

[54] COMBINATION TAMPON APPLICATION
AND PLUNGER

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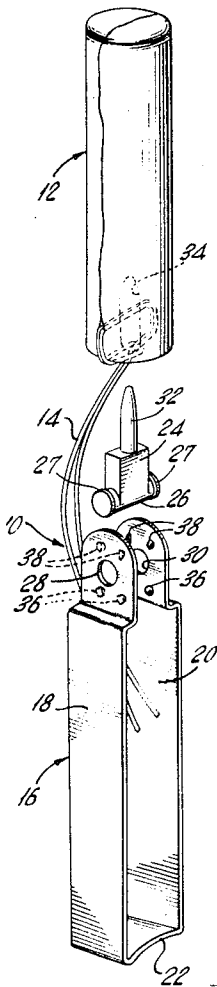
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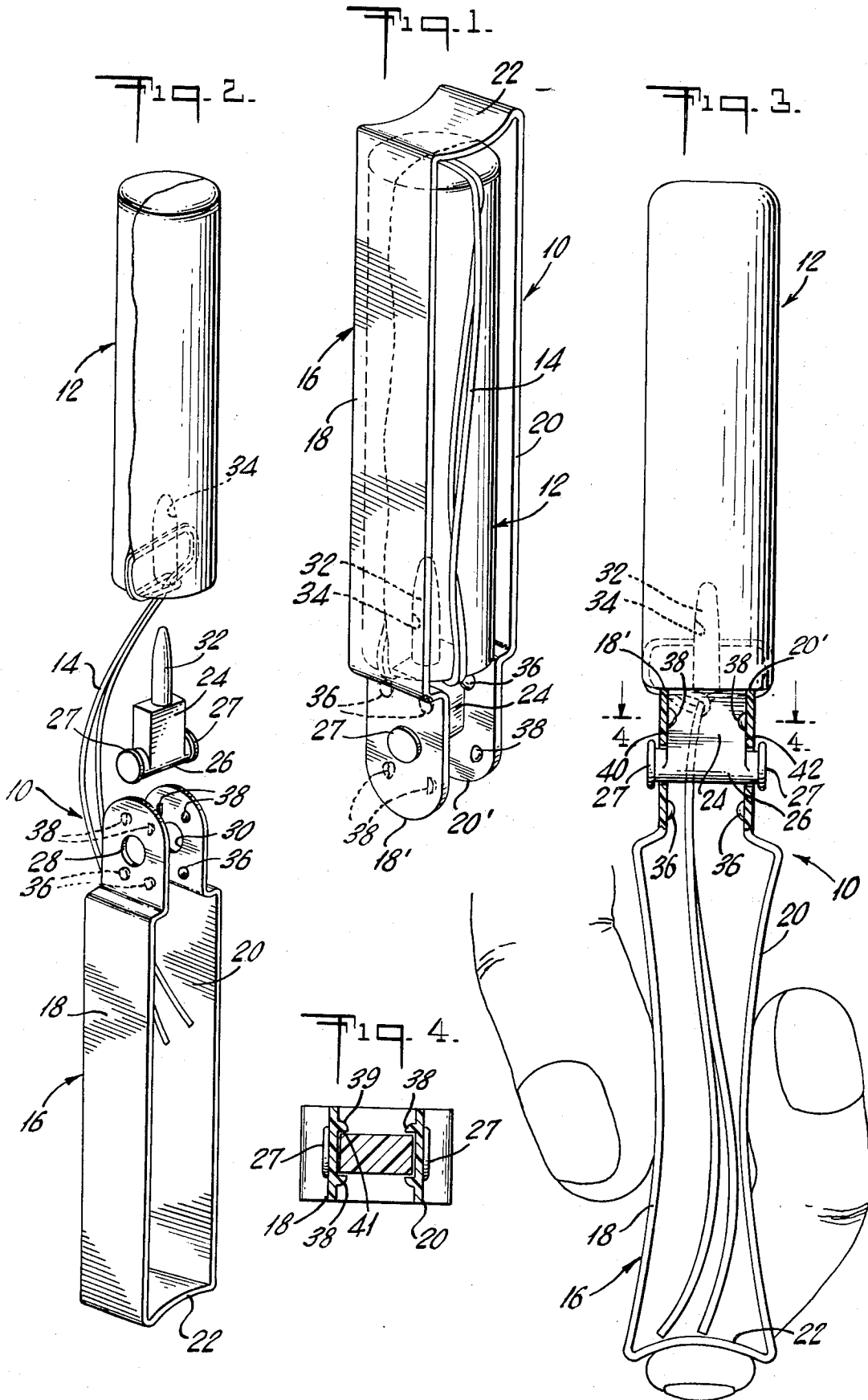
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[57] ABSTRACT

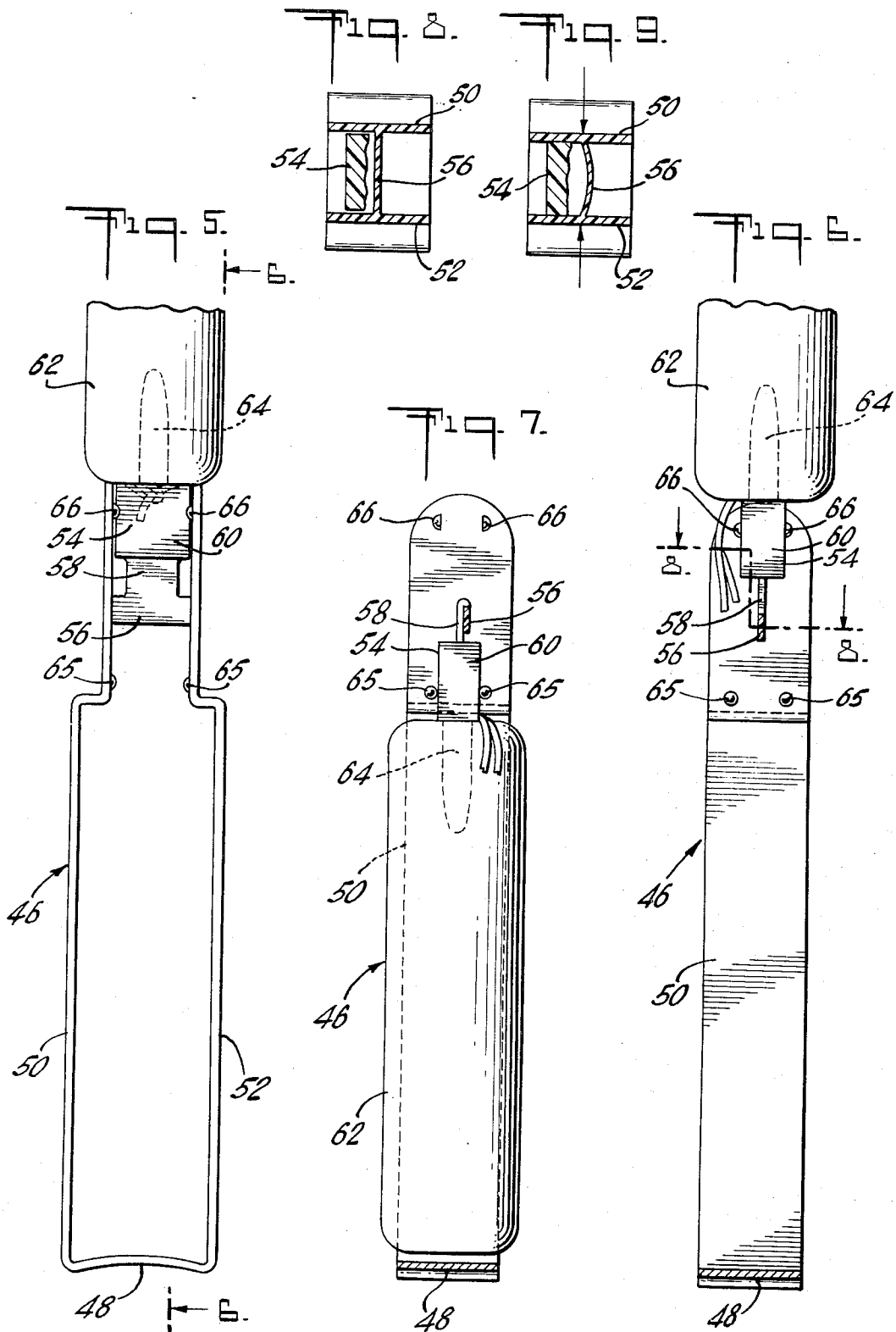
A tampon applicator of reduced length is provided which is not substantially larger than the tampon itself, is economical to produce and simple to use. The applicator comprises a holder having a bottom and upstanding side members forming a frame for enclosing a tampon. Pivotably mounted at the top of and between said side members is a pivot element provided with means for securing the bottom of a tampon thereto; whereby the tampon may be rotated so as to be enclosed within the frame of the holder for packaging and storage. In use, the tampon may be rotated to a position above the holder; the holder then forming a convenient applicator.

7 Claims, 9 Drawing Figures





SHEET 2 OF 2



COMBINATION TAMPON APPLICATION AND PLUNGER

BACKGROUND OF THE INVENTION

This invention relates to applicators for tampons and particularly to applicators of reduced length. Several applicators for introducing catamenial tampons intravaginally are already available. These generally consist of a cardboard, open-ended, tubular holder containing the tampon combined with a plunger adopted to slidably expel the tampon from the holder. In a common embodiment, the plunger is also tubular, though smaller in diameter than the holder, and telescopically positioned therewith so that by moving the plunger into the holder, the tampon may be ejected from the opposite end. The holder is, of necessity, longer than the tampon and to insure the complete ejection of the tampon from the holder, the plunger is, likewise, longer. Consequently, the overall length of the holder and plunger assembly is always more than twice the length of a tampon. The tampon string for removing the tampon after use is generally contained either within the holder or within the plunger.

Several drawbacks are associated with such prior applicators. To provide sufficient tampon and applicator assemblies for a menstrual period, it is customary to package a number of them, e.g., 10, in a single package. From the foregoing description of prior applicators, it is apparent that the tampon applicators and hence the packages used to contain them are comparatively large with respect to the size of the article, i.e., the tampon, ultimately used by the customer. The necessity for large packages greatly adds to the cost of the marketed product, such added cost being particularly important in products of the type herein considered which are intended for a single use and are then to be discarded. Hence, there is an economic incentive for a reduction in product size. Such a size reduction is moreover advantageous from both a convenience and an aesthetic point of view. The product should be small enough to be conveniently carried in a woman's purse. From an aesthetic viewpoint, a shorter product is less noticeable.

To avoid the problems of excessive length, it has been suggested that the plunger and holder be provided in unassembled form and packaged side by side, thereby substantially reducing the overall length of the package. While such a system has in fact greatly reduced the packaging requirements, the modifications heretofore required in the product to insure proper engagement of the plunger with the bottom of the tampon so as to properly eject the tampon have made such products uneconomical. Further, the user is presented with a device with which she has no familiarity and which, in fact, requires the assimilation of written instructions prior to use.

Accordingly, there is a need for a tampon applicator system which is not substantially larger than the tampon itself and is economical to produce and simple to use.

SUMMARY OF THE INVENTION

In accordance with this invention, a tampon applicator is provided comprising a holder having a bottom and upstanding side members forming a frame for enclosing a tampon. A pivot element is mounted at the top of and between the side members, the pivot ele-

ment being capable of pivoting at least about 180° around an axis of rotation transverse to the upstanding side members. The pivot element is provided with means for securing the bottom of a tampon thereto so that the tampon may rotate relative to the holder with its longitudinal axis perpendicular to the axis of rotation of the pivot element.

In packaging and storing tampons, using the applicator of this invention, the tampon may be secured to the pivot element and the engaged tampon and pivot element rotated so that the tampon is enclosed within the frame of the holder. The frame of the holder is sized to closely conform to the tampon and hold the same tightly confined therein. Preferably the holder is constructed of a limitedly elastic polymeric material so that the tampon may be force-fitted into the holder and held in place by the bottom and side members thereof. The tampon string, generally threaded through or otherwise attached to the bottom portion of the tampon, may then be conveniently held between the tampon and the tampon-confining side members or bottom of the holder so as to avoid string entanglement while having the string remain visible to the user. To further insure that the tampon will remain enclosed within the holder, the top portions of the upstanding side members of the holder are provided with detents to restrain unintended rotation of the pivot element which may result from any slight, accidental forces applied thereto. The restraint of the detents, however, is easily overcome when it is desired to reposition the pivot element. The holder enclosing a tampon may be provided with an overwrap to insure cleanliness and may be conveniently packaged. As thus packaged, it is clear that, in contrast to prior devices, the assembly of applicator and tampon is not substantially longer than the tampon itself, i.e., the assembly is at approximately the minimum length, thereby curing deficiencies experienced with prior devices.

To use the tampon assembly of this invention, the user simply removes the overwrap and pushes the tampon out of the frame-like holder, revolving the tampon and the pivot element approximately 180° relative to the holder, until the tampon extends longitudinally above the holder. A second set of detents may be provided for holding the tampon rigidly in this position. Thus, by simply repositioning the tampon in this manner, the user converts the holder into an applicator which can be conveniently gripped and used to insert the tampon. The visible string assures the user that a stringless tampon will not be inserted.

In one specific embodiment of this invention, the holder and the pivot element are separately molded to form a two-piece applicator, while in another embodiment, the holder and pivot element are molded to form an integral piece.

The invention may be more clearly understood by reference to the attached drawings taken together with the following description.

In the drawings:

FIG. 1 is a perspective view of a tampon applicator embodying this invention, shown together with a tampon and illustrated in the packaged position; FIG. 2 is a perspective, exploded view of the applicator and tampon shown in FIG. 1 and illustrated in the open position;

FIG. 3 is a cross-sectional view of the assembled applicator and tampon of FIG. 2, also illustrating the method of gripping the applicator;

FIG. 4 is a cross-sectional view taken along line 4—4 of FIG. 3;

FIG. 5 is an elevation view of a second embodiment of the tampon applicator of this invention together with a tampon.

FIG. 6 is a cross-sectional view of the tampon applicator of FIG. 5 taken along line 6—6;

FIG. 7 is a cross-sectional view of the tampon applicator of FIG. 5 shown in the packaged position;

FIG. 8 is a partial cross-sectional, fragmented view of the tampon applicator of FIG. 6 taken along line 8—8 and shown prior to application of the tampon; and

FIG. 9 is a partial, cross-sectional, fragmented view of the tampon applicator of FIG. 6 taken along line 8—8 and shown during application of the tampon.

Referring now to FIGS. 1-4, an applicator 10 embodying the teachings of this invention is shown along with a catamenial tampon 12. The tampon 12 is of the conventional type, comprising an absorbent material formed into the general shape of a cylinder and having attached at a bottom portion thereof, a withdrawal string 14. As shown in the drawings, the withdrawal string is doubled to form a loop and two loose ends. The loop is then threaded through the tampon and the ends inserted through the loop as it emerges through the tampon to form a slip knot.

The applicator of this invention comprises a holder 16 having two upstanding sidewalls 18 and 20 and a bottom 22 forming a frame for enclosing the tampon 12. A pivot element 24 is provided rotatably mounted to the top portion of the sidewalls 18 and 20. In the embodiment shown in FIGS. 1-4, the bottom portion of the pivot element is molded into an integral axial rod 26 having flanged ends 27. Co-axially aligned holes 28 and 30 are provided in the top portion of sidewalls 18 and 20 respectively, for receiving the ends of the axial rod 26 by snap-fitting the flanged ends through the holes and thereby rotatably mounting and securing the pivot element between the sidewall of the holder. The pivot element is further provided with means for engaging the bottom of the tampon 12. These means comprise an upstanding projection 32, perpendicular to the axis of rotation of the mounted pivot element 24, i.e., perpendicular to the axial rod 26) for cooperating with a bore 34 in the bottom of the tampon so as to engage the tampon and allow it to rotate with the pivot element; the longitudinal axis of the tampon rotating perpendicular to the axis of rotation of the pivot element.

As best shown in FIG. 1, the tampon may be rotated, for packaging and storage purposes, to fit snugly within the sidewalls and bottom of the holder. Preferably the sidewalls are constructed of a limitedly elastic material and are spaced apart; the space being, to a slight degree less than the width of the tampon. The tampon may then be rotated therebetween by the exertion of moderate, manually applied force and because of the elastic nature of such material, the walls will yield and then close upon the tampon, holding it securely within the confines of the holder. It is preferred that the tampon be fitted between parallel, limitedly elastic walls described above and illustrated in the drawings, since parallel walls are desirable in packaging the device in the usual rectangular containers. Alternatively, the tampon may be held snugly in place by providing non-parallel

walls so that the space between them is narrower than the width of the tampon at the top of the holder and wider at the bottom. The limitedly elastic material then provides a spring-like action against the bottom of the tampon when in a packaged position and holds the same snugly within the confines of the frame. An advantage of this configuration is that the spring-like action also tends to prevent the axial rod 26 of the pivot element from disengaging from the holder and thus the flanged ends 27 of the axial rod are no longer needed to secure the pivot element to the holder and hence may be eliminated.

To further insure that the tampon will remain within the confines of the holder during packaging and storage, the top portion of the sidewalls are provided with a set of detents 36 (best viewed in FIG. 3) which act as stops to prevent accidental rotation of the tampon out of the holder. The stopping action of the detents, however, may be readily overcome by the exertion of moderate manual pressure on the tampon.

The tampon string 14 extending from the bottom of the tampon, may be packaged between the bottom 22 of the holder 16 and top of the tampon as shown in FIG. 1. Alternatively, the string may be stored between either of the sidewalls 18 or 20 and the tampon. In either position, entanglement of the string is avoided. Additionally, because of the open frame-like structure of the holder, the tampon string, in contrast to that of prior devices, is visible to the user prior to her applying the tampon. Thus, the user may assure herself that the string is firmly attached and hence obviate the problem of inserting a stringless tampon.

Referring to FIG. 3, the tampon assembly is illustrated in a position for use. This position is obtained by starting with the assembly in the packaged position, shown in FIG. 1, and apply moderate pressure to the tampon to rotate it and the engaged pivot member about the axial rod 26 approximately 180° into the position shown in FIG. 3. Having performed this simple operation, the user is presented with the tampon engaged to the applicator and in a position for gripping as shown in FIG. 3 and inserting intravaginally. In the embodiment shown in the drawings, the sidewalls may be gripped, as shown in FIG. 3, with two fingers and, by virtue of the incurvate bottom 22, a third finger can be applied thereto to supply the pressure for insertion.

When placed into the position for use, the tampon should be rigidly maintained in coaxial alignment with the holder. The greatest force tending to misalign the tampon is the force reacting to the pressure applied to the bottom of the holder for inserting the tampon. This reactive force will tend to push the tampon down onto the holder. To oppose this force, the top portion of the two sidewalls 18 and 20 are spaced apart to an extent less than the width of the tampon. Accordingly, the top surfaces 18' and 20' of the sidewalls provide bearing shoulders for resisting the tendency of the tampon to yield to the reactive force.

Further, because the forces applied to the tampon for insertion cannot be applied in perfect coaxial alignment with the assembly, non-coaxial force components will be exerted, creating a torque which acts to misalign the assembly and rotate the engaged tampon and pivot element out of coaxial alignment with the holder. To resist these unavoidable torques, the top portion of the sidewalls are provided with a set of locking detents 38. Preferably the locking detents 38 should offer greater

resistance to rotation of the pivot element, when placed in a position for use, than the detents 36 as previously described. As best shown in FIG. 4 to accomplish this, the detents 38 may be provided with rounded surfaces 39 over which the pivot element is rotated into the position for use and flat surfaces 41 which will resist repositioning once the pivot element is in a position for use.

Further means for insuring that the tampon will stay in coaxial alignment are illustrated in FIGS. 3 and 4. As aforementioned, it is preferable that the sidewalls 18 and 20 of the holder be constructed of a limitedly elastic material. When so constructed, the forces applied to these walls, when gripping the holder as shown in FIG. 3, will urge the top portion of the sidewalls against the surfaces 40 and 42 of the pivot element 24. Accordingly, the force necessary to rotate the pivot element out of its aligned position and over the detents 38 will be increased, due to the frictional resisting force generated by the contact between the sidewalls and these surfaces of the pivot element, i.e., the force required to rotate the pivot element out of alignment when in use is greater than the force required to reposition the pivot element from the packaged position to the use position. To allow the sidewalls 18 and 20 to be urged toward the surfaces of the pivot element, the axial rod 26 of the pivot element is sized so as to be slightly smaller in diameter than the coaxially aligned holes 28 and 30 in the top portion of the side members. Thus, the axial rod is slidable within the coaxially aligned holes (except as limited by the flanges 27) allowing for movement between the sidewalls and the pivot element in the axial direction of the axial rod.

The invention has thus far been described in terms of a two-piece applicator comprising a holder and a pivot element. For purposes of economy, it may be advantageous to embody this invention in a one-piece applicator which can be molded as an integral unit.

Referring to the drawings, FIGS. 5 and 6 illustrate such a one-piece applicator 46 and tampon 62 assembly, shown in a position for use, and FIG. 7 illustrated the same assembly in a packaged position. The holder portion of the applicator 46 comprises a bottom 48 and two upstanding sidewalls 50 and 52 which again are preferably constructed of a limitedly elastic material. A pivot element 54 is provided, integral with the sidewalls 50 and 52. The pivot element comprises a thin flexible bridging portion 56, integral with and bridging the sidewalls 50 and 52. Extending above said bridging portion is a thinned hinge portion 58, integral with said bridging portion 56 but otherwise unconnected to the sidewalls. Above the hinge portion is a third portion 60 having means for engaging a tampon 62 and having a width essentially equal to the space between the sidewalls, though unconnected thereto and hence free to move relative to them. As illustrated in the drawings, the means for engaging the tampon comprises a pin 64 integral with the pivot element and adopted to engage the bottom of the tampon.

Referring now to FIG. 7, the assembled applicator and tampon are illustrated in the packaged position. This position is accomplished by rotating the tampon relative to the holder so as to be enclosed within the sidewalls and bottom of the holder, the hinge portion of the pivot element flexing to allow such rotation. To accomplish this it will be understood that at least the hinge portion should be constructed of a material which is sufficiently elastic. The sidewalls and bottom

of the holder, on the other hand should be more rigid so as to insure proper alignment of the tampon during insertion. Notwithstanding these seemingly contradictory requirements, the applicator can still be economically molded in one integral piece, using a single material of construction, by the expedient of thinning the hinged portion to the extent necessary to provide the requisite flexibility while thickening the sidewalls sufficiently to provide the requisite rigidity. Materials which lend themselves well to the above requirements are, for example, polyethylene, polypropylene, or other suitable semi-rigid, moldable, polymeric or copolymeric materials of construction.

As in the embodiment illustrated in FIGS. 1-3, detents 65 are provided on the sidewalls to hold the pivot element in the packaged position and prevent the unintentional rotation out of the packaged position.

In FIGS. 5 and 6, the assembled applicator and tampon are illustrated in the position for use. Means are provided for insuring that, in this position for use, the tampon will remain properly aligned. For example, the sidewalls 50 and 52 are spaced apart to an extent less than the width of the tampon. Accordingly, the tampon bears upon the top surfaces of these sidewalls and is prevented from moving relative to the holder in a direction parallel to the longitudinal axis of the assembly. Means are provided for preventing accidental rotation of the tampon out of alignment with the applicator when in use. Detents 66 impede the rotation of the third portion 60 of the pivot element. Again these are preferably of the locking type and have rounded surfaces for sliding the pivot element over and flat surfaces for holding the repositional pivot element. Further, the normal forces applied to the sidewalls 50 and 52 in the use of the applicator will, by virtue of the flexible thinned bridging portion 56 urge the surfaces of the top portion of the sidewalls against the surfaces of the pivot element and prevent rotation by virtue of resisting frictional forces between these surfaces. The flexing of the bridging portion 56 is illustrated in FIGS. 8 and 9, both of which are cross-sectional views taken along line 7-7 of FIG. 5. FIG. 8 illustrates a part of the third portion of the pivot element 60 and the bridging portion 56 prior to the application of the tampon. As illustrated, the third portion is movably fitted between the sidewalls 50 and 52. FIG. 9 illustrates the same view of the applicator after forces have been applied to the sidewalls 50 and 52, as will occur when the tampon is being inserted. The bridging element 56 then tends to bow, allowing the two sidewalls to be urged against the pivot element and thereby providing additional sufficient friction resistance to rotation of the pivot element, thus insuring that the tampon and applicator will be properly aligned during insertion.

It will be apparent to one skilled in the art that numerous modifications, variations and changes may be made in the foregoing illustrative embodiments of the invention while still remaining within its scope and spirit.

What is claimed is:

1. A tampon applicator comprising:

- a. a holder having a bottom member and upstanding side members forming a frame for enclosing at least a portion of the sides of a tampon;
- b. a pivot type element mounted at the top of and between said side members, said pivot element permitting

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a turning motion of at least about 180° between it and said side members; and

c. said pivot element provided with means for securing a tampon thereto and defining a means for rotating the tampon with its longitudinal axis perpendicular to the axis of rotation of the pivot element.

2. The applicator of claim 1 wherein the pivot element comprises an integral axial rod and said sidewalls are provided with coaxially aligned holes for receiving the ends of said axial rod whereby said pivot element may be rotatably mounted between said sidewalls.

3. The applicator of claim 2 wherein said axial rod is mounted in said coaxial holes so as to be slidable in a direction parallel with the axis of said rod.

4. The applicator of claim 1 wherein said pivot element is unitary with said holder.

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5. The applicator of claim 4 wherein said pivot element comprises a bridging portion unitary with and bridging said sidewalls; a hinge portion unitary with said bridging portion but otherwise unconnected to said sidewalls; and a third portion; said third portion having said means for engaging a tampon.

6. The applicator of claim 5 wherein said hinged portion is thinned to an extent sufficient to allow said pivot element to rotate.

7. The applicator of claim 5 wherein said bridging portion is thinned to an extent sufficient to allow said sidewalls to be urged against said pivot element when inserting said tampon, thereby resisting rotation of said tampon.

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