

WHAT IS CLAIMED IS:

1. A device for use in cardiopulmonary bypass, the device comprising a cannula configured to be positioned in at least one of a right atrium, a superior vena cava, or an inferior vena cava of a patient, the cannula having a first end, a second end, and a longitudinal axis extending between the first end and the second end, the cannula comprising:

a first section at the first end, the first section comprising an outer wall and having at least one opening therethrough;

a second section connected to the first section along the longitudinal axis, the second section comprising an outer wall and having at least one opening therethrough; and

a third section connected to the second section along the longitudinal axis on a side of the second section opposite the first section, the third section comprising an outer wall and having at least one opening therethrough;

wherein in a first configuration, the openings in each of the first section, the second section, and the third section are respectively open to inner spaces defined by the first section, the second section, and the third section;

wherein in a second configuration, the at least one opening in the second section is occluded to restrict communication with the inner space defined by the second section, while the openings in the first section and the third section remain open to the inner spaces defined by the first section and the third section, respectively; and

wherein the device further comprises a wall or tubular cover,

wherein the wall is movable relative to the second section between a first position wherein the device is in the first configuration and the at least one opening in the second section of the cannula is open, and a second position wherein the device is in the second configuration and the at least one opening in the second section of the cannula is occluded by the wall, and

wherein the tubular cover is configured to be placed around the outer wall of the second section to occlude the at least one opening in the second section when the device is in the second configuration.

2. The device of claim 1, wherein in the first configuration, the cannula is configured as a multi-stage femoral venous cannula.
3. The device of claim 1 or 2, wherein in the second configuration, the cannula is configured as a bi-caval femoral venous cannula.
4. The device of one of claims 1 to 3, wherein a material of the second section of the cannula is more rigid than a material of at least one of the first section of the cannula or the third section of the cannula.
5. The device of claim 1, wherein the wall is positioned along an inner surface of the outer wall of the second section of the cannula.
6. The device of one of claims 1 to 5, wherein the wall rotates circumferentially around the longitudinal axis to move between the first position and the second position.
7. The device of one of claims 1 to 6, wherein the wall moves laterally relative to the longitudinal axis towards either the first end or the second end of the cannula to move between the first position and the second position.
8. The device of one of claims 1 to 7, wherein the wall comprises a plurality of wall segments.
9. The device of claim 1, wherein the cannula is a multi-stage cannula.

10. The device of one of claims 1 to 9, wherein the cover is impermeable to blood.

11. The device of one of claims 1 to 10, wherein an adhesive on the cover permanently adheres the cover to the second section of the cannula when the device is in the second configuration.

12. The device of one of claims 1 to 11, wherein one cover is selected from a plurality of covers having different sizes for placement around the outer wall of the second section of the cannula when the device is in the second configuration.