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HYGIENIC SYRINGE

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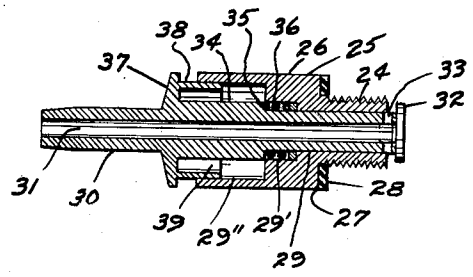

Fig. 3

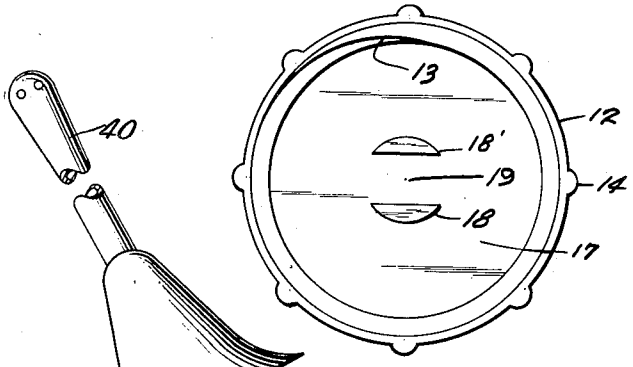

Fig. 2

Fig. 1

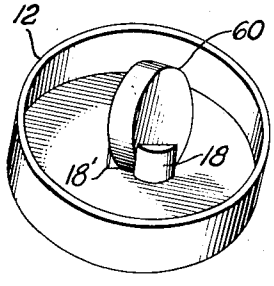

Fig. 4

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HYGIENIC SYRINGE

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1 Claim. (Cl. 128—225)

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This invention relates to a hygienic syringe for use in administering antiseptic or medicated solutions to the interior portions of the human body through its natural openings. More particularly this invention is primarily concerned with that type of syringe commonly employed in femine hygiene for the purpose of effecting a prescribed and safe treatment of the vagina.

In the past, considerable difficulty has been experienced in treating various internal portions of the human body by directing jets of fluids through their adjacent orifices. Such treatment may be either inadequate or dangerous to the health of the person being treated unless competent medical personnel is in attendance. For example, in the treatment of the vagina, it has been a practice to use what is generally referred to as a fountain syringe which consists of a fluid container or bag discharging into a tube of approximately six feet in length terminating in a nozzle and with the tube customarily controlled by a pinch clamp. In using such a device the container either is customarily hung from any available support (such as a door hinge, curtain rod, or nail provided for the purpose) almost invariably selected because of convenience and without regard to the proper hydrostatic pressure generated, or, the container is held in one hand while an attempt is made to control the liquid flow by releasing the pinch clamp with the other hand. Both methods of use are unreliable, unsafe, and cumbersome. In use the pressure of the fluid dispensed becomes greater, in accordance with well known physical laws, as the height of the fluid container increases. Consequently, the pressure might be too low to treat the desired tissue area properly or it might be sufficiently high to cause injury to delicate tissues, as means for obtaining the proper pressure are seldom available. This problem has been appreciated for many years, but the various devices heretofore intended to overcome these objections have failed to provide the solution.

The objective of the present invention is to meet the generally unfilled requirements of the prior art and to provide an economical, reliable and safe hygienic syringe.

An important object is the provision of a syringe having a self-contained pressure producing means and a complementary pressure controlling means which may be used in the administration of antiseptic or medicated douches to the extremely sensitive tissues of the human body.

An important object of this invention is to provide a complete syringe, so constructed and

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proportioned as to permit the container to be held with some of the fingers of one hand while leaving the remaining fingers of the same hand free to operate the dispensing control valve. This frees the other hand, of the user, for guiding and controlling the syringe nozzle.

A further object is to provide a compact hygienic syringe adapted to contain a pressure producing antiseptic or medicated tablet and having a valved outlet of predetermined orifice restriction adapted to release a medicated solution at the desired pressure and rate of flow.

A more detailed object of this invention is the provision of a syringe for use in feminine hygiene adapted to emit fluid under a predetermined pressure through a manually operable valve which is normally maintained in a closed position.

The accomplishment of these and other important objects will become apparent and the invention fully understood by referring to the following specification and drawings wherein:

Figure 1 is a side elevational view, partly in section, of the combined fluid and pressure chamber, the valved outlet and the associated parts of an assembled hygienic syringe made in accordance with the teachings of this invention;

Figure 2 is a top plan view of the fluid and pressure chamber cap showing the antiseptic or medicated tablet retaining means; and

Figure 3 is a cross-sectional view taken laterally through the outlet valve shown in Figure 1.

Figure 4 is an interior perspective view of the syringe cap showing a medicated tablet in position.

Referring to the drawings wherein like reference characters denote corresponding parts, the hygienic syringe is shown as comprising the following cooperating elements, viz. a combined fluid and pressure chamber **10**, made up of a tube closed at one end and fitted at its opposite end with a cap **12**, a valve **25**, a nozzle **40** which may be of any conventional size or shape, and a relatively short length of flexible tubular coupling **50** connecting the valve **25** with the nozzle **40**. Chamber **10** serves the combined function of a fluid container, mixing chamber and pressure flask; and, for economy of production, is preferably cylindrical in form. This member may be fabricated from any of the known materials such as light metallic alloys, processed natural or synthetic rubber and synthetic resinous materials. However, it is recommended that a plastic material be used which has the characteristics of being readily molded into an air tight, hard sur-

faced, light weight, and acid or alkali and heat resistant body. Phenol or urea-formaldehyde resins and the various vinyl resins are very satisfactory. One end, 16, of the chamber 10 is closed, preferably with a semi-spherical integral closure; this end, however, could be provided with a removable cap, if desired. The opposite end of chamber 10 is open but adapted to be closed with a removable cap 12. Preferably exterior, male threads are provided on the outer wall of cylinder 10 adjacent its open end; such threads being adapted to engage matching female grooves 13 formed in cap 12. While small threads and grooves will accomplish the same results, the use of the large size permits economical molding or other processing and eliminates expensive precision boring, casting or turning. It will be understood that cylinder 10 may be interiorly threaded and cap 12 may be exteriorly threaded but the arrangement first described is easier to clean and easier to seal against leakage and so is preferred.

While the cap 12 may be fabricated from any of the known materials specified for use in making the chamber 10, it is preferable to have the cylinder and cap formed of the same material so that, without the use of complicated computations, the coefficients of expansion, chemical resistance, hardness, machineability or setting time, in the case of molding, will be the same. Further, the cap or closure 12 may be formed with projections or vertically disposed ribs 14 about its outer periphery to provide a more positive gripping means when being assembled with or disassembled from the chamber 10. The lowermost face 15 of the cap 12 is preferably flat to permit the assembled syringe to be set on a stand, table or other support, if desired. Similarly, if desired, the curved upper end 16 of the chamber 10 may be squared off (not shown) to permit the structure to be self-supporting when not in use or when being prepared for use.

The interior face 17 of the cap 12 is provided with two studs 18 and 18' suitably spaced apart to form a channel 19 and adapted to provide a receptacle for a pressure producing antiseptic or medicated tablet 60. In addition, the interior of the cap or closure 12 is adapted to receive an annular gasket 20 which abuts the rim of the chamber 10 as at 21 when the cap is threadedly engaged with the chamber for use.

Near the open end, that is the end covered by cap 12, chamber 10 is provided with an exterior nipple 23. Nipple 23 may be integral with chamber 10, being molded simultaneously as part thereof, or may be inserted into a threaded aperture in the sidewall of 10. In either event nipple 23 has an interior bore 22 which directly communicates through the sidewall of chamber 10 and into the interior of the "cap end" of said chamber. The bore 22 will have interior threads 22' to coact with exterior threads on shank 24 of valve 25. Shank 24 has a hollow axial bore which closely accommodates, yet permits reciprocation of, member 30.

Referring to Figure 3, it will be seen that the valve 25 is of the type generally referred to as a spring biased valve, and while it may be produced from many known materials, it is preferably formed of a polymer of an ester of acrylic acid or substituted acrylic acid; such as, for example, methyl methacrylate. If this material is employed, it is susceptible to appropriate and economical manufacturing processes, and will provide a finished product of a transparent nature.

The valve 25 consists of a housing or seat 26 at one end of which is formed the threaded shank 24. At the seat end of the threaded shank 24 there is formed a shoulder 27 on which an annular packing in the form of a gasket 28 may rest. This gasket serves to maintain a gas-and-water-tight seal for chamber 10 at the valve receiving aperture 22.

The outer member 26 is also provided with a bore of varying internal diameters indicated at 29, 29' and 29'' which telescopically receives an inner member 30 having an axial passage 31 which forms the primary conduit for the fluid passing from the chamber 10. The inner end of the axial passage 31 is closed by means of a flanged cap 32, which is preferably an integral part of the inner member 30. Fluid access to the axial passage 31 is had through the radial passages 33. The member 30 is enlarged at a point intermediate of its two ends as at 34 to form a shoulder 35 which retains a spring 36 in the intermediate bore 29'. At the outer extremity of the enlarged section 34 there is formed a flange 37 having an integral inwardly projecting annular sleeve 38 that is telescopically received in the enlarged bore 29''.

When the valve 25 is assembled, the outer member 26 telescopically supports the inner member 30 in a normally closed position due to the pressure exerted against the shoulder 35 by the spring 36. In this position the radial passages 33 are covered by the wall of the bore 29 in the threaded shank 24 and sealed off by the flange 32 which also serves as a stop by limiting the reciprocating movement of the member 30. To open the valve 25, it is only necessary to apply sufficient pressure on flange 37 to overcome the pressure of spring 36, thus obtaining a limited relative telescopic movement between the inner member 30 and the outer member 26 sufficient to uncover the radial passages 33.

To minimize liquid leakage between the inner bore of shank 24 and member 30 the contacting surfaces may be coated with a water repellant lubricant such as Vaseline or the like. Alternatively a gasket or ring (not shown) may be seated around member 30 and against the inner wall of flange 32. If fluid under pressure should leak between the members 24 and 30 through bore 29, 29' and 29'', it will be collected in the chamber 39 and not enter the bore 31.

In the operation of the hygienic syringe, any suitable nozzle 40 adapted for insertion into the human body orifice may be attached to a small flexible hose 50 in any known manner. The other end of the hose 50 is connected to the valve 25 which has been threadedly engaged with the nipple 23 of the chamber 10.

It will be understood that cap 12 will have been removed from cylinder 10. A suitable tablet having the desired antiseptic, or medicating, ingredients and having incorporated therein solids capable of producing gas when wet with water is placed between the studs 18 and 18' in the cap. Chamber 10 is then filled with water or any prescribed aqueous antiseptic solution. To fill the cylinder 10 with water it will, of course, be necessary to invert it from the position shown in Figure 1 of the drawings. Cap 12 containing the medicated tablet is then threaded into place to close cylinder 10 and the cylinder is again inverted so as to assume the position shown in Figure 1 of the drawings. When so inverted, the liquid wets the tablet causing it to go into solution and causing a chemical reaction between

the gas-forming chemicals of the tablet and the water of the solution—the gases thus generated within the chamber produce a controlled gas pressure in the chamber; the dissolved antiseptic or medicament forms an aqueous solution of proper strength and character. As is implied from the above statement that the tablet is wetted upon the last mentioned inversion of the cylinder, the original filling of the cylinder is carried out normally only to such a level that the tablet will not be at once wetted upon screwing the cap onto the cylinder. After generation of the gases, the syringe is then ready for use. The syringe nozzle may be placed in position within the body orifice and by a light pressure of, say the thumb and one finger, on the exterior face 37 of the valve 25, member 30 is reciprocated toward the interior of chamber 10 and radial ports 33 are uncovered. This permits the fluid to flow through the interior bore 31, through tube 50, and through syringe nozzle 40, the flow being augmented by the gas pressure and to a slight extent by the hydrostatic head of the liquid within cylinder 10.

It will be understood that the tablets contemplated for use in this device may be modified with respect to their content of antiseptic of medicated compounds and that the content of the tablets with respect to compounds which generate gas in the presence of water will be regulated and proportioned with respect to the quantity and character of the fluid held within cylinder 10 so that a proper and beneficial degree of pressure is generated. The tablets, of course, can be prepared on a tableting machine after compounding in any known manner. They may be, of course, prepared in any desired shape. It is preferred, however, that the tablets be shaped so as to have at least two relatively flat edges and to be so proportioned as to permit snug insertion between the interior opposed faces of studs 18 and 18' where the tablet will be retained by friction.

It is obvious that chamber 10 may be formed of different sizes and, therefore, different liquid capacities. Consequently, the tablets may be formed of different sizes and with different proportions of compounds which have the properties of generating gas when wet with water. The calculation of the quantities of such compounds with respect to the volume of liquid within the chamber are matters within the knowledge of those skilled in the art and need not be illustrated or explained in this specification. Similarly the sizes of the syringe nozzle orifices, the radial orifices 33, the bore 31, and other dimensions of the valve structure may vary depending upon the desired hydrostatic pressure and the desired rate of liquid flow intended to be utilized in a given syringe. It is preferred, however, to generate the pressure at a low figure, in the vicinity of 2 to 4 pounds per square inch, gauge, which is a mere fraction of the hydrostatic pressure generated by an old fashioned syringe in which the container may be elevated as much as 6 feet above the point of application.

There are certain features with regard to the present structure which provide factors of safety, sanitation, and simplicity of use, which deserve comment. Chamber 10, when constructed in the preferred manner may be easily cleaned and kept sterile. If the top or closed end 16 is rounded as shown in Figure 1, the syringe may only be placed on a table or other supporting surface when in a readiness position, that is, a position in which the medicated tablet is exposed to water. This decreases the possibility of having the user

fill the syringe with liquid, insert the tablet into the cap, and put the syringe aside without promptly using it. Such a condition while not dangerous, is always attended by the likelihood that the tablet will be partially wet and partially decomposed, and therefore incapable of generating the desired controlled gas pressure when ready for use.

However, one of the most important features of the structure is its compact size and its simple shape. The size and shape in conjunction with the simplicity of the valve structure makes it possible to hold the syringe in one hand, utilize only two or three fingers to grasp it and leave free the thumb and index finger to manipulate the valve. This, of course, frees the remaining hand of the user for guiding and controlling the syringe nozzle so as to insure the safe and uniform application of the antiseptic or medicated fluids. In this respect, the structure is a vast improvement over the gravity-type container, with its lengthy hose and pinch clamp, which literally required the use of three hands in order to give a safe and efficient application of the contents of the container. Lastly, the hydrostatic pressure augmented by the gas pressure within the container is always maintained within safe, predetermined, controlled limits; consequently, the tissues to be cleaned are always thoroughly washed and cleansed, or medicated, without fear of dangerous, injurious pressures. By using tablets which have been compounded as herein described, the solution formed with a given tablet will not only be of the proper volume and strength for the intended use, but will be a fresh solution, thus minimizing the decomposition so common with solutions which have been prepared and set aside before use.

While a preferred intended use of the present invention is for feminine hygiene, the device may be used for other surgical purposes. Thus, with appropriate medication and an appropriate spray nozzle, the device may be used to irrigate or spray the mouth, nasal passages, or ears.

I claim:

In a surgical syringe, the combination of: a tubular chamber comprising a tube closed at one end and having a wide cylindrical threaded mouth at the opposite end and a tightly fitted screw cap closure on said wide mouth, said chamber having an unobstructed fluid discharge port at its cap end, said port communicating freely and directly with the interior of the cap end of the chamber, so as to directly receive liquid from the lower end of the chamber when the chamber is held with its cap end downward and gas pressure thereupon begins to build up inside the chamber, spaced lugs formed on the interior side of the cap structurally arranged for ready frictional reception and retention of a tablet containing compounds capable of generating gas when wetted with liquid within the chamber, said spaced lugs positioned to support said tablet above the normal liquid level in the chamber, and a manually operable valve controlling said liquid discharge means, all in such manner that the tablet is fully exposed when the cap is on the chamber but will remain dry while the cap end of the chamber is held upward, but will be immersed in the liquid contents of the chamber to generate gas in the chamber when the chamber is inverted, and also in such manner that said fluid discharge port communicating with the interior of the cap end of the chamber is at the lower end of the chamber in said inverted posi-

tion, whereby the generated gas is enabled to rise to the top of the chamber and then expand downwardly to drive substantially the entirety of said liquid out of the then bottom-located discharge port.

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References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
1,609,125	Pitt	Nov. 30, 1926
1,681,320	Bergl	Aug. 21, 1928
1,719,163	Bergl	July 2, 1929
1,956,006	Coons	Apr. 24, 1934
2,195,554	Beardsley	Apr. 2, 1940

FOREIGN PATENTS

Number	Country	Date
181,922	Switzerland	Jan. 15, 1936