May 28, 1946. C. P. WINTER ET AL 2,401,284

MANUFACTURE OF TAMPONS

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FIG. 1.

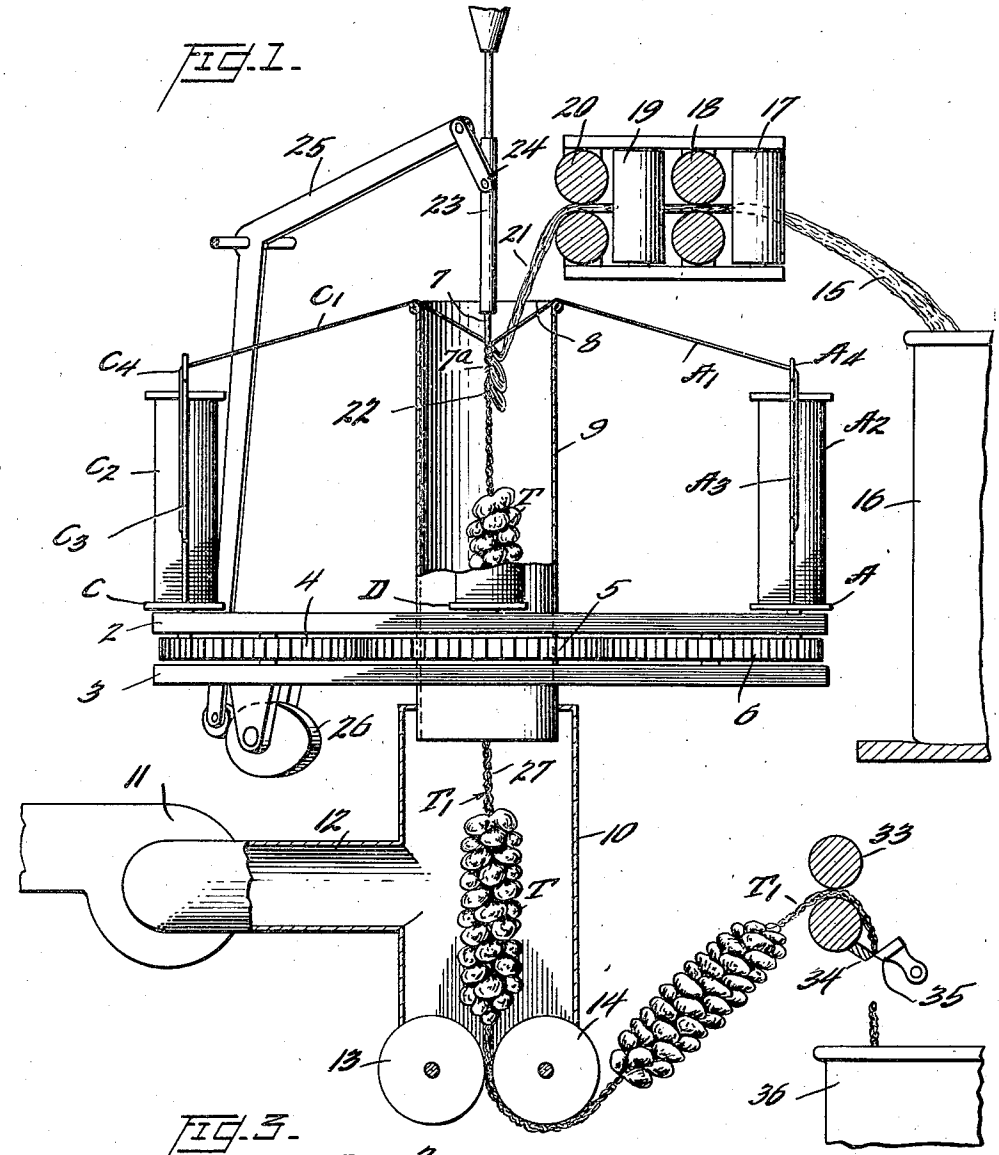


FIG. 3.

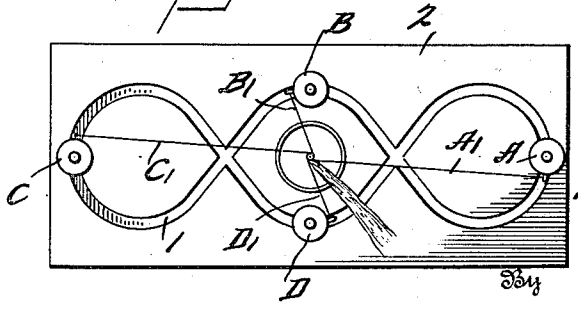
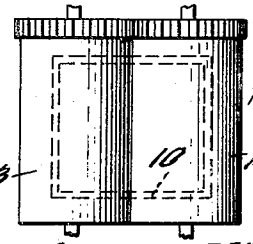


FIG. 2.



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FIG. 4.

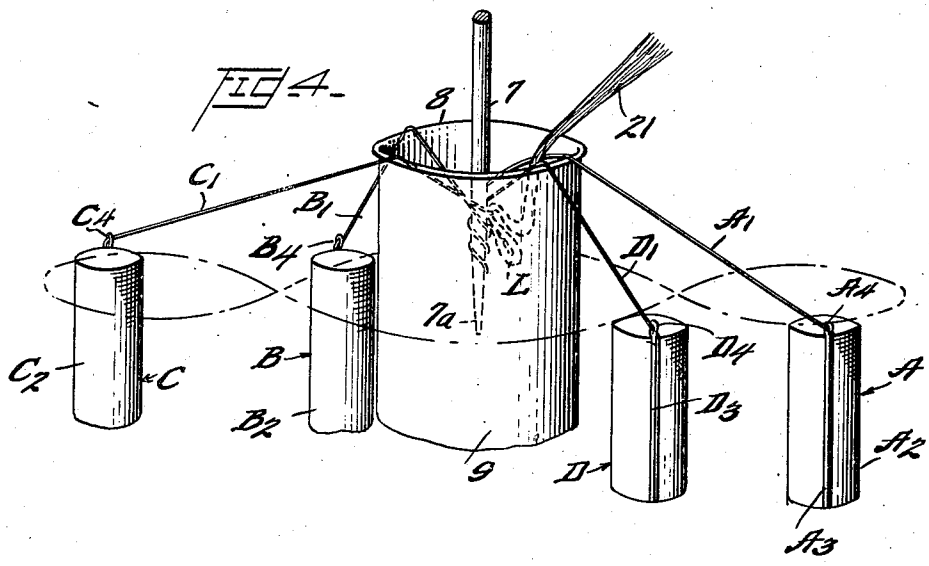


FIG. 5.

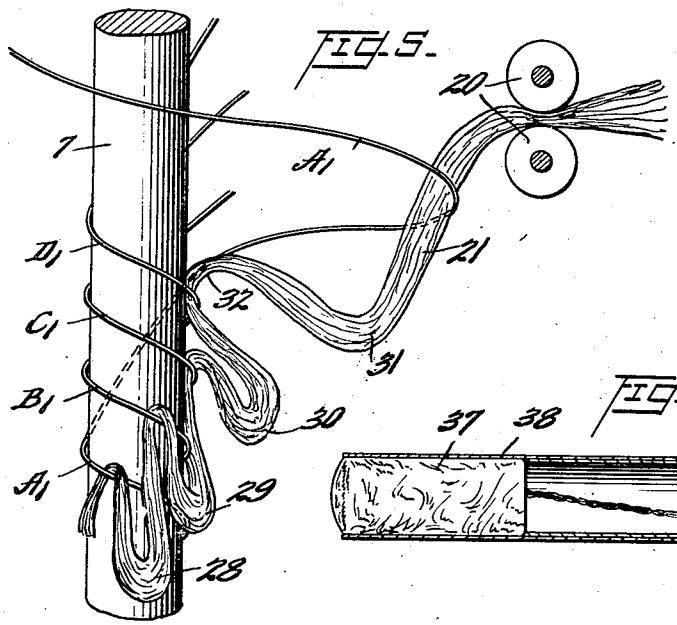


FIG. 10.

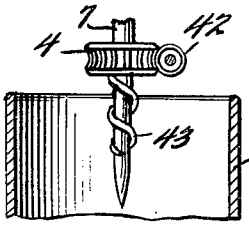


FIG. 11.

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MANUFACTURE OF TAMPONS

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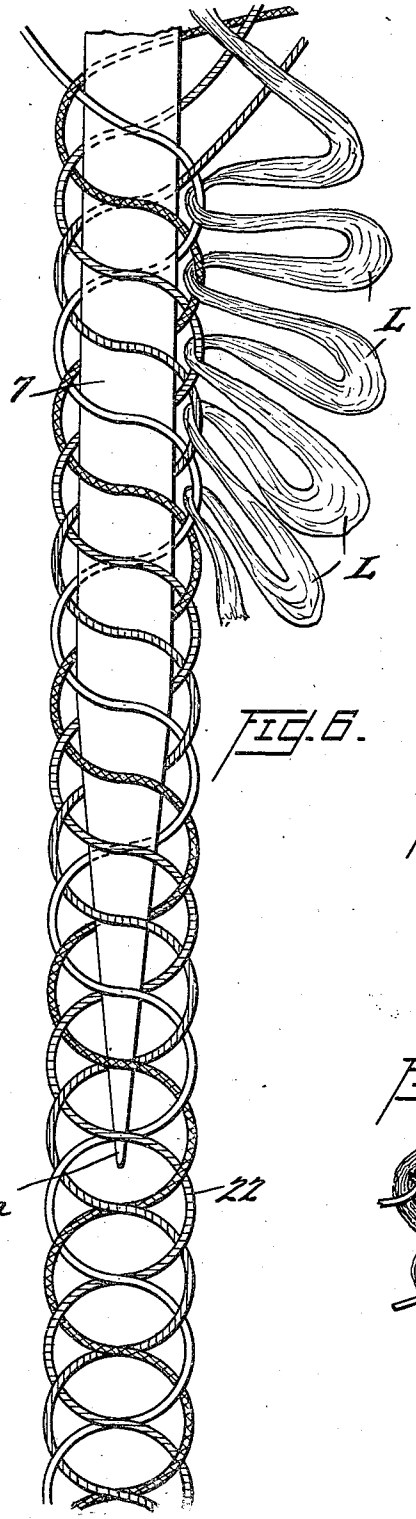


FIG. 6.



FIG. 7.

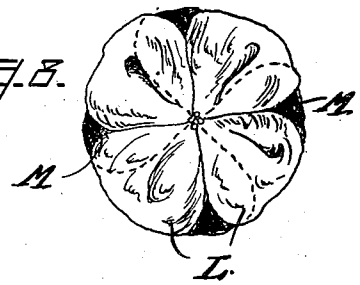


FIG. 8.

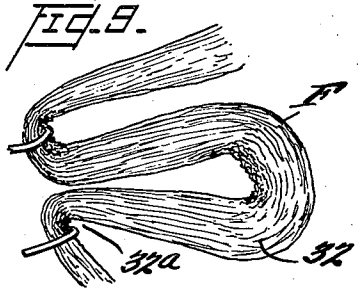


FIG. 9.

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UNITED STATES PATENT OFFICE

2,401,284

MANUFACTURE OF TAMPONS

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Application April 20, 1944, Serial No. 531,922

25 Claims. (Cl. 128—270)

This invention relates to the manufacture of a tampon, and, more particularly, a tampon comprising a longitudinally-extending loop-supporting member, to which there is attached a plurality of adjacent turns of loop members, said loop members being positioned longitudinally of the loop-supporting member, said tampon being provided with a withdrawal member.

In one form of the invention, the tampon comprises a plurality of longitudinally-extending helical turns of loops of absorbent material, each turn of loops of the absorbent material being helically spaced around the longitudinally-extending axial member with the apices of each loop member attached to or fastened to the axial member. Preferably the axial member is a central axial member, although it is within the contemplation of the present invention to have the loop members eccentric with respect to the axial member. In other words, it is only in the preferred form of the invention that it is necessary to have the axial member extend longitudinally and centrally of the tampon. Preferably, the longitudinally-extending member is a braided member, and the loops of each turn of absorbent material are spaced about and radiating from the central axial member.

In one form of the invention, the turns of loops are transversely spaced from one another at and adjacent the exterior surface of the tampon to thereby provide a network of transversely-extending shallow pockets. The tampon may also be provided with loops which are longitudinally spaced from one another at and adjacent the exterior surface of the tampon to thereby provide a network of longitudinally-extending shallow pockets.

In one form of the invention, the loop members at and adjacent their exterior surfaces are provided with looped fibers which are disposed in a relatively straight manner one with respect to the other, each loop at and adjacent its interior surface being buckled to thereby provide a great volume of voids between individual fibers to increase the absorbent capacity of the loops and the tampon member, the latter being preferably provided with a withdrawal member.

The present invention, considered from the standpoint of the article, comprises a plurality of absorbent tampon members fastened together to form a unitary tampon, the surface of which is provided with a network of shallow pockets, which may be transverse pockets or longitudinal pockets, or both transverse and longitudinal pockets, said unitary tampon being provided with a withdrawal member. The invention is also directed to a tampon comprising a longitudinally-extending holding member to which there is attached a plurality of absorbent tampon members progressively extending in helical or spiral formation longitudinally of the holding member, said tampon being provided with a withdrawal member.

It may be stated that while the tampon of the present invention is, in general, adapted for insertion into body cavities, it is particularly adapted for use as a vaginal tampon for the absorption and retention of menstrual discharges.

The body material of the tampon of the present invention may be composed of any absorbent cellulosic material, such as absorbent cotton, flax fiber or wool.

The invention consists not only in the tampon itself but in the method of forming the tampon and the machine for producing the same.

The invention from a method standpoint comprises feeding a strand of absorbent material into a plurality of braid-forming converging threads, the speed of formation of the braid being substantially less than the speed of feed of the absorbent material, and forming a plurality of turns of transversely-positioned loop members attached to the braid as said threads form a braid progressively extending longitudinally of said plurality of turns of loop members. Preferably, although not necessarily, it is desirable to discontinue the feed of the absorbent material after the formation of a predetermined number of turns of loop members while continuing the braiding step to provide a tampon with a withdrawal member. It is highly advantageous to have the longitudinally-extending member to which the loops of absorbent material are attached integral with the withdrawal member, but it is recognized that the loop members may be continuously formed and thereafter cut into tampons to which a withdrawal member may be attached in any suitable manner. Preferably, in carrying out the present invention, the fibers of the strand of absorbent material run approximately longitudinally of the strand.

While it is preferred that the tampon be produced under a slight vacuum, it may be stated that this merely represents the preferred form of the invention, the tampon being capable of being produced at ordinary atmospheric pressure or even under super-atmospheric pressure, although the latter is not usually desirable. When a vacuum is used it functions to remove any short fibers which may be present in the absorbent ma-

terial, although due to the longitudinal arrangement of the fibers the presence of short fibers is reduced to a minimum.

In one form of the invention the absorbent material, in the form of a collection of fibers or threads as a strand, is fed into a plurality of converging threads which form a braid around a central braid-supporting member, and means are provided for intermittently removing the braid from the braid-supporting member.

In order to provide the loop members, the speed of formation of the braid is substantially less than the speed of feed of the absorbent material.

From the standpoint of the apparatus for producing the tampon, the latter comprising a plurality of loop members composed of an absorbent material attached to the braided loop-supporting member, the invention comprises a braid-supporting member, means for feeding a strand of absorbent material into a plurality of braid-forming threads converging towards and around said braid-supporting member, means for forming on the latter and from said threads a braid, the threads of which engage and form loop members from said absorbent material, and means for displacing a portion of the braid from the braid-supporting member, said means being preferably intermittent in character, although continuous means may be employed for displacing or ejecting the braid from the pin. For example, a helical spring may be arranged to revolve on the pin and continuously displace or eject the braid therefrom. A vacuum chamber is preferably provided and means are also provided for maintaining the vacuum while permitting the tampon to be removed from the vacuum chamber. Means are also provided for discontinuing the feeding of the absorbent material while the braid-forming means continues to operate.

The primary object of the present invention is to provide a tampon characterized by an extraordinary ability to absorb fluids when inserted in body cavities of humans and to retain the absorbent fluids.

It is a further object of the present invention to provide a tampon the exterior surfaces of which are provided with valleys or pockets which function to trap, entrain and absorb the fluids from the body cavities, and particularly from the vagina when used as a vaginal tampon.

It is a further object of the present invention to provide a tampon which has a braided longitudinally-extending member to which are attached or fastened loop members of absorbent material, the fibers of the loop member adjacent the looped end having become rearranged due to the looping action to provide a substantial increase in voids.

Other objects of the invention will become apparent from the following specification, which will be described in connection with the accompanying drawings, wherein—

Figure 1 is an elevational view, partly in cross section, of a machine for manufacturing a tampon in accordance with the present invention;

Figure 2 is a bottom plan view of the air lock shown in Figure 1;

Figure 3 is a plan view showing the arrangement of the bobbin carriers whereby they travel a path functioning to produce a braid from the yarn bobbins which they carry;

Figure 4 is a perspective view showing the manner in which the respective braiding threads are drawn to a central axis and engage an absorbent member;

Figure 5 is a perspective detail showing the formation of the loop members of the present invention;

Figure 6 is a detail showing the braid formation of the respective fibers, said fibers having engaged portions of a sliver to form loop members;

Figure 7 is a view of the tampon of the present invention in its substantially complete form, showing said loop members carried by the longitudinally extending axial member, said loop members being arranged in a spiral or helical formation;

Figure 8 is a plan view of the tampon shown in Figure 7;

Figure 9 is an enlarged detail of one of the loop members;

Figure 10 is an elevation partially in section of a compressed tampon in place in its applicator; and

Figure 11 is a detail of constant motion displacement means for displacing the braid from the braiding pin.

The apparatus for manufacturing the tampon of the present invention comprises a series of bobbin carriers A, B, C and D, which fit in and travel in the groove 1 formed in an upper plate 2. The bobbin carriers are carried and guided around in the serpentine path of the groove 1 by means of horn gears 4, 5 and 6, said gears being positioned above the bottom plate 3 of the apparatus and below the top plate 2. These gears are the well known horn gears used in braiding machines and are provided with horns which are engaged with the lower lugs of the respective bobbins. This arrangement forms no part of the present invention, and therefore it is not shown in detail.

The bobbin carriers A, B, C and D each carry a yarn bobbin A_2, B_2, C_2 and D_2, from which are drawn threads respectively herein designated A_1, B_1, C_1 and D_1. The bobbin carriers supply each of said threads evenly and under suitable tension to and around a braiding pin 7, the threads being drawn over the edge 8 of the stationary working tube 9, said tube passing through the upper and lower bobbin carrier plates 2 and 3, the lower end of the tube being in operative connection with a chamber 10, the latter being connected to an exhaust fan 11 by means of an exhaust conduit 12. The lower end of the chamber is provided with an air lock comprising the rollers 13 and 14, one of which is a yieldable roller preferably made of rubber or the like. A sliver of absorbent cotton 15 with its fibers running parallel to each other and of a suitable weight per yard is fed from the container 16 through a series of drawing-out and elongating rolls 17, 18, 19 and 20, whereby the sliver is elongated to a form which facilitates the formation of loop members, as hereinafter set forth. From the drawing-out roll 20 the "sliver," which is hereinafter used to designate an assemblage of fibers or yarns, is drawn by suction into the working tube 10, where it is drawn by a thread, as hereinafter pointed out, to and adjacent the peripheral surface of a pin member 7, which is herein termed a "braid-supporting member." The sliver which is continuously drawn into the working tube 9 is caught at spaced intervals by successive threads and drawn to and adjacent the peripheral surface of the pin 7, said threads forming about said pin a braid 22. It is to be noted that the vacuum also functions as a means for moving and maintaining the bight

of the loops being formed outwardly and/or downwardly from the braid being formed. It has been found that in the absence of the vacuum or equivalent means, certain of the loops will be caught by successive yarns or threads and carried into the core or braid so that an irregularly compact formation will be formed.

Means are provided to strip the braid 22 with its loop members from the pin 7, said loop members being identified by the letter L, specific loops bearing specific identifying characters. In order to strip the braid from the braid-supporting member 7, the latter is provided with stripping means which may comprise a reciprocating sleeve 23 operatively connected at 24 to the bell crank 25 actuated by the cam 26. The carriers A, B, C and D are respectively provided with posts A_3, B_3, C_3 and D_3, which at their extremities terminate in threaded eyes A_4, B_4, C_4 and D_4.

In initiating operation of the machine, the respective free ends of the yarns or threads A_1, B_1, C_1 and D_1 are knotted together by hand, and a sufficient length of each thread drawn off of the respective yarn bobbins A_2, B_2, C_2 and D_2, and the knotted threads are pulled through the working tube 9 preferably by hand and between the rollers 13 and 14. The braiding apparatus has not at this point been started, and the respective threads are therefore unbraided and positioned within the tube 9 and the chamber 10 in longitudinally extending substantially parallel relationship. Thereafter, the braiding machine is started and the respective threads A_1, B_1, C_1 and D_1 are drawn under tension over the edge 8 of the working tube 9 and around the pin 7, and the braid, as shown in detail in Figure 6, is formed on the pin 7, the latter being of a suitable length and extending into the working tube for a distance which will permit the formation of a relatively short section of braid, the length of this braid section being usually about one inch. However, the latter is set forth by way of illustration and not by way of limitation and may, therefore, be varied in accordance with the circumstances. As the machine starts to braid, the pin sleeve 23 begins to reciprocate, and when a small amount of braid builds up at and adjacent the end 7a of the pin 7 the sleeve 23 contacts and ejects from the pin all braid formed over a predetermined amount, that is, a predetermined amount is also left on the pin.

When a predetermined length of braid is formed sufficient to act as the withdrawal member of the finished tampon, then the roller assemblies 17 to 20 inclusive are set in motion, and the sliver 15 is passed therethrough. The resulting drawn-out or elongated sliver 21, after passing through the last roller assembly, is drawn into the working tube 9 by suction supplied by a fan 11. In this connection, it may be stated that the working tube 9 may be of any suitable diameter, as, for example, 2 inches, and the sliver which is fed into the working tube is preferably in its less expanded state, about 3/8 of an inch in diameter, it being pointed out that as the sliver emerges from the last roller assembly 20 the sliver expands to a substantially round, or almost round, state. Here again, the dimensions set forth are by way of illustration and not by way of limitation, and may be materially departed from. The sliver 21, preferably of absorbent cotton or similar cellulosic material having absorbent properties of the character possessed by absorbent cotton, is fed through the rolls at a speed which will supply about 2 inches of sliver for each thread that passes a given point on the upper peripheral edge 8 of the working tube 9. The sliver 21 is caught at loop-forming intervals by threads A_1, B_1, C_1 and D_1 to form, in the order named, loop members 28, 29 and 30 and potential loop member 31, as shown in Figure 5. The sliver 21 is fed to the pin member 7 at a speed greater than that at which the braid 22 is formed, thereby producing loop members as shown in Figure 5 and as more or less diagrammatically set forth in Figure 6. The braid may be formed at the rate of 300 feet per hour, and the cotton sliver fed in during the period is actually forming loops at the rate of about 10 times the speed of formation of the braid.

It is to be noted that the loop-forming members and the potential loop member are held in position by the successive threads A_1, B_1, C_1 and D_1 as the braid is formed. It is further to be noted that, although the loops are all formed on the same side of the pin 7, as shown in Figure 6, namely, at the portion indicated by the numeral 32 in Figure 5, the loops space themselves in a spiral or helical path around the axially braided core member, as shown in Figures 5 and 7 respectively.

While it is not desired to be limited to any specific explanation of what induces the spiral or helical formation or what may be termed a "rotary displacement," it is desired to state that the rotary displacement is due to the lateral crowding of the apices of successive loops and/or to the twist of the thread members constituting the axial braided core. In this connection, it may be stated that the braid may comprise three or more members and may be produced in such a manner that the threads of the braid and the braid itself are given a twist during the manufacture of the braid. The twist present in the braid therefore tends to space the loop members in spiral or helical pattern around the longitudinally-extending braided member. However, it is recognized that the braid may be formed without giving it any substantial twist, and that when such a braid is used in carrying out the present invention, the turns of loops may be disposed in a pattern departing from the helical pattern, and in some cases the turns of neighboring adjacent loops may be substantially transversely parallel.

As shown in Figure 7, the respective loops L of one turn V touch the respective loops L of a neighboring and adjacent turn V_1 at and adjacent the central axial member of the tampon, but as the circumferential portion of each turn is approached there is formed between successive turns, as between turn V and turn V_1, a shallow transversely-extending pocket or valley P.

As will be noted from Figures 7 and 8, in addition to the transversely-extending shallow pockets, the tampon of the present invention is preferably provided with longitudinally-extending shallow pockets M which are formed between adjacent spirally-extending loop members L. The loop members of each turn, as, for example, the turn V, touch each other at and adjacent the longitudinally-extending axial member, but are slightly spaced from each other at and adjacent the outer extremity of each loop. It is to be noted that the loop members L as they are arranged along the turns of the spiral or helix, partially overlap each other, the extent of the overlapping being governed by the number of loops in each turn of the spiral or helix. Using four threads, each turn usually contains four loops. However, the braiding may be accomplished with

a greater or lesser number of threads, as, for example, three threads or five threads, and then each turn of the spiral or helix will consist, for example, of three or five overlapping loops, which consists of a hollow ovoid or egg-shaped member of the character shown in Figure 9. The exact shapes of the loops will be determined to some extent by the amount of twist in the braid.

In the preferred form of the invention, the loop members of the tampon are substantially helically arranged longitudinally of the tampon. To carry out the spirit of the invention it is not necessary that there be a complete spiral or helical arrangement; and, indeed, as pointed out, the helical arrangement may be entirely dispensed with and the tampon members can be arranged in turns which are substantially transversely parallel to each other, that is, said turns may extend substantially at right angles to the longitudinally-extending loop-carrying member.

It is desired to point out that the helical ridge formed by the successive loops acts in a manner similar to the threads of a screw, exerting more concentrated pressure against the walls of the vagina and damming off the menstrual flow in a very effective manner, the longitudinally-extending and/or transversely-extending valleys or pockets between the ridges acting as a reservoir and/or additional absorbing surfaces which have greater entraining and absorbing capacity than the smooth-surfaced tampons of the prior art.

In this connection, it is desired to point out that there has been provided a tampon the surface of which is irregular, rough, or characterized by the presence of valleys or pockets, all in contradistinction to the smooth-surfaced tampons of the prior art.

The cycle as above set forth, and as shown in Figures 5 and 6, is continued until there is formed a tampon of suitable length, as shown in Figure 7, said length being desirably about 5 inches. However, this is set forth by way of illustration and not by way of limitation.

After the tampon is formed, feeding of the sliver 21 is discontinued for a short period of time while the braiding on the pin 7 is continued. The cotton sliver 21 extending from the roller assembly 20 to and adjacent the pin 7 is rather fragile, and as the already-formed tampon T is fed downwardly through the working tube 9 the cotton sliver breaks. Braiding is then continued in order to form the withdrawal member T_1, which may be any desirable length, as, for example, about 4 inches. This is set forth by way of illustration and not by way of limitation. After a braided withdrawal member of suitable length is formed, the roller assemblies 17 to 20 are started and the cotton sliver is again fed through the rolls and drawn from the last roller assembly 20 to the threads A_1 to D_1 inclusive, and the cycle is continuously repeated to form another tampon T. The braided axial core member 1, which is identified as an entity by the numeral 22, together with tampons T, spaced at intervals along the braided axial core, continuously pass through the rolls 13 and 14 and then preferably through the tensioning rolls 33. Thereafter, each tampon T with its core member T_1 is severed by passing between the stationary and rotary knives 34 and 35. The severed tampons pass into the receiver 36.

It may be pointed out that the tampon working tube 9 operates under a suction and this functions to remove undesirable short fibers from the cotton fiber 21. In this manner the tampon produced therefrom is free of short fibers or fibers which are loosely attached to and adjacent the active absorbent surface of the tampon, thereby substantially inhibiting the possibility of the tampon shredding short fibers during the period it is within the vagina. This prevents the short fibers from being left in the vagina and causing discomfort after the withdrawal of the tampon.

The tampon as shown in Figures 7 and 8 may be compressed to a suitable size and shape, as, for example, to a compressed cylinder 37 adapted for insertion in an applicator tube 38 provided with an ejector 39. When the applicator is inserted in the vagina and the tampon ejected therefrom, the latter, upon contact with the vaginal or menstrual fluids, assumes approximately a spiral or helical formation, as shown in Figure 7, presenting a larger surface area, due to the looped structure of the tampon, than is presented by the tampons of the prior art having approximately the same weight of cotton per unit volume.

It is to be noted that the fibers of the sliver 21 run approximately longitudinally of the sliver, and therefore, as the loops are formed, the fibers F assume the contour shown in Figure 9. The fibers extending from adjacent the inner end 32a of the loop 32 assume the contour shown in Figure 9, it being noted that the outside fibers are under relatively slight tension, and are more or less concentrically arranged with respect to the center of the curved part of the loop. The inside fibers are relatively wrinkled and distorted, being under relatively slight compression stresses, the fibers at and adjacent the inner surface of the loop member being buckled or distorted, thereby providing a greater surface of contact for the vaginal or menstrual fluids. Further, this distortion or buckling provides a greater volume of voids or interstices between the individual fibers, which immeasurably increases the absorbent capacity of the loops and the tampon of which they are constituent elements. It is therefore clear that, in accordance with the present invention, the parallel fibers of the original cotton sliver have been caused to become rearranged to present an absorbent unit having a greater number of voids per unit volume than is present in any of the prior art tampons, and in this connection, it may be pointed out that the tampons of the prior art are sheared or otherwise cut across parallel fibers, and this necessarily results in the production of an amount of extremely short fibers which are not bound in any manner to the central mass of the tampon, and therefore are free to and do become detached from the tampon. In accordance with the present invention, the fibers are not severed transversely and therefore substantially no short fibers are produced during the manufacture of the tampon, and, moreover, as previously pointed out, the manufacture of the tampon under suction causes the removal of any short fibers that may have been present in the original sliver.

The tampon of the present invention comprises a multiplicity of loops of absorbent material attached to an axial core, said loops providing an outside vaginal contacting surface of looped fibers rather than fiber ends, whereby the tampon has greater cleaning properties than the prior art tampons, the outside surfaces of which are constituted by loose fiber ends.

Instead of using intermittent displacement means for displacing the braid from the pin 7, a

constant motion displacement means may be used as shown in Figure 11, there being rotatively mounted on the pin a worm gear 41 in mesh with the worm 42, said worm gear 41 rotating on the stationary pin. Fastened to the worm gear is a helical cam 43 which rotates on the pin. As the braid is formed the helical cam will depress the converging threads to the end of the cam causing the braid to be formed below the cam and ejecting all braid as formed over a predetermined amount. Said amount being the length of the braid reaching from the end of the cam 43 to the end of the pin 7.

What is claimed is:

1. A tampon for insertion into a body cavity the walls of which have relatively delicate tissues comprising a plurality of longitudinally-extending turns of loop members of a material highly absorbent of any fluids present in said cavity and exerting no cutting action on said tissues, each loop of each turn being spaced about and radiating from a longitudinally-extending central axial member to which said loops are attached, said tampon being provided with a withdrawal member.

2. A tampon for insertion into a body cavity the walls of which have relatively delicate tissues comprising a plurality of longitudinally-extending helical turns of loops of a material highly absorbent of any fluids present in said cavity and exerting no cutting action on said tissues, each turn of loops being helically spaced around the longitudinally-extending central axial member with the apex of each loop fastened to the axial member, said tampon being provided with a withdrawal member.

3. A tampon for insertion into a body cavity the walls of which have relatively delicate tissues comprising a plurality of longitudinally-extending helical turns of loops of a material highly absorbent of any fluids present in said cavity and exerting no cutting action on said tissues, each turn of loops being helically spaced around a longitudinally-extending braided central member composed of a plurality of threads which fasten each of the loops at their apices to said axial member, said tampon being provided with a withdrawal member.

4. A tampon for insertion into a body cavity the walls of which have relatively delicate tissues comprising a plurality of longitudinally-extending turns of loops of a material highly absorbent of any fluids present in said cavity and exerting no cutting action on said tissues, each loop of each turn being spaced about and radiating from a longitudinally-extending braided central member composed of a plurality of threads which fasten each of said loops at their apices to said axial member, said tampon being provided with a withdrawal member.

5. A tampon for insertion into a body cavity the walls of which have relatively delicate tissues comprising a plurality of longitudinally-extending helical turns of loops of a material highly absorbent of any fluids present in said cavity and exerting no cutting action on said tissues, each turn of loops being helically spaced around the longitudinally-extending central axial member with the apices of each loop fastened to the axial member, the turns of loops being transversely spaced from one another at and adjacent the exterior surface of the tampon to provide transversely-extending shallow pockets, said tampon being provided with a withdrawal member.

6. A tampon for insertion into a body cavity the walls of which have relatively delicate tissues comprising a plurality of longitudinally-extending helical turns of loops of a material highly absorbent of any fluids present in said cavity and exerting no cutting action on said tissues, each turn of loops being helically spaced around the longitudinally-extending central axial member with the apices of each loop fastened to the axial member, the loops of each turn of loops overlapping one another and being longitudinally spaced from each other at and adjacent the exterior surface of the tampon to provide longitudinally-extending shallow pockets, said tampon being provided with a withdrawal member.

7. A tampon for insertion into a body cavity the walls of which have relatively delicate tissues comprising a plurality of longitudinally-extending helical turns of loops of a material highly absorbent of any fluids present in said cavity and exerting no cutting action on said tissues, each turn of loops being helically spaced around the longitudinally-extending central axial member with the apices of each loop fastened to the axial member, the loops of each turn of loops overlapping one another and being longitudinally spaced from each other at and adjacent the exterior surface of the tampon to provide longitudinally-extending shallow pockets, said turns of loops being transversely spaced from each other at and adjacent the exterior surface of the tampon to provide transversely-extending shallow pockets, said tampon being provided with a withdrawal member.

8. A tampon for insertion into a body cavity the walls of which have relatively delicate tissues comprising a plurality of longitudinally-extending turns of loop members of a material highly absorbent of any fluids present in said cavity and exerting no cutting action on said tissues, each loop of each turn being spaced about and radiating from a longitudinally-extending central axial member to which said loops are attached, said loops at and adjacent their exterior surfaces being provided with looped fibers which are disposed in a relatively straight manner one with respect to the other, each loop at and adjacent its interior surface being buckled to thereby provide a great volume of voids between individual fibers to increase the absorbent capacity of the loops and the tampon member, the latter being provided with a withdrawal member.

9. A tampon for insertion into a body cavity the walls of which have relatively delicate tissues comprising a longitudinally-extending loop-supporting member to which there is attached a plurality of adjacent turns of loop members positioned longitudinally of the loop-supporting member, said loop members being composed of a material highly absorbent of any fluids present in said cavity and exerting no cutting action on said tissues, said tampon being provided with a withdrawal member.

10. A compacted tampon for insertion into a body cavity the walls of which have relatively delicate tissues comprising a longitudinally-extending braided loop-supporting member to which there is attached a plurality of adjacent turns of loop members positioned longitudinally of the loop-supporting member, said loop members being composed of a material highly absorbent of any fluids present in said cavity and exerting no cutting action on said tissues, said tampon being provided with a withdrawal member.

11. The method comprising producing a tampon for insertion into a body cavity the walls of

which have relatively delicate tissues by drawing under a partial vacuum a strand of absorbent material into a plurality of braid-forming converging threads, forming a braid from said threads, the speed of formation of the braid being substantially less than the speed of feed of the absorbent material and forming a plurality of turns of transversely-positioned loop members attached to the braid as said threads form a braid extending longitudinally of said plurality of turns of loop members.

12. The method comprising producing a tampon for insertion into a body cavity the walls of which have relatively delicate tissues by drawing under a partial vacuum a strand of absorbent material into a plurality of braid-forming converging threads, forming a braid from said threads, the speed of formation of the braid being substantially less than the speed of feed of the absorbent material and forming a plurality of turns of transversely-positioned loop members attached to the braid as said threads form a braid extending longitudinally of said plurality of turns of loop members, and discontinuing the feeding of the absorbent material after the formation of a predetermined number of turns of loop members while continuing the braiding step to thereby provide a tampon with a withdrawal member.

13. The method comprising producing a tampon for insertion into a body cavity the walls of which have relatively delicate tissues by feeding a strand of absorbent material into a plurality of converging threads, forming a braid from said threads and around a central braid-supporting member, the speed of formation of the braid being substantially less than the speed of feed of the absorbent material, moving and maintaining the excess absorbent material outwardly from the braid to form a plurality of turns of transversely-positioned loop members attached to the braid as said threads form a braid extending longitudinally of said plurality of turns of loop members, and displacing a portion only of the so-formed braid from the braid-supporting member.

14. The method comprising producing a tampon for insertion into a body cavity the walls of which have relatively delicate tissues by feeding a strand of absorbent material into a plurality of converging threads, forming a braid from said threads and around a central braid-supporting member, the speed of formation of the braid being substantially less than the speed of feed of the absorbent material, moving and maintaining the excess absorbent material outwardly from the braid to form a plurality of turns of transversely-positioned loop members attached to the braid as said threads form a braid extending longitudinally of said plurality of turns of loop members, displacing a portion of the so-formed braid from the braid-supporting member, and discontinuing the feeding of the absorbent material after the formation of a predetermined number of turns of loop members while continuing the braiding step to thereby provide a tampon with a withdrawal member.

15. The method comprising producing a tampon for insertion into a body cavity the walls of which have relatively delicate tissues by drawing under a partial vacuum a strand of absorbent material the fibers of which run approximately longitudinally of the strand into a plurality of converging threads forming a braid from said threads and around a central braid-supporting member, the speed of formation of the braid being substantially less than the speed of feed of the absorbent material, forming a plurality of turns of transversely-positioned loop members attached to the braid as said threads form a braid extending longitudinally of said plurality of turns of loop members, displacing a portion of the so-formed braid from the braid-supporting member, and discontinuing the drawing of the absorbent material into said converging threads after the formation of a predetermined number of turns of loop members while continuing the braiding step to thereby provide a tampon with a withdrawal member.

16. In a machine for producing tampons, comprising a plurality of loop members composed of an absorbent material and attached to a braided loop-supporting member, a vacuum chamber, a braid-supporting member projecting into said vacuum chamber, means for feeding a strand of absorbent material into said vacuum chamber and into a plurality of braid-forming threads converging towards and around said braid-supporting member; means for forming on the latter and from said threads a braid, the threads of which engage and form loop members from said absorbent material, means for displacing a portion of the braid from the braid-supporting member, and means for maintaining said vacuum while permitting the so-produced tampon to be removed from said chamber.

17. In a machine for producing tampons, comprising a plurality of loop members composed of an absorbent material and attached to a braided loop-supporting member, a braid-supporting member, means for feeding a strand of absorbent material into a plurality of braid-forming threads converging towards and around said braid-supporting member, means for forming on the latter and from said threads a braid the threads of which engage and form loop members from said absorbent material, means for displacing a portion of the braid from the braid-supporting member, and means for discontinuing the feeding of the absorbent material while the braid-forming means continues to operate.

18. In a machine for producing tampons comprising a plurality of loop members composed of an absorbent material and attached to a braided loop-supporting member, a vacuum chamber, a braid-supporting member projecting into said vacuum chamber, means for feeding a strand of absorbent material into said vacuum chamber and into a plurality of braid-forming threads converging towards and around said braid-supporting member; means for forming on the latter and from said threads a braid the threads of which engage and form loop members from said absorbent material, means for discontinuing the feeding of the absorbent material to the vacuum chamber while the braid-forming means continues to operate, means for displacing a portion of the braid from the braid-supporting member, and means for maintaining said vacuum while permitting the so-produced tampon to be removed from said chamber.

19. A compressed compact tampon for insertion into a body cavity the walls of which have relatively delicate tissues comprising a longitudinally-extending holding member to which there is attached a plurality of tampon members progressively extending in helical formation longitudinally of the holding member, said tampon being composed of a material highly absorbent of any fluids present in said body cavity, and preventing irritation of said tissues, said tampon being provided with a withdrawal member.

20. A tampon for insertion into a body cavity the walls of which have relatively delicate tissues comprising a plurality of longitudinally-extending turns of loop members composed of a material which prevents irritation of said tissues, each loop of each turn being spaced about and radiating from a longitudinally-extending central axial yarn member to which said loops are attached, said tampon being provided with a withdrawal yarn member.

21. A tampon for insertion into a body cavity the walls of which have relatively delicate tissues, comprising a plurality of longitudinally-extending helical turns of loops composed of absorbent material preventing irritation of said tissues, each turn of loops being helically spaced around a longitudinally-extending central axial yarn member, with the apex of each loop fastened to the axial member, said tampon being provided with a yarn withdrawal member.

22. The method of manufacturing a tampon comprising forming a longitudinally extending member from a plurality of strands of yarn, feeding between said strands a surplus of absorbent material in the form of a relatively softer strand, and moving and maintaining portions of said absorbent material outwardly from said longitudinal member so as to form outwardly extending loops held only at points adjacent the longitudinal member by the strands of yarn of said longitudinal member.

23. The method of manufacturing a tampon comprising forming a longitudinally extending member from a plurality of strands of yarn, feeding between said strands a surplus of absorbent material in the form of a relatively softer strand, and drawing by means of a vacuum said absorbent material outwardly from said longitudinal member so as to form outwardly extending loops held only at points adjacent the longitudinal member by the strands of yarn of said longitudinal member.

24. In a machine for manufacturing tampons, means for feeding a plurality of strands of yarn, means for forming from said strands a coherent elongated cord, means for feeding absorbent material in the form of a relatively softer strand between said first strands at a speed substantially in excess of cord formation, and means for moving and maintaining said material outwardly from said cord so as to form outwardly extending loops of absorbent material.

25. In a machine for manufacturing tampons, means for feeding a plurality of strands of yarn, means for forming from said strands a coherent elongated cord, means for feeding absorbent material in the form of a relatively softer strand between said first strands at a speed substantially in excess of cord formation, and means for displacing said material outwardly from said cord so as to form outwardly extending loops of absorbent material, said last mentioned means including means to apply suction to said absorbent material.

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