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2 Sheets-Sheet 1

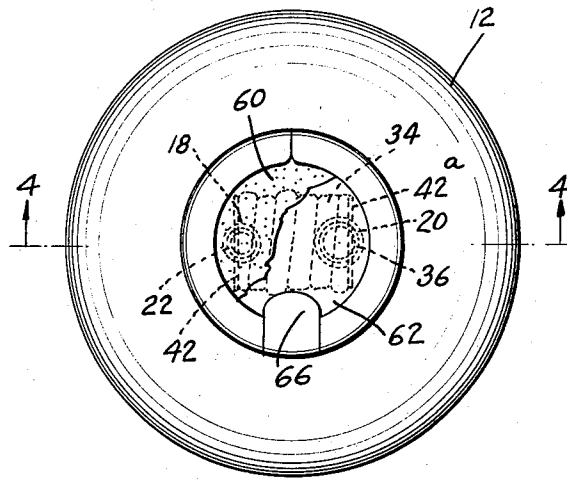


FIG. 2.

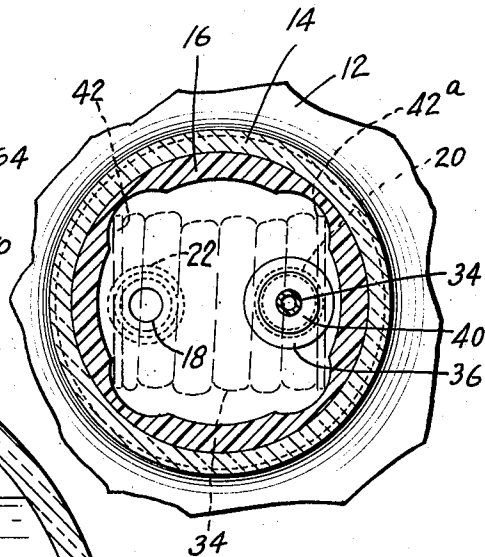


FIG. 5.

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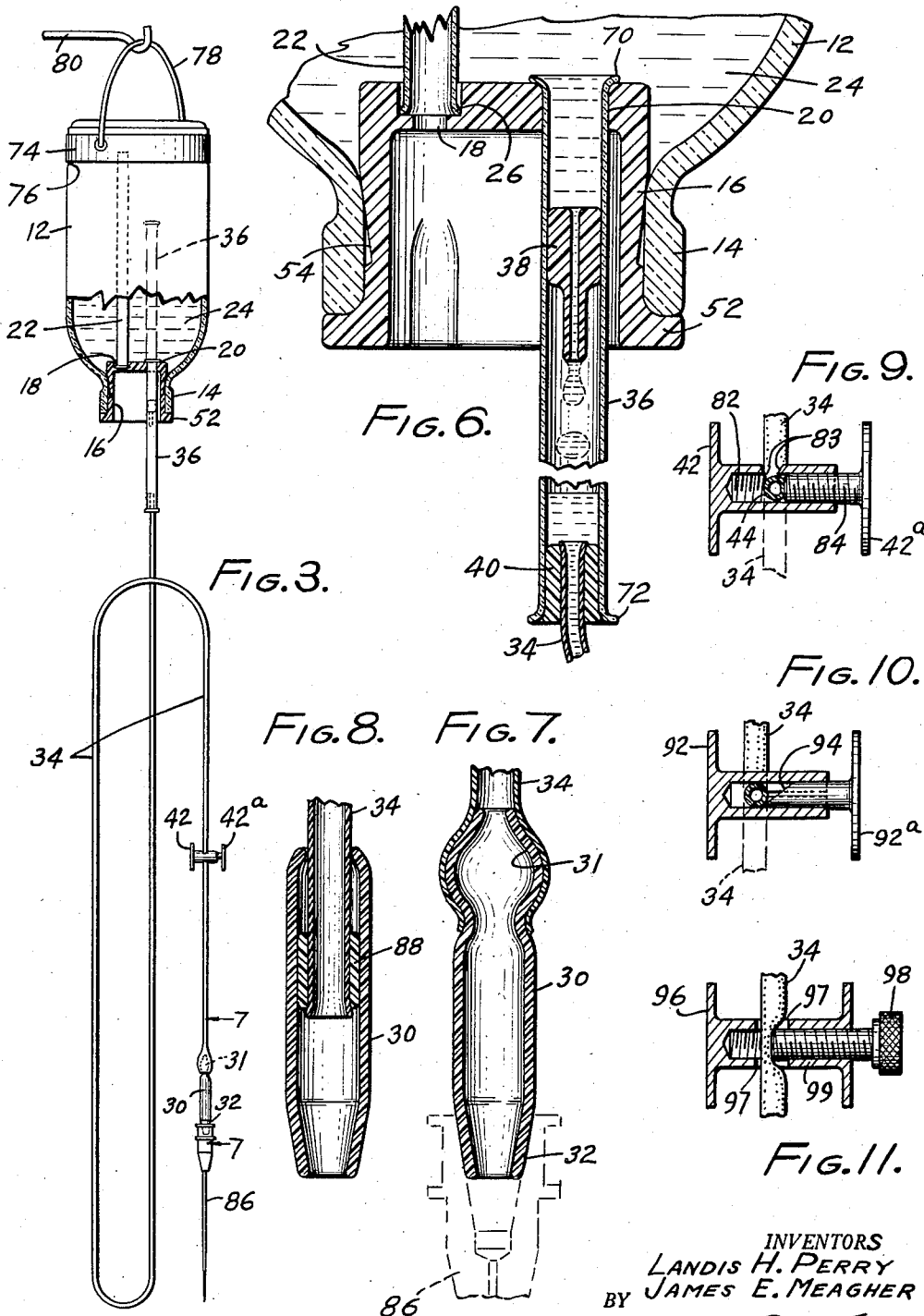
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PARENTERAL ADMINISTERING APPARATUS

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2 Sheets-Sheet 2



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PARENTERAL ADMINISTERING APPARATUS

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5 Claims. (Cl. 128—214)

This invention relates to improvements in "Parenteral Administering Apparatus" and has for one of its principal objects the provision of means whereby parenteral and similar solutions for intravenous and intramuscular or other types of injections can be administered with maximum safety factors so far as the patient is concerned.

Another object of the invention resides in the provision of a device of the class described, wherein certain of the elements for administering the solution are enclosed within the container for the solution and in a hermetically sealed and sterile condition, which is maintained until such time as the container is opened and the seal is broken for administration purposes.

One object of the invention relates to devices for use in the efficient administration of fluids into the body by the intravenous, intraperitoneal, or the subcutaneous method and at the same time combine asepsis and ease of operation.

A further object of the invention resides in the incorporation into the neck of the bottle or other container for the fluid of a length of tubing which is used in administration and in such a manner that the entire apparatus is preserved in a sterile condition until used.

A still further important object of the invention includes the production of a cap or closure for the container which is simple of construction, and which renders easy access to the interior and a prompt use of the solution, all of which is important, particularly in emergencies.

Yet another object of the invention is to provide a novel construction whereby the liquid dispensed issues from the container in an easily regulated stream of droplets and wherein the incoming replacement air does not bubble through the solution, thereby eliminating danger of contaminating the same.

Another object relates to the inclusion in the assembly, of a combination reel and valve for the tubing through which the fluid is administered.

Another and still further object relates to a novel means for securely fastening the hypodermic needle onto the end of the tubing, thereby preventing danger of accidental displacement and subsequent loss of solution and delay and danger to the patient.

Other and further important objects of the invention will be apparent from the disclosures in the accompanying drawings and following specification.

The invention, in a preferred form, is illustrated in the drawings and hereinafter more fully described.

In the drawings:

Figure 1 is a side elevation of the improved parenteral administering apparatus of this invention.

Figure 2 is a top view of the container for the apparatus, parts being broken away to show certain of the internal construction.

Figure 3 is an elevation showing the apparatus inverted and in position for administering the parenteral or other fluid.

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Figure 4 is an enlarged view showing the important details of the structure of this invention.

Figure 5 is a horizontal section taken on the line 5—5 of Figure 4, looking in the direction indicated by the arrows.

Figure 6 is likewise an enlarged view illustrating the apparatus of this invention in inverted position for fluid administering purposes.

Figure 7 illustrates a detail whereby suitable non-leakable connections are made with respect to the ends of the tubing and the needle fitting, and is taken on the line 7—7 of Figure 3.

Figure 8 illustrates a modification of the structure of Figure 7.

Figure 9 is an enlarged section, showing one type of the combination reel and valve for the tubing.

Figure 10 illustrates a modified form of the structure of Figure 9.

Figure 11 shows a still further modification thereof. As shown in the drawings:

The reference numeral 12 indicates the bottle or other container for the improved parenteral administering apparatus of this invention. As shown, the bottle has an integral neck 14, within which is inserted a stopper or other closure 16 of some suitable material, and this stopper is substantially hollow and of a somewhat cylindrical shape, open at the top and with an integral bottom, said bottom having two passages 18 and 20 therein.

The opening 18 does not extend completely through the bottom of the stopper and has a tube 22 of glass, or some other suitable material, positioned therein and as shown in Figure 4 this extends downwardly into the solution 24 in the bottle 12, being held in that position in the hole in the stopper 16 by an end flange 26. A cylindrical sleeve 30 of rubber, or some other suitable resilient material, is loosely inserted in this tube, the same having a tapered end 32, and one end of the liquid administering tube 34 is fitted into this element 30. This sleeve or adapter 30 can also be composed of glass.

The element 30 has a rounded somewhat enlarged inner end 31 and the end of the tube 34 is fitted thereover in stretched non-leakable relationship (Fig. 7). When the sleeve 30, with the tube 34 attached thereto, is passed through the opening 18 in the bottom of the stopper and into the tube 22, the enlarged portion 31 with its surrounding tube end is positioned against the edges of the restricted portion of the opening 18, thereby providing a satisfactory seal at this point.

The tube 34 is of suitable length, as best shown in Figure 3, and is likewise composed of some suitable material such as one of the new plastics which will withstand heat and chemical sterilization and which is at the same time sufficiently flexible for the purpose.

The other opening 20 in the bottom of the stopper 16 also has a tube 36 fitted therein, this being shorter than the tube 22, and a drop dispensing element 33 is fitted into the tube, this being preferably of the shape and contour illustrated in Figure 4, and, as best shown in Figure 6, is provided for the purpose of allowing droplets of the solution 24 to pass there-through and thence exit from the glass tube 36 into the flexible tube 34 in regulated quantities. The end of the flexible tube 34 is securely maintained in position in the end of the glass tube 36 by means of a plug 40, or some other means.

The flexible tubing 34 is preliminarily wound upon a reel 42—42A as best shown in Figures 2, 4, 5 and 9, and one end of the tube 34 adjacent the outlet 30—32 is passed through an opening 44 in the reel hub (Figs. 4 and 9) and the reel with the tubing 34 wound thereon is inserted into the hollow portion of the stopper 16, as best shown in Figure 5. The stopper is internally shaped to accommodate the reel and with a fairly close

fit. These parts are all assembled in the stopper 16 before it is inserted into the neck 14 of the container 12.

When the container 12 has been filled to a desired level with the solution 24, a vacuum can be drawn after which the stopper 16 can be forced into sealing position in the neck of the container. The stopper already has the glass or other tubes 22 and 36 fitted therein, in the position shown in Figure 4 and with the flexible tube 34 on its reel also fitted therein, in the position shown in Figures 4 and 5. Finally, an inner cylindrical flanged cap 50 of thin metal or some other suitable material is applied to the bottle neck and stopper assembly, as shown in Figure 4. It will be noted that the stopper has an upper external flange 52 which fits upon the upper edge of the bottle neck 14 and is also provided with an annular recess 54 at its other end, which, while permitting the stopper to be inserted into the bottle neck without too much difficulty, will help to prevent the same from accidentally falling out when the bottle is inverted for parenteral administering purposes. An inner sealing element 60, preferably in the form of a disc as shown in Figure 4, is then applied and a metal disc 62 inserted over said puncturable disc. The entire assembly is then closed by an outer cylindrical cap 64 having an integral pull-off tab 66, as best shown in Figure 2, whereby the same can be readily removed when desired.

It will be noted from Figure 1, that the tube 22 extends almost to the bottom of the bottle 12 when the same is in the position shown, and the tube 36 extends approximately half way down. The tube 36 is provided with a lower integral flange 70 (Figs. 4 and 6) and an upper integral flange 72 whereby accidental displacement or pulling out is prevented.

The container with its contents can then be sterilized in any suitable manner and so long as the cap 64 is not removed, the equipment will remain in such sterile condition and this condition will prevail throughout shipping and storage operations.

When it is desired to use the solution, a suitable bail or other support in the form of a band 74 is applied to the restricted lower portion 76 of the bottle or container with a handle 78 whereby the whole can be suspended from a convenient hook or other support 80. The caps and seals are then removed, the flexible tube 34, while still wound upon its reel, is taken out of the recess in the stopper 16 and unwound allowing it to assume somewhat the position shown in Figure 3. At the same time the stiff tube 36 is pulled outwardly from the dotted line position shown in Figure 3 to the full line position illustrated in that figure, and the reel and valve combination 42—42A, being on the tube 34 adjacent its delivery end, will act as a control for the liquid flow.

As best shown in Figure 9, the preferred form of reel is in two parts, the portion 42 including a hollow internally screw threaded hub 82, and the portion 42A including an externally screw threaded shank 84, the end of which can be moved against the tube 34 when it is passed through the opening 44 and turning either flange comprises the valve action.

The screw threaded hub 82 of the reel, shown in Figure 9, is slotted as indicated at 83, whereby the tube 34 can be readily inserted in desired position and such saves the time of threading the same through an opening.

The fact that the tube 36 has been pulled into the position shown in Figure 3, while the tube 22 remains in its initial position, enables air to enter into the space adjacent what was originally the bottom of the bottle and allowing egress of substantially all of the fluid 24 through the tube and dropper combination 36—38.

A hypodermic needle 86 has, in the meantime, been fitted onto the exit end of the adapter 30 which is on the tube 34, and, in the modification shown in Figure

8, a secure non-leakable connection is accomplished by means of a resilient plug 88 which has been preliminarily placed on the tube 34, after which the sleeve 30 was fitted into position over that end and the plug. The plug 88, which is of a resilient material, is compressed by the sleeve or adapter, causing a clamping action on the end of the flexible tube 34, all as shown in Figure 8.

Two modifications of the combination reel and valve are shown in Figures 10 and 11. In Figure 10 the reel is composed of two parts 92 and 92A, the stem of the part 92A being fitted into the hollow corresponding stem of the part 92 with a wedge shaped end 94, which can be employed to restrict the flow area of the tube as desired. In Figure 11 the reel 96 is in one piece with a passage 97 therein for the tube 34 and a regulating screw 98 fitted into the hollow internally screw threaded hub 99 to act as a valve. The reels of Figure 10 and 11 may also have slotted hubs for ready insertion of the flexible tube.

It will be evident that herein is provided a completely novel and particularly useful parenteral administering apparatus which, because of its improved construction and design, lends itself particularly to adequate sterilization, proper maintenance of such a condition during shipping and storage and ready availability of the contents without danger of contamination in use.

The parts are simple, easily constructed, readily assembled, can be sterilized with little or no difficulty, and present a most expeditious means of administering the contents and with little or no danger to the patient or difficulty on the part of the operator. The stopper contains substantially all of the equipment and the combination dropper and delivery tube can be almost instantly placed into operative position, and its simplicity of construction assures of positive operation under all conditions. The combination reel and valve provides a novel and useful feature and the improved method of securing the two ends assures against leakage and protects against accidental displacement which could be serious.

We are aware that many changes may be made and numerous details of construction varied throughout a wide range without departing from the principles of this invention, and we, therefore, do not propose limiting the patent granted hereon otherwise than as necessitated by the prior art.

We claim as our invention:

1. A parenteral administering apparatus including a container having a neck, a stopper in the neck of the container, said stopper being substantially cylindrical, having an integral bottom and open at its upper end, the bottom having two openings therein, a tube of stiff material in each opening, one of said tubes being slidable in its opening and shorter than the other, the other tube being approximately the length of the container, a relatively long tube of flexible material coiled in the hollow portion of the stopper, one end of said flexible tube being non-leakably connected to the slidable short tube and the other end of said flexible tube providing an outlet for the material in the container, the exit end of the flexible tube being temporarily positioned in the longer tube when the bottle with its contents is sterilized and sealed for shipping and storage, a reel upon which the flexible tube is wound preliminarily to being positioned in the hollow stopper, said reel including a valve for controlling the flow of liquid through the tube.

2. A device as described in claim 1, wherein a flow regulating device in the form of a dropper is mounted in the relatively slideable tube.

3. A device as described in claim 2, wherein the second and longer stiff tube provides an ingress for air when the apparatus is in use.

4. A device as described in claim 2, wherein the relatively slideable shorter tube is provided with integral flanges at its ends to limit its slidable movement.

5. A device as described in claim 1, wherein a resilient sealing connection is provided at the end of the flexible tube, said resilient sealing connection including a cylindrical flexible plug inserted on the tube adjacent its end, and adapted to expand into sealing relationship with the inner surface of a fitting applied thereto.

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