Jan. 27, 1970 A. F. PATE 3,491,748

VACUUM BLOOD DRAWING DEVICE

Filed March 20, 1966

FIG. 1

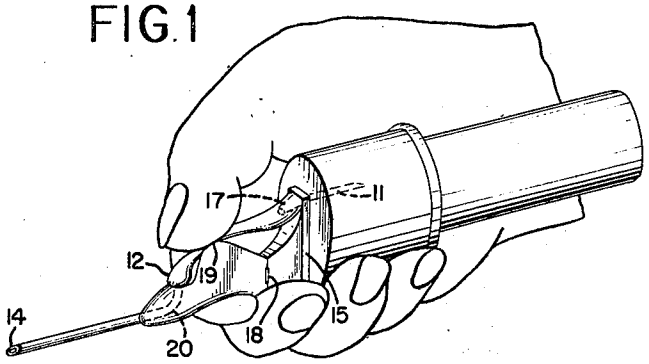


FIG. 5

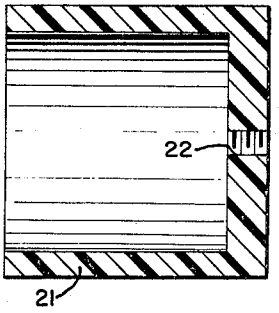


FIG. 2

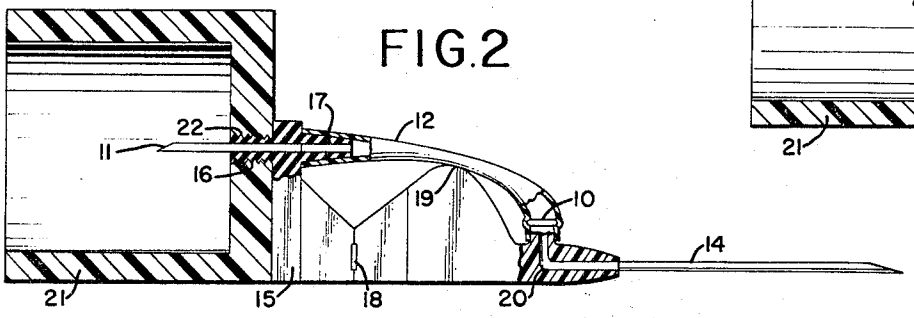


FIG. 3

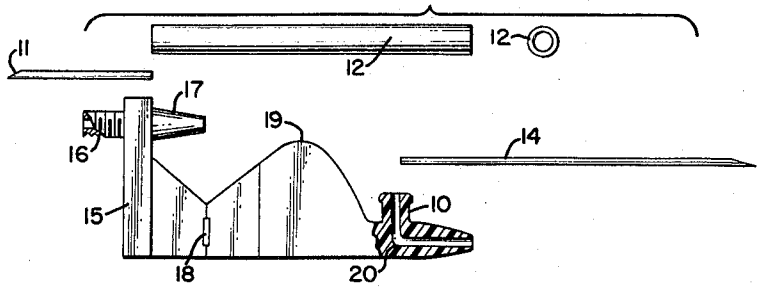


FIG. 4

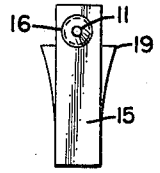


FIG. 6

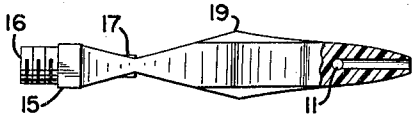
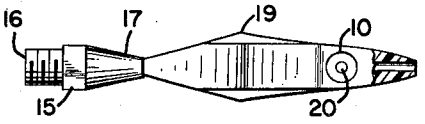


FIG. 7



INVENTOR.

ALBERT F. PATE

United States Patent Office 3,491,748
Patented Jan. 27, 1970

3,491,748

VACUUM BLOOD DRAWING DEVICE

Albert F. Pate, 3828 Valley Ridge Drive,
Nashville, Tenn. 37211

Filed Mar. 20, 1967, Ser. No. 624,612
Int. Cl. A61m 1/00
U.S. Cl. 128—2 3 Claims

ABSTRACT OF THE DISCLOSURE

A blood drawing device including a rigid body supporting a vacuum tap needle and a blood vessel needle spaced apart from each other longitudinally and transversely, the needles being connected in fluid communication by a flexible tube adjacent a pressure surface on the body so that digital pressure applied to the tube and against the surface will permit control of a fluid through the tube.

This invention relates to a phlebotomy and vacuum blood drawing device with which vacuum and blood flow may be digitally or manually controlled; which has an off-center needle attachment to facilitate low angle vein entry; shows a flash of blood when needle enters the vein; avoids traumatic manipulations and collapsed veins due to the uncontrollable vacuum in blood drawing devices in current use; enables the person using the device to stop and control the flow of blood when changing tubes when multiple specimens must be collected; controls the spurting flow of blood in arterial taps; eliminates the need for awkward and difficult removal of conventional vacuum adaptors from the needle requiring a second venipuncture or the use of hemostats and two workers by a break-away feature incorporated into the invention; and is easily removed from the vacuum tube guide and vacuum tap needle guard because of the offset between the vacuum tap and venipuncture needles.

The invention is designed to overcome eight specific objections to now commercially available vacuum devices for drawing blood specimens for laboratory analysis. The eight objections overcome by using the invention will be discussed below in the explanation of the use of the invention, with reference to FIG. 2.

(1) Vacuum devices now available do not have off-center needle attachment to facilitate low-angle vein entry. This feature is incorporated in the invention as a part of its structural design.

(2) Vacuum devices now available do not show a flash of blood when the needle enters the vein. By having control of blood flow through the device, by the thumb or finger on the tubing, the vacuum tube tap needle need not be imbedded in the rubber stopper of the vacuum tube when probing for the vein. Entry into the vein will be immediately indicated by a flash of blood at the point **20**. At this time the vacuum tube may be tapped with confidence that blood will be obtained. Part **21** is a vacuum tube guide and vacuum tap needle guard.

(3) With other vacuum blood drawing devices the vacuum tends to collapse the vein, particularly in the friable veins of aged patients, or when the blood pressure is low. Collapsed veins do not refill unless the vacuum pressure is removed with conventional devices, by removing the tube from the vacuum tap or removing the needle from the vein. With the invention the vein is allowed to refill by simply blocking the vacuum by pressure on tube **12** against surface **19**. This obviates manipulations that may be traumatic to the patient.

(4) When multiple specimens must be drawn, using several vacuum tubes, changing tubes is usually messy and/or traumatic. The invention enables the person using it to stop the flow of blood when changing tubes, eliminating messiness, by pressing the tube **12** against surface **19**, eliminating the need for any needle manipulations to stop blood flow while changing tubes.

(5) With vacuum devices now widely used, arterial taps are not practical, especially if more than one tube of blood is to be drawn, because of the spurting blood. The spurting flow can be blocked by thumb or finger pressure with the invention, without the person drawing blood being spattered with blood when changing tubes. Arterial taps are necessary, in lieu of venipunctures, with many burn victims or where venous pressure is too low.

(6) Vacuum devices with Luer needle adapters must be removed from the needle before blood can be drawn with a syringe for blood gas or pH studies and/or a second venipuncture must be done using an air tight syringe. The invention may be broken off at point **18** and nipple **17** is easily replaced in tube **12** by a syringe nipple. This eliminates the need for awkward and difficult removal of the vacuum adapter from the needle, usually requiring hemostats and two workers when attempting to draw blood with a syringe after vacuum tubes have been drawn using Luer adapters now available.

(7) Sterile Luer needle adapters must be used if fluids are to be given after blood is drawn with vacuum devices now available. With the invention, nipple **17** is replaced with the recipient set nipple after breaking the invention unit at point **18** and removing the nipple.

(8) Needles are difficult to remove from now-available adapters, but offset of drawing needle feature of invention gives leverage that makes removal of entire invention from guard **21** very easy.

These and further objects and features of the invention will become more apparent from the following description and accompanying drawings:

FIG. 1 is a perspective view of the device made in accordance with this invention, assembled upon a vacuum tube, and held in operative position by the operator;

FIG. 2 is a side elevation of the device disclosed in FIG. 1, disassembled from the vacuum tube, and with parts shown in section;

FIG. 3 is a side elevation of the device disclosed in FIG. 2, excluding the tube guide and shield guard, with the parts disassembled;

FIG. 4 is a rear end elevation of the device detached from the tube guide and needle guard;

FIG. 5 is a sectional elevation of the tube guide and needle guard;

FIG. 6 is a bottom plan view of the rigid body, with the front portion in section, to show the front needle support; and

FIG. 7 is a top plan view of the rigid body, with a portion of the front end broken away, to show the front needle support.

Referring now to the drawing:

FIG. 1 shows the device as it might be held in the right hand preparatory to entering a blood vessel, with the thumb pressing the flexible tube **12** against the control surface **19**.

FIG. 2 shows the device assembled, two times actual size, ready for use with commercially available vacuum tubes used for blood specimen collection. Part **11** is the tube tap needle which penetrates the rubber stopper of the vacuum tube to initiate suction of blood into the tube. Part **21** is a vacuum tube guide and vacuum tap needle guard that is threaded at **22** to permit attachment of it to the device by screwing it on by threads **22** at **16**.

The body of the invention and the tube guide and tap needle guard are made of milled or thermoplastically molded transparent or translucent material, such as methylmethylacrylate. Vacuum tap needle **11** and veni-

puncture needle **14** are hollow stainless steel needles. Needle **14** is a standard gauge beveled hypodermic needle. Needles **11** and **14** are cemented or molded into the device as shown in FIG. 2.

Part **17** is a molded or milled integral part of the invention in the form of a nipple of the size found on standard hypodermic syringes, and is open to needle **11**. Part **17** is connected to part **10** by a flexible tube or tubing **12** of a material such as polyvinyl. Tubing **12** is permanently sealed by heat or cement to part **10**, and fits tigh'ly over part **17**, forming an airtight connection between needles **11** and **14**.

The part indicated by **19** is a surface of a shape permitting blockage of flow of air or blood through the tube **12** by applying digital or mechanical pressure on the tube against the surface. The part indicated by **20** is the point at which blood will be initially seen, a "flash" of blood indicating entry into the blood vessel.

The part **18** is the perforated break point, at which the device may be broken. Breaking at **18** permits removal of the nipple **17** from tube **12**, while controlling blood flow by digital or mechanical pressure on tube **12** against surface **19**. This permits insertion of a syringe or intravenous set nipple into the open end of tube **12**.

Part **15** is the heel of the invention, providing structural support for the offset between needles **11** and **14**, enabling low-angle vein entry with needle **14**, and providing leverage for rapid removal of the device from part **22**.

What is claimed is:

1. A vacuum blood drawing device comprising:

(a) a rigid body having a longitudinal axis, and a front needle support and a rear needle support spaced longitudinally and transversely of each other,

(b) a projecting pressure surface on said body between said needle supports,

(c) a tap needle received in said rear support and adapted to communicate with the interior of a vacuum tube.

(d) a puncture needle received in said front support and adapted to communicate with a blood vessel,

(e) a flexible tube having front and rear ends, said front end being connected to said front support and said rear end being connected to said rear support so that said tube and said needles are in fluid communication to establish a flow path, and

(f) said tube extending across said pressure surface, so that digital pressure applied to said tube against said surface permits control of fluid flow through said tube.

2. The invention according to claim **1** further comprising transparent means for viewing a flash of blood in at least a portion of said flow path.

3. The invention according to claim **1** further comprising break-away means in said body between said needle supports whereby said body may be separated into two parts, each part carrying one of said needle supports, and at least one of said ends of said tube being detachably secured to said corresponding needle support.

References Cited

UNITED STATES PATENTS

1,124,285	1/1915	Brown	128—276
2,290,857	7/1942	Booye et al.	128—276
3,304,934	2/1967	Bautistat	128—276 XR
3,308,809	3/1967	Cohen	128—2
3,326,206	6/1967	Barr et al.	128—2

RICHARD A. GAUDET, Primary Examiner

M. F. MAJESTIC, Assistant Examiner

U.S. Cl. X.R.

128—276; 251—4