

the cannula by visualizing blood in a transparent cannula hub, under cases of low blood pressure or dehydration, there may not be sufficient quantity to reach the hub. Therefore, the need exists to visualize the blood as soon as it begins to fill the cannula.

5 SUMMARY OF THE INVENTION

The improved catheter apparatus described herein utilizes a transparent cannula which allows the user to visualize the presence of blood before it reaches the transparent hub. Also the need exists to better deploy the plunger as the ‘253 patent requires two hands to operate. The only mechanism to retract the plunger in
10 the ‘253 patent is to hold the walls of the tubular member with one hand and pull on the control knob with the other. Because many times the plunger needs to be pulled back and pushed forward numerous times in search of the vessel, the need exists for an improved device which can be operated with one hand so that the user has the other hand free to hold the patients arm or deploy the cannula into the
15 vessel. The catheter device described herein has the addition of an external flange and dual plunger paddles which allow dynamic positioning of the fingers and one handed operation. Furthermore these structures are ergonomically associated to maximize finger surface area operation. The need also exists to be able to change the orientation of the beveled needle, especially in veterinary medicine where
20 many species and many angles of approach are needed, however the ‘253 patent utilizes a notch which keeps the plunger locked in just one rotational orientation position by use of a chamber attached to a stem. However, the device described herein utilizes a continuous tubular chamber within the plunger which allows the user to rotate the control knob 360 degrees if desired. It is also the intention of the
25 present invention to have bilateral finger grips which are descending in height on the exterior surfaces of the tubular member to grip the device, as the ‘253 patent utilizes concave surfaces, and flat surfaces. The ‘253 patent also uses a chamber attached to the needle in the plunger seat. This chamber acts as a flashback chamber which is standard throughout the art. However blood within the chamber
30 is essentially inaccessible for collection and testing. The present invention utilizes a continuous tubular chamber which allows easy collection of any blood or fluid for laboratory analysis.

mammillated end 14 and a second end 16. There would be further provided a plunger assembly 20 slidable within chamber 23 within the tubular member 12, with the plunger assembly 20 having a continuous tubular chamber 22 and a vent 24 at the distal end 25 of the member 20. There is further provided, as seen in the drawings, at least a partially transparent chamber needle base 26 and a sealing member 28 on a second end 30 of the plunger assembly 20. As seen in the drawings there is included an elongated tubular needle 40 embedded within a needle base 26 and extending therefrom with the needle 40 in fluid communication with the transparent chamber 22 as seen in Figures 6A and 6B.

10 The assembly 10 further includes a catheter assembly 50, having a transparent cannula 52 and a transparent hub 54 attached to the second end 56 of the cannula 52 with the tubular needle 40 passing longitudinally through the cannula 52. Further, there is formed a fluid passage 60 formed between the needle 40 and the cannula 52 so that when the plunger 20 is retracted, a vacuum is established

15 within the fluid passage 60 and blood is drawn through the fluid passage 60 into the transparent hub 54 within the tubular member. In this manner, a user such a nurse or a medical person, can identify visually blood flow within the cannula 52 and hub 54 of the catheter assembly 10, as seen in the Figures. It should be understood, that the transparent tubular member 12 of the catheter assembly 10

20 further includes external ridges 70 for gripping the tubular member 12 at a first end and at a distal flange 17 at the second end of the member 12, as seen in Figures 1 and 2, for example. Addressing once more the transparent member 12, the plurality of lateral external ridges 70 would preferably be of descending height as seen in Figure 6A for gripping the tubular member 12 by a user. As is

25 illustrated, there is included an oval flange 17 at the distal end for allowing a user to push the flange 17 with ones thumb 100 without engaging the paddle 21, as seen in Figure 3. It should be noted that the plunger assembly 20 can be rotated in order to change the rotational orientation of the bevel needle 40 relative to the transparent tubular member 12.

30 In describing the catheter insertion assembly 10 in another manner, the transparent tubular member 12 opened at each end includes one tapered mammillated first end 14 and one flanged open second end 16. The plunger assembly 20 is slidable within the tubular member 12 and includes a distal knob end 25 at one end, with a knob 23. There is a transparent chamber and fluid

communication with the knob end 25 and a needle base 26 and a sealing member 28 at the proximal end.

There is an elongated tubular needle 40 embedded within the needle base 26 and extending therefrom with the needle 40 in fluid communication with the transparent member. As stated earlier, the catheter assembly 10 includes a cannula 52 and a hub 54 attached to the mammillated end 14 with the tubular needle 40 passing longitudinally through the cannula 52. Lastly there is a fluid passage 60 formed between the needle 40 and the cannula 52 for allowing blood flow through the fluid passage 60 into the transparent hub 54. As a vacuum is established within the fluid passage 60, when the plunger 20 is retracted into the tubular member 12, so that a user can verify that the cannula 52 has entered the blood vessel by identifying blood flow first within the transparent cannula 52 and then within the transparent hub 54 of the catheter assembly 10.

Further identifying aspects of the catheter assembly 10, it is shown that the sealing member 28 at the end of the plunger 20 would be in sliding contact with the interior wall 29 of the transparent tubular member 12. Also, the neutral position for the plunger 20 is when the needle base 26 is making contact with the mammillated end 14 as seen in Figure 5. As further illustrated in Figure 5, for example, there is provided a central opening 31 in the sealing member 28 which is in coaxial alignment with the opening in the needle 40 secured to the plunger assembly 20, which allows the needle to pass through the opening 31 into the tubular chamber 22 of plunger assembly 20.

Additionally, the displacement of the plunger 20 from the neutral position can be done by pulling on either the plunger paddle 21 or control knob 23 which retracts the tubular needle 40 into the cannula 52 and defines a void between the seal and the mammillated end 14. The void can be filled with blood or fluid in either way.

Additional features on the new and improved assembly 10 include the feature that the paddle 21 has an hour glass shape which allows a user to make contact with the oval flange 17 without the paddle 21 obstructing the contact. If the paddle were round, contacting the flange 17 could not be accomplished.

Method of the Present Invention

In describing the method of operating the assembly 10, reference is made to Figures 7 and 8, where it is noted that both the plunger paddle 21 and control knob 23 are in position with the tubular member flange 17 so as to accommodate the thumb 100 and the forefinger 102 of one hand of a user 104 to operate the plunger 20 within in the catheter assembly 10 as illustrated.

Finally, one could describe the method of using the apparatus 10 by two methods of operating the improved catheter assembly 10 utilizing one hand. In one method, as seen in Figure 4, the index finger 102 and thumb 100 on the exterior wall of tubular member 12 with a third finger 103 on the plunger paddle 21. One would then push the third finger to withdraw the plunger 20. In the alternative, the index finger 102 and thumb 100 could be placed on the external lateral finger grips 70.

In a second method of operation, as seen in Figure 3, the thumb dorsal would contact the oval tubular flange 17, the index finger ventral under the tubular member 20, and a third finger 103 ventral on the control knob 23. In operation, one would push with the thumb 100, and pull with the third finger 103 which would withdraw the plunger 20 on the catheter. The method could be described as a method for turning the plunger apparatus 20 so that the rotation orientation of the beveled needle 40 can be changed by rotating the plunger apparatus control knob 23 clockwise or counter clockwise thereby changing rotational orientation of the bevel needle 40 in relation to the tubular member 12.

Parts List

<u>Part Number</u>	<u>Description</u>
10	catheter insertion assembly
12	transparent tubular member
14	mammillated end
16	second end
17	distal flange
20	plunger
21	plunder paddle
22	tubular chamber
23	knob

9. The catheter insertion assembly according to claim 8 wherein said sealing member is in sliding contact with a circumference of the interior of said transparent tubular member.

10. The catheter insertion assembly according to claim 8 wherein displacement of said plunger assembly from said neutral position, can be done by pulling on either the finger paddle of the plunger assembly or the control knob, which retracts said tubular needle to within said cannula and defines a void between said sealing member and said mammillated end, and said void can fill with blood or fluid.

11. The catheter insertion assembly according to claim 8 wherein said continuous transparent chamber ends and is open in the control knob.

12. The catheter insertion assembly according to claim 9, wherein said continuous transparent chamber is within said plunger assembly which has at its terminal end, both the plunger assembly finger paddle and control knob, which are separated by finger grips, and wherein the both plunger finger paddle is in juxtaposition with said tubular member flanged open distal second end.

13. The catheter insertion assembly in claim 1, wherein after use of the catheter insertion assembly, the plunger assembly is retractable a sufficient distance within the transparent tubular member so that a proximal point of the tubular needle is shielded by the transparent tubular member to avoid human contact.