

March 5, 1968

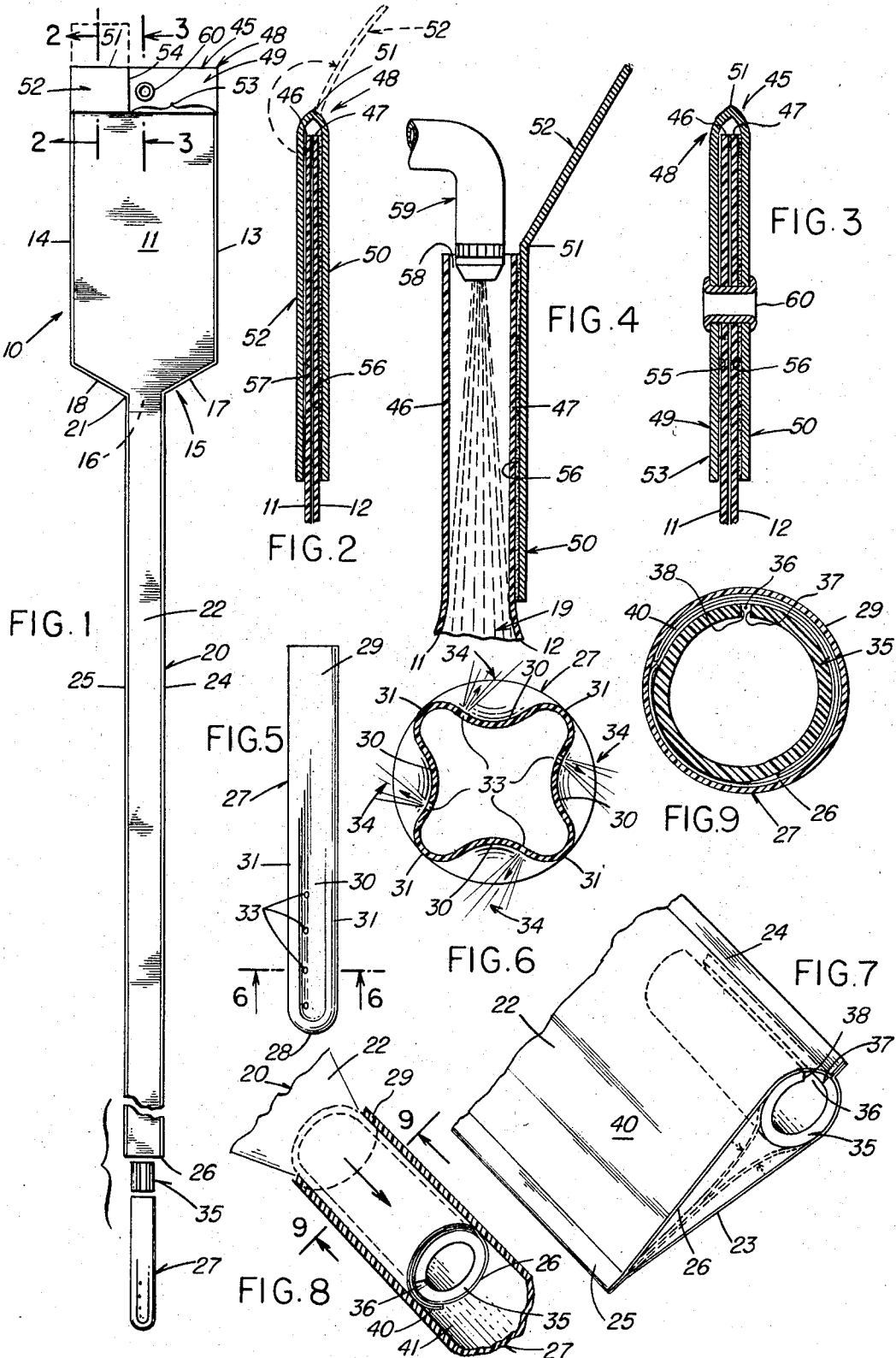
M. M. DRUCKENMILLER ET AL

3,371,665

DISPOSABLE VAGINAL SYRINGE

Filed March 16, 1966

2 Sheets-Sheet 1



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DISPOSABLE VAGINAL SYRINGE

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FIG. 10

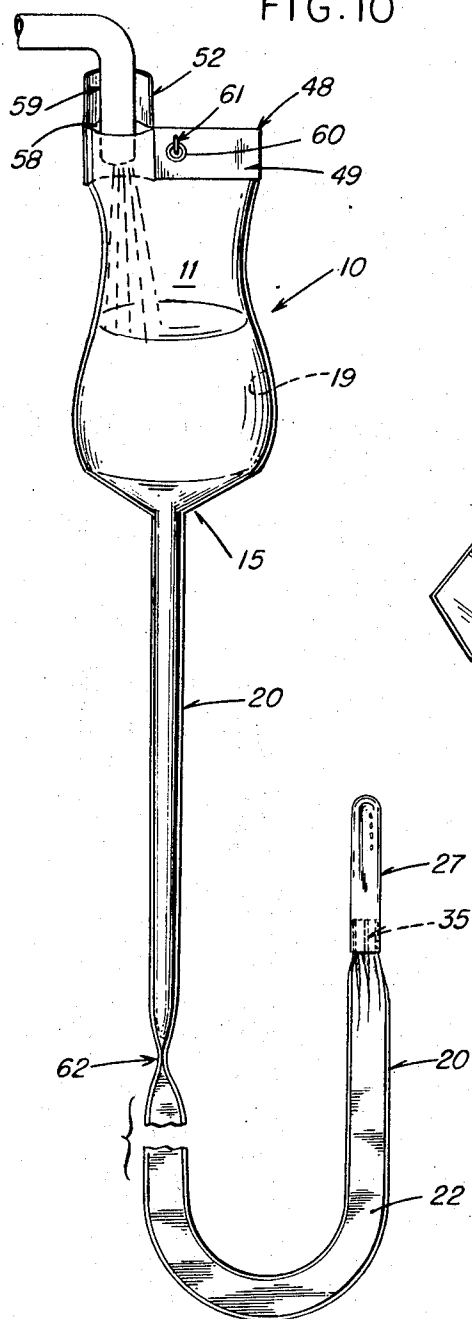


FIG. 11

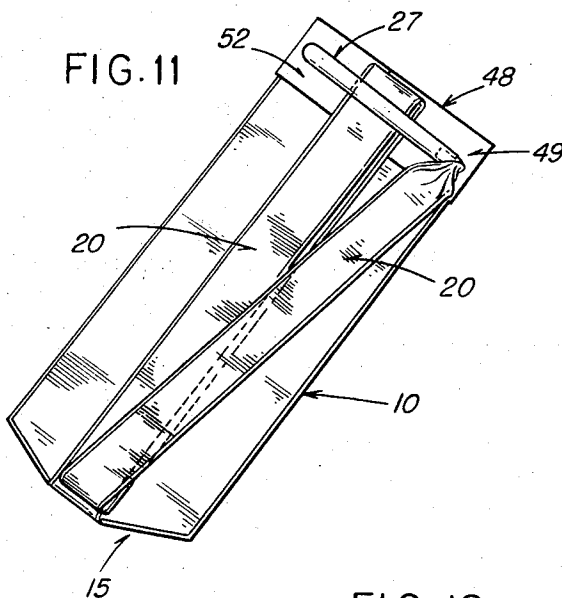


FIG. 12

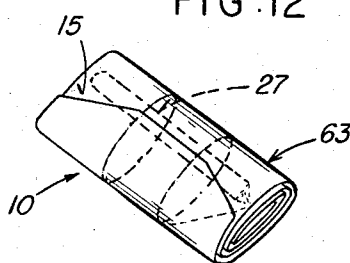
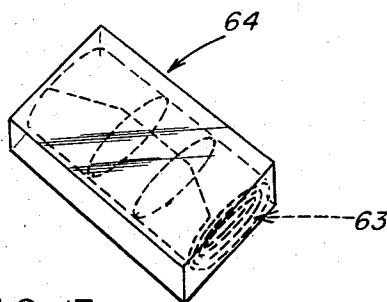


FIG. 13



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DISPOSABLE VAGINAL SYRINGE

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4 Claims. (Cl. 128—227)

The present invention relates to vaginal syringes of the disposable type intended to be discarded after a single use.

An object of the present invention is to provide such a device which is of simple and unique construction, permitting economic production thereof and ready folding into a compact package adapted to consumer distribution in vending machines as well as by other desirable systems of distribution.

It has been previously proposed to provide such disposable syringes in forms permitting folding of the parts thereof into compact packages and to equip them with various means for support, as well as various types of delivery nozzles and means for connecting delivery tubes between the bag chambers and nozzles thereof. However, prior art proposals with respect to such critical characteristics have frequently involved difficult problems of liquid-tight connections and effective spraying action. It is another object of the present invention to provide the present syringe in a structural form which effectively solves these problems in unique and unusually simple manners.

An embodiment of the disposable vaginal syringe of the present invention features a flat bag having its walls formed of highly flexible and foldable plastic sheet material which is substantially chemically inert to body fluids and douche liquids with this bag defining an expandable liquid storage chamber having a filling opening at its top end and a delivery opening at its bottom end. There is provided a flat, foldable and elongated delivery tube of similar plastic sheet material which is connected at its top receiving end to the bag walls in liquid-tight manner about the bag delivery opening with this tube being of a certain dimensional width when in flat foldable condition. The bottom end of this flat tube is provided as an initially open delivery end.

This device is equipped with a spray nozzle in the form of an elongated, thin-wall and substantially form maintaining hollow shell of plastic, which is also substantially chemically inert to such liquids and fluids. The tip end of this shell is closed and the other end thereof is in the form of a substantially cylindrical hollow neck of certain internal diameter. The sidewall of the major portion of this shell is provided with a plurality of jet outlet openings. In a preferred form the sidewall of the nozzle shell is longitudinally fluted about its circumference to define a plurality of longitudinal flutes and intervening hollow, longitudinal and arcuately spaced ribs. Such ribs have oblique sides facing in the same circumferential direction, such as the leading sides thereof when proceeding about the shell in a clockwise direction, and with only these oblique sides being provided with the plurality of jet outlet openings to form a swirling spray when the syringe is in use.

This syringe device includes an elongated, substantially tubular and substantially form maintaining anchorage sleeve of plastic which is also substantially chemically inert to such liquids and fluids, for simple anchorage of the outlet end of the delivery tube to the neck of the spray nozzle. This anchorage sleeve is provided with a lengthwise split extending from end to end thereof with opposed edges on opposite sides of the split being appreciably

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spaced when this anchorage sleeve is unconfined. The unconfined split sleeve has an outer diameter at least no less than, and preferably appreciably greater than, the internal diameter of the nozzle neck with this sleeve outer diameter being appreciably less than the internal diameter of the delivery end of the tube when expanded to substantially tubular form. The spacing of the opposed split edges is sufficient to permit transverse contraction of the sleeve to a diameter less than the internal diameter of the nozzle neck, and this transversely contracted sleeve has an elastic recovery sufficient to cause it to expand transversely when freed substantially back to its unconfined outer diameter. At least a longitudinal section of the split sleeve, which section is of appreciable length, is inserted into the open delivery end of the delivery tube with a side fold of the latter being of appreciable width. This relatively wide side fold in the tube delivery end is lapped back or about an arcuate section of the sleeve whereby the outer side of the longitudinal section of the sleeve is completely encompassed by the sheet material of the tube. With this split sleeve in contracted condition and with its longitudinal section encompassed by the tube sheet material it is inserted in the tubular nozzle neck and then released to expanded snugness in the latter so that the tube sidewall and its lapped side fold intervene and are securely clamped between the sleeve and the inside wall of the nozzle neck in a liquid-tight manner.

The preferred embodiment of the syringe device of the present invention also has the top end of its bag provided in substantial width with the opposed sidewalls thereof terminating in opposed transverse edges. A transversely extending, strengthening and stiffening, bag supporting strip of relatively stiff sheet material extends the full width of the bag top end. This strip is folded longitudinally to provide opposed flaps between which the opposed transverse top edges of the bag sidewalls are inserted. One of these flaps has a relatively narrow hinge end section separated transversely from the remainder of this flap. This hinged end section is swingable upwardly about the longitudinal fold line in this strip. The inside faces of the remainder of this flap and the other flap are anchored by any suitable means, such as by cementing or heat sealing, to the opposed faces of the top edges of the bag sidewalls to close a major portion of the bag top end. The hinged flap end section has its inside face free with respect to the opposed face of the adjacent bag sidewall, so that there is provided an access opening to the bag chamber between the top edges of the bag sidewalls beneath this hinged end section, which may be opened upon upward swinging of the latter for loading into the chamber a suitable medicament and/or water. If desired, such medicament, in soluble solids form may be pre-charged into the chamber to be packaged with the syringe device so that a desired liquid douche mixture may be formed upon adding the desired quantity of water to the chamber immediately before use.

It is another object of the present invention to provide a structural embodiment of a syringe device of the present invention which is readily constructed and allows efficient use and operation thereof.

The invention accordingly comprises the features of construction, combination of elements, and arrangement of parts, which will be exemplified in the construction hereinafter set forth.

Other objects of the invention will in part be obvious and will in part appear from reference to the following detailed description taken in connection with the accompanying drawings, wherein like numerals identify similar parts throughout, and in which:

FIG. 1 is a side elevational view of an embodiment of the syringe device of the present invention, with parts

broken away and others shown in exploded illustration;

FIG. 2 is an enlarged sectional view, with parts broken away, taken substantially on line 2—2 of FIG. 1;

FIG. 3 is a sectional view similar to FIG. 2 and taken on line 3—3 of FIG. 1;

FIG. 4 is a sectional view to enlarged scale, with parts broken away, taken substantially on line 2—2 of FIG. 1, but with a closing flap thereof swung back to expose a filling opening and depicting the insertion of a spigot nozzle therein for supply of water to the bag chamber;

FIG. 5 is a side elevational view to enlarged scale of the spray nozzle illustrated in FIG. 1;

FIG. 6 is a transverse sectional view to enlarged scale of the spray nozzle taken substantially on line 6—6 of FIG. 5, and illustrating therein the action of a plurality of spray jets;

FIG. 7 is a perspective view, with parts broken away, illustrating initial steps in preparing the delivery or outlet end of the delivery tube for insertion and anchorage in the hollow neck of the spray nozzle illustrated in FIG. 5;

FIG. 8 is a perspective view, with parts broken away and in section, of the hollow neck of the spray nozzle shown in FIG. 5 and illustrating the act of insertion of the delivery or outlet end of the delivery tube into the nozzle neck;

FIG. 9 is a transverse sectional view to enlarged scale, taken substantially on line 9—9 of FIG. 8;

FIG. 10 is a side elevational view of the syringe device depicted in FIG. 1, with all parts in their assembled positions, showing the preparation thereof for use by supply of water to the bag chamber from a spigot with the delivery tube being pinched to prevent flow out through the spray nozzle;

FIG. 11 is a perspective view of the syringe device shown in FIG. 1 with all parts in their assembled positions and as it is partially folded up for packing;

FIG. 12 is a perspective view of the device shown in FIG. 11 following further folding and rolling up of the device into a compact pack as it is prepared for packaging; and

FIG. 13 is a perspective view of a package which embodies an enclosing case or box in which the folded syringe device pack of FIG. 12 is housed.

As is illustrated in the drawings, an embodiment of the syringe device of the present invention, which has proven in use to be practical, includes a flat bag 10 having opposed sidewalls 11 and 12 formed of highly flexible and foldable plastic sheet material, such as a web of polyethylene or suitable polypropylene, about one and twenty-five one hundredths mils (1.25 mils) in thickness. The opposed sidewalls 11 and 12 are seamed together along their side edges 13 and 14 in any suitable manner, such as by heat sealing. The bottom end 15 of the flat bag 10 is substantially closed, except for an outlet or delivery opening 16, by transversely extending obtuse seams 17 and 18, which may also be formed by heat sealing. The flat bag 10 thus provides an expandable liquid storage chamber 19. The dimensions of the flat bag 10 may be such that the capacity of the storage chamber 19 is about one quart liquid measure, and for this purpose the bag may be about five inches (5") wide and about sixteen inches (16") deep.

An elongated delivery tube 20, which may be of similar plastic sheet material, has its top receiving end 21 connected to the bag walls 11 and 12 about the bag delivery opening 16 in liquid-tight manner. For this purpose the flat elongated delivery tube 20 may be formed by providing a pair of opposed strip extensions 22 and 23 made integral respectively with the bag sidewalls 11 and 12, and seamed together along opposite sides 24 and 25 by any suitable means, such as heat sealing. In flat condition the tube 20 may be about one and one-quarter to one and one-half inches (1¼" to 1½") wide and about two

and one-half to three feet (2½' to 3') long, and terminates in an initially open delivery end 26.

A spray nozzle 27 is connected to the delivery end 26 of the delivery tube 20, and in the preferred form consists of an elongated, thin-walled and substantially form maintaining hollow shell of suitable plastic which is substantially chemically inert to body fluids and douche liquids, such as a polyolefin or hard impact styrene. The spray nozzle 27 has a closed tip end 28, and a substantially cylindrical hollow neck 29 of certain internal diameter which may be about seven-sixteenths of an inch ($\frac{7}{16}$ ") or slightly greater. The nozzle 27 may be of any desirable length, such as within the range of about three to five inches (3" to 5") and preferably four and one-half inches (4½"). Since in the preferred form the nozzle 27 is molded with side flutes and intervening ribs its transverse dimension from end to end should be substantially uniform with the neck bore being slightly larger than other interior transverse dimensions so as to facilitate pulling the molding pin. For example, the spray nozzle 27 may have an outer transverse dimension from end to end of about one-half inch (½") with the wall thickness being in the range of about forty to fifty thousandths of an inch (0.040" to 0.050").

In the preferred form the nozzle shell sidewall is longitudinally fluted about its circumference to define a plurality of longitudinal flutes 30 intervened by hollow, longitudinal and arcuately spaced ribs 31. The ribs 31 have oblique sides 32 facing in the same circumferential direction, with only these oblique sides being provided with a plurality of jet outlet openings 33 of which the axes extend at obtuse angles to radii of the nozzle shell. Preferably the flutes 30 and ribs 31 are respectively four in number, as shown, and they are curvilinearly shaped and merged in transverse section so that the shapes of cross-sections of the nozzle shell therethrough are substantially symmetrical. As a result, the sprays of liquid, depicted at 34, which are emitted from the angularly disposed jet outlet openings 33 will provide collectively a swirling spray when the syringe is in use.

The spray nozzle 27 is connected to the tube delivery end 26 in a unique and effective liquid-tight manner by an elongated, substantially tubular and substantially form maintaining anchorage sleeve 35. Such sleeve may be formed as a section or length of extruded tubing, of any suitable polyolefin which is chemically inert to douche liquids and body fluid and which may have a hardness of about fifty to sixty (50 to 60) durometers and a wall thickness of about fifty to sixty (50 to 60) mils. In order that the sleeve 35 may be in the form of an expandable clamping sleeve it is provided with a lengthwise split 36 extending from end to end thereof. The opposed edges 37 and 38 on opposite sides of the split 36 will automatically spread apart when the clamping sleeve 35 is split from end to end, due to inherent elastic recovery in the arcuate sidewall. For example, such clamping sleeve, which may be a length of tubing about three-quarters of an inch ($\frac{3}{4}$ ") long having a thickness of about three-sixty-fourths of an inch ($\frac{3}{64}$ ") and an initial outside diameter of about nine-sixteenths of an inch ($\frac{9}{16}$ "), may in its relaxed and unconfined condition have an outer diameter of about three-eighths of an inch ($\frac{3}{8}$ ") with the opposed edges 37 and 38 of the split 36 at the inner side thereof being spaced about one-eighth of an inch ($\frac{1}{8}$ ") and spaced on the outer side almost one-quarter of an inch ($\frac{1}{4}$ ").

While the split sleeve 35 illustrated in the drawings as being provided with its split 36 extending substantially parallel to the sleeve axis it is to be understood that its advantageous use is not limited to such construction. For example, the split 36 may be provided by a spiraled slit extending from end to end of the sleeve 35.

As illustrated in FIG. 7 at least a longitudinal section of the split sleeve 35, with this section being of appreciable length, is inserted into the open delivery end 26

of the delivery tube 20, and the web of the latter is then snugged about a major arcuate section of this sleeve so as to provide a side fold 40 in the tube of appreciable width extending laterally from one side of the sleeve. For example, with the delivery tube 20 being of a width of about one and one-quarter of an inch (1¼") in the flat condition and the split sleeve 35 having an outer diameter of about three-eighths of an inch (¾") in the relaxed or unconfined condition, the side fold 40 in the delivery tube front end 26 will have a width of about nine-sixteenths of an inch (⅜"). The split sleeve 35 may then be suitably contracted, such as by pinching the tube side fold 40, to reduce the diameter of the sleeve and cause the opposed split edges 37 and 38 to be brought to substantial juxtaposition. Then the side fold 40 will be lapped back about an arcuate section of the contracted sleeve 35 so that the outer side of the longitudinal insert section of the sleeve is completely encompassed by the sheet material of the delivery tube 20. With these parts being maintained in such condition in front end of the split sleeve 35 and its covered longitudinal section are then inserted in the nozzle neck bore 41, as is illustrated in FIG. 8. The contracting force is then released so that the split sleeve and its delivery tube covering will be permitted to expand to snugness in the neck bore 41, as is indicated in FIG. 9. Such expansive action occurs readily since the opposed slick surfaces of the folded portions of the delivery tube 20 at its delivery end 26 readily permits relative sliding action. As a result, the expanded split sleeve 35 securely clamps between its outer arcuate surface and the inner cylindrical wall of the neck bore 41 the covering and lapping areas of this delivery tube front end in an effective liquid-tight manner with respect to the pressure of the liquid head of about two and one-half feet (2½') imposed upon the interior of the nozzle 27 when the liquid-containing bag 11 is supported or held in the normal elevated position above the point of use.

The top end 45 of the flat bag 11, which may have a width of about five inches (5"), has the opposed bag sidewalls terminating therein in opposed transverse edges 46 and 47. A transversely-extending, strengthening and stiffening, bag supporting strip 48 of relatively stiff sheet material is provided to extend the full width of the bag top end 45. Such strip of relatively stiff sheet material may be of compact fibrous character impregnated with a suitable polyolefin plastic. The strip 48 is folded longitudinally to provide a pair of opposed flaps 49 and 50 defined on opposite sides of a longitudinal fold line 51. The opposed transverse top edges 46 and 47 of the bag sidewalls 11 and 12 are inserted between the opposed transverse flaps 49 and 50 and suitably anchored thereto in the following manner.

One of the strip flaps, such as 49, is provided with a relatively narrow hinged end section 52 by separating it transversely from the remaining portion 53 of this flap by a transverse slit 54, so that the hinged end section may be swung up about the fold line 51 irrespective of the position of the remainder of this flap. The inside faces 55 and 56 of the remaining portion 53 of flap 49 and of the other flap 50 are anchored to the opposed faces of the top edges of the bag sidewalls 11 and 12 in any suitable manner, such as by cementing or heat sealing, to close a major portion of the bag top end 45. The hinged flap end section 52 has its inside face 57 free with respect to the opposed face of the adjacent bag sidewall 11, so as to define between the opposed edges of the bag sidewalls opposite this hinged flap end section an access opening 58 leading to the bag chamber, into which a liquid supply member, such as a spigot nozzle, a portion of which is shown at 59 in FIGS. 4 and 10, may be inserted for delivering into the chamber the desired quantity of water. Thereafter, with removal of the spigot nozzle 59 from the access opening 58 the hinged flap end section 52 may then be folded down substantially to the plane of the remain-

ing section 53 of the flap 49 so as effectively to close the bag top end 45 for use of the syringe device.

In use of the syringe device, after supplying liquid to the bag chamber 19, the user may support it at an elevated level by firmly grasping the folded strip 48, including its folded down end section 52. Elevated support of the filled bag 10 may, if desired, be accomplished in another manner, such as by supporting it upon a conveniently available hook. For this purpose, the full flap 50 and the flap portion 53, as well as the intervening zones of the top edges 46 and 47 of the bag sidewalls 11 and 12, may be provided with aligned holes. A grommet 60 may be inserted in these aligned holes and crimp anchored in a conventional manner. The resulting hole provides a suitable eyelet for receiving the tongue 61 of any suitable supporting hook or to carry a suspending loop. As is illustrated in FIG. 10 the filling action depicted therein should be accompanied by a closure of the passage through the delivery tube 20, so that the douche liquid will not be sprayed from the nozzle 27 prior to the douching procedure. This may be accomplished in any suitable manner, such as by pinching the sides of the delivery tube 20 together at a suitable point, as is indicated at 62.

In FIGS. 11, 12 and 13 are illustrated certain steps in the folding action to prepare the syringe device 10 of FIG. 1 for packaging and distribution. As is indicated in FIG. 11 the flat delivery tube 20 is folded back and forth upon the body of the bag 10, and the spray nozzle 27 is arranged alongside one panel, such as 49, of the stiffening strip 48. The folded structure of FIG. 11 may then be rolled up about the stiffening strip 48 and nozzle 27 into a compact pack or roll 63, as is indicated in FIG. 12. The compact roll or pack 63 is then suitably packaged in an enclosing box or package 64, as is indicated in FIG. 13. The compact resulting package 64 may then be commercially distributed in any desired manner, such as by means of a vending machine.

It will thus be seen that the objects set forth above, among those made apparent from the preceding description, are efficiently attained and, since certain changes may be made in the above construction without departing from the scope of the invention, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

Having described our invention, what we claim as new and desire to secure by Letters Patent is:

1. A disposable vaginal syringe comprising:

(A) a flat bag having its walls formed of highly flexible and foldable plastic sheet material which is substantially chemically inert to body fluids and douche liquids and providing an expandable liquid storage chamber having a filling opening at its top end and a delivery opening at its bottom end, and

(B) a flat, foldable and elongated delivery tube of similar plastic sheet material connected at its top receiving end to the bag walls in liquid-tight manner about the bag delivery opening with such tube being of a certain dimensional width when in flat condition and having an initially open delivery end, and

(C) a spray nozzle in the form of an elongated, thin-walled and substantially form maintaining hollow shell of plastic substantially chemically inert to such liquids and fluids having a closed tip end and a substantially cylindrical hollow neck of certain internal diameter with its sidewall provided with a plurality of jet outlet openings, characterized by

(a) an elongated, substantially tubular and substantially form maintaining anchorage sleeve of plastic substantially chemically inert to such liquids and fluids and provided with a lengthwise split extending from end to end thereof with opposed edges on opposite sides of the split being appreciably spaced when said sleeve is un-

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confined, said unconfined split sleeve being of an outer diameter at least no less than the internal diameter of said nozzle neck and appreciably less than the internal diameter of the delivery end of said tube when expanded to substantially tubular form with the spacing of the opposed split edges being sufficient to permit transverse contraction of said sleeve to a diameter less than said neck internal diameter and with said transversely contracted sleeve having an elastic recovery sufficient to cause it to expand transversely when freed substantially back to its unconfined outer diameter,

(b) at least a longitudinal section of said split sleeve of appreciable length being inserted into the open delivery end of said tube with a side fold of the latter of appreciable width lapped back about an arcuate section of said sleeve whereby the outer side of said longitudinal section of said sleeve is completely encompassed by the sheet material of said tube, the longitudinal section of said sleeve in contracted condition and the encompassing tube sheet material being inserted in said tubular neck and released to expanded snugness in the latter with the tube sidewall and its lapped side fold intervening and securely clamped between said sleeve and the inside wall of said nozzle neck in a liquid-tight manner.

2. The disposable syringe defined in claim 1 characterized by said nozzle shell sidewall being longitudinally fluted about its circumference to define a plurality of longitudinal flutes and intervening hollow, longitudinal and arcuately spaced ribs having oblique sides facing in the same circumferential direction with only said oblique sides being provided with said plurality of jet outlet openings to form a swirling spray when said syringe is in use.

3. The disposable syringe defined in claim 2 characterized by the walls of said flutes and ribs being curvilinearly shaped and merged in transverse section with the shapes

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of cross-sections of said shell therethrough being symmetrical and with the axes of said jet openings extending at obtuse angles to radii of said shell.

4. The disposable syringe defined in claim 1 characterized by the top end of said bag being of substantial width with the opposed sidewalls thereof terminating in opposed transverse edges, and a transversely extending, strengthening and stiffening, bag supporting strip of relatively stiff sheet material extending the width of the bag top end and folded longitudinally to provide opposed flaps between which the opposed transvers top edges of the bag sidewalls are inserted, one of said flaps having a relatively narrow hinged end section separated transversely from the remainder of this flap and swingable upwardly about the longitudinal fold line, the inside faces of the remainder of this flap and of the other flap being anchored to the opposed faces of the top edges of the bag sidewalls to close a major portion of the bag top end with the hinged flap end section having its inside face free with respect to the opposed face of the adjacent bag sidewall whereby an access opening to the bag chamber is provided between the top edges of the bag sidewalls beneath this hinged end section that is opened upon upward swinging of the latter.

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