

[72]	Inventor	Michael Loyer South Somerville, N.J.
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[73]	Assignee	Johnson & Johnson

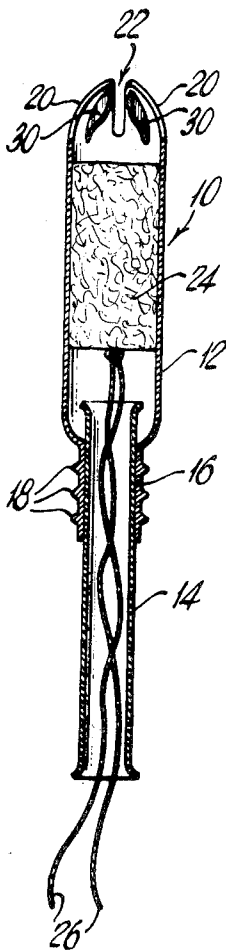
[56]	References Cited		
	UNITED STATES PATENTS		
2,413,480	12/1946	Winter	128/263
3,204,635	9/1965	Voss et al.	128/263
3,347,234	10/1967	Voss	128/263
3,358,686	12/1967	Asaka	128/263

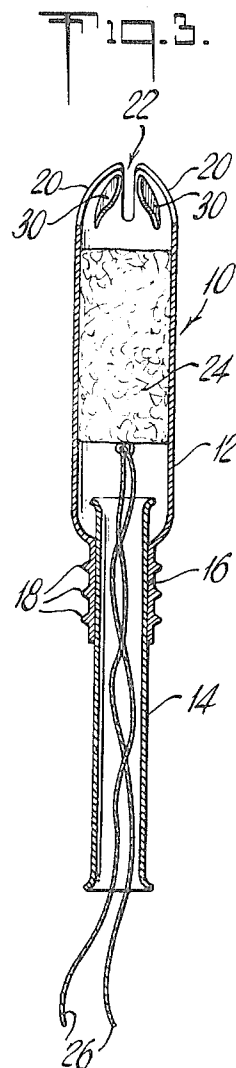
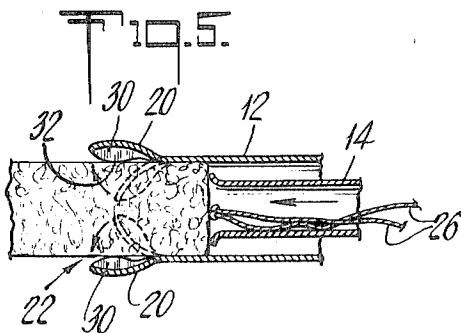
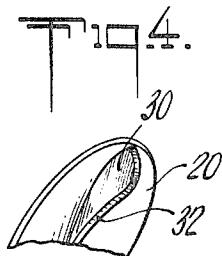
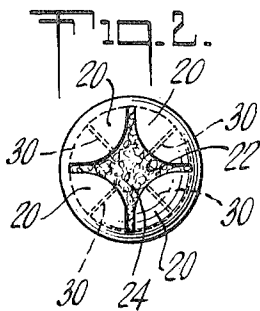
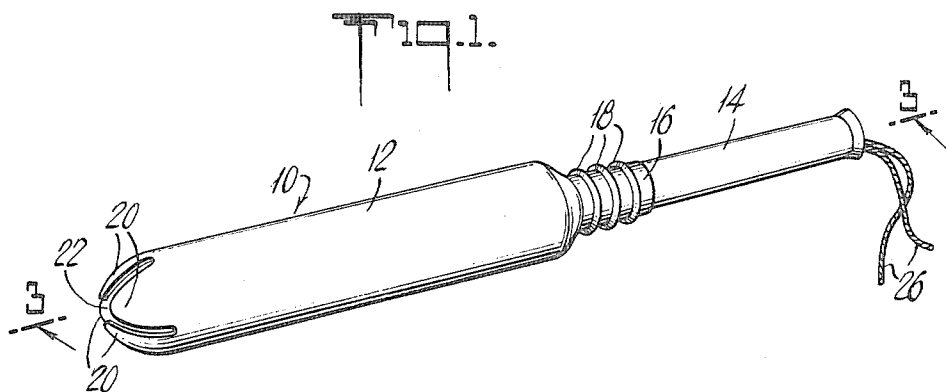
Primary Examiner—Robert W. Michell
Assistant Examiner—J. H. Wolfe
Attorneys—W. Frederick Mayer, Jr. and Robert L. Minier

[54] DOMED-TIPPED APPLICATOR FOR CATAMENIAL TAMPONS
4 Claims, 5 Drawing Figs.

[52]	U.S. Cl.....	128/263
[51]	Int. Cl.....	A61f 15/00
[50]	Field of Search.....	128/263, 270.285

ABSTRACT: A segmented, domed-tipped, tubular applicator for the insertion of catamenial tampons intravaginally is provided with sinusoidal curvilinear ribs positioned centrally and extending axially and radially on the inner surface of each of the dome segments to spread the segments apart and permit the tampon to be expelled from the applicator.





INVENTOR
MICHAEL LOYER
BY *W. Hedevick*
ATTORNEY

DOMED-TIPPED APPLICATOR FOR CATAMENIAL TAMPONS

BACKGROUND OF THE INVENTION

This invention relates to applicators and more particularly, to applicators for introducing catamenial tampons into the vaginal cavity.

Commercial catamenial tampons are generally elongated and cylindrical in shape and are made by compressing absorbent material, usually fibrous, into the desired form. Such tampons due to their compression, are relatively rigid and form stability and may therefore be introduced into the vaginal cavity by digital means. However, it is more common to position them in the vaginal cavity with devices called applicators. These are devices usually packaged assembled with tampons to provide a complete unit ready for use.

Tampon applicators in general use consist of an inner and outer tube arranged in telescopic fashion with the inner tube longitudinally moveable in the outer tube. A tampon is positioned in one end of the outer tube and is expelled therefrom by moving the inner tube in the outer tube in the direction of the tampon. Because of the nature of their use, most tampon applicators have been made of paper, cardboard, plastic or similar materials so that they could be discarded after but a single use.

In tampon applicators generally used heretofore, the forward end of the outer tube presents a blunt cutoff surface which is the portion first introduced into the vagina. Being blunt, initial insertion of the catamenial tampon applicator was often painful to the extent of discomfort. To alleviate this discomfort, it has been proposed to form a tampon applicator with a tapered forward end either by forming a series of pleats in the tubular member or by slitting a previously domed forward end into a series of triangularly shaped segments, in either instance permitting the tapered forward end to open up upon expulsion of the tampon from the tubular applicator.

It has been found, however, that such tapering of the forward end of the tubular applicators, while greatly reducing the discomfort of insertion, increased substantially the force required to expel the tampon from the applicator. In other words, the "expulsion value" was increased beyond the level acceptable to the consumer. In addition, the apices of the dome segments or the forward end of the pleats tended to roughen up the fibers on the surface of the tampon as the latter spread apart the domed tip of the applicator tube upon expulsion thereof from the forward end.

I have now provided a segmented, domed-tipped applicator which overcomes the above disadvantages and shortcomings of prior domed-tipped applicators by providing means for reducing expulsion values and for preventing the shredding of fibers from the tampon upon expulsion.

SUMMARY OF THE INVENTION

According to the present invention there is provided a domed-tipped applicator for catamenial tampons which comprises a first tubular member containing a tampon and a second tubular member telescoped for slideable engagement within the first tubular member. The second tubular member is adapted to expel the tampon from the forward end of the first tubular member upon urging the second tubular member in a forward direction. A plurality of substantially triangularly shaped segments are provided which are integral at their respective bases with the forward end of the first tubular member. The segments have their respective apices converging forwardly to a position where they are radially spaced from one another to define an opening having a diameter smaller than the internal diameter of the first tubular member. Guide means are disposed on the inner surface of each of the triangularly shaped sections for pivoting the triangular segments radially outwardly to a position where the diameter of the opening defined by the apices is at least equal to the internal diameter of the first tubular member prior to the forward end of the tampon reaching the apices upon expulsion of the tampon from the applicator.

The above and other features and advantages of the tampon applicators of the present invention will be even more readily understood by reference to the following detailed description thereof when read in conjunction with the appended drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is an overall perspective view of the tampon applicator of the present invention;

FIG. 2 is a view of the tampon applicator from the forward domed end thereof;

FIG. 3 is a longitudinal, cross-sectional view taken approximately along lines 3—3 of FIG. 1;

FIG. 4 is a segmental perspective view of one of the dome segments of the tampon applicator showing the interior surface thereof; and

FIG. 5 is a segmental, longitudinal, cross-sectional view of the forward domed end of the tampon applicator showing in phantom lines the opening thereof upon expulsion of the tampon from the applicator.

DETAILED DESCRIPTION OF THE INVENTION

Referring now particularly to FIGS. 1 through 3, a tampon applicator, designated generally by the numeral 10, consists of an outer tubular member 12 and an inner tubular member 14 positioned telescopically for slideable movement within the outer tube. The rearward end of the outer tube 12 consists of a finger-gripping section 16 of reduced diameter, the internal diameter of the inner tube 14 thereby providing a bearing surface for slideably engaging the inner tube 14. The finger-gripping section 16 has a series of longitudinally spaced concentric ridges 18 to increase frictional engagement with the fingers when gripped.

At the forward end of the outer tubular member 12 and formed integrally therewith are a plurality of circumferentially spaced, substantially triangularly shaped segments 20 having their apices converging forwardly to be radially spaced from one another to define an opening 22 having a diameter smaller than the diameter of the outer tube 12. While four such segments are shown, a greater or lesser number can be used.

Positioned forwardly of the inner tubular member 14 and contained within the outer tubular member 12, is a catamenial tampon 24 which, upon forward movement of the inner tubular member 14 within the outer tubular member 12, is adapted to be expelled from the forward, domed end of the applicator 10 in a manner more fully explained hereinafter.

The tampon 24 can be made of any of the well-known materials which are highly absorbent such as comminuted woodpulp fibers, bleached sulfite creped wadding, regenerated cellulosic fibers, cotton staple, polymeric or cellulosic foams, etc. Usually, such tampons are provided in densified compressed form and, upon being wetted with menstrual fluids in use, will expand to provide for maximum fluid absorption. Also, for removal subsequent to use, the tampon 24 is provided with the usual withdrawal strings 26 which, when the tampon is packaged in the applicator 10, extend through the interior of the inner tubular member 14.

Now, referring particularly to FIGS. 4 and 5, the triangularly shaped segments 20 forming the forward domed end of the applicator 10 are shown in somewhat greater detail, particularly the interior surfaces thereof which are provided with the novel structure of the present invention. On the interior surface of each of the triangularly shaped segments 20 and extending longitudinally and radially, is a rib 30 formed integrally with the segment 20. The ribs 30 present curvilinear inner edges 32 which, relative to the central axis of the applicator 10, are substantially sinusoidal.

When the applicator 10 is in a relaxed state, i.e., prior to the tampon 24 being expelled therefrom, the triangularly shaped segments 20 assume a domed configuration with their apices spaced radially from one another to define the small opening 22 at the forward end of the applicator. The ribs 30 extend radially inwardly and the curvilinear sinusoidal edges 32 define a bearing surface that is smaller in area than the area of

inner surfaces of the triangular-shaped segments 20. Also, because the ribs 30 depend radially inwardly from the inner surface of the triangularly shaped segment 29 and have a sinusoidal configuration at their inner edges 32, the radial distance from the central axis of the applicator 10 to any point on the bearing surface of the ribs 30 is less than the radial distance to the inner surface of the triangularly shaped segments 20.

When it is desired to expel the tampon 24 from the applicator 10, the inner tubular member 14 is urged forwardly within the outer tubular member 12 until the inner end of the former abuts against the rearward end of the tampon 24. Continued forward movement of the inner tubular member 14 urges the tampon 24 forwardly also. As the forward end of the tampon 24 reaches the base of the domed forward portion of the outer tubular member 12, the curvilinear, sinusoidal edges 32 of the ribs 30, i.e., the bearing surfaces, are engaged by the forward end of the tampon 24. While the tampon 24 is moving forwardly through the segmented domed portion of the applicator, the bearing surfaces 32 of the ribs 30 are gradually lifted radially outwardly, thereby also moving the segments 30 radially outwardly until the diameter of the opening 22 defined by the apices of the triangular segments 30 becomes at least equal to or preferably slightly larger than the internal diameter of the outer tubular member 12 (FIG. 5).

Because the tampon 24 engages only the bearing surfaces 32 of the ribs 30, which are much smaller in surface area than the surface area of the inner surfaces of the converging triangularly shaped segments 20, a substantial reduction in frictional forces is encountered upon urging the segments 20 to pivot outwardly to permit expulsion of the tampon from the domed end of the applicator. Similarly, because the ribs 30 present a sinusoidal curvilinear inner edge, the apices of the triangularly shaped segments 20 do not contact any surface of the tampon 24 upon its expulsion.

Thus it is seen that the guide means 30 provided in domed-tipped tampon applicators according to the present invention substantially reduce expulsion values encountered in such ap-

plicators as have been provided heretofore as well as prevent shredding and roughening of materials from the surfaces of the tampons as has occurred when the tampons were used directly to urge opening of triangularly shaped or pleated segments of prior domed tipped applicators.

I claim:

1. A domed tipped applicator for catamenial tampons comprising:

- a. a first tubular member containing a tampon;
- b. a second tubular member telescoped for slideable engagement within said first tubular member and adapted to expel said tampon from the forward end of said first tubular member;
- c. a plurality of substantially triangularly shaped segments integral at their respective bases with the forward end of said first tubular member and having their respective apices converging forwardly and being radially spaced from one another to define an opening having a diameter smaller than the internal diameter of said first tubular member; and
- d. guide means disposed on the inner surface of each of said triangularly shaped segments for pivoting said segments radially outwardly to a position where the diameter of said opening defined by said apices is at least equal to the internal diameter of said first tubular member prior to the forward end of said tampon reaching said apices upon expulsion of said tampon from said applicator.

2. The applicator of claim 1 wherein said guide means comprises a rib centrally disposed and extending axially and radially on the inner surface of each of said triangular segments.

3. The applicator of claim 2 wherein said rib presents an inner edge that defines a sinusoidal curvilinear surface for bearing against said tampon upon expulsion thereof from said applicator.

4. The applicator of claim 3 wherein the surface area of the inner edge of said rib is less than the surface area of the inner surface of its triangularly shaped segment.

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,628,533

Dated December 21, 1971

Inventor(s) Michael Loyer

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

In Column 1, line 26, "to the extent of discomfort" should read ----to the extent of causing discomfort----.

In Column 2, lines 28-30, " the internal diameter of the inner tube 14 thereby providing a bearing surface for slideably engaging the inner tube 14" should read ---- the internal diameter of which is only slightly larger than the outer diameter of the inner tube 14 thereby providing a bearing surface for slideably engaging the inner tube 14 ----.

In Column 3, line 3, "29" should read ----20----.

In Column 3, line 6, "in less" should read ---- is less ----.

Signed and sealed this 6th day of June 1972.

(SEAL)

Attest:

EDWARD M. FLETCHER, JR.
Attesting Officer

ROBERT GOTTSCHALK
Commissioner of Patents