TAMPON WITH INTERNALLY PACKED WITHDRAWAL STRING

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Field of Search ................................. 128/285, 283

References Cited
UNITED STATES PATENTS
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2,176,114 10/1939 Wells........................................ 128/285

FOREIGN PATENTS OR APPLICATIONS
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ABSTRACT
A compressed absorbent tampon for digital use in which the main portion of the withdrawal string attached to the tampon base is folded and packed inside the tampon within a small diameter longitudinally disposed bore which extends into the interior of the tampon from the tampon base for at least one-third of the tampon length. Only a small portion of the string remains outside of the tampon, which portion the user may grasp in order to pull out the string to its full length when preparing the tampon for insertion.

9 Claims, 10 Drawing Figures
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BACKGROUND OF THE INVENTION

This application is a continuation-in-part of copending U.S. application Ser. No. 175,561 filed Aug. 27, 1971 and now abandoned.

Catamenial tampons comprised of absorbent material compressed to cylindrical form and provided with a withdrawal string attached to a rear portion of the tampon are presently being marketed in three major styles.

One style generally known as the tube type tampon uses a pair of telescoping tubes as an insertion device. In this type the tampon is disposed in the front end of the outer tube of a pair of telescopically associated tubes, and the withdrawal string is extended to substantially its full length through the hollow center of the inner tube. The entire assembly is enclosed in a removable wrapper for hygienic handling.

A second style, generally known as the stick type tampon uses a stick as the insertion device. In this type an elongated inserter stick is removably disposed in a socket extending into the base of the tampon, and the withdrawal string is extended to substantially its full length in an area parallel to the stick. This entire assembly is also enclosed in a removable wrapper for hygienic handling.

A third style known as the digital type tampon has no insertion device associated with it. For this type there are a number of ways suggested for handling the arrangement of the withdrawal string. For example, the string may be coiled in an annular channel near the tampon base; it may be wound around the tampon or disposed adjacent its sides in some fashion; or it may be folded, coiled or compressed in a bundle at the tampon base. This style tampon, too, is enclosed in a removable wrapper.

This application is directed to the digital type tampon, and is particularly directed to an improved temporary storage arrangement for the string which facilitates packaging and handling.

THE PRIOR ART

In the prior art, U.S. Pat. No. 2,587,515 shows the withdrawal string neatly formed in a coil which is closely compacted against the exterior of the tampon base. In U.S. Pat. No. 3,135,262 the withdrawal string is extended along one side of the tampon and the free end protrudes from the front end of the protective wrapper where it acts as a tear string for opening the wrapper. In U.S. Pat. No. 3,477,102, an annular recess is formed in the base of the tampon, and the withdrawal thread is spirally wound in a flat winding and seated in the annular recess. In British Pat. No. 758,879 the withdrawal cord is spirally wound around the sides of the tampon with the terminal portion extending through a sealed wrapper.

In German patent application Ser. No. 254,725 filed Apr. 26, 1954 (published by the German Patent Office on Dec. 30, 1954 under No. Z-2614) the withdrawal string is shown as being folded on itself a number of times and pressed against the tampon base, or compressed into the form of a centrally raised projection on the tampon base.

None of the above disclose or suggest the string arrangement as further described and illustrated in the following specification and attached drawings.

SUMMARY OF THE INVENTION

A compressed tampon having a withdrawal string attached near the base thereof is provided with an elongate internal bore of small diameter extending into the tampon from the base for at least one-third of the tampon length. A major portion of the string extending between the attached end and the free end of the string is folded and firmly packed inside the small diameter bore and physically retained therein by friction. A small portion or portions of the string, including the free end which may also have a terminal knot portion, extends outside the bore. The user may easily grasp this portion and pull out the string to its full length when preparing the tampon for insertion.

BRIEF DESCRIPTION OF THE DRAWINGS

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

FIG. 2 is a longitudinal section of the tampon of FIG. 1 showing one embodiment of a suitable packed withdrawal string.

FIG. 3 is a longitudinal section of a string packing device showing one method suitable for packing the withdrawal string into the tampon to obtain the FIGS. 1-2 embodiment.

FIG. 4 is an enlarged partial section similar to FIG. 2 but showing another arrangement for the packed string.

FIG. 5 is a longitudinal section of a string packing device similar to FIG. 3 and showing a method suitable for packing the withdrawal string into the tampon to obtain the FIG. 4 embodiment.

FIG. 6 is another enlarged partial section similar to FIG. 4 but showing still another arrangement for the packed string.

FIGS. 7, 8, 9 and 10 are longitudinal sections of a modified packing device illustrating the various steps for packing the string into the tampon to obtain the arrangement shown in FIG. 6.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

In FIGS. 1 and 2 there is shown a compressed cylindrical tampon 10 of absorbent material. The tampon has a rounded entrant portion 12 and a substantially flat base 14. Adjacent the base a withdrawal string 16 is suitably attached to the tampon. An elongate small diameter bore 18 extends into the interior of the tampon for at least one-third of the tampon length from an opening in base 14 and string 16 is folded and packed into bore 18 with a terminal portion including knot 20 extending outside the bore. In this embodiment, the string 16 is shown as being foreshortened by a single fold 22 and packed into bore 18 with a number of small undulations 24 along its entire length. It will be noted from the drawing that bore 18 extends longitudinally into the interior of the tampon a substantial length, and as shown in FIG. 2, for at least one-third of the tampon length. It will also be noted from the drawing that the diameter of the bore is less than the radius of the tampon. The physical association of the packed and undulated string with the interior sides of the bore provides sufficient frictional resistance to removal to insure that
the string will be retained within the tampon until the user chooses to remove and extend it by grasping knot 20 when preparing the tampon for insertion. The terminal end of the string extending outside the tampon may be unknotted if desired.

The device of FIG. 3 may be used to produce the packed string tampon arrangement shown in FIGS. 1 and 2. In FIG. 3 a block 26 is provided with a central channel 28 extending longitudinally thereof and having a port 30 through which a vacuum may be drawn. A plunger 12 is positioned for reciprocal movement in channel 28. Tampon 10 with withdrawal string 16 attached is held in a suitable contoured cavity 33 in die block 34.

Small diameter bore 18 in tampon may be suitably provided by the method described in assignee's U.S. Pat. No. 2,926,394 and that description is incorporated herein by reference. Methods for providing such a small diameter internal bore are well known in the art directed to stick tampons and the method of providing the bore is not a part of this invention. What is described herein is the utilization of the small diameter, longitudinally extending bore for another purpose other than is taught in the prior art, i.e., as a temporary and convenient storage area for the withdrawal string. In using the FIG. 3 device to produce the FIGS. 1 and 2 embodiment, tampon 10 is first placed in cavity 33. Die block 34 is then slid toward block 26 while a vacuum is drawn through port 30 thus sucking withdrawal string 16 into channel 28 and partially into port 30 as shown. Plunger 32 is then pushed toward bore 18 of the tampon causing string 16 to wrinkle on itself into multiple undulations 24 as it is compacted and forced into bore 18 to provide the configuration shown in FIG. 2. While the drawing in FIG. 2 shows the packed string 16 to have uniform small undulations 24 and a fold 22 disposed at about the middle of the string it is understood that these are idealized representations and the final product most likely would not be that uniformly configured. The undulations are more apt to comprise irregularly spaced bends. However, when processed by the device as shown in FIG. 2 the string will have some type of multiple small undulations along its entire length and a fold somewhere near the midpoint 22 of string 16 substantially as shown. When plunger 32 is withdrawn knot 20 or an unknotted free end, will remain outside of bore 18 at the base 14 of tampon 10.

In these drawings it should be noted that while bore 18 is shown as being axially disposed in tampon 10, bore 18 need only be substantially parallel to the axis of the tampon to serve the described purpose. In other words there is no need to have the bore centrally disposed other than for convenience in processing.

In the still more enlarged partial section of FIG. 4 an alternative arrangement of the packed string is shown. In that arrangement string 16a, in addition to having the multiple small undulations 24a, is folded on itself at least once more at points 23a.

The FIG. 4 arrangement may be provided by use of the device in FIG. 5. In this device, block 26 and die block 34 and their associated parts are the same as in FIG. 3, and like numbers are used for like parts.

In using the FIG. 5 device, tampon 10a is first placed in cavity 33 and string 16a is then folded in half at 22a before sliding die block 34 toward block 26. As a vacuum is drawn through port 30, fold 22a of string 16a is drawn into channel 28 while knot 20a, or the unknotted free end of the string, remains positioned between the blocks as shown. Plunger 32 is then pushed toward bore 18a of tampon 10a causing string 16a to wrinkle into multiple undulations 24a as well as to provide new fold lines 23a as the string is forced into bore 18a. The approximate arrangement of the packed string in the end product is shown in section in FIG. 4. As shown there, knot 20a is outside of bore 18a at base 14a, as is fold 22a and small portions of the string adjacent fold 22a.

Still another embodiment of the tampon of the invention is shown in FIG. 6, and the arrangement of the device for producing it is shown in FIGS. 7 through 10. The enlarged section of FIG. 6 there is illustrated another alternate arrangement for the packed string. In that arrangement, a number of folds 40 protrude from bore 22b at base 14b along with knot 20b and positively formed folds 41, which are disposed on the string approximately midway between folds 40, are packed within bore 22b.

In the device shown in FIGS. 7 through 10, block 26 and die block 34 and their associated parts are the same as in FIGS. 3 and 5. However in this device, reciprocating jaws 42 and 43 with grooves 46 and 48, as well as plate 44 with a central aperture 29 are interposed between block 26 and die block 34 as shown.

In using this device, tampon 10b is placed in cavity 33 of die block 34 which is then slid toward plate 44. A vacuum is drawn through port 30 causing string 16b to be drawn through aperture 29 and extend its full length along channel 28. Jaws 42 and 43 are then closed as shown in FIG. 8 forming string 16b into a serpentine shape with a number of folds 40 as shown in FIG. 9.

Plunger 32 is then pushed toward bore 22b folding the string at 41 near points on the string midway between folds 40 and packing it in this condition into bore 22b. The result is as shown in FIG. 6 with folds 41 disposed within bore 22b and folds 40 disposed outside bore 22b along with knot 20b or with the unknotted free end of the string. Unlike the FIGS. 2 and 4 arrangements, and because of the method used for packing, those portions of the withdrawal string 16b in the FIG. 6 illustration which are packed within bore 22b are fully stretched out and do not have the minute undulations along those portions of its length.

While the FIGS. 7-10 device is shown as putting four folds in the string, it will be seen that other variations in the number of folds may be employed in obtaining a string arrangement similar to that shown in FIG. 6. By referring to FIGS. 2, 4 and 6 of the drawings, it will be noted that whether the packed string has two folds or a multiplicity of folds, in each case the longitudinal axis of each of the unfolded longitudinal stretches of the string extends in the direction of the longitudinal axis of the bore.

It is also apparent that while all of the FIGURES show a terminal knot in the free end of the withdrawal string as the preferred embodiment, the knot is not necessary in carrying out the broad concept of the invention, and that therefore strings without a terminal knot may be employed if desired.

It is also preferred that the string be of a different color than the tampon to provide sufficient contrast for easy detection by the user.
What is claimed is:
1. In a compressed tampon having a withdrawal string attached to one end thereof, the improvement comprising means for storing said withdrawal string in said tampon one end by being provided with an elongate open bore of small diameter extending longitudinally into the interior of said tampon for at least one-third of the tampon length; the diameter of said bore being less than the radius of said tampon; and the major portion of said string which extends between the attached and the free end of said string being packed and enclosed inside of said bore with sufficient tightness to be frictionally held therein until manually removed; said packed string being folded on itself at least once and the longitudinal axis of each of the longitudinal stretches of said folded string extending in the direction of the longitudinal axis of said bore; and a means for removing said major portion of said string from said bore comprising a minor portion of said folded string disposed outside the open end of said bore defining a free finger grasping end of said string.

2. The tampon of claim 1 wherein said minor portion includes the free end of said string.

3. The tampon of claim 1 wherein said bore is axially disposed.

4. The tampon of claim 1 wherein the free end of said string has a terminal knot.

5. The tampon of claim 4 wherein only the terminal knot remains outside the bore.

6. The tampon of claim 1 wherein the frictionally held portion of said packed string is additionally shortened by a multiplicity of small undulations along the folded and packed length thereof.

7. The tampon of claim 6 wherein said packed and undulated string is folded twice along its length.

8. The tampon of claim 1 wherein said packed string is in the form of a multiplicity of zig-zag folds tucked into said bore by additional folds at points on said string midway between each pair of zig-zag folds, whereby portions of said string immediately adjacent the points of the zig-zag fold as well as the free end portion are disposed outside the bore.

9. The tampon of claim 1 wherein said string is of a color which contrasts with the color of the tampon.