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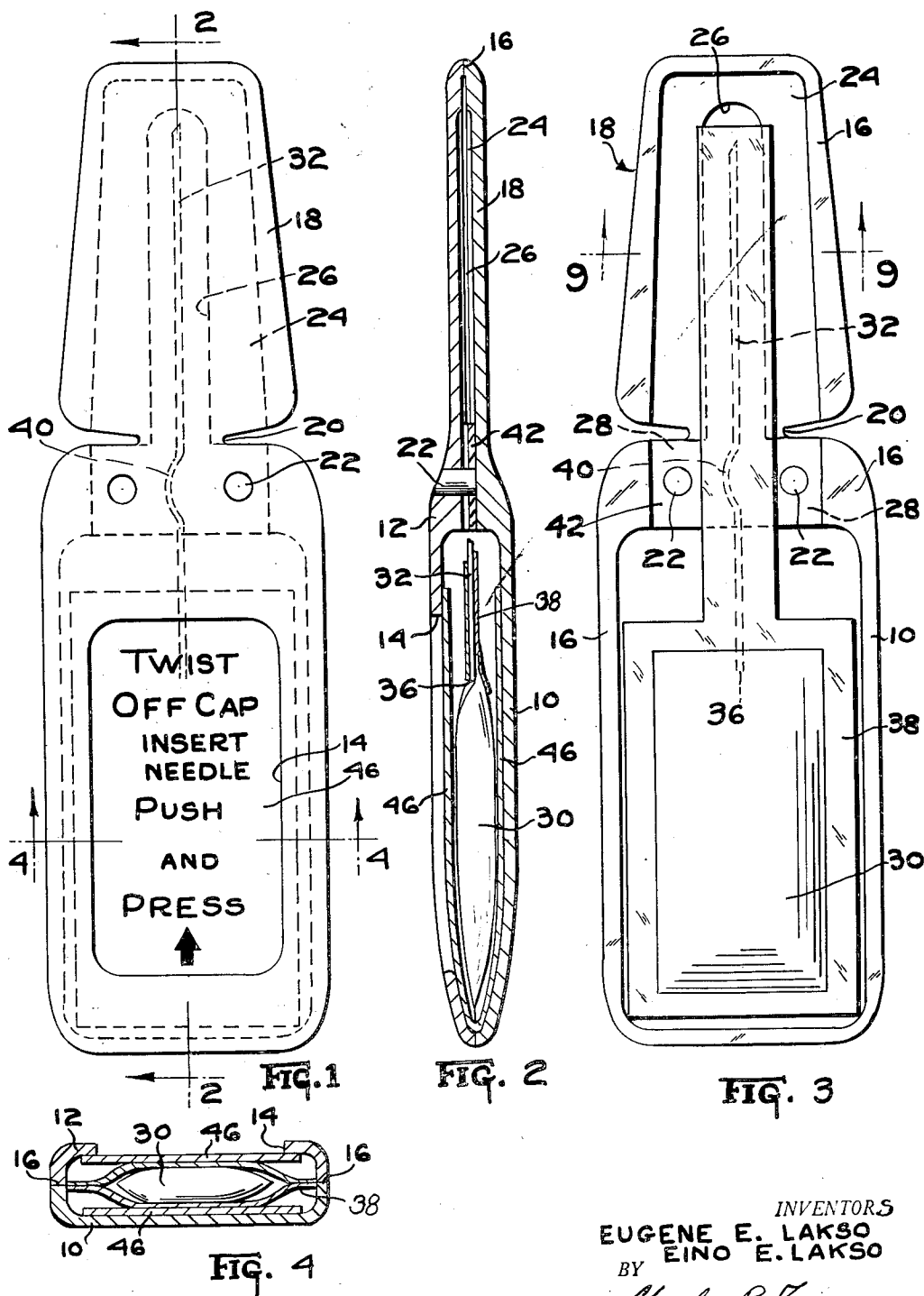
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2,618,263

DISPOSABLE SINGLE-USE SYRINGE

Filed March 14, 1951

2 SHEETS—SHEET 1



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2 SHEETS—SHEET 2

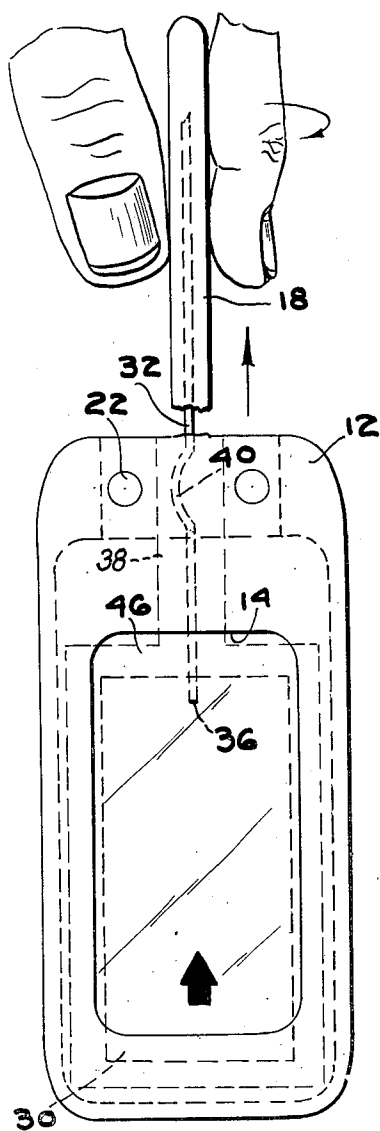


FIG. 5

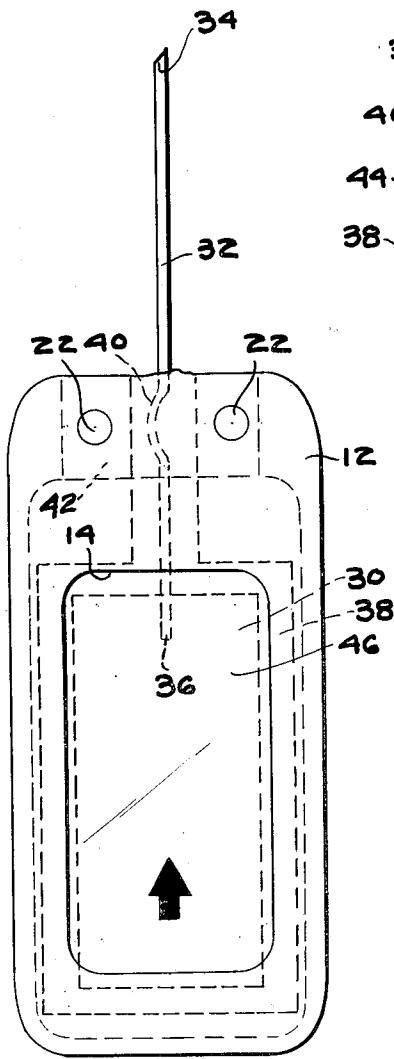


FIG. 6

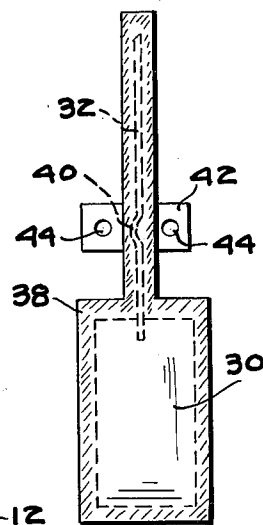


FIG. 7

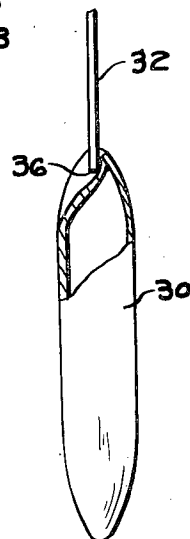


FIG. 8

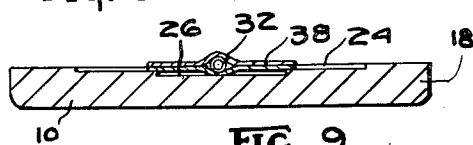


FIG. 9

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DISPOSABLE SINGLE-USE SYRINGE

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7 Claims. (Cl. 128—216)

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This invention relates to a disposable single-use or "one-shot" syringe and the principal object of the invention resides in the provision of a syringe which is completely sterile as to the contents and needle, easy and inexpensive to manufacture and simple to use, and being of a nature such that once used, it is thrown away, the contents being enough for a single injection.

A further object of the invention resides in the provision of a disposable syringe which as manufactured contains the material to be injected and comprises a frame or case which acts as a container for an ampoule and a needle and including means for storage and transportation thereof in a very small space while maintaining the same sterile, said syringe being quickly and easily manipulated for use for the intended purpose.

Another object of the invention resides in the provision of a syringe comprising a case preferably made of an inexpensive plastic material and having two main parts, one of which comprises a container or housing for a puncturable ampoule, the latter being encased in a covering material which also holds the injection needle in close association with said ampoule; and including means holding the needle in place and protecting the same whereby said ampoule is easily and quickly moved by a finger or thumb so that the needle punctures the ampoule, whereupon further pressure being exerted on the ampoule, the contents thereof is expressed through the needle for the intended function of a syringe; and the provision of a syringe as described including another portion of said main frame or casing which contains a major part of the needle and which is easily disrupted so as to expose the needle immediately prior to the intended use thereof, the puncturing of the ampoule by the needle being accomplished subsequent to exposure thereof; the needle being held in relation to the ampoule for accomplishing the puncturing substantially instantaneously and with a minimum of effort.

Other objects and advantages of the invention will appear hereinafter.

Reference is to be had to the accompanying drawings in which

Fig. 1 is a view in front elevation of the novel syringe;

Fig. 2 is a section on line 2—2 of Fig. 1;

Fig. 3 is a view in elevation with a part of the case removed;

Fig. 4 is a section on line 4—4 of Fig. 1;

Fig. 5 is a view in elevation illustrating the rupture and removal of the needle-containing portion of the casing;

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Fig. 6 is a view similar to Fig. 5 showing the needle ready for insertion and indicating the ampoule as punctured and ready for injection;

Fig. 7 is a view in elevation on a reduced scale illustrating the ampoule and needle unit which is enclosed in the casing;

Fig. 8 is an enlarged sectional view illustrating the manner in which the needle is associated with the ampoule prior to use; and

Fig. 9 is a cross section on an enlarged scale on line 9—9 of Fig. 3.

The syringe of the present invention comprises two principal parts which are an exterior holding, carrying, and protective casing, and a combined ampoule and needle unit held therein. The casing preferably comprises two main parts indicated at 10 and 12, the part 10 being referred to as the back and the part 12 being the front. The part 12 is provided with a relatively large opening or aperture 14, the part 10 being continuous and uninterrupted and it may be transparent if desired.

Parts 10 and 12 are made in the same general outline and are adapted to be cemented together along contiguous flat edge surfaces indicated at 16 in Fig. 3. The reference numeral 16 also indicates these surfaces as a parting line between the two molded parts of the syringe casing.

The casing as a whole is divided into two adjoining parts, one of which is enlarged, see Fig. 2, and the other of which indicated at 18 is relatively narrow. These two parts are connected by a reduced neck 20 which is easily broken as will be more fully described hereinafter. One of the parts as for instance the back of the case 10, is provided with a pair of pins 22 which may extend into corresponding holes in part 12 to align the two separate parts of the casing for correct positioning of the pieces and for assembling purposes.

The portion 18 of the casing is smooth and continuous on its outer surface but on its interior surface it is provided with two separate or undercut or recessed areas, one within the other. These areas are indicated at 24 and 26 and are perhaps best illustrated in Fig. 9. The respective configurations of these undercut steps or recesses are clearly shown in Figs. 1 and 3 and the recessed portion 24 extends to the upper part of the enlarged container portion in the region of pins 22 as at 28. The neck 20 may be scored to facilitate a clean break if desired.

The ampoule and needle assembly comprises the ampoule itself which is indicated in the area 30 and is of puncturable thin-walled material preferably in the nature of polyethylene or the

like. This ampoule preferably assumes a kind of pillow shape as indicated in Figs. 2 and 8.

The hypodermic needle itself is indicated at 32. Most of this needle is omitted from Fig. 2 for purposes of clarity of illustration. This needle has a sharp injection end 34 and a squared off or slightly sharpened inner end 36, the latter being arranged in overlapping relation to the end of the ampoule 30 as is clearly shown in Fig. 8. Since the material of the ampoule is flexible and resilient, the inner end of the needle may indent the ampoule to a slight extent without however causing penetration or puncture.

This assembly is covered by foil as at 38 which is completely sealed around the edges thereof and completely houses the ampoule and needle together in a unit which is thus seen to be clearly sanitary and which is not easily accidentally disrupted. On the other hand, of course, the operator may easily disrupt this foil manually. The needle has an offset portion 40 intermediate the ends thereof, but this may take the form of a burr, hub, or enlargement. However, this offset does not affect the operation or injecting qualities of the needle.

In the region of the offset 40, the unit is provided with a small flat sheet of heat-softening material preferably made of a plastic in the nature of an acetate. This sheet is indicated at 42 and is provided with holes 44 to accommodate pins 22. If desired, a corresponding similar sheet may be overlaid at the same location so that there is a sheet of this material at each side of the foil in the region of the needle offset 40, but the device operates satisfactorily with the single sheet 42 of heat softening material. The purpose of this sheet is to anchor the offset 40 and by applying a small amount of heat and pressure to the parts, the offset 40 in part at least sinks into the sheet 42 so as to become secured thereto by impression therein, and the sheet 42 of course then hardens.

Referring now to Fig. 3 this assembly is inserted in the back 10 as shown with the sheet 42 received on pins 22 and providing a lock or holding means for the foil and the needle in this particular area. The edges of the foil along the needle are clamped by the edges of the recess 26 and these recesses, and recesses 24, accommodate the needle 32. At the same time the edges of the foil are gripped closely and tightly so as to exactly position the ampoule and needle package in the casing. After this, the front 12 is applied and cemented and the device is ready for storage, transportation and use.

If desired, a folded piece of cardboard or the like, indicated at 46, is used to cover the ampoule package, see Figs. 1 and 2 and 4. This element may be printed with directions on one side as shown and with identification of contents and manufacturer on the other side. This folded piece of cardboard protects the ampoule mechanically and also provides an operating means as will be explained.

In the operation of the device, the portion 18 is grasped in the fingers and twisted relative to the ampoule containing portion, see Fig. 5. This twisting action not only disrupts the plastic at the neck 20 but also tears the foil so that the entire portion 18 is then merely withdrawn from the needle together with all of the foil above the break, thus exposing the needle 32 for instant use. The needle does not twist because of the offset 40 and its relatively firm anchoring in the sheet 42.

The needle may now be inserted where desired

and the thumb of the operator resting on the cardboard 46 (or on the foil covered ampoule in the absence of the cardboard) merely requires a slight push upwardly to cause the inner end 36 of the needle 32 to puncture the ampoule, whereupon further pressure on the cardboard or ampoule causes expression of the contents thereof as desired. Then, of course, the entire empty device is thrown away.

It is not necessary to insert the needle prior to puncturing the ampoule, as this may be done just prior to injection, particularly in cases where the operator wishes to express a drop or two of the ampoule contents prior to the injection.

It will be seen that this invention provides a single use throw away syringe which is clearly inexpensively manufactured in large quantities, completely sterile, sharp and well protected by the casing, easily stored and transported and very easily and extremely quickly usable when and where desired. This device is particularly useful in cases of emergency and provides great convenience and safety and is easily carried on the person or in the usual medical kit or bag. The ampoule will, of course, be made up in the usual or average amount as to content. The needle is always sharp and under ordinary circumstances cannot become damaged; the needle and contents are sterile, and no care need be exercised as to sharpening, sterilizing, etc.

Having thus described our invention and the advantages thereof, we do not wish to be limited to the details herein disclosed otherwise than as set forth in the claims, but what we claim is:

1. A syringe comprising a casing, a container therein, a needle in the casing, means normally holding the needle in close non-puncturing association with the container, said casing and said means being disruptable to expose the needle, and said container being capable of motion within the casing and toward the needle to cause the latter to puncture the container.

2. A syringe comprising a casing, a container therein, a needle in the casing, means normally holding the needle in close non-puncturing association with the container, said casing and said means being disruptable to expose the needle, and said container being capable of motion within the casing and toward the needle to cause the latter to puncture the container while the same is still held in the casing and means holding the needle in fixed relation in the casing.

3. A syringe comprising a puncturable ampoule, a needle, and a sealed cover securing the needle and ampoule together with one end of the needle in close association with the ampoule in position to puncture the same upon relative motion of the ampoule and needle toward each other, said cover being heat sealable foil and completely enclosing the ampoule and needle.

4. A disposable syringe comprising a casing having two main connected parts, an ampoule in one part and a needle in the other part, said needle extending into said one casing part in close association with the ampoule, said casing parts being disruptable to expose the needle, and said ampoule being movable within the casing against the needle to cause the latter to be inserted therein for injection of the ampoule contents by the needle.

5. A disposable syringe comprising a casing having two main connected parts, an ampoule in one part and a needle in the other part and extending into said one casing part in close association with the ampoule, said casing parts

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being disruptable to expose the needle, and said ampoule being manually movable against the needle to cause the latter to puncture the ampoule for injection of the ampoule contents by the needle, means to hold the needle to the said one casing part, and there being an aperture therein for manual access to the ampoule to move the same.

6. A disposable syringe comprising a casing, an ampoule, a needle, and a cover for the ampoule and needle therein, said casing having a neck in the region of the needle to be disrupted and cause separation of a part of the casing to expose the needle, said casing being larger interiorly than the ampoule held therein and allowing for motion of the ampoule toward the needle for communication therebetween, and means providing for expression of the ampoule contents through the needle.

7. The syringe of claim 6 wherein the casing is recessed to receive and grip the ampoule cover.

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