

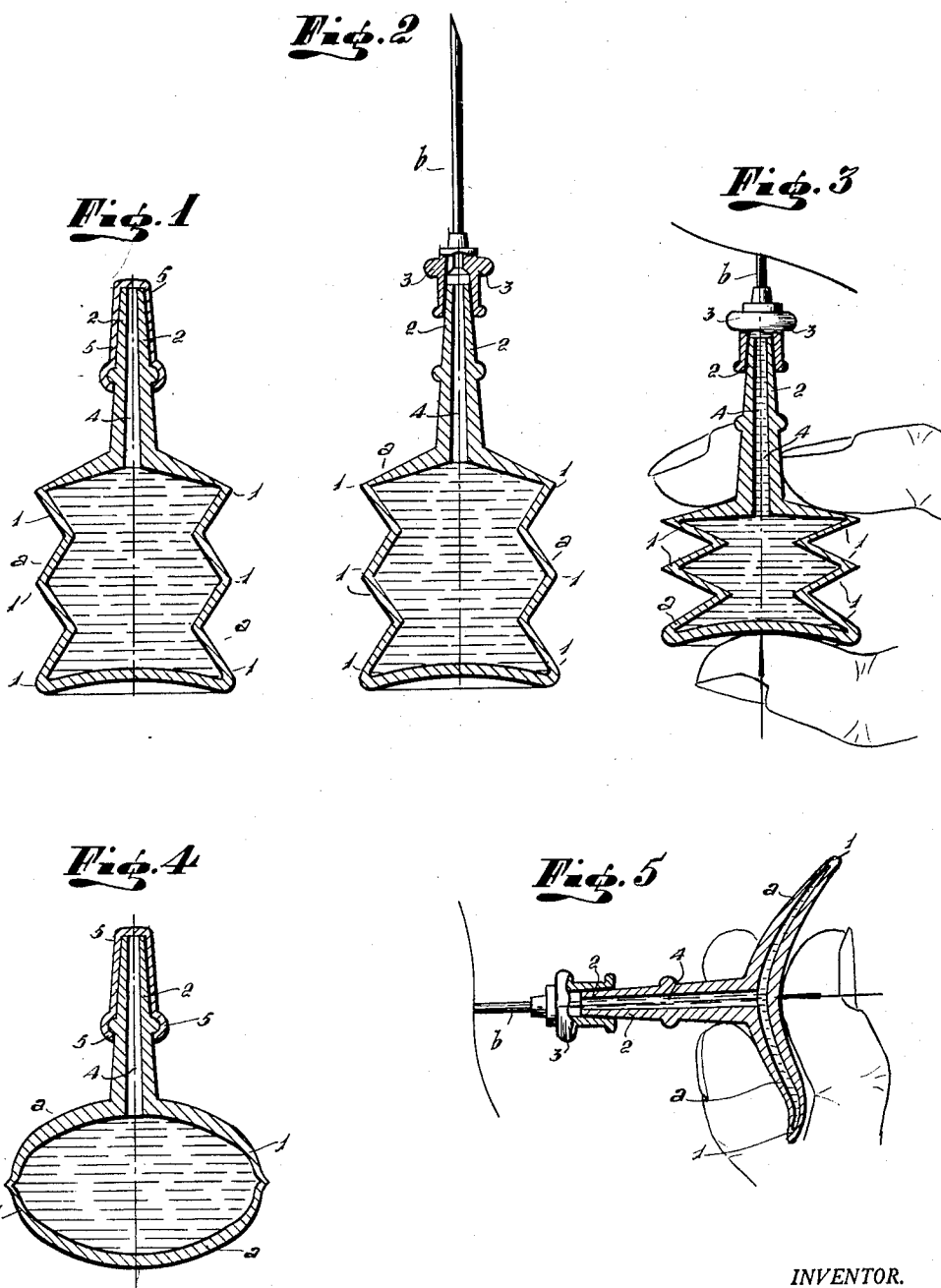
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HYPODERMIC SYRINGE-AMPULLA

2,911,972

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2 Sheets-Sheet 1



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Fig. 6

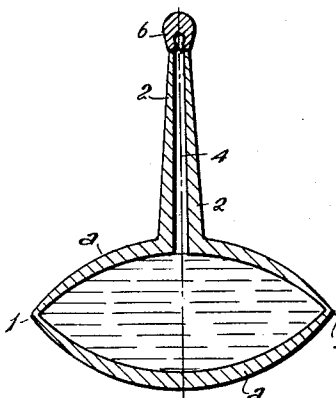


Fig. 7

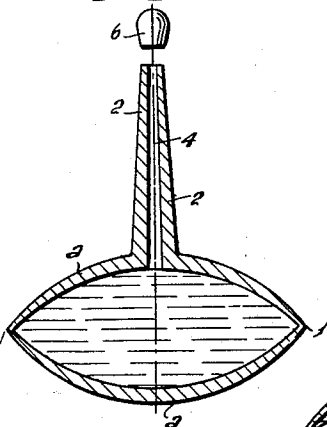
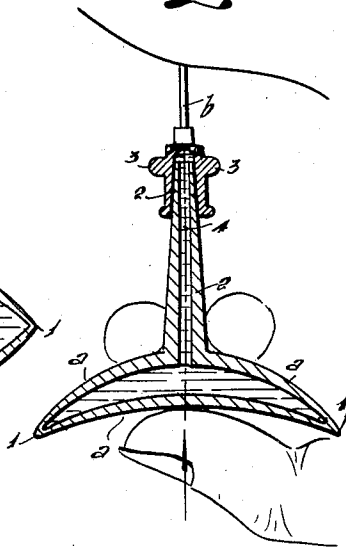


Fig. 8



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HYPODERMIC SYRINGE-AMPULLA

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1 Claim. (Cl. 128—216)

The present invention relates to a hypodermic syringe ampulla for injectable substances wherein the body portion of the syringe ampulla is provided with creases in its walls defined by crease lines rendering the walls pliable in certain parts in order that the injectable substances contained therein may be expelled by manual plying pressure.

The ampulla may be of any suitable shape with flexible and deformable walls so that the liquid contents may be expelled by manual pressure in the manner of a rubber atomizer, the body portion of the ampulla having a nozzle adapted to receive an injecting needle in such manner that said ampulla, after serving as a container, may be converted into a hypodermic syringe, thereby permitting injection of its contents in a direct manner without loading a syringe from a separate container according to usual practice.

The new syringe ampulla has the advantages of great simplicity and practicability and is readily molded from polyethylene or other similar plastic material at low cost as compared with glass ampullas. The present ampulla eliminates the need for conventional syringes as it replaces the same with great advantage.

A further advantage is that sterilization problems are avoided. As only one needle is required for each injection, a number of sterilized needles may be provided for successive injections from a single ampulla, such representing a technical and economic simplification and saving.

By means of the invention greater asepsis can be assured in the injections, as sterilization at the factory is always much safer than that which may be made in boiling water just prior to use.

A still further advantage is that the opening of the ampullas is facilitated without requiring files or other elements which endanger the integrity of the nozzle, and in certain cases of the whole unit, as, by the use of a flexible plastic material, the sealing of the ampullas may be made by a simple stopper or by drilling or perforating in order to receive directly the base of the injecting needle.

The invention is applicable for carrying out injections in medicine and dentistry as well as for veterinary purposes.

The invention is illustrated in the accompanying drawings in which:

Fig. 1 is a vertical section of an ampulla sealed by a detachable stopper and having a bellows-like body portion;

Fig. 2 is a view similar to Fig. 1 after the stopper has been removed and an injecting needle placed in position to convert the device into a syringe;

Fig. 3 graphically demonstrates how an injection is effected by applying pressure to the device to expel liquid through the needle;

Fig. 4 is a vertical section of another shape of ampulla in which the walls are ovoid;

Fig. 5 illustrates how an injection is made with the ampulla shown in Fig. 4;

Fig. 6 is a vertical section of another form of ampulla in which the stopper is an isolated terminal which is cut to form an outlet, leaving the nozzle free for application of the needle;

Fig. 7 shows the ampulla of Fig. 6 after the sealing terminal has been cut; and

Fig. 8 graphically demonstrates how the ampulla shown in Figs. 6 and 7 is converted to and used as a syringe.

Referring now to the drawings in detail, *a* is the body portion of the ampulla which, as already explained, is made of a suitable plastic material, such as polyethylene, which is resistant to attack and to acids in general. In addition, due to the properties of the plastic material, the walls of the body portion of the ampulla are highly flexible and bellows-shaped so that by pressure of the fingers of one hand, the ampulla may be flattened in the manner of a rubber atomizer.

For this purpose the walls of the body portion *a* are provided with one or more wall crease lines 1 which define the creases enabling the ampulla to be flattened axially.

The body portion of the ampulla *a* is provided with an extension constituting a nozzle 2 which is slightly conical and dimensioned to receive the base 3 of injecting needle *b* which is similar to a standard hypodermic needle.

The nozzle 2 has an axial bore or conduit 4 for filling and emptying the liquid medicament.

After filling, the nozzle 2 may be sealed in various ways as by means of a removable stopper 5, or by an adhered stopper 6 which may be cut open, as shown in Figs. 6 and 7.

The sealed ampullas may be marketed like glass ampullas with their contents of liquid medicaments.

When such an ampulla is to be used to make an injection, no transfer of the ampulla contents is required since the injection can be made directly from the ampulla in accordance with the present invention.

Upon opening a sealed ampulla, a previously sterilized hypodermic needle *b* is applied thereto as explained above, whereby the ampulla is converted into a hypodermic syringe, inasmuch as the base 3 of needle *b*, when affixed to nozzle 2, is connected to the ampulla contents for the injection.

The connection of base 3 to nozzle 2 may be effected either before or after the hypodermic needle is inserted in the muscle or vein of a patient, depending on the nature of the injecting fluid. By pressing toward each other the fingers of the hand, as seen from Figs. 3, 5 and 8, the injection is effected. The contents of the ampulla may thus be expelled partially or entirely in response to the amount of finger pressure exerted by the user or operator.

When the injection has been completed, the hypodermic needle is withdrawn and the ampulla may then be discarded as its low cost does not warrant its re-use.

The foregoing is intended as illustrative and not as limitative since variations in details may be made without departing from the spirit of the invention as defined by the appended claim.

I claim:

A hypodermic syringe-ampulla comprising a body portion of flexible plastic material provided with at least one crease line circumferentially disposed with respect to the body portion and whereof all points are equidistant from the body axis, a spout extending axially from one end of the body portion and closed by a seal and the opposite end of the body portion forming a concavo-

convex flexible diaphragm coextensive with said crease line, whereby the flexible diaphragm is adapted to receive and respond to thumb pressure for expelling a liquid in the syringe-ampulla, in which there is only one crease line and the body portion is lenticular.

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