PORTABLE POWER-OPERATED DOUCHING APPLIANCE

Inventor: Jerome I. Rebold, Timonium, Md.
Assignee: Leonard Bloom, Baltimore, Md. a part interest
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Primary Examiner—L. W. Trapp
Attorney—Leonard Bloom

ABSTRACT

A portable power-operated douching apparatus is intended to be held in the user's hand and is furnished with a nozzle for insertion into the vagina. The appliance is compact, battery operated, and has a motor-driven pump for drawing the douching fluid out of a reservoir. The pump is of the oscillatory type, and the douching fluid flows out of the nozzle into the vagina in a series of interconnected fluid pulses, thereby developing a pulsating flow of variable intensity, and thereby improving the cleansing efficiency while providing a refreshing stimulation.

12 Claims, 11 Drawing Figures
PORTABLE POWER-OPERATED DOUCHING APPLIANCE

This application is a continuation-in-part of application, Ser. No. 681,364 filed Nov. 8, 1967, entitled "Vaginal Irrigation Syringe", which application is now abandoned.

THE PRIOR ART

In the prior art of douching, the usual practice is to use a manual syringe. This syringe, consists of a nozzle adapted for insertion into the vagina. The other end of the nozzle is connected to a suitable reservoir. The reservoir may comprise a bulb which is squeezed by the user to discharge the douching fluid out of the nozzle. In other cases, the nozzle is connected by a hose to a douche bag which is mounted above the user, and the douching fluid flows by gravity down the hose and into the nozzle.

Albeit simple and direct, these manual syringes are nevertheless awkward, tiring, inefficient, and somewhat undesirable from a cleansing standpoint. Moreover, at times, the manual method of douching may involve relatively high pressures which are uncomfortable and potentially dangerous to the user.

The prior art has also disclosed some power-operated vaginal irrigating devices intended to improve upon the manual methods. Generally, these devices are large, stationary and somewhat cumbersome; or else involve several hoses together with a high voltage electric cord, the latter being undesirable from a safety standpoint. Hence these power-operated devices are not in current widespread usage, and have not enjoyed commercial success in the consumer market.

Moreover, the prior art, whether manual or powered, has habitually resorted to a generally steady flow of the douching fluid, which is not entirely satisfactory.

OBJECTS OF THE INVENTION

Accordingly, it is an object of the present invention to alleviate the deficiencies of the prior art by providing a portable power-operated douching appliance including oscillatory pumping means for developing a pulsating flow of variable intensity or velocity, whereby the douching fluid flows out of the nozzle means and into the vagina in a series of interconnected fluid pulses, thereby improving the cleansing efficiency while providing a refreshing stimulation.

In accordance with the further teachings of the present invention, the oscillatory pumping means includes a diaphragm which vibrates at a frequency in the range of approximately 5 to 10 cycles per second. The diaphragm is driven by an electromagnet, which in turn is energized by a rechargeable battery mounted within the housing. The battery and electromagnet are controlled by a switch which is mounted on the housing, rearwardly of the nozzle, for convenient manipulation by the user. Preferably, the reservoir comprises a disposable hygienically sealed plastic bag having a frangible seal and containing a predetermined amount of water-soluble douching powder, while the nozzle means comprises a series of interchangeable nozzle elements selectively mounted on the housing by quick-disconnect means.

These and other objects of the present invention will become apparent from a reading of the following specification, taken in conjunction with the enclosed drawings.

DESCRIPTION OF THE DRAWINGS

FIG. 1 is a longitudinal section of one embodiment of the present invention, the hose to the reservoir being broken for clarity of illustration;

FIG. 2 is an enlarged portion of FIG. 1, showing the vibrating diaphragm and the fluid passage means in greater detail;

FIG. 3 is a perspective of a preferred embodiment of the present invention, wherein the hand-held portable douching appliance is connected to a disposable hygienically sealed plastic bag constituting the reservoir means;

FIG. 4 is a longitudinal section of the preferred douching appliance, taken along the lines 4--4 of FIG. 3, showing a preferred embodiment of the oscillatory pumping means;

FIG. 5a is a portion of FIG. 4, showing the manner in which one of the slits in the diaphragm opens to allow the douching fluid to be drawn into the fluid passage means whenever the armature and its attached diaphragm are attracted towards the electromagnet;

FIG. 5b corresponds to FIG. 5a, but shows the manner in which the other slit in the diaphragm opens to allow the douching fluid to be discharged out of the fluid passage means whenever the armature and diaphragm are repelled away from the electromagnet;

FIG. 6 is a detail section, taken along the lines 6--6 of FIG. 4, showing the connection between the hose and the inlet tube mounted on the rear portion of the housing, and further showing a communicating inlet canal leading to the main fluid passage;

FIG. 7 is a detail section, taken along the lines 7--7 of FIG. 4, showing the communication between the inlet canal and the main fluid passage (at one of the slits in the diaphragm) whenever the armature and diaphragm are attracted towards the electromagnet as shown in FIG. 5a;

FIG. 8 is a detail section, taken along the lines 8--8 of FIG. 4, showing the communication between the main fluid passage and an outlet canal (at the other slit in the diaphragm) whenever the armature and diaphragm are repelled away from the electromagnet as shown in FIG. 5b;

FIG. 9 is a detail section, taken along the lines 9--9 of FIG. 3, showing the manner in which the frangible seal on the disposable plastic reservoir bag is broken to admit the cap on the end of the hose; and

FIG. 10 is an elevation of a selection of interchangeable nozzle elements which may be used with the portable power-operated douching appliance of the present invention.

DETAILED DESCRIPTION

With reference to FIG. 1, there is illustrated a portable power-operated douching appliance 10 which may be conveniently held in the user's hand. The appliance 10 has a housing 11 which may comprise a pair of molded plastic, complementary mating halves 11a and 11b suitably secured together and enclosing the electromechanical components therebetween. A reservoir 12, containing a quantity of douching fluid at a desired temperature, is connected to the housing by means of a hose 13. A nozzle 14 is mounted on the opposite end of the housing, and is adapted for direct insertion into the vagina.

With reference to FIGS. 1 and 2, the housing includes an electromagnet or solenoid comprising a core 15, a winding 16, and a vibrating armature 17. The winding is energized by means of a battery 18, which is rechargeable, and is controlled by means of a switch 19. The wiring, being conventional, is omitted for ease of illustration. The switch is mounted on the housing, above and rearwardly of the nozzle, for convenient manipulation by the user as she grasps the housing, FIG. 1., and inserts the nozzle into her vagina.

With further reference to FIG. 2, the reservoir communicates with the nozzle by means of a main fluid passage 20 formed within the housing. A diaphragm 21, connected to one side of the vibrating armature, is disposed within the passage and comprises an oscillatory pumping means for the douching fluid. The diaphragm is formed of a suitable material such as neoprene, and has its ends 22 and 23 bent (as shown) and hooked about respective legs 24 and 25. As hereinafter described, the bent end 23 of the diaphragm comprises a first one-way check valve between the reservoir and the passage 20, while the other bent end 22 comprises a second one-way check valve between the passage and the nozzle.

When the switch 19 is closed, and electrical circuit is completed from the battery 18 to the winding 16 through the normally closed contacts 26 and 27 in a manner appreciated by those skilled in the art. One of the contacts, 26, is stationary while the other contact 27 is mounted on an insulating member 28 for conjoint movement with the vibrating armature 17. The armature is attracted to the winding and core 15,
compressing the springs 29, and causing a momentary interrup-
tion between contacts 26, 27. During the attraction of the
armature and its attached diaphragm, a fluid pressure dif-
ferential is created between opposite sides of the bent end 23,
that is, the pressure within the fluid passage 20 is less than the
pressure on the reservoir side of the bent end 23. As a result, the
bent end 23, which constitutes a one-way check valve between
the reservoir and the fluid passage means, flexes (as shown by
the dotted lines in FIG. 2) and douching fluid is con-
mitt ed to the main fluid passage 20. Then, when the springs 29
are sufficiently compressed, the spring force moves or repels
the armature and diaphragm away from the electromagnet.
Thus, a reverse fluid pressure differential is created, that is,
the pressure in the main fluid passage 20 is greater than the
pressure on the nozzle side of the other bent tab 22, which
constitutes a one-way check valve between the main fluid
passage 20 and nozzle. As a result, douching fluid is now
discharged or pumped out of the fluid passage 20, past the
bent tab 22 (which flexes as shown by the broken lines in FIG.
2) and into the nozzle 14 for application to the user. Further,
the contacts 26, 27 are again closed, and the cycle is repeated
as long as the switch 19 is maintained in its closed position.

The vibrating diaphragm 21, driven by the electromagnet
which in turn is energized by the self-contained rechargeable
battery, comprises an oscillatory pumping means for develop-
ing an irregular or pulsating flow. During each cycle of opera-
tion, the douching fluid flows out of the nozzle into the vagina
in the form of a fluid pulse. However, since the diaphragm
vibrates at a substantial frequency (the preferred range being approximately 5 to 10 cycles per second) the fluid
pulses are interconnected and merge into one another; and as
a result, the flow pulsates, that is, the flow of douching fluid is
characterized by a variable velocity or intensity as distinc-
tiated from the continuous, substantially uniform flow of a
conventional centrifugal pump. As a result, the cleansing effi-
ciency is improved, and the user is provided with a refreshing,
invigorating stimulation.

With reference to FIGS. 3 and 4, there is illustrated a pre-
ferred embodiment 10a of the portable power-operated
douching appliance, like numbers being used to denote struc-
tural elements similar to those in FIGS. 1 and 2. The housing
11, which is adapted to be conveniently held in the user's
hand, is of the "clam shell" type and comprises molded-plastic
complementary mating halves 11a and 11b. The housing en-
closes the electromagnet comprising the core 15, winding 16,
and armature 17. The armature has the diaphragm mounted
thereon for conjoint movement therewith. The diaphragm
comprises a relatively thin sheet of flexible material, such as
neoprene, which is trapped between cooperating peripheral
portions 30a and 30b formed, respectively, in the complemen-
tary mating halves of the "clam shell" housing. The material
of the diaphragm is chosen for its inherent flexibility, sealing
qualities, and for being impervious to the conventional
washing fluids, that is, the material of the diaphragm should
not contaminate the douching fluid with foreign particles that
may be potentially harmful to the user, and nor should the
diaphragm itself be deteriorated by the douching fluid and
hence lose its desirable characteristics. Moreover, the
diaphragm is formed with slits 31 and 32; these slits, have a
function similar to the bent ends 22 and 23 of the FIG. 2 em-
bodiment, and as hereinafter described in detail, constitute
first and second one-way check valves, respectively, for the
admission of douching fluid into the main fluid passage 20 and
its discharge therefrom into the nozzle.

With further reference to FIG. 4, the switch means 19 in-
cludes a switch-operating lever 33 mounted on a boss 34 for
pivotal movement. The location of the lever 33 at the rear-
ward top portion of the housing, opposite to the nozzle means
14, allows the appliance to be easily held in the user's hand
and conveniently manipulated. A first pair of leaf-spring con-
tacts 35, 36 are cantilever mounted on the housing by means
of a screw 37. These first contacts 35, 36 are normally open,
as shown, and comprise the switch contacts whose closure is
affected upon manual actuation of the switch lever 33. A
second pair of leaf-spring contacts 38 and 39 are also cantil-
ever mounted by the screw 37. These second contacts 38, 39
are normally closed, as shown, with the contact 39 bearing
upon the head of a screw 40 carried by the armature. Each
contact in the pairs 35, 36 and 38, 39 is insulated from the
other by a pair of shouldered insulating washers 41 and 42
respectively, positioned beneath the head of screw 37. The
springs 29 bias the armature 17 away from the electromagnet,
in the manner as previously described with regard to the FIG.
1 embodiment of the invention. The electromagnet, moreover,
is preferably energized by means of the self-con-
tained rechargeable battery 18. The battery, electromagnet,
and contacts 35, 36, 38, and 39 are all connected in series with
each other; however the specific wiring, being conventional,
is omitted for ease of illustration.

With reference again to FIG. 4, and with further reference
to FIG. 6, the hose 13 is slipped over the enlarged end 43 of an
inlet tube 44 which is integrally mounted within the housing
and projects rearwardly therefrom. The tube 44 has a series
of apertures 45 which communicate with an inlet canal 46
molded within the top half 11a of the "clam shell" housing,
the bottom of the inlet canal 46 being sealed by the diaphragm
21.

With reference to FIGS. 4 and 7, the diaphragm 21 is fur-
ther supported towards the rearward portion of the housing
by means of first cooperating internal ledges 47 and 48
formed, respectively, in the complementary mating halves 11a
and 11b inwardly of the peripheral clamping portions 30a and
30b. Between these cooperating pairs of clamping portions,
the diaphragm is apertured by the thin slit 32, the thickness of
which is somewhat exaggerated in the drawings for ease of illu-
stratin. Likewise, the diaphragm is further supported

With reference to FIGS. 4 and 8, the top housing half 11b is
molded or formed with an outlet channel 51 disposed above the
slit 31, and the outlet canal 51 communicates with a vertical
canal 52 leading to a recess 53. The recess 53 is coun-
terbored and formed with internal threads 54 to provide a
quick-disconnect coupling with the threaded end 35 of nozzle
means 14.

The operation of the FIG. 4 embodiment of the present
invention is similar to that described herein for the FIG. 1 emb-
bodyment. When the switch lever 33 is depressed, thereby
closing the normally open switch contacts 35 and 36, the
winding 16 is energized by the battery 18, and the armature
17 and its attached diaphragm 21 are alternately attracted to,
and repelled away from, the electromagnet. The head of screw
40, which is carried by the armature, repeatedly interrupts the
normally closed contacts 38 and 39. The springs 29 return the
armature to its original position, re-establishing closure of the
contacts 38 and 39, and the cycle is repeated as long as the
switch lever 33 is maintained in its depressed position.

With reference to FIG. 5a, when the armature and diaphragm are attracted towards the electromagnet, a fluid
pressure differential is created, that is, the fluid pressure in
the inlet canal 46 is greater than that in the main fluid passage
20, and the slit 32 in the diaphragm opens sufficiently to admit
douching fluid into the passage 20 as shown by the small ar-
rows in FIG. 5a. Conversely, when the armature and diaphragm are repelled by the spring force away from
the electromagnet, the fluid pressure in passage 20 is greater than
that in outlet channel 51, and slit 31 in the diaphragm opens
sufficiently to discharge the douching fluid into the outlet
channel 51 and ultimately into the nozzle means 14, as shown
by the small arrows in FIG. 5b. As shown on the drawings,
each of the slits 31 and 32, when opened by the fluid pressure,
constitutes a flap which opens, away from its ledge 30b and

In operation, douching fluid is discharged out of the nozzle in a series of interconnected fluid pulses, thereby creating a pulsating flow of variable velocity or intensity. The discharge pressure of the douching fluid out of the nozzle is preferably equivalent to that developed by a conventional douche bag (of the gravity flow type) which is held approximately 2 feet above the nozzle. Experience has shown that a higher discharge pressure may be uncomfortable and possibly harmful to the user, particularly if the douching fluid would be forced up into the uterus. This can often happen with the prior art douche bag, which the user invariably hangs on any convenient support without especial regard for the height above the nozzle. Since the height governs the discharge pressure, an uncomfortable and perhaps dangerous condition may be experienced in using the conventional douche bag. On the other hand, the present invention has the assurance that douching will not be potentially harmful, while at the same time enjoying the benefits and comforts derived from a small portable appliance which is expected and convenient to use.

With reference to FIG. 9, the end of the hose 13 is retained within a molded plastic cap 56. This cap is pushed into a plastic collar 57 which is heat sealed, as at 59, to the reservoir means 12. The cap 56 and collar 57 are held together by means of respective cooperating protrusions 58a and 58b, which provide a "snap" fit. Preferably, the reservoir means comprises a disposable plastic bag 60 of polyethylene (or other suitable material) and is adapted to receive approximately 1 pint of douching fluid at a desired temperature. The disposable bag 60 may contain a predetermined quantity of douching powder, and may be hygienically sealed. The seal, however, is frangible and may be easily broken, as at 61, by the irregular edges 62 formed at the bottom of the cap 56. Otherwise, the seal may be broken by the finger, by the faucet, or by any suitable instrument. Once the seal is broken, the water may fill the bag to dissolve the powder, and the appliance is ready for use.

The battery-operated douching appliance 10 may be conveniently supplied to the user in kit form together with several bags 60, each of which contains the proper douching powder, and is hygienically sealed and folded. The kit may also include a variety of nozzles, such as the nozzles 63, 64 and 65 shown in FIG. 10. These nozzles provide a variety of sizes and shapes and may be formed with a conical end, as at 66 for nozzle 63. Each nozzle has side apertures, as at 67, so that the douching fluid is suitably sprayed, laterally, for irrigation of the vagina by means of the pulsating variable-velocity flow of the present invention.

Moreover, one or more of the nozzles may be made from a plastic material which, while being sufficiently rigid, may nevertheless be somewhat pliable and adapted to expand and contract slightly as a result of the pulsating flow of douching fluid.

Obviously, many modifications may be made without departing from the basic spirit of the present invention. For example, the armature could be made of a magnetized material and could be replaced by an electromagnet, while the springs could be arranged to urge the armature and its diaphragm towards the electromagnet. Thus, within the scope of the appended claims, the invention may be practiced other than has been specifically described therein.

1. A unitary device for irrigation of the human vagina comprising a flexible diaphragm pump, a nozzle secured to and in direct engagement with the outlet of said pump, a reservoir for irrigating fluid connected to the inlet of said pump, means for oscillating said pump including a magnetizable movable member attached to said pump, an electromagnet adapted to vibrate said member, and means for periodically energizing said electromagnet so that said movable member and the attached diaphragm oscillate at a predetermined frequency of between approximately 5 and 10 cycles per second.
and projecting therefrom, reservoir means containing a
douching fluid, means including a pump in the housing com-
municating the reservoir means with the nozzle element, a
motor in the housing for driving the pump, a battery in the
housing for energizing the motor, and low-voltage electrical
control circuit means including a switch interconnected with
the motor and battery, said switch being mounted on the hous-
ing for convenient manipulation by the user as she grasps the
housing and inserts the nozzle element into her vagina.

12. Douching apparatus comprising a disposable hygieni-
cally sealed plastic bag having a frangible seal and containing
a predetermined amount of a water-soluble douching powder,
whereby the user may quickly break the seal and add a quanti-
ty of water of a desired temperature, thereby dissolving the
powder, a hose, means connecting one end of the hose to the
broken seal of the disposable plastic bag, a power-operated
douching appliance connected to the other end of the hose,
said douching appliance comprising a housing having oscilla-
tory pumping means for developing a pulsating flow of varia-
table velocity, and nozzle means connected to the housing
and adapted for insertion into the vagina, whereby the douching
fluid flows out of the nozzle means into the vagina in a series
of interconnected fluid pulses, thereby improving the cleansing efficiency while providing a refreshing stimulation.

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