SINGLE DOSE APPLICATOR

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This invention relates to new and useful improvements in dispensers for pharmaceutical formulation in the nature of liquids, semi-liquids, and pastes, and relates in particular to dispensers adapted to the application of said pharmaceutical formulations into the vagina.

Herefore it has been the practice to introduce viscous liquid or jelly-like pharmaceutical formulations which are used for the treatment of vaginal infections or for contraception, into the vagina by means of a dispenser which has been filled with a pharmaceutical formulation from a collapsible tube; it has been customary to use the same dispenser repeatedly.

The practice of the prior art entails several disadvantages, the re-use of a mechanical dispenser, in instances where a vaginal infection is being treated, subjects the patient to the possibility of reinfection provided the dispenser is not adequately sterilized after each use. The combination of the dispenser and a collapsible tube containing the pharmaceutical composition to be introduced into a body cavity is bulky and not readily disposable when no longer to be used.

It is necessary, of course, that an applicator designed to be used only once and then discarded be manufactured at the lowest possible cost. Further economy is possible if the applicator is designed to serve as a container for the pharmaceutical formulation. Under these circumstances, the construction must be such that the water and alcohol content or other volatile content of the pharmaceutical formulation does not escape during the storage period between manufacture and use.

An object of this invention is to provide a dispenser by means of which a liquid, semi-liquid, or jelly-like pharmaceutical composition may be neatly, quickly, and conveniently dispensed into a body cavity.

Another object of this invention is to provide a dispenser of simple and inexpensive construction which may be readily manufactured in large quantities and which may be discarded economically or disposed of after use.

Another further object of this invention is to provide a dispenser of the class described adapted to maintain its contents in a sterile condition up to the time of use.

An important object of this invention is to provide a dispenser which is not bulky and is convenient to carry and use.

The accompanying drawings illustrate the structure that is designed to carry out the various objects of the invention, but it is to be understood that the invention is not confined to the exact features in the drawings but that various changes may be made within the scope of the claims which follow.

In the drawings:
Figure 1 is a perspective view of a container designed to store the pharmaceutical formulation to be applied.
Figure 2 is a side elevation of a single use applicator designed to receive the container illustrated in Figure 1.
Figure 3 is a sectional view along the line 3—3 of Figure 2 illustrating the use of the applicator to expel from the container the pharmaceutical composition.

The applicator illustrated in Figure 4 has an inner barrel 10 and an outer barrel 11 of such size at to fit snugly over the inner barrel. The outer barrel 11 preferably has a restricted end 12 and serves the dual function of disposable applicator and container. It is to be sure that the volatile content of the medicament remains unchanged during the storage period, it is advisable that the outer barrel 11 be constructed of an inert and moisture-proof material such as polystyrene or polyethylene. Cylinders of polyethylene and polystyrene may be readily extruded, and these plastics, in addition to being moisture-proof, have excellent dimensional stability and are low in cost.

The restricted end of the barrel 11 is sealed with a moisture-proof plug 13 which may be conveniently constructed of butyl rubber. Butyl rubber is sufficiently flexible that it may be forced into position under slight compression and will provide a moisture barrier for an indefinite period of time. Butyl rubber is also inert to the ingredients likely to be present in the pharmaceutical formulation. The barrel 11 is partially filled with the composition to be administered and is sealed by a movable moisture-proof seal 14. This seal may also be conveniently constructed of butyl rubber and is of such size that when forced into position it will maintain the contents 15 in a sterile condition. The seal 14 is slidable within the barrel 11.

The inner barrel 10 also has a restricted end 16 which serves as a bearing surface when the inner barrel 10 is moved in the direction of the arrow within the outer barrel 11. Inasmuch as the moisture resistance of the barrel 10 is of little importance, it may be constructed of cardboard, plastic, paper, pulp, or any suitable material.

When one wishes to dispense the contents 15 of the applicator illustrated in Figure 4, the stopper 13 is removed and the inner barrel 10 is moved in the direction of the arrow thus exerting pressure against the slidable seal 14 and expelling the contents.

Referring now to Figures 1, 2 and 3, a separate container is provided to retain the pharmaceutical formulation in a sterile condition. A perspective view of the container is shown in Figure 1. This container may be an inexpensive, thin metal tube 17, having a conical tip 18 at one end with an indentation 19. The container 17 is filled with the desired volume of a medicament through the open end 20 which may be conveniently sealed after filling by a slidable seal 21. This slidable seal may be of identical structure and composition as the seal 14 of Figure 4.

Figure 3 illustrates the use of this modification. The container 17 is positioned in the tube 11 so that the shoulder 18 is retained by restriction 12 at one end of the tube. A second tube 10, slightly smaller in diameter,
is placed within the larger tube 11 in such a manner that its restricted end 16 contacts the container seal 21. In use, the end of the container which protrudes beyond the end of tube 11 is broken off at restriction 19, and the composition is administered by forcing the tube 10 and the seal 21 in the direction of the arrow.

It will be apparent to those skilled in the art that the principal objects of the invention have been accomplished and that numerous and various changes and modifications may be made in the embodiments of the invention herein described and that the invention is capable of use and has advantages not specifically described herein; it will, therefore, be appreciated that the hereinmade disclosures are to be construed in the nature of illustration only and that the invention is to be limited 15 or delineated only by the appended claims.

What is claimed is:

1. In combination, a single use applicator adapted to inject pharmaceutical formulations into body cavities comprising a first cylindrical tube constricted at one end; a 20 moisture-proof cylindrical container for said pharmaceutical composition closed at one end with a slidable moisture-proof seal; the other end of said container having a breakable tip of reduced diameter, said container being of such size as to slidably fit within the first tube and be retained by the constriction; and a second cylindrical tube adapted to slide coaxially within the first tube and exert pressure on the slidable moisture-proof seal.

2. The combination of claim 1 in which the slidable moisture-proof seal is constructed of butyl rubber.

3. The combination of claim 1 in which the 25 moisture-proof cylindrical container is constructed of metal.

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