

rotation of the cap relative to the adaptor 133 the necessary amount to release the cap. Securement of the cap 141 to the adaptor 133 positively inhibits any rearward displacement of the bushing with respect to the cannulae 132 and 134 during venipuncture.

In the operation of the assembly 110, with the bushing 140 fully occupying the passageway 136 and with the stylet needle 152 in the fully inserted position (see, for example, corresponding structure in FIG. 1) the venipuncture is made. Note that the securement of the cap 141 with the adaptor 133 prevents the bushing 140 from being displaced rearwardly in the passageway 136 during venipuncture. After venipuncture, the bushing 140 is removed by rotating the cap 141 until the cap is disengaged from the Luer dogs 137. Preferably, the bushing 140 is removed from the passageway 136 before the needle 152 is extracted from the interior cannula 132. The reason for this preferred sequence is to utilize the stylet needle 152 to lend additional strength to the cannula 132 to counteract the resistance imposed as the bushing 140 is pulled around the cannula 132 during withdrawal. Thereafter, the stylet needle 152 is removed by axially displacing the needle through the cap 121.

Clearly, there is a closed and discrete flow channel formed by the interior cannula 132 and sleeve 119. There is a discrete and separate flow path created by the passageway 136, hollow 128 and sleeve 131.

The invention may be embodied in other specific forms without departing from its spirit or essential characteristics. The described embodiments are to be considered in all respects only as illustrative and not restrictive and the scope of the invention is, therefore, indicated by the appended claims rather than by the foregoing description. All changes which come within the meaning and range of equivalency of the claims are to be embraced within their scope.

What is claimed and desired to be secured by United States Letters Patent is:

1. A double lumen intravenous cannula assembly comprising in combination:

- an interior cannula;
- an exterior cannula surmounting the interior cannula and being spaced from at least a portion of the interior cannula to form a passageway therebetween;
- a hub mounted to said interior and exterior cannulae; and
- a removable sleeve-type bushing normally coaxially interposed in the passageway between the interior and exterior cannulae, said bushing extending through said hub and comprising an exteriorly accessible member displaceable to remove the bushing from the passageway.

2. A double lumen cannula assembly as defined in claim 1 comprising a hub having at least one branch, the interior cannula cooperating with the hub to form an axial passageway therethrough and the exterior cannula cooperating with the hub to form a passageway between the branch and the hollow of the exterior cannula.

3. A double lumen cannula assembly as defined in claim 2 wherein said bushing comprises an elongated flexible tube normally telescopically interposed between the interior and exterior cannulae and projecting through the branch of the hub, the bushing being removable from between the interior and exterior cannulae

by withdrawing the bushing through the hub branch.

4. A double lumen cannula assembly as defined in claim 1 wherein said interior cannula projects forwardly beyond the leading end of the exterior cannula and wherein said bushing is tapered at its forward end to present an exterior cannula assembly contour which facilitates venipuncture.

5. A double lumen cannula assembly as defined in claim 1 further comprising an elongated needle telescopically interposed within the interior cannula projecting beyond the leading edge thereof to facilitate venipuncture, said needle having a diametral dimension which accommodates axial withdrawal of the needle from the double lumen cannula assembly after venipuncture.

6. A double lumen cannula assembly as defined in claim 2 wherein said hub and said branch both comprise coupling sites, the coupling site on said hub comprising exclusive fluid communication with the interior cannula and said coupling site on said branch providing exclusive fluid communication with the hollow of the exterior cannula.

7. A double lumen intravenous cannula assembly comprising in combination:

- a hub having an axial bore;
- an interior hollow cannula mounted upon the hub coaxially with the axial bore of the hub;
- an exterior hollow cannula mounted upon the hub coaxially with the axial bore of the hub, the exterior hollow cannula being diametrically enlarged and circumscribing at least a portion of the interior cannula and the interior cannula projecting beyond the leading end of the exterior cannula, the exterior and interior cannulae defining a space therebetween; and
- an elongated bushing extending through said hub and normally coaxially interposed in the space between the interior and exterior cannulae, said bushing comprising a finger-accessible member exterior of said hub and displaceable away from the hub so as to remove the bushing from the space between the interior and exterior cannulae even when the cannulae are both inserted into a blood vessel.

8. A double lumen cannula comprising in combination:

- a hub having a forward end and a trailing end and a bore axially disposed therethrough, said hub further comprising at least one angularly related branch, said branch also having a bore therethrough, the trailing end of the hub and the trailing end of the branch presented thereby both comprising coupling sites;
- an exterior cannula mounted upon the hub and communicating with the hollow of the branch;
- an interior cannula mounted upon the hub so as to be in axial alignment with the axial bore of the hub, said interior cannula being telescopically interposed within the exterior cannula and spaced therefrom so as to define a passageway between the interior and exterior cannulae, said interior cannula projecting beyond the leading end of the exterior cannula;
- an elongated flexible bushing removably interposed in the passageway between the interior and exterior cannula and extending somewhat beyond the leading end of the exterior cannula, the trailing end of the bushing traversing the hollow of the hub