

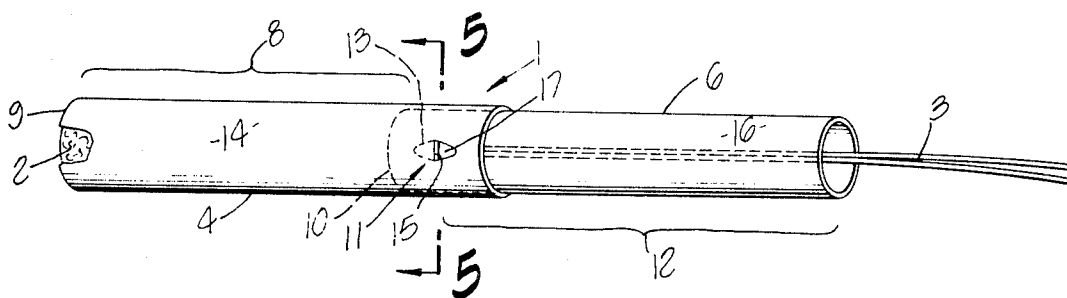
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 [21] Appl. No. **785,265**
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[56] **References Cited**
UNITED STATES PATENTS
 2,587,717 3/1952 Fourness 128/263
Primary Examiner—Adele M. Eager
Attorney—J. L. Jones

[54] **TAMPON APPLICATOR IMPEDANCE**
6 Claims, 8 Drawing Figs.

[52] U.S. Cl..... **128/263,**
128/260
 [51] Int. Cl..... **A61f 15/00**
 [50] Field of Search..... **128/260,**
261, 268, 263

ABSTRACT: A frictional impedance securing together the inner plunger tube within the outer tube, in a pair of telescoping menstrual tampon storage and applicator tubes. The frictional impedance secures the inner tube within the outer tube without interfering with the required tube telescoping mechanism.



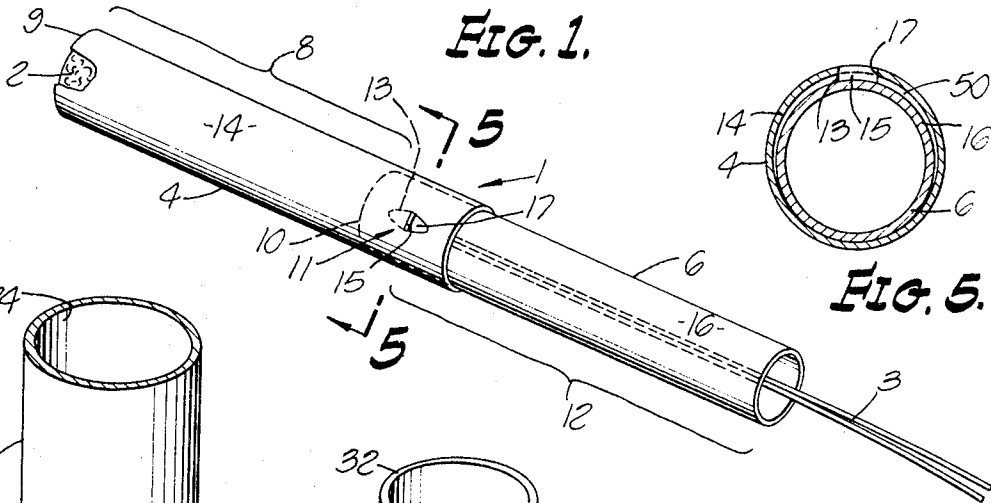
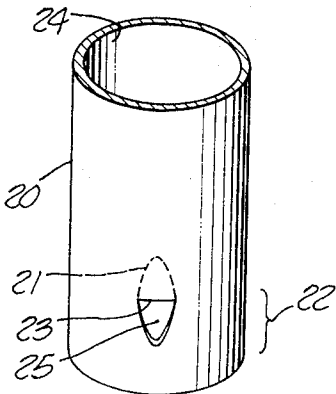


FIG. 2.

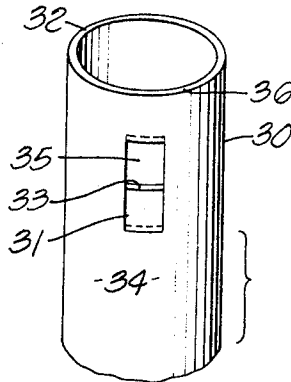


FIG. 3.

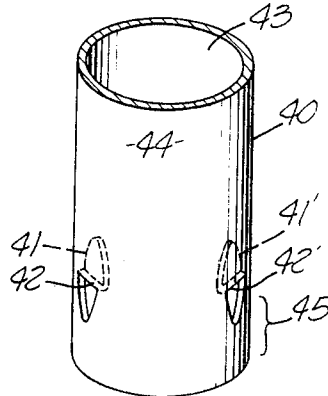


FIG. 4.

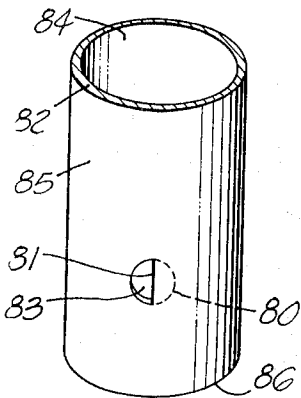


FIG. 8.

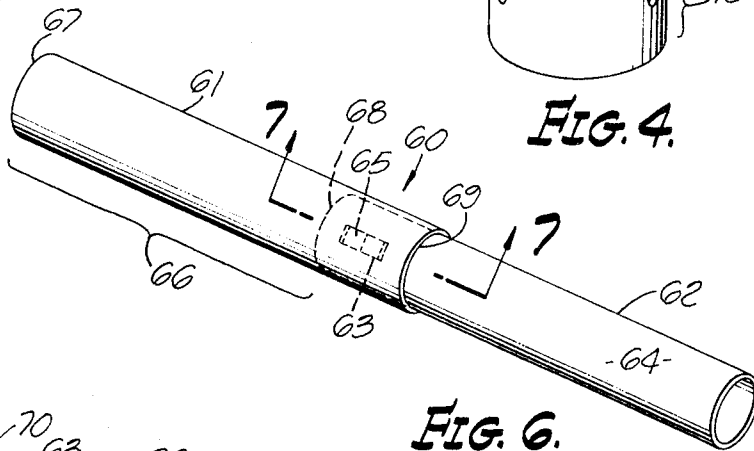


FIG. 6.

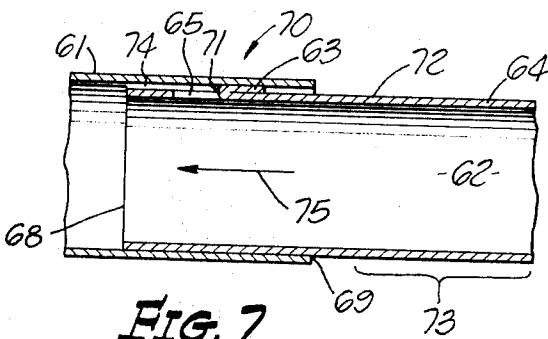


FIG. 7.

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TAMPON APPLICATOR IMPEDANCE

BACKGROUND OF THE INVENTION

There is a well established usage of a pair of telescoping tubes which hold and apply menstrual tampons. The pair of telescoping tubes typically are made of paper or polyethylene plastic, or combinations of the two materials. The tampon is typically enclosed in a receptacle in the outer tube, one end of the tampon being coterminous with the end of the outer tube which is inserted in the vagina. The inner tube may closely fit inside the outer tube and one end of the inner tube forms the second end of the receptacle in which the tampon is enclosed.

It is very important for consumer protection to provide a pair of telescoping applicator tubes which does not allow the inner plunger tube to fall out of the outer tube, while the consumer is handling the tampon device. Likewise it is important from a manufacturing cost viewpoint that the mating outer diameter of the inner plunger tube and the inner diameter of the outer tube be set at manufacturing tolerance limits which allow high speed production without tube rejection due to variations in tube diameters. It is also important that applicator tubes do not fit together too tightly for easy consumer use. A means is needed to secure the pair of telescoping tubes together, which can overcome these problems.

SUMMARY OF THE INVENTION

This invention teaches a detent means for securing the inner plunger tube to the inside of the tampon insertion outer tube by means of a frictional impedance. The frictional impedance is formed by the pair of telescoping applicator tubes, as required during the tampon and applicator tube pair final assembly.

Included in the objects of this invention are:

First, to provide a simple, easily formed frictional impedance for a pair of telescoping tampon applicator tubes.

Second, to provide a securing means for a pair of telescoping menstrual tampon applicator tubes, which prevent the pair of tubes from easily becoming disjointed.

Third, to provide a detent means for one tube of a pair of menstrual tampon telescoping applicator tubes; said detent means capable of being formed on either the inner or outer tube of the pair.

Fourth, to provide a detent means for a tube of a pair of telescoping menstrual tampon applicator tubes, which is easily formed in a single tube after the tube is manufactured.

Fifth, to provide a securing means for a pair of telescoping menstrual tampon applicator tubes, which can be cooperatively operated while the menstrual tampon is enclosed in the tampon insertion outer tube.

Other objects of this invention are taught in the following description and claims.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is an elevational perspective view of a pair of telescoping menstrual tampon applicator tubes in operational position, having a frictional impedance securing the pair of tubes together. The applicator contains a menstrual tampon.

FIG. 2 is a perspective elevational view of one end of an outer tube of a pair of telescoping tampon applicator tubes having a detent means, illustrated by one hinged tube wall flap formed from the tube wall.

FIG. 3 is a perspective elevational view of one end of an inner plunger tube of a pair of telescoping tampon applicator tubes having a detent means, illustrated by another modification of a hinged tube wall flap formed from the tube wall.

FIG. 4 is another perspective elevational view of one end of an outer tube of a pair of telescoping tampon applicator tubes having a detent means. The detent means is two hinged tube wall flaps formed from the tube wall and disposed on a circumference of the tube.

FIG. 5 is a sectional view through 5-5 of FIG. 1 illustrating the geometrical position of the hinged tube wall flap formed

from the outer tube wall, and disposed in a pair of telescoping tubes of FIG. 1.

FIG. 6 is a perspective elevational view of another modification of a pair of telescoping menstrual tampon applicator tubes having an operative frictional impedance securing the two applicator tubes together.

FIG. 7 is a sectional view through 7-7 of FIG. 6 illustrating the cooperative operation of the FIG. 6 modification of the frictional impedance invention.

FIG. 8 is still another perspective elevational view of one end of an outer tube of a pair of telescoping menstrual tampon applicator tubes, having a hinged tube wall flap formed in the tube wall with the hinge parallel to the axis of symmetry of the tube.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to FIG. 1 in detail, a pair of telescoping menstrual tampon applicator tubes 1 is shown in perspective elevational view, with a menstrual tampon 2 disposed therein and the tampon withdrawal string 3 extending from the tubes 1. The tampon insertion outer tube 4 has the inner plunger tube 6 telescoped into it for a controlled distance, forming a menstrual tampon receptacle 8 inside of the outer tube 4. The receptacle 8 is bounded by the outer tube terminus 9 and the inner tube terminus 10. The tampon 2 is coterminous with the outer tube terminus 9 and also the other inner tube terminus 10. The frictional impedance 11 is shown in operation, located adjacent the tampon applicator handle means 12. The frictional impedance 11 comprises a tube wall flap 13, connected to the wall 14 of tube 4 by the flap wall hinge 15, the tube wall flap being in tight frictional slide contact with the outer surface 16 of the inner plunger tube 6. The tube wall flap 13 is folded inward from the exterior of tube 4, being parallel and contiguous to the inner surface of the tube 4. The tube wall flap 13 is formed by precisely cutting a flap section 13 from the tube wall 14, the flap 13 remaining attached to the wall 14 by the wall hinge 15, leaving a flap opening 17 in the wall 14 which is equivalent in area pattern to the wall flap 13.

The frictional impedance 11 provides a tight, frictional slide fit between the outer tube 4 and the inner tube 6, when the inner tube 6 is telescoped into the outer tube 4 by the tampon applicator handle means 12.

FIGS. 2 and 3 together illustrate in detail two detent means modifications of the tube wall hinged flap construction which can be utilized in two frictional impedance modifications. FIG. 2 discloses a partial length of tampon insertion outer tube 20, having a tube wall flap 21 disposed a suitable distance from the tampon applicator handle means terminus 22 of the tube 20. The wall flap 21 is shown folded inward on the wall hinge 23, and lying parallel to the inner surface 24 of the tube 20. The wall flap opening 25 is equivalent in area pattern to the wall flap 21, since the flap 21 is cut from the tube wall. FIG. 3 discloses a partial length of an inner plunger tube 30, having a tube wall flap 31 disposed a suitable distance from the tube end 32 which forms one terminus of a tampon receptacle, such as receptacle 8 of FIG. 1. The wall flap 31 is shown folded outward on the wall hinge 33, and lying parallel to the outer surface 34 of the tube 30. The wall flap opening 35 is equivalent in area pattern to the wall flap 31, since the flap 31 is cut from the tube wall 36.

In principle the tube wall flap 21, or the like, of the tampon insertion outer tube 20, or the like, is folded inward, lying parallel to the inner surface of the tube. Likewise, the tube wall flap 31, or the like, of the inner plunger tube 30, or the like, is folded outward, lying parallel to the outer surface of the tube. In general, the tube wall flap 21, or the like, is disposed a suitable short distance, one-eighth to one-half inch, from the end of the tube 20 which is a part of the handle means terminus 22, or the like. Likewise, the tube wall flap 31, or the like, is disposed a suitable short distance, one-eighth to one-half inch, from the tube end 32, or the like.

FIG. 4 illustrates in detail the detent means modification embodying plural tube wall flaps. A partial length of a tampon insertion outer tube 40 is illustrated, having two tube wall flaps 41 and 41'. The flaps 41 and 41' have respective hinges 42 and 42', which secure the flaps parallel to the inner surface 43 of the tube 40. The flaps 41 and 41', as well as the hinges 42 and 42', are formed by cutting and bending the tube wall 44. The two flaps 41 and 41' are disposed in suitable positions on a circumference of the tube 40, at suitable distance (one-eighth to one-half inch) adjacent the tampon handle means terminus 45 of tube 40. The needed plural number of tube flaps can be formed on the tube.

FIG. 5 illustrates in cross-sectional view through 5-5 of FIG. 1 the operational positions of tampon insertion outer tube 4 and inner plunger tube 6, held in a cooperative, tight, frictional slide, telescopic position by the tube wall flap 13. The tube wall flap 13 slides on the outer surface 16 of the inner tube 6. A crescent shaped cross section opening 50 between the two tubes 4 and 6 generates a similar cross-sectional shaped tubular orifice as the pair of tubes 4 and 6 are telescoped together in use. If two or more tube wall flaps are utilized in a modification of this invention, they would normally generate an annular tubular cross section opening corresponding to the opening 50, if the wall flaps are placed diametrically opposed.

Dimensionally the tube walls of tubes 4 and 6, and the like, are typically 0.015 inch thick. In a typical operational model of the pair of applicator tubes 1, the outer tampon insertion tube 4 is 0.608 inch outside diameter and 0.578 inch inside diameter. The inner plunger tube 6 is 0.558 inch outside diameter, providing a crescent shaped maximum gap of 0.020 inch. The folded tube wall flap of 0.015 inch thickness, plus the spring tension provided by the paper flap wall hinge 15, coact to form a tight, frictional slide for the inner tube 6 which holds it firmly in place.

FIG. 6 illustrates in further detail another pair of applicator tubes 60, telescoped in cooperative operational position. In this modification the tampon insertion outer tube 61 does not have a tube wall flap. The inner plunger tube 62 has a tube wall flap 63 formed from the tube wall 64, as similarly illustrated in detail in FIG. 3. The tube wall flap 63 is equivalent in area pattern to the flap opening 65. The menstrual tampon receptacle 66 is formed inside the tube 61, between the tube terminus 67 of tube 61, and the tube terminus 68 of tube 62. The terminus 69 of tube 61 is opposed to terminus 67.

The frictional impedance 70 shown in detail in FIG. 7 is a cross-sectional view through 7-7 of FIG. 6. The outer tube 61 is shown in partial lengthwise view in the vicinity of terminus 69. The inner plunger tube 62 is likewise shown in partial lengthwise view, in the vicinity of terminus 68, the tube 62 being telescoped into the outer tube 61. The frictional impedance 70 is shown in operative condition. The tube wall flap 63 is formed by cutting a flap opening 65 in the tube wall 64 and outwardly folding the flap 63 at the wall hinge 71 to a position parallel to the outer surface 72 of the tube wall 64. The tube wall flap opening 65 is disposed in a position adjacent to the tube terminus 68 of tube 62, and the flap wall hinge 71 is disposed adjacent the inner tube end portion of the tampon applicator handle means 73. The flap 63 is thus disposed to slide smoothly and tightly in the crescent shaped cross section annular gap 74 in the direction of the arrow 75 showing the operational direction of the telescoping movement.

The tube wall flaps 13, 21, 31, 41, 41', 63 are shown secured by their respective wall hinges 15, 23, 33, 42, 42', 71, and these hinges are shown disposed normal to the axis of symmetry of the respective tubes. In FIG. 8 a further modification of a tube wall flap is illustrated, the tube wall flap 80 of semicircular shaped pattern is shown connected by a wall hinge 81 to the tube wall 82. The flap 80 is formed from the tube wall 82, generating the semicircular opening 83. The flap 80 is folded inwardly lying parallel to the inner surface 84 of the wall 82. The hinge is disposed parallel to the axis of sym-

metry of the tampon insertion outer tube 85. The flap 80 is disposed adjacent (one-eighth to one-half inch) of the tube terminus 86.

In a simple test, the pair of applicator tubes 60 constructed as in FIG. 6 with the above listed tube dimensions was held in one hand, by tube 61. The tube 61 was shaken as one would a bottle of medicine, with the tube 62 extending downward. The tube 62 did not fall out, even after several hard shakes. Then the inner plunger tube 62 was reversed as to tube ends, and reinserted in tube 61 to form a modified tampon applicator handle means, with no frictional impedance. On shaking the pair of applicator tubes 60 again as above, the unsecured tube 62 fell out on the first shake.

Obviously the diameters of the outer and inner tubes of the pair of telescoping applicator tubes may be varied as required, along with required variations in the tube wall thicknesses. Wide manufacturing tolerances on the tube diameters can be allowed, since the crescent or annular shaped tubular orifice required for the frictional impedance is of the magnitude of 0.015-0.030 inch gap width. Further, since the wall flap occupies only a small fraction of the circumference of the pair of tubes, slight distortion of either the inner or outer tube into an egg shaped cross section on telescoping the tubes, allows for a further variation in tube diameters.

Typically, the wall flaps may be triangular, rectangular, semicircular or other geometrical shapes as required. The wall flaps are typically one-eighth to three-sixteenths inch, or the like, in a typical dimension. The flap dimensions are those required to coact as described.

The frictional impedance as described may be formed as a step in the final assembly of a tampon in a pair of telescoping applicator tubes. Either, just before or just after the tampon is placed in the outer tube, the tube wall flap is formed in the designated inner or outer tube, as by a perforating or punching tool. The inner tube is then inserted. Thus the necessity of carefully indexing the correct ends of the pair of telescoping tubes is avoided in the assembly operation. Plain tube blanks can be made at high speed on standard tube rolling machines. The plain tubes are then fed, unindexed, to the tampon and applicator assembly machine, where the tube flap is formed just before final product assembly.

Obviously many modifications and variations in my tampon applicator frictional impedance may be made in the light of my teachings. It is therefore understood that within the scope of the appended claims, the invention may be practiced otherwise than as described.

I claim:

1. A frictional impedance for a pair of telescoping menstrual tampon applicator tubes comprising: at least one hinged tube wall flap formed from the wall of one tube of the pair of telescoping tubes, said at least one tube wall flap folded at the at least one flap wall hinge of the tube wall and located interiorly between the inner wall of the outer telescoping tube and the outer wall of the inner telescoping tube, said at least one tube wall flap uniformly located around the circumference of the tube a suitable distance from the menstrual tampon receptacle of the pair of telescoping applicator tubes adjacent to the tampon applicator handle means; and the inner diameter of said outer tube and the outer diameter of said inner tube adapted to provide a tight, frictional slide, annular cross section, tubular orifice for said at least one tube wall flap, when said inner tube is telescoped into said outer tube, utilizing said applicator handle means.

2. In the frictional impedance for a pair of telescoping menstrual tampon applicator tubes of claim 1, the modification having only one tube wall flap.

3. A frictional impedance for a pair of telescoping menstrual tampon applicator tubes comprising: a hinged tube wall flap formed from and interiorly extending from the tube wall of the outer telescoping tube, said tube wall flap folded at the flap wall hinge parallel to the inner surface of said outer tube, and said tube wall flap located at the outer tube end opposite the tampon insertion end, and the inner diameter of the outer

tube and the outer diameter of the inner tube of the pair of telescoping tubes adapted to provide a tight, frictional slide, crescent shaped cross section, tubular orifice for said tube wall flap, when said inner tube is telescoped into said outer tube utilizing the applicator handle means.

4. In the frictional impedance for a pair of telescoping menstrual tampon applicator tubes of claim 3, the modification wherein said flap hinge is disposed adjacent said tampon insertion end and opposite the wall flap opening, said wall flap opening is disposed adjacent the outer tube portion of said tampon applicator handle means.

5. A frictional impedance for a pair of telescoping menstrual tampon applicator tubes comprising: a hinged tube wall flap formed from and exteriorly extending from the tube wall of the inner telescoping tube, said tube wall flap folded at the

flap wall hinge parallel to the outer surface of said inner tube, and said tube wall flap is disposed at the inner tube end telescoped into the outer tube end; and the inner diameter of the outer tube and the outer diameter of the inner tube of the pair of telescoping tubes adapted to provide a tight, frictional slide, crescent shaped cross section, tubular orifice for said tube wall flap, when said inner tube is telescoped into said outer tube, utilizing said applicator handle means.

6. In the frictional impedance for a pair of telescoping menstrual tampon applicator tubes of claim 5, the modification wherein said flap hinge is disposed at the inner tube end telescoped into the outer tube end and the wall flap opening is disposed adjacent the inner tube end forming a tampon receptacle base.

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