

CLAIMS

1. A blood outflow cage for an intravascular blood pump assembly and sized for passage through a vascular lumen of a patient, comprising:

a distal cap with a substantially conical, substantially curved-conical, or substantially dome-shaped outer surface;

a diffuser having a substantially conical or substantially curved-conical outer surface, wherein the diffuser is disposed proximal to the distal cap; and

a peripheral wall having:

an inner surface;

an outer surface;

two or more blood exhaust openings, each blood exhaust opening being defined by two struts, wherein each strut has rounded inner and outer edges and rounded junctions with the diffuser, and wherein the proximal end of each blood exhaust opening has rounded corners; and

a first cylindrical section that abuts the proximal end of each strut.

2. The blood outflow cage of claim 1, further comprising an aperture through the diffuser and the distal cap.

3. The blood outflow cage of claim 1, wherein the peripheral wall tapers in thickness from a first thickness at the struts to a second thickness at the first cylindrical section, wherein the first thickness is greater than the second thickness.

4. The blood outflow cage of claim 1, wherein the peripheral wall further comprises a second cylindrical section that abuts the first cylindrical section, and wherein an outer diameter of the second cylindrical section is smaller than an outer diameter of the first cylindrical section.

5. The blood outflow cage of claim 1, further comprising a flexible tubular extension coupled to the distal cap.

6. The blood outflow cage of claim 5, wherein the distal end of the flexible tubular extension is curved in its relaxed state.

7. The blood outflow cage of claim 1, further comprising a fillet between an inner surface of each strut and the diffuser.

8. The blood outflow cage of claim 7, wherein the fillet has a radius of approximately 0.30 mm.

9. The blood outflow cage of claim 1, wherein the inner edges of the struts of the blood outflow cage each have a first radius between 0.07 mm and 0.21 mm, and the outer edges of the struts of the blood outflow cage each have a second radius between 0.07 mm and 0.21 mm.

10. The blood outflow cage of claim 1, wherein the blood outflow cage is manufactured from a single piece of metal or polymer.

11. A blood pump assembly sized for passage through a vascular lumen of a patient, comprising:

- a pump;

- an impeller blade rotatably coupled to the pump;

- a blood inflow cage extending about a rotation axis of the impeller blade, and having at least two blood inlet openings;

- a cannula in fluid communication with the first housing, the proximal end of the cannula being coupled to the blood inflow cage; and

- a blood outflow cage coupled to the distal end of the cannula, including:

- a distal cap with a substantially conical, substantially curved-conical, or substantially dome-shaped outer surface;

- a diffuser having a substantially conical or substantially curved-conical outer surface, wherein the diffuser is disposed proximal to the distal cap; and

- a peripheral wall having:

- an inner surface;

an outer surface;
two or more blood exhaust openings, each blood exhaust opening being defined by two struts, wherein each strut has rounded inner and outer edges and rounded junctions with the diffuser, and wherein the proximal end of each blood exhaust opening has rounded corners; and
a first cylindrical section that abuts the proximal end of each strut.

12. The blood pump assembly of claim 11, further comprising an aperture through the diffuser and the distal cap of the blood outflow cage.

13. The blood pump assembly of claim 11, wherein the peripheral wall of the blood outflow cage tapers in thickness from a first thickness at the struts to a second thickness at the first cylindrical section, wherein the first thickness is greater than the second thickness.

14. The blood pump assembly of claim 11, wherein the peripheral wall of the blood outflow cage further comprises a second cylindrical section that abuts the first cylindrical section, and wherein an outer diameter of the second cylindrical section is smaller than an outer diameter of the first cylindrical section.

15. The blood pump assembly of claim 11, further comprising a flexible tubular extension coupled to the distal cap of the blood outflow cage.

16. The blood pump assembly of claim 15, wherein the distal end of the flexible tubular extension is curved in its relaxed state.

17. The blood pump assembly of claim 11, further including a fillet between an inner surface of each strut and the diffuser of the blood outflow cage.

18. The blood pump assembly of claim 17, wherein the fillet has a radius of approximately 0.30 mm.

19. The blood pump assembly of claim 11, wherein the inner edges of the struts of the blood outflow cage each have a first radius between 0.07 mm and 0.21 mm, and the outer edges of the struts of the blood outflow cage each have a second radius between 0.07 mm and 0.21 mm.

20. The blood pump assembly of claim 1, wherein the blood outflow cage is manufactured from a single piece of metal or polymer.