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GB 1583157	GB 1582265	GB 1331140
GB 0986478	GB 0178343	US 4581021
US 4548601	US 4475906	US 4018222

(58) Field of search
 A5R
 Selected US specifications from IPC sub-class
 A61M

(54) Syringe

(57) A flexible bodied syringe has a recess (16) in the interior, which is connected to the needle (14). This recess can be separated from the contents of the interior by a frangible seal which may be part of a sachet (20) or a separate element (40), which is broken by applying pressure or by the needle end.

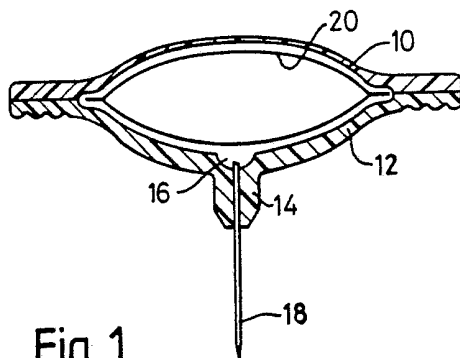


Fig. 1

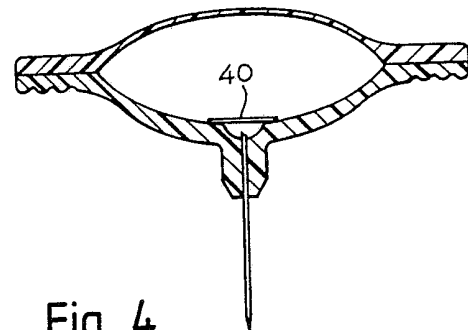
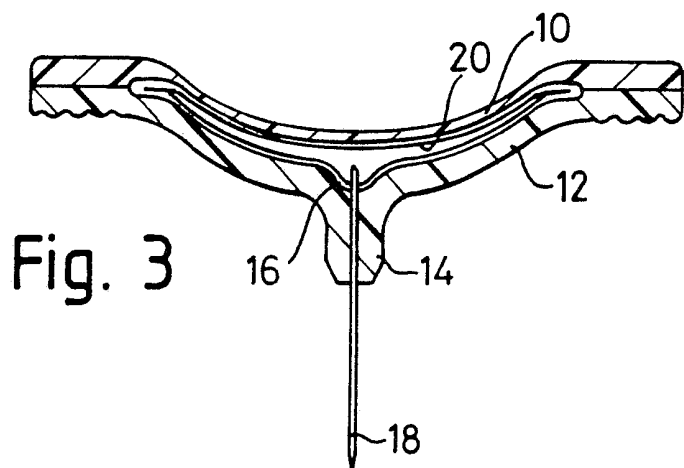
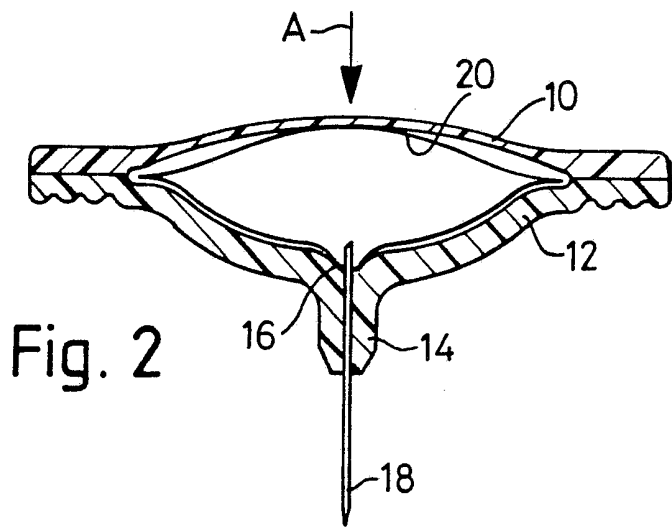
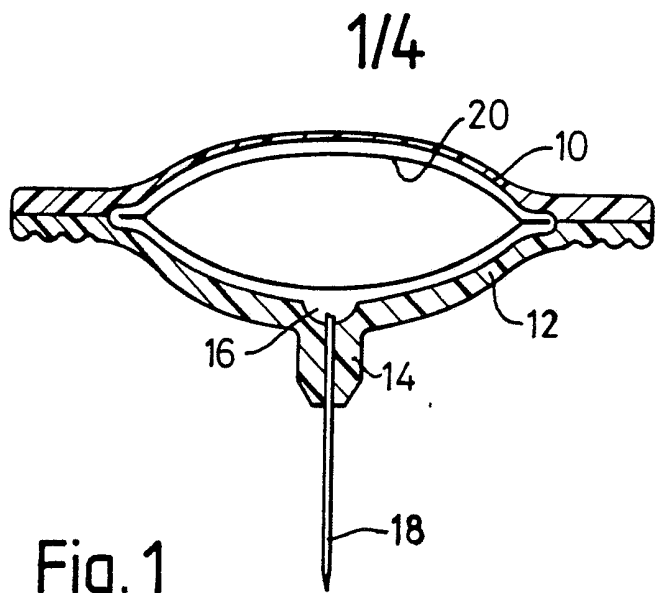


Fig. 4



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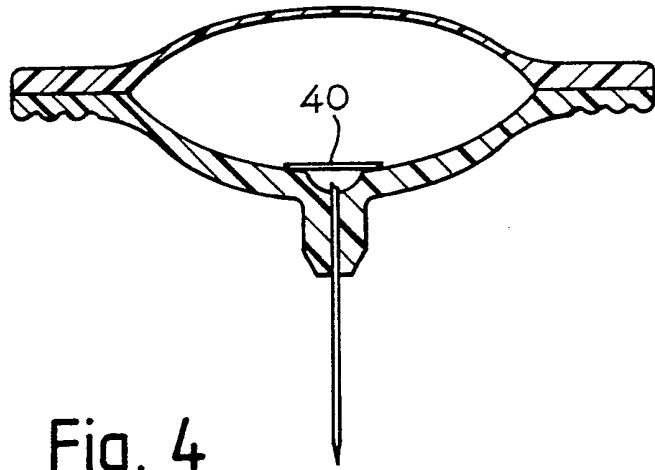


Fig. 4

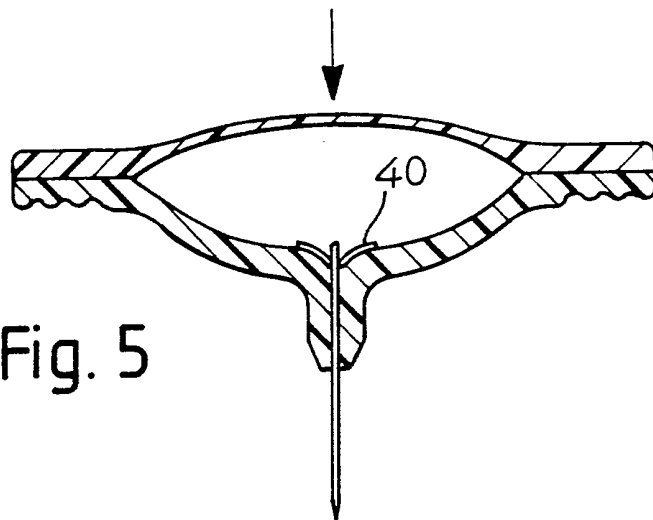


Fig. 5

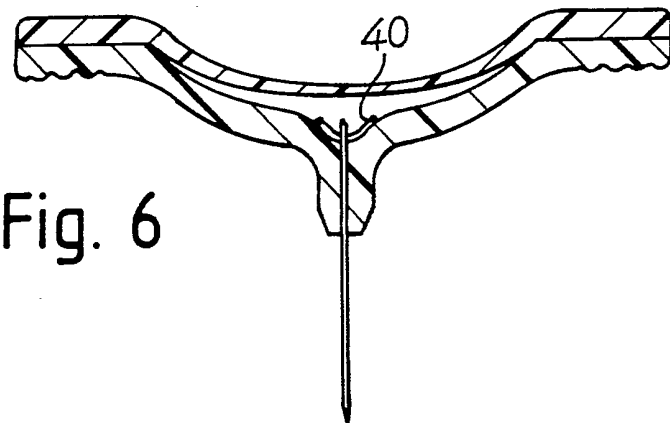


Fig. 6

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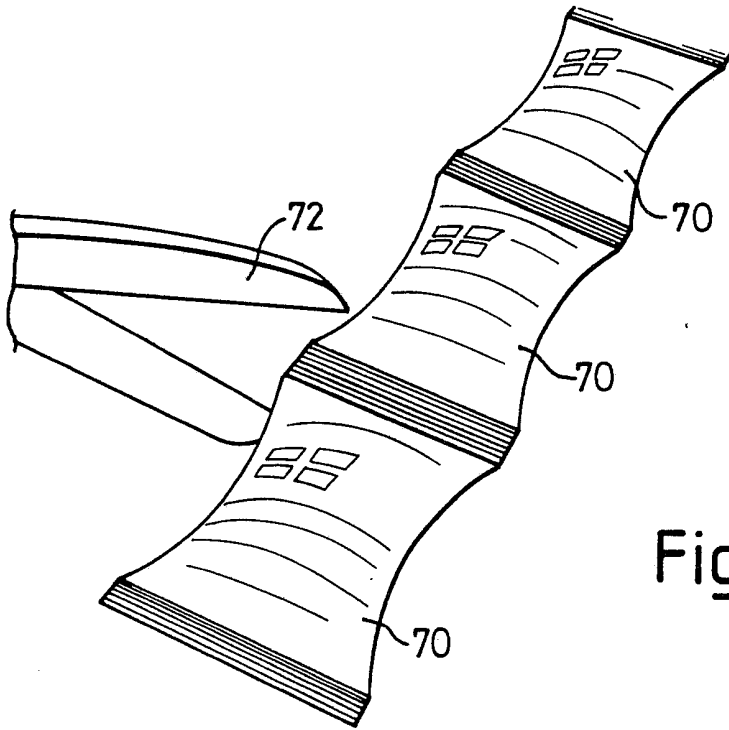


Fig. 7

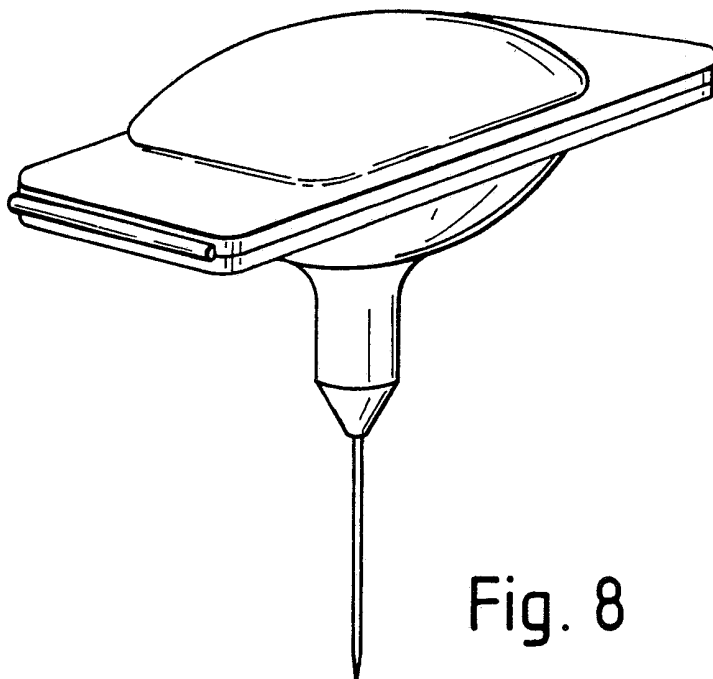


Fig. 8

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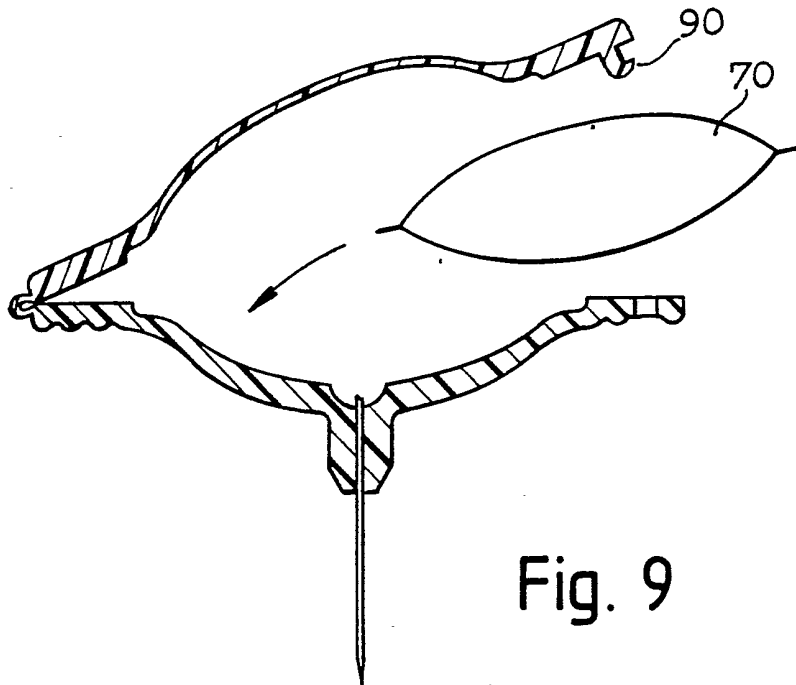


Fig. 9

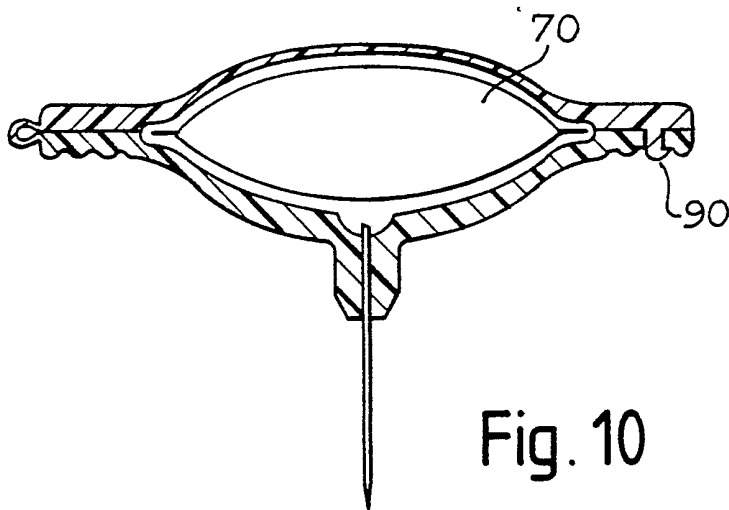


Fig. 10

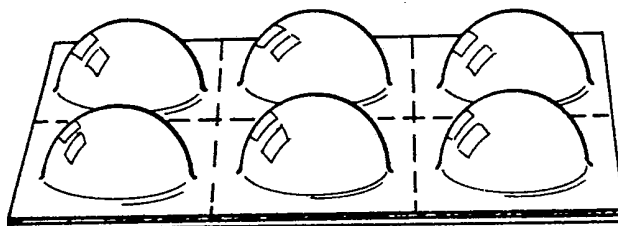


Fig. 11

SYRINGE

This invention relates to syringes for injecting vaccines, drugs and the like. The conventional construction is a piston and cylinder, with a needle attached to one end and a piston rod projecting at the other end. These may be pre-filled, or more often filled (which includes part-filled) at the time of use.

Much attention has been paid to the spread of infection by repeated use of the same syringe without adequate sterilization, and disposable or once-only syringes have been developed as an answer to the problem.

The object of the present invention is to provide a new design of syringe, which can be cheap and simple to manufacture and use, and which is also particularly adapted for once-only use.

According to the invention a syringe comprises a body including a flexible area and which body defines an internal substantially closed cavity containing or adapted to contain fluid to be dispensed, with a recess opening from said cavity, which recess is closed by a frangible seal, said syringe further comprising a hypodermic needle fixed to said wall, extending externally of the body and terminating at or in said recess.

When the body is squeezed the cavity is reduced in volume and hence cavity contents can be displaced to rupture the seal. This can be due to the pressure in which case the needle end may terminate at the recess wall. Alternatively, the needle end can project into the recess, so that it (the needle end) ruptures the seal when it is displaced into the recess.

The seal may be a disc closing the recess, that is to say bridging the mouth of it; alternatively the seal can be formed by an area of a sachet of liquid or like

inserted into the body.

When the seal is ruptured, continued squeezing on the body discharges the contents via the needle, that is to say makes the injection.

Various possibilities exist within the scope of the invention and some of these will now be described with reference to the accompanying drawings wherein:-

Figure 1 is a sectional elevation of a first embodiment of the invention in the ready-for-use state;

Figure 2 shows the same at the beginning of use;

Figure 3 shows the same at the end of use;

Figures 4 to 6 are views similar to Figures 1 to 3 but showing a second embodiment;

Figures 7 to 11 relate to a third embodiment.

Referring now to Figures 1 to 3 of the drawings, the syringe body comprises a top moulding 10 and a bottom moulding 12 both of which may be of a suitable plastics material and which may be generally circular in shape with concave interior shapes. The top moulding is relatively thin and flexible over its central area whereas the bottom moulding 12 is or may be thicker and/or stiffer over its whole area. The bottom moulding also has a central boss 14 projecting externally and recess 16 formed in the inner face extends into the boss. Needle 18 is fixed in the boss and in this embodiment projects into the recess.

A sachet of vaccine or like, 20 is located in the body cavity. The body mouldings may be welded together about the cavity. When pressure is applied in the area and direction of the arrow A, Figure 2, the sachet is squeezed and bulges into the recess. The needle pierces it. Continued pressure causes discharge through the needle. The thin wall of the part 10 goes from concave to convex so that it conforms closely to the concavity of the bottom wall and allows effectively complete discharge of the sachet contents. The thin wall may remain in that condition after use and the syringe is not reusable.

In the version of Figures 4 to 6 the sachet is dispensed with. The recess is bridged by a disc seal 40 which may be of a plastics film for example high frequency or heat welded about its periphery to the body around the rim of the recess. Thus, in this embodiment of Figures 4 to 6 a separate seal is provided and the body cavity is used to contain the vaccine or like, whereas in the Figures 1 to 3 embodiment the vaccine is packed in a sachet and a portion of the wall of the sachet forms the seal. In this embodiment of Figures 4 to 6 the joint between the body parts must be fluid tight and the cavity must be for example factory filled prior to completing the manufacture. The seal is ruptured at the beginning of the injection by pressure, and the syringe ends up in the same collapsed condition as in the Figures 1 to 3 embodiment.

Figure 7 shows a supply of sachets 70 made from a length of lay flat tube which is filled and then transversely sealed. These can be cut off as required for example by scissors 72 for individual insertion into a construction generally as shown in Figure 8 which is similar to that in Figure 1 except that the body parts may be hinged together at one radial position and mechanically latched together after inserting the sachet at a diametrically located position.

Figure 9 shows the sachet inserted and Figure 10 the syringe ready for use. When used, the body will again be as in Figure 3,

Preferably the mechanical catch 90 for locking the parts is arranged so as to be cammed to snap engage, but to be difficult or impossible to release, thus contributing towards the once-only limitation on the construction.

Figure 11 shows blister pack sachets of the vaccine or like as an alternative packaging for them.

The volume of injection may be varied by using sachets of a different volume, using one and the same body

construction.

CLAIMS

1. A syringe comprising a body including a flexible area and which body defines an internal substantially closed cavity to contain fluid to be dispensed, with a recess opening from said cavity, said syringe further comprising a hypodermic needle fixed to said wall, extending externally of the body and terminating at or in said recess.
2. A syringe as claimed in Claim 1 wherein said recess is closed by a frangible seal.
3. A syringe as claimed in Claim 2 wherein the seal comprises an area of a sachet of liquid or like.
4. A syringe as claimed in Claim 2 wherein the seal comprises a disc closing the recess.
5. A syringe as claimed in any preceding claim wherein the needle end protrudes into the recess for rupturing the seal when the latter is displaced into the recess.
6. A syringe substantially as described with reference to Figures 1 to 3, 4 to 6 or 7 to 10 of the accompanying drawings.

**POOR
QUALITY**