Sept. 3, 1968 J. E. McLAUGHLIN 3,399,676

LIQUID DISPENSING APPARATUS FOR USE IN BODY TREATMENT

Filed Feb. 12, 1965 2 Sheets-Sheet 1

FIG_1

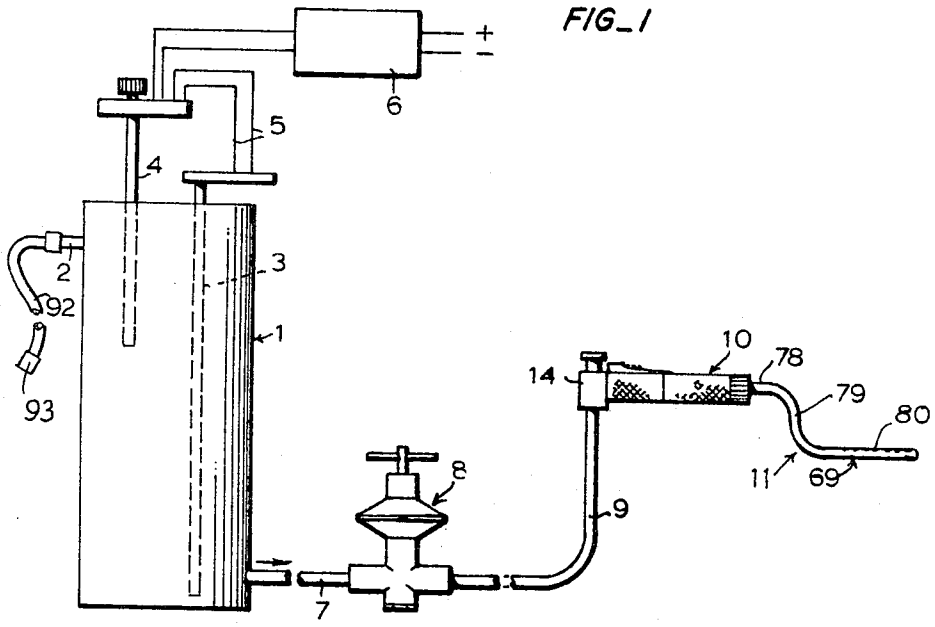


FIG_2

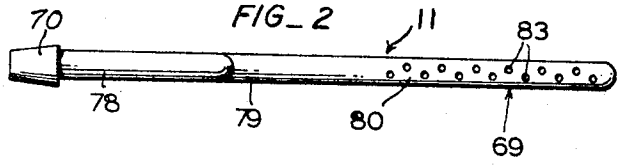
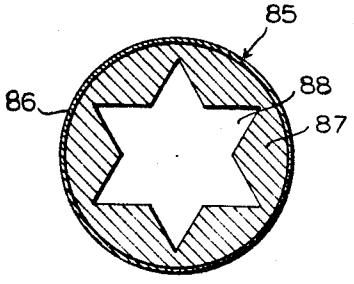


FIG_7



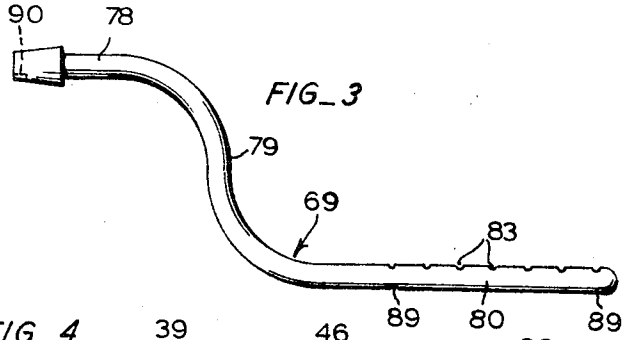
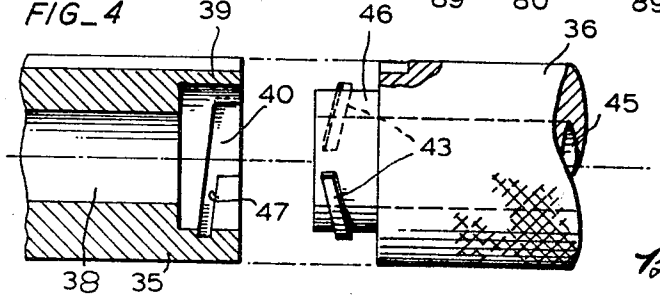


FIG_3

FIG_4



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LIQUID DISPENSING APPARATUS FOR USE IN BODY TREATMENT

Filed Feb. 12, 1965 2 Sheets-Sheet 2

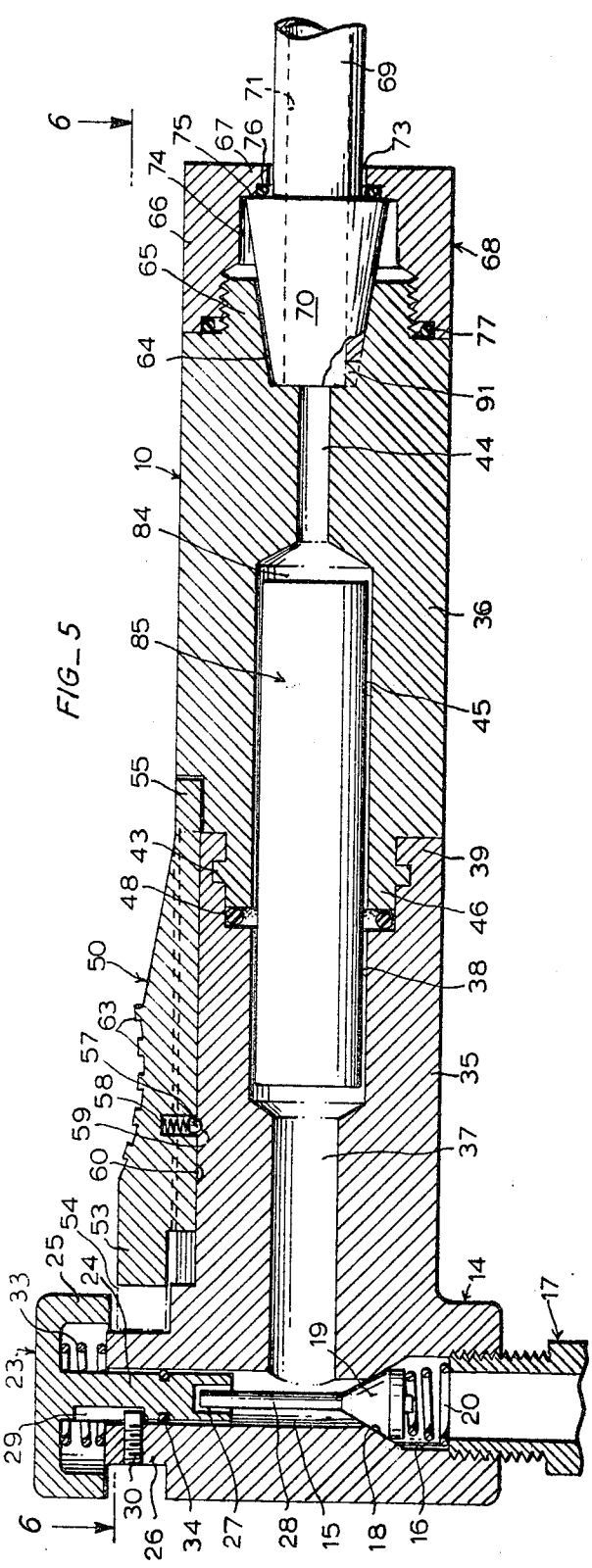

FIG_5

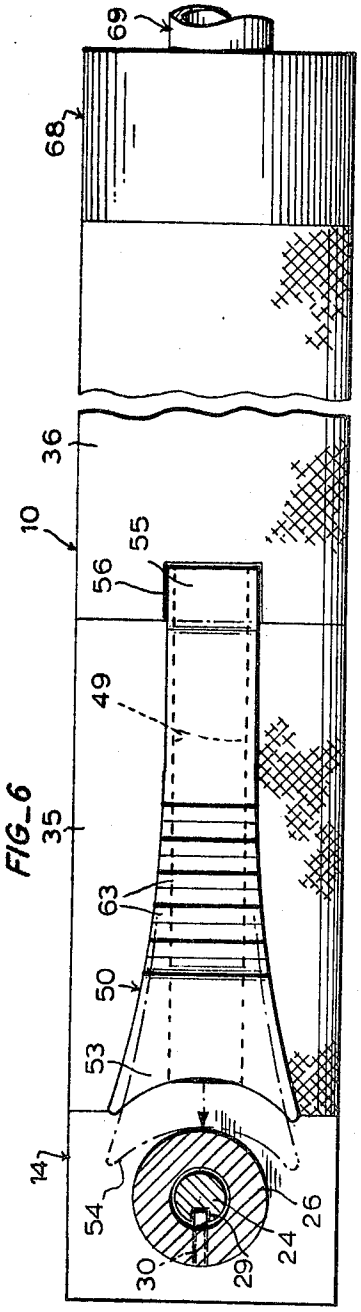

FIG_6

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United States Patent Office

3,399,676

Patented Sept. 3, 1968

3,399,676

LIQUID DISPENSING APPARATUS FOR USE IN BODY TREATMENT

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Filed Feb. 12, 1965, Ser. No. 432,297

6 Claims. (Cl. 128—229)

ABSTRACT OF THE DISCLOSURE

Apparatus for mixing and dispensing a temperature controlled, medicated douche from any source of water, under pressure, including means for maintaining the medicated solution so discharged at a substantially uniform concentration, temperature, and pressure, from the beginning to the end of the flow of the solution, and which means includes a water soluble solid body of a medicament in a conduit for the water, so shaped and related to the conduit as to provide a substantially uniform and constant surface area in contact with the water during dissolution of the medicament.

This invention relates to apparatus for dispensing and applying a temperature controlled medicated douche.

Heretofore mixing and dispensing apparatus, such as disclosed in U.S. Patent No. 3,044,465 of July 17, 1962, invented jointly by myself and Edith T. Anderson, has been adopted for use in hospitals and similar institutions for use by patients for similar purposes. However, such installations are relatively expensive and require features for mixing chemicals and water delivered from different sources in different amounts, all of which, together with the relatively numerous mechanical elements, fittings, tubes, etc., require inspection and maintenance properly done by hospital employees. The present apparatus is one that is suitable for home use by patients, in that it is quite simple, and provision is made to insure its safety and the proper automatic mixing of solutions, free from dependence on special mixing valves.

One of the objects of the invention is the provision of apparatus for dispensing and applying a temperature controlled medicated douche for the treatment of certain diseases or conditions of the human body, followed by a temperature controlled rinse douche of water, or either, and which apparatus is very simple, rugged, safe, economical to make and use, and one that will require little or no maintenance by skilled workmen or otherwise.

Another object of the invention is the provision of simple apparatus for dispensing an aqueous solution at a predetermined pressure, which solution includes one or more medicaments in a predetermined amount, said medicament or medicaments being a body of soluble material adapted to dissolve in the water flowing thereover to provide a solution having the desired ratio of medicament to water for application to the part of the body to be treated, upon such solution being discharged onto said part.

A still further object of the invention is the provision of an improved discharge handle and medicament container that enables the handle to be safely changed while the water for said solution leading to the handle is maintained under pressure.

An additional object is the provision of a method and apparatus for home use by a patient independently of a nurse or other assistance for safely applying a medicated douche to parts of the body to be treated, and which apparatus may be safely loaded with the medicament by the patient.

Other objects and advantages will appear in the description and drawings.

In the drawings,

FIG. 1 is a side elevational view of the apparatus employed, including the water system.

FIG. 2 is a top plan view of a disposable applicator, separate from the apparatus shown in FIG. 1.

FIG. 3 is a side elevational view of the applicator of FIG. 2.

FIG. 4 is an enlarged, fragmentary, part sectional, part elevational view of coupling structure between the coaxial tubular parts of the combined cartridge holder and handle of FIG. 5, said parts being shown before connection with each other.

FIG. 5 is a vertical sectional view taken through the combined handle and cartridge holder.

FIG. 6 is a cross sectional view taken along line 6—6 of FIG. 5.

FIG. 7 is an enlarged cross sectional view taken through a cartridge shown within the handle and holder of FIG. 5, but separate from said handle and holder.

In FIG. 1, tank **1** is vertically elongated, and while its capacity may vary, a practical and adequate size for home use is one having a one-gallon capacity. As will later be explained, in the present instance the arrangement is such that a one-gallon tank will deliver several gallons of water to the applicator for continuous discharge at a substantially uniform temperature.

A water supply pipe **2** enters the upper portion of the tank in relatively close relation to the top wall, which pipe is connected with the city main or other main source, under the normal pressure of from 20 pounds per square inch upward. The tank is enclosed and completely filled, and the water supplied thereto through pipe **2** is unheated and is normally of substantially uniform temperature.

A conventional, vertically elongated, rod-type electrical immersion heater **3** extends downwardly within the tank through the top wall of the latter to a point adjacent to its bottom wall, and a conventional vertically elongated immersion thermostat **4**, which is adjustable for temperature control, also extends downwardly into the tank **1** through the top wall of the latter with the control bulb of the thermostat restricted to approximately the upper third of the tank **1**, the height of the tank normally being several times its width, as shown in FIG. 1. The heating element **3** and thermostat **4** are in an electrical circuit **5** in which a conventional circuit breaker **6** is positioned.

A discharge pipe **7** opens into a side of tank **1** adjacent to the bottom of the latter, and preferably at the side opposite to the cold water inlet **2**, and an adjustable pressure regulator **8** is provided in pipe **7** to reduce the pressure of the water at the discharge side of said regulator.

Connected with the discharge side of the pressure regulator is a flexible tube **9**, the discharge, or outer end of which is connected with one end of a handle, generally designated **10** (FIGS. 1, 5, 6). A removable applicator, generally designated **11** connects with the opposite end of handle **10**.

Handle **10** is elongated, and the end thereof with which the hose or tube **9** is connected is formed with a head portion **14** having an open ended bore **15** extending therethrough transversely of the longitudinal axis of the handle **10**. One end of bore **15** is formed with a counterbore **16**, the latter being threaded for a fitting **17** to which line **9** is connected.

A tapered shoulder **18** is formed at the juncture between bore **15** and counterbore **16**, which shoulder provides a valve seat for a complementarily tapered outer surface of a valve element **19**, which element is reciprocable within the counterbore **16** axially thereof.

The handle **10** will be described with respect to its position as seen in FIG. 5 since this is approximately its normal position when in use.

A spiral spring 20 within the counterbore 16 reacts between said valve element 19 and the fitting 17 to yieldably hold said valve element substantially in closed position, until positively moved downwardly away from the valve seat 18, although said valve element will normally be held in closed position by the liquid pressure in line 9.

A finger actuatable button or valve actuating member 23 is at the upper end of bore 15 that is opposite to fitting 17, which member is in the form of a cap having a central depending projection 24 that, in turn, is reciprocable in bore 15 axially thereof. A depending annular flange 25 on member 23 is adapted to receive the adjacent, restricted diameter portion 26 of head 14 when said member 23 is moved toward said head.

The lower end of the depending projection 24 on member 23 is formed with an axially outwardly opening recess 27, which is downwardly opening, as seen in FIG. 5, into which the upper end of a stem 28 loosely projects. This stem is coaxial with and extends upwardly from valve element 19, as seen in FIG. 5.

One side of the depending projection 24 on member 23 is formed with a vertically elongated recess, and a screw 30 extends through one side of the portion 26 of head 14 and into said recess to limit the reciprocable movement of the member 23 and the depending projection 24 thereon. This recess is designated 29.

A coil spring 33 reacts between member 23 and the upper end of portion 26 of head 14 to yieldably hold the member 23 in elevated position so that the valve element 19 will be self seating under the influence of liquid pressure in line 9 and spring 20. An O-ring 34 in an annular outwardly opening recess on the depending projection 24 will seal the upper portion of bore 15 against leakage of liquid therepast.

When the member 23 is in elevated position, the pin or screw 30 will engage the lower end of the recess 29 in projection 24 and the lower edges of flange 25 will be approximately even with the upper end of portion 26.

The main horizontal body of the handle 10 projects laterally away from the head portion 14, and is formed in two tubular parts, one part 35 being integral with head 14 and the other part being designated 36 and in axially outward extension of part 35.

A horizontally extending bore 37 in part 35 opens at one end into a side of bore 15 above the valve seat 18 in head 14, and the opposite end of bore 37 spaced from bore 15 is counterbored to provide an enlarged diameter portion 38.

The outermost end section 39 of part 35 at the outer end of enlargement 38, relative to head 14, is further internally enlarged with the inner surface of said section 39 being formed with recesses 40 (FIG. 4) at opposite sides thereof for releasably receiving locking lugs 43 on part 36 to provide a substantially bayonet-type coupling between parts 35, 36.

The part 36 is coaxial with part 35 and is formed with a bore 44 in the end portion thereof that is remote from the part 35 that is of a diameter substantially less than the diameter of bore 37, while bore 37 is greater than bore 15.

The part 36 is counterbored from the end thereof that is adjacent to part 35 to provide an enlarged portion 45 coaxial with, and of the same diameter as the enlarged portion 38 in part 35.

The terminating end portion 46 of part 36 that is adjacent to part 35 of reduced outside diameter and carries the locking lugs 43 that are adapted to enter the recesses 40 in end portion 39 of part 35. The recesses 40 include generally helically extending portions 47 relative to the axis of part 35 so that upon lugs 43 entering the recesses 40 and being given a predetermined fractional rotation relative to part 35 (which rotation is limited by the outer closed ends of recesses 47), a tight couple between parts 35, 36 will be effected. However, the terminating end edge of the end portion 46 on part 36 is spaced from the axially facing shoulder at the juncture between the end section 39 on part 35 and the main body of the latter for an O-ring 48 to effect a liquid tight seal between said parts 35, 36.

The upper surface of part 35 is formed with an elongated dovetail groove or recess 49 (FIG. 6) extending from a point adjacent to the portion 26 on head 14 to the outer end of part 35, and a manually actuatable elongated slide 50 having its edges formed complementary to the dovetail sides of recess 49 is slidably fitted in recess 49 for horizontal reciprocable movement of the slide in said recess longitudinally of the latter.

The end portion 53 of slide 50 that is adjacent to portion 26 on head 14 is adapted to slide under the flange 25 when the slide is moved toward said portion 26, to dot-dash line position 54 (FIGS. 5, 6) to positively prevent downward movement of the member 23 to a degree that would open valve 19.

In the full line position of slide 50, as seen in FIGS. 5, 6, the end portion 55 that is remote from head 14 will enter a recess 56 formed in part 36, when the parts 35, 36 are coupled together, thus preventing said parts from being uncoupled when the member 23 is in a position to actuate valve 19 to move the latter to open position.

A spring urged detent 57 is carried by slide 50 and is adapted to be yieldably held by spring 58 in a recess 59 formed in part 35 when the slide 50 is in the full line position, and said detent will be yieldably held in recess 60 when the slide is moved to the dot-dash line position 54. Transversely extending ribs 63 formed on the upper surface of slide 50 in a concavely curved row are adapted to be engaged by a finger of the user to push the slide to and from the full line position. Thus, the slide will be yieldably held in one position or the other according to the recess in which detent 57 is held.

The outer end of part 36 is formed with an outwardly opening taper-sided recess 64 that is coaxial with bore 44, the smaller diameter end of said recess 64 being adjacent to the outer end of bore 44 and preferably of larger diameter than the diameter of said bore, and the outer end of part 36, designated 65, is of reduced outside diameter and is threaded for threadedly engaging the internal threads on annular flange 66 that is formed on the head 67 of applicator retaining cap generally designated 68.

The applicator itself (FIGS. 2, 3) is an elongated relatively rigid plastic tube 69, one end of which is formed with a taper-sided head 70, the outer surfaces of which are complementary to the tapered surfaces of the enlarged taper-sided recess 64 of the bore 44, and the uniform diameter passageway 71 in said tube (FIG. 5) opens outwardly through said head 70 coaxially thereof, while the opposite end of the tube is closed.

The head 67 of retaining cap 68 is centrally apertured at 73 to pass the tube 69, and said head is counterbored at 74, to receive the larger diameter end of the taper-sided head 70 of tube 69. An axially facing shoulder 75 on head 67 of the retainer cap 68 is adapted to engage the axially facing shoulder on the head 70 of the tube or applicator 69 at the enlarged diameter end of said head 70, and a rabbet around aperture 73 of head 67 of the retainer cap 68 has an O-ring 76 therein to prevent leakage of liquid past said ring. Also an O-ring 77 is positioned in a rabbet around the inner side of flange 66 along its terminating end edge to prevent leakage of liquid past the juncture between the retaining cap 68 and the part 36.

The applicator tube itself is formed longitudinally thereof to a generally ogee curve to provide a straight imperforate shank 78 extending axially of the handle 10 for a short distance, then an angularly extending intermediate imperforate portion 79 and a straight outer, end portion 80 that is substantially parallel with the shank 78 but offset to one side of the latter. The said outer end portion is formed with a pair of parallel rows of spaced spray openings 83 in the side that faces generally toward the longitudinal axis of the shank 78 with the openings in one row in staggered relation to the openings in the other row, and said openings in said rows are directed outwardly at

an angle of approximately 5 degrees relative to vertical, when said shank, intermediate portion and outer end portion are in a vertical plane, so that the solution ejected upwardly therefrom will not fall directly back onto the openings to block the solution being ejected.

The shape of the applicator tube **69** enables it to extend over the rim of a toilet bowl at the shank, with the perforated outer end portion **80** in a position below the perineal area of the body of a person seated on the toilet.

The enlarged internal diameters **38**, **45** of the parts **35**, **36**, together provide a horizontally elongated, enlarged, cylindrical sided chamber **84** of uniform diameter within the handle **10** extending axially thereof, between bores **37**, **44** and coaxial therewith. A cylindrical cartridge generally designated **85** is adapted to removably fit within chamber **84** and to extend approximately from end to end of the latter.

The cartridge **85** comprises a relatively thin, cylindrical, open ended outer shell of water impervious material **86** of an outside diameter slightly less than that of the chamber so as to be readily fitted in said chamber and removed therefrom.

Within said shell, and preferably extending substantially from end to end thereof, is a solid, water soluble liner-body **87** composed of the desired soluble salts or chemicals for medicating the area to which a solution of such chemicals is to be applied.

The body **87** is formed with a through passageway or bore **88** extending axially thereof, the perimeter of which bore is such that the exposed surface area thereof will remain approximately uniform as the solid is dissolved. FIG. 7 shows a bore **88** as having a cross sectional contour corresponding to the outline of a six-pointed star, which is one form that is satisfactory. The rate of dissolution of the body **87** from the core outwardly will be substantially constant until the body is dissolved. The chemical mixture of the body, and its rate of dissolution by the water passing through the bore of the body will determine the concentration of the medicated solution that is discharged from the applicator.

The concentration of the solution discharged, and the time required for dissolving the body **87** at the temperature and rate of flow of the water from tank **1**, are normally such that, for a treatment, the body **87** will be completely dissolved and it will be automatically followed by a rinse of clear warm water of the desired duration.

Referring back to the water tank **1**, which, in a small household unit, has a capacity of approximately one gallon, the thermostat will be adjusted to attain the desired water temperature at the bottom of the tank, hence the temperature of the water in the upper portion of the tank will be substantially higher.

In use, as warm water of the desired temperature is drawn from the bottom of the tank through line **7**, cold water from inlet pipe **2** will enter the top of the tank to mix with the hot water in the upper portion of the tank, lower its temperature so it will be at the desired temperature when discharged. Thus, in one treatment, approximately two gallons of water at the desired warm temperature may be drawn continuously from a one-gallon tank.

The importance of this arrangement is in not only providing a small unit that may be carried by a person while travelling, but one that is light in weight and economical to make, and one in which the patient may readily perform the desired or necessary cleansing, medicating and rinsing operation without using a timer or complicated shut-off mechanism, since the slight change in the temperature of the solution is apparent when approximately two gallons of water has passed through the device.

Obviously, proportions and sizes may be modified to provide for longer or shorter application, and the volume of the soluble body **87** may vary without changing the structure of the apparatus itself.

A drain opening **89** may be formed in the underside of the outer portion **80** at each end of the portion **80** (FIG. 3) to provide for drainage of liquid from the applicator before it is removed and stored. Obviously, the structure of the handle and applicator enable quick replacement of the applicator where several persons are using the device, so there will be no danger from cross contamination.

In order to insert or replace a cartridge **85**, it should be noted that the parts **35**, **36** must be separated, and to separate them, the slide **50** must be moved toward the head **14** of the handle so that end portion **55** of the slide is out of the recess **56** in part **35**. Thus it is apparent that the finger actuatable member **23** cannot be depressed to open valve **19** when the parts **35**, **36** are being separated.

Insofar as the applicator itself is concerned, for convenience of the user in positioning the applicator so the push button **23** is uppermost when the end portion **80** is lowermost, one edge of the head **69** on the applicator may be notched out at **90** (FIG. 3) to receive a corresponding projection **91** (FIG. 5) that projects radially inwardly into the taper sided recess **64** at the smaller diameter end of the latter. By this structure the applicator will always be in the correct and most convenient position relative to the valve actuating button or cap **23** on head **14**.

While the cold water inlet pipe **2** may be more or less permanently connected with a municipal or other water supply source under the usual pressure, a flexible hose **92** may be connected with said pipe **2** having a suitable coupling **93** for connecting it with a source of water under pressure, thus enabling a person to carry the apparatus from place to place and connect it with any suitable water system.

The bore **44** between the cartridge **85** and the applicator restricts the flow of water at this point so that the bore of the cartridge **85** is always filled with water, thereby insuring proper concentration of the chemicals in the water. Preferably the pressure regulator **8** is set for a pressure of three to five pounds on the low presure side. At this pressure the water will flow to the applicator and from the latter at the rate of approximately one and one-half of two quarts per minute. Most treatments last from about two to three minutes, hence from about one to one and one-half gallons of water are used at each application.

As has been noted, the cartridge will dissolve when substantially one gallon of water has passed through the applicator, and thereafter the water will be clear, thus automatically providing a rinse of clear temperature controlled water, since the incoming water will be mixed with the hotter water in the upper portion of the tank as the water at the correct temperature is withdrawn from the lower end of the tank.

The handle **10** and applicator **69** as a whole or unit may be called a dispensing nozzle or nozzle.

While no claim is made to any specific formulation for the cartridge, one example of a formulation that is satisfactory for many types of treatment, and principally for its cleansing and antiseptic properties, is as follows:

	Percent
Sodium lauryl sulfate	34.0
Coconut acid ester of sodium isothionate	5.0
Sodium bicarbonate, U.S.P.	56.4
Citric acid, U.S.P.	3.54
Hexachlorophene	1.0
Lilac perfume	0.06

It is obvious that others may be formulated for different purposes but preferably they should be of a character that will completely dissolve in a single treatment of normal length at the desired temperature with a rinse at the end of such treatment. Inasmuch as each treatment is normally of short duration of substantially less than five minutes, a user quickly knows when a full treatment is concluded without any automatic time or volume control. One feature that contributes to the safety in the use of the device is that the cartridge, which may be called the prescription product, is a water soluble product that is automatically dissolved in water at a predetermined temperature at a predetermined rate during a treatment to be

applied to the part to be treated at a predetermined safe pressure and to be exhausted as a medicated solution when the treatment is concluded and immediately followed by a rinse of clear water at the desired temperature and pressure.

The apparatus described broadly enables the carrying out of a method of treatment of tissue within the body of a person that comprises the steps of; providing a body of water and heating water of said body to a predetermined temperature that is safe for application to said tissue; conducting the water so heated through a passageway having inner walls of a limited section thereof of a solid, water-solvent material including a medicament to provide a solution that includes said medicament, and discharging said solution at the end of said passageway into a person against said tissue; controlling the rate of flow of said water and the volume thereof through said section to a predetermined rate and volume per minute proportioned to the rate of solubility of said section to provide for discharge at said end of said passageway of a solution having said medicament of substantially uniform strength, and limiting the volume of said section of said walls to an amount substantially sufficient for one treatment only, and thereafter continuing the passage of water from said body thereof through said passageway to said discharge point without interruption to thereby rinse the tissues against which said solution has been applied.

Heretofore where liquids are mixed with water to form a solution to be applied to body tissues which may be injured or diseased, there has been a problem of maintaining the solution at a uniform temperature. The different liquids must be heated to the temperature of the water, or the temperature of the solution will vary as the temperature of the different liquids vary, and where some of the liquids must be replaced, the replacement liquids would be brought to the desired temperature.

This is not difficult in larger installations, as in hospitals, where the entire system including the sources of the different ingredients of the mixture are maintained in a heated area, but, for home use, there is no room for the facilities necessary to accomplish this result.

The use of the word "medicament" is intended to include antiseptics or disinfectants and any other products that are adapted to promote the welfare of the tissues to which the solution is applied, including those that promote the efficiency of the solution in any way.

In the present instance there is no such problem since no liquids are introduced into the water, yet the ultimate solution is the same as where liquids were added to make the solution.

The advantages of the particular structure employed has been described. Obviously other modifications and variations of the present invention are possible in the light of the above teachings. It is therefore to be understood that any modifications within the scope of the claims may be made in construction without departing from the principle of the invention or sacrificing any of its advantages.

I claim:

1. In apparatus for making and dispensing an aqueous cleansing, sanitizing, and treating solution for application to body tissue within a body cavity, wound and the like; a dispensing nozzle, comprising:

(a) an elongated outer tubular body having a passageway extending therethrough opening outwardly of said body at its opposite ends providing an inlet for water at one end and an outlet for said solution at its opposite end;

(b) said body being separable along a line of separation extending transversely of said body and passageway at a point intermediate the ends of said body for exposing sections of said passageway at opposite sides of said line of separation for receiving opposite end portions of an elongated cartridge of water soluble salts therein in a position extending transversely across said line of division when said end portions of said body are connected together, and for dividing said body into an inlet end portion having said inlet and an outlet end portion having said outlet, said sections of said passageway being elongated longitudinally of said body and of a larger uniform diameter than the portions of said passageway respectively extending therefrom toward said inlet and said outlet, and reduced diameter portions of said passageway in said inlet and outlet end portions of said body so extending from said sections toward said inlet and outlet;

(c) a cartridge comprising an elongated tubular open-ended body of solidified water soluble salts incorporating a medicament, and an outer tubular shell of water impermeable material around and coaxial with said body of salts and bonded therewith, said cartridge being removably disposed within said sections of said passageway extending across said line of division substantially to said reduced diameter portions at its ends whereby upon separation of said body an end portion of said cartridge will project from said inlet or said outlet portion of said body for removal and replacement, said cartridge having an open-ended bore, the open ends of which are respectively adjacent to and coaxial with said reduced diameter portions of said passageway for conducting said water through said bore in contact with the walls thereof from said inlet end portion to said outlet end portion whereby said walls of said bore will be dissolved by said water to form the solution conducted to said outlet and the radially outer surface of said body of salts will be sealed by said shell against contact with the water passing through said bore until said body of salts is substantially completely dissolved;

(d) coupling means respectively on said inlet and said outlet end portions of said outer tubular body adjacent to said line of separation movable from uncoupled position in which said end portions are disconnected to coupled position, securing said end portions together and vice versa when said cartridge is enclosed with said larger diameter sections of said passageway and said end portions are in engagement with each other at said line of separation;

(e) a valve member in said inlet end portion movable from a closed position to an open position and vice versa;

(f) finger actuatable valve actuating means supported on said inlet end portion for reciprocable movement transversely of said outer body and projecting from one side of said inlet end portion operably connected with said valve member for moving said valve member from said closed position to said open position upon application of pressure of a finger of the operator grasping said outlet end portion against said finger actuatable means, and means for automatically moving said finger actuatable valve actuating means to its original outward projecting position upon removal of pressure against said finger actuatable valve actuating means to permit movement of said valve member to said closed position and means for automatically so moving said valve member to said closed position upon removal of said pressure;

(g) said nozzle including an elongated tubular applicator removably secured at one end thereof in said outlet in a position rigid relative to said outlet end portion and projecting axially outwardly of said outer tubular body for conducting said solution from said passageway and inlet, said applicator being formed with a plurality of discharge openings for discharge of said solution against said tissue when said applicator is within a body cavity or a wound;

(h) means for connecting said inlet with a source of water under pressure.

2. In apparatus as defined in claim 1:

(i) finger actuatable body locking means supported on said elongated outer body for reciprocable movement longitudinally of the latter from an unlocked position to one side of said line of division in which said coupling means are movable from said uncoupled position to said coupled position, to a locked position extending across said line of division and in engagement with said outlet end portion positively locking said coupling means in coupled position against movement to said uncoupled position and vice versa, said finger actuatable body locking means being between said line of division and said finger actuatable valve actuating means accessible for operation to the finger adapted to actuate said valve actuating means.

3. In apparatus as defined in claim 2:

(j) valve holding means on said body locking means movable therewith upon movement of said body locking means to unlocked position into a position obstructing movement of said finger actuatable valve actuating means for moving said valve member to its open position, whereby said finger actuatable valve actuating means will be inoperative for moving said valve member to open position when said body locking means is in its unlocked position;

(k) said valve holding means being movable with said body locking means to a position releasing said valve actuating means in which said finger actuatable valve actuating means is free for moving said valve member to its open position upon movement of said body locking means to its said locked position.

4. In apparatus as defined in claim 1:

(i) the cross sectional contour of said shell being of uniform cross sectional contour from end to end and the surface of said bore of said cartridge being of a uniform cross sectional contour from end to end of said cartridge to provide a substantially uniform amount of surface area exposed to said water at all times during dissolution of said solid body of salts from said bore outwardly to said shell, whereby the strength of said solution will remain substantially uniform during flow of said water through said bore to said outlet and during complete dissolution of said solid body of salts.

5. In apparatus for making and dispensing aqueous solutions for application to body tissues within body cavities, wounds and the like, for cleansing, sanitizing and treating said tissues:

(a) a dispensing nozzle comprising an elongated body having a passageway therethrough longitudinally thereof provided with an inlet for water at one end thereof and an outlet at its opposite end;

(b) a cartridge comprising a solid body of water soluble salts incorporating a medicament therein held within said passageway spaced between said inlet and said outlet, said cartridge having an axial open ended noncircular bore therethrough, the open ends of which are respectively in communication with said inlet and outlet for conducting said water through said bore in contact with the walls thereof to said outlet, the inner surface area of the walls forming said bore being substantially equal to the outer surface area of said cartridge, and the surface of said bore being of a uniform cross sectional contour from end to end of said cartridge, whereby a predetermined amount of surface area is exposed to intimate contact with the water adapted to pass through said bore from said inlet, and said surface area so exposed will remain approximately uniform as said solid is dissolved radially outwardly to provide a solution of substantially uniform strength for passage from said solid body to said outlet,

(c) said dispensing nozzle including a tubular applicator for said solution removably secured at one end thereof in said outlet and projecting outwardly of said body for insertion into the body cavity of a person, said applicator having discharge openings formed in its outwardly projecting portion for discharge of said solution onto said tissues;

(d) a manually actuatable valve member on said elongated body at said inlet to said passageway for opening and closing said passageway to flow of water therethrough and past said cartridge; and

(e) means for connecting said valve member to a source of water under pressure for passage through the latter to said passageway.

6. In apparatus as defined in claim 5:

(f) said passageway being of cylindrical cross-sectional contour, and said cartridge being tubular having a cylindrical external cross-sectional contour adapted to exteriorly substantially fit within said passageway, said bore being of substantially star-shape in cross-sectional contour to provide said exposed surface area adapted to be in intimate contact with water passing through said bore.

References Cited

UNITED STATES PATENTS

745,815	12/1903	Gibson	285—85
808,446	12/1905	Gill et al.	285—85
1,428,933	9/1922	Bean	285—85 XR
1,654,745	1/1928	Miller	128—229
1,858,054	5/1932	Miller.	
2,117,622	5/1938	Morton et al.	128—229
2,199,844	5/1940	Tucker	128—229
2,272,381	2/1942	Marvin	128—229
2,484,290	10/1949	Handel	128—239
3,044,465	7/1962	Anderson et al.	128—230
3,085,573	4/1963	Meyer et al.	128—224 XR

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