

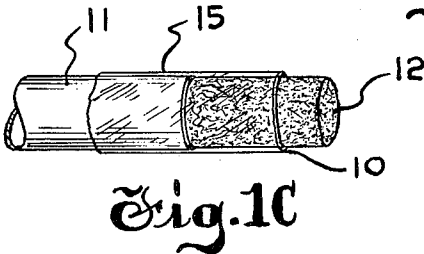
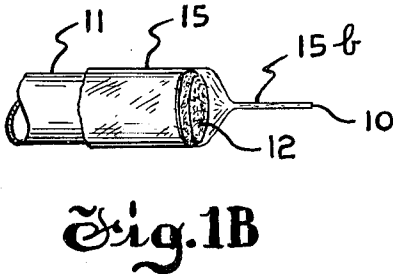
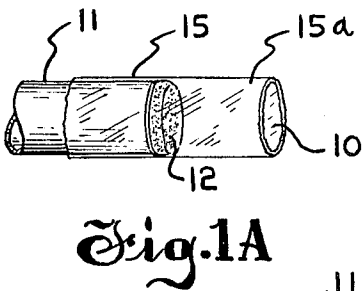
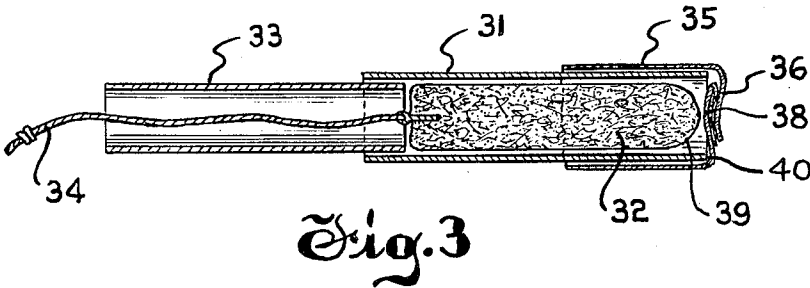
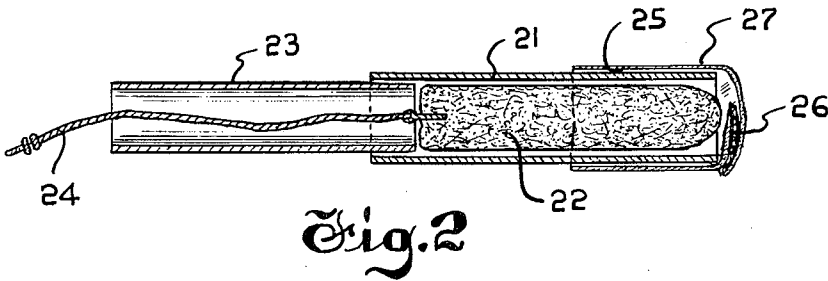
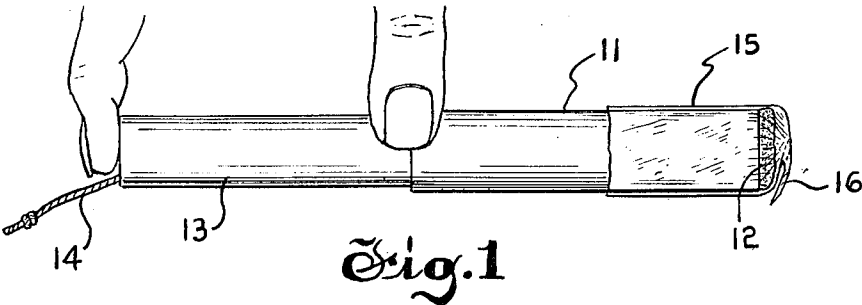
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W. J. MATTES ET AL

3,499,447

TAMPON APPLICATOR

Filed Feb. 27, 1968



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3,499,447

TAMPON APPLICATOR

William J. Mattes, Neenah, Virginia A. Olson, Appleton, and Robert F. Skora, Neenah, Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis., a corporation of Delaware

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8 Claims

ABSTRACT OF THE DISCLOSURE

A tube-type tampon applicator having its leading edge covered by an open-ended sleeve of thin plastic film. The forward portion of the sleeve, including the open end, is flattened and folded back on itself to bridge over and close the front opening of the tube where it serves to smooth over the nose portion of the tube and facilitate insertion into a body cavity. The film is sufficiently thin to retain its flattened and folded condition before and during insertion, but will unfold and open easily when the tampon is pushed against it while being ejected from the applicator.

BACKGROUND OF THE INVENTION

Tampons have been used for internal absorption of menstrual fluids for many years, and are becoming more acceptable by a greater number of users each year. An important factor which prevents the number of new users from growing still more rapidly is the problem of personal discomfort involved during insertion, largely because of the excessive insertion force required. Most tampons and applicators now on the market are of such construction that they tend to wipe the vaginal tract dry as they are inserted, thus increasing frictional resistance to insertion, and adding to discomfort. These problems can be relieved by treating the tip of the tampon or applicator with lubricants. However, when stick type or digital tampons are involved, the lubricant must be applied to the absorbent tampon body itself. This procedure tends to reduce absorbency and renders the tampon less effective. When lubricants are applied to the tube of a tube-type applicator, the lubricant also tends to be absorbed by the tube material whereby some of the lubricity is lost while giving the tube an unsanitary appearance. Also, the front of the tube normally is left open, exposing the tampon and giving the impression that it may be unhygienic.

An attempt to overcome the above problems with respect to tube-type applicators may be found in U.S. Patent 2,413,480, wherein it is suggested that the tampon-containing tube would be easier to insert if a thin, flexible material is used as a closure to cover the forward end of the tube and tampon, to prevent absorption or displacement of body fluids by the forward end of the tube during insertion. The closure is formed by radially pleating the material to form a cover over the forward end of the tube. This cover or closure then must be broken open, or forced open, by the tampon when the tampon is ejected. However, this patent is devoid of any teaching as to how the closure of the flexible cover might be bonded to retain it in its closed condition over the tube end in a manner which would open reliably and easily when the tampon is to be ejected after insertion. All of the materials suggested in the patent, for use as the cover, are very resilient in nature, and ordinarily cannot be held closed as described unless some positive sealing means such as a light application of adhesive or heat-bonding is used for that purpose. When one of these sealing means is employed, the forces necessary for ejection of the tampon with this type of applicator arrangement are unpre-

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dictable and in many cases ejection forces become so high that the tampon can be ejected only with difficulty, if at all.

A similar problem concerning ejection of tampons from a protective sheath after insertion, occurred with respect to proposed insertion aids for stick-type tampons as disclosed in U.S. Patents 2,922,422 and 2,922,423, both assigned to the assignee of this application. In these structures the tampon is mounted on a removable stick and covered with a polyethylene tube about 1.25 mils thick. The forward end of the film tube is stretched to conform itself around the nose of the tampon. This stretching process simultaneously thins the polyethylene to about .5 mil or less and weakens the portion around the tampon nose, so that when the tail of the tube is grasped by the fingers and force asserted against the stick after insertion of the assembly in the body cavity, the tampon will break through this weakened portion and be ejected from the tube into its proper position within the body. It was found that although the polyethylene tube structure with its slick surface characteristics, worked nicely as an aid for inserting the assembly, because the weakening of the forward end of the tube by stretching could not be controlled effectively to provide a uniform thickness in the weakened portion of the film, the amount of force required to eject the tampon was unpredictable. In many cases, the weakened portion was too thick so that ejection could be accomplished only with difficulty, or in other cases the weakened portion was too thin so that the tip of the tampon was easily uncovered before use and thus was unprotected.

One suggestion for overcoming these ejection problems, with respect to the polyethylene-tube covered stick-type tampon described in these patents, was to make the tube from a thin open-ended film sleeve which extended substantially beyond the leading end of the tampon, and which was flexible enough to be folded back on itself alongside the tampon body to completely cover the forward end of the tampons. The folded portion provided a smooth rounded surface for insertion, yet it could be subsequently unfolded from the force of the tampon as it is pushed therethrough for ejection after insertion. It was also suggested that the outer portion of the tube be coated with a lubricant such as petroleum jelly or surgical gel to aid both in facilitating insertion and in subsequent unfolding. This construction worked very well, and with reproducible results, when ordinary laboratory bench tests were made in which case no external forces are pressing against the sides of the film-enclosed tampon. However, in actual use, it was found that while insertion of the assembly was facilitated by the slick lubricous surface provided by the film, after insertion in the body cavity the sides of the film-enclosed tampon are subjected to so much pressure from the vaginal walls that the frictional resistance between the absorbent body of the tampon and the film is increased to a point where it is almost impossible to eject the tampon from the sleeve as required. Ejection is possible, but it can be done only with careful manipulation by the user, and by employing extreme force on the stick, both of which are undesirable. Because the film sleeve is in direct contact with the tampon structure it also tends to cling very tenaciously to the inserter stick and withdrawal string, making these elements difficult to manipulate properly with one hand as convenient insertion requires.

SUMMARY OF THE INVENTION

It has now been found, rather unexpectedly, that both the disadvantages of the tube applicator construction in the 2,413,480 patent as described above, and the disadvantages inherent to the stick-type tampon construction

of Patents 2,922,422-3 as modified with the folded-over sleeve, are overcome if an open-ended sleeve of film, which is thin and flaccid enough to retain its folded over condition, is combined with, and attached to, the forward end of a tube-applicator for tube-enclosed tampons. The tube is structurally strong enough to be self-supporting and retain its tubular form without collapse under the pressures developed during insertion as well as the pressures exerted against the sides of the tube when placed within the vaginal canal. Thus, since the tube is not deformed by these pressures, the tampon body retains its capability to slide easily within the tube, while the forward end of the tube, which is bridged over by the folded-over sleeve, maintains the sides of the tampon out of contact with the sides of the sleeve until the unfolding is started during ejection. It is thought that the front end of the tube acts as a sort of suspension hoop for the folded-over sleeve, permitting the sleeve to bridge over the tube opening, while providing easy entry for the tampon into the folded over portion of the film sleeve to facilitate the unfolding action of the sleeve and alleviate any tendency the inner surfaces of the film may have to cling to itself as the tampon is pushed therethrough during ejection. While an untreated film may be used for the sleeve, the outer surface of the film may also have a lubricant applied to provide additional lubrication and further reduce frictional resistance during insertion.

Accordingly it is an object of this invention to provide a tube-type applicator for tampons of a construction which facilitates the insertion of the applicator into a body cavity and which does not substantially resist the ejection of the absorbent tampon body therefrom after insertion.

It is a further object to provide a tampon applicator in which ejection force can be predictably controlled.

Other objects and advantages of the invention will become apparent by reference to the following specification and accompanying drawing.

BRIEF DESCRIPTION OF THE DRAWINGS

In the drawing:

FIG. 1 is a side elevation of a tube-type tampon applicator provided with the aid insertion means of this invention.

FIGS. 1A and 1B are fragmentary views of the front edge of the applicator of FIG. 1 showing various steps in folding the aid insertion means.

FIG. 1C shows a tampon partially ejected from the applicator.

FIG. 2 is a longitudinal section of another embodiment of the applicator and tampon.

FIG. 3 is a longitudinal section of still another embodiment.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

The embodiment shown in FIG. 1 comprises a tubular applicator member 11 in which there is inserted an absorbent tampon body 12. Telescopically mounted within tube 11 is an ejection plunger 13 through which there is threaded a withdrawal thread 14 conventionally attached to the rear end of tampon 12. In this embodiment, the forward end of tampon 12 is mushroomed over the leading edge of tube 11 as is practiced in tube-type tampons currently being marketed. Attached to, and encircling, the forward portion of tube 11 is a flaccid sleeve 15 of thin plastic film. As shown in FIG. 1A, the sleeve is open ended, as at 10 and extends well beyond the leading edge of tube 11, as at 15a. This extended portion is flattened, as at 15b in FIG. 1B, and folded back to give the final configuration shown at 16 in FIG. 1. The amount of sleeve which extends beyond the end of the tube should be only of sufficient length to permit folding back of the sleeve in a manner to close the forward end of the tube and protectively cover the tampon. It should not

be excessively long, thus avoiding having the folded portion extend down along one side of the tube any appreciable distance, if at all, or unfolding will be hampered.

In use, the covered end of the applicator tube is inserted into the vaginal tract, aided by the lubricous surface of film 15. After insertion, ejection plunger 13 is telescoped into tube 11 by the action of the fingers, whereby the tip of tampon 12 is moved forward to cause film 15 to unfold and permit ejection of tampon 12 as shown in FIG. 1C. Tube 11, sleeve 15 and plunger 13 are subsequently removed as a unit and discarded.

In FIG. 2 there is shown an outer tubular applicator 21 containing tampon body 22 having a withdrawal string 24 attached thereto and threaded through inner tubular ejector plunger 23 telescoped within tube 21. This embodiment varies from that shown in FIG. 1 in that the tampon body 22 has a rounded nose portion which smooths the entry of the tampon into sleeve 25 to facilitate unfolding thereof and ejection therethrough. It also differs from FIG. 1 in that a coating of lubricant 27 is applied to the outer surface of the film 25. As indicated previously, this lubricant preferably is petroleum jelly, surgical jelly, or the like. The lubricant further improves the ease of insertion and also acts to hold the folded-over portion 26 of open-ended sleeve 25 more securely in its folded configuration. This lubricant also assists the sliding action of the folded portion of the sleeve on itself as it unfolds during ejection of the tampon.

In FIG. 3 still another embodiment is shown having the usual outer applicator tube 31, inner ejection member 33, tampon body 32, withdrawal string 34 and open-ended sleeve 35. In this embodiment the forward end 39 of tampon 32 is recessed with respect to the leading edge 40 of applicator tube 31. As a result the folded back portion 36 of sleeve 35 may be recessed within the forward end 40 of tube 35. This provides a neater appearing arrangement and when the folded-over portion is recessed in the tube end, it may be used to hold medications or the like for application to the cavity, if desired. Merely having the sleeve provide a slick rounded surface on the circumferential portion of the tube is sufficient to reduce friction and thus aid insertion.

The absorbent body of the tampon may comprise any of the usual absorbent fiber or sponge structures commonly employed for such purposes, and is preferably compressed to self-sustaining form before being disposed within the applicator.

The applicator tube may be made of paper, plastic, cardboard or the like, and should have sufficient structural strength and rigidity to prevent collapse under normal vaginal pressures.

The film sleeve may be made of any film which is thin enough to substantially retain its folded configuration without the need for supplementary restraints. An especially suitable film has been found to be polyethylene .5 mil or less in thickness. If a lubricant coating is employed, the polyethylene film may be slightly thicker and still retain its folded configuration. Films other than polyethylene may be used. The film may be either clear or opaque and may be decorated in any selected colors or patterns. It may also extend to the rear of the outer applicator tube, covering the full length of the tube. In fabricating the sleeve, it may be extruded as a seamless tube, or it may be formed from a flat sheet rolled into a tube with overlapping or butt seams. The sleeve may be attached to the tube by heat-sealing, by suitable adhesives or by known heat-shrinking methods.

When a lubricant is used on the sleeve, each of the assemblies should preferably be enclosed in a removable protective wrapper to prevent loss or transfer of the coating before use.

While several specific embodiments of the inventive concept have been set forth herein, it is understood that the invention is not to be construed as limited thereby, and that suitable changes, modifications and variations

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may be made without departing from the spirit and scope of the invention as defined in the appended claims.

What is claimed is:

1. In a tampon applicator comprising an outer tube containing an absorbent tampon and an inner tube telescoped in one end thereof and adapted for slidable movement therein to eject said tampon therefrom, the improvement in which the forward portion of said outer tube has attached thereto a thin open-ended sleeve of plastic film, said sleeve extending beyond the end of said tube and being folded back on itself sufficiently to bridge over and cover the front opening and leading edges of said outer tube, said film being sufficiently thin to retain its folded over configuration until said tampon is ejected therethrough.

2. The applicator of claim 1 in which said film is polyethylene.

3. The applicator of claim 2 in which said film is not more than about .5 mil in thickness.

4. The applicator of claim 1 in which the outer surface of said sleeve is coated with a lubricant.

5. The applicator of claim 1 in which said film is opaque.

6. The applicator of claim 1 in which the trailing portion of said film sleeve covers the entire rear portion of said outer tube.

7. The applicator of claim 1 in which said tampon is disposed within said outer tube so that the forward tip of the tampon is recessed with respect to the front opening of the tube and the folded-over portion of said sleeve is tucked in said recess.

8. The applicator of claim 7 in which the outer surface of said sleeve is coated with a lubricant.

References Cited

UNITED STATES PATENTS

2,413,480	12/1946	Winter	128—263
2,922,422	1/1960	Bletzinger	128—263
2,922,423	1/1960	Rickard et al.	128—263
3,135,262	6/1964	Kobler et al.	128—285

ADELE M. EAGER, Primary Examiner

U.S. Cl. X.R.

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