What is claimed is:

1. An implantable medical device comprising

a first set of a plurality of first struts extending in a first direction; and

a second set of a plurality of second struts extending in a second direction;

wherein the first struts are interwoven with the second struts to form an annular frame that is radially compressible and expandable;

wherein each first strut:

is pivotally connected to at least one second strut, and passes radially outside of at least one second strut and radially inside of at least one second strut.

2. The medical device of claim 1, wherein each first strut comprises a plurality of projections spaced apart from each along a length of the first strut and each second strut comprises a plurality of apertures extending along a length of the second strut, and wherein the projections of the first struts extend into respective apertures of the second struts.

3. The medical device of claim 2, wherein each first strut has at least one projection that extends radially inwardly and into an aperture of an adjacent second strut and at least one projection extends radially outwardly and into an aperture of an adjacent second strut.

4. The medical device of claim 2, wherein the projections are integrally formed on the first struts.

5. The medical device of any of claims 1-4, wherein each first strut passes radially outside of at least two second struts and radially inside of at least two second struts.

6. The medical device of any of claims 1-5, further comprising a valve member comprising a plurality of leaflets mounted inside the annular frame.

7. An implantable medical device comprising:

a radially expandable and compressible annular frame comprising a plurality of interconnected struts, the plurality of struts comprising a first set of a plurality of first struts and a second set of a plurality of second struts, wherein the first struts overlap adjacent

second struts at junctions and expansion or compression of the annular frame causes the first struts to pivot relative to the second struts at the junctions;

wherein the frame comprises a plurality of hinges at the junctions extending from the first struts through corresponding non-circular apertures of the second struts at the junctions; and

wherein each hinge comprises a cylindrical pivot portion that can rotate in a corresponding aperture of a second strut and a locking member extending from the pivot portion, wherein the locking member is sized and shaped relative to the corresponding aperture of the second strut so as to prevent radial separation of the first and second struts whenever the locking member is rotationally offset from the corresponding aperture upon radial expansion and compression of the frame.

8. The medical device of claim 7, wherein the second struts are formed with recessed portions surrounding the non-circular apertures and the locking members of the hinges are disposed within the recessed portions.

9. The medical device of any of claims 7-8, further comprising one or more actuators mounted on the frame and configured to radially expand and compress the frame between a radially compressed state defining a compressed diameter and a radially expanded state defining an expanded diameter, wherein the locking members are rotationally offset from corresponding non-circular apertures in the second struts at the compressed diameter, the expanded diameter, and all diameters in between the compressed and expanded diameters.

10. The medical device of any of claims 7-9, wherein the hinges are integrally formed on the first struts.

11. The medical device of any of claims 7-9, wherein:

the hinges are separate components from the first and second struts;

each of the first struts comprises a plurality of non-circular apertures; and

each hinge extends through an aperture in a first strut and an adjacent aperture in a second strut at a junction.

12. The medical device of claim 11, wherein each of the hinges further comprises a retaining member configured to be retained within the non-circular apertures on the first struts.

13. The medical device of any of claims 11-12, wherein each of the hinges further comprises a circular base member configured to be retained within a circular recess surrounding one of the non-circular apertures on the first struts.

14. The medical device of any of claims 7-13, wherein the locking members comprise a non-circular shape.

15. The medical device of any of claims 7-14, wherein the locking members comprise a non-circular central protrusion with at least two ears extending outward therefrom in a plane parallel to the strut.

16. A method of assembling an implantable medical device, the method comprising:

providing a plurality of first struts;

providing a plurality of second struts, each second strut comprising a plurality of non-circular apertures spaced along a length thereof;

connecting the first and second struts to each other to form an annular frame by inserting hinges through the non-circular apertures of the second struts, each hinge having a cylindrical pivot portion disposed in a corresponding non-circular aperture and a locking member extending from one end of the pivot portion, wherein the locking members are rotationally aligned with corresponding non-circular apertures when the hinges are inserted into the non-circular apertures;

pivoting the first struts relative to the second struts to cause the locking members to become rotationally offset from their corresponding non-circular apertures; and

mounting one or more actuators on the frame, the one or more actuators configured to radially expand and compress the frame within a predetermined range of diameters corresponding to a predetermined range of angles between the first and second struts at which the locking members are at all times rotationally offset from the non-circular apertures.

17. The method of claim 16, wherein each first strut comprises a plurality of non-circular apertures spaced along a length thereof, and wherein connecting the first and second struts further comprises inserting the hinges through the non-circular apertures of the first struts and the second struts.

18. The method of claim 16, wherein the hinges are integral to the first struts.

19. The method of any of claims 16-18, further comprising interweaving the first struts with the second struts.