Oct. 8, 1963 S. LIPSCHUTZ ETAL 3,106,329

DISPENSER PACKAGE

Filed March 14, 1961 2 Sheets-Sheet 1

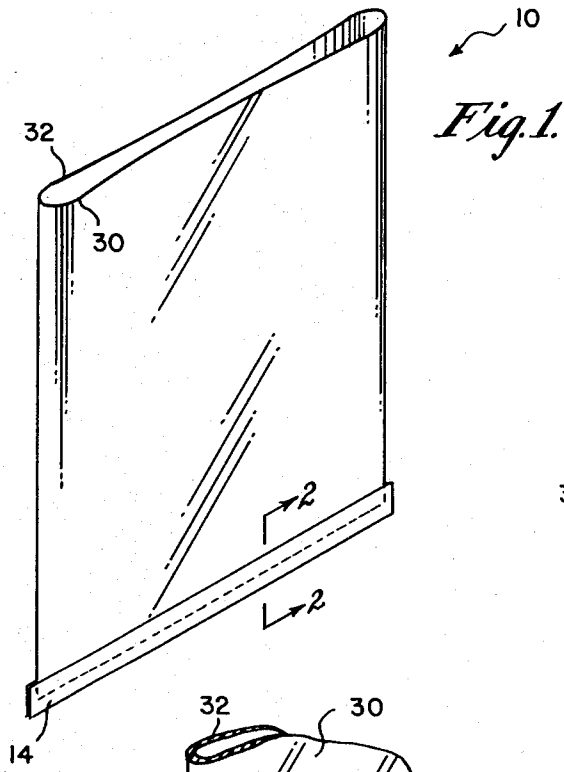

Fig.1.

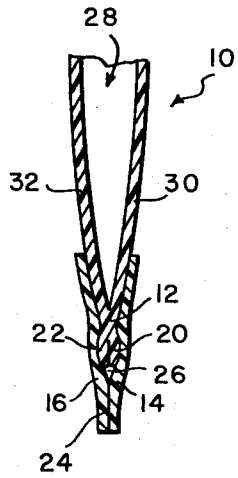

Fig.2.

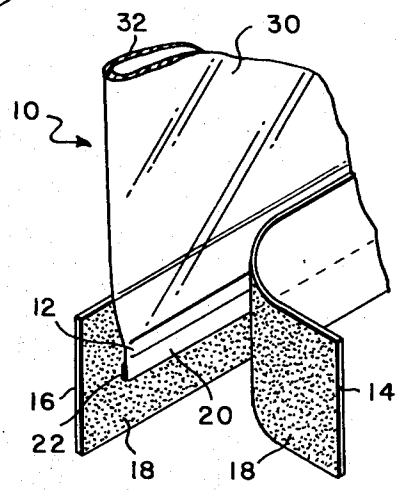

Fig.3.

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DISPENSER PACKAGE

Filed March 14, 1961 2 Sheets-Sheet 2

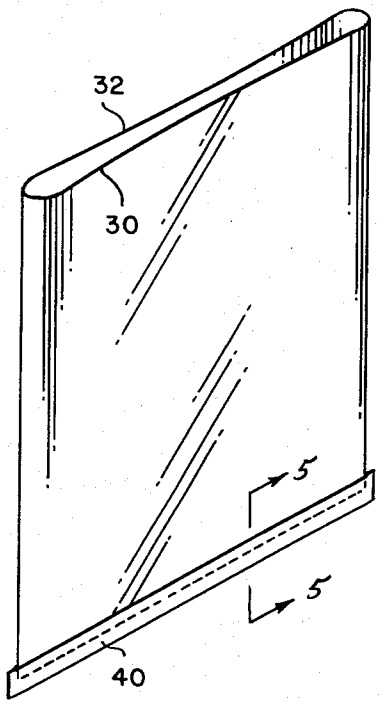

Fig. 4.

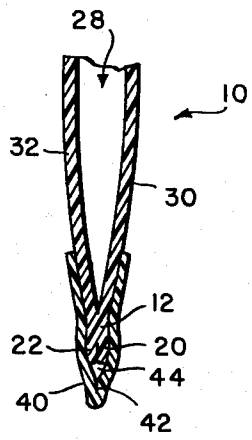

Fig. 5.

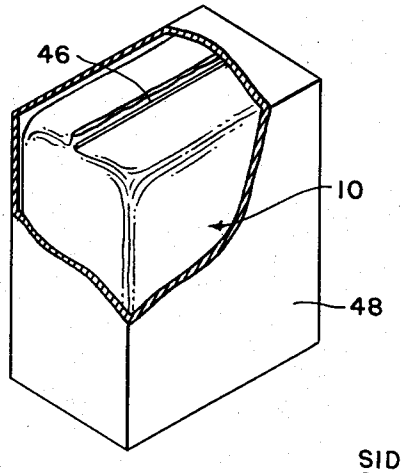

Fig. 6.

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DISPENSER PACKAGE

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6 Claims. (Cl. 229—14)

This invention relates to containers for corrosive liquids and, more particularly, it relates to containers of the multiple unit type.

It has been the prior practice in the industry to package corrosive liquids such as acids or alkalies in containers consisting of a relatively rigid outer unit made of fiberboard enclosing a flexible inner unit of non-corrosive material such as polyethylene, cellulose acetate and the like. The flexible inner unit heretofore used has consisted of inner and outer flexible bags entirely separated from each other except for a single common line of sealing at the bottom thereof. The purpose of this construction is to protect against leakage or inadvertent rupture of the unit resulting in a flow thereof into the outer unit This flow must be avoided as the corrosive liquid will quickly damage the outer unit and leak into the surrounding area.

It has been discovered that the aforementioned combination of flexible inner and outer bags has not proved to be adequate. Because a liquid is contained within the inner bag, the bag combination must resist a characteristic of liquids under confinement known as hydrostatic shock. This occurs whenever the bags must be moved such as when being transported to the user's site. Whenever the bags are shaken in any way, pressure waves are generated within the liquid which cause it to tend to move in a lateral direction or to force the sides of the bag away from each other. In the case of a solid, the pressure wave is almost immediately dissipated but, with a liquid, the pressure waves rebound from the sides of the bag and move toward an opposing side. Moreover, where there is more than the slightest degree of shaking or vibration, many pressure waves in varying directions are established which create unusual stresses against the bottom seam of the bag where, of course, the hydrostatic pressure is greatest. Where the bottom seam is exposed to the unusual pressure waves for any degree of time, there is a danger that it will rupture.

The foregoing problem was effectively solved in pending application Serial No. 14,838 filed March 14, 1960. In this application, there was provided a combined inner and outer flexible bag with open upper ends coaxially arranged and the bags being separate from each other except at their bottom edges which were joined by a double line of heat sealing comprising an upper and a lower seal separated by an air space. In this construction, the lower seal and the air space thereabove supported the upper seal. The outer bag tended to assist the inner bag in resisting hydrostatic shock and the tendency of the liquid in the inner bag to spread the walls thereof.

The manufacture of this bag, however, involved a series of manipulative steps. One process of manufacture included forming pairs of closely spaced lateral seals in a flexible tube at relatively widely spaced intervals. The tubing was then severed approximately at mid-points between adjacent seal pairs to form units comprising two half sections open at one end and having a common edge. The unit was then reversed by turning one of the half sections inside out so as to telescope over the other open half section. The half section so reversed becomes the outer bag.

Another process of making the multiple bag assembly comprised providing a first and second section of flexible

tubing, one end of the first tubing section was heat sealed and the other end open. The ends of the second tubing section were both open. The second tubing section was telescoped over the first tubing section and heat sealed to the first tubing section in such a manner that the walls of the second tubing section were heat sealed to short legs depending from the heat seal formed in the first tubing section. The heat sealing operation also included a simultaneous cutting or trimming action performed by the hot knife. The second heat seal was so formed as to be spaced from the first heat seal by a cushioning air space.

It is thus seen that the foregoing manipulative operations tended to increase the cost of the bag unit and, therefore, it is desirable that these be minimized.

It is accordingly an object of the present invention to provide a novel dispenser package which will resist the destructive pressure caused by hydrostatic shock. A further object of the present invention is to provide a novel dispenser package which comprises seal and means to support the seal in a simple and economical manner.

Yet another object of the present invention is to provide a novel dispenser package with but a single flexible bag which is easily manufactured with a minimum of manipulative steps and which possesses the desirable properties of multi-bag dispenser packages heretofore manufactured by more complex techniques.

The foregoing, as well as other objects of the invention, are achieved by providing a package comprising a multiple unit container, the container including an outer unit of substantially rectangular shape and relatively rigid construction and an inner unit comprising a flexible bag having an open upper end and a closed bottom end. Tape means secured adjacent the closed bottom end of the bag and being positioned to lie over both sides of the bottom end, the tape means meeting at a common point below the closed end. The tape means support the closed bottom end and prevent it from being spread apart by fluid contained in the bag. Moreover, the tape means meet at the common point in such a manner as to provide an air space thereabove which also supports the closed bottom end.

Other objects and many of the attendant advantages of this invention will be readily appreciated as the same becomes better understood by reference to the following detailed description when considered in connection with the accompanying drawings wherein:

FIG. 1 is a perspective view of a novel dispenser package embodying the present invention;

FIG. 2 is an enlarged sectional view taken along the lines 2—2 of FIG. 1;

FIG. 3 is an enlarged fragmentary perspective view of a lower corner at the bottom end of the bag of FIG. 1 and showing an adhering tape partially removed;

FIG. 4 is a perspective view similar to FIG. 1, but showing a slightly modified embodiment of the dispenser package of this invention;

FIG. 5 is an enlarged sectional view taken along the line 5—5 of FIG. 4; and

FIG. 6 is a perspective view of a multiple unit container embodying the present invention, the outer unit of the container being broken away to expose the inner dispenser package.

Referring now in greater detail to the various figures of the drawing wherein similar reference characters refer to similar parts, there is shown in FIG. 1 a novel dispenser package **10** constituting an embodiment of this invention. The package **10** is of a flexible material such as polyethylene or cellulose acetate and assumes the shape of a bag. The package **10** is used in a manner generally similar to the packages disclosed and claimed in pending application Serial No. 9,898, filed February

19, 1960. In other words, the flexible bag is positioned in an outer unit such as a stiff fiberboard box of generally rectangular shape. A probe or tap of the nature of the device disclosed and claimed in pending application Serial No. 845,851, filed October 12, 1959, is then thrust directly through the fiberboard wall and also through the flexible wall of the container **10**. The plastic memory of the material comprising the flexible bag **10** tightly adheres about the tap (not shown) and the corrosive liquid contained in the flexible bag **10** may flow through the tap and then through a hose secured to the tap to be dispensed as desired. The bag **10** may be held in the fiberboard container to facilitate the insertion of the tap in the manner disclosed and claimed in pending application Serial No. 43,532, filed July 18, 1960.

Returning now to the drawing, the bag **10** is heat sealed to form a heat seal **12** along its lower edge as indicated in FIG. 2. Tapes **14** and **16** of polyethylene or other well known material have a surface coated with a pressure sensitive adhesive **18**. The tapes **14** and **16** are each adhered to the bag **10** about the entire extent of heat seal **12** as shown in FIGS. 2 and 3 in such a manner that the adhesive surfaces thereof face each other to lie adjacent the outer surfaces of the bag **10** and adhere strongly thereto.

The adhesive tapes **14** and **16** are of sufficient thickness that they extend downwardly in the adhered position from the outer walls of the bag **10**, over spaced legs **20** and **22** which depend from heat seal **12** and which constitute a part of the bag **10**. The adhesive tapes **14** and **16** then extend downwardly beyond the legs **20** and **22** and finally adhere together at common point **24**. In so doing, an air space **26** is formed, delineated by legs **20** and **22** and tapes **14** and **16**. Air space **26** functions as a cushion to protect the heat seal **12**. A slightly modified embodiment of this invention is shown in FIG. 4. It is seen therein that tapes **14** and **16** are replaced by a single tape **40**. This tape is approximately twice the width of either tape **14** or **16**, and is folded in half, with each half functioning as one of the tapes **14** or **16**. As seen in FIG. 5, tape **40** forms a junction **42** below seal **12** and additionally provides an air space **44** between the seal **12** and junction **42**. Air space **44** serves the same function as air space **26**.

In use, the acid or other corrosive material is dispensed in the bag **10** and held therein because of the reliable bottom seal **12** just described. The weight of the acid in the bag **10** tends to spread sides **30** and **32** thereof to pull apart heat seal **12**. This spreading action is resisted in the area of the heat seal **12** by the adhering tapes **14** and **16**. In addition, the junction **24** of the tapes **14** and **16**, in cooperation with cushioning air space **26** plus depending legs **20** and **22** from heat seal **12**, gives more than adequate support to the heat seal **12**. As previously stated, such support enables heat seal **12** to resist the hydrostatic shock of the liquid **28** which occurs whenever the bag **10** is shaken such as during transportation to the user's site.

The present device is simply manufactured by employing a tube of flexible material and collapsing it to form sides **30** and **32**, permitting the upper end to remain open and forming the seal **12** by heat sealing apparatus or

other known devices. Seal **12** is preferably formed to permit legs **20** and **22** to depend therefrom. Tapes **14** and **16** are then positioned at the lower edges of sides **30** and **32** to be against seal **12** and meet at common point **24** to provide cushioning air space **26** thereabove. The use of bag **10** is illustrated in FIG. 6. As seen therein, after bag **10** is filled it is sealed along its top edge as at **46**. It is then placed within outer rigid box **48**, which box is subsequently sealed. Bag **10** contains a liquid which will subsequently be dispensed.

It is thus seen that a reliable lower seam for a bag to contain a liquid is established without the necessity of providing a second bag positioned about the liquid containing bag with the accompanying extra costs, heat sealing, cutting and manipulative operations.

Obviously many modifications and variations of the present invention are possible in the light of the above teachings. It is, therefore, to be understood that within the scope of the appended claims, the invention may be practiced otherwise than as specifically described.

What is claimed as the invention is:

1. A package containing a liquid which is adapted to be probe dispensed therefrom comprising a multiple unit container including an outer unit of substantially rectangular shape and relatively rigid construction and an inner unit containing said liquid and comprising a flexible plastic bag having a seal along its lower edge, tape means positioned to lie against said seal and meet at a common point below said seal, said tape means further meeting adjacent the edges of said bag to provide an enclosed cushioning air space below said seal, said tape means being on lateral sides of said bag and having portions thereof lower than any part of said bag, whereby said tape means support the seal and also resist the spreading tendencies and hydrostatic shock of the contained liquid.

2. The invention of claim 1 wherein said bag has opposing sides which are joined at the seal along the lower edge of the bag.

3. The invention of claim 2 wherein said seal is formed above the lower edge of said sides to permit a pair of short legs to depend from said seal.

4. The invention of claim 3 wherein said tape means lie against said sides in opposing relation to lie against said seal and meet at a common point below said seal.

5. The invention of claim 4 wherein said tape means constitute two tapes.

6. The invention of claim 4 wherein said tape means constitute a single tape folded to form opposing adhesive surfaces.

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