March 11, 1941. W. V. LAY 2,234,494

VAGINAL DIAPHRAGM

Filed Sept. 29, 1939

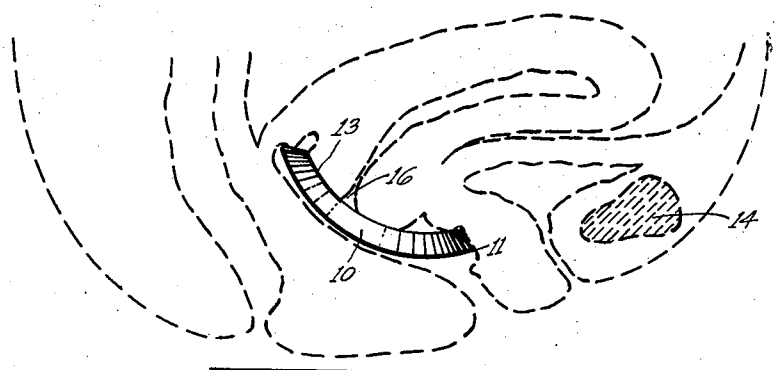


Fig. 3.

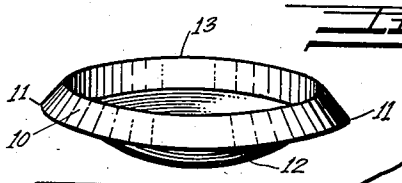


Fig. 1.

Fig. 2.

Fig. 4.

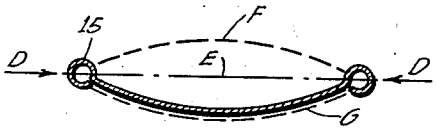


Fig. 6.

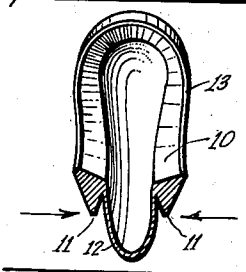


Fig. 5.

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VAGINAL DIAPHRAGM

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4 Claims. (Cl. 128—127)

This invention relates to a vaginal diaphragm for the application of medication to the vaginal portion of the cervix uteri and to isolate the cervical portion of the uterus.

The objection to the usual diaphragm is that it will not stay in position and it is impossible to ascertain whether the diaphragm has become distorted and in which direction it is distorted when in place in the vagina.

The principal object of this invention is to provide a vaginal diaphragm construction which, when subjected to the side pressure of the vagina, will automatically form an arcuate curve with the extremities thereof extending upwardly into the upper vault of the vagina so that it will automatically enclose the cervix and retain its position in the upper vault of the vagina.

Another object of the invention is to so construct the diaphragm that when subjected to side pressure, it can curve in one direction only, so that it can lie only in the proper position at all times.

Other objects and advantages reside in the detail construction of the invention, which is designed for simplicity, economy, and efficiency. These will become more apparent from the following description.

In the following detailed description of the invention reference is had to the accompanying drawing which forms a part hereof. Like numerals refer to like parts in all views of the drawing and throughout the description.

In the drawing:

Fig. 1 is a perspective view of the improved diaphragm in its natural position when not subjected to side pressure.

Fig. 2 is a perspective view illustrating the automatic curvature formed when the diaphragm is subjected to side pressure.

Fig. 3 is a fragmentary sagittal section illustrating the position of the diaphragm in the vagina.

Fig. 4 is a cross sectional view through the improved diaphragm in its uncompressed condition.

Fig. 5 is a similar view as it would appear when subjected to side pressure.

Fig. 6 is a diagrammatic section illustrating the action of the usual type of diaphragm.

The improved diaphragm is formed from rubber or similar flexible, water-proof, resilient material. It consists of a relatively thick, annular, resilient peripheral rim 10 of triangular cross section. In cross section, the rim presents a right triangle with one face outlining a cylinder coaxial with the axis of the rim and with the adjacent rectilinear face lying in a plane at right angles to the axis of the rim. The outer face of the rim is inclined and forms the hypotenuse of the triangular cross section so as to present a relatively sharp offset outer edge 11.

The entire midportion of the rim 10 is closed by a very thin, flexible sack or diaphragm 12. The entire article is molded as a unit so that the diaphragm and the rim are integral with each other.

It is desired to call particular attention to the action of the triangular rim 13. If the opposite sides of this rim are pressed together, as they would be by the sidewalls of the vagina, as shown in Fig. 2, this pressure forces the two end extremities of the rim upwardly to form an arc. The resulting curvature is always in the same direction. This is due to the particular shape of the ring. With reference to Fig. 4, the axial plane of the rim is indicated by the line "A." The edge 11 of the rim, it will be noted, is positioned to one side of the axis "A" so that, when pressure is applied on this edge, it tends to rotate the rim in the direction indicated by the arrows "B." This downward rotation of the rim edges snaps the intermediate sections of the rim upwardly as indicated by the arrow "C." This movement of the rim is always uniform and always in the same direction and can not be otherwise. It is this particular feature that retains the diaphragm in place in the upper vault of the vagina over the cervical portion of the uterus. In Fig. 3 the position of the diaphragm in the vagina is diagrammatically indicated.

Before insertion, the sides of the rim are compressed as shown in Fig. 2. The contracted end of the rim is then inserted past the cervix, indicated at 16, so that the other contracted end thereof will curve upwardly into the tissues of the upper vault of the vagina immediately back of the pubic bone, as shown at 14. The bottom wall of the vagina acts as a fulcrum to hold these two upper points in position, and absolutely prevents their dislodgement.

Let us consider the action of the usual type of diaphragm, such as shown at 15 in Fig. 6. In this form, pressure on the sides, as indicated by the arrows "D," is in the axial plane of the rim, so that the rim need not curve in any direction, but can simply compress in a flat plane along the axis line "E." If subjected to outer side pressure, it can be distorted upwardly as indicated at "F" or downwardly, as shown at "G."

Therefore, when it is in place in the vagina, there is no assurance of its position since it may become distorted to curve downwardly in the opposite direction of Fig. 3, or can lie in a flat plane across the vagina. All of these objections have been obviated by the automatic arc produced by the applicant's rim when under compression.

It is desired to call particular attention to the supporting feature of the improved diaphragm. As before stated, the confining pressure of the side walls of the vagina causes the arced posterior and anterior extremities of the rim to elevate in the vaginal vault where they will act to force redundant tissue, or a prolapsed bladder or uterus, back into normal position. The weight of the prolapsed organs, and/or tissue, is flexibly, resiliently, uniformly, and radially distributed over all areas of the rim contacting the vaginal vault and is not concentrated at any point or points. Thus the improved vaginal diaphragm forms an ideal supporting pessary where its use is indicated for prolapsed conditions.

While a specific form of the improvement has been described and illustrated herein, it is desired to be understood that the same may be varied, within the scope of the appended claims, without departing from the spirit of the invention.

Having thus described the invention, what is claimed and desired secured by Letters Patent is:

1. A vaginal diaphragm comprising: an annular ring of resilient material, said ring being completely triangular or three sided in cross section; and a flexible diaphragm closing the middle of said ring.

2. A vaginal diaphragm comprising: an annular rim of resilient material, said rim being triangular in cross section so as to present only three faces, the inner face outlining a cylinder, the bottom face lying in a plane at right angles to the inner face, the outer face being inclined from the top of the inner face to the outer edge of the bottom face; and a thin flexible diaphragm extending across the circular area defined by said rim.

3. A vaginal diaphragm comprising: an annular rim of resilient material, said rim being triangular in cross section so as to present only three faces, the inner face outlining a cylinder, the bottom face lying in a plane at right angles to the inner face, the outer face being inclined from the top of the inner face to the outer edge of the bottom face; and a thin flexible diaphragm extending from the annular junction line between the inner and bottom faces across the circular area defined by said rim.

4. In a vaginal diaphragm of the type having an annular rim of resilient material with a thin flexible diaphragm extending across the circular area defined by said rim, means for causing said rim to always bow upwardly at the ends when the same is compressed inwardly at the sides comprising: an annular inclined upper surface on said rim extending from the inner diameter thereof outwardly and downwardly to the outer diameter thereof so as to position the peripheral edge thereof in a plane below the medial diametric plane of said rim.

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