

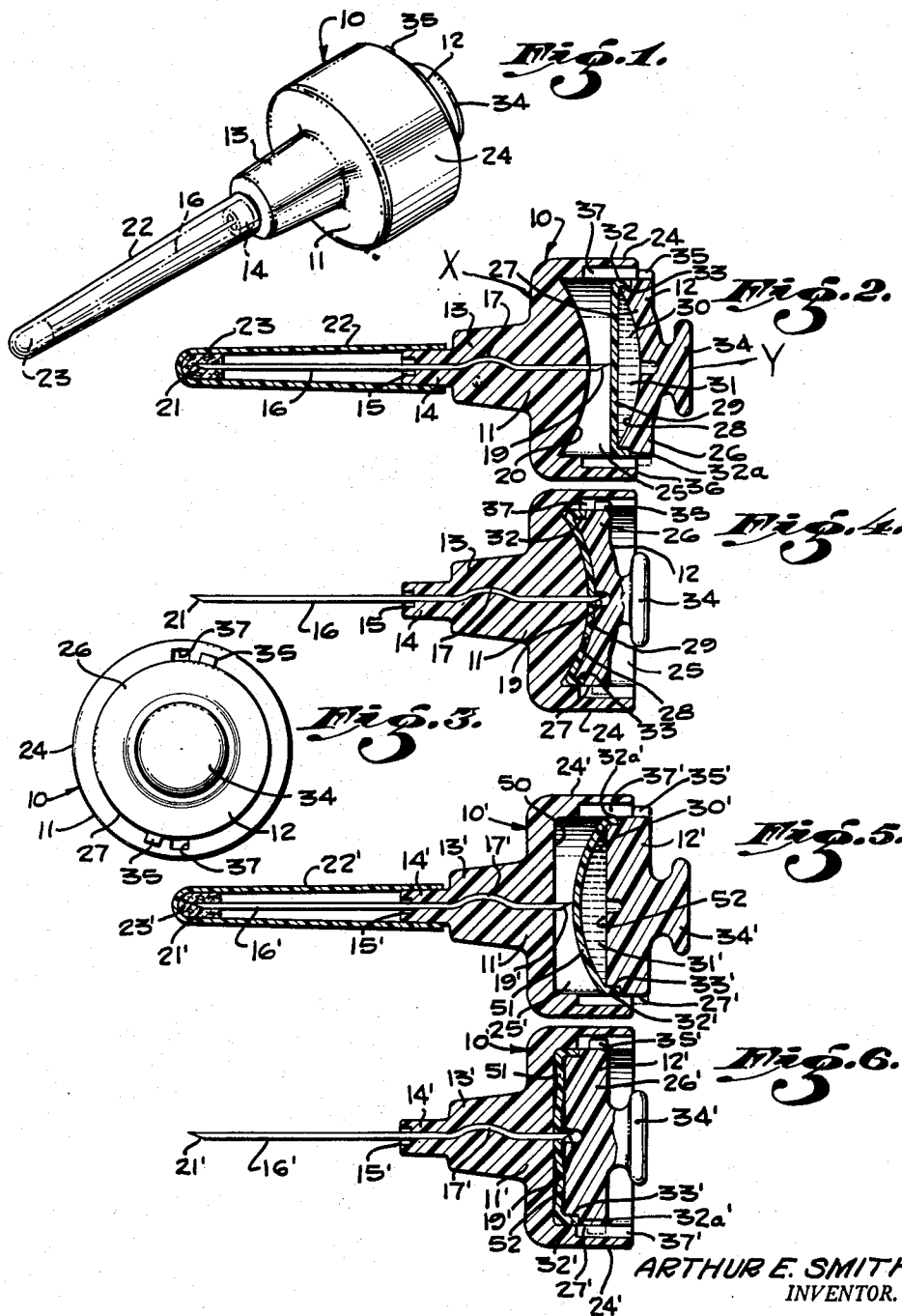
Dec. 7, 1954

A. E. SMITH

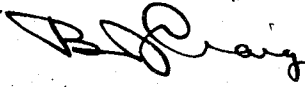
2,696,213

DISPOSABLE SYRINGE

Filed Dec. 26, 1951



ARTHUR E. SMITH,
INVENTOR.

BY 
ATTORNEY

1

2,696,213

DISPOSABLE SYRINGE

Arthur E. Smith, Los Angeles, Calif.

Application December 26, 1951, Serial No. 263,462

3 Claims. (Cl. 128—218)

This invention relates to a syringe.

The general object of the invention is to provide a novel syringe which includes a minimum number of parts and provides a highly effective syringe.

A more specific object of the invention is to provide a syringe wherein a more or less rigid, recessed front member is employed as a needle support and wherein a sliding plunger associated with the front member has a resilient and flexible closure member thereon to provide a medicament holding chamber, the volume of which is reduced as the plunger advances.

Another object of the invention is to provide a novel syringe which includes a front member and a resilient, chambered, slidable rear member; the volume of the chamber being 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 sliding rear member, having a diaphragm thereon forming a chamber, the capacity of the chamber 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 sliding rear member, the rear member having a flexible wall which in conjunction with the adjacent part of the rear member forms an ampule, with the rear member serving to force the flexible wall against the front member to reduce the capacity of the ampule when operated.

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 sliding 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 of the syringe shown in Fig. 1, and on an enlarged scale;

Fig. 3 is a rear end view of the syringe;

Fig. 4 is a view similar to Fig. 2, showing the parts in condition after the solution has been discharged;

Fig. 5 is a sectional view similar to Fig. 2, showing a modification, and

Fig. 6 is a fragmentary view similar to Fig. 5, showing the parts in the position they assume when the medicament is discharged.

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 sliding 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 and to provide a projecting end which can be grasped should the needle be broken off at the inner end of the tip recess.

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 pointed end of the needle projects at 19 beyond the rounded rear end 20 of the front member. The front of the needle is preferably sharpened as at 21 in the usual manner. A cap 22 is disposed about the needle and engages the tapered por-

2

tion 14 to prevent contamination of the needle before use. A cork 23 may be disposed in the closed end of the cap 22 to engage the point 21 of the needle for additional protection for the point.

5 The body 11 includes a cylindrical rear portion 24. The outer wall of this portion 24 is continuous and uninterrupted throughout its entire length. The portion 24 with the rounded end portion 20 forms a chamber 25.

10 The closure member 12 may be translucent or transparent and may be made of natural rubber, artificial rubber or plastic such as polyethylene, and includes a body 26 which has a cylindrical portion 27 slidable in the portion 24 and forming a closure for the chamber 25.

15 The closure includes a curved inner wall 28 which is curved similar to the wall 20 previously mentioned. The curved wall 28 is closed by a pierceable, flexible diaphragm 29, which may be made of the same material as the rear member, to form a spherical segment shaped chamber 30 in which a medicament 31 is placed. The medicament 31 may be placed in the chamber 30 before the diaphragm 29 is secured in place.

20 The diaphragm 29 has an edge flange 32 which is seated in a groove 32a in the rear member 12 and may be cemented in place by cement 33. The flange 32 may lightly engage the inner wall of the portion 24 to prevent accidental movement of the rear member.

25 The closure member 12 has a pair of lugs 35 diametrically arranged and projecting therefrom which normally engage the end 36 of the cylindrical portion 24. When the rear member is rotated relative to the portion 24, the lugs 35 will align with flaring slots 37 in the portion 24 so that the rear member may then advance in the portion 24.

30 In use the cap 22 is removed and the first and second fingers engage with the front member at X, Fig. 2, with the thumb engaging the end 34 at Y. The lugs being out of alignment with the slots 37, the rear member or plunger cannot advance. The injection is then made and then the rear member is turned to align the lugs 35 with the slots 37 and then pressure on the end 34 will advance the rear member, causing the pointed end 19 of the needle to pierce the diaphragm 29 and to place the needle in communication with the medicament 31. Continued pressure on the end 34 will move the diaphragm 29 against the rounded end 20 and will cause the volume of the chamber 30 containing the medicament solution 31 to be reduced so that the medicament will pass through the needle 16.

35 In order to test and determine whether the needle is in a vein, the flange 32 on the rear member 12 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.

40 In Figs. 5 and 6, wherein I show a modification of my invention, parts similar to those previously described are designated by single primed reference numerals.

45 In the modification the end 50 of the front member is planar and the diaphragm 51 is rounded. The end 52 of the rear member 12' is also planar. In the modification when the rear member 12' is advanced the needle point 19' will pierce the diaphragm 51 and thereafter, as the rear member advances, the diaphragm will be flattened against the wall 50 to reduce the capacity of the chamber 30' to thereby secure the injecting effect.

50 With my invention 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:

1. A syringe including a front member and a rear member, a needle carried by said front member, said front member including a body having a cylindrical portion thereon, the entire outer wall of said front member cylindrical portion being continuous and uninterrupted, said rear member including a cylindrical portion slidably engaging the front member cylindrical portion, said rear member having a front face complementary to the rear face of the front member, a diaphragm extending across the front face of said rear member and including a portion spaced from the front face of the rear member to form a medicament holding chamber, and a medicament in said medicament holding chamber, said needle

3

having a rear projecting end adapted to pierce said diaphragm when the rear member is advanced to thus cause the needle to communicate with said rear member chamber.

2. A syringe including a front member and a rear member, a needle carried by said front member, said front member having a rear end portion and having a cylindrical portion extending rearwardly from the rear end portion to form a front member chamber, said rear member including a cylindrical portion slidable in the front member cylindrical portion, said rear member having a front face complementary to the rear face of the rear end portion of the front member, a diaphragm extending across the front face of said rear member and including a portion spaced from the front face of the rear member to form a medicament holding chamber and a medicament in said medicament holding chamber, said needle having a rear end projecting into said front member chamber and adapted to pierce said diaphragm when the rear member is advanced to thus cause the needle to communicate with said rear member chamber, said rear member having outwardly directed lugs thereon and normally engaging the end of the front member cylindrical portion, said front member cylindrical portion having slots adapted to receive the lugs when the rear member is rotated on the front member, said rear member having a protuberant portion adapted to be grasped by the fingers of an operator.

3. A syringe including a front member and a rear member, a needle carried by said front member, a cap on said front member and surrounding said needle, said front member having a semispherical, rounded rear end portion and having a cylindrical portion extending rear-

4

wardly from the rounded rear portion to form a front member chamber, said rear member including a cylindrical portion slidable in the front member cylindrical portion, said rear member having a substantially semispherical, forwardly facing recess complementary to the rounded rear portion of said front member, a flexible, pierceable diaphragm extending across and closing said rear member recess and forming a medicament receiving chamber, said rear member having a peripheral groove and said diaphragm having a flange disposed in said groove, said flange slidably engaging the inner wall of said front member cylindrical portion, a medicament in said medicament receiving chamber, said needle having a rear end projecting into said front member chamber and adapted to pierce said diaphragm when the rear member is advanced to thus cause the needle to communicate with said rear member chamber, said rear member having outwardly directed lugs thereon normally engaging the end of the front member cylindrical portion, said front member cylindrical portion having slots adapted to receive the lugs when the rear member is rotated, said rear member having a protuberant portion thereon adapted to be grasped by the fingers of an operator.

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
388,029	Dunn	Aug. 21, 1888
1,288,174	Pittenger	Dec. 17, 1918
1,668,588	Greeley	May 8, 1928
2,627,856	Waterman	Feb. 10, 1953