

[54] SUCTION CURETTAGE

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[58] Field of Search..... 128/276, 277, 304, 128/2 B

[56] References Cited

UNITED STATES PATENTS

3,542,031 11/1970 Taylor..... 128/304
3,670,732 6/1972 Robinson..... 128/304 X

3,648,698 3/1972 Doherty..... 128/276

FOREIGN PATENTS OR APPLICATIONS

423,134 7/1947 Italy..... 128/277

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[57]

ABSTRACT

Apparatus and method for the safe and rapid vacuum evacuation of the female uterus in an abortion procedure which can be performed in substantially any location having a supply of fluid flowing under pressure as the power source. The apparatus includes a thin hollow flexible catheter of a size to permit the operation to be performed without the necessity of dilating the cervix either mechanically or by the use of medicines.

4 Claims, 2 Drawing Figures

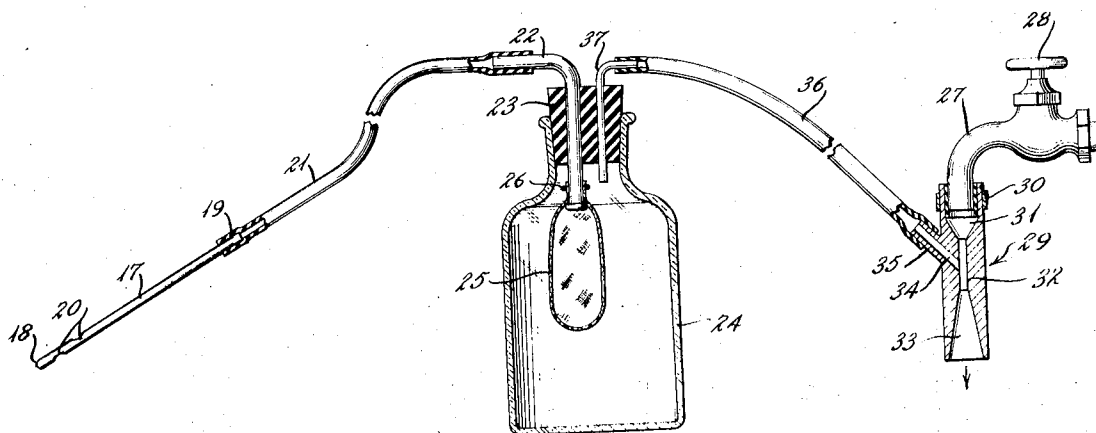


Fig. 1

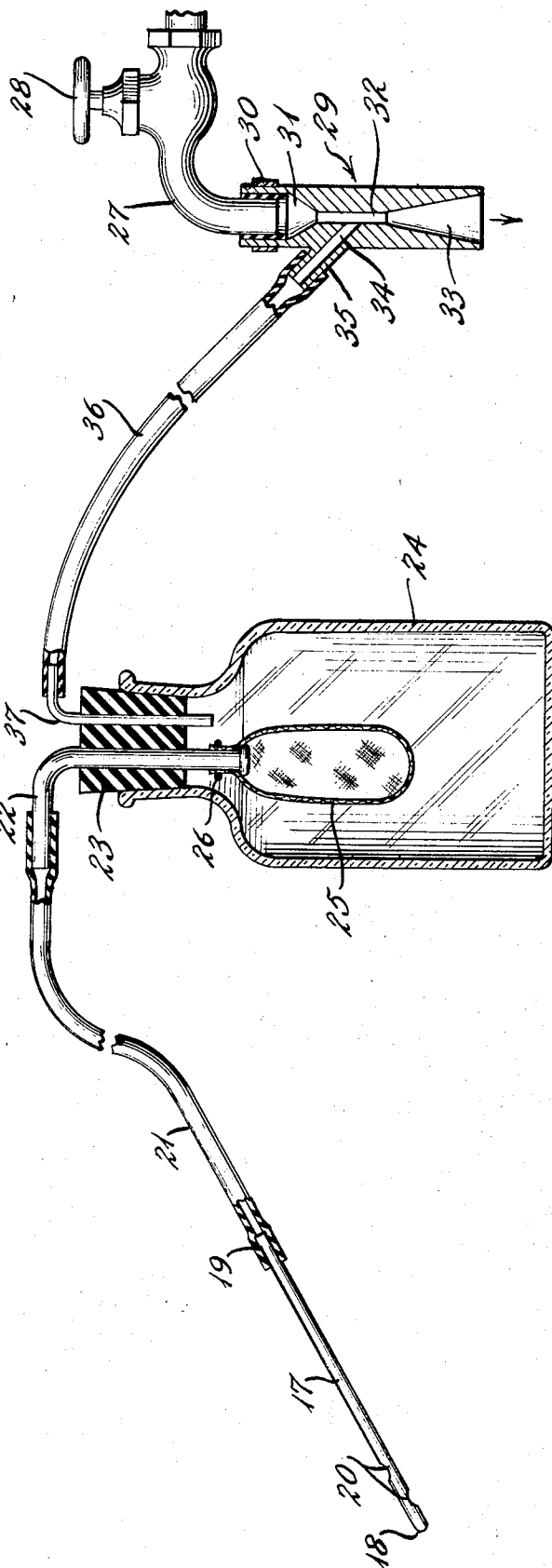
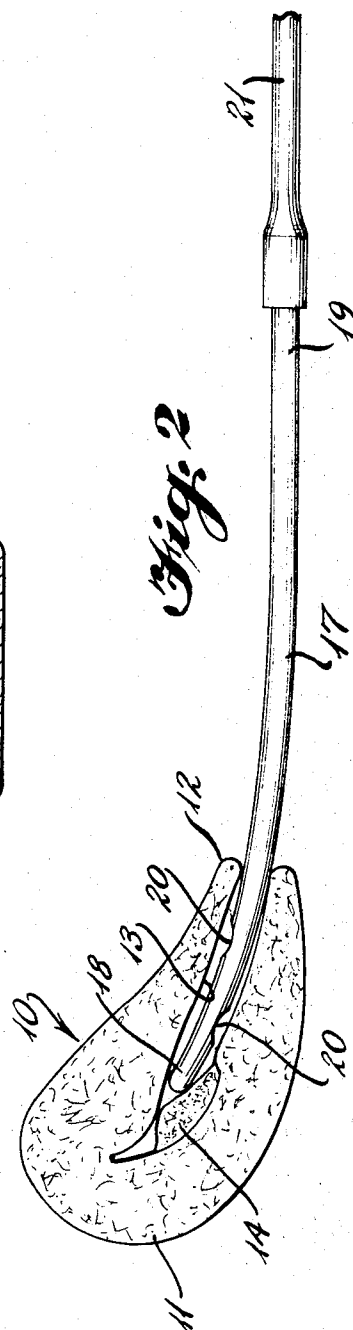


Fig. 2



SUCTION CURETTAGE

BACKGROUND OF THE INVENTION

1. Field of the Invention. This invention relates generally to surgical procedures of various kinds in both humans and animals, and relates particularly to easily portable apparatus by means of which the embryo, placenta and other matter can be safely and reliably removed from a female uterus in an elective abortion approximately ten weeks or less in gestation.

2. Description of the Prior Art. The uterus of a human female body includes a flexible body or fundus having a neck or cervix at one end with an opening therein. When conception occurs, the embryo is partially imbedded in the uterine wall of the fundus together with the placenta or products of conception. When a therapeutic abortion is indicated, the traditional procedure has been to mechanically or medically dilate the cervix and scrape the embryo and placenta away from the uterine wall using a metal curette.

Recent improved procedures have included the use of a relatively rigid catheter having an opening at or adjacent to the front or proximal end and with the distal end being connected to a vacuum pump. During the abortion procedure, the catheter is moved in and out of the uterus in a systematic pattern while the vacuum pump is operated to create a negative pressure so that soft tissue and matter are scraped from the walls of the fundus by the catheter, sucked through the catheter, and discharged exteriorly of the body. An example of this type of apparatus is in the U.S. Pat. No. to Taylor 3,542,031. This type of structure has produced a relatively high base line negative pressure since the vacuum pump has been driven by an electric motor, internal combustion engine, or other electro-mechanical means and it has been difficult to regulate the source of vacuum so that the instrument could be employed without the danger of damage to the uterine wall.

Also the vacuum pump and drive means have been heavy, bulky and not easily portable so that the operation normally has been confined to hospital centers which have been equipped with a source of vacuum. In many areas a well equipped hospital center is not readily available and therefore the patient has been put to considerable discomfort and expense, as well as being subjected to a traumatic and possibly dangerous experience merely to have a minor operation performed, which could be carried out in a practitioner's office or elsewhere if the necessary equipment were available.

SUMMARY OF THE INVENTION

The present invention is embodied in a suction curettage which includes a thin hollow flexible catheter connected by flexible tubing to a filter trap within a collection bottle, and the collection bottle in turn is connected to a source of normally low base line negative pressure or partial vacuum created by passage of water or other fluid under pressure through a venturi tube. The catheter is provided with one or more openings adjacent to its proximal end for scraping and removing matter from the uterine wall, and such catheter is of sufficiently small cross-sectional diameter that it can be received within the opening in the cervix without dilation thereof.

It is an object of the invention to provide a suction curettage assembly which can be utilized anywhere that a source of fluid under pressure is available, as well as

to provide an apparatus and method for using a catheter which can be inserted easily and safely into the uterus without dilation of the cervical opening.

Another object of the invention is to provide a simple, inexpensive, portable, lightweight suction curettage which provides negative pressure only without danger of introducing air under pressure into a uterus and which is quiet in operation.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a side elevation with portions broken away for clarity and illustrating the apparatus.

FIG. 2 is a fragmentary enlarged side elevation illustrating the catheter in use.

DESCRIPTION OF THE PREFERRED EMBODIMENT

With continued reference to the drawing, the female body includes a uterus 10 having a flexible body or fundus 11 with a neck or cervix 12 at one end. A channel 13 with internally collapsed walls leads inwardly from the cervix and after conception the embryo and placenta indicated at 14 are partially imbedded within the walls of the channel 13.

When a therapeutic abortion is indicated within approximately ten weeks after conception, an elongated hollow flexible catheter 17 is provided having a small cross-sectional outer diameter of approximately 5 to 6 millimeters. Such catheter has a closed rounded proximal end 18 and an open distal end 19. The catheter 17 is provided with one or more openings 20 located adjacent to the proximal end and providing communication between the hollow interior and the exterior thereof. As illustrated, the catheter has openings 20 on opposite sides so that the products of conception on the uterine walls of the channel 13 within the fundus can be sucked away and evacuated in a minimum of time and with minimal rotary motion of the catheter.

The open distal end of the catheter 17 is connected to one end of a flexible tubing 21 and the opposite end of such tubing is connected to one end of an elbow 22. Such elbow extends through a stopper 23 into an airtight collection bottle 24. Within the bottle 24, a filter trap 25 is secured to the discharge end of the elbow 22 in any desired manner, as by a cord 26.

A negative pressure or partial vacuum is maintained within the collection bottle 24 so that matter scraped from the uterine wall will be sucked into the collection bottle 24 where the more solid matter is retained within the filter trap 25. In order to maintain the negative pressure within the collection bottle 24, a conventional pipe or faucet 27 is provided having a control valve 28 which is connected to any suitable readily available source of water or other fluid under pressure.

A venturi tube 29 has one end mounted on the outlet of the faucet in any desired manner, such as by using a clamp 30 and the opposite end of such venturi tube is open to atmosphere. Such venturi tube includes a high pressure inlet portion 31 in communication with a restricted throat 32 which in turn communicates with a tapered low pressure discharge portion 33 having a discharge opening of substantially the same cross-sectional diameter as the inlet portion 31. When water under pressure from the inlet portion 31 is forced through the restricted throat 32, the velocity of the water passing through the restricted throat 32 is increased and the pressure of the water within the throat

is decreased in direct proportion. Within the discharge portion 33 the pressure increases so that the flow of water from the venturi tube is discharged substantially at atmospheric pressure.

An orifice 34 extends from the restricted throat 32 through the body of the venturi tube and through a nipple 35 at one side of such body. A flexible tubing 36 is connected at one end to such nipple and the opposite end of such tubing is connected to an elbow 37 which extends through the stopper 23 and communicates with the interior of the collection bottle 24. When water or other fluid is forced through the venturi tube, a low base line negative pressure results which increases automatically to a range of 50 to 60 centimeters of mercury when the catheter is located within the uterus. Such negative pressure depends on the pressure of the water and the flow rate thereof which, in most municipal systems, is ample for operating the apparatus. Also, the flow of water is easily controllable as to volume and velocity by regulating the control valve 28 so that no damage may occur.

In the operation of the device, water under pressure flowing through the faucet 27 creates a negative pressure within the collection bottle 24 and in turn draws air through the openings 20 of the catheter 17. As long as the catheter is exposed to atmosphere, negative pressure at the venturi tubes causes atmospheric air to flow gently through the catheter, the flexible tubings 21 and 36, and the collection bottle 24. The catheter is of a diameter to fit snugly within the opening of the normal cervix of the uterus without dilation of such opening and therefore as soon as the catheter is inserted, the normally collapsed walls of the cervix provide a seal around the catheter so that the openings 20 are disposed in a closed area. A lag time of several seconds occurs before the negative pressure increases to the full amount and, therefore, the openings 20 are permitted to slip past the cervix without adhering to the delicate tissues. Within the closed area of the fundus, the efficiency of the negative pressure is increased substantially but is not sufficient to cause damage to the uterine wall along the channel 13. The flexible catheter 17 is moved in and out in a systematic pattern so that the negative pressure sucks the embryo, placenta and other matter from the uterine wall through the openings 20 and evacuates such matter into the collection bottle 24.

Since no electro-mechanical vacuum pump is required, the operative procedure can be carried out in

any location which has access to water or other fluid under pressure, and since no dilation of the cervix is required, the patient can return to normal activity in a minimum of time. There is no danger from excess negative pressure and no possibility of accidentally introducing positive pressure into the uterus such as with conventional mechanical pumps. Also, there is no need for a manual control to adjust negative pressure levels after the venturi tube is operating.

We claim:

1. A portable suction curettage for evacuating matter from an undilated female uterus, said curettage comprising an elongated thin flexible catheter defined by a cylindrical wall having a closed proximal end and an open distal end, at least one opening in said wall adjacent to said proximal end only and providing communication between the interior and exterior of said catheter, said wall otherwise being imperforate, flexible tubing means having one end connected to the open distal end of said catheter, a venturi tube having a high pressure inlet portion communicating with a restricted throat and a low pressure discharge portion, means for connecting said venturi tube to a source of fluid under pressure, said venturi tube having an orifice providing communication between said inlet portion and the end of said low pressure discharge portion and the exterior of said venturi tube, the opposite end of said tubing means being connected to said venturi tube in communication with said orifice, whereby fluid under pressure flowing through said venturi tube creates a sub-atmospheric pressure for evacuating matter through the openings in said wall.

2. The structure of claim 1 in which said catheter is of a diameter to be received within the cervical opening of the uterus without dilation thereof so that the cervix provides a seal about said catheter.

3. The structure of claim 1 in which said flexible tubing means includes a collection bottle intermediate the ends thereof.

4. The structure of claim 3 in which said flexible tubing means includes a first elbow extending into said collection bottle, a filter trap connected to said first elbow within said bottle, a second elbow extending into said bottle in a position remote from said filter trap, and said second elbow connected to the flexible tubing means leading to said venturi tube.

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