

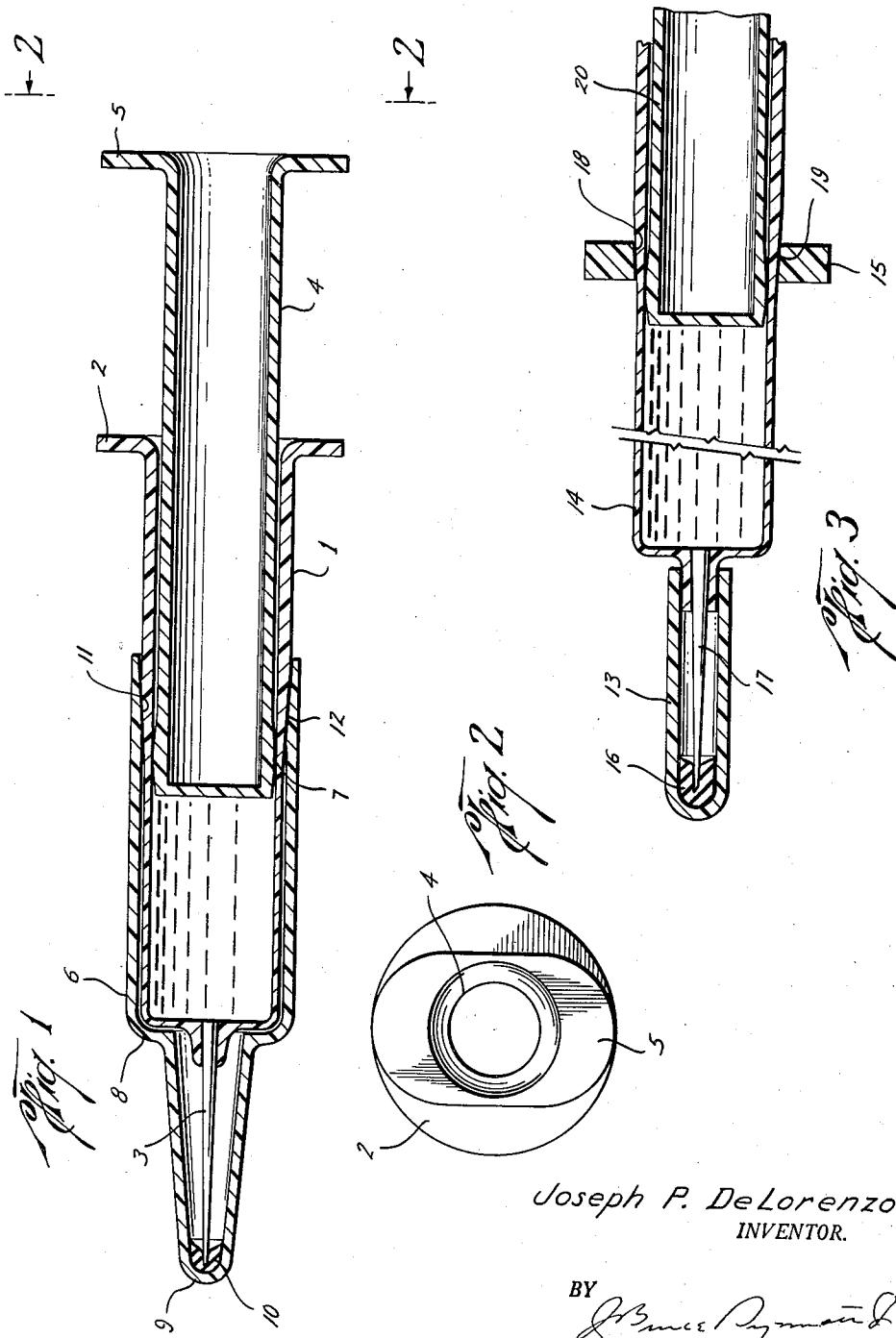
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DISPOSABLE HYPODERMIC SYRINGE

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DISPOSABLE HYPODERMIC SYRINGE

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The invention relates to a disposable hypodermic syringe, and it concerns more particularly a comparatively inexpensive hypodermic syringe which is capable of being used as a combined package and injector for a measured dosage of medication, and which may be used once only and thereafter discarded.

It is an object of the invention to provide a hypodermic syringe which may be formed substantially entirely of plastic materials, and which is comparatively indestructible and is relatively inexpensive from the standpoint of its manufacturing cost as well as the expense of shipping and storing it.

Another object of the invention is to provide a hypodermic syringe which is capable of being used as a combined package and injector for a measured dosage of medication, and which is sterile and ready for immediate use, without need for sterilizing the syringe or for breaking or opening packages and introducing the desired dosage of medication into the syringe.

Another object of the invention is to provide a hypodermic syringe which is capable of being used as a combined package and injector, as above described, and which may be calibrated whereby a predetermined amount of medication may be removed therefrom, as desired, after which the syringe may be sealed to retain therein the unused portion of the medication.

Another object of the invention is to provide a combined package and injector which may be readily filled with medication while maintaining the medication sterile.

Another object of the invention is to provide, in combination with a hypodermic syringe capable of being used as a combined package and injector for a measured dosage of medication, and having a hypodermic needle attached thereto whereby the syringe is ready for instant use, cover means for the needle whereby the needle may be maintained sterile, and sealing means carried by the cover means for engagement with the point of the needle to prevent leakage therefrom.

A further object of the invention is to provide, in combination with a syringe having an elastic barrel and a plunger received within the barrel, and in which the outer surface of the barrel is tapered intermediate its ends, means surrounding the barrel and capable of slidably engaging the tapered outer surface thereof whereby the barrel is compressed about the plunger to form a fluid tight seal between the plunger and the barrel and to prevent the plunger from being pulled out of the barrel.

Another object of the invention is to provide a syringe having an elastic barrel and a plunger received within the barrel, and in which the plunger is of slightly larger diameter than the inside diameter of the barrel whereby the barrel is capable of being expanded by the action of the plunger to thereby form a fluid tight seal between the barrel and the plunger.

The invention will be readily understood by referring to the following description and the accompanying drawing, in which:

Fig. 1 is a sectional view, taken on a median line, of

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a disposable hypodermic syringe embodying the invention;

Fig. 2 is an end view taken on the line 2—2 of Fig. 1; and

Fig. 3 is a fragmentary sectional view, taken on a median line, of a modified form of the invention.

Referring to Figs. 1 and 2 of the drawing, a disposable hypodermic syringe is shown which includes an elastic tubular barrel 1. The barrel 1 advantageously may be made of plastic material and is open at one end, which is flanged at 2. A hypodermic needle 3, which is aligned axially with the barrel 1, is connected at one end to the end of the barrel 1 opposite its open end and is in fluid communication with the interior thereof. A tubular plunger 4 is received telescopically within the barrel 1. The plunger 4 may be made of plastic material harder than the material of the barrel 1 and is open at its outer end, which is flanged at 5. The needle 3 and the adjacent end of the barrel 1 are received telescopically within a tubular cap 6, which likewise may be made of plastic material harder than the material of the barrel 1 and is open at one end.

The inner end of the plunger 4 is enlarged at 7 for engagement with the inner wall of the barrel 1. The outside diameter of the enlarged portion 7 of the plunger 4 preferably is slightly larger than the inside diameter of the barrel 1, so that the portion of the barrel 1 immediately adjacent the enlarged portion 7 is expanded as the plunger 4 is moved longitudinally with respect to the barrel 1. This arrangement prevents the fluid contained in the syringe, indicated by the dotted lines, from leaking thru the annulus between the plunger 4 and the barrel 1 upon advancing the plunger 4 within the barrel 1 to discharge the fluid therefrom.

Upon advancing the plunger 4 within the barrel 1 to discharge the fluid contained in the barrel 1 from the opposite end thereof, thru the needle 3, the barrel 1, which is elastic, may be stretched hydraulically by the action of the contained fluid, so that the enlarged portion 7 of the plunger 4, which is of slightly larger diameter than the inside diameter of the barrel 1, may be readily moved longitudinally with respect thereto while at the same time preventing leakage of fluid thru the annulus between the plunger 4 and the barrel 1, as above described.

The diameter of the cap 6 is reduced at 8, intermediate its ends, to form an internal shoulder for engagement with the inner end of the barrel 1 to limit the longitudinal movement of the cap 6 with respect to the barrel 1. The end of the cap 6 opposite its open end, which surrounds the needle 3, is tapered to a point at 9. A mass of resilient material 10 is received within the pointed end 9 of the cap 6 for engagement with the point of the needle 3. The resilient material 10 prevents leakage of fluid through the annulus between the needle 3 and the pointed end 9 of the cap 6. The adjacent surface of the resilient material 10 preferably is indented for engagement by the point of the needle 3 so that it is capable of centering the needle 3 with respect to the pointed end 9 of the cap 6.

The inner surface of the cap 6 is tapered at 11, adjacent its open end, and the outer surface of the barrel 1 is tapered at 12, intermediate its ends, for engagement by the tapered surface 11 of the cap 6 whereby the adjacent portion of the barrel 1 is compressed about the plunger 4, to prevent leakage of fluid thru the annulus between the barrel 1 and the cap 6 and to prevent displacement of the plunger 4 from the barrel 1.

The barrel 1 may be calibrated, whereby a predetermined amount of medication may be removed therefrom, as desired, after which the syringe may be sealed to retain therein the unused portion of the medication.

The barrel 1 may be readily filled by first removing the

needle 3 and the cap 6. The barrel 1 is then filled thru an opening provided therein for the needle 3, after which the needle 3 is attached and the cap 6 is applied.

Referring to Fig. 3 of the drawing, a modified form of the invention is shown in which the cap 6 per se has been eliminated. The arrangement shown is advantageous when the syringe is designed for comparatively large dosages and a cap therefor comparable to the cap 6 necessarily would be relatively long. In the arrangement shown only parts corresponding to the end portions of the cap 6 are used, which results in a saving of material. A needle point cover 13, which corresponds to the end of the cap 6 opposite its open end, is applied to the adjacent end of a barrel 14, which corresponds to the barrel 1, and an annular member 15, which corresponds to the open end of the cap 6, is applied to the barrel 14 intermediate its ends.

A mass of resilient material 16, which corresponds to the resilient material 10, is received within the needle point cover 13 for engagement with the point of a needle 17, which corresponds to the needle 3.

The inner surface of the annular member 15 is tapered at 18 for engagement with a tapered outer surface 19 of the barrel 14, the tapered surfaces 18 and 19 corresponding to the tapered surfaces 11 and 12, whereby the adjacent portion of the barrel 14 is compressed about a plunger 20, which corresponds to the plunger 4.

The invention may be modified in various ways without departing from the spirit and scope thereof.

I claim:

1. In combination with a syringe having an elastic barrel and a plunger received within the barrel, and in which the outer surface of the barrel is tapered intermediate its ends, means surrounding the barrel and capable of slidably engaging the tapered outer surface thereof whereby the barrel is compressed about the plunger to form a fluid tight seal between the plunger and the barrel and to prevent the plunger from being pulled out of the barrel.

2. A disposable hypodermic syringe comprising an elastic barrel, open at one end, the outer surface of the barrel being tapered intermediate its ends, a hypodermic needle attached to the end of the barrel opposite its open end, a plunger received telescopically within the barrel, cover means for the needle whereby the needle may be maintained sterile, sealing means carried by the cover means for engagement with the point of the needle to prevent leakage therefrom, and means surrounding the barrel and capable of slidably engaging the tapered outer surface thereof whereby the barrel is compressed about the plunger to form a fluid tight seal between the plunger and the barrel and to prevent the plunger from being pulled out of the barrel.

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