Aug. 28, 1956 E. E. LAKSO 2,760,630

FOIL COVERED AMPOULE

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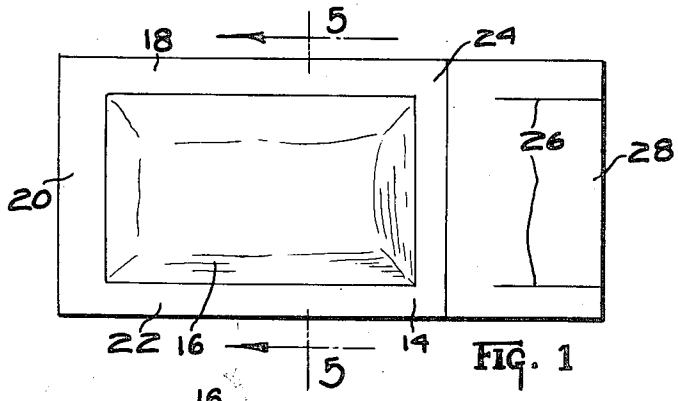


FIG. 1

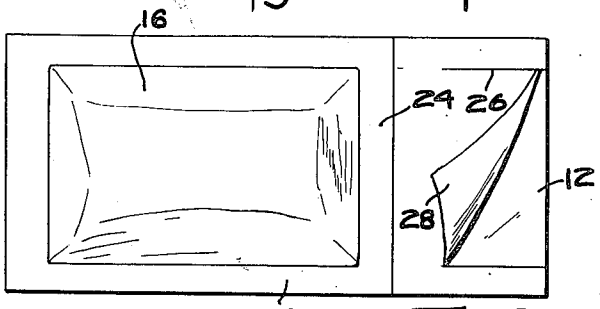


FIG. 2

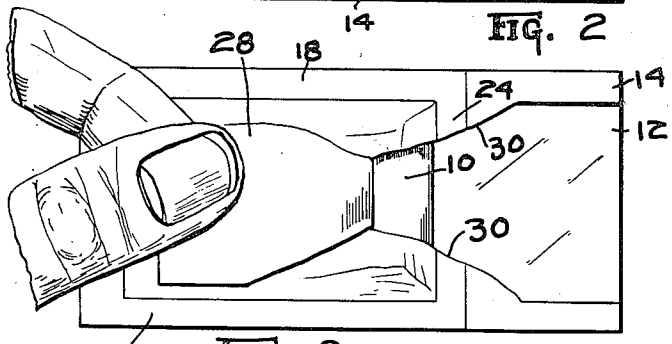


FIG. 3

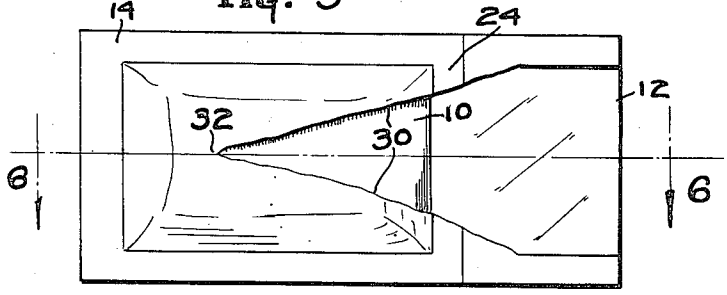


FIG. 4

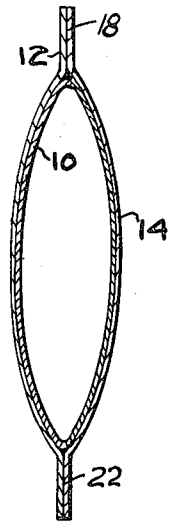


FIG. 5

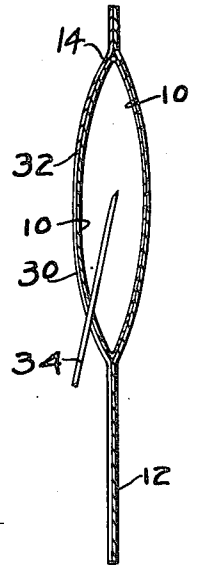


FIG. 6

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FOIL COVERED AMPOULE

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Application December 8, 1954, Serial No. 476,320

1 Claim. (Cl. 206—56)

This application is a continuation-in-part of my prior application Serial No. 200,322 filed December 12, 1950, now abandoned, and relates to a thin walled, puncturable plastic ampoule, in combination with a reenforcing and moisture-impervious, heat-sealed covering, in which the cover itself is heat-sealable and preferably of a material in the nature of metal foil, said cover completely enclosing the ampoule and being provided with an extending portion including a tab which may be grasped in the fingers and torn in toward the area of the ampoule, so as to expose the latter for purposes of content extraction, as by a hypodermic needle or other means which easily penetrates the plastic wall exposed for access to the ampoule contents.

Plastic ampoules or the like containers are most easily made in a practical manner from a material known as polyethylene, this material being heat-sealable and easily produced in tube or sheet form of thin stock, so that ampoules or the like are relatively easily fashioned, filled and closed. However, this material is semi-pervious and transmits moisture or vapor and, therefore, cannot be used for most purposes involving the use of serums, medicines, etc. This invention contemplates covering medicine or serum containing ampoules by some impervious material such as thin, flexible, coated metal foil, but in this case it has been found difficult to puncture the ampoule to extract the contents.

It is the principal object of the present invention to provide a practical and inexpensive pervious polyethylene ampoule or container completely covered and rendered impervious as described above, the cover being completely sealed and including a special new and improved tearing tab for quickly and easily disrupting the same and ensuring quick access to at least a portion of the plastic ampoule for easy extraction of the contents, while at the same time the tab provided for disrupting the cover is substantially prevented from accidental tearing and consequent unwanted uncovering of the ampoule, and also avoids many further problems as to bulkiness, inconvenience, etc.

Other objects and advantages of the invention will appear hereinafter.

Reference is to be had to the accompanying drawings, in which

Fig. 1 is a plan view of a covered ampoule according to the present invention;

Fig. 2 is a view similar to Fig. 1, but illustrating the initial action in disrupting the cover to expose the ampoule;

Fig. 3 shows the ampoule exposed in part but with the tearing tab still connected to the cover;

Fig. 4 shows the tearing tab completely removed;

Fig. 5 is a section on an enlarged scale on line 5—5 of Fig. 1; and

Fig. 6 is a section on line 6—6 of Fig. 4.

In illustrating the preferred form of the invention, the ampoule or other container, which is made of a thin, flexible, puncturable heat-sealing plastic, assumes a rectangular or pillow shape. Any other shape is clearly within the limits of the invention, but the shape shown lends itself especially well to manufacture, storage, handling and use.

The material used to make the ampoule is polyethylene or a similar plastic material which is easily made into ampoules, filled, sealed, etc. This material is easily puncturable by means of a hypodermic syringe needle or other device of like nature, and is easily cut if necessary, to provide access to the contents thereof for use as needed or desired. However, it has been determined that such plastic ampoules containing aqueous solutions of medicaments tend to lose weight due to the diffusion of water vapor through the polyethylene wall of the ampoule. This loss of water is sufficiently substantial so that the product does not have sufficient shelf life for any such period of time, as is ordinarily encountered in practice.

Tests show that the loss in weight in water per square inch is 1.6 grams, that is 1.6 cc. per square inch of surface per 0.001" of thickness in the three year period. Thus the present ampoules lose over one-half of their volume considering that the original volume is two cubic centimeters. This renders impractical the otherwise very desirable ampoule.

The permeability values for polyethylene film in respect to various pure liquids are shown below:

	Grams per 100 sq. in. transmitted by 1-mil film in 24 hr.
Mineral oil	0.007
Water	0.16
Ethylene glycol	0.02
Ethyl alcohol, 95%	0.55
Nitrobenzene	2.60
Acetone	7.6
Kerosene	18
Propionaldehyde	25
Butyl acetate	40
Turpentine	61
Toluene	320
Diethyl ether	410

In order to combat this loss of content which renders the ampoule impractical, this invention proposes to cover the same with foil which is impervious and which lends itself to provide an adequate cover for the ampoule. However, the foil is not easily punctured by the hypodermic needle and therefore the ampoule cover has been made with novel means to render the same accessible to the needle.

The material used to cover the ampoule is preferably a metal foil which is easily handled because of its light weight, flexibility, and thinness. This foil is first coated on one side with a thin film of polyethylene or other heat-sealing material as indicated at 8, so that the foil itself becomes heat-sealable. The ampoule which is indicated at 10 is placed between two layers of the coated foil, the coated sides of which contact the ampoule and each other. Instead of using two sheets of foil for this purpose, a single coated sheet may be utilized and folded over upon itself and the ampoule along one edge, so that the edges may be heat-sealed. In either case, however, the foil cover half-portions 12 and 14 are placed in a superposed relation including the ampoule which occupies the area indicated at 16 in Figs. 1 and 2.

The two layers 12 and 14 are then sealed completely about the ampoule by pressing or pressing and heating at the edges, forming a continuous border which is indicated at 18, 20, 22 and 24. Thus the ampoule is completely hermetically sealed within the metal foil layers or sheets, this effect being due to the adherence of one coated foil to the other.

At one edge of the ampoule, herein shown as adjacent to the sealed border portion **24**, the two foil sheets extend outwardly in flattened superposed relation, and this extended area of the cover forms a double tab which is conveniently used for handling the ampoule. However, the sheet **14** is slit, cut or perforated along spaced lines **26**, forming a separate, smaller tab **28**. Tab **28** may be free of sheet **12**, that is, not sealed thereto, but lies in flat position thereon because it preferably has been pressed down into close but not sealed relation therewith at the time of formation of the heat-sealing border **18**, **20**, **22** and **24**.

In order to expose the ampoule so as to use the contents, the tab **28** is grasped between the thumb and forefinger and pulled inwardly toward the ampoule or toward the left in Figs. 2 and 3. When this is done, tab **28** tends to tear the cover **14** along converging lines **30** and easily tears directly through heat-sealed border **24** and into the area of the ampoule in a triangular form, see especially Fig. 4, and finally at about the point **32** the tear tab is completely disrupted from the cover part **14**.

The cross sectional view of Fig. 6 illustrates the fact that the ampoule is now exposed over a sufficient area for the insertion thereinto of a hypodermic needle **34**; or the ampoule may be cut or opened in any other way desired to extract the contents.

It will be seen that this invention provides an inexpensive, easily manufactured, practical ampoule or other plastic container of the class described, having an impervious cover which, however, is easily and quickly disrupted when it is desired to use the ampoule contents. The extending tab may be used also for printed material, labeling, etc., and provides a convenient finger tab by which the ampoule may be easily handled, both before disruption of tab **28** and afterward. Further, the extending tab being thin and comprising essentially but two layers of thin metal foil, results in an extremely small storage space being necessary in addition to that required for the ampoules or containers themselves.

Having thus described my invention and the advantages thereof, I do not wish to be limited to the details herein disclosed, otherwise than as set forth in the claim, but what I claim is:

A substantially flat covered ampoule package of substantially rectangular shape adapted to be stored for a long period of time without deterioration of the contents of the ampoule, and having means whereby access may be had to the ampoule to permit extraction of its contents, comprising a fluid containing ampoule having a thin wall of heat-sealable plastic material such as polyethylene which is semi-pervious to the contents of the ampoule and which wall may be readily punctured to extract the contents of the ampoule, an outer cover of material such as metal foil which is impervious to the contents of the ampoule and which is also more difficult to puncture than the wall of the ampoule, such cover being in the form of two superposed halves with the ampoule completely enclosed between said cover halves, and said cover halves extending beyond the ampoule to form a sealed border completely surrounding the same, said halves being heat-sealed together throughout the border, said cover halves extending a substantial distance beyond the ampoule at one edge to form a two-ply tab, one ply only having a pair of thin substantially parallel slits extending from the outer edge of the tab toward the ampoule and terminating short of said sealed border, said slits forming a finger-grip for tearing a portion of the cover half to expose a portion of the plastic ampoule to permit puncturing the same to extract its contents, said finger-grip being free of adhesion to the tab.

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