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A. E. SMITH
DISPOSABLE SYRINGE
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2,497,562

Fig. 1.

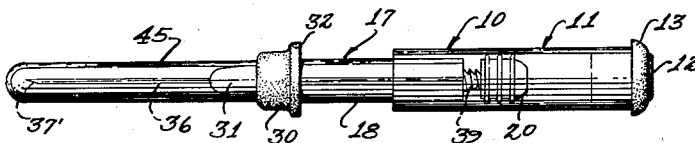


Fig. 2.

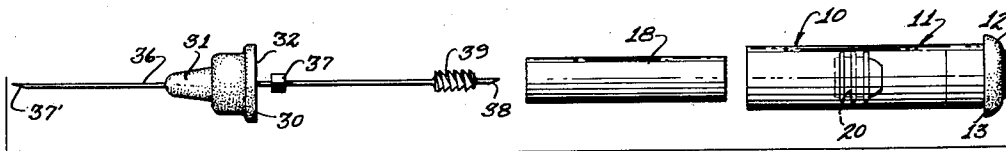


Fig. 3.

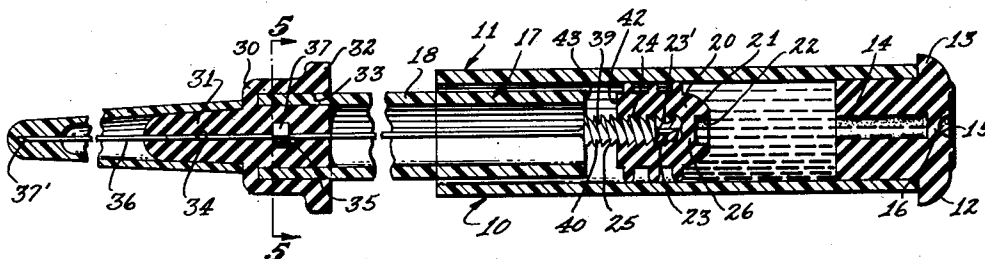


Fig. 4.

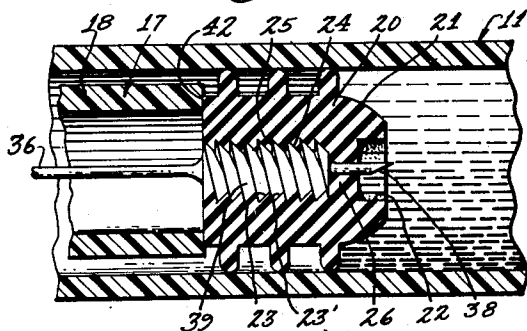
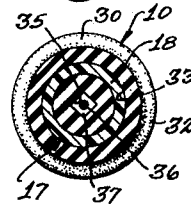


Fig. 5.



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DISPOSABLE SYRINGE

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5 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 syringe which is useful for the injection of medicinal preparations.

A more specific object of my invention is to provide a novel plunger for use in a disposal syringe.

Another object of the invention is to provide a novel needle member for use in a hypodermic syringe.

Further objects and advantages of my 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 an extended side elevation showing the parts constituting my syringe;

Fig. 3 is an enlarged, fragmentary, central sectional view showing my syringe;

Fig. 4 is a fragmentary view showing the end of the plunger when the syringe is ready for use, and

Fig. 5 is an enlarged section taken on line 5—5, Fig. 3.

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 ampule or barrel 11, which may be made of plastic. A stopper 12, which may be made of rubber, 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, which is indicated generally at 17. The plunger includes a body 18 which is a cylindrical tube and may be made of transparent plastic or similar material.

In the ampule I arrange a cylindrical piston stopper 20 which has a bulbous front end 21 and is recessed as at 22 at its inner end. At its outer end the stopper 20 has a recess 23 which is threaded with threads 23' which have steeply inclined forward faces 24 and rear faces 25 which are substantially perpendicular to the axis of the stopper.

On the plunger tube 18 I arrange a front member 30 which includes a tapered tip 31 and a projecting flange 32, the latter being adapted to be grasped by the fingers of the operator.

The front member includes an annular groove 33 which receives the forward end of the plunger body 18, as shown in Fig. 3. The front member

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includes a bore 34 which includes an enlarged recess 35 intermediate the length of the bore. The recess 35 is preferably of a general cubical shape.

A hypodermic needle 36 is arranged in the bore 34 and has a substantially cubical protuberance 37 which is arranged in the recess 35. The needle includes a pointed forward tip 37 and the needle extends rearwardly from the front member and at its extreme rear end is sharpened as at 38. Secured upon the needle, as by brazing, I show a threaded member 39. The threads 40 on the member 39 have the same shape as the threads 23'.

In use the stoppers 12 and 20 are arranged in the ampule in close-together relationship and a hypodermic needle is then inserted through the diaphragm 16 and the material to be injected is run into the ampule, thus forcing the piston stopper 20 away from the stopper 12. When the desired amount of material is in the ampule, the needle is withdrawn from the diaphragm 16 and the hole through which the needle passed is sealed due to the resiliency of the material. The plunger body 18 is then inserted in the forward portion of the ampule and the threads 40 are engaged with the threads 23' and the front member 30 is rotated, causing the plunger body 18 to move into the ampule. The movement continues until the end of the tip 38 is closely adjacent to, but does not enter, the diaphragm 26 and the parts assume the position shown in Fig. 3. A flexible, preferably transparent, sleeve 45 is then placed over the needle 37 and is engaged by the tapered tip 31 to maintain the needle 37 in sterile condition.

When the syringe is to be used, the front member 30 is turned relative to the ampule 11 to cause the threads 40 to further advance along the threads 23' so that the tip 38 punctures the diaphragm 26 and places the contents of the ampule in communication with the needle 36. When this occurs the forward end 42 of the piston stopper engages the rear end 43 of the plunger body 18 and the syringe is then ready for use.

In use the tip 45 is removed and the plunger is rotated to place the syringe in working condition, as described, and the injection is made. The plunger is slightly advanced and is then withdrawn to determine by the absence or presence of blood in the ampule whether a blood vessel has been pierced. If blood is present, indicating that a blood vessel has been pierced, the

needle is withdrawn and re-inserted properly and the injection is made.

From the foregoing description it will be apparent that I have invented a very simple and effective hypodermic syringe which can be economically manufactured and readily maintained sterile and wherein the syringe may very readily be prepared for use.

Having this described my invention, I claim:

1. A syringe comprising a cylindrical, transparent ampule and a plunger, a closure for one end of the ampule, said plunger including an elongated body, a threaded piston movable in the ampule, said plunger having a bore therethrough, a hypodermic needle disposed in said plunger bore, and a threaded member on said needle, the threads on said piston engaging said needle threaded member threads.

2. A syringe comprising a cylindrical, transparent ampule and a plunger, a closure for one end of the ampule, said plunger including a cylindrical body, a threaded piston movable in the ampule, said plunger having an axial bore therethrough, a hypodermic needle disposed in said plunger bore, and a threaded member on said needle, the threads on said piston engaging said needle threaded member threads, said plunger having a front member thereon, said front member having an axial bore, said needle extending through said front member bore.

3. A syringe comprising a cylindrical, transparent ampule and a plunger, a closure for one end of the ampule, said plunger including a cylindrical body, a piston movable in the ampule, said plunger having an axial bore therethrough, a hypodermic needle disposed in said plunger bore, a threaded member on said needle and threads on said piston engaging said needle threaded member threads, said plunger having a front member thereon, said front portion including a projecting tapered tip, said front portion having a finger engaging flange, said front member having an axial bore, said needle extending through said front member bore, said needle having a rectangular protuberance thereon, said front member having a recess receiving said protuberance.

4. A syringe comprising a cylindrical, transparent ampule and a plunger, a closure for one end of the ampule, a piston in the ampule, said piston having a threaded recess, a diaphragm

closing the inner end of said recess, said plunger having an axial bore therethrough, a hypodermic needle disposed in said plunger bore, a threaded member on said needle, the threads on said piston engaging said needle threaded member threads, said plunger having a front member thereon, said front member having an axial bore receiving said needle, said needle projecting beyond said front member, the inner end of said needle having a pointed tip arranged in said piston recess and movable when the plunger is rotated relative to the piston to pierce the piston diaphragm to thereby place the needle in communication with the interior of the ampule.

5. A syringe comprising a cylindrical, transparent ampule and a plunger, a closure for one end of the ampule, said plunger including a cylindrical body, a piston in the ampule, said piston having a threaded recess, a diaphragm closing the inner end of said recess, said plunger having an axial bore therethrough, a hypodermic needle disposed in said plunger bore, a threaded member on said needle, the threads on said piston engaging said needle threaded member threads, said plunger having a front member thereon, said front member including a projecting tip, said front portion having a finger engaging flange, said front member having an axial bore receiving said needle, said needle projecting beyond said front member, the inner end of said needle having a pointed tip arranged in said piston recess and movable when the plunger is rotated relative to the piston to pierce the piston diaphragm to thereby place the needle in communication with the interior of the ampule, said needle having a rectangular protuberance thereon, said front member having a recess receiving said protuberance, and a flexible cap engaging said tip and surrounding said needle, said cap having a hole receiving the end of said needle.

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

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