

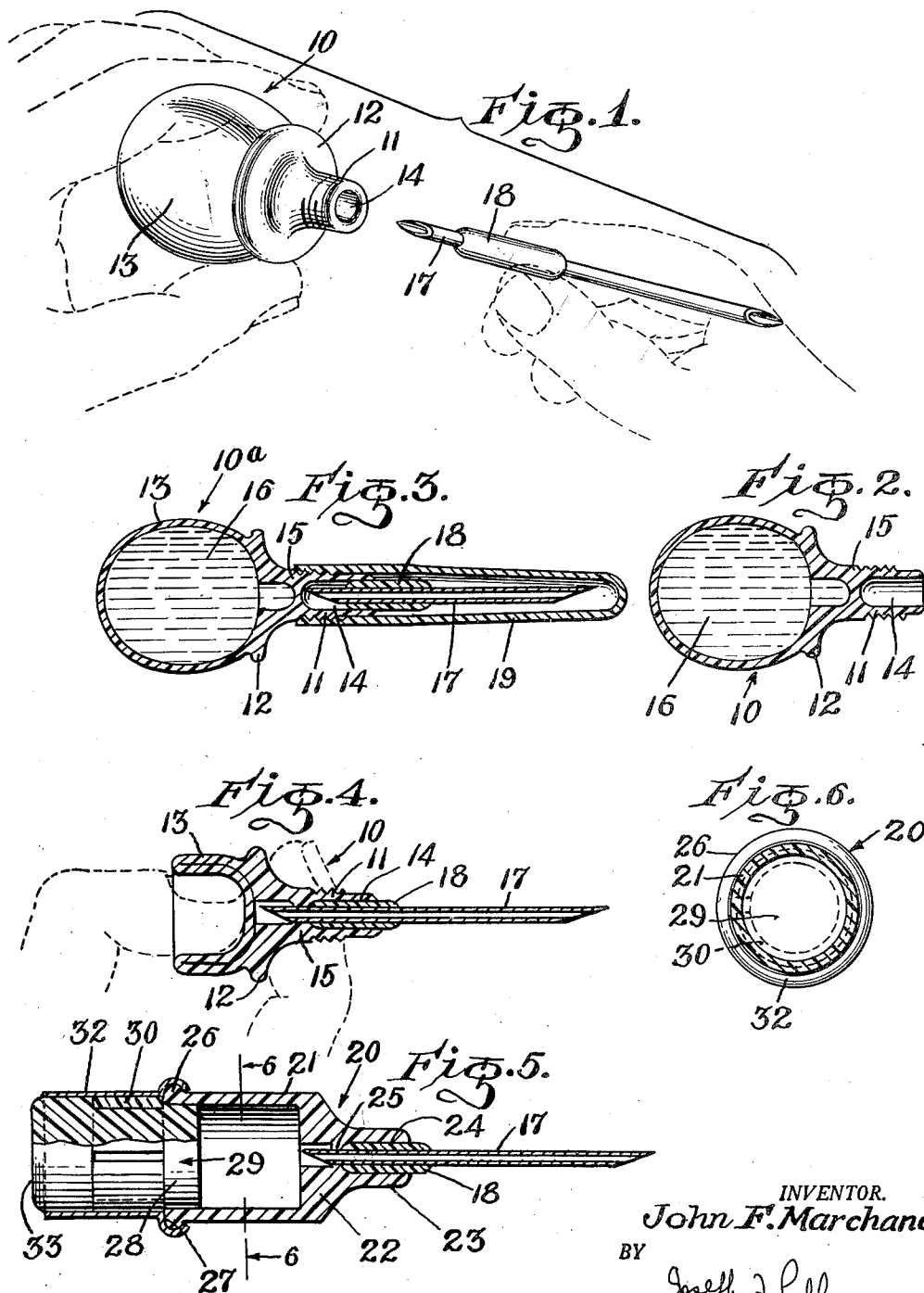
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CONTAINER FOR LIQUIDS, AND MORE PARTICULARLY TO A CONTAINER  
WHICH INCORPORATES THEREIN THE FUNCTION OF A SYRINGE

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## CONTAINER FOR LIQUIDS, AND MORE PARTICULARLY TO A CONTAINER WHICH INCORPORATES THEREIN THE FUNCTION OF A SYRINGE

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1 Claim. (Cl. 128—218)

This invention relates to containers for liquids and more particularly to a container which incorporates therein the function of a syringe.

It is an object of the present invention to reduce the overall cost and inconvenience of the conventional single or multiple dose containers of chemicals and pharmaceutical preparations and the additional multiple piece equipment normally employed therewith for the distribution and administration of such chemical and pharmaceutical preparations as parenteral injections or chemical reagent addition steps by providing a disposable, single dose container of unitary low cost construction which eliminates the need for employing a sterile ground glass calibrated syringe or pipette for the parenteral injection of volumetric measurement in transfer of the contents of the conventional container.

I am aware that containers of unitary sealed construction are not new, for example the conventional glass ampule or gelatin capsule are well known. However, the known containers of this type are not adapted for measured or unit dose injection parenterally through the skin under aseptic conditions without the employment of additional equipment in the form of a syringe or pipette.

I am also aware that disposable container assemblies for the injection parenterally of the liquid material through a single or double hollow point needle have been employed. However, such container assemblies are complex, of multiple piece or multiple material construction and moreover fail to provide a hermetical seal for the contents for complete protection against contamination and loss up to the actual time of evacuation.

It is accordingly another object of the present invention to provide a novel container of simple, low cost and unitary construction which incorporates the function of the syringe for a parenteral injection of the contents.

It is another object of the present invention to provide a container of the above type wherein finger or thumb pressure at one end of the container serves to eject the contents through the standard sterile two-way double point hollow needle inserted through the opposite end.

It is still another object of the present invention to provide a container of the above type wherein the standard two-way double point hollow needle is automatically inserted and held in proper alignment due to the shape of the container.

It is still another object of the present invention to provide a disposable container incorporating therein the function of a syringe, which container may be supplied during manufacture with a sterile unit dose for a routine parenteral injection through the skin or a measure for the convenient addition of a reagent to a chemical process.

It is still another object of the present invention to provide a container incorporating therein the function of a syringe which can be manufactured bacteriologically sterile without contents for ultimate use as a disposable substitute for the ordinary calibrated ground glass

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syringe. For such an application, the same standard two-way double point hollow steel needle is inserted through the diaphragm of the container whereupon the liquid to be dispensed or measured or injected can then be drawn up into the interior of the needle by a single pumping action at the other end of my container.

It is still another object of the present invention to provide a container of unitary seal construction wherein the contents can be conveniently emptied by thumb or finger pressure when tapped at the appropriate point by a hollow double point needle, the container being designed to hold the hub or shaft of the needle in firm alignment therewith. Such alignment of the needle permits the use of the container in a novel manner, i. e. as a handle by means of which the needle can easily be held for controlled direction of its free point under the skin or elsewhere preparatory to evacuation of the contents of the container.

It is still another object of the present invention to provide a container of the above type fabricated of unitary material, which material is selected for compatibility with the contents and sealed by direct fusion throughout for complete protection against chemical as well as bacteriological contamination or loss.

It is still another object of the present invention to provide a container of the above type which is fabricated from non-toxic, non-sensitizing, chemically inert and insoluble material which is self-shape retaining, yet deformable, and which when of sufficiently thin gauge is translucent and flexible to permit the necessary pumping action. Such a material is sufficiently self-shape retaining to withstand rough handling while at the same time is soft enough to be pierced at the vent diaphragm portion by the steel needle. Polyethylene or other substance having like physical properties is ideally suited for the fabrication of this container for use with a variety of acid, alkaline, salty or watery solutions or alcoholic solutions. Other materials which may be employed include the vinylites, nylon and rubber. However, the contents of the container will determine the nature of the material best suited for fabrication purposes.

It is still another object of the present invention to provide a disposable container incorporating therein the function of a syringe which eliminates the necessity of reesterilization of reusable equipment and thereby the possibility of cross infection from person to person by latent virus or other foreign bodies.

For other objects and a better understanding of the invention, reference may be had to the following detailed description taken in connection with the accompanying drawing, in which:

Figure 1 is a perspective view of a preferred embodiment of the present invention shown just prior to the insertion therein of a standard hollow double point needle;

Fig. 2 is a longitudinal sectional view of the invention shown alone;

Fig. 3 is a view similar to Fig. 2 showing a modified form of the present invention wherein the needle is provided along with the container and is maintained in a sterile condition by a thin cover;

Fig. 4 is a longitudinal sectional view of the device showing the standard needle in position therewithin and showing the compression of the integral blister for the ejection of the contents of the container through the needle;

Fig. 5 is a side view shown partly in elevation and partly in section of a still further modified form of the present invention and

Fig. 6 is a transverse sectional view thereof taken along the line 6—6 of Fig. 5.

Referring now more in detail to the drawing, and

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more particularly to Figs. 1, 2 and 4, there is shown a container indicated generally at 10 and including a cylindrical body portion 11 of heavy gauge of polyethylene or other substance having like physical properties, substantially as illustrated.

The body portion 11 at one end is flared outwardly at integrally formed flange portion 12, the face of the flange portion 12 remote from body portion 11 being in turn integrally formed with a spherical hollow blister 13.

The body portion 11 is provided with a central longitudinal cylindrical bore 14 which communicates at its inner end with the interior of the blister 13, the bore 14 being interrupted at its midpoint by an integrally formed diaphragm 15. During manufacture, the blister 13 is filled with the liquid 16 of medicinal, pharmaceutical or chemical nature, the liquid 16 being sealed therein due to the diaphragm 15. Preferably the volumetric capacity of the blister will be such as to conform with the required standard dosages or measurements.

In operation, the container 10 will be held in one hand by means of the flange formation 12 (Fig. 1) while the standard double point hollow needle 17 is inserted inwardly through the bore 14, the needle being held by the standard hub or body portion 18 which latter is adapted to be snugly received within the outer portion of the bore 14 (Fig. 4). During this operation, the inner point of needle 17 will puncture the diaphragm 15 and permit the liquid 16 to flow outwardly through the needle. During the measuring or injecting operation, the blister 13 will be compressed by the thumb or other finger, as shown in Fig. 4, to forcibly eject the contents outwardly through the needle. It will be noted that the bore 14 of the relatively rigid body portion 11 serves to align the needle 17 with the diaphragm 15 and that the inward movement of the hub portion 18 of the needle is limited by the abutment of the inner end thereof with the diaphragm 15 (Fig. 4).

During the ejection of the contents of the container, as shown in Fig. 4, the device may be employed directly through the skin into one of the tissues of the body or to dispense a volumetric quantity of chemical material into a vessel during a chemical process. After ejection, the container may be discarded to eliminate the usual problem of the reesterilization of reusable equipment.

It will be noted that the body portion 11 provides sufficient space for a comfortable grasping by the fingers and the outside surface of the body portion will be provided with suitable labels or the like identifying the contents and the amounts within. If desired, the body portion 11 may be grooved longitudinally to provide the maximum strength and optimum dimensions with a minimum of weight.

It should now be apparent that there has been provided a container which incorporates therewithin the function of a syringe, which container is formed at low cost in a unitary structure by a simple molding operation. It should also be apparent that there has been provided a container of the above type which is discardable after a single use or injection to eliminate the uncertainty and inadequacy of conventional reesterilization of reusable equipment. Such uncertainty and inadequacy has heretofore been associated with cross infections from person to person by latent virus such as that of serum hepatitis as well as epidemics, all of which could have been avoided if the single use sterile and disposable syringe containers embodying the features of the present invention had been employed.

Referring now particularly to Fig. 3, there is shown a modified form of the present invention indicated generally at 10a and differing from the previous form in the assembly of the needle 17 and hub 18 during manufacture with the body portion 11. In this case the contents are hermetically sealed therewithin by the pro-

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vision of a plastic cover 19 closed at one end and which surrounds the needle 17, the other end of the cover 19 being screwed or heat sealed or otherwise secured to the body portion 11. The cover 19 will preferably be formed of the same material as the container. In this form, it is only necessary to sever the cover 19 (which is of relatively thin gauge) and to inject the contents into the desired area, after the syringe has been pushed through diaphragm 15 as shown in Fig. 4.

In other respects the form of the invention shown in Fig. 3 is the same as that shown in Figs. 1, 2, and 4, and like reference numerals identify like parts throughout the several views.

Referring now particularly to Figs. 5 and 6, there is shown a still further modified form of the present invention indicated generally at 20 and including a hollow cylindrical blister or body portion 21 of relatively thick gauge polyethylene or other substance having like physical properties. The body portion 21 at one end is integrally formed with the hollow conical portion 22 which is in turn integrally formed with the cylindrical extension 23. The extension 23 is of relatively thick gauge and is provided with a central longitudinally extending bore 24 which is separated from the interior of the body portion 21 by means of an integrally formed diaphragm 25. The bore 24 is adapted to receive snugly therewithin the hub 18 of the standard double point hollow needle 17, the inner end of which again pierces the diaphragm 25 when the hub 18 is in proper position within the bore 24, as shown in Fig. 5.

The other end of the body portion 21 is integrally formed with the flange formation 26 as well as the end wall 27. The end wall 27 is provided with a central circular opening through which is slidable the cylindrical shank 28 of a piston 29 adapted for sliding movement within the body portion 21, the forward end of the piston 29 being adapted to reach the inner wall of the body 21 when the piston 29 is pushed forwardly toward the inner point of needle 17 after it has pierced diaphragm 25 preparatory to use. The piston 29 and shank 28 are preferably formed of the same material as the body portion 21. A split removable sleeve 30 is provided around piston shank 28. The outer end of the shank 28 and sleeve 30 are integrally covered with a membrane 32 which surrounds the shank and which is in turn integrally formed with the end wall 27 whereby to prevent the contamination or loss of the contents during movement of the piston. Upon use of this invention, the membrane 32 is removed, then the sleeve 30 is taken off the shank, and needle 17 is pushed into bore 14 so that the inner needle pierces the diaphragm, whereupon pressure is applied on the exposed end 33 of shank 28.

During manufacture, the interior of the body portion 21 will be filled with the pharmaceutical, medicinal or chemical liquid 16, the liquid being sealed therewithin by means of the diaphragm 25. The membrane 31 will seal the contents further within the container. Just prior to use, the standard needle 17 will be injected through the membrane 25 until the hub 18 is properly positioned within the bore 24. The contents will then be ejected through the hollow needle by simply pressing the end of the shank 28 inwardly to move the piston 29 from the position of Fig. 5 into abutment with the conical portion 22. For this purpose the flange formation 26 may be employed, abutting the fingers while the thumb is pressed against the shank 28. Here again, as in the previous forms, the body portion 21 may serve as a convenient handle by means of which the needle 17 may be held for controlled direction of its free point under the skin or elsewhere preparatory to evacuation of the contents of the container. Furthermore the bore 24 serves to align the needle 17 with the diaphragm 25.

It should now be apparent that there have been provided disposable containers of continuous unitary construction which are useable as syringes when tapped at

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the proper point by the standard hollow steel needle. It should also be apparent that there have been provided disposable containers of the above type which are formed from polyethylene or other substance having like physical properties and which are chemically inert, non-toxic and permeable and of unitary structure.

While various changes may be made in the detail construction, it shall be understood that such changes shall be within the spirit and scope of the present invention as defined by the appended claim.

I claim:

A unitary compact injectable fluid container comprising a blister, a reinforced portion extending from one end of said blister, an elongated portion protruding from the blister, said elongated portion having a sealed bore therein, and a two way hypodermic needle in the elongated portion having an enlarged portion adapted for insertion and accommodation into the bore, said needle being adapted to penetrate the blister through the sealed

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bore and permit expulsive ejection of the contents of the blister, said blister being substantially of cylindrical shape and provided with a piston, and a displaceable sleeve member between the piston and the blister, and a removable sealing member enclosing the piston and displaceable sleeve member.

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