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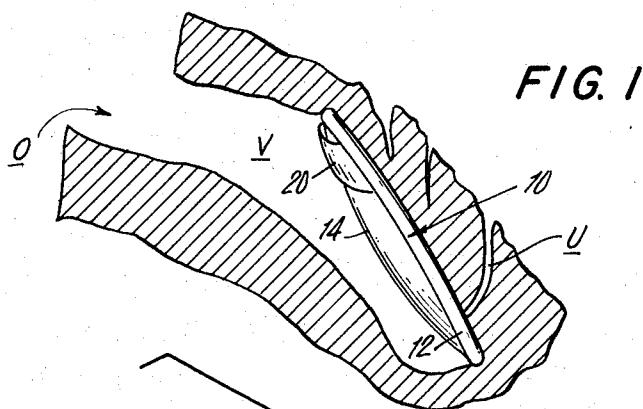


FIG. 1

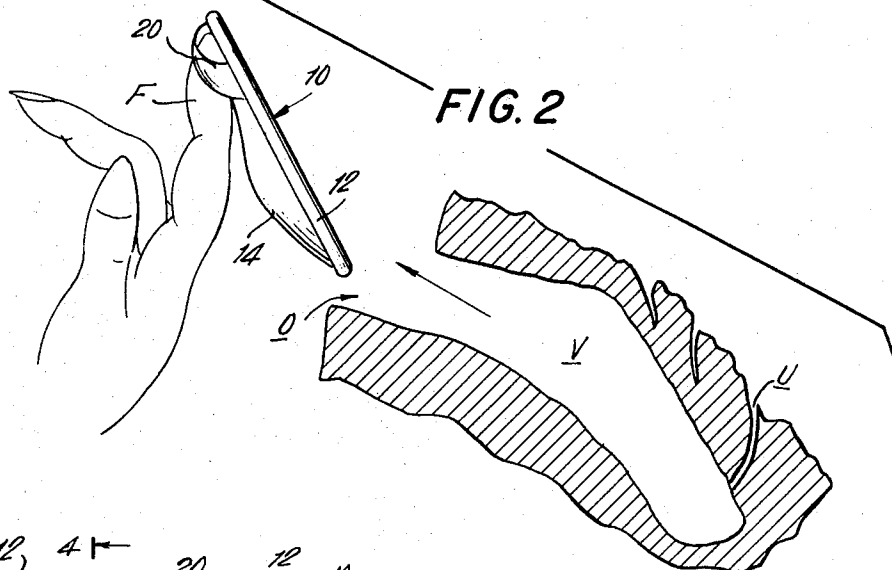


FIG. 2

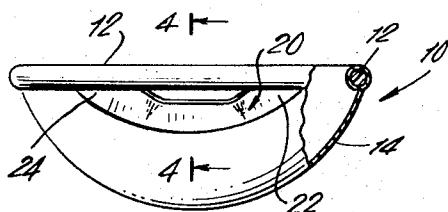


FIG. 3

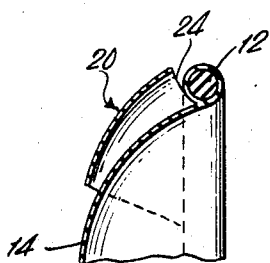


FIG. 4

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ABSTRACT OF THE DISCLOSURE

An intravaginal diaphragm having a circular peripheral frame providing the operative shape to the device and a removal band connected to extend across the perimeter of the frame and adjacent thereto so as to produce an optimum change in said operative shape to facilitate removal of the diaphragm.

The present invention relates generally to an improved diaphragm, and more particularly to a diaphragm including a withdrawal band to facilitate removal.

The use of diaphragms has become more prevalent, especially as a contraceptive device. In connection with this specific use, the diaphragm is usually inserted into the vaginal cavity as a means of blocking the cervix which is at the lower end of the uterine cavity. The actual position of the diaphragm in the vaginal cavity, presents a problem in that it is difficult to remove the diaphragm from the vaginal cavity. Accordingly, it is desirable to provide a means for easily withdrawing the diaphragm which does not interfere in any way with the function of the diaphragm.

Accordingly, it is an object of the present invention to provide a diaphragm which can be easily removed from the vaginal cavity. Specifically, it is within the contemplation of the invention to provide a simple, yet entirely effective withdrawal means for a diaphragm which can be easily operated through digital manipulation.

In accordance with the present invention, there is provided a diaphragm comprising a circular frame of flexible material defining an inner circular area shaped for insertion into the vaginal canal. A substantially circular membrane is attached to and surrounded by the frame. Withdrawal means are fixed to the frame at two spaced-apart points and extend across the circular area of the diaphragm. Thus, the diaphragm is adapted to be manually grasped by inserting a finger through the external orifice of the genital canal to remove the diaphragm from the vaginal canal.

The above brief description as well as further objects, features and advantages of the present invention will be more fully appreciated by reference to the following detailed description of a presently preferred, but nonetheless illustrative embodiment, in accordance with the present invention, when taken in conjunction with the accompanying drawings wherein:

FIG. 1 is a perspective view of a diaphragm embodying features of the present invention, shown positioned in the vaginal canal of the female organ, which is shown in section;

FIG. 2 is an exploded view showing the portion of the human anatomy and diaphragm shown in FIG. 1, illustrating the removal of the diaphragm through digital manipulation;

FIG. 3 is a top plan view of the diaphragm shown in FIG. 1, with portions thereof being broken away and sectioned to better illustrate the withdrawal means; and

FIG. 4 is a transverse sectional view of the diaphragm shown in FIG. 3 taken along the line 4-4 and looking in the direction of the arrows.

Referring now specifically to the drawings, there is shown in FIGS. 1 and 2 the anatomical region or en-

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vironment in which a diaphragm is generally used, as well as a preferred embodiment of the diaphragm of the present invention which has generally been designated 10. More particularly, the human anatomy shown in FIGS. 1 and 2 is a portion of the female genital organ including the vaginal canal V which has an external orifice O at one end and the uterine cavity U at the other end.

By progressively inspecting FIGS. 1 and 2, the diaphragm 10 can be seen in its position of normal use of FIG. 1 and its inoperative position of FIG. 2. The diaphragm 10 comprises a circular annulus or frame 12 which is fabricated of a flexible material which is readily deformable so as to easily be inserted into the vaginal canal V. Attached to the frame 12 is a relatively thin membrane 14 which is formed of an elastomeric material. The membrane 14 is substantially circular in area and can be attached to the frame 12 by any convenient means, such as heat sealing so as to completely seal the area surrounded by the frame 12 to provide an effective contraceptive. The structural features of the diaphragm 10 thus far described herein are of a conventional nature, and the particular type of diaphragm which has been chosen to illustrate the instant invention is the cone type, in which the membrane 14, when in the inoperative position as shown in FIG. 2, normally consists of a rounded convex cone. However, it is to be understood that the instant invention is likewise adaptable to other types of diaphragms such as the well known plane type, flexed type, and the like.

In accordance with the present invention, the diaphragm 10 is provided with a withdrawal band 20 which is fixed to the frame 12 at two spaced-apart points and extends across the circular area defined by the frame 12. The withdrawal band 20 is in the form of an elongated strip having ends 22 and 24, respectively, which are attached to the frame 12. The ends 22 and 24 are positioned at spaced-apart points on the frame 12 and any convenient means may be used for attachment, such as looping the ends 22 and 24 over the portions of the membrane 14 which cover the frame 12, and then applying a heat seal seam.

As best seen in FIG. 3, the removal band 20 overlies a portion of the membrane 14, and is formed so as to conform to the shape of the portion of the membrane 14 which is covered. Thus, since the diaphragm 10 illustrated herein has a dome-convex shape, the removal band 20 is formed to conform to the coextensive area of the convex portion of the membrane 14. In this manner, it is possible to incorporate the withdrawal band 20 as an integral part of the diaphragm 10, without in any way interfering with the actual use of the diaphragm, and also have the withdrawal band 20 readily available when needed for removing the diaphragm 10 after it has been used.

In connection with the integration of the removal band 20 into the diaphragm structure, the ends 22 and 24 of the removal band 20 are located at spaced-apart points on the rim 12 which are substantially close to each other, such that the withdrawal band 20 does not extend across the diameter of the frame 12, thereby interfering with the actual use of the diaphragm 10. Thus, the withdrawal band 20 is positioned in an area which is not very close to the central portion of the membrane 14.

The actual use of the instant invention is best demonstrated by referring to FIG. 2, where the tip of an index finger F is shown positioned under the withdrawal band 20 for manually grasping the diaphragm 10. Accordingly, to remove the diaphragm 10 from its position in the vaginal canal V as shown in FIG. 1, it is merely necessary to insert the finger F through the external orifice O and insert the tip of the finger F under the withdrawal band

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20, between the undersurface of the withdrawal band 20 and the upper surface of the membrane 14. In this manner, it is relatively easy to pull the diaphragm 10 through the vaginal canal V and out through the external orifice O.

A latitude of modification, change and substitution is intended in the foregoing disclosure and in some instances some features of the invention will be employed without a corresponding use of other features. Accordingly, it is appropriate that the appended claim be construed broadly and in a manner consistent with the spirit and scope of the invention herein.

I claim:

1. An intravaginal diaphragm comprising a flexible membrane body, a circular frame of resilient material

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attached about the periphery of said membrane body to hold said membrane body in a substantially unfolded shaped, and a removal band attached at opposite ends at spaced points along said frame having an operative position entirely overlying said membrane body and closely adjacent to a peripheral extent of said circular frame bounded by said spaced points of attachment.

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