

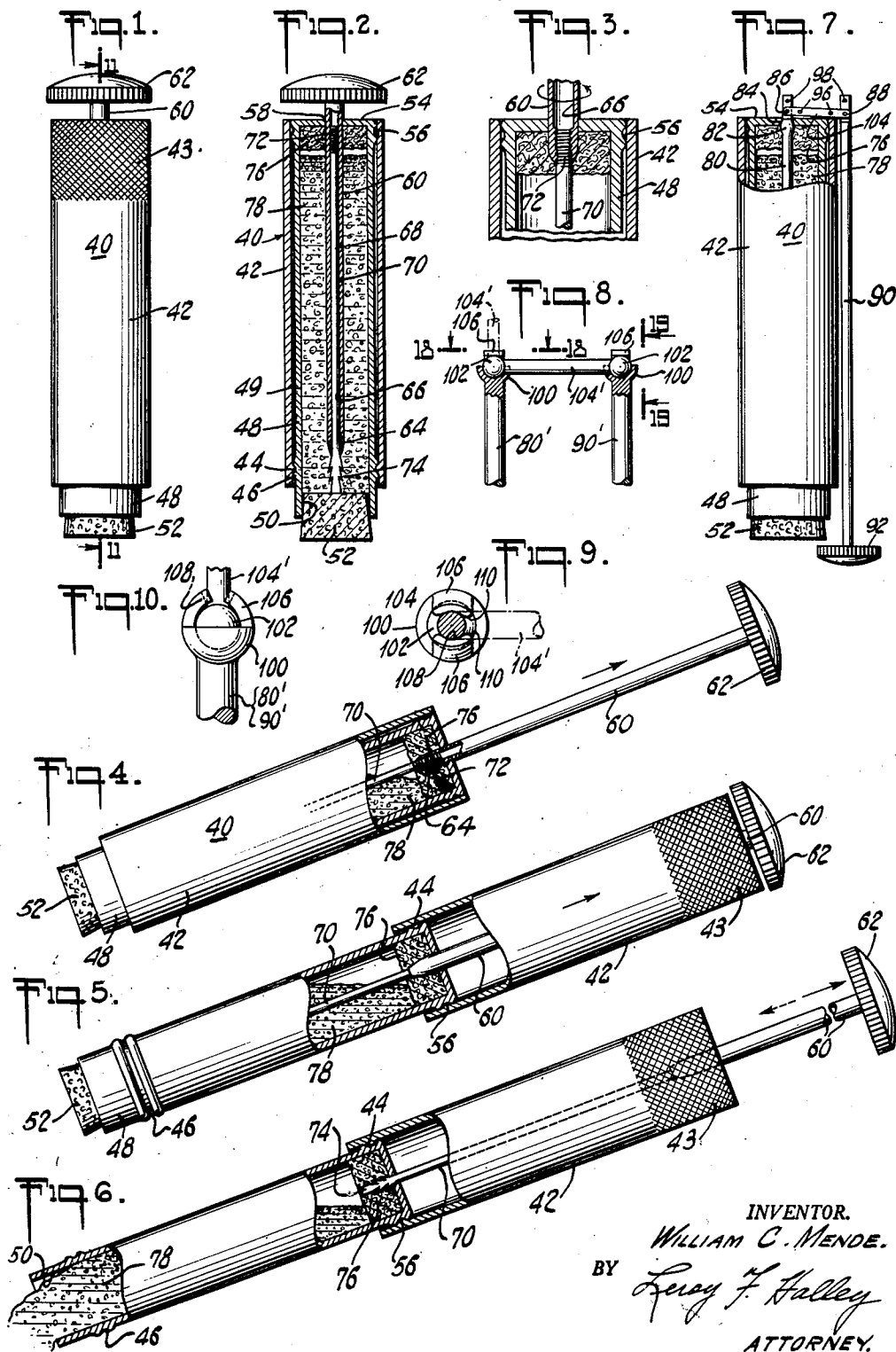
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SINGLE DOSE CAVITY DISPENSER

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SINGLE DOSE CAVITY DISPENSER

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This invention relates to new and useful improvements in dispensers for pharmaceutical formulations in the nature of solid tablets, liquids, semiliquids, and jellies, and particularly relates to dispensers adapted to the application of said pharmaceutical formulations into the vagina.

Heretofore 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.

Dispensers commonly used are about five and one-half inches long since the depth of a human vagina is five inches and at least one-half inch of the dispenser must protrude in order to provide a convenient purchase. The plunger is also five and one-half inches long and so when the dispenser is fully extended it has a length of about eleven inches; the use of such a dispenser is cumbersome and inconvenient.

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.

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

A further 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 and further object of this invention is to provide a dispenser which in addition to providing means for applying pharmaceutical compositions also serves to provide a holder or container for the pharmaceutical composition prior to its being dispensed into a body cavity.

A still further object of this invention is to provide a dispenser of the class described which is adapted to contain an amount of a pharmaceutical composition suitable for one application or treatment.

Still another object of this invention is to pro-

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vide a dispenser of the class described adapted to maintain its contents in a sterile condition up to the time of use.

Still another object of this invention is to provide a dispenser of the class described which may be readily prepared of inexpensive material and which is so constructed that the pharmaceutical composition contained therein may readily and conveniently be projected from one end of the dispenser into a body cavity without exposing the said pharmaceutical composition to contamination.

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

Other objects of the invention will appear from the following description and drawings as well as in the appended claims.

In the accompanying drawings a structure has been disclosed which 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 drawing:

Fig. 1 is an elevation of a form of the dispenser showing a telescoping and more compact tube.

Fig. 2 is a vertical cross-section taken on line 11—11 of Fig. 1.

Fig. 3 is a fragmental cross-section on an enlarged scale showing the locking relation between the piston rod and the telescoping piston rod extension.

Fig. 4 is a view in elevation partly broken away and in cross-section showing the piston rod extension fully extended and in threaded engagement with the piston rod.

Fig. 5 is a view in elevation partly broken away and in cross-section showing the outer sleeve or barrel disengaged from a lower lock on the inner tube and in engagement with an upper lock on the said inner tube.

Fig. 6 is a view in elevation partly broken away and in cross-section showing the piston rod in threaded relation with the telescoping extension, both being fully extended, and the dispenser ready for use.

Fig. 7 is a view in elevation partly broken away and in cross-section showing a modified form of a telescoping dispenser having a hinged piston rod.

Fig. 8 is a fragmental view on an enlarged scale of the hinged portion of a piston rod using a ball and socket arrangement with locking tabs.

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Fig. 9 is a top plan section on an enlarged scale taken on the line 18—18 of Fig. 8.

Fig. 10 is a fragmental view of Fig. 8 looking in the direction of the arrows 19—19 showing the position of the jointed parts with the piston rod aligned.

It is essential when the dispenser is to be used for inserting a contraceptive or pharmaceutical formulation into a position adjacent to the cervix that the barrel or cylinder be approximately $5\frac{3}{4}$ inches in length. A barrel or cylinder of this length will reach to a position adjacent to the cervix and extend beyond the entrance of the vagina at the other end sufficiently to allow a convenient purchase. Figs. 1-6 are illustrative of a dispenser in the form of a telescoping device which can be extended to a length of at least $5\frac{3}{4}$ inches. This embodiment of the invention has the advantage of compactness.

The device 40 as shown in Figs. 1 and 2 has an inner barrel 48 and an outer barrel 42 of such a size as to fit snugly over the inner barrel. Outer barrel 42 preferably has knurling 43 on its upper end to enable it to be more firmly grasped by the fingers at this point. A stopper 52, which may be a plug or cap made of cork, rubber, plastic, paper, or wood, in the lower end 50 of inner barrel 48 keeps the contents 78 of the inner barrel in position in the inner barrel until the contents are to be dispensed, at which time the stopper is removed. Inner barrel 48 has female locking members 46 on its lower end for engagement with male locking members 44 on the inside of the lower end of outer telescoping barrel 42, and as the dispenser is carried and before it is used, the two barrels are telescoped and locked by means of the male and female members on the lower ends of the telescoping barrels. There is a slight clearance 49 between the inner and outer telescoping barrels. Inner barrel 48 has a female locking member 56 at the upper end thereof, which locking member is adapted to become engaged with male locking members 44 on the inside of the telescoping barrel when said telescoping barrel is extended. Upper end 54 of inner barrel 48 is partially closed but has an aperture 58 which is of such a size that telescoping extension of piston rod 70 fits snugly therein.

A piston which is positioned inside of inner barrel 48 through the aperture 58 of closed upper end 54 of inner barrel 48 is comprised of a piston rod 70 which may be fabricated of felt, plastic, cork, paper, wood, pulp, or any suitable substance which is inert to the pharmaceutical composition contained in the dispenser and having a lower barbed or mutilated end 74, upper threaded, or otherwise engaging, portion 72, and a telescoping extension 60 which fits snugly over piston rod 70 and is adapted to be easily and smoothly extended until its internally threaded, or otherwise engaging, lower end 64 engages with the upper threaded portion 72 of piston rod 70. Fig. 4 shows the piston extended to a position such that the internally threaded lower end 64 of the telescoping extension 60 has engaged with the upper threaded portion 72 of piston rod 70. The telescoping extension 60 of piston rod 70 has a knurled button 62 on its upper end.

The enlarged fragmental cross-section of Fig. 3 shows in detail the engaging relation between piston rod 70 and telescoping piston rod extension 60.

The procedure for using the device illustrated in Figs. 1 to 6 to dispense the pharmaceutical

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formulation 78 comprises grasping outer barrel 42, exerting a pulling force on knurled button 62 which before use is in the position illustrated in Figs. 1 and 2. By exerting said pulling force on the knurled button, the first action is to move the telescoping extension 60 along piston rod 70 until its internally threaded lower end 64 becomes engaged with the upper threaded portion 72 of piston rod 70. This position is illustrated by Fig. 4. The second operation comprises grasping the lower end of inner barrel 48 with one hand and grasping the knurling or finger grip 43 on outer telescoping barrel 42 with the other hand and exerting a pulling force whereby the male locking members 44 on the inner surface of telescoping barrel 42 become disengaged from the female locking members 46 on the exterior of the lower end of inner barrel 48. The outer telescoping barrel readily slides along the surface of the inner barrel until the said male locking members become engaged with the upper female locking members 56 on the exterior of inner barrel 48. Fig. 5 illustrates the dispenser after the piston rod has been extended its full length and after the telescoping barrels have been extended to their full length and have become engaged.

The third operation to be performed in the use of the dispenser comprises grasping inner barrel 48 and exerting a pulling force on knurled button 62 whereby the piston rod is extended to a position wherein its lower barbed or mutilated end 74 is partially drawn through a hole in piston 76. Fig. 6 illustrates the dispenser at the end of this operation. To expel pharmaceutical formulation 78 into a body cavity, such as the vagina, the stopper 52 is removed and the tubular portion of the dispenser is inserted into the vagina to a suitable distance and to a distance such that the knurling or finger grip 43 extends beyond the entrance of the vagina. Finger grip 43 is held in one hand, and pressure is exerted on knurled button 62 whereby piston 76 is forced to the lower end 50 of inner barrel 48, thus expelling the pharmaceutical formulation.

A modification of the piston rod system is illustrated by Figs. 7 to 10. In this modification the telescoping extension of the piston rod is replaced by a hinged non-telescoping piston rod. This modification is illustrated in Fig. 7 where a lower portion 80 of the piston rod corresponds to piston rod 70 of Fig. 2 and has a protuberant portion 82 which acts as a seal but which can readily be drawn through aperture 84 in the closed upper end 54 of inner barrel 48. The protuberant portion extends beyond the inner barrel, and there is attached to it a link 104 by a pivot pin 86. The link is attached to an upper portion 90 of the hinged piston rod by a pivot pin 88. The upper portion 90 of the hinged piston rod has a knurled button 92 on the end for convenient grasping. In order to dispense the pharmaceutical composition 78 the upper portion 90 of the hinged piston rod is brought into direct alignment with lower portion 80 of the piston rod. By this action protuberances 96 on link 104 are brought into cooperative relationship with dimples 98 on the upper portion 90 of the hinged piston rod and protuberant portion 82 on the lower portion 80 of the piston rod. By this locking mechanism the piston rod is maintained in straight alignment and the operation of the dispenser is the same as that for the first modification which was described above.

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A ball and socket locking mechanism can be used in place of the locking mechanism illustrated in Fig. 2 in which protuberances on link 104 cooperate with dimples 98 on the upper and lower portions of the hinged piston rod. Such a mechanism is illustrated in Figs. 8, 9, and 10 in which 80' designates the lower portion of the piston rod and 90' the upper portion of the hinged piston rod and 104' the link. In this locking mechanism the link 104' has ball ends 102 which fit into ball sockets 100 on lower portion 80' of the piston rod and upper portion 90' of the hinged piston rod. Ball sockets 100 have side ears 106 which are slightly bent together so that they provide notches 108, as illustrated in Figs. 9 and 10, to retain ball ends 102 and which also receive link 104' in its vertical position. Side ears 106 have cam edges 110 which are conveniently sprung apart to receive link 104' when brought into a vertical position and into direct alignment with lower portion 80' of the piston rod. Upper portion 90' of the piston rod is locked in the same manner to link 104' when brought into direct alignment with said link.

Fig. 9 illustrates the positional relationship of the parts when link 104' is in right angular relationship with the upper or lower portions of the piston rod.

Fig. 10 illustrates the positional relationship of the members when the link is in direct alignment with lower portion 80' or upper portion 90' of the piston rod.

A feature of the invention resides in the simple and inexpensive nature of the cavity dispenser, whereby it may be economically discarded or disposed of after use. It is, therefore, preferably constructed of paper, paper board, cardboard, or a synthetic material such as polyvinyl alcohol which readily lends itself to the formation of sheets, films, and tubes or of other plastics which may be formed into tubes by extrusion. The use of a synthetic material such as polyvinyl alcohol has the added advantage that it softens and swells upon short contact with water due to its water-absorbing properties, thus making it more readily disposable than paper or cardboard, since it may be discarded into a toilet hopper without clogging said hopper. Other water-absorbing synthetic materials may be substituted for polyvinyl alcohol. Paper or paper board, lined with a water-resistant film such as cellulose acetate butyrate, polyethylene, and the like, have also been found satisfactory for use in fabricating the tubes of the dispenser.

It will be apparent to those skilled in the art that the principal objects of the invention have

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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 herein-made disclosures are to be construed in the nature of illustration only and that the invention is to be limited or delineated only by the appended claims.

What is claimed is:

1. A disposable container and applicator device adapted to contain and inject pharmaceutical formulations contained therein into body cavities, said device comprising telescoping inner and outer elongated tubes having sufficient rigidity to maintain their shape, and cooperating locking means which act to hold the tubes firmly in position when the said tubes are in an extended position; said inner tube having a movable, internally disposed piston with a centrally located hole; a telescoping piston rod positioned inside the telescoping tubes, through the hole of the piston and reaching the length of and beyond one end of the extended telescoping tubes to afford convenient purchase, said piston rod comprising a rod and a tube adapted to fit snugly over the rod and having engaging means on the end of the rod part thereof which is positioned inside the telescoping inner tube adapted to firmly engage the piston.

2. A device according to claim 1 which is composed of polyvinyl alcohol.

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