

Nov. 29, 1949

H. M. RUTH

2,489,502

TAMPON APPLICATOR

Filed July 18, 1946

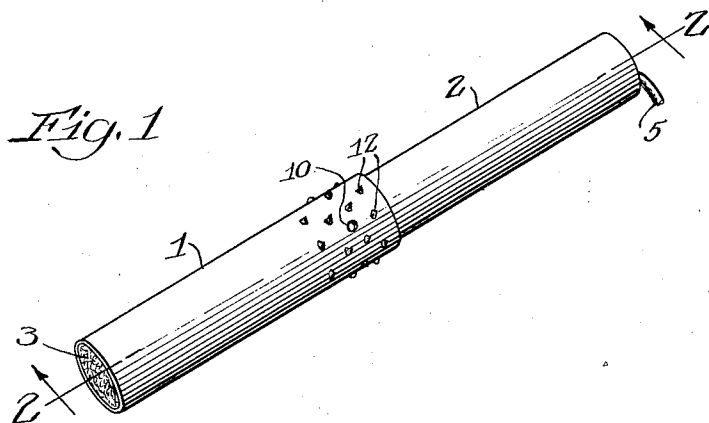


*Fig. 2*

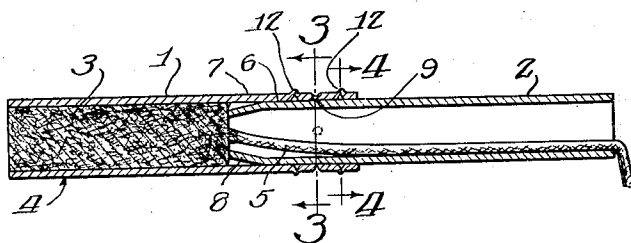


*Fig. 5*

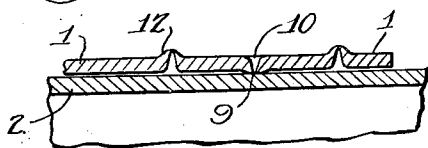


*Fig. 3*

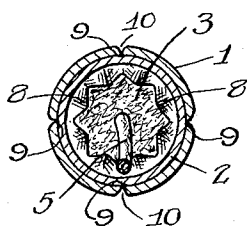
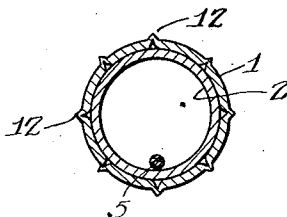


*Fig. 4*



INVENTOR

Howard M. Ruth

BY

Loans, Pond & Anderson  
ATTORNEY

## UNITED STATES PATENT OFFICE

2,489,502

## TAMPON APPLICATOR

Howard M. Ruth, Appleton, Wis., assignor to International Cellucotton Products Company, a corporation of Delaware

Application July 18, 1946, Serial No. 684,569

1 Claim. (Cl. 128—270)

1

This invention relates to a tampon applicator, and it has reference especially to applicators for catamenial tampons although not necessarily confined thereto.

A common form of tampon applicator consists of an inner tube and an outer tube, the outer tube being of such internal size and length as to house and frictionally retain a tampon in one end portion thereof, and the inner tube being of such length that one end portion thereof may initially be seated within an end portion of the outer tube not occupied by the tampon while a remaining portion of the inner tube projects from said outer tube. The external size of said inner tube is usually designed to fit frictionally within the outer tube so that when the parts are initially assembled they will be frictionally held in assembled relation. The inner tube which may be called an ejector, may be moved longitudinally of the outer or applicator tube so as to eject the tampon from the applicator tube.

The conventional construction referred to is reasonably satisfactory provided that the two tubes have the necessary frictionally interfitted relationship to hold them in the described assembled relationship independently of any wrapping which may be employed in the packaging of the tampons and applicators. Considerable difficulty, however, has been experienced in maintaining this relationship. Expansion and contraction of the tubes incident to varying weather conditions, initial inaccuracies in the sizes of the tubes, material characteristics, and perhaps other factors are probably responsible for the indicated difficulty in producing and maintaining the required frictional interattachment of the parts.

The main object of the present invention is to provide in a tampon applicator structure of the character indicated means whereby the required frictional interattachment may be easily attained without adversely affecting the relative slidability of one of the parts of the applicator longitudinally of the other for tampon ejection purposes.

Another object of the invention is to eliminate the necessity or requirement for accurate size relationships of the outer and inner tubes of a tampon applicator such as referred to, and, in general, it is the object of the invention to provide an improved tampon applicator.

Other objects and advantages of the invention will be understood by reference to the following specification and accompanying drawings wherein there is illustrated a tampon applicator embodying a selected form of the invention.

In the drawing:

2

Fig. 1 is a perspective,

Fig. 2 is a longitudinal section on the line 2—2 of Fig. 1,

Figs. 3 and 4 are cross-sections on the lines 3—3 and 4—4 of Fig. 2, respectively, and Fig. 5 is a section corresponding to a portion of Fig. 2 but on an enlarged scale and showing an exaggeration of the relationship of the parts.

The tampon applicator comprises an outer tube 1 and an inner tube 2. These tubes are usually made of paperboard of sufficient thickness to provide a desirable amount of rigidity especially lengthwise of the tubes, or of a good grade of paper laminated to the desired thickness and rigidity. Plastic, fibrous material other than paper, and other suitable materials may also be used. In the cross-sectional illustration, Fig. 2, the thickness of the tubes is somewhat exaggerated for illustrative purposes.

As best shown in Fig. 2, a tampon 3 of any suitable form is initially seated in the front end portion 4 of the outer tube 1, and it is shown in this instance as being provided with a drawstring element 5 which extends rearwardly from the tampon.

The outer tube is of substantially cylindrical form, and the inner tube 2 is of corresponding transverse form and of such external diameter as to fit freely within the inside of the outer tube. The fit of the inner tube in the outer tube is not critical; it may be such that there is light contact between the adjacent walls of the tubes or the outer tube may be so much larger than the inner tube that a small clearance would exist between said walls (as represented in Fig. 5). A front end portion 6 of the inner tube is initially inserted into the rear portion 7 of the outer tube, the drawstring 5 of the tampon being threaded through the inner tube 2 as shown. The forward extremity of the inner tube may be fluted or crimped longitudinally as indicated at 8 if desired so as to widen the area of engagement between the front end of the ejector and the rear end of the tampon, thereby to avoid any possible wedging of the ejector between the surface of the tampon and the inside of the tube 1.

The tube 2 may be moved longitudinally of the tube 1 to eject the tampon. To attain the desired frictional interattachment of the tubes so as to maintain the same in their described assembled relationship while at the same time providing for the required movability of the inner tube relative to the outer tube for tampon ejection purposes, the following described structure is provided.

The outer tube 1 is provided with one or more internal surface protuberances such as represented at 9, four such protuberances being shown in this instance. These protuberances 9 may be formed by inwardly indenting the outer tube, for example by means of pin pricks which produce slight punctures 10 through the tube. Pricking of the tube is, of course, effected from the outside thereof towards the inside thereof and without removing any material. The material displaced in forming a puncture 10 is, at least partially, displaced into the said protuberance 9. The protuberances so formed may be of such size that even though the external diameter of the ejector tube 2 is slightly less than the internal diameter of the outer tube 1, the inner ends of said protuberances will bear frictionally on the external surface of the tube 2 sufficiently to frictionally hold the tubes in the assembled relationship shown in Fig. 2. Such frictional holding of the tubes in assembled relation is not, however, so strong as to prevent manual movement of the inner tube into the outer tube for tampon ejection purposes.

In the event that the tubes furnished for producing the structure are initially of such snug fit as to leave no room between them for said protuberances 9, the protuberances will be more or less flattened or returned into the normal thickness of the outer tube, or that the portion of the outer tube which bears the protuberances will be forced outwardly slightly, or that the portion of the inner tube which is engaged by the protuberances may be offset inwardly slightly. Any of these distortions, or any combination thereof, will not be too objectionable since they do not prevent manipulation of the applicator in the manner already explained.

The friction producing enlargements may be formed by indenting the tube without penetrating all the way through the tube, or by applying small drops of wax or resin to the outer surface of the inner tube, or by raising barb-like portions of the tube from said outer surface, or in other ways. Also, any of these friction producing enlargements may be formed on the inside of the outer tube if preferred.

To facilitate holding of the applicator for initial insertion into the vagina, and to also facilitate holding of the outer tube against movement when the ejector is moved forwardly in the outer tube to eject the tampon, the outer tube may be provided with a plurality of circumferentially spaced external protuberances such

as represented at 12, these protuberances being also preferably formed by pin pricking the tube radially outwardly so as to cause the production of relatively sharp ended protuberances which will afford a desirable finger grip on the outer tube. Such sharp ended external protuberances will permit effective gripping of the applicator in the fingers without squeezing and more or less collapsing the applicator to such an extent as to make it difficult to move the ejector tube into the outer tube for tampon ejection purposes. The provision of the external gripping means is especially desirable in combination with the above described ejector tube gripping protuberances since the latter may, in some instances, necessitate a somewhat stronger grip on the outer tube while the tampon is being ejected.

Various changes may be made in the described structure without departing from the invention.

I claim:

A tampon applicator comprising a pair of fibre tubes, one of said tubes having a normal external transverse size approximating the normal internal transverse size of the other so as to be insertable into and movable longitudinally of said other tube, the outer tube having a portion of its normal thickness offset inwardly into frictional engagement with the adjacent outer surface of the inner tube to thereby frictionally hold said tubes in assembled relationship while permitting the aforesaid longitudinal movement of one of said tubes relative to the other, said outer tube also having adjacent the end thereof into which said inner tube enters, a plurality of small, circumferentially spaced portions of its normal thickness offset outwardly to provide a plurality of external surface protuberances for facilitating holding of said outer tube.

HOWARD M. RUTH.

#### REFERENCES CITED

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

#### UNITED STATES PATENTS

| Number    | Name     | Date          |
|-----------|----------|---------------|
| 487,434   | Steen    | Dec. 6, 1892  |
| 1,350,981 | Wilkins  | Aug. 24, 1920 |
| 2,222,088 | Petersen | Nov. 19, 1940 |
| 2,413,480 | Winter   | Dec. 31, 1946 |

#### FOREIGN PATENTS

| Number  | Country     | Date         |
|---------|-------------|--------------|
| 186,674 | Switzerland | Jan. 2, 1937 |