

Sept. 14, 1965

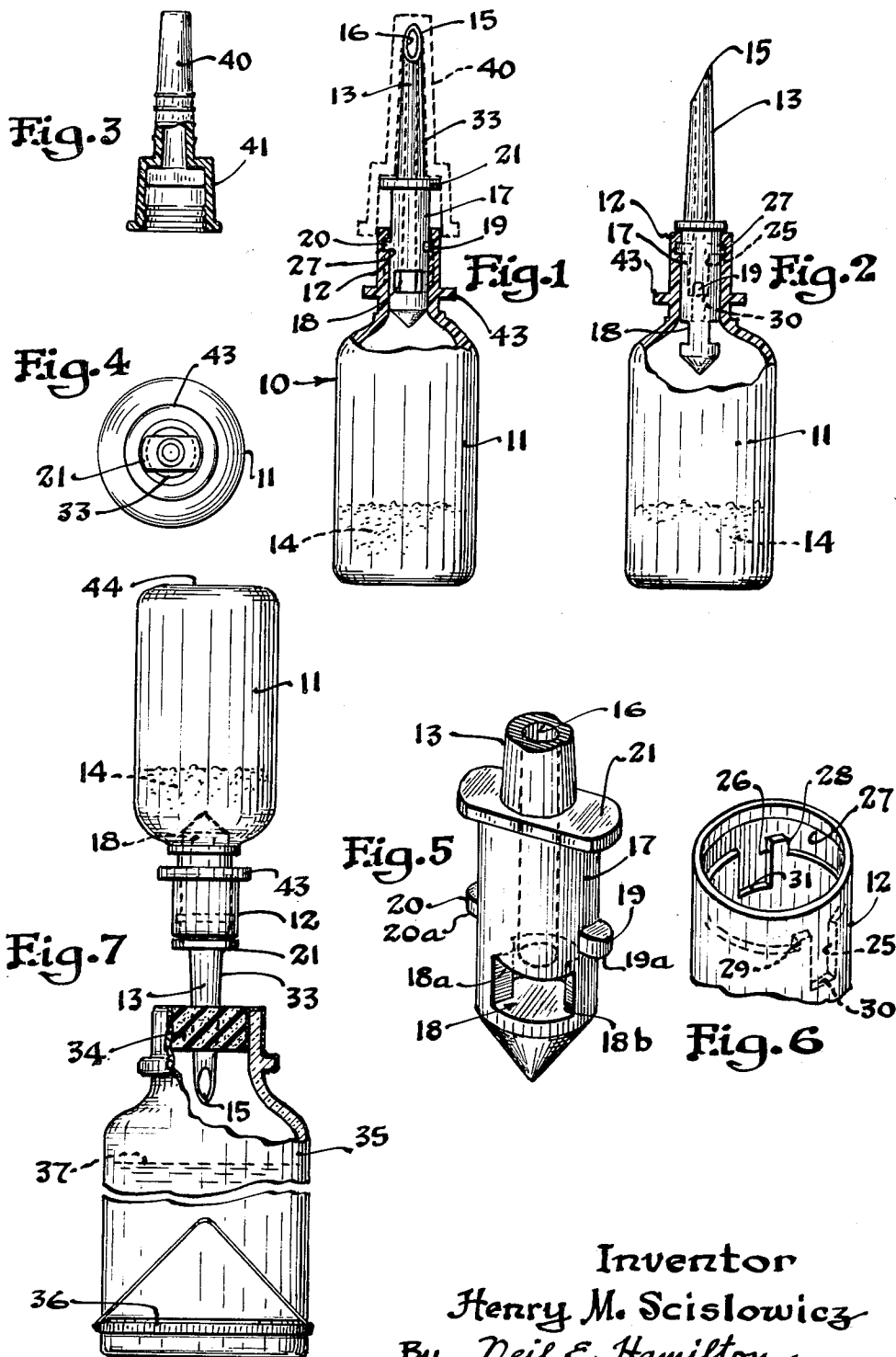
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3,206,073

DISPENSING ASSEMBLY FOR A CONTAINER AND A SHEATH THEREFOR

Filed Feb. 13, 1963

2 Sheets-Sheet 1



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FIG. 9

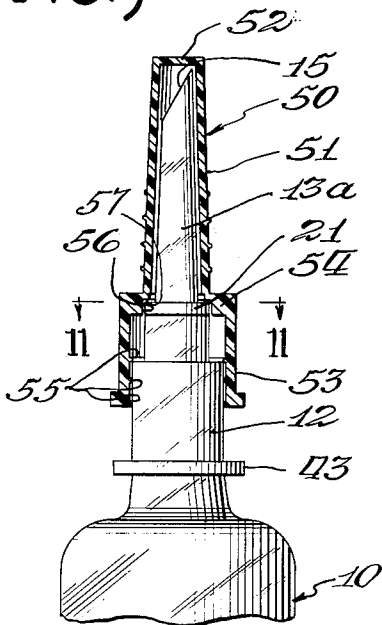


FIG. 10

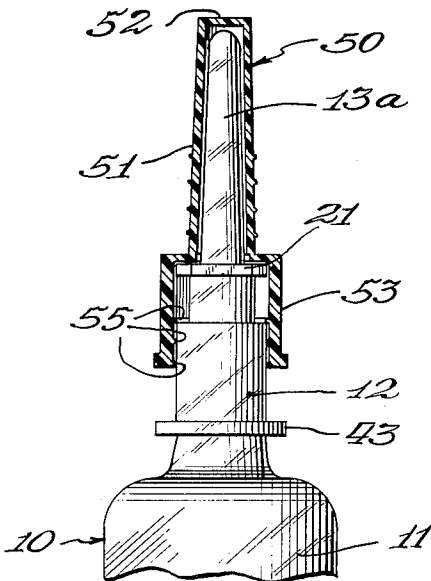


FIG. 8

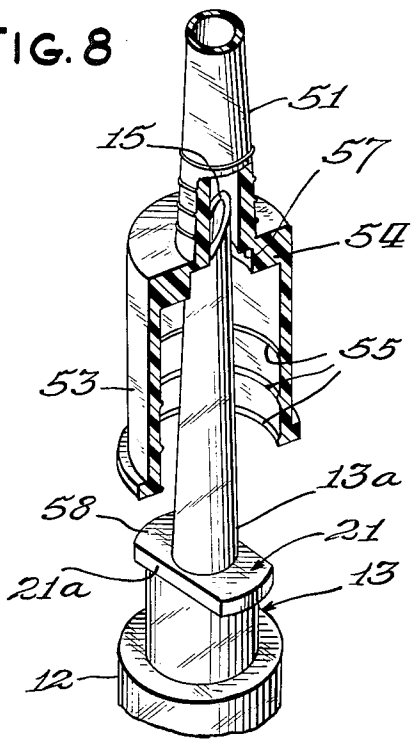


FIG. 12

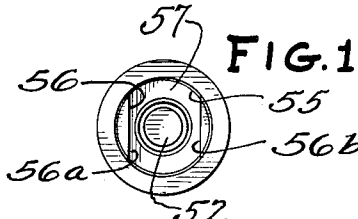
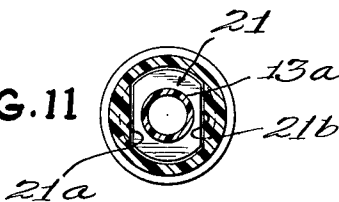


FIG. 11



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DISPENSING ASSEMBLY FOR A CONTAINER AND A SHEATH THEREFOR

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1 Claim. (Cl. 222—80)

This invention relates to a dispensing assembly for a container and a sheath therefor.

In preparing medicinal solutions for parenteral administration, it is common practice to provide one container for the medicament, such as a sterile powder and another container for the solvent, such as sterile water. This procedure is followed because of the instability of some medicaments in solution form. The combining of the medicament with the solvent poses many problems as regards sterility, waste of the medicament as well as the handling of various types of apparatus. For example, where the powder is to be transferred to a container of sterile water having a closure in the form of a resealable rubber stopper, a device having some means to pierce the stopper and to effect a mixing of the powder with the water must be employed. Heretofore, some devices for composing medicinal solutions of the type with which the present invention is concerned have a thin membrane-like plug in the piercing pin member. The plug is dislodged by squeezing the flexible bottle. This type of device results in a waste of the medicament if it is inadvertently squeezed.

It is, therefore, an object of the present invention to provide a dispensing assembly for a container which prevents waste of the medicament and in addition is convenient to operate.

It is a further object of the present invention to provide a dispensing assembly for a container which maintains the sterility of the medicament and the resulting solution.

It is a further object of the present invention to provide a mixing device for sterile solutions which is easily fabricated and assembled at a minimum of cost.

It is a further object of the invention to provide a sheath for a dispensing cannula, with the sheath also serving as a socket wrench.

In the diagrammatic, illustrative drawings:

FIGURE 1 is a front elevational view of a dispensing assembly and a container, partially in vertical section, showing the dispensing assembly in a closed position;

FIGURE 2 is a side elevational view of the dispensing assembly and container, partially in vertical section, showing the dispensing assembly in the open position;

FIGURE 3 is a side elevational view, partially in vertical section, of a protective sheath for use in conjunction with the dispensing assembly and container, as shown by broken lines in FIGURE 1;

FIGURE 4 is a top plan view of the dispensing assembly and container shown in FIGURES 1 and 2 for example;

FIGURE 5 is a fragmentary perspective view of the dispensing assembly;

FIGURE 6 is a fragmentary perspective view of the tubular neck of the container shown in FIGURES 1 and 2 for example;

FIGURE 7 is an elevational view of the dispensing assembly and container in communication with a solution container the neck of which is shown partially in vertical section;

FIGURE 8 is an exploded fragmentary view, partly cutaway, showing a fragmentary portion of a sheath, a

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fragmentary portion of a dispensing cannula and a fragmentary portion of the tubular neck of the container;

FIGURE 9 is a side elevational view, partly in cross-section, showing the manner in which non-circular socket wrench portion in the sheath is engageable with a non-circular projection on the dispensing cannula;

FIGURE 10 is a front elevational view, partly in cross-section, with the sheath in place on the dispensing cannula;

FIGURE 11 is a cross-sectional view taken along line 11—11 of FIGURE 9; and

FIGURE 12 is a bottom plan view of the sheath.

Referring now to the embodiment of FIGURES 1 through 7 of the illustrative drawings, a container generally indicated at 10 is shown to have a longitudinally extending body 11 with a tubular neck 12 for receiving a dispensing assembly generally indicated at 13 in a fluid-tight engagement therein. The container 11, having a sterile powder 14 placed therein, in this instance is formed of a transparent, flexible, resilient, plasticized polyethylene material. The dispensing assembly 13 is composed of a rigid plasticized styrenemethacrylate material commonly known as Implex. The dispensing assembly 13 includes a dispensing cannula 13a. A sharpened bottle-stopper piercing end 15 is provided on the dispensing cannula 13a and a longitudinal passageway 16 terminates a short distance from the opposite end of a rotatable and slidable portion 17.

As best illustrated in FIGURE 5 of the illustrative drawings, a transverse port 18 communicates with the passageway 16 at its point of termination. Two oppositely disposed outwardly extending projections 19 and 20 are provided on the portion 17 of the dispensing cannula 13a. An outwardly extending projection 21 is disposed on the dispensing cannula 13a outwardly of the tubular neck 12 of the container 10.

Two internal, opposed longitudinal guide grooves 25 and 26 are provided in the tubular neck 12 along with an arcuately extending transverse guide groove 27 adjacent the outer end of the tubular neck 12 as best illustrated in FIGURE 6. Two stopping faces 28 and 29 are provided along the groove 27. The tubular neck 12 is of a diameter to resiliently accommodate the rotatable and slidable portion 17 of the dispensing cannula 13a and the grooves 25, 26 and 27 are of such dimension to accommodate projections 19 and 20 therein. When the rotatable and slidable portion 17 has been slid into place in the tubular neck 12, as shown in FIGURE 1 of the illustrative drawings, stopping faces 28 and 29 limit the rotational movement of the dispensing cannula 13a through contact with the projections 19 and 20. It will thus be seen that two arcuately extending transverse guide groove portions 27' and 27'' are in effect formed from the groove 27 by the placement of stopping faces 28 and 29 therealong. The longitudinal downward movement of the dispensing assembly 13 in the direction of the interior of container 10 is limited by the contacting of the projections 19 and 20 with abutment surfaces 30 and 31 at the end of longitudinal guide grooves 25 and 26, respectively.

When the projections 19 and 20 contact the abutment surfaces 30 and 31, as best illustrated in FIGURE 2, the transverse port 18 establishes communication between the passage 16 of the dispensing cannula 13a and the interior of the container 10. This is accomplished by having the distance from the uppermost portion 18a of transverse port 18 to lower walls 19a and 20a of the projections 19 and 20, respectively, at least equal to and preferably greater than the distance between abutment surfaces 30 and 31 and the interior of the container 10. The distance between the guide groove 27 and the interior of the container 10 is greater than the distance between walls 19a and 20a and the lowermost portion 18b of the

port 18 to enable the port 18 to be out of communication with the interior of the container 10 and completely within the tubular neck 12 as best shown in FIGURE 1. The rotatable and slidable portion 17 has a continuous annular blocking portion 17a disposed below the port 18. The tubular neck 12 correspondingly has a continuous annular blocking portion 12a. When the projections 19 and 20 are in the position shown in FIGURE 1 of the illustrative drawings, then the blocking portions 12a and 17a are in fluid-tight sealing engagement with each other, thereby preventing communication between the inside of the container 10 and the passageway 16 through the port 18.

Stop means specifically in the form of an inwardly extending projection 27a is shown to be disposed at the upper marginal end of the tubular neck 12. The tubular neck 12 is sufficiently flexible and is composed of a sufficiently resilient material at least at the inwardly extending projection 27a to enable the tubular neck 12 at the inwardly extending projection 27a to flex resiliently in response to the force exerted by the outwardly extending projections 19 and 20 when the slide portion 17 is being slid into the tubular neck 12. The stop means defined by the inwardly extending projection 27a and the complementary stop means defined by the outwardly projecting projections 19 and 20 serve to stop the dispensing assembly 13 from being accidentally slid out of the tubular neck 12 by the user. The outwardly extending projections 19 and 20 each have a greater radial extent than the minimum radial extent of the inwardly extending projection 27a.

Referring now to FIGURE 7, it will be seen that the dispensing cannula 13a has a tapering free-length portion 33 for piercing a rubber stopper 34 of a conventional solution bottle 35. The bottle 35 is provided with the standard bail band assembly 36 for supporting the bottle during administration of the contents.

A protective sheath 40 is placed over the free-length portion 33 and is received partially over the tubular neck 12 of the container 10 for shipment and storage as shown in FIGURE 1 of the illustrative drawings. The sheath 40 has an enlarged section 41 which fits around the projection 21 of the dispensing assembly 13. Frictional engagement is provided between the sheath 40 and the outside of the resilient tubular neck 12. To aid in the forcing of the free-length portion 33 into stopper 34 a gripping ring 43 is provided around the outside of the tubular neck 12.

In packaging, the container 10 is filled for example with a sterile powder 14. The free-length portion 33 is inserted into the sheath 40 and the portion 17 of piercing assembly 13 is then slidably inserted into the tubular neck 12 with the projections 19 and 20 accommodated in the arcuately extending transverse groove 27. Because of the resilient construction of neck 12, pegs 19 and 20 can, with the exertion of a slight force be snap-fitted into the transverse groove 27. The dispensing assembly 13 and the associated container 10 are now ready for shipment, storage and use.

As shown in FIGURE 1, when the projections 19 and 20 are in place in the groove 27, the port 18 is completely sealed off in and by the tubular neck 12. The powder 14 cannot enter into the passageway 16 of the dispensing cannula 13 during shipment or storage through the accidental or inadvertent squeezing of the body 11 of the container 10. When it is desired to transfer the powder 14 into a solution bottle 35 containing for example the sterile water 37, the sheath 40 is removed and the gripping ring 43 is held against the forefingers with the base 44 of container 10 held against the palm of the hand. The portion 33 of the dispensing cannula 13a is then forced through the stopper 34. With the piercing end 15 communicating with the interior of the bottle 35 and the free-length portion 33 consequently secured in the stopper 34, the container 10 is turned to orientate the projections 19 and 20 with the longitudinal tracks 25 and 26. With the

projections 19 and 20 orientated in the tracks 25 and 26, the container 10 is moved toward the bottle 35 until the projections 19 and 20 contact the abutment surfaces 30 and 31 and the stopping flange 21 simultaneously contacts the terminal end of the neck 12. The port 18 is thereby moved into the inside of the container 10. The container 10 is then squeezed to cause the powder 14 to flow into the bottle 35. Should some of the powder 14 tend to adhere to the inside of container 10, the bottle 35 can be inverted and the water 37 allowed to be drawn into the container 10. With some of the solution formed in the container 10, it can be forced back into bottle 35 by again squeezing the container 10.

In the embodiment of FIGURES 8 through 12 of the illustrative drawings, the same reference characters are applied to those components having the same construction, function and relative location as applied in the embodiment of FIGURES 1 through 7 of the illustrative drawings. In the embodiment of FIGURES 8 through 12 of the illustrative drawings, there is shown a rigid sheath generally indicated at 50. A suitable, sufficiently rigid plastic material is preferably employed in the construction of the sheath 50. The sheath 50 includes a relatively small-diametered tapering tubular portion 51 which terminates at what is shown to be a closed end 52. The closed end 52 terminates slightly beyond the tip of the sharpened piercing end 15 of the dispensing cannula 13a. A relatively large-diametered tubular portion 53 is jointed to the tubular portion 51 by a flange portion 54. The inner surface of the tubular portion 53 is provided with a plurality of inwardly extending annular sealing rings 55. The sealing rings 55 are shown in FIGURES 9 and 10 to engage the outer surface of the tubular neck 12 and serve to maintain the dispensing cannula 13a in the sterile condition. The flange 54 is shown to have a non-circular socket wrench portion 56 defined by a pair of parallel flats 56a and 56b. The non-circular projection 21 of the dispensing assembly 13 is shown to have a pair of flats 21a and 21b. The non-circular projection 21 is shown in FIGURES 9 and 10 to be received in the non-circular socket wrench portion 56. When it is desired to orient the dispensing assembly 13 from the position shown in FIGURE 1 to the position shown in FIGURE 2 of the illustrative drawings, the user grips the rigid sheath 50 with one hand and the container 10 with the other hand and rotates the dispensing assembly 13 until the projections 19 and 20 are aligned with the longitudinal groove 26. The user then exerts a downward force on the sheath 50 which causes a stop shoulder 57 of the non-circular socket wrench portion to exert a force on the top surface 58 of the projection 21, thereby moving the dispensing assembly 13 downwardly into the position shown in FIGURE 2 of the illustrative drawings.

It will thus be seen that the dispensing assembly 13 when employed by the container 10 enables the transferring of a sterile medicament into a sterile solution container while preventing accidental or inadvertent waste of the medicament. A closed sterile system is maintained at all times during the mixing procedure. All of these features are accomplished by a dispensing assembly 13 and a container 10 having a total of only two basic parts that can be fabricated and assembled with a minimum of cost.

While the container 10 for the sterile powder 14 has been described as being formed of a transparent, flexible, resilient polyethylene plasticized material, it should be understood that other flexible, resilient, plasticized and natural materials can be employed such as polyvinylchloride, polypropylene, nylon and vinylidene chloride copolymer commonly known as Saran; as well as rubber.

Rigid materials other than the preferred styrene-methacrylate composition could be employed such as the plasticized cellulose derivatives. Representative of these are the acetate, the propionate and the butyrate. In the alternative, glass and metal are employable.

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This application is a continuation-in-part of my copending application Serial No. 51,568, filed August 24, 1960, now abandoned.

The above-described embodiments being exemplary only, it will be understood that modifications in form or detail can be made without departing from the spirit and scope of the invention. Accordingly, the invention is not to be considered as limited save as is consonant with the scope of the following claim.

What is claimed is:

A dispensing container having a tubular neck, a longitudinally extending rigid dispensing cannula having a longitudinally extending passage therein, said cannula having a bottle-stopper piercing end, said dispensing cannula having an integral rotatable and slidable portion fitted in said tubular neck, a transverse port in said rotatable and slidable portion, the longitudinal wall of said rotatable and slidable portion below said transverse port defining a continuous annular blocking portion of said dispensing cannula, an arcuately extending groove formed in said tubular neck, a longitudinally extending groove formed in said tubular neck in communication with said arcuately extending groove, said longitudinally extending groove terminating in a continuous annular blocking portion of said tubular neck, an outwardly extending projection integral with said rotatable and slidable portion, said dispensing cannula adapted to alternately project into one of said grooves to frictionally engage the outer wall thereof, said blocking portions being in fluid-tight contact with each other when said projection is in said arcuately extending groove, said transverse port being in communication with the inside of said container when said dispensing cannula has been moved downwardly to uncover said transverse port while said outwardly extending projection is in said longitudinally

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extending groove, the upper side of said arcuately extending groove being defined by a continuous annular inwardly extending projection, said tubular neck being composed of a sufficiently resilient material and being sufficiently flexible to enable said tubular neck at said inwardly extending projection to flex sufficiently to enable said outwardly extending projection to be snapped into said arcuately extending groove an integral non-circular projection on the distal end of said rotatable and slidable portion adjacent said cannula, a rigid sheath covering the portion of said dispensing cannula which extends beyond said tubular neck, said sheath having internal sealing rings to frictionally engage said tubular neck, a socket wrench portion defined by said sheath having substantially the same cross-sectional shape as said non-circular projection and engageable with said non-circular projection to rotate said dispensing cannula with respect to said tubular neck, and a stop shoulder integral with said sheath and engageable with said non-circular projection for sliding said dispensing cannula downwardly.

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