Dec. 29, 1942. V. E. ROBINSON 2,306,406

TAMPON

Filed July 19, 1940

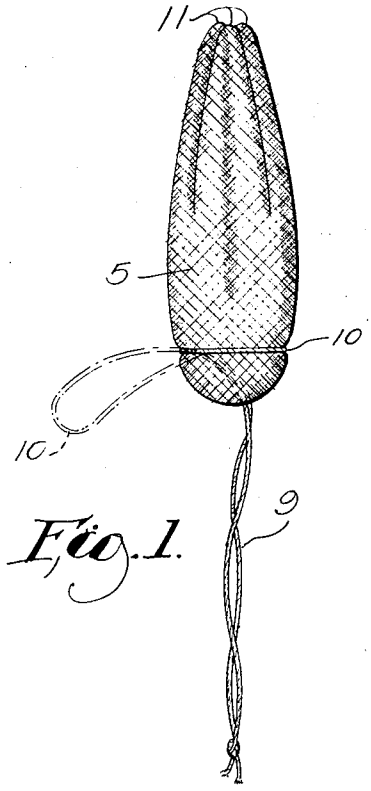


Fig. 1.

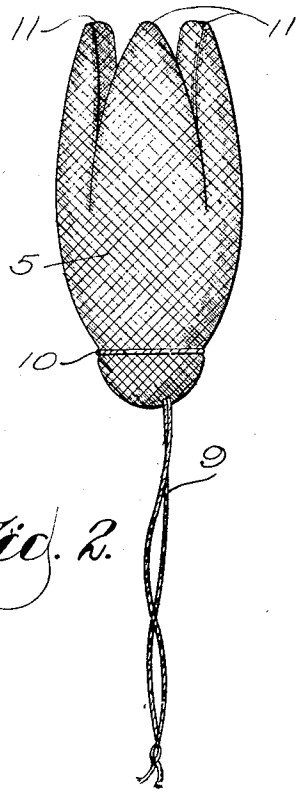


Fig. 2.

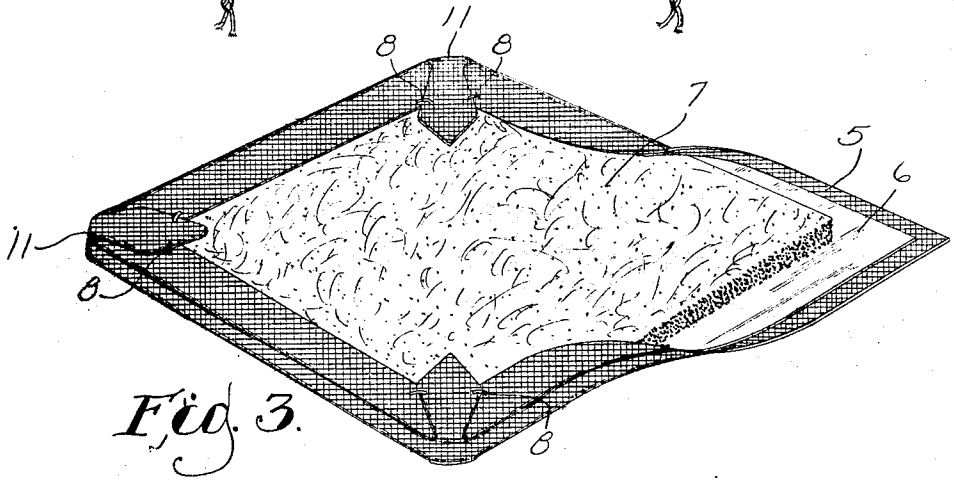


Fig. 3.

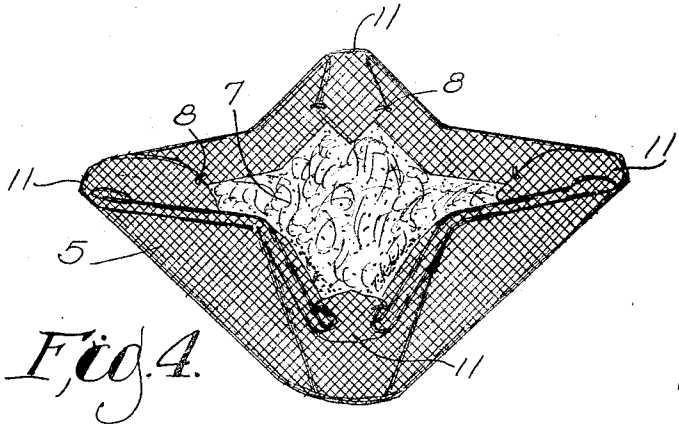


Fig. 4.

INVENTOR
VERA. E. ROBINSON
BY
Wheeler, Wheeler & Wheeler
ATTORNEYS.

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TAMPON

Vera E. Robinson, Chicago, Ill., assignor of five per cent to Frank Nichols, Chicago, Ill.

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16 Claims. (Cl. 128—285)

This invention relates to improvements in tampons.

It is the primary object of the invention to provide a novel and improved tampon particularly designed for vaginal use which will provide increased area for absorption.

More particularly, it is an object of the invention to provide a cupped tampon initially closed and made from a blank so formed that its corners are pressed together and there secured in a shape comparable to the bud of a flower, whereby to facilitate the placement of the tampon while providing for the opening of the petal-like corners to afford ease and direct access of excretions directly into the interior of the tampon, the opening being automatically effected by swelling of the body portion of the tampon in the presence of moisture.

It is a further object of the invention to provide an arrangement such that a gauze ply on the exterior of the tampon will be lined to prevent the escape of the fibruos material constituting the highly absorbent molded body of the tampon, the gauze defining those portions of the fibrous body which become mutually adherent in the molding operation and those portions which are precluded from adhesion in such operation, thereby facilitating the opening of the tampon to its desired cup-shaped form in the presence of moisture.

It is a further object of the invention to provide a tampon having a greatly increased moisture absorbing surface presented to the direction from which excretions are received, the four petal-like corners of the tampon being each available on all of their respective sides for moisture absorption and opening to expose a cup-shaped interior peculiarly well adapted to receive coagulated material and further increasing the available moisture absorbing area. In this connection it is an important feature of the invention that the coagulated material is received directly into the center of the device and absorbed directly into the fibrous body without any necessity for passing through the gauze cover or the tissue restraining ply.

Other objects will be apparent to those skilled in the art upon analysis of the following disclosure of the invention.

In the drawing:

Fig. 1 shows, in side elevation, my improved tampon in the preferred form in which it is to be constructed.

Fig. 2 shows, in side elevation, the expanded form of the tampon which it assumes in use.

Fig. 3 is a diagrammatic view in perspective showing the blank from which my improved tampon is constructed.

Fig. 4 shows in perspective the initial operation in shaping the blank of Fig. 3.

Like parts are identified by the same reference characters throughout the several views.

My improved tampon comprises a cover **5** which is made of some fabric such as gauze, preferably cut into a substantially square piece as indicated in Fig. 3. A liner **6** of tissue prevents the enfolded wadding **7** from escaping through the gauze. Material **7** is preferably, but not necessarily, an extremely soft cottony mass of ground wood fiber. Surgical cotton or any other recognized absorbent material may be substituted but a wadding of ground wood fiber is believed to be the best and most absorbent material currently available. It is possible to use this material safely only because of the employment of the tissue liner. Without the liner the individual fibers might escape through the gauze.

The tissue liner **6** is preferably slightly smaller in area than the gauze cover **5** and the bat of absorbent filler at **7** is materially smaller than the liner to permit the liner and cover to be turned over the bat in the manner best shown in Fig. 3. The inturned margins of the tissue liner and the gauze wrapper may, if desired, be pleated and connected by stitches at **8** at the corners of the blank shown in Fig. 3, or they may be adhesively joined, but no physical connection is ordinarily required since the materials used are sufficiently soft and clinging so that they tend to remain in the position to which they are folded.

It is possible for the gauze square **5** and the tissue liner **6** to have greater area so that the inturned edges will substantially meet at the center of the resulting pad or blank, but if this is done the component portions of the bat will not cling to each other in the manner hereinafter described and therefore only a slight infolding of the gauze and wrapper at the margin is preferred. Where the gauze and wrapper are only slightly infolded as shown, and the blank is thereafter folded in the manner shortly to be described, the central portions of the wood fiber wadding will be mutually adherent and will become a solid core under pressure. However, those portions of the wadding between which the gauze and tissue plies intervene will not be mutually adherent, even when compressed, and this will facilitate the opening of the petal-like corner portions of the folded blank when the superficial sizing, initially holding such petal portions, is dissolved and the interior core expands in the presence of moisture.

The gauze used is preferably given a preliminary impregnation of glycerine gluten or some other sizing material which will render it adhesive and smooth and will enable the tampon to hold its form when compressed to the shape indicated in Fig. 1. The material used, however, should be such that in the presence of moisture the impregnation or coating will completely soften to permit the free expansion of the tampon.

When the pad or blank is completed to the form shown in Fig. 3 it is compressed in a die. The sides between the corners are preferably folded up first as shown in Fig. 4 and the corners are then folded up together and the entire pad subjected to heavy pressure to form it to the shape shown in Fig. 1. The impregnation of starch and glycerine will serve as a freely soluble adhesive to hold the article in this form with its several apices or corners closely joined at 11. In this compact and solid form the bat 7 will represent a solid mass or core at the center of the tampon, the fibrous surfaces exposed within the inturned margins of the gauze being mutually adherent, but the petal-like corners being free to open out instantly into cupped form when the starchy sizing dissolves and the core expands in the presence of moisture.

The withdrawal string 9 is passed by a needle or otherwise obliquely through the lower end of the tampon. It preferably comprises a double strand and its projecting end constitutes a loop 10. This loop is initially in the position shown in dotted lines in Fig. 1 but is readily passed about the withdrawal string 9 and the base of the tampon and securely anchored about the tampon by tension on the withdrawal string as shown in full lines. While there are other suitable ways of fastening the withdrawal string to the tampon, the arrangement disclosed is preferred because the loop 10 constitutes a band about the absorbent core to limit the extent to which such core may expand at its lower end as its moisture content increases.

When the device is in use the coating will dissolve, permitting the tampon to expand from the form shown in Fig. 1 to the form shown in Fig. 2. Initially the tampon as shown in Fig. 1 had an absorptive area limited to its exterior surface only. The petal-like corners or apices of the blank, however, are nonadherent by reason of the interposed gauze margin. Consequently as soon as the tampon is positioned and its sizing or coating softens, the petals will spring open. Immediately the absorptive area becomes enormously increased since all sides of each petal are now fully exposed and, in addition, the tampon now has a cup-shaped form within which the absorbent core is directly exposed. As the core begins to receive moisture it swells and increases the opening or spreading of the petal-like corners toward the form of the device illustrated in Fig. 2. The device as a whole now has the form of a cup, whereof the margins are defined by the petal-shaped external gauze ply and apices 11, and the center opens into the mass of absorbent material provided by the bat 7. Thus it is not dependent upon penetration of the gauze for the reception of the material to be absorbed but such material is given free access to the cavity in the interior of the tampon between the open apices.

It will be understood that the square form of the various plies making up the blank from which the tampon is shaped, while preferred, is not necessary to the invention. The cup-shaped form into which the tampon opens when in use may also be achieved with polygonal or even circular blanks, but the square blank achieves the result with less material and is therefore less bulky and less expensive, and is thus preferred.

I have not disclosed herein any dies or other means for shaping the cup-shaped tampon to its initial ovoid form, but I have disclosed such dies in my Patents Nos. 2,178,704 and 2,188,923, and other dies may be used to produce said form or such modifications thereof as may come within the scope of the appended claims.

I claim:

1. A tampon of compact elongated form comprising an external ply of gauze and an interior ply of highly absorbent wadding, said gauze being continuous about the lower end of the tampon and gathered at the upper end thereof and provided with a soluble adhesive means at least superficially impregnated upon said gauze, whereby the gauze is rendered smooth, said adhesive means intervening between and joining gathered portions of said gauze for maintaining the tampon in said compact elongated form, the gathered upper end of the tampon being adapted to open upon the dissolution of said adhesive and the absorption of moisture by said wadding to provide a cup-shaped structure adapted to receive and retain coagulated discharge without requiring such discharge to penetrate the gauze.

2. As a new article of manufacture, a tampon provided centrally with absorbent wadding and provided externally with a penetrable confining ply, the margins of said confining ply being gathered upwardly and provided with soluble adhesive means intervening between and joining said gathered margins compactly about said wadding, said tampon being adapted to open upon the dissolution of said adhesive means to a cup-shaped form.

3. As a new article of manufacture, a tampon of elongated ovoid form comprising a cup-shaped container having seperably gathered marginal portions and absorbent filler in the bottom thereof, and moisture soluble adhesive means holding said gathered marginal portions of the cup-shaped container united in compressive relation about said filler, said adhesive means externally coating and smoothing the container.

4. As a new article of manufacture, a tampon of elongated ovoid form comprising a cup-shaped central portion having petal-like upward extensions and moisture soluble means separably holding said extensions together and adapted to release said extensions in the presence of moisture to increase the moisture absorption surface of the article.

5. As a new article of manufacture, a tampon comprising a core of absorbent material having upward marginal extensions, a permeable cover ply enveloping said core and marginally secured about said extensions to isolate them from each other, said extensions being adapted to open under compression induced by expansion of the core in its absorption of moisture, whereby to increase the exposed moisture absorbing surfaces of the respective extensions while exposing said core between said extensions.

6. A tampon comprising an initially flat blank having a plurality of corners and composed of an exterior ply of gauze and an interior layer of wadding over the margins of which the margins of said gauze are turned inwardly, the several corners of said blank being folded upwardly and

gathered together above said wadding to constitute an ovoid compact tampon, said gauze being provided with water soluble adhesive means joining the gauge portions at said corners to each other for retaining said tampon in said ovoid form pending the dissolution of said means.

7. As a new article of manufacture, a tampon comprising a core of absorbent material having upward marginal extensions, a permeable cover ply enveloping said core and marginally secured about said extensions to isolate them from each other, said extensions being adapted to open under compression induced by expansion of the core in its absorption of moisture, whereby to increase the exposed moisture absorbing surfaces of the respective extensions while exposing said core between said extensions, and a withdrawal string comprising a looped strand, having its loop portion secured about said tampon and constituting means for holding the lower end of said core portion to a limited expansion.

8. An ovoid compact tampon having an absorbent core and a permeable covering therefor, said covering being expansibly gathered about said core, and a withdrawal string having a looped portion passing obliquely through said core from a point substantially at the tampon center to the outside thereof and thence extending in a loop about said core, whereby to constitute means for limiting the expansion of said core.

9. A tampon of ovoid form comprising a square of gauze, a square of wadding over which the margins of said gauze are inturned, the corners of said gauze and wadding squares being compressed together and provided with water soluble adhesive means for securing them in an elongated ovoid tapered shape, the central portions of said wadding being mutually adherent and expansible in the presence of moisture, said gauze margins intervening between the enfolded corner portions of said wadding, whereby said corner portions are relatively nonadherent to each other and open readily when said wadding expands in the presence of moisture.

10. A method of tampon manufacture which comprises the positioning of a ply of wadding on a ply of gauze, folding the margins of the gauze ply inwardly over the margins of the wadding ply to comprise a blank, and gathering the margins of the blank over the center thereof and molding the blank to ovoid form under compression.

11. The method of making a tampon which comprises registering a square of absorbent wadding centrally in a larger square of glyceride-gluten-treated gauze, folding the margins of the gauze square inwardly over the margins of the wadding to comprise a blank, folding in the sides and gathering the corners of the square blank together above the center thereof, whereby to provide a cup-shaped blank and compressing the cup-shaped blank into ovoid form whereby to compact the tampon and to join the contacting surfaces of said gauze by means of the glyceride-gluten impregnation therein.

12. As a new article of manufacture, a tampon comprising an absorbent body of porous material provided with side portions initially closed above the interior and provided with moisture-releasable adhesive means for joining and holding such side portions closed.

13. As a new article of manufacture, a tampon comprising an elongated ovoid absorbent body of loose fibrous material under compression, a gauze jacket enveloping said body, soluble means holding said jacket under tension, whereby to maintain said body releasably under compression and a moisture permeable tissue liner for said jacket constituting means for admitting moisture to said body while confining the fibers of said body against escape through said jacket.

14. As a new article of manufacture, a tampon comprising an initially flat blank made up of a jacket ply of gauze, a ply of tissue and a bat of cellulose fiber, the margins of said blank being gathered together and compressed upon said bat into the form of a tampon about one end of which said gauze jacket and liner are continuous, soluble adhesive means securing together the gathered margins of said gauze jacket whereby to maintain said blank in tampon form pending use, said adhesive means being adapted to release said jacket for expansion when moist to admit matter into the interior of said bat through the end of the tampon opposite that about which the jacket is continuous, said jacket being marginally infolded over said bat and pleated at the corners thereof and said liner constituting means for preventing the escape of fibers from said bat through said jacket.

15. As a new article of manufacture, a tampon comprising an absorbent body of porous material provided with upward extensions at its sides initially gathered under compression about the center of said body, a permeable covering externally fitted about said absorbent body and intervening between said upward extensions, moisture releasable means for securing together portions of said covering applied to said upward extensions whereby to hold said extensions releasably subject to said compression, said body being expansible in the presence of moisture, whereby to open outwardly the extensions and directly expose the absorbent body in a cavitated form within said extensions.

16. As a new article of manufacture, a tampon comprising an absorbent body of porous material provided with upward extensions at its sides initially gathered under compression about the center of said body, a permeable covering externally fitted about said absorbent body and intervening between said upward extensions, moisture releasable means for securing together portions of said covering applied to said upward extensions whereby to hold said extensions releasably subject to said compression, said body being expansible in the presence of moisture, whereby to open outwardly the extensions and directly expose the absorbent body in a cavitated form within said extensions, together with a withdrawal string having a portion encircling said body below its hollow interior and constituting means for limiting the expansion of the encircled portion of the body.

VERA E. ROBINSON.