

Feb. 21, 1967

D. O. BAUTISTA

3,304,934

BLOOD DRAWING DEVICE

Filed Sept. 29, 1964

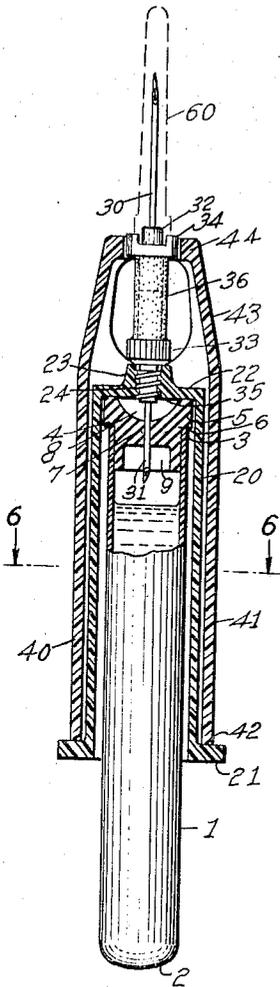


Fig. 1.

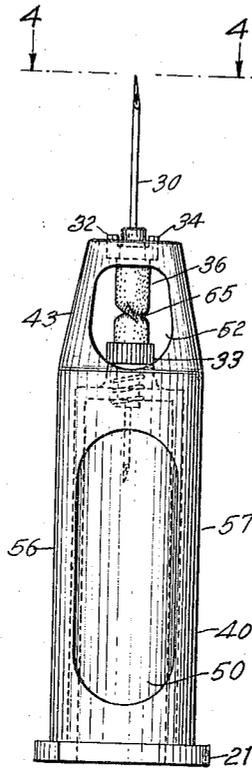


Fig. 2.

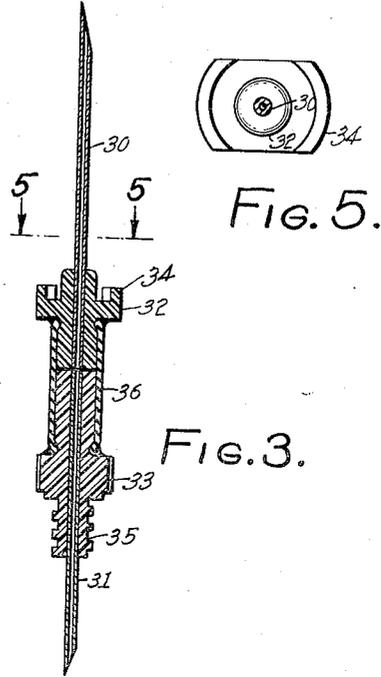


Fig. 3.

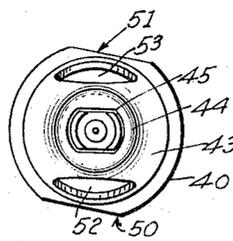


Fig. 4.

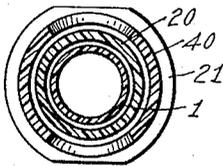


Fig. 6.

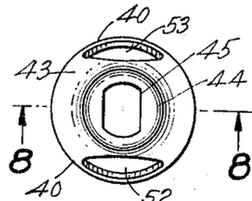


Fig. 7.

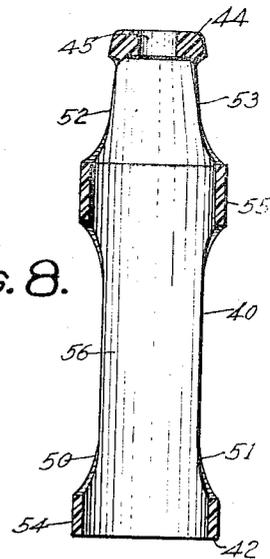


Fig. 8.

INVENTOR,  
DIONISIO O. BAUTISTA;  
BY  
*Calvin Brown*  
ATTORNEY

1

3,304,934

**BLOOD DRAWING DEVICE**

Dionisio O. Bautista, 4610 $\frac{1}{4}$  Hollywood Blvd.,  
Los Angeles, Calif. 90027

Filed Sept. 29, 1964, Ser. No. 400,024

1 Claim. (Cl. 128—2)

2

The present invention relates to a blood drawing device of the type which permits the drawing of a blood specimen from a patient or blood donor with a single veni puncture regardless of the number and kind of blood tests ordered by the physician.

A further object is to provide a blood drawing device of simple construction, economical in cost of manufacture, easily used by the physician and generally superior to devices for a similar purpose now known to the inventor.

A further object is the provision of a blood drawing device utilizing blood receiving vials which are evacuated and wherein after a single veni puncture, separate specimens of the blood may be obtained for different vials without blood drip or blood spatter while changing from one vial to a further vial.

A further object is the provision of a blood drawing device for directing blood after a veni puncture into an aspirated vial and in such a manner that blood flow through the device may be stopped by novel means while removing the blood specimen vial and substituting an empty aspirated vial for receiving a further blood specimen.

At the present time, it is the practice to provide a vial having a closed end and an open end, the open end receiving a self sealing stopper with the interior of the vial under vacuum. The cannula or hypodermic needle has two beveled ends and after one end of the cannula has penetrated a vein, the opposite end of the cannula which has partially penetrated the self sealing stopper is moved through the stopper and received within the evacuated area of the vial. Under these conditions blood is aspirated through the cannula into the vial and when the vial has received a desired amount of blood, the cannula is withdrawn from the vein.

In the practice of my invention, I may use a vial under vacuum of the type just described, and I provide a valve means positioned between two separate aligned cannulas. After one cannula has made a vein penetration to allow passage of blood therethrough and the second cannula is in communication with the interior of the vial under vacuum, blood flow may be stopped through the cannulas by the valve in a simple, efficient manner and a further vial utilized for the removal of additional blood samples without removing the cannula from the vein. The construction of my device is such that there is no blood drip or spatter during the change from one vial to a further vial.

Other objects and advantages of the invention will appear as the specification proceeds.

In the drawing:

FIGURE 1 is a fragmentary, axial sectional view of the blood drawing device and blood receiving vial as used in the practice of my invention;

FIGURE 2 is an elevation of the device shown in FIGURE 1 the blood receiving vial being removed from the assembly;

FIGURE 3 is an axial sectional view on an enlarged scale of a valve arrangement for two cannulas used in the practice of my invention;

FIGURE 4 is an end view looking in the direction of the arrows 4—4 of FIGURE 2;

FIGURE 5 is an enlarged sectional view on the line 5—5 of FIGURE 3;

FIGURE 6 is a sectional view on the line 6—6 of FIGURE 1;

FIGURE 7 is an end view of the member shown in FIGURE 8; and,

FIGURE 8 is a sectional view on the line 8—8 of FIGURE 7.

Referring now to the drawing, and specifically to FIGURE 1 wherein I have shown a vial 1 consisting of a tube of glass, plastic, or other material, and which is usually transparent, having a closed end 2 and an open end 3 for receiving a self sealing stopper 4 formed of rubber or other suitable material. The stopper is formed to have a flanged end 5 which overlies the open end of the vial as shown at 6. The stopper is provided with a diaphragm portion 7 by recessing the stopper at 8 and 9 on opposite sides of the diaphragm to thereby form a relatively thin diaphragm and one that is easily penetrated by a hypodermic needle or cannula. No invention is claimed for the vial and the stopper construction, as shown other than to describe an ordinary form for a blood receiving vial readily obtainable on the market. As a rule, the vial is evacuated so that when a cannula or hypodermic needle makes a penetration of the diaphragm so as to be received in the vial, as shown, blood is aspirated from a vein through the cannula into the vial.

Also, included in the blood drawing device and for which no invention is claimed, is a tubular type holder 20 having an open end surrounded by a flange 21 and closed at the opposite end 22, the end 22 being provided with a central external enlargement 23 provided with a screw threaded central bore 24. The holder 20 is adapted to receive within the same the vial 1 with its stopper 4 so positioned that penetration of the stopper by a cannula is assured. Thus, it is common practice to use a hypodermic needle or cannula which is beveled at opposite ends, the cannula having an intermediate surrounding hub provided with screw threads for reception within the threaded bore 24. When the vial is pushed within the holder 20, one end of the cannula will be caused to penetrate the diaphragm of the stopper. However, in actual practice only a slight penetration of the diaphragm is made by one end of the cannula so as not to completely penetrate the diaphragm into the vial. The external portion of the cannula is then inserted by the technician or physician into the vein of the blood donor followed by further penetration of the stopper diaphragm whereby the vacuum within the vial aspirates blood from the vein. Where a single penetration of a vein is to be made, the method just described is satisfactory and for a single blood specimen. However, in surgical practice, it is often desired that many specimens of blood be received from the donor and to avoid repeated penetrations of the vein by a cannula or hypodermic needle I have devised the present device of the invention.

My device for blood drawing, and particularly where several specimens of blood are desired, consists in providing two cannulas or hypodermic needles 30 and 31, the bores of which needles or cannulas lie on the same axis. I term cannula 30 as the upper cannula and 31 as the lower cannula. Each cannula is provided with a hub at the nonbeveled end thereof as shown at 32 and 33. The hubs may be formed of any material desired such as metal, plastic and the like as long as the hub is closely bonded to the cannula in each instance. Hub 32 includes an intermediate member 34 of irregular outline. Member 34, in the present instance, is substantially rectangular in form and is so formed as to allow ready grip of the hub by the fingers or other instrumentality as hereinafter set forth. The hub 33 is similarly formed except that the intermediate portion may be circular and provided with knurling to allow a gripping thereof by the

3

fingers. This portion of the hub is provided with a screw threaded part 35. Adapted to interconnect the hubs 32 and 33 is an elastic tube 36 and ends of this tube may be glued to the hubs or held to the hubs by any convenient form of clamping means. Such a construction slightly separates the contiguous ends of the hubs and the elastic tube provides a valve for permitting or stopping flow through the cannulas 30 and 31 by means as hereinafter described. Thus assuming that the threaded area 35 of the hub 33 is connected to the threaded base 24 of the holder 20, the cannulas and the tube 36 will be in the position shown in FIGURE 1, assuming that the vial 1 is not within the holder 20. To stabilize the device as an entirety, I utilize a sleeve 40 which is adapted to surround the holder 20. The sleeve 40 has a cylindrical surfaced portion or tube 41 terminating in an open end at 42 and provided with a hollow frusto-conical portion at 43 having an upper base 44. The upper base is centrally provided with an irregular outlined bore or opening 45 adapted to receive and conform to the outline of the hub 32, as shown in FIGURE 1. The length of the sleeve is such that when the open end at 42 is resting upon the flange 21, the hub 32 is confined within the opening 45. The cylindrical portion of the sleeve is provided with a pair of diametrically disposed slots 50 and 51, the cutting planes for which are substantially parallel and the frusto-conical portion or head portion is likewise provided with a pair of slots at 52 and 53 which are positioned substantially 180° apart, the cutting planes being substantially parallel to the cutting planes for the slots 50 and 51. This construction provides a tubular base portion at 54 and a tubular portion at 55 between the slots 50 and 52, 51 and 53 which join the solid connecting leg portions of the sleeve, as shown at 56 and 57.

It is modern medical practice to utilize a disposable cannula or hypodermic needle and not to depend upon sterilizing the needles after use. In accordance with the practice of using disposable needles, both hypodermic needles or cannulas may be protected with sheaths such as the sheath shown at 60 for the upper needle 30. The sheath is usually a light tubular plastic closed at one end and sealed to the hub 32 to maintain the needle sterilized. The opposite hypodermic needle or cannula 31 may be provided with a sheath. In fact, it is good practice that it should be so provided to prevent contamination.

The operation, uses and advantages of my invention are as follows.

I first assume the assembly of FIGURE 1 which will include the two cannulas 30 and 31 with the hubs 32 and 33 interconnected by the elastic tube 36 which may be formed of rubber or other suitable material, the hub 33 being screw threaded to threads 24 of the holder 20 and with the sleeve 40 having its open end at 42 resting on the flange 21 of the holder 20. This positions the hub 32 within the opening 45 of the upper base end of the sleeve 40. The technician or physician, as the case may be, grasps the sleeve 40 by the hand, the hand enveloping the sleeve and contacting the holder 20 through the slots 50 and 51. The elastic tube 36 may be observed through the slots at 52 and 53. The technician removes

4

the sheath 60 from the upper cannula or hypodermic needle 30 for the purpose of making a vein penetration. However, before doing so the vacuum vial 1 is inserted within the holder 20 and the lower cannula or needle 31 is caused to partially penetrate the diaphragm 7 of the stopper 4. To assure that pressure is not felt by the blood donor when the cannula or needle 31 completely penetrates the diaphragm of the stopper, the technician or physician maintains his grip upon both the sleeve 40 and the holder 20 whereupon the cannula 30 is caused to penetrate the vein followed by complete penetration of the diaphragm of the stopper by the cannula 31. Blood is then aspirated from the vein and received within the vial 1, and the cannula 31 may then be removed from the self-sealing stopper to maintain the blood within the vial in a sterile condition for laboratory tests or other purposes. If further specimens of the blood of the donor are desired, the physician or technician while still grasping by the hand the sleeve 40 rotates the holder 20 which twists the elastic tube, as shown in FIGURE 2 at 65. This is capable of being accomplished due to the fact that contiguous ends of the hubs 32 and 33 are slightly spaced apart and such a twisting of the elastic tube (the tube functioning as a valve) completely stops passage of blood flow through the cannulas 30 and 31 with the result that blood droplets are not formed to escape from the cannula 31. While maintaining the sleeve and holder in a position to retain the twisted portion 65 in the elastic tube, the upper cannula 30 being still within the vein of the blood donor, a further vial and its self sealing stopper may be inserted within the holder for penetration of the self sealing stopper for the vial by the lower cannula 31 whereupon the grip on the holder and the sleeve may be released to allow the elastic tube to untwist and thereby assume the position shown in FIGURE 1 whereupon blood is aspirated from the vein into the new vial. The operation may be repeated as desired and the twisting of the elastic tube functions as a valve means.

I claim:

A blood drawing device as disclosed, including: two cannulas with attached hubs, a tubular valve joining the hubs, a tubular holder attached to one hub for releasably mounting a vial, an outer sleeve surrounding the tubular holder and attached to the other hub, upper and lower apertures in said sleeve providing means whereby rotation of the tubular holder relative to the outer sleeve closes or opens the tubular valve.

#### References Cited by the Examiner

##### UNITED STATES PATENTS

2,168,437	8/1939	Buercklin	128—218.1
2,416,391	2/1947	Hixson	128—214
2,448,989	9/1948	Lockhart	128—220

ROBERT E. MORGAN, *Acting Primary Examiner.*

RICHARD A. GAUDET, *Examiner.*

60 K. L. HOWELL, *Assistant Examiner.*