

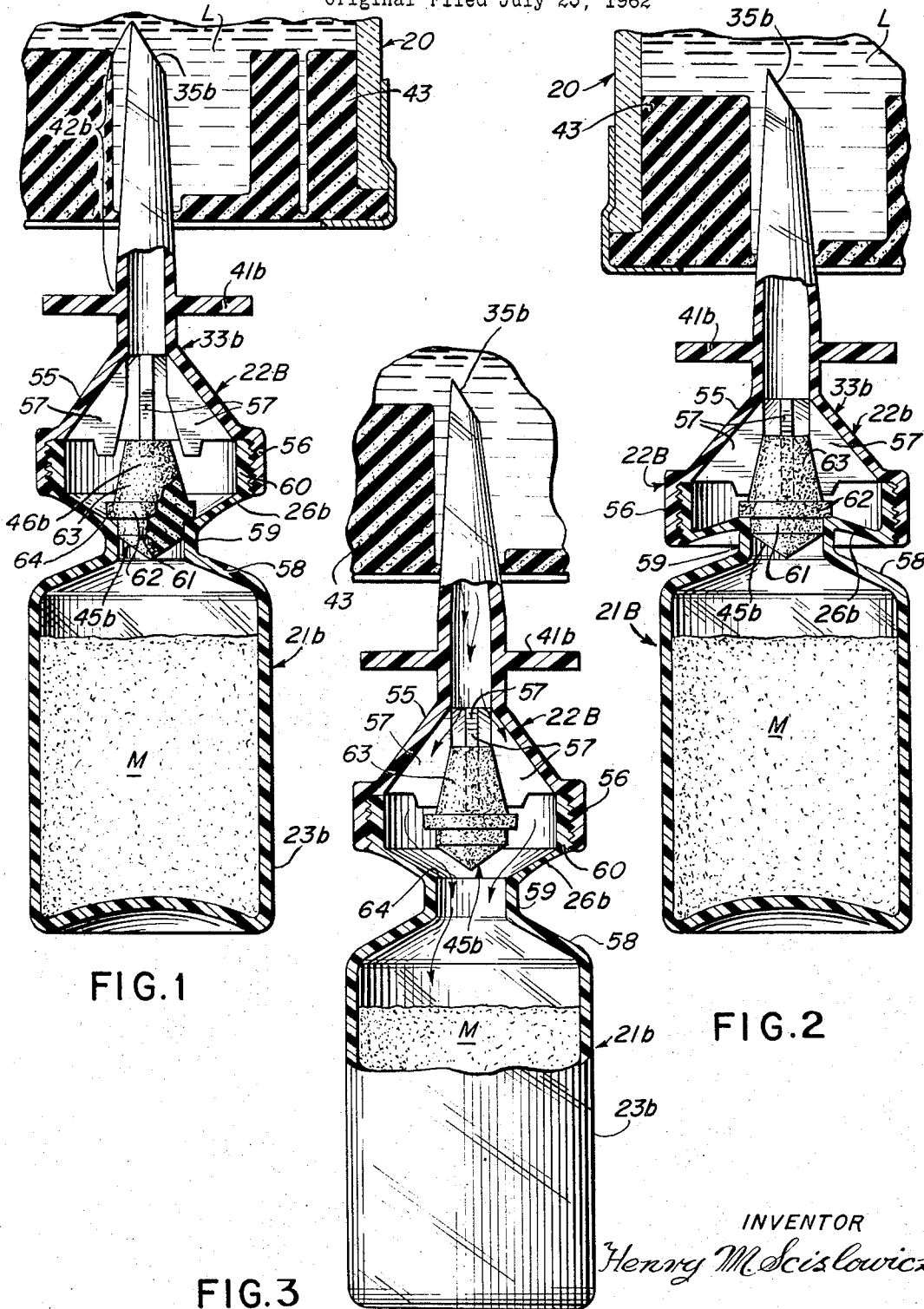
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DISPENSING CONTAINER WITH CLOSURE

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DISPENSING CONTAINER WITH CLOSURE

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2 Claims. (Cl. 222—383)

This is a division of application Ser. No. 211,660, filed July 23, 1962, now Patent 3,206,080.

This invention relates to a dispensing assembly and in particular the invention relates to a dispensing assembly which is particularly adapted to serve as a pump. In the art it is sometimes necessary to store a substance such as powdered medicament or the like in the dry state until the time arrives when it is ready to be used. At that time it is necessary to bring the medicament into contact with the liquid, for example, a parenteral solution, for purposes of parenteral administration. The primary purpose of storing a medicament or the like in a dry state is to preserve its medicinal characteristics.

In accordance with the invention there is provided a dispensing assembly which includes a flexible diaphragm to which there is suitably connected a dispensing cannula. The container with which the dispensing assembly of the invention is to be employed has a tubular neck in which there is slidably seated a closure plug.

In accordance with an embodiment of the invention there is provided a dispensing container having a flexible diaphragm to which the dispensing cannula is secured. The dispensing container has a restricted neck in which there is slidably seated a closure plug. The dispensing cannula has at least one gripper which grips the closure plug to unseat the same in response to the inward flexure of the flexible diaphragm. Once the closure plug has been gripped by the gripper or grippers, the closure plug is held out of seating engagement with the restricted neck of the dispensing container. There is at least one opening around the gripper or grippers so that communication is able to be established between the dispensing container and the dispensing cannula and vice versa.

It is a purpose of the invention to provide a dispensing assembly which is adapted to serve as a pump, which is provided with a plug-type closure and which is simple, economical to manufacture and effective and dependable in use.

In the diagrammatic, illustrative drawings:

FIGURE 1 is a side elevation view, mainly in cross-section, of the embodiment of the dispensing assembly of the invention, showing the closure plug seated in the restricted tubular neck of the dispensing container;

FIGURE 2 is a side elevation view, mainly in cross-section, of the dispensing assembly and a fragmentary portion of the liquid container, with grippers shown to be gripping the closure plug just prior to unseating of the closure plug from within the restricted tubular neck of the dispensing container;

FIGURE 3 is a cross-sectional view similar to FIGURES 1 and 2 of the illustrative drawings, but showing the grippers gripping the closure plug after it has been unseated from within the restricted tubular neck of the dispensing container.

Throughout the specification like reference characters are employed to designate components having the same construction, function and relative location.

Referring now to the embodiment of FIGURES 1 through 3 of the illustrative drawings there is shown a dispensing assembly generally indicated at 22B. The dispensing assembly 22B includes both a dispensing cannula generally indicated at 33b and a dispensing container 21b.

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The dispensing cannula 33b has a free-length portion 42b terminating at a sharpened portion 35b. At the proximal end of the free-length portion 42b, there is disposed a flange 41b. The dispensing cannula 33b has a downwardly and outwardly inclined portion 55 terminating at an annular internally threaded portion 56. The dispensing cannula is shown to be provided with a plurality of grippers 57, preferably four in number, which are formed as an integral part thereof. The dispensing container 21b is provided with a container body 23b which is joined to an annular upwardly and inwardly inclined portion 58. The upwardly and inwardly inclined portion is joined to a tubular neck 59 while the tubular neck in turn is joined to an annular outwardly and upwardly inclined flexible diaphragm 26b. The flexible diaphragm 26b terminates at its marginal edge in an annular externally threaded portion 60. A closure 45b in the form of a closure plug 46b is shown to have a closure portion 61, an annular stop portion 62 and a grippable portion 63. The closure portion 61 of the closure plug 46b before use is normally seatingly and slidably engaged in the tubular neck 59 while the stop portion 62 is normally seated against an upper end 64 of the tubular neck 59. When it is desired to provide communication between the liquid L in the liquid container 21 and the medicament M in the dispensing container 21b, the free-length portion 42b is inserted into the bottle stopper 43 and the dispensing container 21b is urged toward the liquid container 21 thereby flexing the flexible diaphragm 26b so that the grippers grip the grippable portion 63 of the closure plug 46b to unseat and hold the closure plug 46b out of seating engagement with the tubular neck 59 as best shown in FIGURE 2 of the illustrative drawings. As the flexible diaphragm is relaxed into the position best shown in FIGURE 3 of the illustrative drawings, the closure plug 46b remains gripped by the grippers 57. The flexible diaphragm 26b can be repeatedly flexed upon the pumping movement of the dispensing container 21b toward the liquid container 20 or vice versa until the liquid L and the dry medicament M have been brought into a solution. During the pumping movement of the dispensing assembly 22B, the grippable portion 63 remains wedged between the grippers 57. The closure plug 46 is preferably resilient so that gripping engagement with the grippers 57 is facilitated.

In the embodiment of FIGURES 1 through 3 of the illustrative drawings, the dispensing container 21b is preferably composed of a flexible material such as polyethylene or vinyl, while the dispensing cannula 33b is preferably composed of more rigid material, for example polypropylene. The closure plug 46b is preferably composed of rubber although other materials possessing sufficient resilience for the stated purpose are employable.

The above-described embodiments being exemplary only, it will be understood that modifications in form or detail are within the purview of the invention. Accordingly, the invention is not to be considered as limited save as is consonant with the scope of the following claims.

What is claimed is:

1. In a dispensing assembly: a dispensing container having a flexible diaphragm, an outwardly extending dispensing cannula secured to a marginal edge of said flexible diaphragm, said container having a restricted neck inwardly of said flexible diaphragm, a closure plug in slidably seating engagement in said neck and means on said dispensing cannula for gripping said closure plug upon the flexure of said flexible diaphragm to unseat and hold said closure plug out of seating engagement with said tubular neck, said means having at least one opening to allow communication from said dispensing container through said dispensing cannula.

2. In a dispensing assembly: a dispensing container

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having a flexible diaphragm and a tubular neck, an outwardly extending dispensing cannula secured to a marginal edge of said flexible diaphragm, said container having a restricted neck inwardly of said flexible diaphragm, a closure plug in slidable seating engagement in said tubular neck, and at least two spaced grippers on said dispensing cannula for gripping said closure plug to unseat and hold said closure plug out of seating engagement with said neck, and at least two openings between said grippers to allow communication from said container through said dispensing cannula.

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