

Aug. 1, 1950

C. BETZ

2,516,846

APPLICATOR

Filed July 21, 1948

Fig. 1.

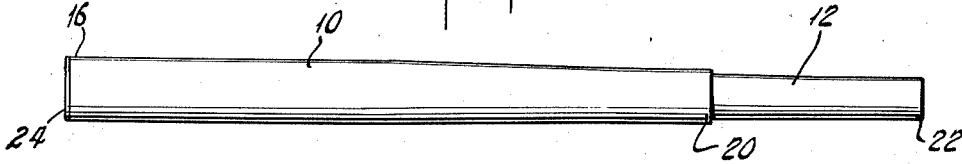


Fig. 2.

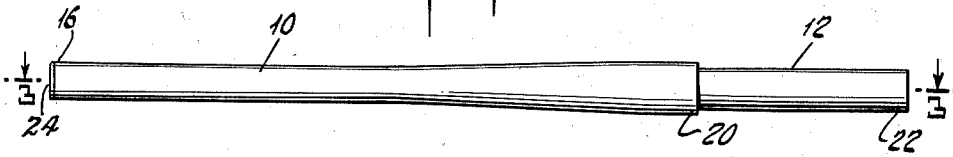


Fig. 3.

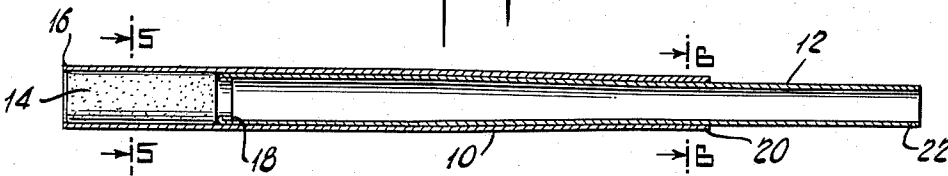


Fig. 5.

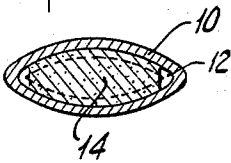


Fig. 4.

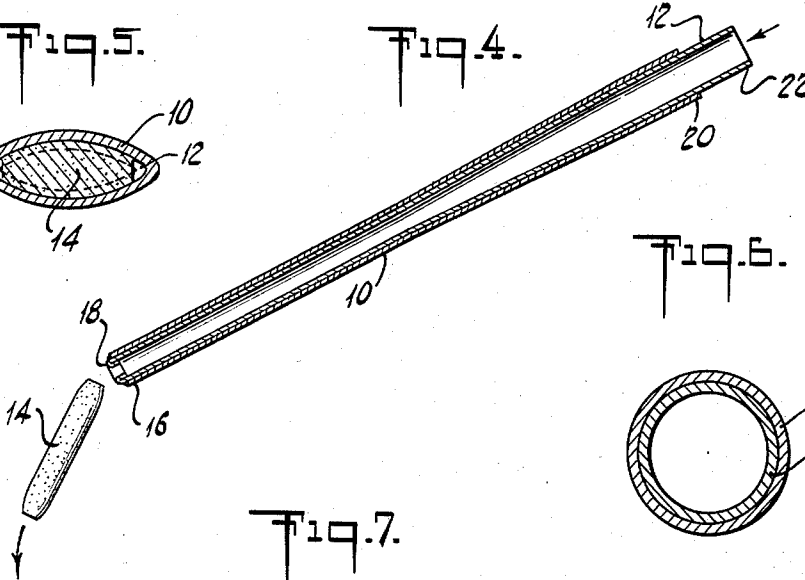


Fig. 6.

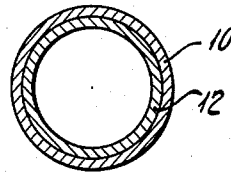
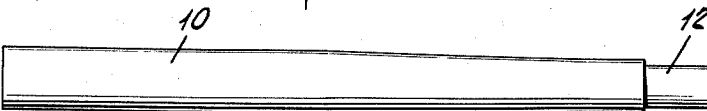


Fig. 7.



INVENTOR
CARL BETZ.
BY *Leroy F. Halley*
ATTORNEY

UNITED STATES PATENT OFFICE

2,516,846

APPLICATOR

Carl Betz, New Brunswick, N. J., assignor to The
Cleveland Container Company, a corporation
of Ohio

Application July 21, 1948, Serial No. 39,987

8 Claims. (Cl. 128—264)

1

This invention relates to new and useful improvements in applicators for use in dispensing pharmaceutical formulations in the nature of solid tablets, semi-solid tablets, gelatin coated capsules, and the like into body cavities; and specifically relates to applicators and dispensers adapted to the introduction of such pharmaceutical formulations into the vagina.

Heretofore it has been the practice to introduce such pharmaceutical formulations as tablets, gelatin coated capsules and the like into body cavities by means of digital action or by means of a non-disposable mechanical dispenser. The repeated use of a non-disposable dispenser entails several disadvantages; the reuse of a mechanical dispenser in instances where a vaginal infection is being treated subjects the patient to the hazard of reinfection unless adequate precautions are taken to sterilize the dispenser after each use. The practice of introducing tablets into body cavities by means of digital action also is apt to present hazards of infection and reinfection.

An object of this invention is to provide a simple dispenser by means of which a solid, semi-solid, gelatin coated capsule, and the like may be neatly, quickly, and conveniently dispensed into a body cavity and specifically into the human vagina.

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 economically discarded or disposed of after a single use.

Another and further object of this invention is to provide a dispenser which in addition to providing means for administering pharmaceutical compositions in the nature of solid or semi-solid tablets into a body cavity also serves to provide a holder or container for the tablet prior to its being dispensed.

A still further object of this invention is to provide a dispenser of the class described which is adapted to maintain its contents in a sterile condition up to the time of use and from which the said contents contained therein may readily and conveniently be projected into a body cavity without exposure to contamination.

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

Other objects will appear from the following description and drawing as well as in the appended claims.

In the accompanying drawing a structure has been disclosed which is designed to carry out the

2

various objects of this invention, but it is to be understood that the invention is not confined to the exact features in the drawing but that various changes may be made within the scope of the claims which are appended.

In the drawing:

Fig. 1 is a plan view in front elevation of the dispenser in retracted position;

Fig. 2 is a side elevation of a dispenser in retracted position;

Fig. 3 is a view in cross-section taken on the line 3—3 of Fig. 2 of the dispenser in retracted position and showing the tablet in position;

Fig. 4 is a view in cross-section similar to Fig. 3 but showing the device in forward position after the tablet has been expelled;

Fig. 5 is an enlarged cross-section on the line 5—5 of Fig. 3;

Fig. 6 is an enlarged cross-section on the line 6—6 of Fig. 3; and

Fig. 7 is a view in front elevation of a dispenser in closed position.

The novel dispenser herein described comprises a tube 10 having a portion of its length progressively flattened toward end 16 which is adapted to contain a tablet 14. In the preferred form, tube 10 has a portion of its length, adjacent to end 20, of uniform circular cross-section. A second tube 12 slidably and frictionally fitted into first tube 10 is progressively flattened toward its end adjacent to the tablet-receiving end of the first tube and in the preferred form has a portion of its length of uniform cross-section adjacent to end 22.

Figs. 1 and 2 show the device in its preferred form in the retracted position in which a tablet is contained entirely within end 16 of tube 10. Fig. 3 shows a cross-section of the device and illustrates the position of the tubes when the tablet is in position in end 16 of tube 10.

In manufacturing the applicator device two tubes of uniform cross-section throughout their length are placed in a position so that the lower ends 16 of the outer tube and 18 of the inner tube are adjacent, as illustrated in Fig. 7, and the assembly is then progressively flattened toward the ends in adjacent position. In its preferred form inner tube 12 is slightly longer than outer tube 10, since this gives grasping means for withdrawing the inner tube to its retracted position, as shown in Figs. 1 and 2. Fig. 5 illustrates the flattened outer tube 10 and the position of the tablet in that tube. In the preferred form of the device, the flattening begins a slight distance from end 20 of the outer tube, thus leav-

3

ing this end and an end portion of the inner tube 12 with a uniform cross-section in the form of a circle, which is illustrated by Fig. 6. Fig. 4 illustrates the position of the inner and outer tubes after an expelling force has been applied to inner tube 12 sufficient to force this tube to its forward position and consequently expel the tablet.

By progressively flattening the inner and outer tubes when they are in a position as illustrated by Fig. 4, the tablet-receiving end 16 of tube 10 and lower end 18 of inner tube 12 are made to take an elliptical shape, which is of advantage when the pharmaceutical formulation in the nature of a tablet and contained in the applicator is introduced into a vaginal cavity, since this shape is conducive to ease of insertion into said cavity.

The progressively flattened inner and outer tubes are also advantageous for, when they are fabricated of semi-rigid deformable material such as paper board, inner tube 12 binds when retracted to a position as illustrated in Fig. 3 because the elliptical contour of inner tube 12 binds in the throat of outer tube 10 which becomes progressively more round in the direction away from its tablet-containing end. This binding effect is particularly advantageous because the inner tube will maintain its position in retracted position and not be moved by any accidental shocks such as those which are incidental to normal shipping and handling. This feature protects the tablet from being accidentally and unintentionally expelled from the device and from becoming contaminated by substances outside the device. This feature is also of advantage when the pharmaceutical formulation to be dispensed is frangible and easily shattered or chipped by shock or contact with outside surfaces. For added protection to the tablet, end 16 of outer tube 10 may be closed by means of a separate paper cover 24 (shown in Figures 1 and 2) which may be sealed over that end or attached by other means and removed just prior to insertion of the tablet into a body cavity, or the cover may be of material of little strength and readily ruptured by the tablet as it is expelled, which makes its removal unnecessary.

The flattening of the two tubes is of further advantage, particularly when inner tube 22 is longer than outer tube 10, because the inner tube binds in the throat of the outer tube when the said inner tube is in the forward position, such as illustrated by Figs. 4 and 7. Such a binding action is particularly effective when a portion of the lengths of the two tubes at ends 20 and 22 are of uniform cross-section because this portion of uniform cross-section of inner tube 12 binds strongly in the flattened portion of outer tube 10, and this binding effect offers substantial resistance to the propulsion of the inner tube beyond a point such that ends 16 and 18 of the inner and outer tubes are in coincidence, thus insuring against injury to a body cavity which might result from end 18 of inner tube 12 being forced beyond end 16 of outer tube 10.

In the preferred form of the device, end 18 of inner tube 12 is curled inwardly to provide a seat for tablet 14 and thus more efficiently and effectively act as a plunger for the ejection of the said tablet.

In the preferred form of the device, the inner tube is approximately $5\frac{1}{2}$ inches in length after curling its forward end to provide a plunger end for ejection, the outer tube is 5 inches in length, and the flattening begins $\frac{3}{4}$ inch from end 20 of

4

outer tube 10. An applicator with these dimensions is used in the application of a pellet tablet or capsule $1\frac{1}{4}$ inches long, $\frac{3}{8}$ inch wide, and $\frac{3}{8}$ inch high.

A feature of the invention resides in the simple and inexpensive nature of the material of which it is fabricated whereby it may be economically discarded or disposed of after a single 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 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 danger of clogging said hopper.

Other water-absorbing synthetic materials may be substituted for polyvinyl alcohol, and these may include any combination of plastic and paper; the plastic and/or paper may be convolute or spiral wound. 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 applicator.

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 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 combined container and applicator for a tablet comprising in combination a tube having a portion of its length of uniform circular cross-section and a portion of its length progressively flattened from said portion of the uniform cross-section to an end adapted to contain said tablet; a second tube within the first having a portion of its length of uniform cross-section and being progressively flattened from such portion of uniform cross-section toward one end, a portion of uniform cross-section of the second tube being slidable within a portion of uniform cross-section of the first tube but being impassable through the flattened portion of the first tube, and the flattened portion of the second tube being impassable through the portion of uniform cross-section of the first tube.

2. A combined container and applicator for a tablet comprising in combination a tube having a portion of its length of uniform circular cross-section and a portion of its length progressively flattened from said portion of the uniform cross-section to an end adapted to contain said tablet; a second tube within the first having a portion of its length of uniform cross-section and being progressively flattened from such portion of uniform cross-section toward one end, a portion of uniform cross-section of the second tube being slidable within a portion of uniform cross-section of the first tube, and the flattened portion of the second tube being impassable through the portion of uniform cross-section of the first tube.

3. A device according to claim 1 which is en-

5

tirely composed of materials capable of swelling in water.

4. A device according to claim 1 which is composed of water-absorbing material.

5. A combined package and applicator comprising inner and outer telescoping tubes with their adjacent surfaces in frictional engagement, with one end of the inner tube spaced from the corresponding end of the outer tube; a tablet snugly positioned within the outer tube in the space thereof between said corresponding tube ends, said tubes in the vicinity of one end of the package having the same cross-sectional configuration and being correspondingly deformed to a different configuration at the other end of the package in a manner to limit relative longitudinal movement of the tubes substantially to that which will permit the tablet to be expelled from the outer tube.

6. A combined package and applicator comprising inner and outer telescoping tubes with their adjacent surfaces in frictional engagement, with one end of the inner tube spaced from the corresponding end of the outer tube; a tablet snugly positioned within the outer tube in the space thereof between said corresponding tube ends, said tubes being correspondingly deformed at the end adjacent to the tablet to a

6

flattened configuration in cross-section and being progressively less flattened toward a point near the other end of the package, at which point the tubes are circular in cross-section in a manner to limit relative longitudinal movement of the tubes substantially to that which will permit the tablet to be expelled from the outer tube.

7. A device according to claim 5 which is composed of water-absorbing material.

8. A device according to claim 5 which is entirely composed of materials capable of swelling in water.

CARL BETZ.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,191,736	Roberson	July 18, 1916
1,538,678	Blinn	May 19, 1925
2,024,218	Haas	Dec. 17, 1935

FOREIGN PATENTS

Number	Country	Date
510,816	Great Britain	Aug. 9, 1939