

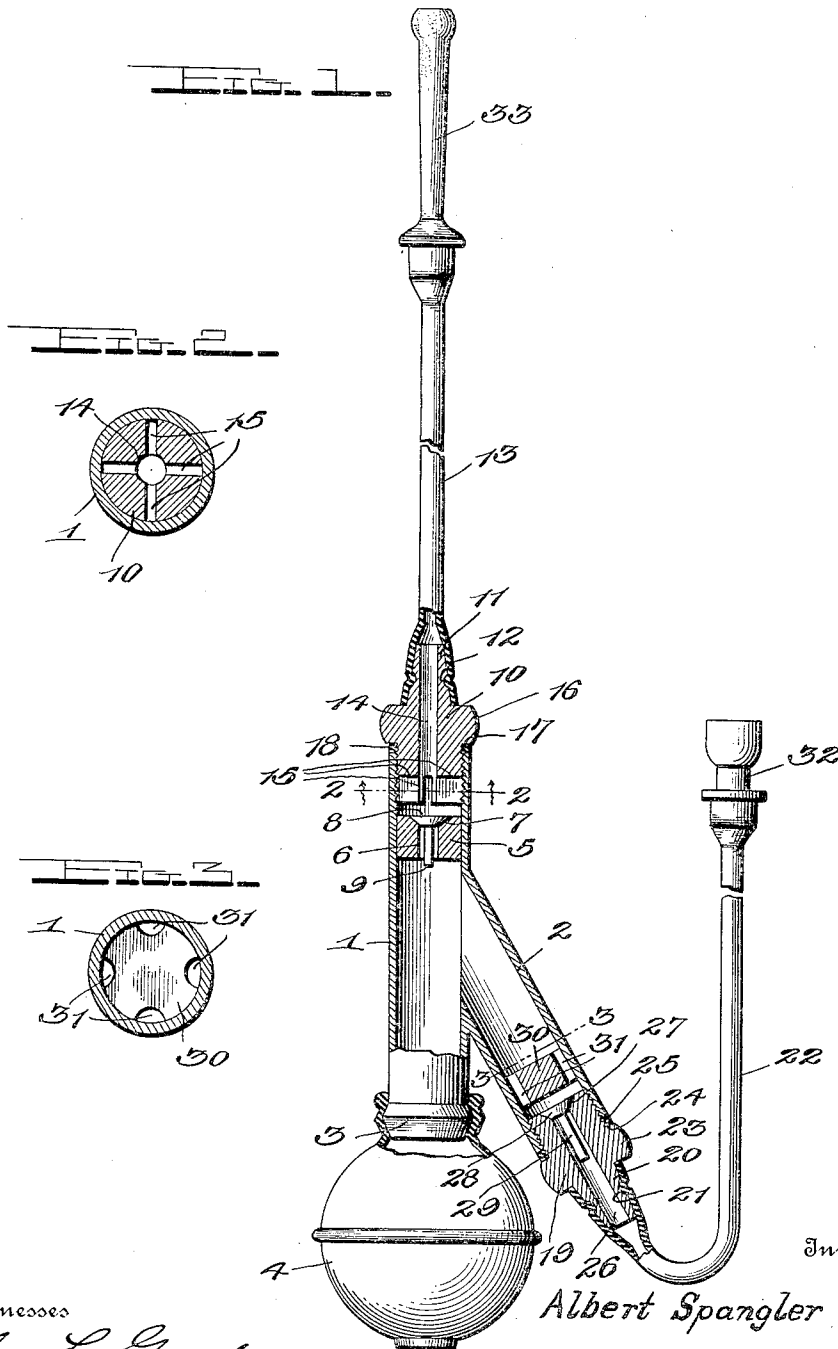
A. SPANGLER.

SYRINGE.

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SYRINGE.

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To all whom it may concern:

Be it known that I, ALBERT SPANGLER, a citizen of the United States, residing at Moline, in the county of Rock Island and State of Illinois, have invented certain new and useful Improvements in Syringes; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to improvements in syringes.

One object of the invention is to provide a syringe having an improved construction of valve casings, each made in two parts with the valve loosely mounted between them so that when the outer part is taken off the valve itself drops out of place and the body may be cleaned or sterilized.

Another object is to provide a syringe which will be simple, strong, durable and inexpensive in construction, efficient in operation and in which the parts may be readily separated for cleaning or other purpose.

With these and other objects in view, the invention consists of certain novel features of construction and the combination and arrangement of parts as will be more fully described and claimed.

In the accompanying drawings: Figure 1 is a plan view of my improved syringe with parts broken away to more clearly illustrate the construction and arrangement of the valves and their casings. Fig. 2 is a cross sectional view through the outer portion of the barrel or body of the syringe taken on the line 2—2 of Fig. 1. Fig. 3 is a similar view through the water inlet branch of the barrel or body of the syringe, taken on the line 3—3 of Fig. 1.

My improved syringe comprises a tubular cylindrical body portion 1 which may be of any desired diameter and length and on one side of which is formed a branch 2. The body 1 and branch 2 may be formed of hard rubber or any other suitable material and the branch is disposed at an acute angle to the body 1 and projects a short distance beyond the inner end thereof as shown. On the inner end of the barrel or body 1 is formed a knob or head 3 with which is adapted to be engaged the open end of the bulb 4 which as herein shown is preferably spherical in shape. The bulb and tubes are of soft rubber, as are the washers referred to below. The opposite or outer end of the

body 1 is interiorly threaded, as is also the outer end of the branch 2 thereof.

Within the barrel or body 1 near the outer or forward end thereof and between said end and the inner end of the branch 2 is a partition 5 in the form of a cylindrical block having therethrough a central bore or passage 6, the outer end of which is flared to form a valve seat 7. Adapted to be engaged with the valve seat 7 is a check valve 8, the stem 9 of which works loosely in the bore or passage 6 as shown. Engaged with the outer or forward end of the barrel or body 1 is a tube attaching plug 10 having a tapered outer end 11 provided with an annular groove 12 and adapted to receive the inner end of the water discharging tube 13. The plug has formed therethrough a central bore or passage 14 and the inner end of the plug is provided with notches 15 which are arranged at diametrically opposite positions and extend inwardly for a suitable distance as shown. The inner portion of the plug is threaded and is adapted to be screwed into the threaded end of the barrel 1 and on the plug intermediate its ends is an annular enlargement 16 which forms a shoulder 17 between which and the end of the barrel is arranged a washer 18 whereby a fluid-tight connection is formed between the bulb and the barrel or body of the syringe.

Arranged in the outer end of the branch 2 is a plug 19 having a threaded inner portion which is screwed into the end of the branch 2 and has on its opposite end a tapered extension 20 in which is formed an annular groove 21 and which is adapted to receive the end of the suction tube 22 of the syringe. The plug has formed intermediate its ends an annular enlargement 23 which provides a shoulder 24 between which and the end of the branch is arranged a washer 25 whereby a fluid-tight connection is formed between these parts. In the plug 19 is formed a central bore or passage 26 the inner end of which is flared to form an annular valve seat 27 with which is engaged a check valve 28 having a stem 29 which works loosely in the bore of the plug as shown. Within the branch 2 and spaced a suitable distance from the inner end of the plug is a partition in the shape of a cylindrical block 30 having in its edges a series of notches 31. This block is provided to limit the opening movement of the valve 28 while the notches 31 will permit the water to pass

freely through the branch 2 and into the barrel or body 1 of the syringe.

In the outer end of the suction tube 22 is arranged a hollow member 32 which is 5 formed of metal and is of sufficient weight to sink and hold this end of the suction tube beneath the surface of the water in the receptacle from which the same is being forced by the syringe. The suction tube 22 may be 10 of any desired length as may also the discharge tube 13. With the outer end of the tube 13 is adapted to be engaged any form or style of nozzle 33 according to the purpose for which the syringe is to be used. 15 The member 32, the nozzle, and the valves may be of metal; and the plugs and blocks may be of metal or hard rubber held in place in any suitable manner as by being forced into the body 1 and branch 2.

In the operation of the syringe the member 32 and outer end of the suction tube 22 of the syringe is placed in the receptacle containing the water or other fluid to be injected by the syringe after which the bulb 4 25 is contracted and then permitted to expand. The expansion of the bulb creates a suction in the body or barrel 1 and through the branch 2 which will close and hold the discharge valve 8 in a closed position, at the 30 same time opening the inlet valve 28 and drawing a charge of water or other fluid through the suction tube 22, branch 2 and into the body 1 of the syringe. After the water has been thus drawn into the barrel 35 the bulb is again contracted by pressure, which operation will close the inlet valve 28, open the discharge valve 8 and force the contents of the barrel out through the discharge tube 13 and nozzle 33 as will be 40 readily understood. The opening movement of the valve 8 is limited by the engagement thereof with the notched inner end of the plug 10 and by providing the notches 15 in said end of the plug, the valve will not be 45 permitted to close the passage 14 as the water will flow around the valve through the notches 15 and into the passage 14 as will be readily understood. By thus constructing and arranging the barrel or body 50 of the syringe and the valves therein it will be seen that by rapidly compressing and releasing the bulb 4, a large, strong and practically continuous stream of water may be discharged from the nozzle of the syringe.

The soft rubber tubes and bulbs may be 55 readily withdrawn and replaced, and as these are the most susceptible to the action of sterilizing acids or chemicals, the remaining parts of the syringe may then be treated 60 without injury. If the body portion be of hard rubber and all parts excepting those just mentioned of metal, such parts may be

removed from the body portion and boiled or treated with chemicals which might injure said body portion. In restoring the 65 parts the plugs will of course be screwed into place until they compress the washers beneath them, and therefore the blocks will be inserted first and pushed inward far enough to allow the valve heads to play between 70 them and the inner ends of the plugs. Each valve casing is therefore made up of a tubular outer extremity of the body, a plug screwed into it to a certain point, and a block disposed within it inside the plug and 75 remote from the inner end of the latter to a sufficient extent to allow the valve-head to move as will be clear. When the plug is withdrawn the valve itself falls out, and it is quite possible to cleanse the body very 80 thoroughly by washing it without removing the block because what sediment accumulates will ordinarily be outside of such block.

From the foregoing description, taken in connection with the accompanying drawings, 85 the construction and operation of the invention will be readily understood without requiring a more extended explanation.

Various changes in the form, proportion, and the minor details of construction may be 90 resorted to without departing from the principle or sacrificing any of the advantages of the invention as claimed.

Having thus described my invention, what I claim is:

A syringe comprising a tubular body 95 having a lateral branch, a bulb connected with the inner end of said body, a tubular plug screwed into its other end and having transverse notches across the inner extremity of its bore, a tube detachably connected 100 with this plug and carrying a nozzle, a cylindrical block disposed within this end of the body beyond the inner extremity of the plug and having a central bore and a valve 105 seat at the outer end of the same, a valve resting on said seat and loosely disposed below the inner extremity of the plug; a tubular plug screwed into the outer end of said branch and having a valve seat in the inner 110 extremity of its bore, a tube and suction member detachably connected with this plug, a cylindrical block disposed within said branch beyond the inner extremity of this plug and having peripheral notches, and a 115 valve on the seat in this plug and whose opening movement is checked by the block.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

BERT SPANGLER.

Witnesses:

EMMA PRICE,

MIMY SPANGLER.