Oct. 16, 1956 J. F. GREENE 2,766,755

PLURAL COMPARTMENT VIALS AND SYRINGE CARTRIDGES

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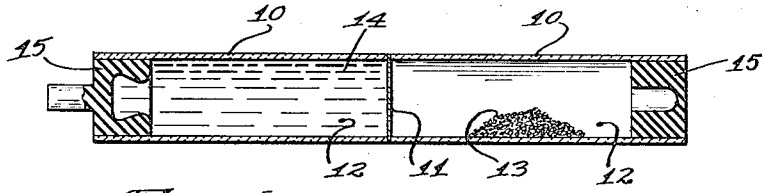


FIG. 1.

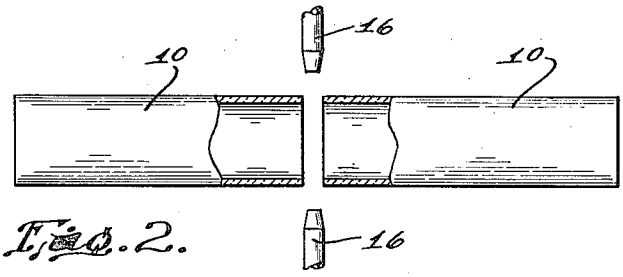


FIG. 2.

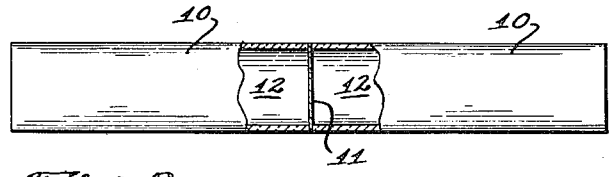


FIG. 3.

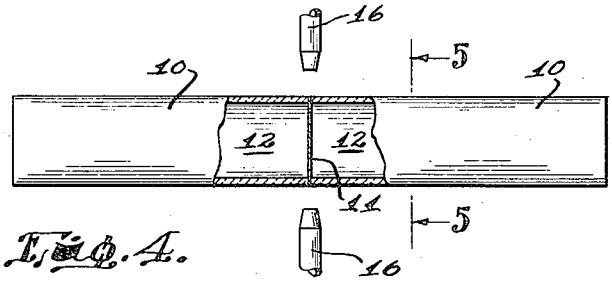


FIG. 4.

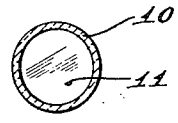


FIG. 5.

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PLURAL COMPARTMENT VIALS AND SYRINGE CARTRIDGES

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1 Claim. (Cl. 128—272)

The present invention relates to improvements in vials and syringe cartridges and more particularly is a novel means for dividing a vial or syringe cartridge into two compartments, one of which is intended to accommodate a dry powdered material, such as a medicament, while the other houses the diluent, such for example as water, or some physiological saline solution. Such separation of the two components is essential in many instances and particularly so where the drugs involved are not stable in solution.

An object of the present invention is the provision in a vial or syringe cartridge of a thin frangible glass partition which is readily breakable merely by the inward movement of a plug-type closure, such movement increasing the pressure against the diaphragm or partition so that it is broken and thereby permits admixing of the powdered material and diluent.

Another object of my invention is the provision of a vial or syringe cartridge which is formed from a pair of open-ended glass cylinders and a relatively thin frangible glass disk which is welded to adjacent ends of the cylinders to thereby provide a partition dividing the vial or cartridge into two separate compartments.

Other objects will be in part apparent and in part pointed out hereinafter.

In the accompanying drawings:

Fig. 1 is a longitudinal sectional view of a vial incorporating my invention;

Fig. 2 is a side elevational view with parts in section illustrating one procedure by which adjacent ends of the cylinders may be softened preparatory to welding same to the margins of a partition disk;

Fig. 3 is a view similar to Fig. 2, but shows the frangible partition disk welded to the adjacent ends of the cylinders;

Fig. 4 is a view similar to Fig. 3, showing the final heating step designed to glaze and finish the joints between the cylinders and partition; and

Fig. 5 is a sectional view taken substantially at the line 5—5 of Fig. 4.

In an article as just described, whether it be used as a vial and a hypodermic needle inserted through the closure at one end, or as a replaceable syringe cartridge, it is formed from a pair of cylinders 10 of identical diameter and wall thickness and of lengths required by the particular use to be made of the vial or cartridge. By means of a transverse partition 11 lying in a plane at

right angles to the axis of the cylinders 10 and preferably formed of glass, and being of sufficient thinness to be readily broken by an increase in internal pressure at one side thereof, the vial or cartridge is divided into two compartments 12; one of which contains a dry powdered material 13, while the other will house the diluent 14, which as stated, may be water or some other suitable saline solution. The partition 11, as shown, is of a substantially uniform thickness, less than the wall thickness of the cylinders and also is of a diameter greater than the interior diameter of the cylinders. The ends of the device are closed by plugs 15 which may be formed of rubber or some such material which is resilient and capable of effectively sealing the outer ends of the compartments 12. In use, either of the plugs, but preferably that which seals the diluent containing compartment, is pressed axially inward thereby increasing the pressure and breaking the frangible partition 11 and effecting admixing of the diluent and powdered material. Thereafter, the needle of a hypodermic syringe (not shown) may be inserted through either of the closure plugs for the purpose of withdrawing a measured amount of the solution. In the event the device is used as a syringe cartridge, it of course would be placed in the conventional holder and one end of a double-ended hypodermic needle would be forced into the cartridge through one of the closure plugs and the partition broken as above described, as the initial step in effecting admixing of the materials.

As is perhaps apparent by reference to Figs. 2, 3, and 4, the vial, or cartridge, is formed by first preparing two lengths of glass tubing and subjecting adjacent ends to a heating-up step in the presence of burners 16, which softens the ends preparatory to bringing same into coaxial alignment and effecting a glass-to-glass seal with the opposed faces of a frangible glass partition disk 11. Following such uniting of the parts (as shown in Fig. 3) the assembled article is again subjected to the heat of the burners 16 for the purpose of completing the seal and fire-polishing or glazing the joint.

Modifications may be resorted to within the spirit and scope of the appended claim.

I claim:

In a plural-compartment vial, or syringe cartridge, a pair of open ended glass cylinders arranged end to end in axial alignment and a frangible partition lying in a plane at right angles to the axis of and closing the adjacent ends of the cylinders and welded thereto, said partition being a glass disk formed separately from the cylinders and of a substantially uniform thickness less than the wall thickness of the cylinders, said disk also being of a diameter greater than the interior diameter of the cylinders.

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