July 2, 1968 G. F. HILDEBRAND 3,390,671

TAMPON APPLICATOR

Filed Dec. 30, 1965

FIG. 1.

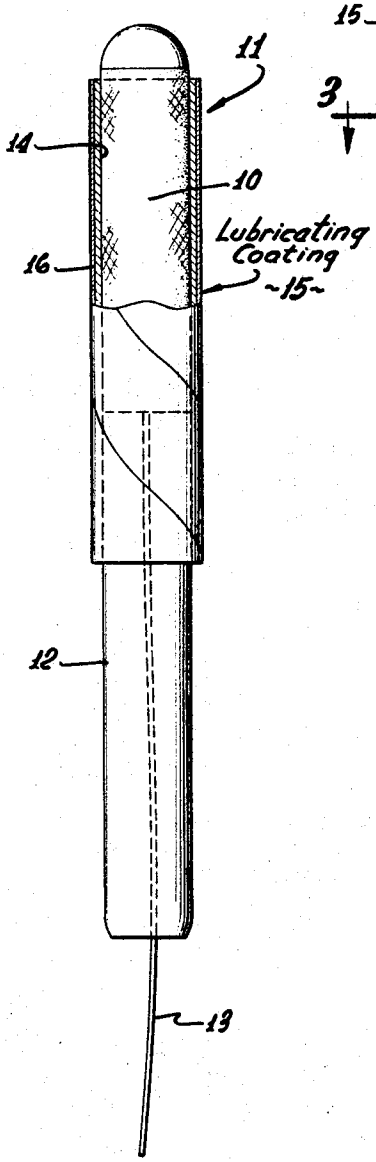


FIG. 2.

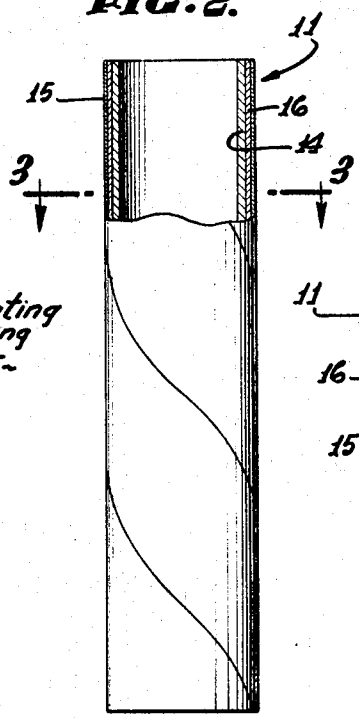


FIG. 3.

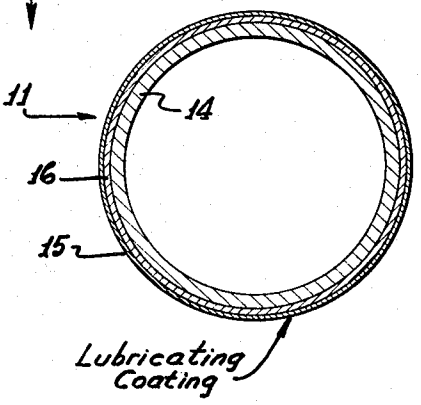
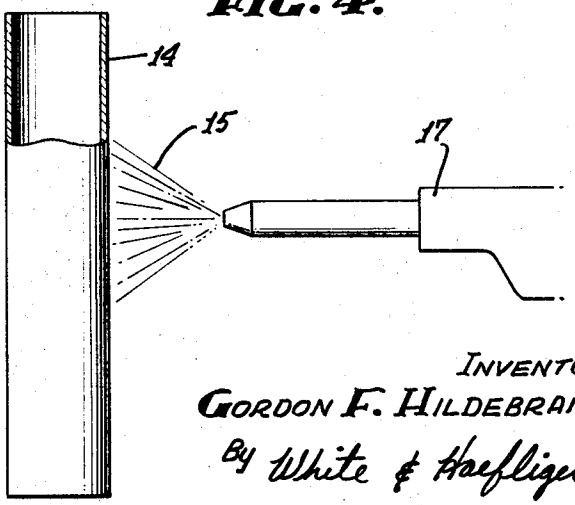


FIG. 4.



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TAMPON APPLICATOR

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ABSTRACT OF THE DISCLOSURE

A tampon applicator providing a self-lubricating surface utilizing a thin coating of a normally essentially dry but water soluble material on the exterior surfaces of the applicator.

This invention has to do generally with improvements in catamenial tampon applicators adapted for vaginal insertion and to contain ejectable tampons. More particularly the invention relates to lubrication of such applicators to facilitate insertion into body orifices.

Preliminarily it may be observed that the desirability for providing lubricated applicators arises from the normally relatively dry nature of the vaginal tract which, therefore offers resistance to insertion of the applicator.

Heretofore it has been proposed to lessen such resistance as by providing applicators with very smooth surfaces, using e.g., smooth plastic materials to form the exposed applicator surface. Also it has been proposed to lend lubricity to the applicator as by waxy (oil soluble) coatings.

Such expendients however do not afford the lubrication desired because they are predicated upon presenting water insoluble surfaces which, however smooth, cannot possess or permit slippage to the degree required for ease and comfort in the use environment.

The present invention departs from such prior proposals in its contemplation of thinly coating an applicator with a normally essentially dry material which itself has water solubility and therefore, upon becoming moistened, acquires a high degree of slipperiness in and by virtue of at least partial dissolution of dispersion of the coating substance itself, as distinguished from mere surface condition.

The invention has for its general object to provide a tubular tampon applicator with a coating, preferably having continuous uniform thickness, of a material having that degree of water solubility as dispersability in the presence of body cavity moisture, or by virtue of premoistening, that the material becomes inherently slippery and thereby eases the tampon insertion.

While the invention does not contemplate limitation to any particular coating material, useful substances may be selected from the class of organic polymeric materials including the polyvinyl alcohols, polyvinylpyrrolidone, polyethylene oxide, polyglycols, polyether film, alkali metal salts of polyacrylic acid, alkali metal salts of alginic acid, polysaccharides such as modified starch, sodium carboxymethyl celluloses and hydroxyethyl celluloses. Of these polymers, polyvinyl alcohol may be regarded as typical.

Generally the degree of water solubility of such materials may be deepndent upon their degrees of polymerization, solubility decreasing with increasing polymerization. For purposes of the present invention, intermediate polymerization is desirable so that the coating will not tend to have undue moisture acceptiveness as by exposure to normal humid atmosphere, but will at least partially dissolve or disperse upon aqueous liquid contact. Whether in a strict technical sense these polymers undergo apparent dissolution by formation of true aqueous solution, or aqueous dispersion, the change in state herein will be referred to as one of solution.

The various features and objects of the invention will be more fully understood from the following detailed description of illustrative embodiments shown by the accompanying drawing, in which:

FIG. 1 is a view partly in section showing an illustrative tampon and its applicator assembly;

FIG. 2 is an enlarged elevation also partly in section, showing the coated section of the applicator tube;

FIG. 3 is an enlarged cross section on line 3—3 of FIG. 2; and

FIG. 4 is a view illustrating a variational embodiment of the invention.

Referring first to FIG. 1, the assembly in its generalities is shown to comprise a usual combination of a tampon **10** which may be of any suitable specific form and composition, contained within an applicator tube **11** which receives within its open end opposite the tampon a slideable ejector **12**. The usual string **13** connected to the tampon, extends through the ejector **12** so as to be retained by the tampon after its projection from the applicator.

In more particular reference to FIG. 2, the applicator **11** is shown to comprise an open end coated tube, the inside or base **14** of which may be formed of any suitable or usual material, such as single or multiple layer paper. The invention is more particularly concerned with the provision on the exposed applicator surface of a coating or layer **15** of the previously described moisture soluble lubricant. Preferably, in the interests of assuring uniformity of the coating thickness and continuity, and for efficient manufacture, the tube **14** is wrapped spirally or otherwise, with relatively thin paper **16**, the surface of which is coated by known paper finishing methods with the polymer **15** at a thickness of between about ½ to 1½ mils.

While use of a polymer coated paper wrap about the tube is preferred for the reasons stated, it is also possible to coat the tube **14** directly at some sacrifice of thickness uniformity, as by spraying or otherwise depositing the polymer onto the tube surface. Thus in FIG. 4, a solution of the polymer is shown to be deposited from a spray **17**, the deposited film being dried in any suitable manner.

Upon being contacted by moisture, the polymer coating **14** undergoes at least partial solution or dispersion so that within itself, as distinguished from mere surface effect, the coating acquires a flowability or shearability which results in inherent slipperiness affording the ideal qualities for non-irritating lubrication.

I claim:

1. A catamenial tampon and applicator therefor adapted for vaginal insertion comprising an ejectable tampon and an applicator comprising a tube having an outer surface coating of a thin water soluble polymer which becomes slippery upon and by virtue of vaginal moistening.

2. Applicator according to claim **1**, in which the thickness of said coating is between about ½ and 1½ mils.

3. Applicator according to claim **1**, in which said coating is a preformed film of uniform thickness.

4. Applicator according to claim **1**, in which said tube includes a tubular body having a wrapper whose outer surface is filmed with said coating.

5. Applicator according to claim **1**, in which said body is a paper tube and said wrapper is carrying said paper coating.

6. Applicator according to claim **1**, in which said tube comprises a tubular body covered by a wrapper having a water soluble organic polymer outer surface coating of thickness between about ½ and 1 mil.

7. Applicator according to claim 6, in which said coating is carried on paper wrapped around said tube.

8. Applicator according to claim 1 in which said coating is selected from polyvinyl alcohol, polyvinyl pyrrolidone, polyethylene oxide, polyglycols, polyethers, alkali metal salts of polyacrylic acids, alkali metal salts of alginic acid, and polysaccharides selected from starch, carboxymethyl celluloses and hydroxyethyl celluloses.

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