INTRAUTERINE CONTRACEPTIVE DEVICE

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ABSTRACT OF THE DISCLOSURE

An intrauterine contraceptive device for positioning, through the use of an applicator, in the uterus and therein control conception. The device is formed with a stemlike portion that seats upon the leading edge of the sterile rod of the applicator during insertion into the uterus, while the main embodiment of the applicator remains exteriorly of said uterus and its cervix. The device is formed having resilient arms extending from the stem, and they are normally distended so as to prevent expulsion of the device when properly positioned within the uterus. But, these arms are also contractible so as to facilitate the insertion and removal of the device, and a cord attaches to the arms and may cooperate with the applicator to accomplish these functions.

BACKGROUND OF THE INVENTION

This invention relates in general to birth control means, and more particularly, pertains to an intrauterine contraceptive device.

It is the principal object of this invention to provide an intrauterine contraceptive device which may be easily inserted through the use of an applicator within the uterus with a minimum of incident damage or pain with said device lasting remaining therein, or subject to rapid and facile removal as required.

Currently, thorough studies and much emphasis is being placed upon the means and methods through which the regulation and control of reproduction of the populace may be achieved. More specifically, a great amount of effort has been extended in studies of the various forms of medical or mechanical devices that may be effectively employed in controlling human conception. The basis for such investigation is generally twofold, from its broader aspects many experts have demanded that measures be discovered and taken to prevent overpopulation, particularly in poverty stricken countries, with the immediate and more primary basis being the desire to find the most practical solution for the problem of women who cannot and should not for medical reasons be given birth to progeny.

Frequently, the more chemically oriented methods are receiving widespread attention and acceptance as the means for regulating conception. The methods in this category, although seemingly producing satisfactory results, have never been thoroughly investigated or examined to determine the precise effects upon the user, either temporarily or over a protracted period of time. Furthermore, these methods when employed generally demand constant attention of the user in that the compounds must be orally consumed either daily or upon stipulated frequent dates.

More recently there has come under investigation mainly through experimental usage the forms of devices that may be inserted and situated directly encompassed with the female uterus and therein function to prevent conception. The definitive biological reason or reasons why a form of intrauterine implantation functions to either prevent or reduce the occurrence of conception is yet to be realized, although it is a foremost belief that when such a device is emplaced within the aforesaid organ it has a tendency to either induce prematurely the periodic ovulation in the female thereby causing passage of the immature ova, or simulates the conditions of pregnancy in irritating the uterine wall and precluding the implantation of the ova, thereby preventing normal conception.

Of the intrauterine contraceptive devices that have thus far been contrived, the earliest used was the stainless steel ring. This form of device having been constructed approximately to a diameter of two centimeters was found to produce two most unsatisfactory results, in that tests indicated that it is incident to a high pregnancy rate, and during usage it is frequently and easily expelled from its emplacement. In addition, insertion and removal of the device requires the attention and care of a physician, it being essential during either of these processes that the cervix be properly dilated. Other more recent devices, such as those designed in the ovoid spirals, bows, loops, and coils, have been given some attention and usage, and in certain instances, some of them have proved quite apt in tendency to prevent conception, but many of them are too complicated in structure demanding special attention and effort on the part of the attending physician either during their insertion or removal. For example, most of the foregoing devices when inserted within the uterus require a special applicator, generally constructed in the form of a tube, in which prior to and during insertion has the device tightly compacted and deformed within its interior. Then, after the tube has probed and been advanced through the cervical portion and into the uterus, the compacted device is then forced out of the tube and into position to take the desired formation within the interior of the uterus and function as previously described. One serious drawback in this standard method of applying these devices of this class is that frequently the tubular applicator during insertion will excoriate and damage the cervical passage lining and the cervix itself, and in certain instances cause an injurious perforation of the uterine lining. This may occur since frequently the positioning of the uterus is unknown, and the precise direction that the tube should move into its cavity cannot be determined. The foregoing perforations can be most serious in that frequently a laparotomy of the abdomen is required for correction. Other pelvic inflammatory diseases may result. Also, many of the earlier devices, such as the steel ring, require the use of instruments to effect their removal, said instruments being used, as for example, to first dilate the cervix to facilitate the process. Often, times, next to, and other forms of dilations must be employed. In addition, many of the foregoing devices when used induce some form of bleeding and persistent uterine cramping. Bleeding is frequently associated with those devices that are formed having an appendage in the form of a transversal stem that slightly protrudes exteriorly of the cervical opening. Some devices are constructed in this manner to provide accessible means to facilitate their removal when such is required. It has been found, though, that appendages of this nature cause discomfort and frequently become embedded within the proximate cervical linings if left in position for any extended period of time.

One of the objects of this invention is to provide an intrauterine contraceptive device which may be easily inserted within the uterus without requiring a probing or insertion of the main embodiment of the applicator into or through the cervical passage.

It is a further object of this invention to provide an intrauterine contraceptive device which incorporates in its construction means for preventing its premature expulsion or removal after it has been properly positioned for functioning within the uterus.

It is another object of this invention to provide an intrauterine contraceptive device which when desired may be easily removed from its retention within the uterus.

It is still another object of this invention to provide an intrauterine contraceptive device which is effective in
usage, may be easily inserted into the body without causing any pain, injury or damage, and does not cause any pain or discomfort when maintained in place.

It is an additional object of this invention to provide an intrauterine contraceptive device and applicator which may be produced and packaged in a pre-sterilized condition, thereby making the combination available for safe and immediate usage when required.

These and other objects of this invention will become more apparent upon a review of the invention as hereinafter described.

SUMMARY OF THE INVENTION

This invention relates to a device for regulating birth and controlling conception in women, and is of the type which to accomplish this purpose is positioned directly within the uterus. The device is formed having a main embodiment comprising a stem-like portion formed of its leading part thereof, and connecting with said stem are one or more expansive members which normally extend at an angle with the longitudinal axis of the foregoing stem. The expansive members may be constructed as springy arms which normally maintain the angular position as just described, but which may be bent or urged into axial alignment with said stem so as to facilitate the insertion or removal of the device from the uterus. To provide for contraction of the arms, as when it is desired to remove the device from operation, or as when which normally connects with said arms may be appressed thereafter, and when drawn, induce the necessary contraction. This cord may be constructed of nylon, or any other form of flexible filament-like material, and has a length sufficient to provide for a small length of it to protrude out of the cervical opening while the device is maintained for free movement in operative position within the uterus. The interior of the stem is formed having a central cavity of such proportions as to accommodate and provide for engagement with part of the applicator used to insert the device. The applicator as used comprises a length of tubular material that is sufficient to provide for the placement of its inserted end flush against the cervical opening while the other end of the tube extends exteriorly of the body, easily accessible and free for manipulation. A slide rod inserts through the tubular member since it has a length greater than the tubular member, it extends for a distance beyond either of its ends. The leading end of said rod, that is, the end of the rod that normally extends through the edge of the tube that abuts the cervix during usage, is contoured so that it may be easily inserted into the body cavity of the device registering with any instrumentation that may be used and the rod is provided with a support or structural finger grip that may be easily grasped as when the applicator is utilized. When the applicator is properly positioned as previously described in relation to the various female organs, the rod, having a device mounted thereupon, should have previously been adjusted so as to provide for disposition of the device within the uterus, or the rod may be further slightly advanced through the cervical passage to allow the device to be placed in the interior of the uterus. During this function the rod cooperates with the applicator to contract the device arms, preventing their interfering with the outer end of the cervix, and thereby against the interior wall of the uterus to prevent removal of the device as the rod is further and completely withdrawn from the uterus. When the device has taken this position, the cord attaching with its arms extends for a short length exteriorly of the cervical opening and is conveniently disposed for grasping with any instrumentation that may be used to exert a pull upon the cord and effect an easy removal of the device. As previously discussed, the cord attaches with the device at approximately the ends of its arms so that as any form of a pulling force is exerted upon this exposed end of the cord it effects a contraction of the connecting arms into approximate axial alignment with the entire device thereby rendering the entire device rather linear in formation and making the process of its removal affectively easy.

The intrauterine contraceptive device of this invention is effective in achieving its intended results, primarily that of reducing the incidence of pregnancy in women utilizing said device, while at the same time, minimizing the frequency of problems that often arise during usage of contraceptive devices of this type heretofore known and used. Employment of this present device is made without requiring usage of any other medical instruments, except perhaps a vaginal speculum and a mild antiseptic. For these and the foregoing reasons the invention presents an advancement in this phase of the pertinent art.

BRIEF DESCRIPTION OF THE DRAWING

In the drawing, FIG. 1 is a view of the intrauterine contraceptive device as mounted upon its applicator during the process of its insertion into the uterus, here shown as a side sectional schematic view.

FIG. 2 is a frontal view of the device as shown positioned within a sectional schematic of the uterus, with the cord of the device being appressed therefrom;

FIG. 3 is a side view of the device;

FIG. 4 is a top view of the device as shown in FIG. 3;

FIG. 5 is an end view of the device shown mounted upon its applicator and having its expansive members contracted into axial alignment, as during insertion;

FIG. 6 is a side view of the device as shown mounted upon a part of the applicator, with the cord of the device being arranged for operating with said applicator, as during insertion; and

FIG. 7 is a cross sectional view of the applicator tube and slide rod taken along the line 7--7 of FIG. 6.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to the drawing for one illustrative embodiment of the intrauterine contraceptive device of this invention, FIG. 1, reference numeral 1 depicts the device as fixed in place upon its applicator 2 as during its insertion into operative position within the interior cavity 3 of the female uterus 4. A unique feature of this invention, herein illustrated, reveals that the main embodiment, or tubular member 5, of the applicator need only be located during insertion process within the vaginal canal 6, with the forward edge 7 of this tubular member only required to be set at a position approximately adjacent with the cervical opening 8 of the uterus. In this manner, the only instruments of this invention that need be inserted through the cervical passage and into the uterus when it is desired to insert the intrauterine device therein are the device 1 itself, and the applicator slide rod 9 to which it mounts. Under such an arrangement, a larger size intrauterine device, than heretofore used, may be inserted through the smaller cervix since the entire applicator need not pass through.

The operation of the applicator and its slide rod are of a sufficient length so as to provide for the location of the finger grips exteriorly of the body, thereby being readily accessible for handling and maneuvering while inserting a device, while at the same time allowing for the leading edge of both the applicator and its rod to be positioned as disclosed in the drawing. It should be additionally noted that the slide rod 9 is of substantially greater length than the tubular member.
The intrauterine contraceptive device of this invention is disclosed in greater detail in FIGS. 3 and 4. The device 1 is revealed as formed having a stem-like portion 12, which may be circular in cross section as shown at 13, with the leading or upward end 14 of said stem being rounded for facilitating its insertion into and through the cervical passage and to reduce any abrasive effects as it moves towards the interior of the uterus. This stem 12 will not readily form the stem-in-the-cavity position form the cavity 15 which is provided for accommodating the leading end of the applicator slide rod 9 as when these two members co-act during movement into the uterus. Projecting integrally from the downward end of the stem-like portion of the device are its expansive members, herein disclosed as a pair of arms 16, which are normally disposed, as shown, at an angle with respect to the longitudinal axis of the stem. These expansive members, or arms, are provided having sufficient resiliency, primarily at the location of their bends, as at 17, so that the arms 16 may be folded into approximate axial alignment with the stem, particularly during the process when the device is being transferred into the uterus. Each arm is constructed having proximate its free end an aperture 18 through which is located a cord 19, the function of which will be hereinafter described.

The device 1 when properly positioned will be located within the cavity 3 of the uterus, as revealed in FIG. 2. The device will generally seat with its stem-like portion 12 standing upright, with the arms 16 expanded as shown to form a hindrance against the untimely expulsion of the device out through the cervix 20. The cord 19 has its strands 21 extending outwardly through the cervical passage so as to provide that a short length of said cord 22 be disposed externally of the vagina 23, so that it may be easily grasped by any instrument as when it is desired to remove a device from its location within the uterus. It should be noted that the strands 21 of the cord have a sufficient length so as to provide for play or movement of the device when implanted within the uterine cavity, which allows it to freely move and make contact with any of the internal surfaces of the uterus. In addition, the strands of the cord are of such small gauge that they cause no discomfort while extended through the cervix. When maintained in this manner, it can be readily seen that the device 1, when it is inserted into the uterus, is always maintained as disclosed in FIG. 2, but rather, it might turn from the position as shown and come to rest at a different angle. In any event, and regardless of the position that the device may take when inserted into the uterus, as the cord 22 is gradually pulled, it has a tendency to elastically extend, and orient the device in axial alignment with the stem 12, and eventually orient these contracted arms into alignment with the cervical passage, providing for ease of removal of the device therefrom. No other utensil is required during this maneuver.

Referring to FIGS. 5 and 6, the device 1 of this invention is more accurately disclosed as mounted upon the slide rod 9 of the applicator 5. The device, and all aspects of the applicator in combination, may be packaged and sold as a pre-sterilized unit, prepared for ready usage. Pre-sterilizing the assembly insures the health of the party making use of the same. As disclosed in FIG. 6, the stem-like portion 12 of the device is mounted upon the ent contour of the device 12 and is securely held snugly within the cavity 15 of the device. This engagement of the rod end within the stem cavity of the device is sustained mainly by friction, and is sufficient to prevent the untimely removal of said device from the applicator, but, does not provide too snug of an engagement that prevents the release of the device from the applicator rod after it has been thoroughly inserted and is being slowly retracted from the uterine cavity. The resilient arms 16 of the device may or may not be contracted into axial alignment, as revealed in FIG. 5, during the period of time from its packaging until used, since maintaining the device in this position for an extended length of time may gradually decrease the resiliency of the arms to expand outwardly after insertion into an arrangement as disclosed in FIG. 2, when the device has been located within the uterus. In any event, when the device and applicator are readied for use, the cord 19 is drawn through the spacing intermediate the rod 9 and the sleeve 23 of the applicator. Thus, the opening provided through the sleeve before the applicator rod has been inserted therethrough, with the cord end 22 being drawn and retained through the opening 24 provided in the tubular member 5 of the applicator. The rod may then be inserted through the sleeve 23, and the device mounted upon its forward end. The rod may be advanced for a distance until the cord 19 becomes taut, and any further advancement of the rod will cause a drawing and contracting of the device arms 16 into contiguity with the rod, as disclosed in FIG. 5. When maintained in this manner, both the applicator and the device are ready for use in inserting the latter into the uterus. As previously stated, to provide for sufficient tensioning of the cord 19 so as to maintain the arms contracted, especially during the insertion process, the cord is positioned intermediate the rod 9 and the sleeve 23. The sleeve 23, as disclosed in cross section in FIG. 7, has an internal groove, as at 25, formed lengthwise of its upper inner surface, and the strands of the cord 19 are positioned within said groove and arranged in the manner as previously described. The strands are of sufficient size so as to provide some binding of the rod within the sleeve, but this binding should not be sufficient to prevent it from slipping through when a pulling force is exerted upon it should it be necessary to further advance the device and rod deeper into the uterus, or to withdraw the rod therefrom. It should be noted that the forward end of the applicator is slightly curved, as at 26, so that it may be properly oriented in alignment with the cervical passage, thereby insuring and facilitating the process of penetration of the device and rod through the cervix. Although this degree of curvature may be varied with every applicator, the amount of curvature provided is sufficient to aid in positioning of the device under regular conditions. Another advantage of the inter-relation-ship between the device and cord, and applicator is that should it be necessary to further move the rod through its applicator to properly position the device within the uterus, as the rod advances through the applicator tube and also the cervix and to the uterus, the tension developed in the cord tends to slightly bow the rod forward, so as to position the device properly to where the uterus is normally located. This also aids in the proper positioning of the device within the uterus. Usage of this uterine contraceptive device and applicator should be readily apparent from the aforesaid description of one of its embodiments, but a primary consideration of the invention is to facilitate the insertion of the device within the uterus while at the same time minimizing the likelihood of injury or pain which so frequently occurs with devices presently available. To mount the device upon the applicator rod, the rod is
first withdrawn from the tubular member of the applicator, at least until the leading edge of the rod has been retracted from within the sleeve 23. When this is performed, the rod may be inserted through the sleeve, aligned in its groove, and held externally of the applicator through its opening 24. The rod may once again be inserted through the sleeve 23 with the strands of the cord positioned within said sleeve groove 25, thereby allowing for the rod to be advanced through the exertion of only a slight amount of force. The device may then be mounted upon the applicator rod with the rod end being inserted into the cavity 16, and the inherent resiliency of the arms 16 and 15 and the inherent resiliency to expand outwardly to a position as disclosed in FIG. 3. Further withdrawal of the rod causes the ends of the arms to contact the inner walls of the uterus, and when such results, the associated binding effect separates the rod from its engagement within the device. At the further withdrawal of the rod the device releases and the positioning of the device within the uterus, and a complete withdrawal of the rod, at least beyond the applicator sleeve 23, allows for both the rod and applicator to be removed from within the vaginal chamber 6. When this happens, the cord end 22 will move through the sleeve 23 and rotate the thread 25. When the applicator is totally removed, the cord end will remain slightly exposed out of the vaginal end 8, while the device is properly implanted for functioning within the uterus. If for any reason the intrauterine contraceptive device must be removed from the uterus, any convenient instrument may be used for grasping the cord end 22, and through a slight continuous pulling force exerted thereupon, the resilient arms 15 will eventually once again contract thereby causing the device to become linear in configuration, such as it is disclosed in FIG. 5. Continual pulling upon the cord causes the device to engage and be drawn through the vaginal passage so as to eventually become freed therefrom. Thereafter, the device may be removed from the vaginal chamber, and disposed of.

It should also be stated that the end 14 of the device stem 12 may be coated with barium or any other comparable material so as to X-ray so that upon investigation the location or positioning of the device within the uterus may be determined.

Numerous variations and modifications in the construction of the intrauterine contraceptive device and applicator of this invention, within the scope of the appended claims, have become obvious to those skilled in the art of the foregoing disclosure. For example, somewhat different shaped arms or an expansive member having inherent resiliency may be devised, but so long as they function to achieve the same results as acquired through usage of the device as disclosed, they are intended to be included within, and protected by, the following claims. These are merely illustrative.

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

1. An intrauterine contraceptive device for positioning within the uterus comprising a stem-like portion formed of its leading part thereof, said stem-like portion having a cavity formed within its interior, said stem having expansive means formed integrally rearwardly therefrom and normally biased at an angle with the longitudinal axis of the stem, said expansive means having sufficient resiliency to provide for its contraction into approximate axial alignment rearwardly of the stem during insertion or removal of the device.

2. The intrauterine contraceptive device of claim 1 wherein the expansive means comprises a pair of generally rearwardly extending straight arms.

3. The intrauterine contraceptive device of claim 1 wherein the leading edge of the stem-like portion is rounded for easing the insertion of said device into the uterus.

4. The intrauterine contraceptive device of claim 1 and further characterized by a cord attaching to the expansive means of the device proximate the location of its free ends thereof whereby a pulling force exerted upon said cord effects contraction of said expansive means thereby providing for a removal of the device from its positioning within the uterus.

5. The intrauterine contraceptive device of claim 4 wherein a portion of said cord is depended externally of the uterus when the device is positioned therein thereby rendering the cord accessible for effecting removal of the device.

6. The intrauterine contraceptive device of claim 1 and further including an applicator for use in conjunction with the insertion of said device into operative position within the uterus, said applicator comprising a tubular member, a rod located within said tubular member and disposed for shifting axially therein, support means connecting with said rod for inducting its shifting, the forward edge of the rod being inserted within the cavity formed within the interior of said stem-like portion of the device and functioning to provide for advancement of the device as during its insertion into the uterus.

7. The intrauterine contraceptive device of claim 6 and further characterized by a cord attaching to the expansive means of the device proximate their free ends thereof, said cord cooperating with the applicator to provide for contraction of said expansive means into contiguity with the rod as during insertion of the device into the uterus.

8. The intrauterine contraceptive device of claim 3 wherein the forward portion of the applicator is slightly curved so as to provide for alignment of the rod and device with the members into which they insert.

9. An intrauterine contraceptive device for positioning within the uterus comprising a stem-like portion formed of its leading part thereof, said stem-like portion having a cavity formed within its interior, said stem having expansive means formed integrally rearwardly therefrom and normally biased at an angle with the longitudinal axis of the stem, said expansive means having sufficient resiliency to provide for its contraction into approximate axial alignment rearwardly of the stem during insertion or removal of the device, an applicator for use in conjunction with the insertion of said device into operative position within the uterus, said applicator comprising a tubular member, a rod located with said tubular member and disposed for shifting axially therein, support means connecting with said rod for inducting its shifting, the forward edge of the rod being inserted within the cavity of said stem and functioning to provide for advancement of the device as during its
insertion, said forward edge of the rod being contoured to provide for its reception and snug engagement within the stem cavity and thereby retaining the device firmly affixed to the applicator rod during their insertion into the uterus, and said device freely disengaging from the applicator rod after insertion of the device within the uterus and as said rod is being withdrawn from the same.

10. The intrauterine contraceptive device of claim 9 and further characterized by a cord attaching with the expansive means of the device, said cord cooperating with the applicator to provide for contraction of said expansive means into contiguity with the rod as during insertion of the device into the uterus, a sleeve formed with the forward edge of the tubular member and being axially aligned therewith for reception of the rod there-through, said cord during insertion of the device being disposed through the space intermediate the rod and sleeve so that as advancement of the rod and device is effected into the uterus the cord retains the expansive means into contiguity with the rod.

11. The intrauterine contraceptive device of claim 10 and further characterized by the sleeve having a groove formed longitudinally of its inner surface and co-axially with the axis of said tubular member for use in guiding the cord and effecting its sufficient tensioning for retaining in contraction the expansive means during insertion of the rod and device into the uterus.

12. A method for inserting an intrauterine contraceptive device through the use of an applicator into a uterus comprising, mounting a device having a leading stem portion with a cavity interior thereof opening rearwardly and rearwardly disposed expansive means upon the applicator slide rod, contracting the expansive means of the device through usage of a cord into axial alignment contiguous with said rod, setting the applicator rod and device to a length sufficient with respect to the applicator tubular embodiment to simultaneously provide for insertion of said device and rod into the interior of the uterus while said applicator and rod into the interior of the uterus while said applicator tubular embodiment remains exteriorly thereof, advancing the device and rod into and through the cervical passage and into the uterus while the applicator tubular embodiment remains exteriorly or adjacent to the cervical opening, slowly withdrawing the applicator rod until the expansive means of the device re-expand and engage with the inner surface of the uterus thereby effecting a disengagement of the device from its seating upon the applicator rod, continuing withdrawal of the applicator rod from the uterus and cervix while the device remains positioned within said uterus.

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