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A. E. SMITH
DISPOSABLE SYRINGE
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2,524,363

Fig. 1.

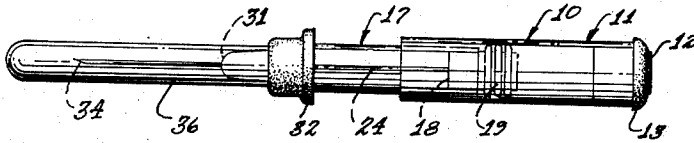


Fig. 2.

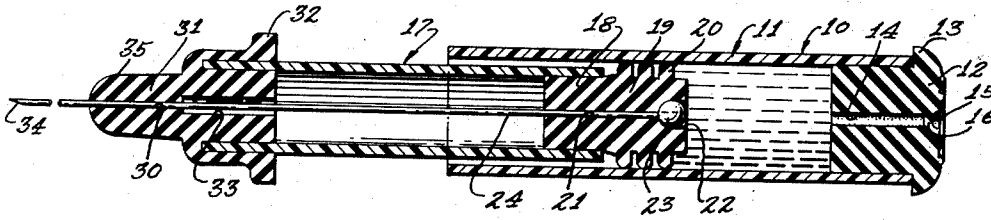


Fig. 3.

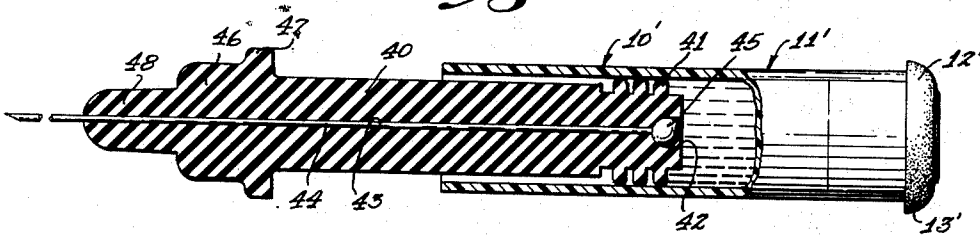
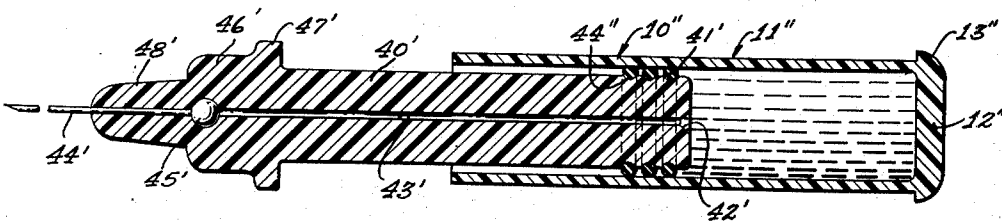


Fig. 4.



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DISPOSABLE SYRINGE

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3 Claims. (Cl. 128—220)

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This invention relates to disposable syringes.

The general object of the invention is to provide an improved disposable syringe useful for the injection of medicinal preparations and wherein a novel plunger member is employed for causing the injection.

A further object of the invention is to provide a novel plunger for use in 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 a side elevation of a syringe showing my invention;

Fig. 2 is a central, sectional view on a large scale of a syringe;

Fig. 3 is a view similar to Fig. 2 showing a modification, and

Fig. 4 is a view similar to Fig. 2 showing a further modification.

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 an ampule or barrel 11, which may be made of plastic and which is cylindrical and has a stopper 12 which may be made of rubber and which is mounted in one end of the ampule. The stopper includes a projecting flange 13 and has an inwardly directed recess 14 and an outwardly directed recess 15 with a diaphragm 16 between the recesses.

The syringe includes a plunger, indicated generally at 17. The plunger is shown as tubular and may be made of plastic or glass. A cylindrical piston stopper 18 is arranged within the plunger and has a projecting end 19 which has piston ring forming beads 20 integral therewith. I show three of the beads 20 although the number may be varied as desired.

The piston stopper 18 has a bore 21 there-through. At its inner end the bore 21 is enlarged to form a recess 22 and in this recess I arrange a protuberance 23 on a hypodermic needle 24 which extends forwardly through the bore 21 and has its forward end arranged in a bore 30 in a front member 31. The front member includes a flange 32 which may be grasped by the fingers of the operator during an injection. The front member includes a recess 33 which communicates with the bore 30. The needle extends forwardly from the front member and at its free end is sharpened as at 34. The forward end of the front member tapers as at 35 and is engaged by a cap 36 which surrounds the needle and maintains the latter in sterile condition.

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In use the parts are constructed as described and are assembled preferably with the plunger 17 fully advanced into the ampule. A hypodermic needle is then inserted through the diaphragm 16 and the medicament or solution to be injected is forced into the ampule and as this occurs the piston stopper 18 and plunger 17 are caused to be moved away from the stopper 12. The amount of movement of the piston indicates the amount of medicine within the ampule and when the correct amount has been passed into the ampule the hypodermic needle is withdrawn from the diaphragm 16. The hole is self-sealing due to the resiliency of the material. The cap 36 is then placed on the tip 35 to maintain the needle 34 in sterile condition.

In use the cap 36 is withdrawn and the needle 34 is inserted in the patient. The barrel 11 is then pushed forward a slight distance and then withdrawn and if blood appears in the ampule, it will show the needle is in a blood vessel, whereupon the needle may be withdrawn and correctly inserted. When upon withdrawal of the barrel 11 there is no appearance of blood within the barrel, this fact will indicate to the operator that the needle has been correctly inserted. The ampule is then pushed along the plunger, thus reducing the volume within the ampule and causing the medicamentous substance to be forced through the needle 24. The needle is held securely in place due to the fact that it is resiliently engaged by the wall of the plunger bore. The protuberance 22 on the needle also prevents forward movement of the needle.

In the modification shown in Fig. 3 the construction is similar and includes a syringe 10' which employs an ampule 11', and a stopper 12', having a flange 13' thereon. The plunger includes a body 40 having integral piston ring-forming beads 41 thereon. The plunger includes an axial recess 42 which communicates with a bore 43 in which a needle 44 is arranged. The needle 44 has a protuberance 45 arranged in the recess 42. The plunger includes a front member 46 having a flange 47 and having a tip 48.

In the modification shown in Fig. 4 the syringe 10'' includes an ampule 11'' having an integral closure 12'' which has an integral flange 13''. The plunger includes a body 40' which has resilient piston rings 41' arranged in grooves 44''. The plunger includes an axial recess 42' which communicates with a bore 43'. The bore 43' communicates with a needle 44' arranged in the forward part of the bore 43'. The needle is surrounded by a protuberance 45'. The plunger

includes a front member portion 45' which has a flange 47' thereon and a tapered tip 48'.

The modified types of syringe are used in the same manner as that described in connection with Figs. 1 and 2.

From the foregoing description it will be apparent that I have invented a novel hypodermic syringe which may be economically manufactured and which is highly efficient for its intended use.

Having thus described my invention, I claim:

1. A syringe comprising a cylindrical ampule member and a plunger having a piston forming portion thereon forming a closure for and slidable in one end of the ampule, a closure for the other end of the ampule, an elongated body having an axial bore therethrough, the inner end of said bore being enlarged, a hypodermic needle extending through said plunger bore and being fixedly held in place by its resilient engagement with the wall of the plunger bore, said needle having a protuberance thereon disposed in the enlarged portion of the plunger bore, said plunger having a finger engaging portion thereon.

2. A syringe comprising a cylindrical ampule member and a plunger having a piston forming portion thereon forming a closure for and slidable in one end of the ampule, a closure for the other end of the ampule, said plunger including an elongated body having an axial bore therethrough, the inner end of said bore opening into the ampule, a hypodermic needle extending through said plunger bore, said plunger bore including an enlarged portion, said needle having a protuberance thereon disposed in the enlarged portion of the plunger bore, said plunger including a projecting tip having a finger engaging flange, said needle being fixedly held in place by its resilient engagement with the wall of the plunger bore.

3. A syringe comprising a cylindrical ampule, a plunger, a stopper disposed in one end of the ampule, said plunger including a hollow, tubular body having a piston stopper therein at one end, said piston stopper including a portion projecting beyond the inner end of the body and engaging the inner wall of the ampule, and forming a closure for the other end of the ampule, said piston stopper having an axial bore therethrough, the inner end of said bore being enlarged, and a hypodermic needle extending through said piston bore, said plunger having a front member thereon, said front member including a portion within the plunger and a projecting tip, said front member having a finger engaging flange, said front member having an axial bore, said needle extending through said front member bore, said needle being fixedly secured in the front member and piston stopper bores by its resilient engagement with the wall of the bores.

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