

[54] INSERTER FOR INTRA-UTERINE CONTRACEPTIVE DEVICE

3,507,281 4/1970 Cassou..... 128/260

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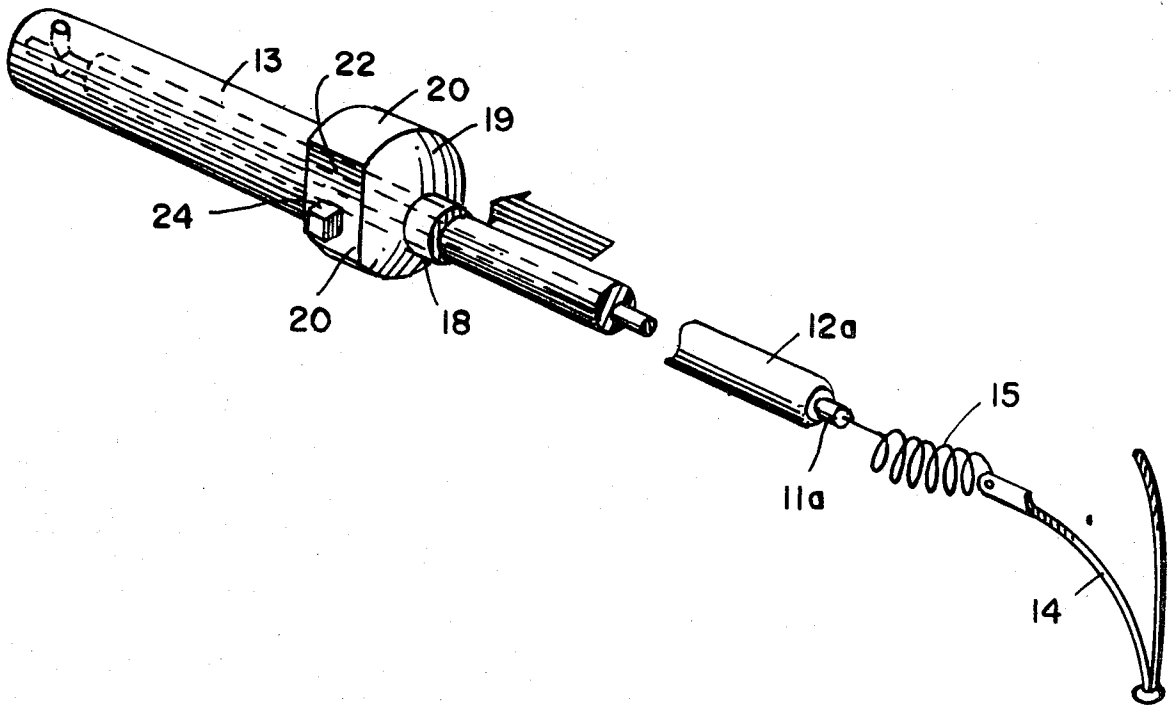
[57] ABSTRACT

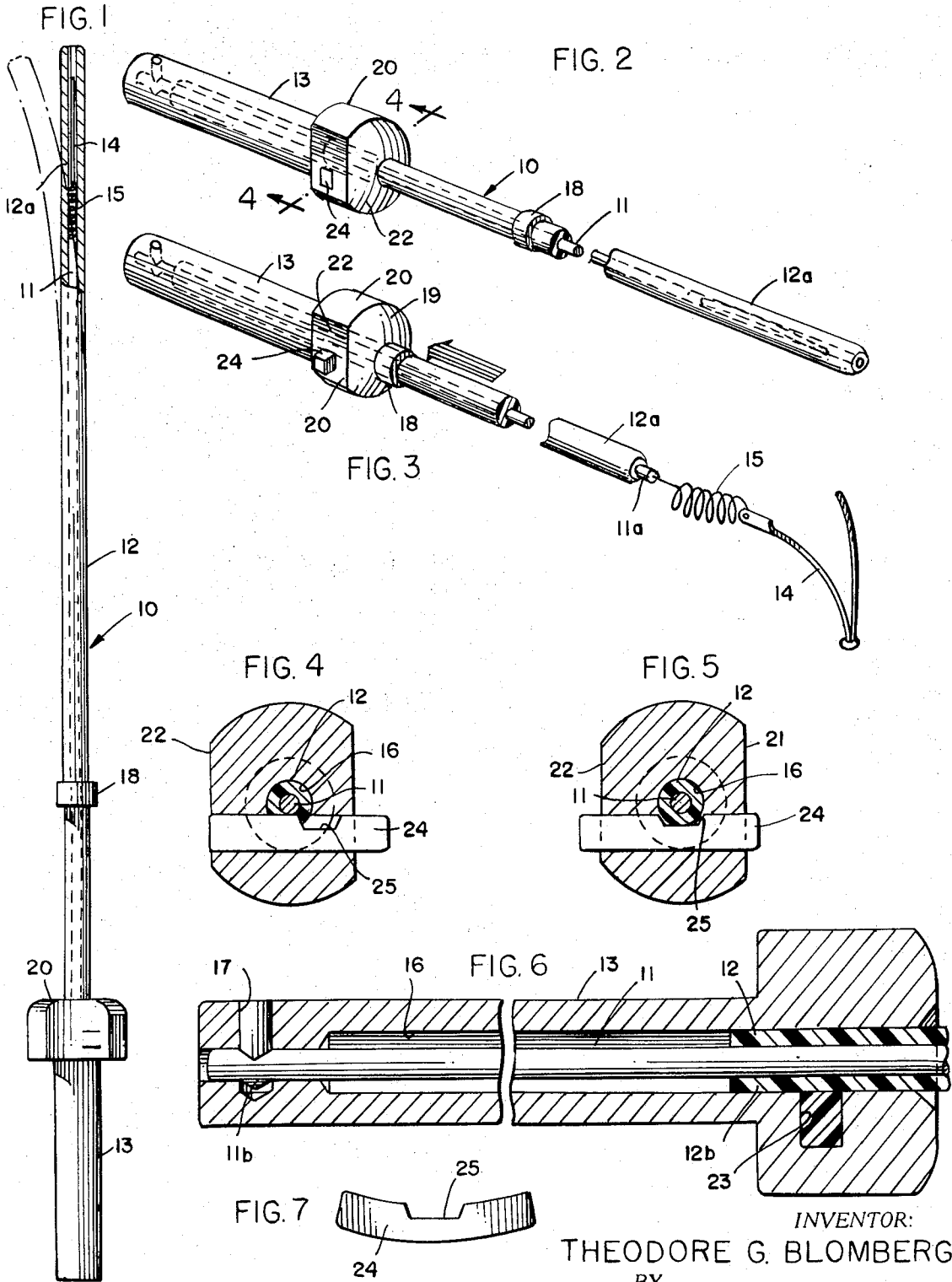
An inserter for an intra-uterine contraceptive device (IUD) in which a bendable rod is fixed at one end to a handle and is normally sheathed by an outer protective tube which projects beyond the rod's opposite end. A locking member projects from the handle and may be positioned to lock the tube against sliding movement upon the rod during insertion of the IUD. Thereafter, upon insertion of the IUD, the lock is released and the outer tube is retracted to deposit the contraceptive device within the uterus.

[56] References Cited  
UNITED STATES PATENTS

3,410,265	11/1968	Chaft .....	128/130
3,492,990	2/1970	Clarke .....	128/130
3,522,803	8/1970	Majzlin .....	128/130

12 Claims, 7 Drawing Figures





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## INSERTER FOR INTRA-UTERINE CONTRACEPTIVE DEVICE

### BACKGROUND

An inserter for a conventional intra-uterine device commonly includes an insertion tube which encloses the device until the end of the tube has been advanced into the uterus and the device is ready to be deposited, at which time the device is ejected by advancing a rod through the tube or is released by retracting the tube upon such a rod. The latter technique, as disclosed in U.S. Pat. Nos. 3,522,803 and 3,410,265, is preferable because the danger of uterine perforation occurring during insertion is reduced. However, even with such precautions the dangers of perforation continue to exist, partly because of difficulty in manipulating the presently-available inserters and because the control means for retracting the outer tube or for locking the tube against movement relative to the rod may be inadequate.

Other examples of the prior art are disclosed in U.S. Pat. Nos. 3,401,689, 3,200,815, 3,234,938, 2,122,579, 3,077,879, and 3,253,590.

### SUMMARY

An important aspect of this invention is to provide an inserter for an intra-uterine contraceptive device which is relatively easy to manipulate and comparatively safe in operation. The result is a unit which may be used with less discomfort for the patient and a reduced risk of uterine perforation or other injury.

The inserter of this invention is provided with an elongated handle, preferably formed of transparent plastic, which is securely fixed to one end of the inserter rod. A tube is slidably mounted upon the rod for movement between extended and retracted positions. A bore extends into the handle and has cross sectional dimensions slightly larger than the tube for slidably receiving the end portion of the tube therein.

The handle is provided with an enlarged head portion of non-circular cross sectional configuration. A transverse passage extends through the head portion and a stop or locking member, movably mounted in the passage, may be shifted into a locking position in which it restricts the end portion of the tube against sliding movement. Without significantly changing his grip upon the handle, a doctor may shift the stop member into its releasing position, thereby permitting the tube to be shifted into its retracted position when deposit of the intra-uterine device is desired.

Unlike certain prior constructions, the inserter of this invention is provided with a stop member which does not require rotation of any of the parts during its manipulation. Thus, the rod and the outer sheath or tube may be bent by the doctor prior to or during insertion to reduce pain, discomfort, and the possibility of injury to the patient. Since rotation of the parts is not required for a release of the locking means, the discomfort and problems that might otherwise be occasioned by rotation of a bent or curved inserter are avoided.

Ease of manipulation also results from the non-circular cross sectional configuration of the head portion of the handle. Such construction assures the doctor that the unit remains properly oriented, a matter of considerable concern where it has been found desirable to bend or curve the rod prior to insertion. Extension

and retraction of the outer tube may be determined by touch, an annular enlargement of the tube being spaced from the handle when the tube is extended and abutting the handle when the tube is retracted, and also by visual examination. It is in the latter connection that the use of a transparent handle is particularly desirable.

The stop member is self-retaining in either of its selected positions because of frictional resistance resulting from deformation and tension of the member. The stop member, which is arcuate in configuration in its normal untensioned state, is required to assume a straightened condition when the parts are assembled. The spring action of the flexible stop member thereby serves to maintain that member in any selected position of adjustment.

Other objects and advantages of the invention will become apparent as the specification proceeds.

### DRAWINGS

FIG. 1 is a side elevational view, taken partly in section, showing an inserter embodying the present invention;

FIG. 2 is a broken perspective view illustrating the inserter with the tube in its extended position;

FIG. 3 is a perspective view illustrating the inserter with the tube in its retracted position;

FIG. 4 is an enlarged sectional view taken along line 4-4 of FIG. 2;

FIG. 5 is a sectional view similar to FIG. 4 but showing the tube in a released condition;

FIG. 6 is a longitudinal sectional view illustrating details of the handle construction;

FIG. 7 is a side elevational view of the stop member in an untensioned state.

### DESCRIPTION

Referring to the drawings, FIG. 1 illustrates an inserter 10 comprising an insertion rod 11, an outer tube or sheath 12, and a handle 13. An intra-uterine contraceptive device 14 with its connecting thread or suture 15 is shown in FIGS. 1 and 2 within the distal end 12a of the tube. The device may be formed of plastic or metal and may assume any suitable configuration in accordance with the teachings of the art. Since intra-uterine contraceptive devices are well known, as discussed in some of the patents already identified herein, and since the present invention is not concerned with the construction of such a device except to the extent that it be capable of fitting within the lumen of tube 12 as indicated in FIGS. 1 and 2, further discussion of the intra-uterine device as such is believed unnecessary.

The distal end 11a of the rod is secured to thread 15 by any suitable means. Referring to FIG. 6, it will be observed that the rod extends through an axial bore 16 in the longitudinally-elongated handle 13 and that the proximal end 11b of the rod is deformed to secure the parts together. While a variety of attachment means might be used, it has been found that swaging the end of the rod through lateral opening 17 is particularly effective for anchoring the parts together against relative longitudinal, lateral, and rotational movement.

The major length of bore 16 is of a diameter substantially larger than that of rod 11. In particular, the diameter of the bore is slightly larger than the outside diameter of tube 12, the inside diameter of the same tube being slightly larger than that of rod 11. The tube is therefore freely slidable along rod 11 and into (and out

of) the cavity or bore 16 of the handle. In its normal extended position, the proximal end 12b of the tube is partially inserted into the bore of the handle, as illustrated in FIGS. 1 and 6. In its retracted position, the tube extends completely, or almost completely, into the enlarged portion of bore 16 and an annular enlargement 18 of the tube abuts against the front face 19 of the handle (FIG. 3).

The front portion or head 20 of the handle is preferably enlarged and is of non-circular cross sectional configuration. In the illustration given, the head is provided with a pair of flattened opposite sides 21 and 22. So that the inserter may be oriented in the hand simply by touch, surfaces 21 and 22 are preferably of different size. Alternatively, only a single flattened surface may be provided or, if desired, one of the surfaces may be dishd (i.e., concavely curved), roughened, or otherwise treated to permit such differentiation.

The head portion 20 has a transverse passage 23 which intersects a peripheral portion of bore 16. As shown in FIG. 6, the bore is non-circular (rectangular) in cross sectional configuration with a substantial portion of the passage extending through the head beyond the peripheral limits of the bore. A stop or locking member or bar 24 is slidably received within the passage and has cross sectional dimensions slightly smaller than such passage. In an untensioned state, the stop member has a slightly arcuate longitudinal curvature (FIG. 7); however, when the stop member is disposed in the straight passage 23 of the handle, it assumes a straightened and tensioned condition. Because of the resilient or spring-like material from which the stop member is formed, such member resists the straightening action and frictionally engages the walls of the passage to remain in whatever selected position of adjustment it has been moved.

The stop member is provided with an intermediate recess 25. As a result, when the member is moved into the position illustrated in FIG. 5, no appreciable frictional contact is made between surface 25a and the outer surface of tube 12. On the other hand, when the stop member is shifted into the position illustrated in FIG. 4, rearward movement of the tube 12 relating to the handle is blocked. Movement of the member 24 between its locking and releasing positions is readily accomplished because the member is substantially longer than passage 23 and projects laterally beyond the ends of the passage in both of such positions.

In use, the inserter is adjusted so that tube 12 assumes the extended position illustrated in FIGS. 1, 2, and 6. The stop member is shifted into the locking position illustrated in FIG. 4, thereby limiting the extent of rearward sliding movement of the tube upon the rod. If considered necessary or desirable, the end of the inserter may be bent as indicated in broken lines in FIG. 1. Thereafter, the distal end of the tube is advanced through the uterine passageway and into the uterine cavity until the end of the tube contacts the inner end wall or fundus of the cavity. The doctor then shifts member 24 into its unlocking position and, grasping annular enlargement 18, urges the tube into the retracted position shown in FIG. 3. The tube is then completely withdrawn from the uterine passageway and thread 15, which may later be used for removal of the intra-uterine device, is severed at an appropriate point.

The materials from which the inserter is formed may be varied considerably. However, it has been found

particularly effective to form rod 11 from a relatively soft bendable metal such as aluminum. Tube 12 may be formed of a soft flexible plastic, such as polyethylene, polypropylene or polyvinyl chloride, and handle 20 may be formed of any suitable rigid plastic or metal, the former being preferable and being necessary where transparency is required. It is believed apparent that if handle 13 is formed of transparent material and tube 12 is composed of an opaque (preferably colored) material, then the extended or retracted condition of the tube may be easily determined simply by looking through the handle.

While in the foregoing I have disclosed an embodiment of the invention in considerable detail for purposes of illustration it will be understood by those skilled in the art that many of these details may be varied without departing from the spirit and scope of the invention.

I claim:

1. An inserter for an intra-uterine contraceptive device comprising a bendable rod having one end adapted for connection to an intra-uterine device, an elongated handle fixed to said rod at the opposite end thereof, said handle having a longitudinal bore receiving a portion of the length of said rod adjacent said opposite end, a tube slidably mounted upon said rod for movement between extended and retracted positions, said bore having cross sectional dimensions slightly larger than said tube for slidably receiving an end portion of the tube, and a stop member movably mounted on said handle for movement between a locking position wherein said member engages said end portion of said tube to hold said tube against sliding movement from its extended position into its retracted position and a releasing position wherein said tube is freely movable along said rod between its extended and retracted positions, said rod, said tube, and said bore all being of cylindrical shape, said handle being provided with a transverse passage intersecting a peripheral portion of said bore, said member being longer than said passage and being slidably disposed therein, said member also having an intermediate recess freely accommodating said tube when said member is in its releasing position and having a surface abutting an end of said tube when said member is in its locking position.

2. The structure of claim 1 in which said member is of non-circular cross section.

3. The structure of claim 2 in which said member is of generally rectangular cross section.

4. The structure of claim 2 in which said transverse passage is spaced a substantial distance longitudinally along said handle from said opposite end of said rod.

5. The structure of claim 1 in which said handle has at least one flattened side wall portion, said passage extending through said flattened side wall portion.

6. The structure of claim 1 in which said transverse passage is straight, said member being formed of flexible material and being longitudinally arcuate when in untensioned condition, said member when disposed in said passage being substantially straight and in a state of tension, whereby, said locking member is retained by its own tension in any selected position of adjustment in said passage.

7. An inserter for an intra-uterine contraceptive device comprising a bendable rod having one end adapted for connection to an intra-uterine device, an elongated handle being fixed to said rod at the opposite end

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thereof and having a head portion of non-circular cross section, said handle having a longitudinal bore receiving a portion of the length of said rod adjacent said opposite end, a flexible plastic tube slidably mounted upon said rod for movement between extended and retracted positions, said bore having cross sectional dimensions slightly larger than said tube for slidably receiving an end portion of the tube, and a locking member movably mounted on the head portion of said handle for movement between a locking position wherein said member engages said end portion of said tube to block retraction of said tube and a releasing position wherein said tube is freely movable along said rod between its extended and retracted positions, said rod, tube, and bore all being generally cylindrical in configuration, said head portion of said handle being provided with a transverse passage intersecting a peripheral portion of said bore, said locking member being longer than said passage and being slidably disposed therein, said locking member also having an intermediate recess freely accommodating said tube when said member is in its releasing position and having a surface

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abutting an end of said tube when said member is in its locking position.

8. The structure of claim 7 in which said locking member is of non-circular cross sectional configuration.

9. The structure of claim 8 in which said locking member is of generally rectangular cross section.

10. The structure of claim 7 in which said head portion is spaced a substantial distance longitudinally along said handle from said opposite end of said rod.

11. The structure of claim 7 in which said head portion of said handle has at least one flattened side wall, said passage extending through said flattened side wall.

12. The structure of claim 7 in which said transverse passage is straight, said locking member being formed of flexible material and being longitudinally arcuate when in untensioned condition, said locking member when disposed in said passage being substantially straight and in a state of tension, whereby, said locking member is retained by such tension in any selected position of adjustment in said passage.

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