

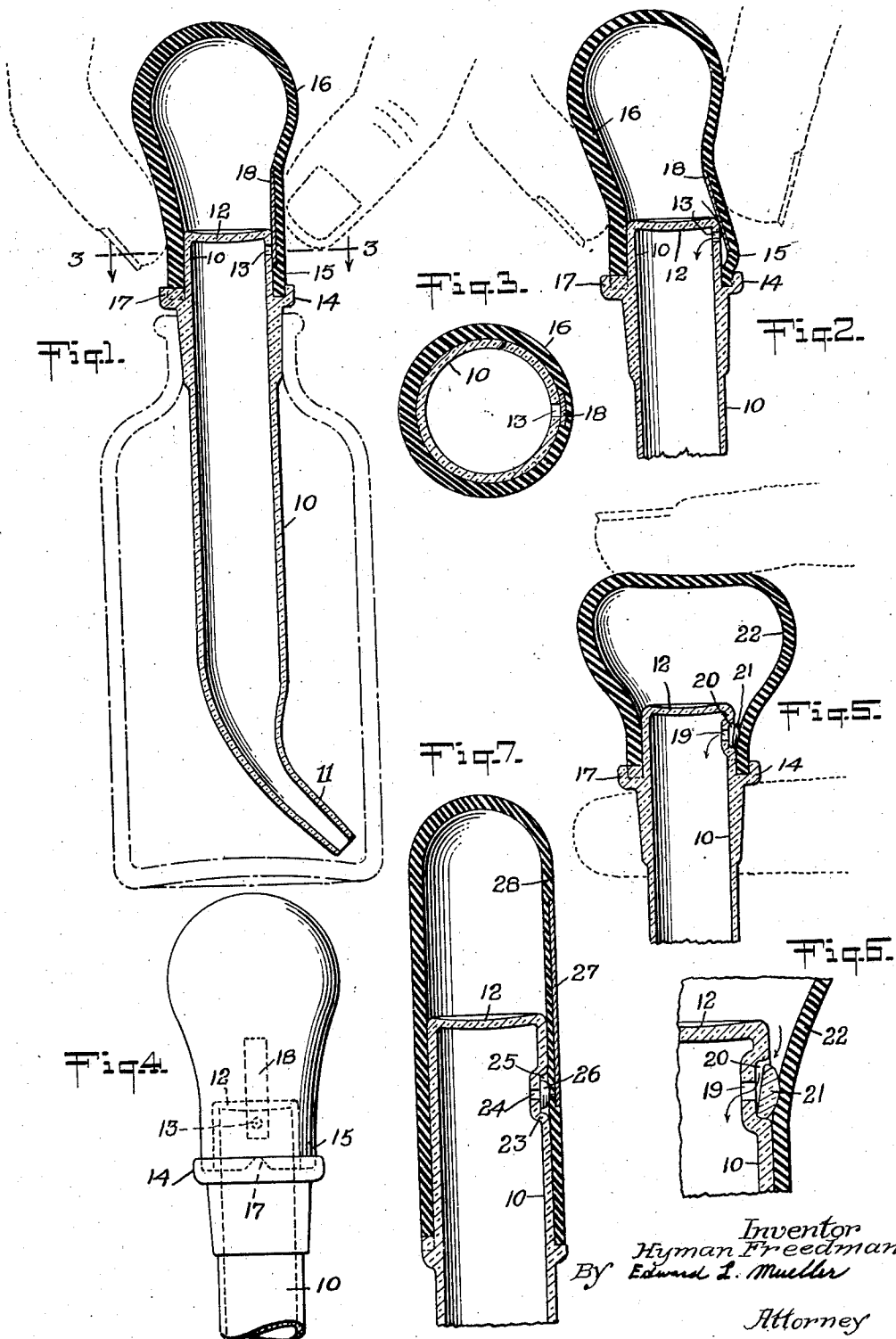
May 7, 1946.

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2,399,796

SYRINGE

Filed Oct. 20, 1943



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UNITED STATES PATENT OFFICE

2,399,796

SYRINGE

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Application October 20, 1943, Serial No. 506,985

1 Claim. (Cl. 128—224)

This invention relates to improvements in liquid dispensing devices and has particular reference to a syringe or dropper employed in dispensing medicants and the like.

In syringes and droppers most commonly used, the liquids contained in the glass body have easy access to the interior of the customary rubber bulb as there is a direct communication therebetween. Better types of instruments have been provided with means adjacent the inner, open end of the body or barrel designed to restrain such communication. However, attempts of this nature have been only partially successful in preventing leakage of fluid into the bulb as it is well known that, by inverting and shaking the instrument, considerable amounts of the liquid in the body thereof will flow into the rubber bulb. Many drugs, being delicately balanced and unstable, undergo definite chemical changes on contact with rubber, not only causing thereby a deterioration and discoloration of the drug but also an adverse effect upon the rubber.

It is proposed, by the present invention, to improve upon known means for reducing liquid communication between the body and bulb of a syringe or the like by confining the liquid practically as in an ampule and thus reducing to an absolute minimum all possibility of leakage into the bulb. At the same time, leakage at the nozzle of the instrument is also diminished to a great extent.

More specifically, a feature of the invention resides in providing the body of the instrument with a closed bulb end having a small vent adjacent thereto which is controlled by a valve of a material, such as glass, which will have no adverse effect upon a medicant in the body by reason of possible contact therewith.

The inventive idea involved is capable of receiving a variety of mechanical expressions some of which, for purposes of illustration, are shown in the accompanying drawing wherein:

Fig. 1 is a longitudinal section through an instrument which may be used as a dropper or a syringe, and showing the same inserted into a vessel preparatory to filling the body of the device.

Fig. 2 is a fragmentary sectional view illustrating the bulb of the instrument compressed, as when expelling a liquid from said body.

Fig. 3 is an enlarged section on the line 3—3 of Fig. 1.

Fig. 4 is a fragmentary elevation, showing the manner of properly placing the bulb on the body of the device.

Fig. 5 is a view similar to Fig. 2 showing another form of the invention.

Fig. 6 is an enlarged fragmentary sectional view of Fig. 5; and

Fig. 7 is a fragmentary vertical section of still another form of the invention.

Referring more particularly to Figs. 1 to 4, the instrument is shown as comprising a body 10 of glass such as used in devices of this kind, and provided with the usual outlet or nozzle end 11. Contrary to common types of devices of this kind, the end of the body opposite the nozzle 11 is closed, as indicated at 12, and adjacent said closed end the wall of the body is provided with a small vent 13 to admit air into the body when expelling liquid therefrom. Also adjacent the closed end of the body the same is provided with an annular limiting and retaining flange 14 forming a groove adapted to receive the open reduced end 15 of the compressible member 16 which may be the usual rubber bulb. In order to position the bulb axially upon the closed end of the body for the purpose of properly controlling the vent 13, the flange 14 is provided with an indicating projection 17 with which a corresponding notch in the end of the bulb is adapted to register when placing the latter on the body.

In accordance with the present invention, a means other than the bulb itself is provided for controlling the vent 13 and said means is designed to prevent contact, under normal conditions, of the liquid in the body with the material of said bulb. In Fig. 1, this means takes the form of a valve 18 made of glass which, when contacting the glass of the body 10 forms an exceptionally good seal. Said valve, in this instance, is an elongated strip which is countersunk in the inner wall of the reduced portion 15 of the bulb so as to extend lengthwise thereof and, adjacent one end, overlies the vent 13 so as to effectively close the same in the normal position of the bulb. The other end of the valve extends inwardly of the bulb beyond the end 12 of the body so that the latter end will act as a fulcrum for the valve when the bulb is compressed, as indicated in Fig. 2, the projection 17 then performing its other function of indicating the approximate point at which a finger or the thumb is to be placed when compressing said bulb. As shown in Fig. 2, when the bulb is compressed, the valve 18 will be rocked about the inner end of the body 10 and its lower end will be thus moved away from the vent 13 to open the same. When the valve is so rocked, it will combine with the curved edge of the body 10 to form a slight pas-

sage sufficient to allow air to enter the body from the bulb 16 and upon the release of pressure said valve will be restored to its closing position in which it prevents all contact of the fluid in the body with the rubber of the bulb. This rocking action of the valve reduces to a minimum any friction between the valve and the part of the body with which it contacts.

In the form of the invention illustrated in Figs. 5 and 6, the body 10 is provided adjacent its inner closed end 12 with a vent 19 and communicating directly with said vent in the outer wall of said body is a recess 20 of greater diameter than said vent and adapted to form a seat for a valve 21 in the form of a small disc. This valve is merely loosely seated in said recess and is held in its closing position relative to said vent by pressure of the neck or reduced end of the bulb 22. The outer surface of the valve is rounded to avoid contact of sharp edges with the rubber bulb and also to permit of a more positive rocking action of the valve in its seat. Fig. 5 illustrates the device when used as a syringe, with the end of the bulb being compressed by a pressure in an axial direction. However, it is also possible to employ the device as a dropper by a lateral compression, as in Fig. 2. In either event, the neck of the bulb will move away from the body and thus permit the valve to also move partially out of the recess 20, as best shown in Fig. 6, to allow air to enter the

body 10 from said bulb, and when the latter is released so as to return to its normal position said valve will be restored to its seat 20 and close the vent 19.

5 In the form of the invention shown in Fig. 7, the body 10 is provided adjacent its closed end 12, as in Fig. 5, with an inwardly offset portion 23 having a vent 24 therein and forming a valve seat 25 adapted to receive the valve 26 which normally closes said vent. In this instance, the outer rounded surface of the valve is joined to the lower end of the valve lever 27 which is countersunk in and extends upwardly along the outer surface of the bulb 28 so that when the latter is compressed, 15 as in Fig. 2, the lever will rock on the rounded end of the body 10 to form a space sufficiently large to permit air in the bulb to enter the body through the vent 24.

What is claimed is:

20 In a syringe, a fluid-containing body having a closed end and a vent adjacent said end and being provided with a recess surrounding said vent to form a seat, a valve loosely seated in said recess, and a compressible member carried by said body 25 and normally retaining said valve seated, a portion of said member being movable away from said body, when compressed, to release said valve for movement in said seat and away from said vent.

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