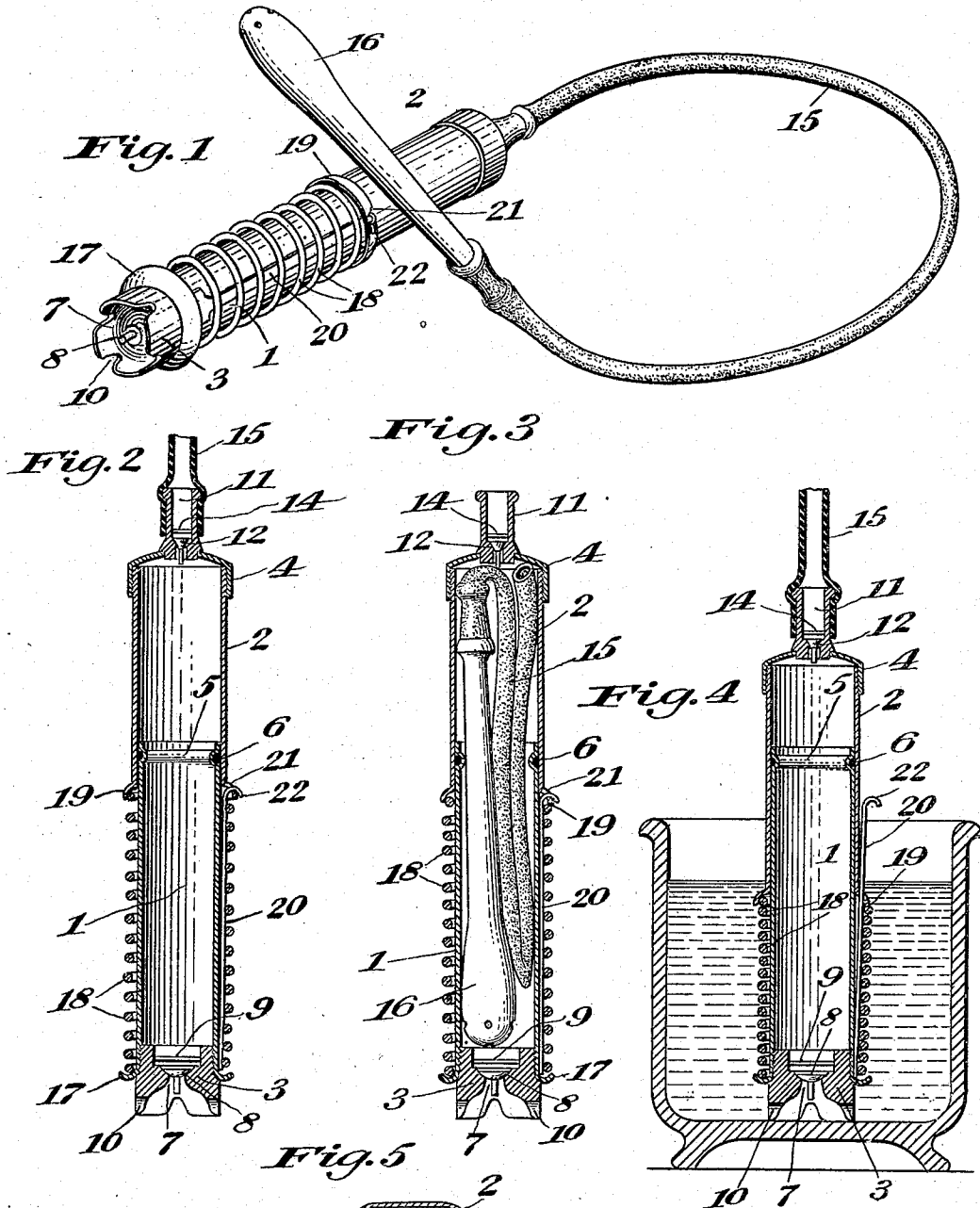


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 SYRINGE.

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SYRINGE.

933,490.

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To all whom it may concern:

Be it known that I, CHARLES REMHOF, a citizen of the United States, and a resident of Brooklyn, Kings county, New York, have invented certain Improvements in Syringes, of which the following is a specification.

This invention relates to certain improvements in syringes, and more particularly to that class of such devices which are especially designed and adapted for vaginal and other similar uses, and the object of the invention is to provide a device of this general character of a simple and comparatively inexpensive nature, and of a strong and compact construction, permitting the improved syringe to be readily packed within a small compass so as to be capable of being conveniently put out of the way when not required for use.

The invention consists in certain novel features of the construction, and combinations and arrangements of the several parts of the improved syringe, whereby certain important advantages are attained, and the device is rendered simpler, cheaper and otherwise better adapted and more convenient for use, all as will be hereinafter fully set forth.

The novel features of the invention will be carefully defined in the claims.

In the accompanying drawings, which serve to illustrate my invention—Figure 1 is a perspective view showing a syringe embodying my improvements; Fig. 2 is a sectional view taken axially through the syringe, the flexible tubing and discharge nozzle being broken away for lack of space; Fig. 3 is a sectional view, similar to Fig. 2, but showing the improved syringe compacted, the flexible tubing and discharge nozzle being disconnected from the body portion of the device and packed within the barrel or cylinder thereof; Fig. 4 is another sectional view, similar to Fig. 2, but showing the body portion of the improved syringe compressed as it appears when operated to discharge the contained fluid from its barrel or cylinder, and Fig. 5 is a sectional view taken transversely through the cylinder or barrel of the syringe and illustrating a modified form of the device wherein said cylinder or barrel is made flattened in cross section.

As shown in Figs. 1 to 4, the improved syringe is constructed with a cylindrical body portion formed from a lower or base member 1, and an upper or actuating mem-

ber 2, said members 1 and 2 being made from thin metal tubing and having their interiors adapted for communication to produce a liquid chamber within said cylindrical body portion. The lower or base member 1 is formed from tubing with an exterior diameter as nearly like the interior diameter of the upper or actuating member 2 as is practicable, and the side walls of said lower or base member 1, are adapted to fit snugly within and slide telescopically flush upon and along the side walls of the upper or actuating member 2 in order to permit the body portion or barrel formed from said members to be longitudinally compressed or extended in the operation of the syringe for discharging liquid from or drawing the same into the liquid chamber produced within said body portion or barrel, as will be hereinafter explained. This construction of the members 1 and 2 insures accurate and flush contact of the side walls of the members, when the body portion or barrel is compressed, as shown in Fig. 4, throughout substantially the whole extent to which said members are overlapped, and thereby permits of dispensing altogether with the employment of extraneous guiding means, and affords the maximum pumping capacity consistent with the length of the body portion or barrel when compressed. The structure is, moreover such that the upper or actuating member 2 affords a cap or closure for the upper open end of the lower or base member 1, and thereby affords a material simplification of the device.

3 and 4 represent end members or valve casings which are secured upon the opposite open ends of the respective lower and upper members 1 and 2, said end members 3 and 4 being herein shown provided with screw connections with said tubular members 1 and 2, although it will be evident that the present invention is not limited to the employment of said screw connections and that any other preferred attachment may be substituted therefor. The upper end member 4, however, is preferably adapted for ready detachment from the upper tubular member 2, in order that access may be afforded to the interior of the barrel or body portion for purposes to be hereinafter explained.

At the overlapping ends of the telescoping tubular members 1 and 2 of the device I provide a packing to prevent excessive leakage of the fluid between the parts, and I

have herein shown this packing in the form of an annular band or gasket 6 of rubber or other suitable material which is held in place in a seat or channel 5 extended around the upper end of the lower tubular member 1, said channel being formed by swaging the material from which said member is formed inwardly in a manner which will be readily understood by inspection of the drawings.

The lower end member or casing 3 is formed with a passage 7 extended centrally through it, the lower end of said passage being expanded, and the wall of said end member or casing being notched at suitable intervals as shown at 10, to afford access to the said expanded lower end of passage 7, when the syringe is rested upon the bottom of a vessel containing a supply of liquid, as shown in Fig. 4, so that the liquid contained in said vessel may enter said expanded lower end of passage 7, and the upper end of said passage 7, where it communicates with the interior or bore of the cylindrical body portion of the device is provided with a valve seat adapted to be engaged by a valve 8 provided with a check 9 for limiting its movement and so arranged as to permit free entry of liquid into the bore of the body portion through said passage 7, while being adapted to effectively prevent, by its engagement with said valve seat, the outflow of liquid from the body portion through said passage.

The detachable upper end member or casing 4 is provided with a nipple 11 extended from it and adapted for detachable connection with a flexible tube 15 of rubber or the like, the extremity of which is likewise adapted for detachable connection with a discharge nozzle 16 in a well known way, and a passage is provided within said nipple 11, with its lower end communicating with the interior or bore of the body portion of the device for the discharge of liquid therefrom to the flexible tube 15, which passage has a valve seat adapted to be engaged by a valve 12, the movement of which is also limited by a check 14 in a well known way. This valve 12 is adapted, by engagement with its seat, to prevent the backflow of liquid or air from the tube 15 into the interior or bore of the cylindrical body portion of the syringe, but is adapted to permit the free flow of the liquid from said body portion through said tube 15 in order that the same may be discharged at the nozzle 16. The valved inlet and valved outlet of the body portion being, by this construction, located adjacent to the opposite ends of the device, it will be evident that occlusion of said outlet and inlet during the telescopic movement of the members from which the body portion is produced is effectively avoided and a maximum discharge capacity is afforded.

At the lower part of the cylindrical body

portion of the syringe is arranged an annular flange 17, projecting around the lower end of the lower tubular member 1, and herein shown as formed integrally with the lower end of said member 1 by pressing the material from which said member is formed outwardly, and this flange forms an abutment or shoulder against which is rested the lower end of a spiral spring 18, which encircles said lower tubular member above said shoulder or abutment and has its upper end engaged with a similar abutment or shoulder 19 produced at the lower end of the upper tubular member 2 of the device, and which is formed, as herein shown, of an integral annular flange bent or swaged outwardly around the said lower end of the member 2. By this arrangement of the parts it will be seen that the tension of the spring 18 is normally exerted to hold the two tubular members 1 and 2 of the body portion slid endwise one upon the other in such a way as to extend or elongate said body portion as shown in Figs. 1, 2 and 3, the liquid chamber within said body portion being thus given a greater capacity than that of either of its members separately considered, and said spring being coiled upon the exterior of the device is readily accessible for purposes of repair, and is not liable to be corroded by the liquid in connection with which the improved syringe is used, as would be the case were said spring arranged within the liquid chamber. In order to prevent separation of said tubular members 1 and 2 from each other I provide a securing device connected at one end with one of said members and having its opposite end adapted for sliding engagement with the other member in such manner as to effectively prevent dislocation of the parts while permitting the sliding movement of the members relative to each other which is necessary for the operation of the improved syringe. This securing device, as herein illustrated, is in the form of a narrow strip 20 of metal, extended parallel with and closely adjacent to the lower tubular member 1, and preferably inclosed within the spiral spring 18 so as to be protected thereby, the lower extremity of said strip 20 being connected with said lower tubular member 1 near the lower end of the latter, while the upper end of said strip is passed through and adapted for sliding engagement in an aperture 21 produced in the annular flange 19 at the lower end of the upper tubular member 2, and has a bent extremity 22 which forms an enlargement adapted for engagement against the upper surface of said flange 19 in such a manner as to limit the longitudinal extension of the body portion of the device and prevent separation of the members from which the same is formed.

In the use of the device, the flexible tube 15 and nozzle 16 being attached to the body

portion of the syringe, the lower end of said body portion, comprising the lower end member or casing 3, is dipped within the liquid contained in a suitable vessel, where-
 5 upon by pressing the upper member 2 down-
 ward upon member 1 against the tension of
 the spring, the air will be discharged from
 the body portion of the device, and upon
 permitting said spring to react and lift said
 10 upper member, a portion of the liquid con-
 tained in said vessel will be drawn through
 the ports 10 and passage 7 into said body
 portion to replace said discharged air. By
 repeating this operation until the body por-
 15 tion shall have become filled with the liquid
 it is evident that such liquid will thereafter
 be discharged from the body portion through
 the flexible tube and nozzle 16 as in the well
 known bulb syringe.

20 When the device is not required for use,
 the upper end member or casing 4 may be
 detached to afford access to the interior or
 bore of the body portion, which thereupon
 serves as a receptacle for the flexible tube
 25 and nozzle 16 upon the disconnection of
 these parts at the nipple 11, whereby as indi-
 cated in Fig. 3, the character of the device
 is to a great extent disguised, while at the
 same time the tubing and nozzle are ready
 30 at hand for use.

From the above description it will be seen
 that the improved syringe constructed ac-
 cording to my invention is of an extremely
 simple and comparatively inexpensive con-
 35 struction and is especially well adapted for
 use by reason of its compact and durable
 construction, and it will also be obvious
 from the above description that the device is
 susceptible of some modification without
 40 material departure from the principles and
 spirit of the invention and for this reason
 I do not desire to be understood as limiting
 myself to the precise form and arrangement
 of the several parts herein set forth in carry-
 45 ing out my invention in practice. Nor do
 I desire to be understood as limiting my-
 self to the employment of any special ma-
 terial for the construction of the improved
 syringe, since it is evident that the inven-
 50 tion is not limited in this respect. Nor is

the cylindrical form of the body portion at
 all essential to the invention since, when de-
 sirable, the telescoping members 1 and 2
 may be made flattened as shown in Fig. 5, or
 may have other cross sectional forms with 55
 good results.

Having thus described my invention, what
 I claim and desire to secure by Letters Pat-
 ent is—

1. A syringe having a body portion com- 60
 prising two tubular members arranged for
 telescopic sliding movement one within the
 other, a securing device formed of a strip
 having one end attached to one of the tubu-
 lar members, and having its opposite end 65
 extended lengthwise along the body por-
 tion and engaged for sliding movement in
 an aperture of the other tubular member to
 limit the telescopic sliding movement there-
 of, and a spring coiled around the body 70
 portion outside of said strip and having en-
 gagement at its opposite ends with the re-
 spective tubular members to hold the same
 normally in one position while permitting
 telescopic movement of such members against 75
 the tension of said spring, said body portion
 having an inlet and an outlet, and valves
 controlling the inlet and outlet of the body
 portion.

2. A syringe having a body portion pro- 80
 vided with two members of substantially
 like diameters having adjacent open ends
 fitted to slide telescopically one within the
 other, the interiors of said members being in
 communication and forming an unobstruct- 85
 ed liquid chamber extended from end to
 end of the body portion, valves controlling
 the admission and discharge of liquid to
 said chamber, and closures for the opposite
 ends of the body portion, one of said closures 90
 being removable to afford access to the liquid
 chamber for the insertion of nozzles or the
 like therein.

In witness whereof I have hereunto
 signed my name in the presence of two sub- 95
 scribing witnesses.

CHARLES REMHOF.

Witnesses:

HENRY DISTLER,

WILLIAM A. VAN INWEGEN.