

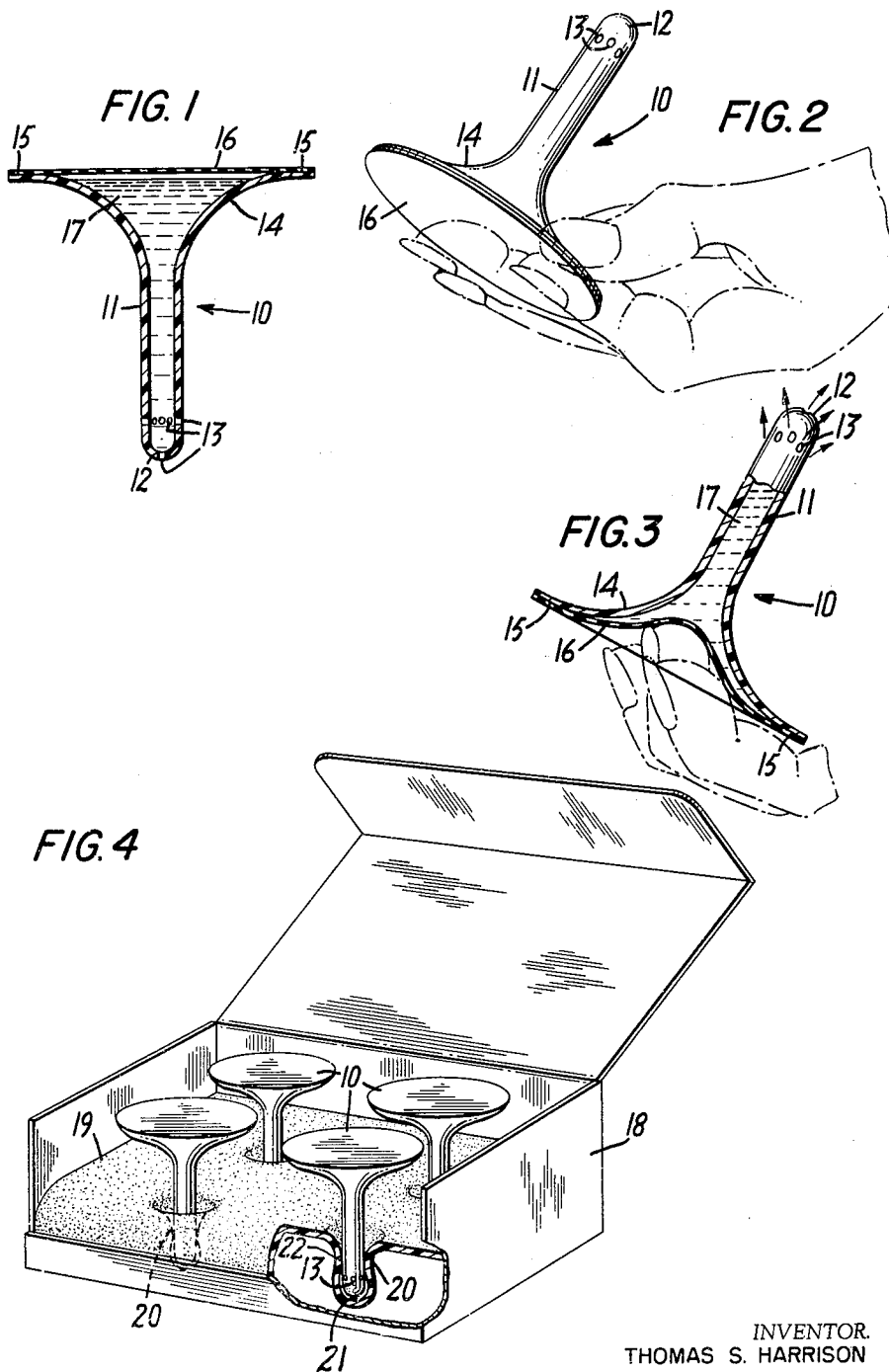
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INTERNAL MEDICAMENT APPLICATOR

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INTERNAL MEDICAMENT APPLICATOR

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The invention relates in general to fluid applicators and more particularly to applicators suitable for injecting medicament into body cavities.

Collapsible dispensing units such as syringes have long been known in the art with many of these devices being made from rubbery material and formed into one-piece totally flexible units. The flexibility of the neck portion of this type of applicator often causes difficulty when it is being inserted into a small body cavity, for the premature yielding of a portion of the wall will unfortunately force the applicator to discharge its contents at the wrong location. Furthermore, the rubbery composition of these totally flexible applicators often prevents their use, between applications, as storage facilities for certain medicaments which in time would be contaminated by the applicator walls.

There are, of course, rigid applicator nozzles presently on the market, but these units, which are designed to be fastened onto a flexible container, are very difficult to manipulate and are often unsatisfactory where sterilization is important. This type of rigid applicator has been designed for repeated use which necessitates washing and sterilizing the unit after each application, a process which is not always effective. Furthermore these rigid applicators must be handled and usually screwed into the medicament container, thus greatly increasing the danger of contamination.

The applicator disclosed by this invention overcomes these disadvantages and consists of a body of plastic or other material flared conically at its base so as to form a reservoir for medicament. This reservoir is connected through a hollow neck to a perforated tip, the length of the neck being determined by the body cavity for which it is designed. A thin plastic film which is elastically expandable, hermetically seals one dose of the prescribed medicament within the reservoir. When placed under manual pressure, the film expands inwardly, reducing the volume of the reservoir and forcing the contained fluid, in turn, through the neck and apertures and onto the irritated area.

It is intended that a plurality of applicators be mounted on a thin plastic base, in which wells of appropriate depth and diameter have been formed. The individual applicators are to be inserted in, and their perforated tips sealed by, the wells.

There is thus provided by this invention a single dose disposable unit which dispenses with time-consuming and often uncertain sanitary precautions which are necessary when using the many devices presently available. The inexpensive disposable unit disclosed herein, may be manufactured in such quantity and at such a low cost that the entire unit may be disposed of after a single application. Since the medicament and the tip of the applicator are free from contamination until initially used, this device insures complete sterilization upon every application, an assurance which cannot be made by applicators designed for repeated use.

This invention also provides a novel dispensing unit consisting of a platform and a series of wells each of which rigidly supports the neck portion of a disposable applicator and hermetically seals the perforations or apertures in the tip of the applicator thereby providing for sterilization of the medicament. These platform wells lock the applicators in place with the flared base of each

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applicator projecting outwardly away from the platform to facilitate removal from the container. It is important to note that the single motion of pulling the applicator from its supporting unit also breaks the seals covering the apertures in the tapered neck, rendering the entire unit ready for immediate use. This invention thus eliminates the often troublesome and unsterile methods of removing the seal from applicators which are presently employed in this field.

Furthermore the invention herein disclosed provides an efficient method for the self-administration of medicament by allowing the user to hold the applicator in a convenient manner when removing it from its storage container and when actually ejecting the prescribed medicament onto the desired area. This method consists of holding the flared base between the tips of the fingers and the thumb when removing the applicator and of shifting slightly to apply pressure with the three middle fingers against the expandable elastic film covering the base after the applicator has been inserted. Allowing the user to readily shift his grip on the base of the applicator between removal and application not only eases handling but assists greatly in lowering the possibility of contamination.

Still further, the neck portion of the applicator which is designed for entering body cavities is rigid in structure, thus easing insertion and avoiding the problem of premature yielding discussed above. In addition, with this design, it is possible to store medicament within the applicator for extended periods of time since plastic or some other non-reacting rigid material can be used in place of the rubbery substance found in the syringe-type applicators, which are now available.

Other objects and a fuller understanding of the invention may be had by referring to following description and claims, taken in conjunction with the accompanying drawing in which:

FIGURE 1 shows a cross-sectional elevation of the applicator filled with medicament;

FIGURE 2 shows an isometric view of the applicator as it is held during insertion;

FIGURE 3 shows a partial cross-sectional elevation of the applicator in a compressed position having ejected its contents;

FIGURE 4 shows a partially cut-away isometric view of a dispensing unit composed of a container and four applicators sealed therein.

With reference to the drawings, the applicator is indicated generally by the reference character 10 and, as illustrated in FIG. 1, is in part composed of a substantially rigid hollow body having an elongated neck portion 11, being generally cylindrical in shape and leading to a semi-spherical perforated end portion 12. A series of apertures 13 pierce end portion 12 and extend through the cylindrical side wall at the part of the neck portion 11 which is adjacent end portion 12, piercing at points generally equidistant along the circumference of the wall. The upper part of the rigid body consists of a base 14 flaring conically at a substantially large diverging angle. The flared base 14 curves gently outward at its extreme upper point forming a circumferential rim 15 in a plane generally perpendicular to the elongated cylindrical neck portion 11.

A thin elastically expandable film 16 is drawn tightly over the outer rim 15 and is hermetically sealed thereto. During application the user merely compresses this expandable film inwardly, thereby forcing the fluid contained within reservoir 17 outwardly through the neck 11 and the plurality of apertures 13. As described above, this method for ejecting medicament may be performed quite easily by merely holding the conically flared base 14 between the outer fingers and applying pressure with

the three middle fingers on the film 16 as shown in FIG. 3.

The applicators 10 may be marketed in a group and dispensed from the container 18 as shown in FIG. 4. The platform 19 which is made from plastic or other material contains a series of wells 20, each of which provides support for one applicator 10. The side walls of the wells 20 not only hold the applicators rigidly in place, but in addition, provide the all important function of hermetically sealing the apertures 13, thereby keeping the ointment or medicament within the reservoir 17 free from contamination.

In the preferred embodiment of the container shown in FIG. 4 the lower portion of the wells 20 expands into a wider recessed portion 21 below the rigid seal 22. In this version the recess 21 surrounds all of the apertures 13 and receives a small amount of the medicament therethrough; this medicament being sufficient to lubricate the lower tip of the applicator and ease its removal from the well. Other embodiments are, of course, envisioned in which each aperture 13 is individually sealed against the side wall of the well 20.

The three operational steps, i.e., removal, insertion and ejection, are all easily and conveniently performed when using this applicator. As shown in FIG. 4 the upper conically flared base portion of the applicator 10 may easily be removed by simply having the user place two or three fingers beneath one side of base 14 and his thumb beneath the other side and by having him pull straight upwardly. In this manner the applicator is quickly removed from its supporting unit and, at the same time, the sterile apertures which deliver the medicament to the irritated area are freed from their seal.

Once the applicator is removed it may be readily positioned for insertion as shown in FIG. 2 with the three center fingers placed against the elastically expandable film.

Finally, with the applicator placed in the appropriate body cavity, its contents may be ejected by having the user press his three center fingers against the expandable film as shown in FIG. 3. The flared base 14 engages the sides of body cavity and resists this manual pressure thereby holding the applicator in place and permitting the ejection of the medicament.

Each applicator contains medicament sufficient for a single application, after which it should be disposed. This is an important consideration in avoiding contamination for the applicator which is to be used at the next application is, in the interim, still held in its sealed sterile position, unlike the rigid applicators and the reusable syringes which have to be rinsed and washed for reuse. The invention also avoids the unsanitary practice of refilling the applicator by submerging it into a reservoir of medicament.

Although not disclosed at length herein, other embodiments are envisioned which vary in design but which are within the scope of this invention. For example, applicators are contemplated which have generally conically flared bases, with narrower and wider diverging angles. Also variations in the design of the neck portion in combination with this flared base are contemplated, including, for example, neck portions which are individually suited for a particular body cavity or channeling within the neck portion which will insure that only a very small

portion of the medicament within the reservoir will fail to be ejected from the applicator.

Although the invention has been described with a certain degree of particularity, it is understood that the present disclosure has been made only by way of example and that numerous other changes in the details of its construction or in combination and arrangement of its parts may be resorted to without departing from the spirit and the scope of the invention as hereafter claimed.

I claim:

1. An applicator suitable for injecting medicament into body cavities comprising a substantially rigid hollow body portion having a neck with a perforated tip and having a base flaring conically to an open end defined by a circumferential rim in a single plane, and a thin elastically expandable film portion hermetically sealed across said open end of said flared base substantially in said plane of said rim, thereby forming an enclosed reservoir for holding medicament, said film being expandable inwardly under pressure for ejecting one dose of said medicament through said perforated tip.

2. An applicator suitable for injecting medicament into body cavities as described in claim 1 wherein said perforated tip of said body portion comprises a hollow perforated semispherical end portion and a hollow cylindrical portion having a plurality of apertures extending through the side of said cylindrical portion at points circumferentially equidistant.

3. An applicator suitable for injecting medicament into body cavities comprising a rigid hollow body portion having an elongated neck with a perforated tip and having a base flaring conically from said neck to an opening defined by a circumferential rim in a plane substantially perpendicular to said neck, and a thin elastically expandable film portion across said opening in said base substantially in said plane of said rim, said film being hermetically sealed to said rim thereby forming an enclosed reservoir for holding medicament and being expandable inwardly under pressure for forcing said medicament from said reservoir through said neck and out of the applicator through said perforated tip.

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