Sept. 30, 1952 W. Y. NORMAN 2,612,163

CONTAINER FOR HYPODERMIC PREPARATIONS

Filed Oct. 9, 1950

Fig. 1.

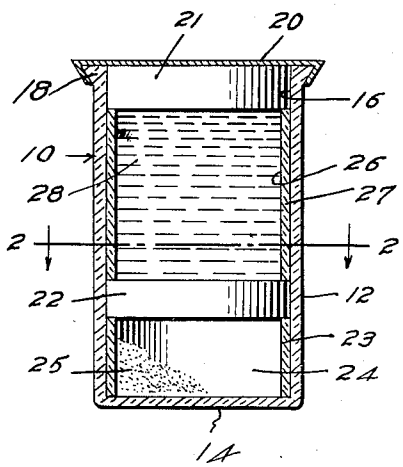


Fig. 3.

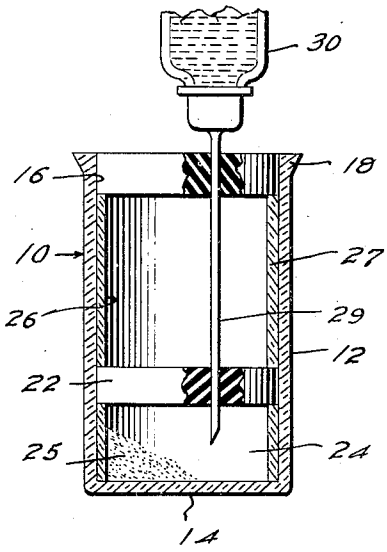


Fig. 2.

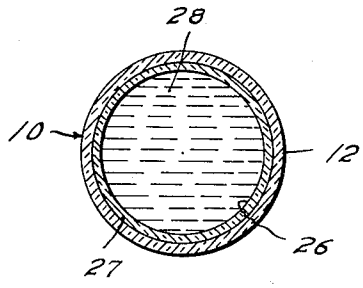
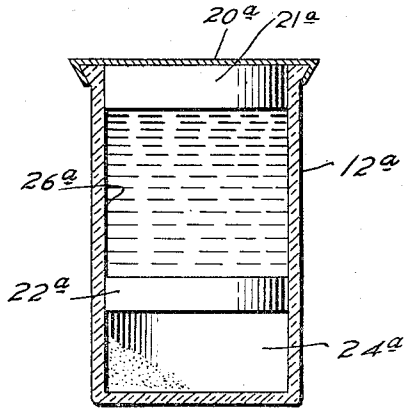


Fig. 4.



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CONTAINER FOR HYPODERMIC PREPARATIONS

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2 Claims. (Cl. 128—272)

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This invention relates to the packaging of medicinal preparations intended for hypodermic administration and more especially to an improved receptacle or container therefor.

Certain medicines intended for hypodermic injection cannot be kept in solution because of undesirable changes which take place unless the solution is kept properly refrigerated, and even then it is not desirable that they be kept for too long a period. Penicillin is an example. This is marketed in powder or crystal form in a sealed container, with a separate container of the sterile liquid in which it is to be dissolved and the solution is then effected at the time the medicine is to be used.

An object of the present invention is to provide a two purpose vial or container which will make it more convenient for doctors making house calls, to easily and quickly prepare the solution for use, without having to handle separate containers as is now required.

Another object of the invention is to provide a novel two chamber vial containing the medicinal substance and the solvent therefor, separated by a septum through which a hypodermic needle may be thrust easily, whereby the solvent and the medicine may be picked up and mixed without removing the needle from the vial.

Other objects and advantages of the invention will become apparent as the description of the same proceeds and the invention will be best understood from a consideration of the following detailed description taken in connection with the accompanying drawing forming a part of the specification, with the understanding, however, that the invention is not to be limited to the exact details of construction shown and described since obvious modifications will occur to a person skilled in the art.

In the drawing:

Figure 1 is a longitudinal section through a two chamber vial constructed in accordance with one embodiment of the invention.

Figure 2 is a transverse section taken on the line 2—2 of Figure 1.

Figure 3 illustrates a stage of the method of preparing and withdrawing the solution into a hypodermic syringe.

Figure 4 illustrates another form in which the vial may be made.

Referring now more particularly to the drawing the numeral 10 generally designates one form of vial constructed in accordance with the present invention. This comprises a glass body 12 in the form of a short cylinder having a bottom 14

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and a mouth opening 16, having the same diameter as the inside of the vial which is straight, or of constant diameter through its length.

Around the outside of the vial, at the mouth end, a flange or bead, 18 is formed to facilitate the securement of a cap 20 thereover as shown, such cap being of thin easily torn metal, or other suitable material, whereby it may be readily removed.

The numerals 21 and 22 designate respectively a stopper disk and a septum which are of substantial thickness and are formed preferably of rubber or other suitable material, which may be easily pierced by the needle of a hypodermic syringe.

In the lower end of the vial is a glass liner cylinder 23 and upon this is positioned the septum 22 which is tightly press fitted into the vial, thus forming the chamber 24, in which is placed the medicine 25.

The septum 22 has its periphery in sufficiently tight contact with the wall of the vial to prevent leakage into the chamber 24, of the solvent liquid in the upper chamber 26, which has for its side wall a glass liner cylinder 27 which, like the liner 23, fits tightly in the vial. The bottom of the liner 27 presses against the top of the septum 22 and its top edge is spaced from the top of the vial a distance equal to the thickness of the stopper disk 21.

The liquid, designated 28, may be any desired solvent for the medicinal powder 25. In the case of penicillin it would be sterile water. This is kept tightly in the chamber 26 by the rubber stopper 21 which, like the stopper 22, is forced tightly into the mouth of the vial and rests against the top edge of the liner 27.

The cap 20, as shown, covers the stopper 21 and holds it against accidental removal.

While the form of the vial so far described is preferred, it may also be as shown in Figure 4, that is, without the glass liners 23 and 27. Here as shown the body is designated 12*a* and it is divided into the two chambers 24*a* and 26*a* by the septum 22*a* which is pressed tightly into the bottle, and the rubber disk stopper 21*a* which is pressed tightly into the mouth of the vial. This stopper is covered by the easily removable metal cap 20*a*.

In the use of the vial according to the method forming a part of the present invention, the physician removes the metal cap 20 or 20*a* and thrusts the needle 29 of the hypodermic syringe 30 through the soft rubber stopper into the liquid chamber 26 or 26*a*. The liquid may then be ex-

tracted into the barrel of the syringe, after which the needle is thrust further in and through the septum **22** or **22***a* into the medicine carrying chamber **24** or **24***a*. The liquid may then be partially ejected to effect the solution of the medicine therein and the solution then drawn back into the syringe barrel and the needle then withdrawn.

Thus the making of the solution is accomplished and the solution is drawn into the syringe barrel without exposing either the liquid or the medicinal powder to the atmosphere; there is no handling of two separate containers or pouring off the liquid from one container, through the air, into the other, and there is no thrusting of the needle into one container and withdrawing it and thrusting it into, or through the stopper, of another container.

It is also pointed out that the vial does not have to be made of a specified diameter to fit into a syringe barrel as in the case of the packaging of some sterile solutions which are ejected directly from the vial or ampoule and neither is it necessary for the physician to carry a special type of syringe made to accommodate such special vials which are plugged or closed at both ends by removable, or easily penetrable, stoppers.

As previously stated, the present invention may be carried out by the use of either type of vial, but the type first described is preferred, because the use of the liners against which the stopper and septum bear, prevents any possibility of either slipping in forcing the needle therethrough.

While in describing the invention the lower chamber **24** or **24***a* has been set forth as containing the medicinal powder with the liquid in the top chamber, it is understood that they may be reversely placed if desired without departing from the invention.

I claim:

1. A receptacle for maintaining a medicinal agent and solvent therefor separate and sterile until ready for use, comprising a vial having a solid bottom at one end and a mouth opening at its other end, the vial being internally cylindrical and of unvarying inside diameter, the diameter of the mouth being the same as the inside diameter of the vial, a moisture proof septum dividing the vial between its ends to form a lower chamber, a stopper disk fitting tightly into the mouth opening and spaced from the septum to form an upper chamber, said septum and disk being of a soft material for penetration by a hypodermic needle and having their peripheries tightly, frictionally engaging the vial wall, one of said chambers containing a medicinal agent and the other chamber containing a solvent therefor, and means separate and separable from the stopper and overlying the vial mouth for preventing accidental escape of the stopper.

2. A receptacle of the character stated in claim 1, with a glass liner cylinder within the lower chamber against the wall thereof and between the septum and the solid bottom and a second glass liner cylinder in the upper chamber between and maintaining the septum and stopper separated.

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