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2,538,391

SYRINGE

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Fig. 1.

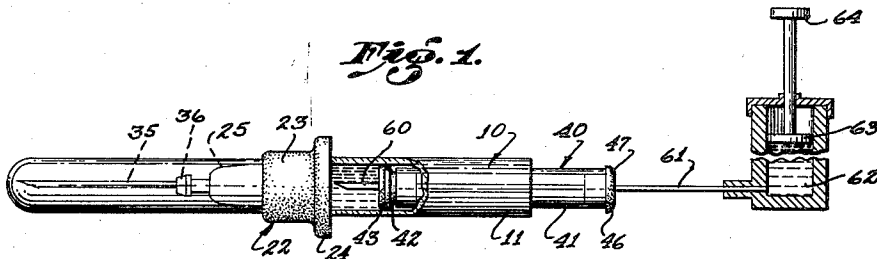


Fig. 2.

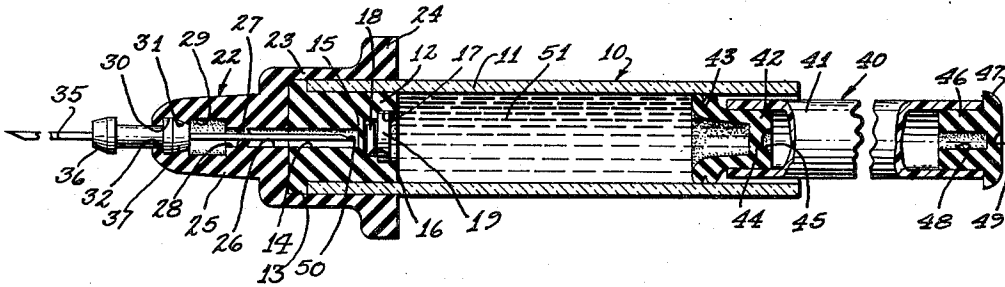


Fig. 3.

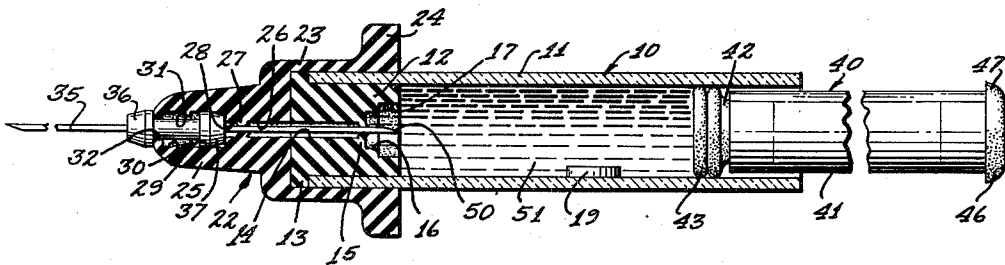
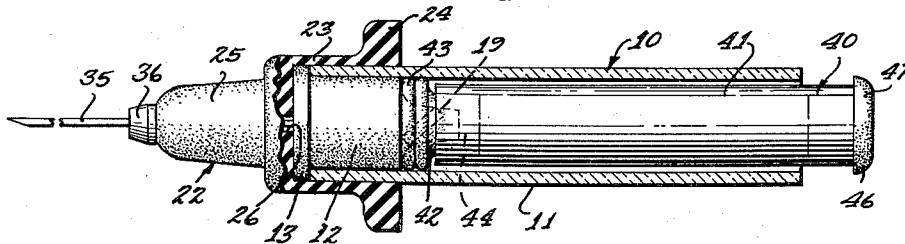


Fig. 4.



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2,538,391

SYRINGE

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Application January 10, 1948, Serial No. 1,551

1 Claim. (Cl. 128—215)

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This invention relates to a syringe.

The general object of the invention is to provide an improved syringe of the disposable type which will permit the quick preparation and ready use of a medicinal solution.

A further object of the invention is to provide a syringe including a novel plunger member.

A further object of the invention is to provide a novel plunger member for use in the 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 a side elevation with parts in section showing my improved syringe and one type of filling apparatus employed in connection therewith;

Fig. 2 is an enlarged, central, sectional view showing the syringe fully loaded;

Fig. 3 is a view similar to Fig. 2 showing the syringe prepared for use, and

Fig. 4 is a sectional view with parts in elevation showing the syringe after the contents have been discharged therefrom.

Referring to the drawing by reference characters, I have shown my invention as embodied in a syringe, indicated generally at 10. As shown the syringe includes a cylindrical barrel 11 having a closure 12 at the front end thereof, the closure 12 including a flange 13 engaging the outer end of the barrel, and the closure is provided with an outer bore 14 which is separated by a diaphragm 15 from a second bore 16, which in turn communicates with an enlarged bore 17. Within the bore 16 I arrange a medicinal tablet 18 and in the bore 17 a displaceable sealing disc 19.

Upon the barrel 11 I arrange a front end closure indicated generally at 22 and which includes a skirt 23, having a finger engaging flange 24 thereon. The front end closure includes a tapering tip 25 and this tip is provided with an axial bore 26, separated by a diaphragm 27 from another bore 28. The bore 28 communicates with a bore 29 and the bore 29 communicates with a bore 30 which has a tapering wall 31 at one end thereof. The tip 25 has an end aperture 32.

A hypodermic needle 35 has a hub 36 thereon, the inner end of which is beveled as at 37 to fit the tapering wall 31 in the bore 30.

The barrel 11 has a plunger 40 in the rear end thereof. The plunger 40 comprises a tubular member 41, having a piston stopper 42 in the front end thereof. The piston stopper is in the nature of a cup and includes peripheral beads

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43 with a diaphragm 44 at the inner end of the cup and with an indentation 45 coaxially arranged. At its outer end the plunger includes a stopper 46 which has a peripheral flange 47 and an axial recess 48 and with an indentation 49 coaxial with the recess 48.

In operation, with the parts as shown in Fig. 2, the person using the syringe pushes in on the hub 36, causing the inner end 50 of the needle to pierce the diaphragm 15 and thereafter dislodge the disc 19 to cause the tablet 18 to be discharged into the vehicle 51 within the barrel 11. The syringe is then ready for use and by pressing on the stopper 46 the plunger is moved forward, causing the ampule contents to be discharged.

The syringe may be filled in any desired manner, although I prefer to have the parts arranged with the plunger fully within the ampule and then I insert the end 60 of a hypodermic needle 61 through the stopper 46 and the piston stopper 42. The needle 61 communicates with a chamber 62 in which a piston 63 operates by means of a finger button 64. When the button 64 is depressed, liquid will flow into the ampule 11, causing the piston to withdraw until it is in the position shown in Fig. 2, whereupon the needle 61 is removed and the syringe is ready for shipment or use.

In the present application, Serial No. 1,551, filed January 10, 1948, the claim is directed to the piston stopper which is hollow and has pierceable front and rear closures therein, the front closure acting as a plunger and both closures being pierceable by the needle of a filling apparatus.

In applicant's copending application Serial No. 548, filed January 5, 1948, the claim is directed to the outer barrel with a front closure therein and the claim includes the sliding barrel forming ampule within the outer barrel and with the piston closure in the sliding barrel at its front end. The claim also includes the piston plunger within the sliding barrel and having a piston head thereon.

Applicant's copending application Serial No. 2,900, filed January 17, 1948, relates to a syringe wherein there is a barrel having a front member, a recess and with a needle extending through the front member and recess and having a protuberant portion engageable in the recess and with the needle adapted to be advanced to its seated position by means of a protective cap carried upon the needle.

From the foregoing description it will be apparent that I have invented a novel syringe which

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can be economically manufactured and which is highly efficient for its intended purpose.

Having thus described my invention, I claim:

A disposable syringe including a barrel having a resilient closure construction at the front end thereof, a resilient end member on the barrel, said closure construction including an outer recess and an inner recess with a pierceable diaphragm between the recesses, a needle movably mounted in the end member, said needle having its inner end disposed normally adjacent to said diaphragm and being adapted to pierce said diaphragm when the needle is moved inwardly, a piston plunger within said barrel, said piston plunger including an elongated tubular body having a piston head mounted on the inner end thereof, said piston head being made of resilient material and having a peripheral portion slidable within the barrel, said piston head having a recess with a resilient, pierceable, imperforate diaphragm closing said last mentioned recess, said piston plunger having a resilient closure at the outer end thereof, said last mentioned closure having a

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recess and a resilient, pierceable, imperforate diaphragm closing said last mentioned recess, said piston plunger being movable in the barrel to force the contents therefrom, said resilient, pierceable, imperforate diaphragms being adapted to be pierced by a barrel filling needle with the holes made therein by the filling needle closing by the resiliency of the material when the filling needle is withdrawn.

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The following references are of record in the file of this patent:

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