CUP-SHAPED DEVICE FOR THE COLLECTION OF MENSTRUAL FLUIDS AND INTENDED FOR INTERNAL USE

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ABSTRACT
This invention concerns a menstrual device for internal use consisting of a liquid-proof, soft and elastomeric material. The device is generally cup-shaped and has on its outside annular ribs extending peripherally around the wall of the cup, the ribs having for its purpose to sealingly abut the wall of the vaginal canal when the device is in use in order to maintain the device in position in the vaginal canal. The invention is characterized in that at least one annular rib extending around the periphery of the wall of the cup is wave-shaped.

6 Claims, 3 Drawing Figures
CUP-SHAPED DEVICE FOR THE COLLECTION OF MENSTRUAL FLUIDS AND INTENDED FOR INTERNAL USE

The present invention relates to a generally cup-shaped device for collecting menstrual fluids and intended for internal use, said device being made from a liquid-proof, soft, elastic material and being provided on the outside thereof with annular ribs which extend around the periphery of said device and which are intended to hold the device in firm abutment with the walls of the vaginal canal when the device is in use.

Such menstrual devices have long been known to the art, and to facilitate their insertion into the vaginal canal are constructed in a manner which enables them to be folded transversely of their longitudinal direction. When being inserted, the device is held compressed in its folded state by means of the fingers of the user or by a tool especially suited for the purpose. Subsequent to placing the device in position in the vaginal canal, the pressure on said device is released and the device expands as a result of the inherent springiness of the elastic material from which it is made and as a result of the annular ribs arranged around the periphery of the wall of the device, said ribs because of their shape and their dimensions expanding the device so that it firmly abuts the walls of the vaginal canal.

The first such menstrual devices manufactured had two parallel, annular ribs of which one comprised an outwardly folded edge or flange member extending around the open end of the device, said end in practice facing inwardly and upwardly in the vaginal canal so that menstrual fluid could be collected, while the second rib was located immediately beneath the first rib to define therebetween a concave groove which acted as a form of suction cup for holding the device tightly against the walls of the vaginal canal.

This design, however, was found to be uncomfortable and could not be reliably held in the correct position in the vaginal canal, but was found to tilt and thereby allow fluid to escape, to soil the clothes of the wearer. To overcome this disadvantage, there was suggested a modified design of the annular ribs and of the cup-shaped device as a whole. It was also proposed that additional ribs should be made integral with said two annular ribs and the wall of the menstrual cup and that said additional ribs should cross the groove in a manner such that, together with the two annular ribs, said additional ribs divided the suction cup acting groove into alternate triangular and square recesses, each of which was intended to function as a separate suction cup for the purpose of holding the device in position in a manner such that no fluid could escape around the edges of the device. With regard to the total design of the menstrual cup it was proposed that there should be arranged on the outside of the cup and integral therewith a longitudinally extending, bulged or keel-like appendage which, through its abutment with the wall of the vaginal canal, would prevent tilting of the cup as a result of the body movements executed by the wearer. In addition, it was also suggested that the plurality of longitudinally extending ribs on the inner surface of the cup wall of the first known type of device were replaced by the arrangement of a single spiral rib extending along the inner surface of the cup wall from the bottom to the open end thereof, said spiral rib being assumed to effectively lock the cup in position both longitudinally and laterally.

Because of its rigidity, this modified design of the type of menstrual device described in the introduction above was found to be difficult to fold and insert, and since it was also found to be extremely uncomfortable as a result of said rigidity and of the large number of comparatively hard components from which it was constructed, said modified design has not been used to any appreciable extent.

Instead, further changes in the actual shape of the cup and to the shape and positioning of the annular ribs have been suggested. The cup has been made more cylindrical in shape than with previously known designs, and in connection herewith the number of annular ribs has been increased to embrace a first and a second set of annular ribs designed to act as sealing lips and arranged in the vicinity of the open end of the cup, the two sets of ribs comprising two radially outwardly projecting parallel lips of which the lips belonging to the first or the upper set are directed obliquely downwardly, while the lips belonging to the second or lower set are directed upwardly, there being provided between the two lips in each set of lips an annular groove of wedge-shaped cross section.

Even though an internal menstrual device constructed in this manner is seated somewhat more reliably in the vaginal canal and is somewhat more comfortable to wear than devices according to the previously suggested designs, the construction does not ensure such complete securement of the device subsequent to its being inserted in a folded state into the vaginal canal that a fully reliable seal is obtained against the canal walls. With narrow vaginal canals the device, which is essentially only folded double, cannot fully expand, whereby incomplete abutment is obtained against the wall of the canal. To prevent this, the annular ribs or sealing lips provided with present menstrual devices must in practice always be made so rigid that, under all circumstances, they exert a strong pressure against the walls of the vaginal canal. In other words, the further modified design of the menstrual device does not greatly differ from its predecessors since similar thereto instead of being soft and readily adaptable to vaginal canals of different sizes it is, to the contrary, hard and conforms firmly to different vaginal canals according to the outer diameter of the annular ribs on the device, as a result of their relatively considerable stiffness.

The object of the present invention is to circumvent the aforementioned disadvantages associated with menstrual devices of the type described in the introduction and to provide a device which can be readily folded for insertion into the vaginal canal and which is self-adaptable to different sizes and shapes thereof and which is capable of constantly conforming softly and gently to the tissues of the canal so as to ensure a good seal and reliable retention even when the wearer performs relatively violent body movements. This object is achieved by means of the device according to the present invention, which is mainly characterized in that at least one of the annular ribs extending peripherally around the wall of the device has the shape of a waved line.

So that the invention may be more readily understood and further features thereof made apparent, a menstrual device constructed in accordance with the
invention will now be described with reference to an embodiment thereof illustrated in the accompanying drawing in which FIG. 1 is a partially cut away side view of an embodiment of a menstrual device for internal use constructed in accordance with the invention, FIG. 2 is a cross sectional view taken through the line 2—2 in FIG. 1, and FIG. 3 is a cross sectional view taken through the line 3—3 in FIG. 1.

As will be seen from the drawing, an internal menstrual device according to the invention comprises a cup-shaped body 1 which is made from a liquid-impervious, soft, elastomeric material such as natural or synthetic rubber, plastics or other appropriate elastomeric material having the desired degree of imperviousness to liquid and which can be readily cleaned. With the illustrated embodiment, the cup 1 is provided on the outside thereof with a number of annular ribs 4—7 which extend around the periphery of the wall of the cup and which are made integrally therewith and are intended to hold the device in position in the vaginal canal whilst sealingly abutting the walls thereof.

With the illustrated embodiment one of the four illustrated annular ribs forms an outwardly folded edge around the open end of the body, while the remaining ribs are disposed downwardly on the inside of the cup, two of said ribs, namely 5 and 6, being arranged at a relatively small distance apart from each other and from the rim of the cup, while one rib, 7, is arranged considerably further down towards the bottom of the cup and has on the outside thereof a finger grip 8 by means of which the device can be removed after use.

The high degree of foldability of the menstrual device according to the invention, its high degree of adaptability to different sized vaginal canals and its ability to constantly lie softly in conforming abutment with the wall of the vaginal canal are all obtained by the fact that at least one, and in the illustrated embodiment three, of the ribs 5—7 extending circumferentially around the wall of the cup are wave-shaped. The shape of the rib may be a zigzag wave-shape, as with the illustrated embodiment, or a sine wave-shape, or any other wave-shape suitable for the intended purpose. The only decisive feature is that the wave-shape enables the body 1 to be folded and unfolded in a manner similar to that obtained when opening and closing an umbrella. The device is intended to be inserted into the vaginal canal by means of the fingers of the user or by means of a device suitable herefor, in a folded condition, essentially in the condition of a folded umbrella whereupon the device when released will automatically expand, primarily as a result of the elasticity of the ribs, until a soft and conforming sealing abutment is obtained with the walls of the vaginal canal.

One of the great advantages afforded with the device of the present invention is that the effect afforded by the wave-shaped ribs can be adapted to suit the most widely varied requirements, for example at least one of the wave-shaped ribs can be given a varying height.

Further advantages and the possibility of varying the degree of abutment and the extent of expansion as required when manufacturing the device of the invention, whilst retaining an extremely high degree of foldability, are also afforded since at least one, but at most each alternate one of the crests of the annular ribs can be arranged to coincide with a known longitudinally extending rib arranged externally or internally of the cup such as the rib 9 shown in the illustrated embodiment.

Since the different ribs, whether they be annular or longitudinal, are suitably made integral with the cup and therefore from the same material, it will readily be perceived that the portions of the cup wall located between the different ribs are more resilient, i.e. springier, than the ribs. This means that the device according to the invention accompanies and conforms to the walls of the vaginal canal particularly well. Since at least one of the annular ribs has a wave-shaped form, the abutment zone obtained against the wall of the vaginal canal is so wide that any tendency of the device to tilt is effectively counteracted. This is particularly the case with the illustrated embodiment which has three such wide abutment zones provided by the three wave-shaped annular ribs 5—7.

So that the menstrual cup need not contain the menstrual fluid in liquid form, at least a portion of the interior of the cup may be provided with a liquid absorbing material which may be of any type suitable for the purpose.

The invention is not restricted to the described and illustrated embodiment but can be modified within the scope of the following claims.

What I claim is:

1. A menstrual device intended for internal use and made of a liquid-proof, soft, elastomeric material and which is generally cup-shaped and provided on the outside thereof with annular ribs extending peripherally around the wall of said cup, which ribs are intended to sealingly abut the wall of a vaginal canal when the device is in use to hold said device in position in said canal, characterized in that at least one of the annular ribs extending around the periphery of the wall of the cup has a wave-shape and is spaced from the other said ribs.

2. A device according to claim 1, characterized in that the wave shape is a zigzag wave shape.

3. A device according to claim 1, characterized in that the wave shape is a sine wave shape.

4. A device according to claim 1, characterized in that at least one of the wave-shaped ribs has a varying height.

5. A device according to claim 1, characterized in that at least one, but at most each alternate one of the crests of the annular ribs coincides with a longitudinally extending rib arranged on the outer surface or the inner surface of the cup.

6. A device according to claim 1, characterized in that the portions of the cup wall located between the different ribs have slight springing properties as compared with the ribs.

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