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Johnson et al.

[11] **3,885,563**

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[54] **SPREADABLE TAMPON AND INSERTER COMBINATION**

[75] Inventors: **Russell L. Johnson**, Weyauwega; **Leonard M. Kaczmarzyk**, Menasha; **Robert F. Skora**, Neenah, all of Wis.

[73] Assignee: **Kimberly-Clark Corporation**, Neenah, Wis.

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[52] **U.S. Cl.** **128/263**; 128/270; 128/285; 128/269

[51] **Int. Cl.** **A61f 13/20**

[58] **Field of Search** 128/263, 270, 285, 130, 128/269

[56] **References Cited**

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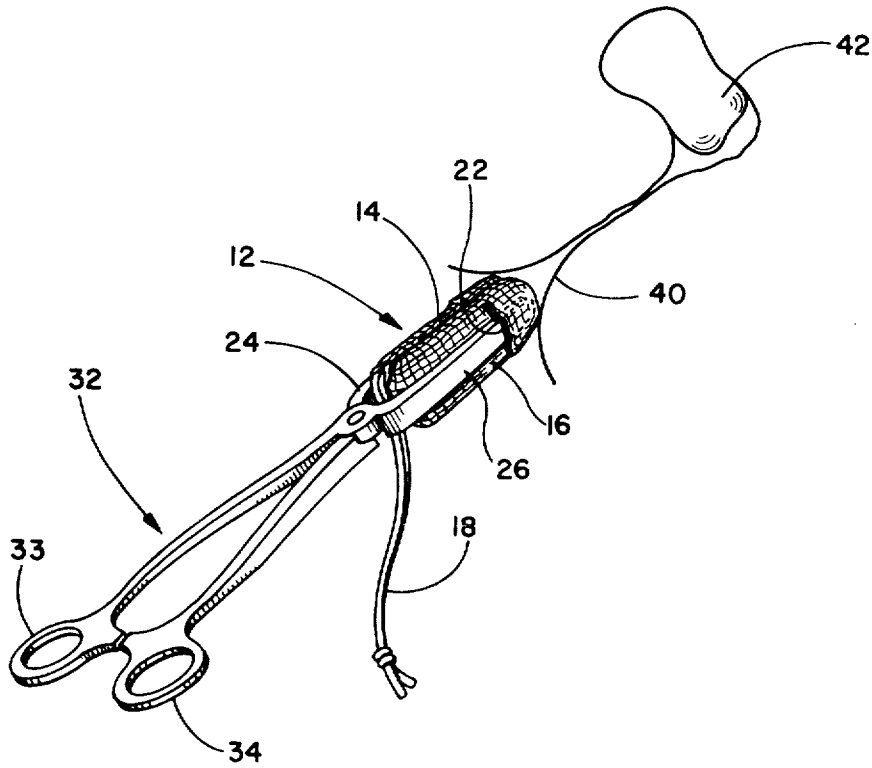
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Primary Examiner—Aldrich F. Medbery
Attorney, Agent, or Firm—Daniel J. Hanlon, Jr.; William D. Herrick; Raymond J. Miller

[57] **ABSTRACT**

The combination of a single fold tampon capable of being mechanically spread open by the user after insertion to form a transverse block within the vagina, and an inserter-spreader therefor. The tampon is folded in half to form two adjoining legs. A withdrawal string is attached at the fold. The outer extremity of the upper end portion of each leg is provided with a downwardly facing pocket. The inserter-spreader is provided with a pair of arms which fit into the pockets and may be operated by the user to mechanically spread apart the legs of the tampon within the vagina after insertion.

10 Claims, 10 Drawing Figures



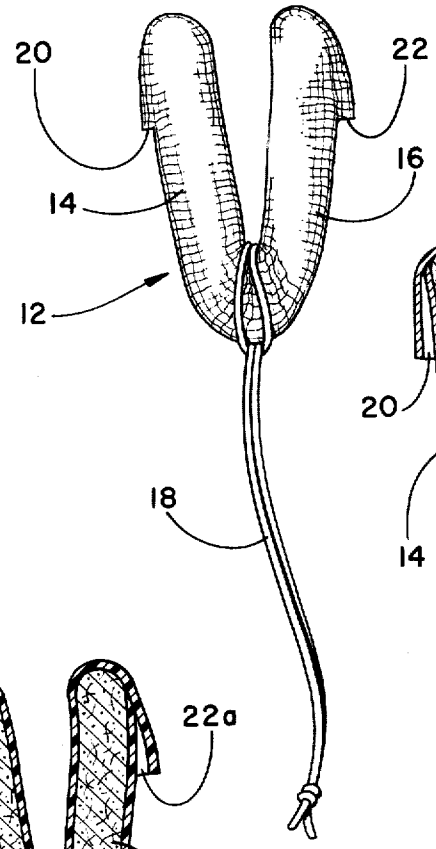


FIG. 1

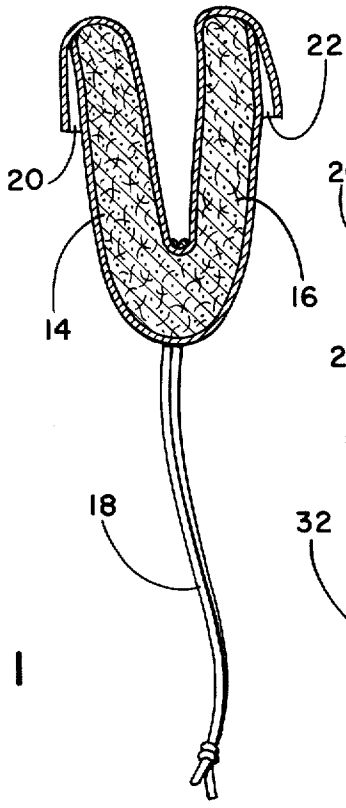


FIG. 2

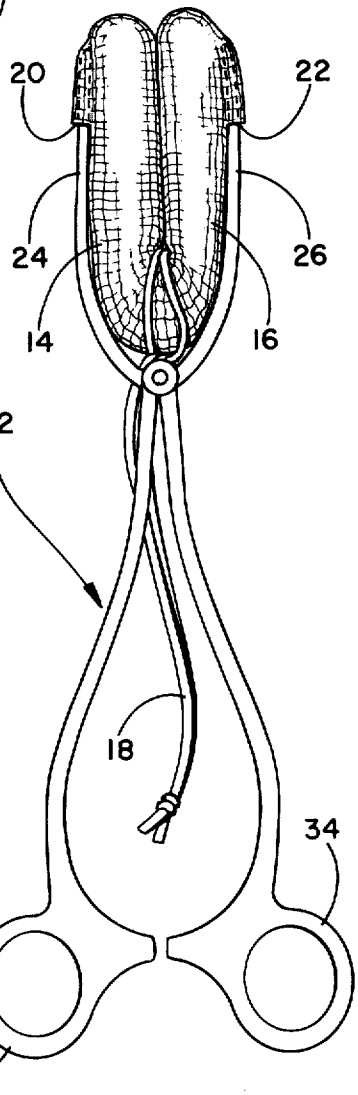


FIG. 3

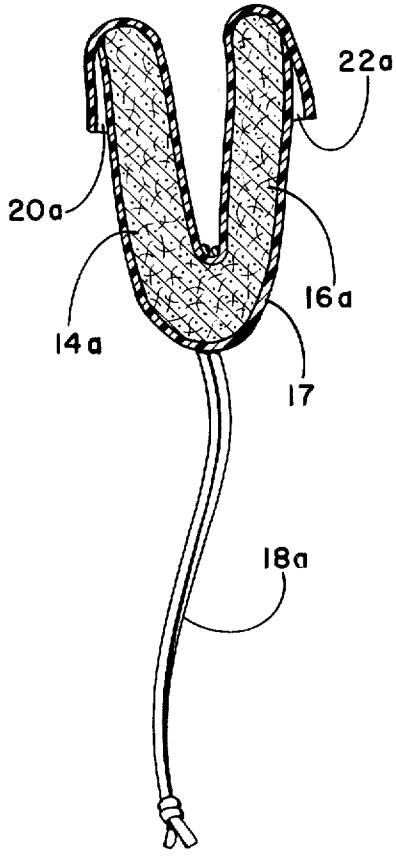


FIG. 4

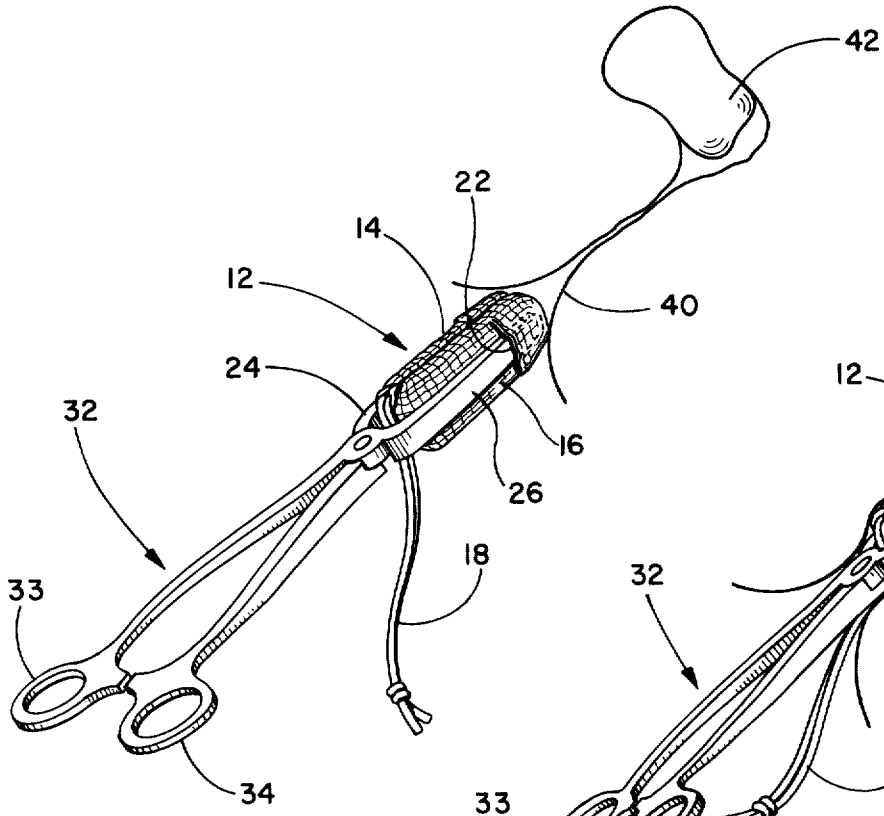


FIG. 5

FIG. 6

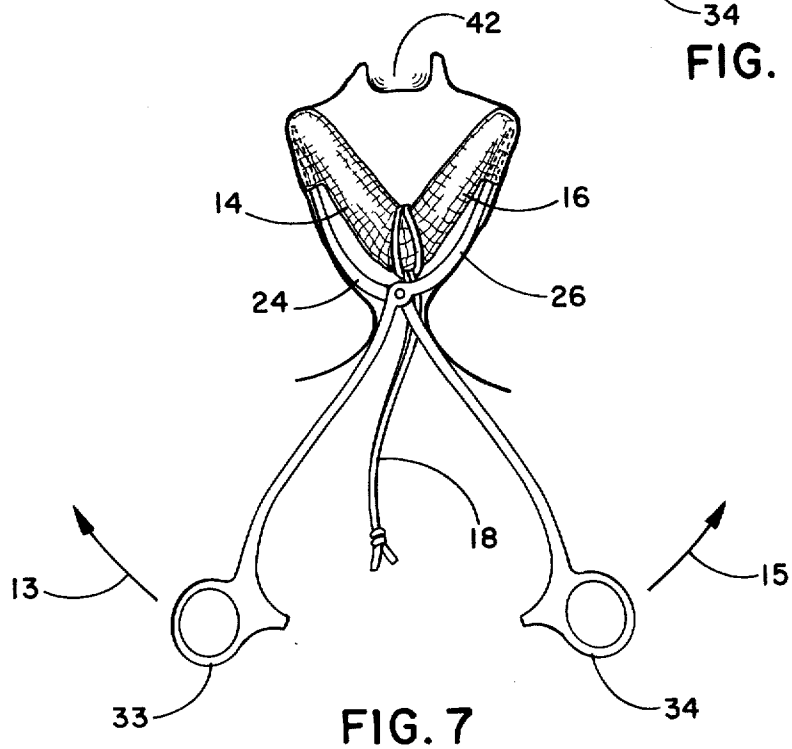


FIG. 7

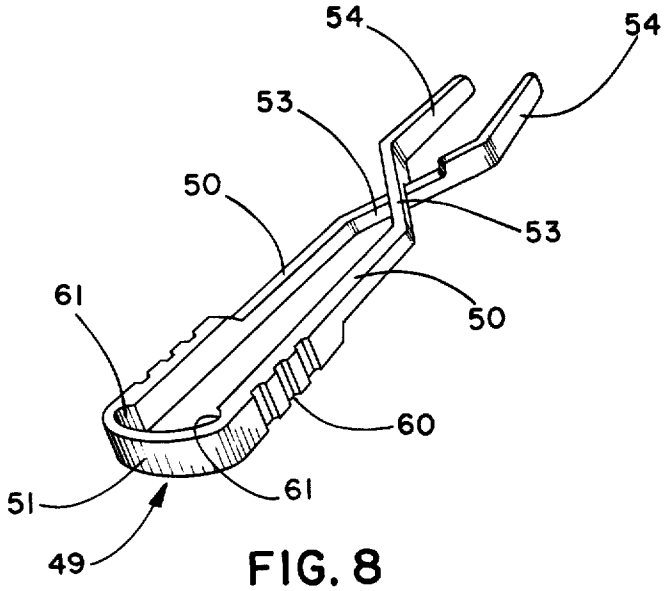


FIG. 8

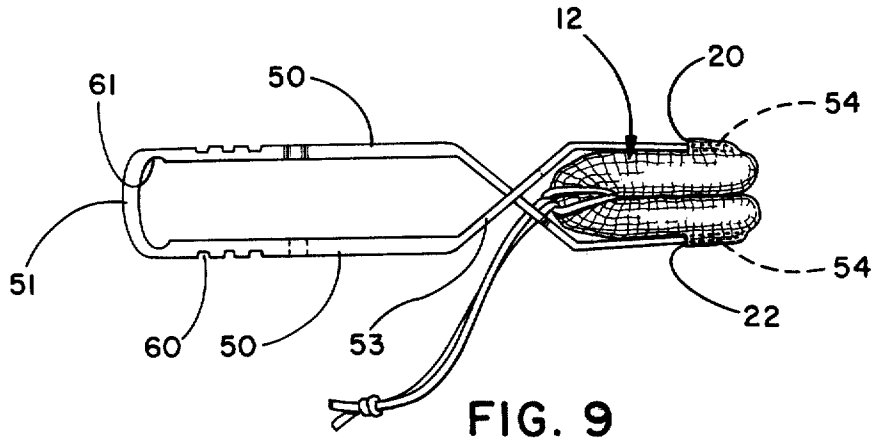


FIG. 9

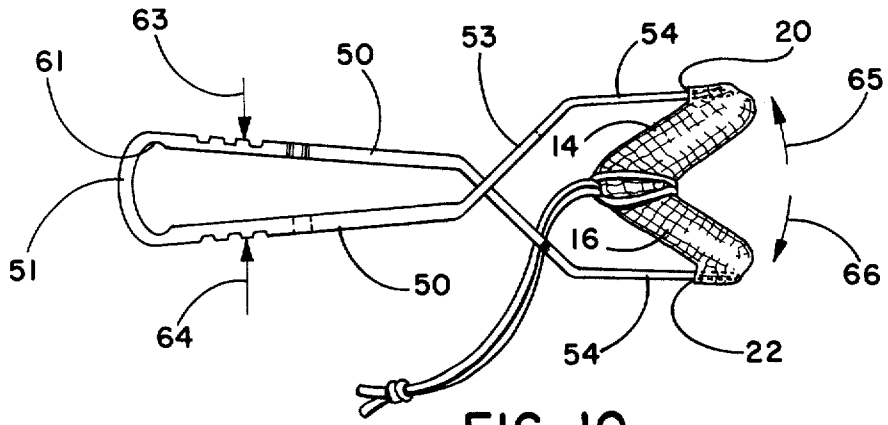


FIG. 10

SPREADABLE TAMPON AND INSERTER COMBINATION

BACKGROUND OF THE INVENTION

It has long been recognized that the cross-sectional dimensions of the vagina in its normal collapsed state are much wider in the transverse plane than in the vertical plane. It would be desirable therefore, when considering a tampon structure for use in absorbing vaginal exudates such as menstrual fluids, to design a tampon which can be easily spread transversely immediately after insertion into the vaginal passageway. While this is a desired objective it is difficult to achieve because of the size limitations imposed primarily by insertion requirements. The vaginal orifice is normally much smaller than the interior dimensions of the vaginal passageway which a tampon is expected to seal against leakage, accordingly the size of a tampon which can be inserted without physical discomfort is severely limited. In order to meet these requirements, tampons now in general use generally comprise small cylindrical plugs about one-half inch to three-eighths inch in diameter and about 2 inches to 2-½inches in length. These tampons are usually formed from a much larger batt of absorbent fibers, the batt being compressed to a small self-sustaining form in the sizes mentioned above. As body discharged fluids are absorbed by the tampons these compressed batts are expected to re-expand toward their precompressed size and become large enough when expanded to effectively block the vaginal passageway against fluid leakage or bypass. However, it has been found that while these compressed tampons do their intended job tolerably well, even the best of them do not re-expand sufficiently, or quickly enough, to provide an effective block in the transverse direction even though the vertical block obtained is usually satisfactory. In any event, these tampons all rely on some fluid absorption to obtain the necessary expansion. In view of the small size of the tampon at the time of insertion, it appears that fluid bypass or leakage can occur most easily immediately following the time of insertion. Further, because of the reduced size limitations imposed by the insertion or comfort requirements it has been found when the tampon is fully re-expanded effective leakage control is difficult to achieve.

More effective utilization of the available absorptive capacity of a tampon would be achieved if some way could be devised to provide means to expand or spread a tampon in the transverse dimension immediately after insertion. Such expansion should preferably be independent of the fluid absorption requirement, and preferably coincident with insertion. It should also be independent of whether or not the tampon body is in compressed form at the time of insertion. Folded leaf springs or other resilient and expandable means interiorly disposed in folded tampons have been suggested, but one disadvantage arising from using such means is that while these resilient means serve to hold the tampon in spread condition when the tampon is worn, the tampon should preferably be capable of being returned to its folded or relaxed state for removal. In the case of internal springs there is no suitable means available for that purpose, and refolding occurs only when withdrawal forces are exerted against the base of the tampons during withdrawal. The sidewise pressure exerted by the internal spring during such withdrawal is undesirable. Further, if the spring is made so weak that it will readily refold, it usually does not have sufficient resilience to be able to span the vaginal tract effectively without assistance.

The present invention is directed to a tampon structure adapted to be conveniently spread transversely within the vagina by means of an exteriorly operated insertion device to provide an immediate transverse expansion and an accompanying block against fluid leakage along the sides of the vaginal passageway. The tampon is not biased transversely by any mechanical means and therefore will easily return to its folded state during withdrawal.

SUMMARY OF THE INVENTION

The tampon of this invention comprises an elongate absorbent pledget folded on itself into a u-shaped to form a tampon with adjoining legs and having the withdrawal string attached at the fold formed at the base of the legs. In the improved tampon structure each of the legs of the folded tampon is provided at the upper end portion of the outer extremity of the leg with a pocket having a downwardly facing opening. Each of these pockets is designed to receive the manipulatable arms of a device adapted to transversely spread these legs apart inside the vagina after insertion. One readily available spreading device which suits this purpose is a pair of surgical forceps. However, simpler and more economical single-use devices are preferred and described herein. The spreading device, with the tampon positioned on the spreadable arms thereof, is first employed to insert the tampon into the vaginal passageway to the desired depth. The arms are then operable from outside the vagina to spread the tampon legs apart to a comfortable width within the vagina, after which the spreading device is easily withdrawn. The spread legs of the tampon thus placed in the vagina are immediately effective in blocking the downward flow of fluids through the vagina as they are discharged from the cervix and thereby serve to prevent early leakage from the vaginal passageway.

The above and other advantages of the improved tampon will become apparent by reference to the following detailed description and accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

In the drawings:

FIG. 1 is a side view of one embodiment of a tampon made in accordance with this invention.

FIG. 2 is a longitudinal section of FIG. 1.

FIG. 3 is a side view of the tampon of FIG. 1 in association with a pair of placement forceps.

FIG. 4 is a sectional view similar to that of FIG. 2 but showing another embodiment of a tampon in accordance with the invention.

FIG. 5 illustrates the tampon-forceps combination of FIG. 3 ready for insertion into the vaginal passageway with the latter partially shown in vertical longitudinal section represented in a simplified diagrammatic form.

FIG. 6 is similar to FIG. 4 and illustrates configuration of the tampon and forceps after full insertion into the vaginal passageway.

FIG. 7 illustrates the tampon in position in the vagina after the legs of the tampon are spread apart by manipulation of the forceps, with the vaginal passageway now shown in a simplified diagrammatic section that is transverse of the longitudinal axis of the vagina.

FIG. 8 is a perspective view of another type of insertion device for the tampon.

FIG. 9 is a side view of the insertion device of FIG. 7 with a tampon of this invention positioned thereon.

FIG. 10 is a view similar to FIG. 9 but with the tampon shown in a spread-open position obtained by inward manipulation of the rear portion of the insertion device.

DETAILED DESCRIPTION OF THE INVENTION

As shown in FIGS. 1, 2 and 3 of the drawings, the improved tampon 12 of this invention comprises an elongate batt of absorbent material folded in half to a general U-shape with the folded tampon having a pair of upwardly extending legs 14 and 16. A withdrawal string 18 is attached at the fold near the base of the legs. Disposed at the outer side of the forward extremity of each leg 14 and 16 are exterior pockets 20 and 22 respectively, with downward facing openings.

When being made ready for insertion, an insertion and spreading device such as a pair of surgical forceps 32 has the leading ends of its forward tong elements or spreadable arms 24 and 26 inserted into pcokets 20 and 22 respectively.

Forceps 32 is provided with gripping elements 33 and 34 which may be manipulated in a scissors-like movement to open arms 24 and 26 and thus spread tampon legs 14 and 16. When legs 14 and 16 are spread to a comfortable width the forceps are easily removed, the pressure of the vaginal walls on the tampon being sufficient to hold the tampon in place during withdrawal of the forceps.

The tampon body may be made of any suitable absorbent material such as absorbent cotton, wood fluff fiber, cellulose sponge, synthetic sponge, or the like. When the absorbent material is made of loose fiber batts it is usually wrapped in a fluid-pervious wrapper. The pockets on the side of each leg may be formed from the absorbent material itself; from a fluid-pervious wrapper material such as is commonly used in tampon construction; or from a fluid-impervious film or the like.

The latter construction is shown in the section view of FIG. 4. In FIG. 4, the legs 14*a* and 16*a* are formed of absorbent material and laminated to the outside thereof is a layer of thin plastic film 17 such as polyethylene, polyvinyl chloride or the like. The used withdrawal string is also shown at 18*a*. In this embodiment, downwardly opened pockets 20*a* and 22*a* are formed by cuffs made of the plastic film. This embodiment provides two additional advantages. The plastic film 17 which sheaths only the outer sides of the folded tampon eases insertion since it has a smooth slick surface. When the tampon is spread open after insertion the plastic film is disposed on the lower surface of the tampon where it acts as a fluid barrier and thus permits more of the effective capacity of the tampon to be utilized before removal.

In FIG. 5, the tampon-forceps combination of FIG. 3 is shown poised for insertion in vaginal passageway 40 at the end of which is located cervix 42.

In FIG. 6 the tampon-forceps combination of FIG. 3 is shown fully inserted.

In FIG. 7 the forceps have been opened as indicated by the directional arrows 13 and 15 to spread apart the tampon legs 14 and 16 and thus deploy the legs across the transverse dimension of the vaginal cavity. Preferably legs 14 and 16 are spread sufficiently far apart to touch the side walls of the vaginal passageway below the cervix. However, any amount of spreading of the tampon legs which feels comfortable to the user may be employed and still provide improved leakage control when compared with a conventional tampon or one without mechanical spreading capabilities. The forceps or other insertion device may then be removed leaving the spread tampon in place.

In the spread position, legs 14 and 16 of the tampon effectively intercept substantially all of the menstrual fluids which may be discharged into the vaginal passageway through the cervix, and by so doing insure against early leakage problems.

The basic improvement of this invention is the provision of what otherwise may be characterized as a conventional U-shaped or single-folded tampon with downward facing pockets at the upper leading end of each leg which pockets are adapted to receive exteriorly maneuverable elements of a suitable spreading device, thus enabling the tampon to be mechanically spread to its full effectiveness across the transverse plane of the vagina immediately after the tampon has been placed therein.

Many variations of this improved structure are possible. The pockets may be an integral part of the tampon body. The pockets may be composed of the tampon wrapper only, if such a wrapper is used in the tampon structure. The pockets may be comprised of a stocking-like mesh material if desired. The tampon body itself need not be compressed as is necessary with most present day tampons, since the insertion device provides a positive delivery system which does not need the rigidity of a compressed tampon structure to support itself during insertion. However, compressed material may be used for the tampon when larger capacity is required. In such case the fluid dependent delay in re-expanding the compressed material will not be detrimental as in the case of conventional compressed tampons, because the mechanical spreading achieved at time of insertion provides an effective block. As noted earlier, any of the usual absorbent materials may be used in the improved tampon construction.

The deployment of spreading device also may take on many variations. While the deploying device set forth in the specific examples above has been described as surgical forceps which are quite expensive and usually made of stainless steel, it is preferable that the insertion device be constructed of relatively inexpensive plastic which then may be conveniently disposed of after a single or multiple use if desired. The surgical style forceps may be made of plastic, for example. However, a much more simplified device and its method of use are shown in FIGS. 8–10. As shown therein, the device 49 comprises a one-piece element of flexible spring-like material such as polypropylene, polyethylene or the like having two substantially parallel arms 50 connected at their base by an arcuately shaped flexible portion 51 from which said arms extend. Portions 53 of the arms, spaced from said arcuate base 51 a substantial distance, diverge inwardly from parallel alignment to cross each other and then revert back to their parallel alignment where the free ends form a pair of finger-like extensions 54. The cross-over portion thus is in the form of an X with extensions on each end. The lower extensions are joined at the bot-

tom to form a U at **51** and the upper extensions **54** have free ends for insertion in the pockets.

When extensions **54** are inserted into pockets **20** and **22** of tampon **12** as shown in FIG. **9**, the tampon is ready for insertion.

After insertion, inward finger pressure exerted against arms **50** in the directions shown by arrows **63** and **64** in FIG. **10** will cause extensions **54** to diverge and to spread apart legs **14** and **16** of the tampon as indicated by arrows **65** and **66**. At this stage finger pressure is relaxed slightly and the insertion device is easily withdrawn leaving the spread tampon in place.

The outside portion of arms **50** of insertion device **49** may be provided with grooves **60** or some other roughened surface to aid in gripping. It may also have grooves **61** at each end of arcuate base **51** to facilitate the inward flexing action used to spread the tampon.

When the insertion device **49** is made of molded polyethylene or other like plastics, it is sufficiently low in cost so that one device may be included with each tampon and discarded after use. A light metal construction may also be used. When a low cost element is used, each combination of tampon and insertion device may be enclosed in an individual wrapper to preserve its hygienic condition.

What is claimed is:

1. The combination of a tampon particularly adapted to be transversely spread within the vagina at the time of insertion and an inserter device adapted for inserting and spreading said tampon; said tampon comprising an elongate absorbent member folded on itself to form a pair of adjoining, upwardly extending legs and having a withdrawal string attached near the base of said legs; the upper end portion of each of said legs being provided with an open pocket disposed on the exterior side thereof with the open end of each of said pockets facing downwardly; said inserter comprising an elongate device provided with a grip portion at one end and a tampon delivery portion at the other end; the tampon delivery portion comprising a pair of generally parallel extensions adapted for movement away from each other by manual operation of said grip portion; the extensions of said tampon delivery portion being disposed in the pockets of said tampon whereby manipulation of said grip portion will spread apart the legs of said tampon.

2. The tampon and inserter combination of claim **1** wherein said inserter comprises a pair of surgical forceps.

3. The tampon and inserter combination of claim **1** wherein said inserter comprises a pair of surgical forceps and said forceps are made of flexible plastic.

4. The tampon and inserter combination of claim **1** wherein the tampon is comprised of absorbent fibers enclosed in a fluid pervious wrapper.

5. The tampon and inserter combination of claim **1** wherein the tampon is of highly compressed absorbent material.

6. The tampon and inserter combination of claim **1** wherein the tampon in its folded configuration has its exterior sides surfaced by a plastic film and said film is also employed to form the pockets.

7. The tampon and inserter combination of claim **1** wherein said inserter comprises a one piece element of flexible material having two substantially parallel arms, said arms being connected at their base by a flexible segment, said arms being bent to cross over each other a substantial distance from said base and ending in parallel extensions beyond said crossover.

8. The tampon and inserter combination of claim **7** wherein said inserter is comprised of flexible plastic.

9. The tampon and inserter combination of claim **8** wherein said plastic is molded polyethylene.

10. The tampon and inserter combination of claim **8** wherein said plastic is molded polypropylene.

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