

Nov. 4, 1952

E. M. GREENBERG

2,616,421

NOZZLE IN THE FORM OF CERVICAL CAPS

Filed May 18, 1950

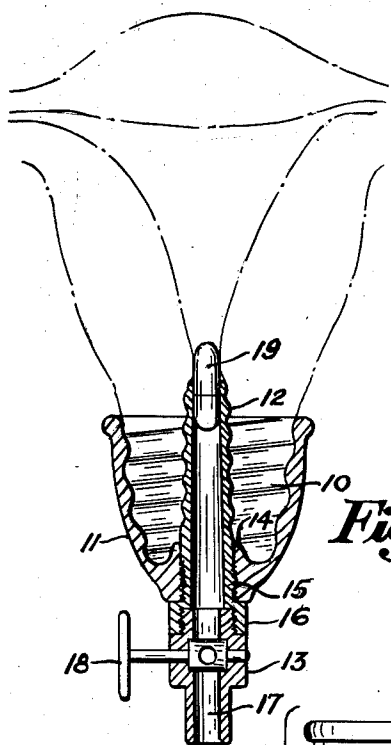


Fig. 2

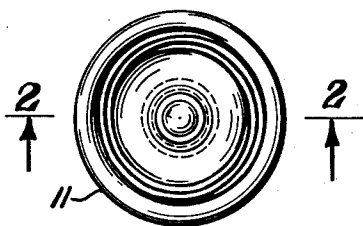


Fig. 1

Fig. 3

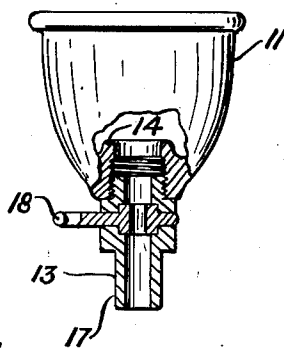
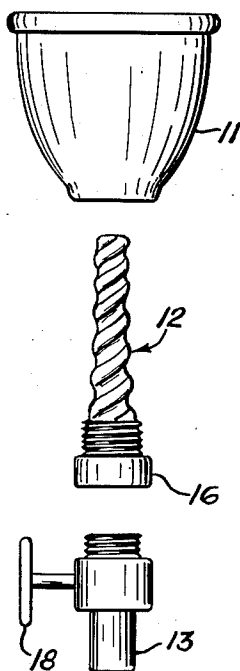


Fig. 4



INVENTOR.
EMANUEL M. GREENBERG

BY *Richardson & Fein*
ATTORNEYS

UNITED STATES PATENT OFFICE

2,616,421

NOZZLE IN THE FORM OF CERVICAL CAPS

Emanuel Martin Greenberg, New York, N. Y.

Application May 18, 1950, Serial No. 162,755

4 Claims. (Cl. 128—245)

1

This invention relates to improvements in cervical caps designed for artificial insemination, the treatment of dysmenorrhea, and for the injection of gas or radio-opaque media into the uterus for diagnostic purposes.

It is an object of the instant invention to provide a device for the conservation of sperm especially where the count is border line or low either in quantity or quality or both by preventing the regurgitation of sperm by muscular contraction or by gravity.

Another object is to provide a device that will permit flushing the sperm with a physiologically amicable solution so that as much of the sperm as possible reaches the upper levels of the uterus.

It is also an object to provide a device that can be used in artificial insemination, in the treatment of dysmenorrhea, or for diagnostic purposes.

Other objects of the instant invention will become apparent in the course of the following specification.

In the attainment of these objectives, the cervical cap is a cup-like device internally threaded for removable attachment to the cervix uteri. Through the bottom of the cap is an internally threaded opening in which is removably inserted a sperm chamber, and to the bottom of the sperm chamber is removably attached a valve member. The valve member and sperm chamber are so designed that the valve may be inserted directly into the threaded opening of the cap without the sperm chamber such as would be necessary where the cervical canal is too narrow for acceptance of the chamber.

The invention will appear more clearly when considered in conjunction with the accompanying drawings showing by way of example a preferred embodiment of the inventive idea.

In the drawings:

Figure 1 is a plan view of the cervical cap, assembled with sperm chamber and valve member, on an enlarged scale, and constructed in accordance with the principles of this invention;

Figure 2 is a sectional view along line 2—2 of Figure 1;

Figure 3 is a front view of the cervical cap assembled with the valve member but without the sperm chamber, and having a portion of the surface broken away to more clearly show the internal construction; and

Figure 4 is an exploded view of the cervical cap, sperm chamber, and valve member shown in Figure 2.

Referring now in greater detail to the draw-

2

ings where like reference numerals indicate like parts, reference numeral 10 indicates the cervix, 11 the cervical cap, 12 the sperm chamber, and 13 the valve member.

5 The cervical cap 11 is made from any suitable material substantially in the form of a cup with open top as illustrated. The inner surface of the cap has formed thereon a spiral thread as shown in Figure 2 for attachment to the cervix, and through the bottom of the cap at the center is an internally threaded circular opening. Around the periphery of the circular opening is a collar 14 which extends inwardly to aid in the support of the later described sperm chamber 12.

15 Removably inserted through the collar 14 is the hollow sperm chamber 12 of circular cross section. The base 16 of the chamber 12 is of enlarged diameter, compared with the remainder of the tube, and has a threaded opening in the bottom communicating with a longitudinal opening formed through the chamber or the hollow interior thereof. Adjacent the base 16, the chamber has an externally threaded portion 15. The chamber is also tapered between the threaded portion 15 and the opposite end or top so that the diameter of the cross section adjacent the top is less than that adjacent the threaded portion. Moreover, both the diameter and number of threads per unit of length of the opening in the bottom of the cap and the opening in the bottom of the chamber are identical.

Threaded into the opening in the base member 16 of the sperm chamber 12 or directly into the opening in the cap 11 is the manually operated shut-off valve member 13. The valve 13 may be connected by slip connection, hose connection, or the known "Luer-Lock" connection to a syringe or any other necessary apparatus. At the top, the valve member 13 may have an externally threaded portion of reduced diameter, the number of threads per unit of length being the same as in the case of the internally threaded base of the chamber 12 or the bottom opening in the cap 11. Through the valve member 13 is a longitudinal passageway 17 which communicates with the longitudinal opening in or the interior of the hollow sperm chamber 12 when the valve 13 is open. Of course, the sperm chamber and valve member could be integrally formed as well as the chamber and cap and each member may be of any desired size.

In operation, the cervical cap 11 is attached to the cervix uteri with the aid of the internally threaded surface of the cap. The sperm chamber 12 with a capsule 19 filled with sperm pro-

3

truding from the top is next inserted through the opening in the bottom of the cap and into the cervical canal. The sperm chamber is then removably fastened in the threaded opening of the cap by the coacting threaded portions previously described. The valve 13 is next threaded into the bottom of the chamber and the valve closed, if desired, or open for the attachment of a syringe (not shown) containing additional sperm for injection, later followed by the injection of a suitable solution for flushing the sperm into the uterus. On the other hand, the sperm may be inserted directly into the chamber, the open top of which is closed by an empty capsule while the chamber is being inserted. Upon the dissolution of the capsule, a syringe charged with the same or similar amicable solution is attached to the open end of the valve member for flushing the sperm into the uterus and the valve is then closed. Where the cervical canal is of pin point construction, the cap 12 is attached in the manner previously described and a capillary gelatin tube charged with sperm introduced into the canal through the opening in the cap whereupon the valve 13 is attached directly to the cap and closed. In the treatment of dysmenorrhea it is common knowledge that dilation of the cervical canal aids many cases. The sperm chamber will accomplish this dilation. The cap is equally well adapted for injecting, by well known instruments passed through the opening in the base, gas or radio-opaque media for diagnostic purposes. The cap with the valve but without the sperm chamber is also suitable for the collection of samples used in studies of exfoliative cytology of the cervix and uterus, such as in the study of cancer.

It will be understood that the invention is not limited to the exact disclosure herein described but may lend itself to a variety of expressions within the scope of the appended claims. For example, the three units above described may be made as one unit.

What is claimed is:

1. A cervical cap comprising a cup-like body with open top adapted to coact with the cervix, the inner surface of the body having at least one turn of a spiral thread formed thereon and the body at the center having a circular opening formed therethrough, the opening being threaded; an elongated hollow sperm chamber of circular cross section removably disposed in the opening, the base of the chamber terminating in a portion of enlarged diameter and having an internally threaded opening in the end, the diameter of the internally threaded opening being the same as the diameter of the threaded opening in the cap and the number of threads per unit of length the same in both, the outer surface of the chamber adjacent the enlarged base being threaded and coacting with the internally threaded opening in the cap, the outer surface of the chamber further having at least one turn of a spiral thread formed thereon; the cervical cap further comprising a valve member removably disposed in the threaded opening in the base of the sperm chamber, the valve member having a longitudinal passageway communicating with

4

the interior of the sperm chamber, and means for opening and closing the valve passageway.

2. A cervical cap in combination with a sperm chamber, the cap comprising a single cup-like body with open top adapted to coact with the cervix, the cup-like body having a spiral thread formed on the inner surface thereof, the sperm chamber comprising an elongated hollow body removably disposed through the bottom of the cap, the top of the hollow body extending above the open top of the cap and the bottom of the hollow body extending below the bottom of the cap.

3. A cervical cap in combination with a sperm chamber, the cap comprising a single cup-like body with open top adapted to coact with the cervix, the cup-like body having a spiral thread formed on the inner surface thereof, the sperm chamber comprising an elongated hollow body removably disposed through the bottom of the cup-like body, at least a portion of the hollow body being tapered in the direction of the open top of the cup-like body, the tapered portion having a spiral thread formed on the outer surface thereof, and the top of the hollow body extending above the open top of the cup-like body and the bottom of the hollow body extending below the bottom thereof.

4. A cervical cap comprising a cup-like body with open top adapted to coact with the cervix, the cup-like body having a threaded opening formed through the bottom thereof at the center, a sperm chamber threaded through the opening, the sperm chamber having a longitudinal opening formed therethrough and the outer surface having a spiral thread formed thereon, the top of the sperm chamber extending above the open top of the cup-like body and the bottom of the chamber extending below the bottom of the cup-like body, the longitudinal opening at the bottom of the chamber being internally threaded, the pitch and diameter of the threads being identical with the pitch and diameter of the threads of the threaded opening of the cup-like body, and a shut-off valve removably threaded into the longitudinal opening in the bottom of the sperm chamber, the valve having a passageway adapted to be aligned with the longitudinal opening in the sperm chamber in one position and adapted to close the longitudinal opening in a second position.

EMANUEL MARTIN GREENBERG

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
635,004	Souder	Oct. 17, 1899
696,728	Eddy	Apr. 1, 1902
724,913	Montgomery	Apr. 7, 1903
2,153,753	Hayton	Apr. 11, 1939
2,295,062	Townsend	Sept. 8, 1942
2,392,045	Hudgins	Jan. 1, 1946

FOREIGN PATENTS

Number	Country	Date
587,231	Germany	Nov. 1, 1933