

[54] **DEVICE FOR THE DIRECT TRANSFER OF BLOOD FROM A HUMAN TO CULTURE BOTTLES**

2,684,068 7/1954 Orens128/220
 3,536,061 10/1970 Ogle128/2

FOREIGN PATENTS OR APPLICATIONS

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1,239,808 5/1967 Germany128/221
 1,019,500 2/1966 Great Britain128/272

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[58] Field of Search128/2 F, 2 G, 2 R, DIG. 5, 128/276, 215, 216, 218 R, 220

[57] **ABSTRACT**

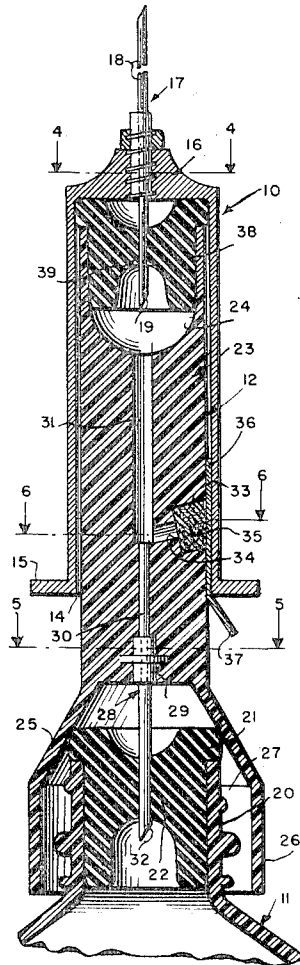
A device for use with a conventional vacuum adapted with insertion needle for the direct transfer of blood, usually in small quantities, from a human being to a plurality of vacuumized culture bottles with one insertion of the needle into the patient's vein. The device is especially adapted for the drawing of blood to be tested for septicemia and bacteremia, where the blood specimen must be drawn and aerated aseptically. The device eliminates the need for using syringes and tubing units for drawing blood for testing, and provides sterile aeration of the blood after it is drawn.

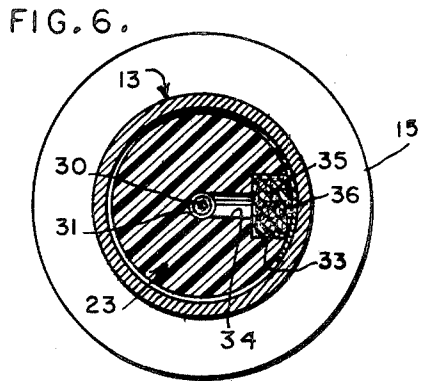
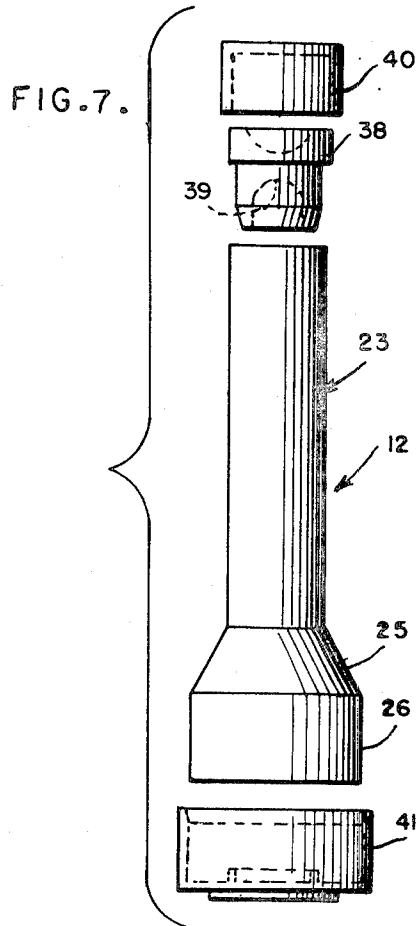
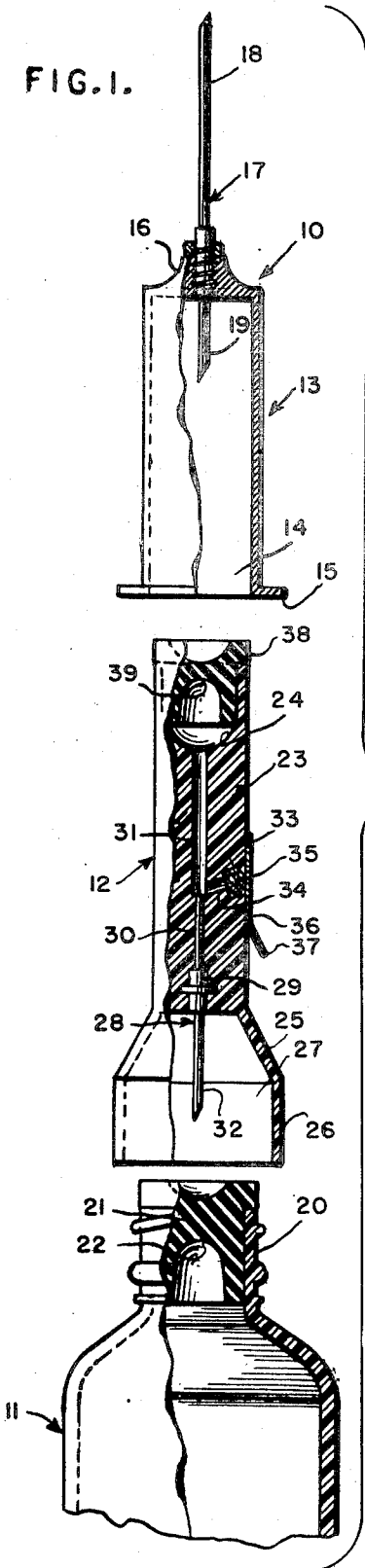
[56] **References Cited**

UNITED STATES PATENTS

2,524,363 10/1950 Smith128/220
 2,604,095 7/1952 Brody128/220

5 Claims, 8 Drawing Figures





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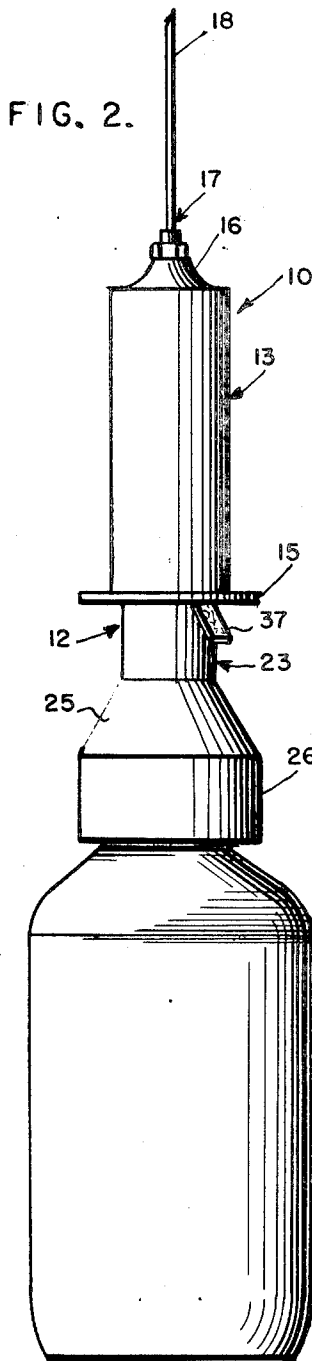


FIG. 8.

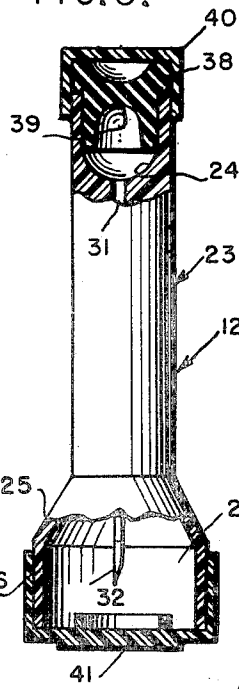


FIG. 3.

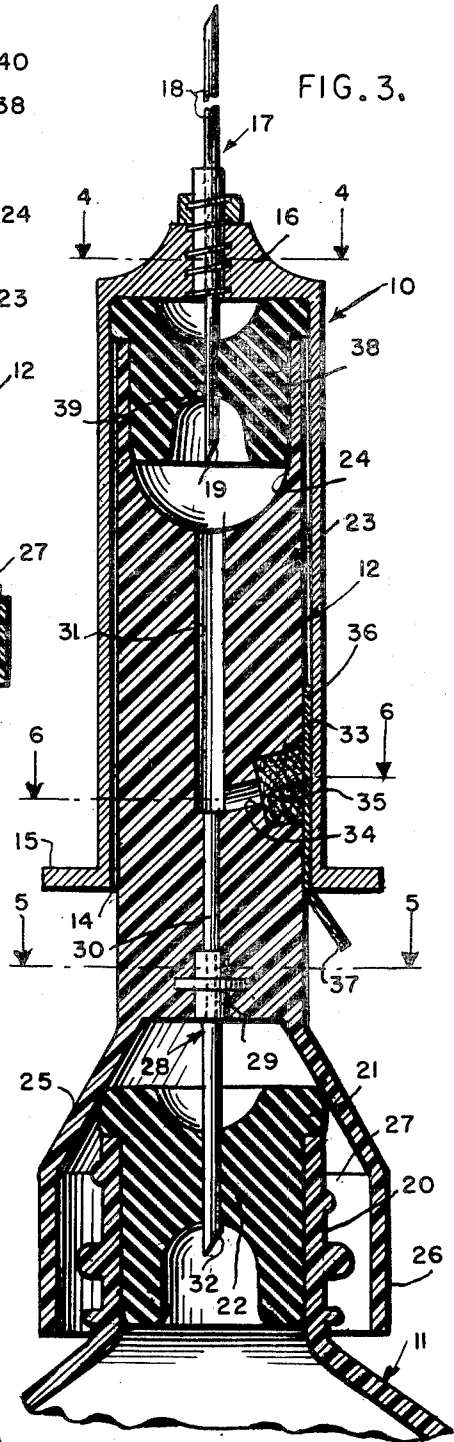


FIG. 4.

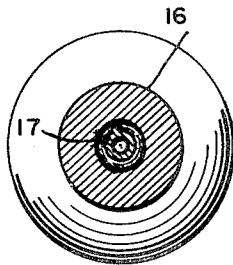
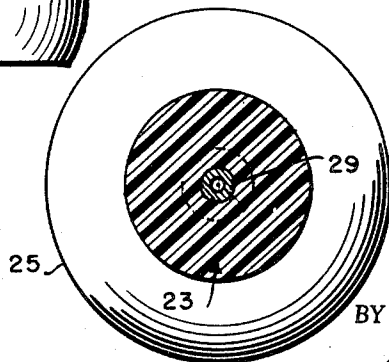


FIG. 5.



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SUMMARY

It is a primary object of the present invention to provide a novel device adapted for use with a conventional vacuum adapter with insertion needle for drawing blood directly into vacuumized blood culture bottles, to avoid the present practice of transferring blood from collecting tubes to culture bottles by the use of syringes or other devices.

Another object of the invention is to enable sterile aeration of the blood culture without removal of the needle from the patient's vein, and which eliminates the need for entering the blood culture bottle twice with a needle, for supplying blood and air thereto.

A further object of the invention is to provide a device which when connected to a vacuum adapter and blood culture bottle can be readily held steady and comfortable for the user and the patient.

Another object of the invention is to provide a device which may be very economically manufactured, enabling it to be disposed of after a single use, so that the needle thereof is inserted only into a single culture bottle, to minimize the possibility of contamination.

Various other objects and advantages of the invention will hereinafter become more fully apparent from the following description of the drawings, illustrating a presently preferred embodiment thereof, and wherein:

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a fragmentary exploded view, partly in elevation and partly in longitudinal section, showing the device, constituting the invention, and the two conventional components with which it is utilized;

FIG. 2 is an elevational view showing the components illustrated in FIG. 1 assembled for use;

FIG. 3 is an enlarged fragmentary substantially central vertical sectional view of the parts seen in FIG. 2;

FIGS. 4, 5 and 6 are cross-sectional views taken substantially along the lines 4-4, 5-5, and 6-6, respectively, of FIG. 3;

FIG. 7 is an exploded view in elevation of the device comprising the invention, and

FIG. 8 is an elevational view partly in longitudinal section showing the parts appearing in FIG. 7 assembled.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring more specifically to the drawings, a conventional vacuum adapter 10 and a conventional vacuumized blood culture bottle 11 are illustrated in the drawings to illustrate the use of the device 12, comprising the invention, which enables the direct transfer of blood from a human to the culture bottle 11.

The vacuum adapter 10 includes a hollow cylindrical body or sheath 13 having an open end 14 provided with a surrounding outwardly projecting flange 15, and an end wall 16 in which is secured the intermediate portion of an insertion needle 17. The tubular needle 17 is disposed axially of the body 13 and has an outer end 18 which is adapted to be inserted into the vein of a human being and an inner end 19 which is disposed in the body 13 and which extends a portion of the length thereof.

The bottle 11, which may be of any size and shape, has a neck 20 which is closed and sealed by a conventional rubber stopper 21 which is recessed at its opposite ends to provide a central portion 22 of reduced thickness which can be readily penetrated by a needle.

The device or invention 12, as best seen in FIGS. 1 and 3, includes an elongated plastic body 23 having a cavity 24 at one end which is provided with a rounded inner end. The other end of the body 23 terminates in an integral flared annular wall 25 having a cylindrical extension 26 projecting from

its enlarged outer end and which combines with the portion 25 to form an outwardly opening chamber or cavity 27.

A tubular needle 28 has an enlarged intermediate portion 29 which is molded into the body 23 adjacent the wall 25. An inner end portion 30 of the needle 28 is disposed within the body 23 and opens into one end of an axial bore 31 of the body 23. The bore 31 which is of a diameter several times larger than the diameter of the bore of the needle 28 has an opposite end which opens into the cavity 24. The other end 32 of the needle 28 extends into the cavity 27 and terminates within the skirt 25, 26 and inwardly of the open end thereof.

A cavity or chamber 33 is formed in the body 23 and opens outwardly of a part of the periphery thereof, and a port 34 connects an inner portion of the cavity 33 to a portion of the bore 31. A nonabsorptive sterile air filter 35 is pressure fitted into the cavity 33. The filter 35 may be formed of fibers of synthetic materials or wool. The outer end of the cavity 33 is sealed by a strong moisture and air proof tape 36, having a loose end or tab 37 to facilitate removal of the tape.

A rubber plug 38 closes and seals the open end of the cavity 24 and has recessed ends forming a central portion 39 of reduced thickness.

As seen in FIGS. 7 and 8, a cap 40 is provided for sealing the plug 38 and a cap 41 fits over the extension 26 and seals the chamber 27. FIG. 8 shows the device 12 as it would appear prior to use. When the device 12 is to be assembled with vacuum adapter 10 and bottle 11, caps 40 and 41 are removed.

To assemble the device 12 with the vacuum adapter 10 and the bottle 11, as seen in FIG. 1, the body 23 is inserted into the sheath 13 until the stopper 38 abuts against the end wall 16, as seen in FIG. 3. Before the body 23 reaches this position, the needle end 19 will have passed through the restricted wall portion 39, so that said needle end will open into the cavity 24 and be in communication with the bore 31 and the bore of the needle 28. The other end 18 of the needle 17 is then inserted into the vein, not shown, from which the blood is to be drawn. The bottle neck 20, carrying the plug 21, is then inserted into the cavity 27 to cause the needle end 32 to pass through the stopper wall portion 22, so that the bore of the needle 28 will be in communication with the vacuumized interior of the bottle 11, when the parts are in their positions of FIG. 3, with the other end of the stopper 21 seating against a part of the flared wall 25. The blood will then be drawn from the vein through the needle 17 into the cavity 24, and through the bore 31 and needle 28 into the bottle 11.

If the blood being drawn does not require aeration, the sealing tape 36 is left in place, as seen in FIG. 3. If the blood is to be tested for septicemia or bacteremia, requiring that it be aseptically aerated, the tape 36 is removed by grasping the tab 37 and stripping the tape from the body 23, so that air will be drawn by the vacuum in the bottle 11 inwardly through the filtering plug 35 and port 34 into the bore 31 to pass with the blood through the needle 28 into the bottle 11, without requiring another penetration of the plug 21 with a second needle in order to aerate the blood supplied to the bottle 11.

The filter 35 is nonabsorptive so that the blood in the bore 31 will not adhere thereto and commence clotting and clogging the air filter.

When blood is to be supplied to more than one vacuumized bottle 11 without removing the needle end 18 from the vein, the device 12 is removed from the adapter 10 and another device 12 applied thereto and to the second bottle 11 to prevent the possibility of contamination which could occur by the user's finger touching the needle end 32.

Since the body 23 is substantially rigid, the assembly as shown in FIG. 2 including the adapter 10, bottle 11 and device 12, provides a rigid structure which can be readily held steady and comfortably by the user and with a minimum of discomfort to the patient, since there is less chance of movement of the needle end 18 in the arm or of said needle end slipping out of the vein. As a result, less time is required to effect withdrawal of the blood.

Various modifications and changes are contemplated and may be resorted to, without departing from the function or scope of the invention.

We claim as our invention:

1. A connecting device for use in an apparatus for transfer of blood from a human to a vacuumized blood culture bottle comprising; elongated body means having a passage therethrough; a cavity opening outwardly of one end of said body; a needle pierceable plug sealingly positioned in said cavity; a hollow needle secured in the opposite end of said body and projecting outwardly therefrom; said hollow needle communicating with the passage in said body; an opening intermediate the ends of said body and extending radially from the outer surface of said body to said passage; air filter means secured in said opening; and means detachably connected to said body for sealing the outer end of said air filter.

2. A connecting device as set forth in claim 1, and further including caps detachably applied to and sealing the ends of said body.

3. In combination with a vacuum adapter including a sheath having an open end and an end wall disposed remote from said open end in which is mounted an intermediate portion of a first tubular needle, and a vacuumized blood culture bottle having a rubber plug sealing the neck thereof; a connecting means including an elongated body having an end sized to fit

slidably in said sheath and having a cavity opening outwardly of said end, a rubber plug sealing an outer end of said cavity and penetrated by an inner end of the needle when said body end is inserted into the sheath, a second hollow needle having one end secured in the opposite end of said body and an exposed opposite end projecting from said last mentioned body end to penetrate the bottle stopper when the bottle neck is displaced endwise toward said last mentioned body end, said body having a passage connecting the cavity thereof to the bore of the second needle for vacuumizing the bore of the first needle when the bore of the second needle is in communication with the interior of the bottle an air filter disposed in and opening outwardly of said body and a port connecting an inner end of said filter to said passage of the body between the adjacent ends of the needles, and means detachably connected to the body for sealing the outer end of said air filter.

4. In a combination as defined by claim 3, said body having a skirt extending from the last mentioned end thereof and disposed around the last mentioned end of the second needle, said skirt being sized to receive the bottle neck and to provide a seat for the bottle stopper.

5. In a combination as defined by claim 3, said passage of the body being of a diameter substantially greater than the diameter of the bores of the needles.

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