Jan. 26, 1954 A. E. SMITH 2,667,163

UNITARY SYRINGE

Filed Oct. 13, 1951

Fig. 1.

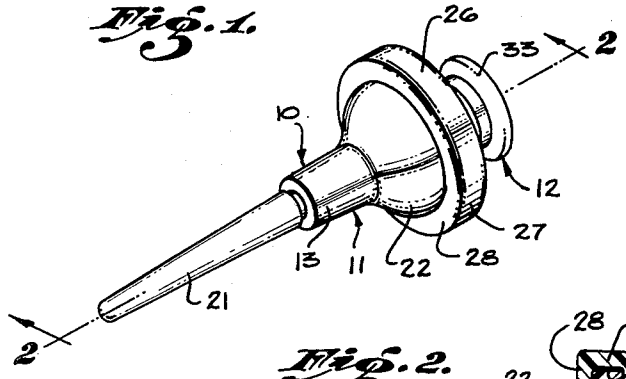


Fig. 2.

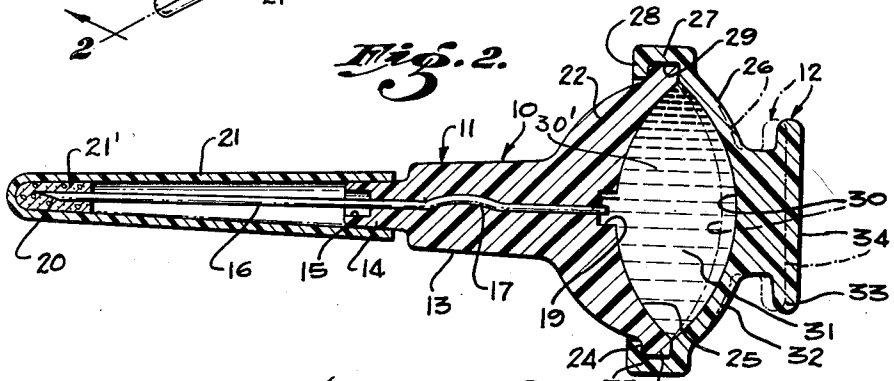
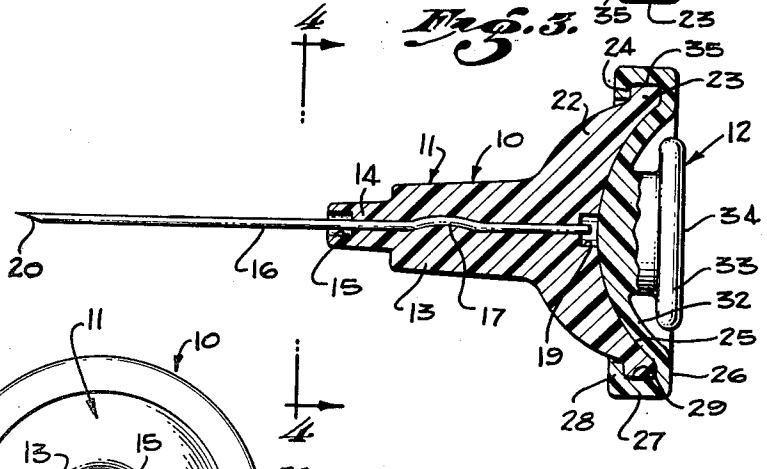


Fig. 3.



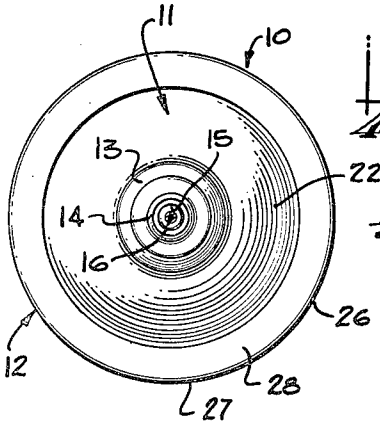


Fig. 4.

ARTHUR E. SMITH,
INVENTOR.

BY

ATTORNEY

Patented Jan. 26, 1954

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UNITED STATES PATENT OFFICE

2,667,163

UNITARY SYRINGE

Arthur E. Smith, Los Angeles, Calif.

Application October 13, 1951, Serial No. 251,165

1 Claim. (Cl. 128—216)

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This invention relates to a unitary syringe.

The general object of the invention is to provide an improved syringe construction which, while involving a minimum number of parts, provides a highly effective, disposable syringe.

A more specific object of the invention is to provide a unitary syringe wherein a more or less rigid, recessed front member is employed as a needle support and wherein the volume of the recess associated with the front member is reduced by a resilient and flexible closure member to provide an injecting effect.

Another object of the invention is to provide a novel disposable syringe which includes a front member and a resilient rear member with the two members combined to form a chamber the volume of which is reduced when the rear member is operated to thus produce an injecting effect.

A further object of the invention is to provide a syringe including a needle carrying front member and a flexible rear member with a cavity disposed within the two members, the capacity being reducible when the rear member is pushed inwardly, and with the rear member movable rearwardly to produce an aspirating effect.

A further object of the invention is to provide a novel syringe construction which includes a front member and a rear member, the two members in conjunction forming an ampule, with the rear member serving to reduce the capacity of the ampule when operated so that in effect a pistonless syringe is provided.

An additional object of the invention is to provide a novel front member for a syringe.

Another object of the invention is to provide a novel rear member for a syringe.

Other objects and advantages of the invention will be apparent from the following description taken in connection with the accompanying drawings, wherein:

Fig. 1 is an isometric view showing a syringe embodying the features of my invention;

Fig. 2 is a sectional view taken on line 2—2, Fig. 1, and on an enlarged scale;

Fig. 3 is a view similar to Fig. 2, showing the parts in condition after the solution has been discharged, and

Fig. 4 is a section taken on line 4—4, Fig. 3.

Referring to the drawing by reference characters, my invention is shown as embodied in a syringe which is indicated generally at 10.

As shown, the syringe includes a front member 11 and a rear member 12. The front member may be made of rigid material such as metal, rubber or plastic, and includes a tapered portion 13 and a reduced, tapered tip 14. The tip 14 has a recess 15 which is spaced from a needle 16 to allow flexibility of the needle.

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The needle 16 includes a curved portion 17 which is disposed in the body 11 to prevent rotation and axial movement of the needle. The inner end of the needle is disposed in a recess 19 in the front member. The front of the needle is preferably sharpened as at 20 in the usual manner. A cap 21 is disposed about the needle and engages the tapered portion 14 to prevent contamination of the needle before use. A cork 21' may be disposed in the closed end of the cap 21 to engage the point 20 of the needle for additional protection for the point.

The body 11 includes a rear portion 22, which has an exterior flange 23 which provides a shoulder 24, and the portion 22 includes a recess 25.

The closure member 12 is flexible and may be translucent or transparent and may be made of natural rubber, artificial rubber, polyethylene or other flexible plastic, and includes a body 26 from which a collar 27 extends forwardly and terminates in an internal flange 28. The flange 28 forms a recess 29 which receives the shoulder 23 on the front member. The closure includes an inner wall 30 which is curved complemental to the wall 25 previously mentioned. The two walls are of the same size and shape together form a double convex shaped chamber 30' in which a medicament 31 is placed. The medicament may be inserted through the closure wall at 32 of the closure member in the usual manner in which containers are filled.

The body 26 of the closure, at its rear end, terminates in a peripheral flange 33 and an end 34. Cement, as at 35, may secure the flange 23 in the recess 29.

In use the cap 21 is removed and the needle is inserted. After the needle is in place, pressure on the end 34 will cause the volume of the chamber 30', containing a solution 31, to be reduced so that the medicament will pass through the needle 16. Due to the complemental shape of the walls 25 and 30 a complete discharge of the syringe contents may be effected, as shown in Fig. 3. In order to test and determine whether the needle is in a vein, the flange 33 and the closure wall 32 may be moved rearwardly from the dotted line position in Fig. 2 to aspirate into the syringe and if blood appears, the needle may be withdrawn and reinserted.

With my invention, wherein there is no piston employed in the syringe, I secure a very compact,

highly efficient syringe, which does not take excessive space in a doctor's kit, in storage or in transportation, and in which the solution is maintained in sterile condition until used.

Having thus described my invention, I claim:

A disposable syringe including a front member and a rear member, said front member including a body having a forward portion, a needle mounted in said body forward portion, a cap on said body forward portion and surrounding said needle, said front member having an external peripheral flange at the rear end thereof and having a substantially semi-spherical recess therein, said rear member being made of flexible material and including a body having a peripheral portion engaging said front member flange, said rear member having a substantially semi-spherical recess complemental to and of the same size and shape as the recess of said front member, said two recesses forming a double convex shaped solution-receiving chamber, said needle communicating with said chamber, said rear member having a protuberance projecting therefrom and adapted to be grasped by the fingers of an operator.

ARTHUR E. SMITH.

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