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INTRAVENOUS INJECTION EQUIPMENT AND METHOD OF OPERATING SAME

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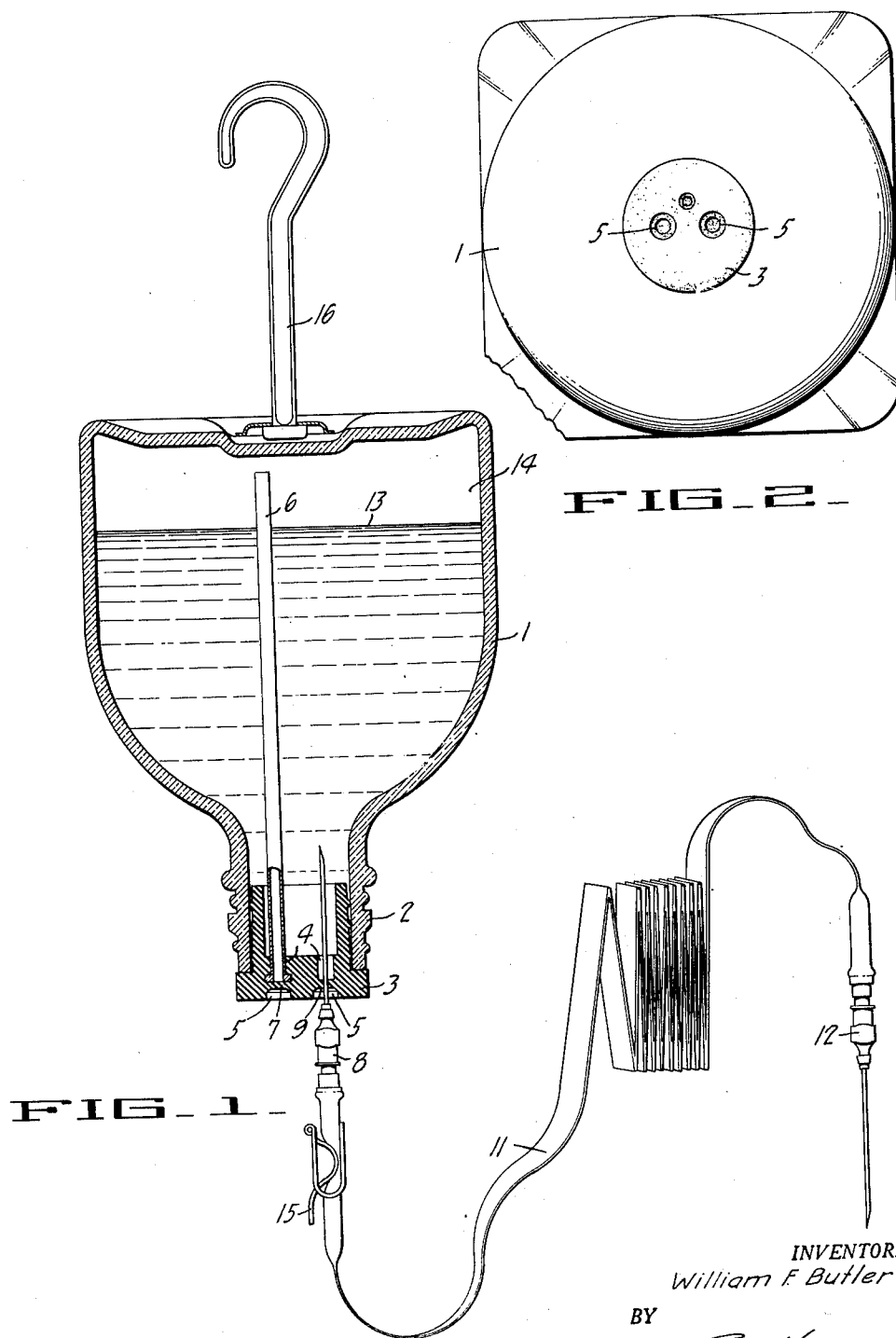


FIG. 2--

FIG. 1--

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INTRAVENOUS INJECTION EQUIPMENT AND
METHOD OF OPERATING SAMEWilliam F. Butler, Berkeley, Calif., assignor to
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3 Claims. (Cl. 128—214)

In general, my invention relates to a flask and accessory equipment for making intravenous and allied injections and to a method of operating such flask and accessory equipment.

More specifically, my invention relates to a sealed flask containing under superatmospheric pressure a liquid to be injected into a body through a section of normally collapsed tubing, and to the method of making an injection with such equipment.

Up to the present time, solutions for making intravenous injections have been bottled and sealed for use in flasks either under atmospheric or subatmospheric pressure. The use of partially evacuated flasks has attained considerable preference for the reason that when the seal is broken, the sound of the inrushing air is indicative that the flask was properly sealed in the first instance and that this seal has not been broken in the meantime.

There are, however, at least two objections to sealing flasks of this kind under a partial vacuum. When the flask is filled and sealed, every precaution is taken to insure that the flask and its contents are absolutely sterile. However, when the seal is broken preparatory to making an injection, unsterilized air is drawn into the flask. The same thing happens when there is only a slow leak through the flask, for the inwardly directed differential pressure forces some unsterilized air into the flask. In this connection, it is to be noted that before the contents of the flask can be dispensed, sufficient air must be admitted into the flask to equalize the internal and external pressures.

For years, intravenous injections have been made through a section of rubber tubing connected at one end to the flask and at the other end to the patient through the conventional hypodermic needle. Within the last year or two, a collapsible Cellophane tubing has been put on the market as a substitute for the conventional rubber tubing heretofore used. While Cellophane tubing has certain advantages, in that it may be collapsed so as to form a ribbon and folded on itself so as to conserve space in shipping and storing, and has the further advantage at this time in that it displaces rubber which is needed elsewhere, it has a decided disadvantage when used in combination with a flask for making intravenous injections. Since flasks for this purpose have invariably been delivered to users with their contents under either subatmospheric pressure or atmospheric pressure, the use of a collapsed Cellophane tubing of ribbon form is highly

impractical, for the reason that, as experience has shown, gravity is insufficient to force the solution through the tubing, and consequently to start the flow of the solution through the tubing, it must be "milked" from its point of connection with the flask to its opposite end. Obviously this is a fussy operation which should be avoided.

The object of this invention is the provision of a flask for making intravenous injections through a section of normally collapsed flexible tubing and which is sealed under superatmospheric pressure so that the introduction of dirty air into the flask may be avoided and the intravenous solution forced through the tubing without the necessity of "milking" the tubing.

The invention possesses other advantageous features, some of which with the foregoing will be set forth at length in the following description where that form of the invention which has been selected for illustration in the drawing accompanying and forming a part of the present specification is outlined in full. In said drawing, one form of the invention is shown, but it is to be understood that it is not limited to such form, since the invention as set forth in the claims may be embodied in a plurality of forms.

Referring to the drawing:

Figure 1 is a vertical mid-section of a flask connected with a hypodermic needle to a section of collapsed tubing, in its operative position for making an intravenous injection.

Figure 2 is a top plan view of the flask shown in Figure 1 in its upright position.

As shown in these figures, the object of my invention is embodied in a conventional Saffi-flask 1, formed with a neck 2 to which is sealed a rubber stopper 3. The rubber stopper 3 is provided on its interior with two or more recesses 4 in alignment with depressions 5 formed in the outer end of the stopper. Secured within one of the recesses 4 and extending substantially to the base of the flask is an air eduction tube 6 which can be placed in communication with the outer atmosphere by inserting a hypodermic needle through the wall or diaphragm 7 separating the recess 4 within which the air eduction tube 6 is connected, and its aligned depression 5. Communication between the interior of the flask and the patient may be established by a hypodermic needle 8 inserted into the flask through the wall or diaphragm 9, and a section of collapsible Cellophane tubing 11 secured at one end to the needle 8 and at its opposite end to a second hypodermic needle 12.

Disposed within the flask 1 is a suitable quantity of intravenous solution 13 which only partially fills the flask, so as to leave space 14 for placing the flask under sufficient pressure to force enough solution through the tubing 11 to completely fill the tubing, or under sufficient pressure to force the entire contents of the flask into the veins of the patient. To simply force the solution through the tubing so that "milking" of the tubing can be avoided, the flask should be sealed under a pressure of two or three pounds. When it is desired to dispense the entire contents of the flask under a positive pressure, a higher pressure will obviously be required.

Although forming no part of this invention, the tubing 11 may be provided with a suitable pinch cock 15 of any standard construction, and the flask 1 may be provided on its base with a hook 16 or other means by which it may be suspended in an inverted position from any suitable support.

From the above description it will be noted that I have provided a combination of a flask and collapsible tubing which, due to the fact that the flask is under superatmospheric pressure, obviates the necessity of "milking" the collapsible tubing for initiating the flow of solution therethrough, which can be used to positively force the entire contents of the flask into the patient, and which avoids the introduction into the flask of unsterilized air from the time that the flask is sealed to the time that the injection is completed.

I claim:

1. A device for making intravenous injections comprising: a flask partially filled with an intravenous solution, said flask being sealed under superatmospheric pressure by a stopper puncturable by a hypodermic needle; a hypodermic needle extending through said stopper; a section of normally collapsed flexible tubing secured to the outer end of said needle; and a second hypodermic needle secured to the free end of said tubing.

2. A device for making intravenous injections comprising: a flask partially filled with an intravenous solution, said flask being sealed under superatmospheric pressure by a stopper puncturable by a hypodermic needle; an air eduction tube secured to said stopper; a hypodermic needle extending through said stopper; a section of normally collapsed flexible tubing secured to the outer end of said needle; a second hypodermic needle secured to the free end of said tubing and a pinch valve associated with said tubing intermediate its ends.

3. A device for making intravenous injections comprising: a flask partially filled with an intravenous solution and sealed by a stopper puncturable by a hypodermic needle; a section of normally collapsed flexible tubing communicating with the interior of said flask; and a hypodermic needle secured to the free end of said tubing, said flask being sealed under a superatmospheric pressure of about three pounds.

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