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[54] **TAMPON APPLICATOR**
2 Claims, 9 Drawing Figs.

[52] U.S. Cl. 128/263

[51] Int. Cl. A61f 15/00

[50] Field of Search. 128/263,
270, 285

[56] **References Cited**

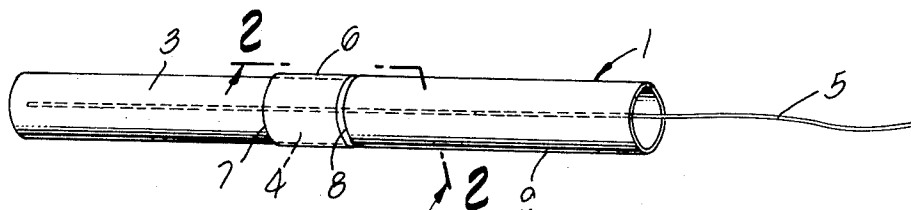
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ABSTRACT: A one-piece, thin wall, rigid cylindrical menstrual tampon applicator, of uniform cylinder diameter, has a tubular receptacle disposed at one end of the applicator. The receptacle is capable of snugly holding a compressed, absorbent cellulosic menstrual tampon in storage. The applicator dispenses the tampon in a vagina, as needed.



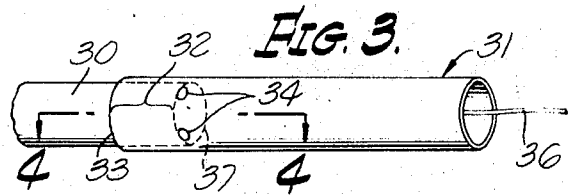
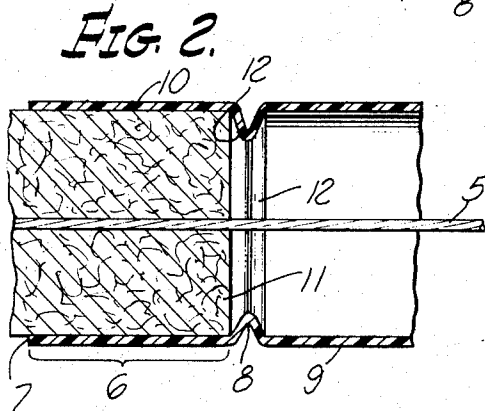
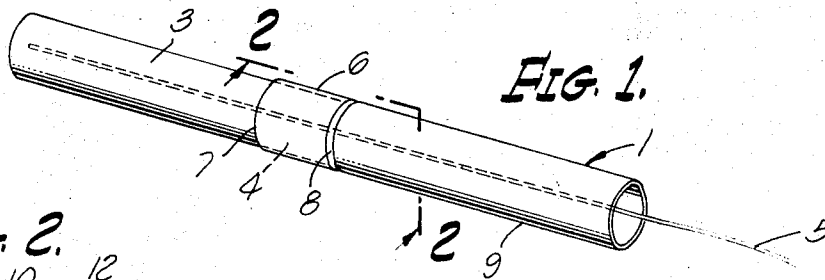


FIG. 4.

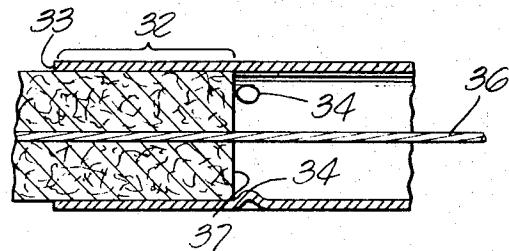


FIG. 5.

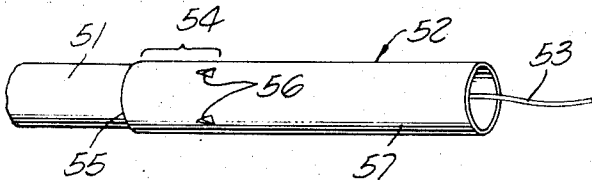


FIG. 6.

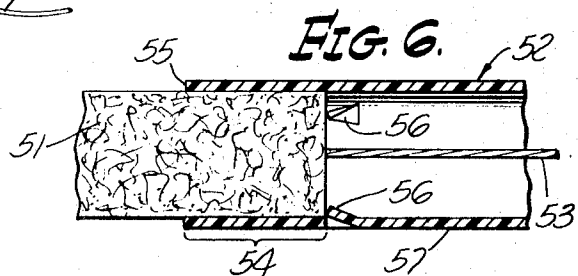


FIG. 7a.

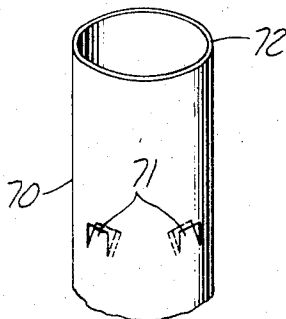


FIG. 7b.

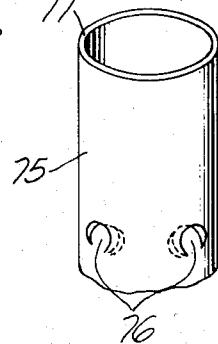
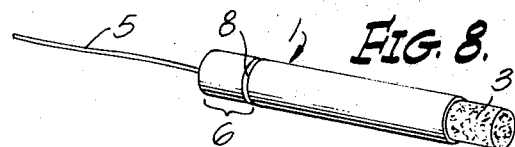


FIG. 8.



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TAMPON APPLICATOR

Compressed cellulosic material tampons are commonly used to absorb menstrual fluid. Conventionally many of the tampons are packaged for public use with a pair of telescoping, cylindrical paper tubes functioning as the tampon applicator. In the conventional tampon package an outer thin wall paper tube completely encloses the tampon, and an inner paper plunger tube telescopes into the outer tube on application of force, extruding the tampon. The outer paper tube is disposed in the vagina prior to extruding the tampon.

This invention teaches a new modification of a tampon applicator comprising a thin wall, rigid, one-piece cylindrical tube, having a tubular receptacle located in one end of the applicator. The receptacle is capable of snugly holding one end of a compressed, absorbent cellulosic menstrual tampon in storage. The applicator dispenses the tampon in a vagina, as required. The applicator is also capable of storing the tampon in a cooperative and protective mode which greatly decreases the length of the stored tampon-applicator combination.

Included in the objects of this invention are:

First, to provide an inexpensive, simple, one-piece, single-use tubular tampon applicator.

Second, to provide a one-piece, single-use, menstrual tampon applicator which is simple and easily applicable to dispensing a tampon in a vagina.

Third, to provide a one-piece, single-use menstrual tampon applicator which can be cheaply manufactured, and hence is inexpensive.

Fourth, to provide a one-piece, single-use, menstrual tampon applicator which does not stain in contact with menstrual fluid and is easily removed from the menstrual tampon, when the tampon is properly placed in position in a vagina.

Fifth, to provide a one-piece menstrual tampon applicator, which as a consequence requires a much smaller commercial package volume for a standard multiple lot of menstrual tampons, as compared to other commercial tampon packages available for public use.

Sixth, to provide a cooperative storage mode combination of tampon and tampon applicator which greatly decreases the stored length of the combination in a package suitable for public use.

Further objects and advantages of my invention will become apparent in the following description, to be read in connection with the accompanying drawing.

FIG. 1 is a perspective elevational view of one modification of my tampon applicator, disposed in a cooperative operative position with a compressed cellulosic menstrual tampon.

FIG. 2 is an enlarged partial cross-sectional view through 2-2 of FIG. 1, further illustrating the tampon applicator construction modification.

FIG. 3 is an elevational, perspective partial view of another modification of the tampon applicator invention, disposed in a cooperative position with a compressed cellulosic menstrual tampon.

FIG. 4 is a cross-sectional view through 4-4 of FIG. 3, illustrating further details of the tampon applicator construction.

FIG. 5 is an elevational, perspective, partial view of still another modification of the tampon applicator invention, disposed in a cooperative position with a compressed cellulosic menstrual tampon.

FIG. 6 is a cross-sectional view through 6-6 of FIG. 5 illustrating further details of the tampon applicator construction.

FIGS. 7a and 7b illustrate further detailed modifications of the tampon applicator leaf support detents illustrated in FIGS. 5 and 6.

FIG. 8 illustrates the cooperative storage mode of packaging the menstrual tampon - tampon applicator combination in perspective elevational, partial sectional view.

Referring to FIG. 1 in detail the tampon cylindrical applicator 1 is shown cooperatively disposed in a vaginal insertion operating relationship with a menstrual tampon 3.

The tampon cylindrical applicator 1 receives the tampon end 4, from which the withdrawal string 5 extends. The tam-

pon end 4 fits snugly in the tampon applicator receptacle 6, the receptacle 6 being formed between the tampon applicator end 7 and the tampon applicator detent 8. The tampon applicator detent 8 is an internally projecting tube crimp circumscribing the thin wall, uniform cylindrical cross section tube 9, located a uniform distance from the tube end 7, to form a required length of applicator receptacle 6.

In FIG. 2, the cross-sectional view 2-2 of FIG. 1 illustrates the tampon end 4 disposed as snugly fitting inside the tube wall 10 of the receptacle 6. The tampon end face 11, from which the withdrawal string 5 emerges, is disposed against the tube internal crimp face 12, which is inscribed in the tube 9, as a portion of the applicator detent 8. The length of the tampon applicator receptacle 6 is controlled by the distance the tampon detent 8 is located from the applicator end 7.

FIGS. 3 and 4 together respectively illustrate in perspective elevational view and cross-sectional view of another modification of the tampon applicator invention.

In FIGS. 3 and 4, the compressed cellulosic absorbent tampon 30 is shown disposed in vaginal insertion operational position in the circular cross section, thin wall, tubular tampon applicator 31. The tampon applicator receptacle 32 is formed by the internal tubular volume opening formed between the applicator end 33 and the multiple, internally projecting protuberances 34 which are shown in a regular circular spaced relationship around the circumference of the tube wall 35. The tampon withdrawal string 36 is shown extending from the tampon end 37. The tampon end 37 rests on and is supported by the multiple internally projecting protuberances 34. The internally projecting protuberances 34 are hemispherically shaped and are circular in cross section. They are formed in the continuous wall 35 of the applicator 31, extending into the internal volume of the applicator 31 the required distance necessary to support the tampon 30, typically one thirty second to one sixteenth inch. Typically, three to four hemispherical shaped protuberances 34 regularly circularly spaced on a perimeter in tube wall 35, a uniform distance from tube end 37, is sufficient.

FIGS. 5 and 6 together respectively illustrate in perspective elevational view and cross-sectional view an additional modification of the tampon applicator invention. Referring to FIGS. 5 and 6 in detail, a further modification of this invention is illustrated in which a compressed cellulosic menstrual tampon 51 is held in a thin wall, uniform cross section, cylindrical tube tampon applicator 52, the withdrawal string 53 extending from the tampon applicator 52. The tampon applicator receptacle 54 is formed by the tubular volume of applicator 52 between the tampon applicator end 55 and the multiple, triangular shaped, hinged leaf supports 56. The multiple hinged leaf supports 56 are each disposed at regular intervals on the circular circumference of the thin tube wall 57, at a necessary distance from the tube end 55 to form the uniform cylindrical volume of receptacle 54 required to hold the tampon 51. The leaf supports 56 are shown triangular-shaped, formed of the tube wall material, and have two free unsupported sides and a third hinge side permanently secured to the remainder of the tube wall 57. The leaf supports 56, which are formed from the tube wall 57, bend inwardly into the inside free volume of the applicator 52, forming leaf detents 56 for the tampon 51.

Leaf supports which have other than triangular shape are shown in FIGS. 7a and 7b. In FIG. 7a, the applicator 70 has rectangular-shaped, inwardly protruding leaf support detents 71 formed in the thin wall 72 of the applicator.

In FIG. 7b, the applicator 75 has the circular-shaped leaf support detents 76 hinged to the thin wall 77 of the applicator.

All of the leaf detents are fabricated by forming a desired pattern or contour of free standing leaf detents from the thin wall of the linear tube, providing a continuing thin wall hinge section connecting the leaf detent to the remainder of the tube wall. A thin wall, linear tube of uniform internal and external diameter is preferred as the initial component upon which to practice this invention. The linear tube may be either a standard spiral wound paper tube, or an extruded thermoplastic of

polyethylene, polypropylene, or the like. The paper tube may typically have a thin wall 0.010 to 0.020 inch thick. The thermoplastic, extruded tube may typically have a thin wall 0.005 to 0.010 inch thick. The applicator tube lengths are those necessary for the required usage.

Both the plastic and paper tubes may be conventionally manufactured at very high production rates and stored as simple linear tubes without the tampon applicator detent structure of this invention. Just prior to insertion of the menstrual tampon into the applicator tube, the tampon applicator detent of this invention may be formed in site on the tampon insertion machine, while the applicator tube is maintained in a spaced indexed geometrical position with respect to the tampon. Thus, the applicator tube is automatically properly indexed to place the tampon applicator receptacle in juxtaposition for correct insertion of the tampon into the tampon receptacle of the tampon applicator adapted to receive the tampon.

The paper, spiral wound tube which is one raw material component for this applicator invention, can be made with paper plies providing both exterior and interior tube faces, coated with polyethylene or polypropylene film or the like low-coefficient of friction, non-fluid staining properties. Thus, both the interior surface of the tampon receptacles 6, 32, 54 or the like and the exterior walls of the applicators 1, 31 and 52 can be coated with the plastic film.

The paper tubes may have the detents formed by conventional paper converting means, as by creasing, perforating with dies, and the like. The plastic tubes may have the detents formed by conventional plastic fabricating means, as by dielectric heating and rolling, hot die stamping and the like.

In FIG. 8 the storage mode of the menstrual tampon 3 and applicator 1 combination is shown, which clearly illustrates the marked reduction in tampon-applicator combination length which can be achieved by storing the tampon 3 inside the applicator 1 volume opposite the tampon applicator receptacle volume 6. The tampon end 11 again rests on the detent 3, but on the opposite face of the crease 12. Thus the storage mode of the tampon-applicator combination can be markedly reduced in length, by the length of the applicator 1, less the length of the receptacle 6. It is required that the tampon 3 protrude out of the applicator 1 in the storage mode of FIG. 8, to provide a finger hold necessary to remove the tampon from storage and reinsert the tampon in the receptacle 6

prior to tampon insertion in the vagina.

In the storage mode illustrated in FIG. 8, a 2-inch long tampon can be stored in a tampon applicator of this invention having a ½-inch long tampon applicator receptacle and a total tampon applicator length of 2¼ inch, with a tampon storage mode length opposite the tampon applicator receptacle of 1½ inch. A ¾-inch long tampon fingerhold is thus provided to remove a tampon and reinsert it in the tampon applicator receptacle. The other tampons of this invention incorporating other tampon detents may also be used in the storage mode combination.

Still another packing improvement using this tampon applicator invention is illustrated in packaging a 2-inch long tampon in a 0.45-inch inside diameter × ½-inch long applicator receptacle, the total applicator tube length being 2¾ inch. As a consequence of this improved one-piece applicator, ten menstrual tampons can now be packaged in a paper carton box which measures 4½ inch long × 1 inch wide × 2¼ inch deep. The new improved package of ten tampons now approximates the size of a package of cigarettes and is a more easily carried, purse size package. In view of the personal privacy required by the users of menstrual tampons, this disclosed improvement in package size for a conventional lot of ten menstrual tampons can result in widespread increased commercial usage of this tampon package product.

Obviously many modifications and variations in my tampon applicator may be made in the light of my teachings.

I claim:

1. A one-piece vaginal tampon tubular applicator, securing a menstrual tampon, comprising: a single, cylindrical, uniform diameter, thin wall tube of the required length; a tampon detent disposed in a short length circular perimeter of said tube wall, said short length perimeter disposed a spaced distance from one tube end; said tampon detent comprising multiple, hinged leaf supports cut from said tube wall, the leaf support hinges disposed coplanarly uniformly parallel in and around said circular tube perimeter, said leaf supports radially extending inside said cylindrical tube; and a tampon receptacle thereby disposed between said tube end and said tampon detent, including the tube wall from which the leaf supports are cut, the tampon receptacle length sized to contain not more than a minor length of the tampon disposed therein.

2. In the tubular applicator of claim 1, the modification wherein there are at least three hinged leaf supports.

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