Sept. 25, 1956 J. F. OLIVA ET AL 2,764,157

AMPULES

Filed Dec. 1, 1953

Fig. 1

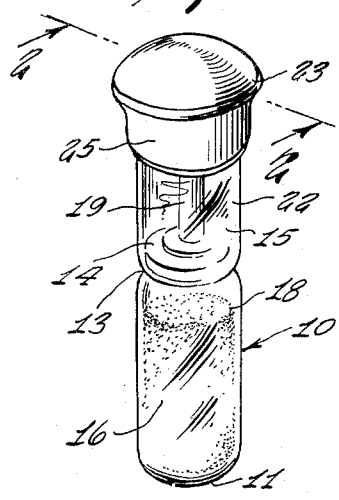


Fig. 2

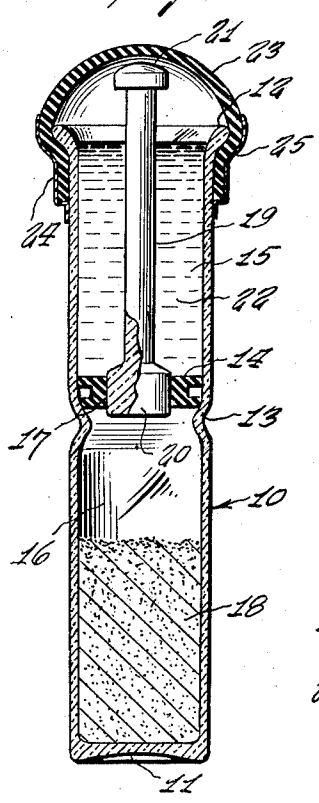


Fig. 3

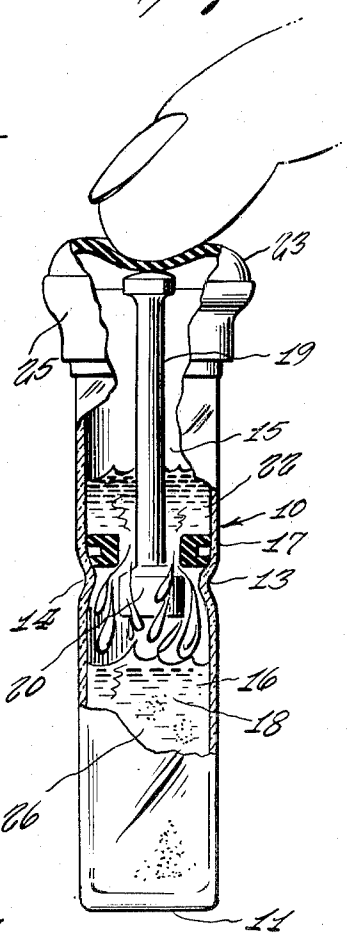


Fig. 4

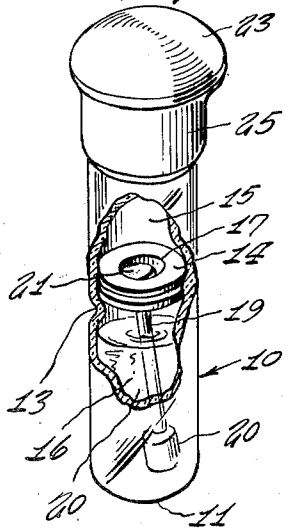
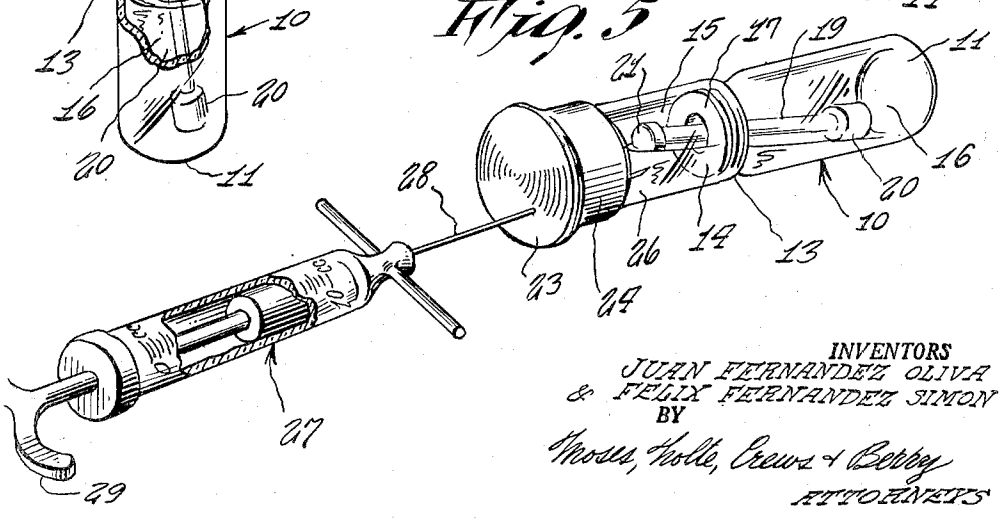


Fig. 5



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2,764,157

AMPULES

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1 Claim. (Cl. 128—272)

This invention relates to containers and more particularly, to containers or ampules of the type commonly employed to fill hypodermic syringes.

In such ampules or containers currently in use, the ampule or container is filled after the powdered material has been dissolved in the desired solution, whereupon the solution may then later be extracted by the hypodermic syringe by puncturing the container cover. Such containers wherein the powdered material is already dissolved in the desired solution are objectionable in that deterioration and decomposition of the material occur on standing.

It is accordingly a principal object of the present invention to provide a container or ampule adapted to be easily and readily used to fill hypodermic syringes wherein the powdered material is sealed off from the solution until such time as it is desired to employ the contents of the container, just prior to filling the hypodermic syringe, whereupon the contents are permitted to mix in a novel manner.

It is another object of the present invention to provide a container or ampule of the type commonly employed to fill hypodermic syringes wherein the powdered material is sealed off from the solution, the powdered material being permitted to dissolve in the liquid by simply pressing a flexible cover which also serves to later receive therethrough the needle of the hypodermic syringe.

Other objects of the present invention are to provide a container or ampule bearing the above objects in mind which is of simple construction, inexpensive to manufacture, has a minimum number of parts, is easy to use and efficient in operation.

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 container or ampule embodying the features of the present invention and shown prior to the dissolving of the powdered material in the solution;

Figure 2 is an enlarged longitudinal sectional view taken along the line 2—2 of Figure 1;

Figure 3 is an enlarged side view, shown partly in section and partly in elevation, and showing the manner in which the powdered material is dissolved in the liquid solution just prior to puncturing with the hypodermic needle;

Figure 4 is a view similar to Figure 1 but showing the container after the powdered material has been permitted to dissolve in a solution, shown partly broken away; and

Figure 5 is a perspective view showing the invention being employed to fill a hypodermic syringe.

Referring now more in detail to the drawing, wherein similar reference numerals identify corresponding parts throughout the several views, **10** represents an elongated hollow cylinder of glass or other suitable material having a bottom end wall **11** and an outwardly flared or rimmed open top end **12**, substantially as illustrated.

The cylinder **10** intermediate its ends is provided with a restricted portion **13** which serves to retain a rubber piston **14** against downward displacement therethrough, the latter dividing the cylinder into an upper compartment **15** and a lower compartment **16**. The piston **14** is provided with a central opening **17** for a purpose which will hereinafter become clear.

The container **10** is first filled with the powdered material **18**, for example penicillin, after which the piston **14** is then inserted and moved downwardly until it abuts the restricted portion **13**.

An elongated rod **19** of glass or other suitable material is integrally formed at its lower end with an enlarged cylindrical plug **20** adapted to be forced into the central opening **17** of rubber piston **14** and providing a closure therefor. The upper end of rod **19** extends above the open end **12** and is formed with an enlarged knob **21** for a purpose which will hereinafter become clear.

After the plug **20** of rod **19** is forced into piston **14**, whereby to close the central opening **17** of the latter and to seal off the lower compartment **16** from the upper compartment **15**, the liquid, for example saline solution **22**, is poured into the container up to the enlarged mouth **12** (Figure 2).

A convex cover **23** of rubber or other elastic, flexible material and having a flanged portion **24** is stretched and then snapped over the open mouth **12** (Figure 2) and secured in place by means of a plastic seal **25**. It will be noted that the knob **21** of rod **19** is disposed within and adjacent to the convex cover **23**. It will also be noted that the solution or liquid **22** is sealed off from the powdered material **18**, preventing their mixing and subsequent decomposition during prolonged standing or storage.

The container or ampule is now ready for shipment, marketing and ultimate distribution to hospitals or physicians, and may be stored indefinitely without decomposition or deterioration.

When it is desired to use the contents of the container, it is only necessary to press the convex cover **23** downwardly, as shown in Figure 3, which brings the cover **23** into contact with the knob **21** of rod **19** and forces the latter downwardly, pushing the plug **20** downwardly through piston **14**. The liquid **22** will then pass downwardly through opening **17** into the lower compartment **16** where it dissolves the powdered material **18** to form the solution **26**. The hypodermic syringe **27** (Figure 5) may then be filled with this freshly prepared solution **26** by inserting the hypodermic needle **28** through the cover **23** and drawing the plunger **29** upwardly in the usual manner, providing a syringe filled with a freshly prepared solution **26** of maximum potency, regardless of the period during which the ampule or container was stored.

While the cylinder **10** and rod **19** have been described as being formed of glass, it will be readily apparent to those skilled in the art that these parts may be formed of aluminum, plastic or any other suitable material. It will also be apparent to those skilled in the art that while the container or ampule has been described in connection with a hypodermic syringe, it will be readily appreciated that the construction may be employed wherever it is desired to store two separate and different substances without mixing until they are ready to be used.

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.

We claim:

A container comprising a hollow body portion closed at one end, and open at the other, said body portion having a restricted portion intermediate the ends thereof,

a closure within said body portion and in abutment with the side of said restricted portion remote from said closed end, said closure having a central opening, a plug press fitted within said central opening whereby to close the same and to permit powdered material to be disposed intermediate said closure and the closed end of said body portion and liquid material intermediate said closure and the open end of said body portion without admixture, an elongated rod connected to said plug and extending upwardly through the open end of said body portion, and a flexible cover sealing the open end of said body portion, the upper end of said rod terminating within and near said flexible cover.

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