

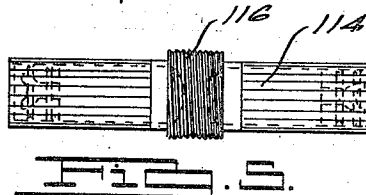
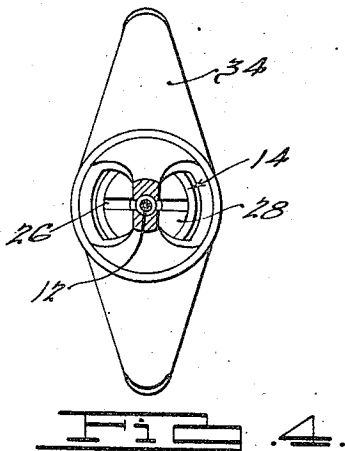
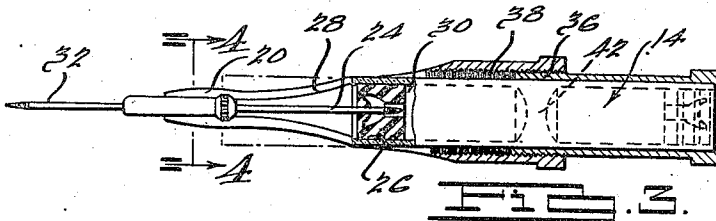
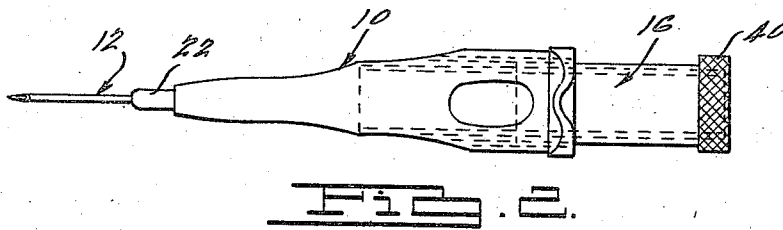
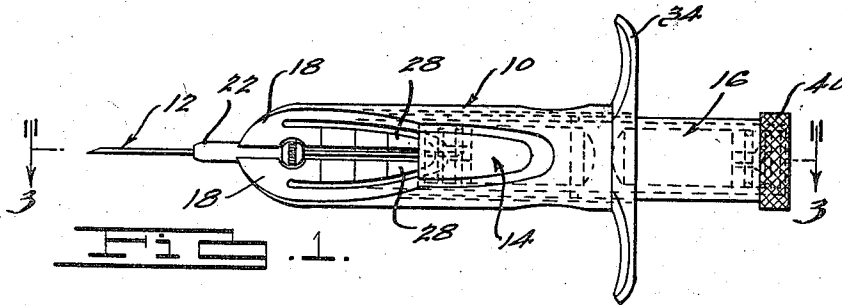
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2,457,313

HYPODERMIC SYRINGE

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HYPODERMIC SYRINGE

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6 Claims. (Cl. 128—220)

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This invention relates to functionally and structurally improved hypodermic syringes and has particular reference to certain new and useful improvements in syringes of the type shown in my prior copending application Serial No. 556,737, filed October 2, 1944.

It is an object of the invention to furnish a unit of this type and by means of which relatively minute doses of medicament may be dispensed by the operator or physician with assurance that an accurate dosage will result.

A further object is that of furnishing an assembly which will include both a syringe proper as well as an ampule; both of these units embodying functionally and structurally improved characteristics and, when combined, cooperating in an extremely efficient and desirable manner.

Still another object is that of furnishing an apparatus of this type which will embody relatively few parts of relatively simple and rugged design, such parts being capable of quantity manufacture to furnish units which may be sold for relatively nominal figures. Moreover, the assembly will be of such a simple nature that a relatively unskilled person will have no difficulty in either grouping the parts or, when so grouped or assembled, will be readily capable of operating the unit with complete control over the resultant dosage or injection.

With these and other objects in mind, reference is had to the attached sheet of drawings illustrating practical embodiments of the invention, and in which:

Fig. 1 is a plan view of an assembly;

Fig. 2 is a side elevation thereof;

Fig. 3 is a longitudinal sectional view taken along the lines 3—3 in the direction of the arrows as indicated in Fig. 1;

Fig. 4 is a transverse sectional view taken along the lines 4—4 and in the direction of the arrows as indicated in Fig. 3; and

Fig. 5 is a side elevation of an ampule element embodying a structure different from that of the ampule shown in certain of the preceding views.

In the embodiment of the invention selected for purposes of illustration, a hypodermic syringe comprises a holder 10, a double-ended hollow needle 12, an ampule 14, and a propelling means in the form of a cap 16.

The holder, as illustrated in Figs. 1-4, may be provided by a hollow metal tubular member open at its back end so as to telescopically or slidably receive the ampule 14. The forward end of the holder 10 comprises a pair of spring arms 18 spaced and formed as jaws 20 so as to receive and clamp therebetween the shank 22 of the double-ended hollow needle 12. The needle 12 may be inserted in or removed from the holder 10

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when the ampule 14 is withdrawn sufficiently from the holder 10 so as to clear the inner end 24 of the needle.

The jaws 20 removably clamp the needle in the position as illustrated relative to the holder and position the inner end 24 of the needle so that upon telescoping movement of the ampule 14 relative to the holder 10, the stopper 26 closing the medicament containing bore 30 of the ampule 14 will be punctured so as to establish communication between the interior of the needle and the medicament containing bore of the ampule 14.

The holder 10 further includes a pair of rearwardly facing abutments 28 which are positioned in the path of the stopper 26 upon telescoping movement of the ampule 14 relative to the holder 10 so as to engage such stopper 26 and cause the same to move relative to the ampule 14 and inwardly in the medicament containing bore 30 thereof to function as a piston for expressing medicament from such bore 30 through the needle 12 and from the projecting end 32 thereof.

The holder 10 may include wings 34 to facilitate holding the same. Propelling means in the form of a cap 16 is provided for advancing the ampule 14 into the holder 10, and this cap 16 may comprise a hollow tubular member externally threaded at the open end 36 thereof for cooperation with the internal threads 38 provided in the hollow ampule receiving space of the holder 10. The end 40 of the cap 16 may be knurled.

Thus, by threading the cap 16 into the holder 10, the ampule 14 will be advanced into the holder and medicament will be displaced from the bore 30 of the ampule 14 from the projecting end 32 of the needle.

From the foregoing it will be appreciated therefore that by a predetermined amount of rotation of the cap 16 relative to the holder 10, predetermined minute amounts of medicament may be expelled from the projecting end 32 of the needle into the tissue to be treated. This is extremely important in many types of hypodermic injections where only a drop or two of the medication is required for the particular treatment.

The ampule 14 may comprise a hollow tubular member formed of a suitable plastic or other material having a partition 42 intermediate the ends thereof for dividing the bore of the ampule into two separate compartments. In this manner, after the medicament from one compartment is used, the ampule 14 may be withdrawn and the other end, which is identical, may be inserted in the holder.

In Fig. 5 a modified form of the invention is illustrated in which the ampule 114, similar to that previously described, is provided with an externally threaded portion 116 at the center for

cooperation with the threads 38 of the holder. In the type of ampule illustrated in Fig. 5, the cap 16 may be omitted, as the threads 116 on the ampule 114 will cooperate with the threads 38 of the holder 10 to advance the ampule into the holder for expelling medicament from the projecting end 32 of the needle. The ampule illustrated in Fig. 5, like that illustrated in the afore-said embodiment, may be formed of a suitable plastic material.

While I have illustrated and described a preferred embodiment of my invention, it is understood that this is capable of modification and I therefore do not wish to be limited to the precise details set forth but desire to avail myself of such changes and alterations which fall within the purview of the following claims.

I claim:

1. In a hypodermic syringe, in combination, a tubular body formed with an unobstructed rear opening, screw threads extending on the inner face of said body and adjacent said opening, a double ended needle mounted by the forward end of said body with the outer end of said needle extending beyond said body and its inner end extending within said body to a point short of the rear opening thereof, a thrust portion forming a part of said body and projecting from the forward end of the same, adjacent said needle and terminating at a point short of the inner needle end, an ampule comprising a body having one of its ends closed, its opposite end being open, a stopper for sealing such opposite end, such end of the ampule having a diameter less than the screw threads of said body whereby said ampule may be introduced through the rear opening of said body and be directly projected to a point at which the outer face of the stopper is engaged by the end of the thrust portion and the inner end of the needle penetrates said stopper and means thereupon engageable with the threads of said body for advancing said ampule within said body to telescopically enclose said thrust portion to effect a retraction of the stopper within the ampule.

2. In a hypodermic syringe, in combination, a tubular body formed with an unobstructed rear opening, screw threads extending on the inner face of said body and adjacent said opening, a double ended needle mounted by the forward end of said body with the outer end of said needle extending beyond said body and its inner end extending within said body to a point short of the rear opening thereof, a thrust portion forming a part of said body and projecting from the forward end of the same, adjacent said needle and terminating at a point short of the inner needle end, an ampule comprising a body having one of its ends closed, its opposite end being open, a stopper for sealing such opposite end, such end of the ampule having a diameter less than the screw threads of said body whereby said ampule may be introduced through the rear opening of said body and be directly projected to a point at which the outer face of the stopper is engaged by the end of the thrust portion and the inner end of the needle penetrates said stopper and threads forming a part of said ampule and disposed adjacent its closed end, such ampule threads being cooperable with the threads adjacent the opening of said tubular body after the ampule has been disposed therein to cause a projection of the ampule within said body to telescope the same over said thrust portion and

to simultaneously retract the stopper within the ampule.

3. In a hypodermic syringe, in combination, a tubular body formed with an unobstructed rear opening, screw threads extending on the inner face of said body and adjacent said opening, a double ended needle mounted by the forward end of said body with the outer end of said needle extending beyond said body and its inner end extending within said body to a point short of the rear opening thereof, a thrust portion forming a part of said body and projecting from the forward end of the same, adjacent said needle and terminating at a point short of the inner needle end, an ampule comprising a body having one of its ends closed, its opposite end being open, a stopper for sealing such opposite end, such end of the ampule having a diameter less than the screw threads of said body whereby said ampule may be introduced through the rear opening of said body and be directly projected to a point at which the outer face of the stopper is engaged by the end of the thrust portion and the inner end of the needle penetrates said stopper and a cap to receive said ampule and said cap having its exterior face threaded to cooperate with the threads of said body to cause the ampule to telescope over said thrust portion and to cause the ampule stopper to be retracted.

4. As an article of manufacture, an ampule comprising a tubular body, an end wall permanently closing one end of the same, the opposite end of said body being open and screw threads of a diameter larger than said body and disposed adjacent the closed end of the same.

5. As an article of manufacture, an ampule comprising a tubular body, a wall disposed substantially between the opposite ends of said body and providing a permanent partition sealing said opposite ends from each other and screw threads encircling said body substantially in the zone of said partition and having a diameter greater than the diameter of said body.

6. In a hypodermic syringe, in combination, a tubular body formed with an unobstructed rear opening, screw threads extending on the inner face of said body and adjacent said opening, a double ended needle mounted by the forward end of said body with the outer end of said needle extending beyond said body and its inner end extending within said body to a point short of the rear opening thereof, a thrust portion forming a part of said body and projecting from the forward end of the same, adjacent said needle and terminating at a point short of the inner needle end and said body being adapted to have a stoppered ampule introduced through its rear opening, the stopper thereof being penetrated by the inner needle end and engaged by said thrust portion; the said screw threads coacting with other threads to move the ampule in telescopic relationship with respect to said thrust portion.

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