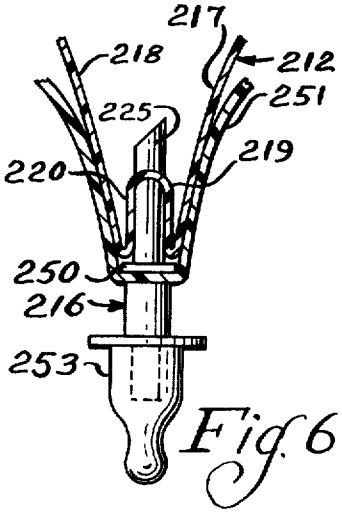


Fig. 6

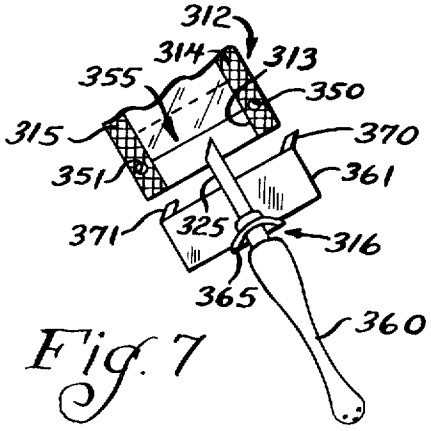


Fig. 7

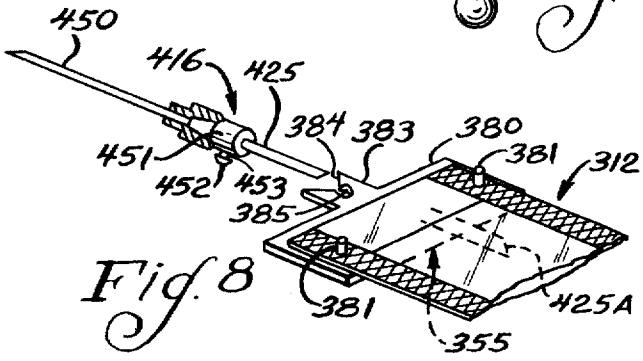


Fig. 8

FLEXIBLE PACKAGE WITH COUNTER-PRESSURE DISPENSER

BACKGROUND AND SUMMARY

The present invention relates to apparatus for dispensing medicaments or the like; and more particularly, it relates to a sealed package for a liquid medicament and a separate attachable dispenser for use with it.

The invention may be regarded as improving aspects of the devices disclosed in my U.S. Pat. Nos. 3,255,923 and 3,474,789, and in its broader aspects, it includes a sealed collapsible container of puncturable film material in which the medicament is contained. A portion of the container is doubly folded to provide two inner folds defining a pocket. In one embodiment, the periphery of the container is stiffened and holds the pocket material fixed in relation to a dispenser. The stiffened container material also provides a tab in front of the gusset opening defining an aperture or providing equivalent receiving means for a dispenser.

The dispenser may include a cannula and an insert conduit in communication with the cannula. The insert conduit is of sufficient length to pierce the innermost part of the pocket when the dispenser is attached to the container. The dispenser also includes a rivet-like attaching button with a rounded head for being inserted through the aperture on the stiffened tab of the container, thereby securing the dispenser to the container after insertion of the insert conduit through the pocket.

The liquid contents of the container may be dispensed under gravity or under slight hand pressure exerted on the collapsible container, as may be required to overcome resistance or back paressure, for example, in teh case of an intramuscular injection.

One of the important features of the present invention is the means by which the inner folds of the gusset sealingly engage the insert conduit of the dispenser after it penetrates the innermost portion of the pocket. After piercing, the insert conduit is, of course, free to transmit the contents of the container for application or dispensing. As pressure is applied, even the slightest pressure as would be caused by gravity acting on the contents of the container, will cause the inner folds of the pocket to wrap around the inset conduit of the dispenser to prevent seepage through the broken portion of the pocket. As the pressure is increased on the contents, the contact area between these inner folds and the insert conduit and the sealing force will increase progressively, thereby preventing seepage or loss through the punctured location.

Other embodiments of the invention are disclosed for different applications, including variations of the means for attaching the dispenser to the container, and modifications of the dispenser for different applicators.

Other features and advantages of the present invention will be apparent to persons skilled in the art from the following detailed description of a preferred embodiment accompanied by the attached drawing wherein identical reference numerals will refer to like parts in the various views.

THE DRAWING

FIG. **1** is a front view of a package with attached dispenser constructed according to the present invention;

FIG. **2** is a close-up cross sectional view of FIG. **1** showing the attachment of the dispenser and insertion into the container;

FIG. **3** is a close-up view, similar to FIG. **2**, with the container partially cut away, but showing the dispenser prior to insertion and attachment;

FIG. **4** is a partially cut-away close-up view of the tab portion of the container of FIG. **1**;

FIG. **5** is a cross sectional view, similar to FIG. **2**, of a first modification of the invention;

FIG. **6** is a partially broken-away cross sectional view, similar to FIG. **2** of a second modification of the invention;

FIG. **7** is a partially broken-away exploded view just prior to piercing, of a third modificaton of the invention; and

FIG. **8** is a partially broken-away perspective view, with the attaching dispenser again shown in exploded relation just prior to insertion, of a fourth modification of the invention.

DETAILED DESCRIPTION

Turning first to the embodiment of FIGS. **1–4**, reference numeral **10** generally designates a flexible container with liquid contents **11**. The container **10** may be formed by laminating two sheets of polyethylene film together having a thickness, for example, of approximately 5 mils. The surrounding border of the container **10** is generally designated **12**, and it forms a stiffened, yet collapsible periphery, the lower end of which, designated **13** is sometimes referred to as a tab.

As best seen in FIG. **4**, the tab **13** defines an aperture **14** for attachable receiving a dispenser generally designated by reference numeral **16**. Although this embodiment is designed for dispensing medicaments or the like, the term "dispenser" is intended to have a meaning not limited to medical applications, as will be apparent from the other embodiments.

The container **10**, when viewed from the side, includes first and second flexible side walls **17**, **18**. The side wall **17** is doubly folded at its bottom portion, the two folds being designated **19** and **20** in FIG. **2**, and thence laminated to the other wall **18** to form the tab **13**. The doubly-folded wall provides a pocket having an innermost portion designated **21** in FIGS. **2** and **3**. The pocket may be built into the container, or formed by an attachment, or pre-formed at the time of use.

As best seen in FIG. **3**, the dispenser **16** includes an insert conduit or tube **25** having an inclined tip as at **26** to facilitate piercing of the container material at the base or innermost portion of the socket. An enlarged body portion **27** is provided with a rivet-like attaching member generally designated **28** and including a rounded head member **29** and a neck of reduced diameter designated **30**.

At the end of the body portion **27** opposite the insert conduit **25** and in fluid communication with it, there is an external cannula **31** to which a flexible conduit **33** (FIGS. **1** and **2**) may be attached, for example, as in the case of a dispenser for saline or plasma. The upper portion of the stiffened border **12** may also be provided with an aperture as at **35** in FIG. **1** for hanging the container during use.

The dispenser **16** may be made of metal or other rigid material, but it may be made of a rigid plastic material such as high-density polyethylene.

The cannula **16** may be packaged separately (in a sterile enviroment for medical applications) for re-

moval prior to use. When it is desired to dispense the contents **11** of the container **10**, the dispenser **16** is taken from its container and located approximately in the position shown in FIG. **3**. It is then moved axially until the slanted tip **26** pierces the innermost portion **21** of the pocket. The rounded head **29** of the attaching structure **28** is then placed through the aperture **14** on the tab **13** of the flexible container to hold the dispenser in place during use.

Referring particularly to FIG. **2**, when the dispenser is attached to the container, and particulary when the application is one in which some resistance must be overcome or a back pressure is created (as in the case of intramuscular injections, for example), it may be desired to induce a pressure on the fluid contents **11** of the container **10** by collapsing the container under hand pressure. The attachment of the cannula **16** to the container **10** resists any tendency to dislodge the dispenser, but more importantly, the flexible nature of the pocket walls **19** and **20**, enables them to engage the insert conduit **25** of the cannula and seal against it, the application pressure being transmitted through the fluid contents to the inner surface of the container walls, as indicated diagrammatically by the arrows. Further, the greater the internal pressure, the greater and more progressive will be the sealing area and sealing pressure, thereby preventing loss or spillage, not only during insertion but also during application.

In this as in other embodiments, the limited width of the pocket in relation to the outer diameter of the insert conduit **25** is important in that a narrow mouth of the pocket makes it difficult to insert the dispenser, whereas a wide mouth would permit the inner fold of the pocket to extend outwardly. As an example, if the outer diameter of the insert conduit is 14 mm., the pocket walls should be loose enough to permit easy entry but taut enough to make it difficult to insert a conduit with an outer diameter of 20 mm.

Turning now to the embodiment of FIG. **5**, the flexible walls of a container for flowable contents are designated **117** and **118** respectively, and they are inclined toward a mouth or dispensing location **100**. A pocket is formed of flexible interior walls **119** and **120**.

A dispenser, generally designated **116** is heat-sealed or crimped as at **116A** to the container **112** (either during manufacture or just prior to use).

In this application, the distal end of the dispenser **116** is provided with external threads **131**, and a cap **132** is secured to it. The embodiment of FIG. **5** is particularly useful in dispensing pastes. Again, the dispenser is provided with an insert conduit **125** which pierces the innermost portion of the pocket formed by the flexible walls **119, 120**.

Turning now to the embodiment of FIG. **6**, the flexible side walls of a container generally designated **212** are individually designated **217** and **218** respectively. The inner walls of the pocket are designated **219** and **220**. In this embodiment, the dispenser **216** is provided with an enlarged collar **250** over which is received a strip or patch of adhesive or pressure-sensitive tape **251**. The dispenser **216** is provided at one end with an insert conduit **225**, and at the other end with a nipple **253**.

In the embodiment of FIG. **7**, the flexible container is designated **312**, and it has an enlarged neck **313** with first and second side borders **314** and **315**. Apertures **350** and **351** are provided in the borders **314** and **315** respectively, at locations adjacent the gusset which is generally designated **355**.

The dispenser, generally designated **316**, includes an insert conduit **325** and an irrigating applicator **360**. The dispenser is attached to a rigid body **361** of sheet material by means of a ring bracket **365**. The body **361** is provided with side tabs **370, 371**, which are received in the apertures **350, 351** respectively, and thence bent backward to secure the attaching dispenser and its holder to the borders of the flexible container adjacent the mouth, after the insert conduit **325** has been inserted into the pocket **355** and pierced the innermost end thereof to dispense the fluid contents of the container.

In the embodiment of FIG. **8**, the container is similar to that shown in FIG. **7** and generally designated **312**. In this embodiment, however, a rigid receiving device **380** including bosses **381** is attached to the container **312** adjacent its mouth, and outwardly of the pocket **355**. The central outer portion of the member **380** is provided with an extension **383** defining a V-shaped guide surface **384** leading into a receiving mouth **385**.

The dispenser is generally designated **416**, and it includes an insert conduit **425** and a needle **450**. A central body portion **451** is provided with a rivet-like attaching device **452**, having a neck **453** which is guided, during insertion, by the guide surfaces **384** into the mouth **385**, where it is secured during use. The inserted position of the insert conduit **25** is shown in dashed line, as at **425A** in FIG. **8**.

In all of the disclosed embodiments, it will be appreciated that the dispenser is attached or secured to the container, and that an insert conduit of the dispenser is received between the inner folds of a pocket formed in the flexible container, the insert conduit of the dispenser piercing the innermost portion of the pocket for dispensing the contents. Further, any back pressure during insertion or any internal pressure exerted on the contents of the container during dispensing will transmit a sealing force to the inner folds of the pocket to progressively wrap the inner folds of the pocket about the insert conduit in sealing, wrapping engagement to prevent loss of contents during insertion and use.

Having thus disclosed in detail a number of embodiments of the invention, each modified to a different application, persons skilled in the art will be able to alter certain of the structure which has been illustrated or substitute equivalent elements for those disclosed while continuing to practice the principle of the invention; and it is, therefore, intended that all such modifications and substitutions be covered as they are embraced within the spirit and scope of the appended claims.

I claim:

1. A package, comprising a sealed, collapsible container of puncturable, flexible material and defining a dispensing location, a portion of said container adjacent said dispensing location being doubly folded to provide two inner folds defining a pocket, said folds being joined at an innermost location; receiving means on said container adjacent said dispensing location; dispenser means detachably securable to said container, and including an insert conduit for insertion between said inner folds of said pocket for penetrating the innermost portion thereof to gain access to said contents of said container, and means on said dispenser for securing said dispenser to said container at said receiving means adjacent said dispensing location; said

receiving means on said container providing stiffening means including a stiffened tab portion of said container defining an aperture adjacent said pocket for stiffening said container adjacent said pocket to retain said folded shape even when the contents are subjected to pressure; and means projecting from the body of said dispenser for extending through and coupling with said aperture of said tab portion of said container when said dispenser means is inserted in assembled relation with said container; whereby back pressure during insertion of said dispenser means and hand pressure exerted on said container after insertion will be transmitted to the inner folds of said pocket to force the same together in progressive sealing engagement with said insert conduit to prevent seepage of the contents.

2. A package, comprising a sealed, collapsible container of puncturable, flexible material and defining a mouth adjacent a dispensing location, a portion of said container adjacent said dispensing location being doubly folded to provide two inner folds defining a pocket, having a channel shape and extending across said mouth, said folds being joined at an innermost location; said container including first and second apertures adjacent the ends of said pocket; receiving means on said container adjacent said dispensing location; and dispenser means detachably securable to said container, and including an insert conduit for insertion between said inner folds of said pocket for penetrating the innermost portion thereof to gain access to said contents of said container, and means on said dispenser means for securing said dispenser means to said container at said receiving means adjacent said dispensing location; said dispenser means providing stiffening means for stiffening said container adjacent said pocket to retain said folded shape even when the contents are subjected to pressure and including a rigid base portion with first and second tabs extending therefrom, said tabs registering with the apertures on said container when said dispenser means is assembled thereto in dispensing relation, said dispenser means further comprising means for mounting said insert conduit to said rigid base portion, whereby when said dispenser means is assembled to said container in dispensing relation, the tabs of said base portion of said dispenser means are in register with said apertures of said container and said tabs may be folded backwardly to releasably secure said dispenser means to said container, said insert conduit extending through said pocket and penetrating the innermost portion thereof; whereby back pressure during insertion of said dispenser means or hand pressure exerted on said container after insertion will be transmitted to the inner folds of said pocket to force the same together in progressive sealing engagement with said insert conduit to prevent seepage of the contents.

3. The structure of claim 2 wherein said dispenser means further comprises an irrigation device in fluid communication with said insert conduit and extending from the other end thereof.

4. A package, comprising a sealed, collapsible container of puncturable, flexible material and defining a mouth adjacent a dispensing location and two apertures adjacent said location, a portion of said container adjacent said dispensing location being doubly folded to provide two inner folds defining a pocket, said folds being a pleated portion of a wall of said container extending across said mouth and joined at an innermost location; stiffening means for stiffening said container adjacent said folds to maintain said pocket comprising a stiff attaching member having projections extending through the apertures of said container and including a socket with a lead-in surface; first and second receiving means on the periphery of said container adjacent said dispensing location; and dispenser means detachably securable to said container, and including an insert conduit for insertion between said inner folds of said pocket for penetrating the innermost portion thereof to gain access to said contents of said container, said insert conduit further including a projection adapted to snap into said socket, guided during insertion by lead-in surface and means on said dispenser means for securing said dispenser means to said container at said receiving means adjacent said dispensing location; whereby back pressure during insertion of said dispenser means or hand pressure exerted on said container after insertion will be transmitted to the inner folds of said pocket to force the same together in progressive sealing engagement with said insert conduit to prevent seepage of the contents.

5. The apparatus of claim 4 wherein said dispenser means further comprises a needle extending from the end thereof opposite said insert conduit.

6. A package, comprising a sealed, collapsible container of puncturable, flexible material and defining a dispensing location, a portion of said container adjacent said dispensing location being doubly folded to provide two inner folds defining a pocket, said folds being joined at an innermost location; means for stiffening said container adjacent said folds to maintain said pocket; receiving means on said container adjacent said dispensing location; and dispenser means detachably securable to said container, and including an insert conduit for insertion between said inner folds of said pocket for penetrating the innermost portion thereof to gain access to said contents of said container, and means on said dispenser for securing said dispenser to said container at said receiving means adjacent said dispensing location; said dispenser including rigid connector means releasably secured to said dispenser means and adapted to be releasably secured to said container to provide said stiffening means for stiffening said container adjacent said pocket to retain said folded shape even when the contents are subjected to pressure; whereby back pressure during insertion of said dispenser means or hand pressure exerted on said contaner after insertion will be transmitted to the inner folds of said pocket to force the same together in progressive sealing engagement with said insert conduit to prevent seepage of the contents.

7. A package, comprising a sealed, collapsible container of puncturable, flexible material and defining a dispensing location, a portion of said container adjacent said dispensing location being doubly folded to provide two inner folds defining a pocket, said folds being joined at an innermost location; means releasably secured to said container for stiffening said container adjacent said folds to maintain said pocket; receiving means on said container adjacent said dispensing location; and dispenser means detachably securable to said container, and including an insert conduit for insertion between said inner folds of said pocket for penetrating the innermost portion thereof to gain access to said contents of said container, and means on said dispenser for securing said dispenser to said container at said receiving means adjacent said dispensing location; said stiffening means when secured to said container stiffens

said container adjacent said pocket to retain said folded shape even when the contents are subjected to pressure; whereby back pressure during insertion of said dispenser means or hand pressure exerted on said container after insertion will be transmitted to the inner folds of said pocket to force the same together in progressive sealing engagement with said insert conduit to prevent seepage of the contents.

8. A package, comprising a sealed, collapsible container of puncturable, flexible material and defining a dispensing location, a portion of said container adjacent said dispensing location being doubly folded to provide two inner folds defining a pocket, said folds being joined at an innermost location; means for stiffening said container adjacent said folds to maintain said pocket; receiving means on said container adjacent said dispensing location; and dispenser means detachably securable to said container, and including an insert conduit for insertion between said inner folds of said pocket for penetrating the innermost portion thereof to gain access to said contents of said container, and means on said dispenser for securing said dispenser to said container at said receiving means adjacent said dispensing location; said stiffening means being fixed to said dispenser means for stiffening said container adjacent said pocket to retain said folded shape even when the contents are subjected to pressure; whereby back pressure during insertion of said dispenser means or hand pressure exerted on said container after insertion will be transmitted to the inner folds of said pocket to force the same together in progressive sealing engagement with said insert conduit to prevent seepage of the contents.

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