

[016a] A first aspect of the present invention provides a bioprosthetic heart valve assembly having a geometric configuration for implantation in an annulus of the native ~~heart~~ mitral valve comprising, a tubular structure having an entry opening end and an exit opening at opposite ends thereof, wherein the tubular structure is comprised of an expandable stent structure comprised of a plurality of interconnected elements having a compressed configuration and an expanded configuration and wherein a plurality of the elements are comprised of winglets that extend away from the external circumferential surface of the stent in the expanded configuration; a biocompatible material ~~covering~~ affixed to a substantial portion of an inner annular region between the entry opening and the exit opening, and a ~~valve~~ valve comprised of a plurality of leaflets capable of forming a fluid tight seal at the apposing edges thereof wherein the circumference of the plurality of leaflets together form a fluid tight seal about an interior of the valve assembly between the entry opening and the exit opening, wherein the tubular structure has a tapered diameter along a length thereof such that the entry opening has a smaller diameter than ~~and the exit opening have different diameters.~~

[017] In its simplest embodiment, generally to simplify its fabrication or manufacture, when addressing the device for use in the correction of regurgitation of the mitral valve, the device here described may consist of a circular tubular structure having an entry section or orifice at one end and one exit section or orifice. This tubular structure incorporates a plurality of surfaces of specific shapes and dimensions, made of biological membranes. These surfaces are attached within the tubular structure at one of the margins along a length thereof to create a margin of attachment that joins an arc of its periphery and maintains these surfaces within the inner sector (LUMEN) or volume of the tubular structure, while allowing other margins of

What is claimed is:

1. A bioprosthetic heart valve assembly having a geometric configuration for implantation in an annulus of the native ~~heart~~ mitral valve comprising:

- a. a tubular structure having an entry opening end and an exit opening at opposite ends thereof, wherein the tubular structure is comprised of an expandable stent structure comprised of a plurality of interconnected elements having a compressed configuration and an expanded configuration and wherein a plurality of the elements are comprised of winglets that extend away from the external circumferential surface of the stent in the expanded configuration;
- b. a biocompatible material ~~covering~~ affixed to a substantial portion of an inner annular region between the entry opening and the exit opening, and
- c. a ~~value~~ valve comprised of a plurality of leaflets capable of forming a fluid tight seal at the apposing edges thereof wherein the circumference of the plurality of leaflets together form a fluid tight seal about an interior of the valve assembly between the entry opening and the exit opening, wherein the tubular structure has a tapered diameter along a length thereof such that the entry opening has a smaller diameter than ~~and the exit opening have different diameters.~~

2. The bioprosthetic valve assembly of claim 1, wherein the plurality of circumferential ~~portion of the leaflets is~~ are sutured to the biocompatible material.

3. The bioprosthetic valve of assembly claim 1, whereas the winglets protrude from an axis parallel to the stent surface at the first end and the second end respectively ~~are disposed about an inferior outer circumferential surface of the stent member.~~

~~4.~~ The bioprosthetic valve assembly of claim 1, whereas the winglets are disposed about an superior outer circumferential surface of the stent member.

~~54.~~ The bioprosthetic valve assembly of claim 1 wherein the stent member is comprised of a plurality of vertical bars having eyelets at the end thereof.

~~65.~~ The bioprosthetic valve assembly of claim 1, further comprising a holder affixed to the stent member in the compressed configuration.

~~76.~~ The bioprosthetic valve assembly of claim ~~54~~, wherein the eyelets on reassembly engage a fixture on an interior portion of the holder.

~~87.~~ The bioprosthetic valve assembly of claim 1, wherein the expandable stent and the valve are maintained in a compressed configuration in the interior of a capsular device having a sleeve covering at least a portion of an axial length of the tubular structure.

~~98.~~ The bioprosthetic valve assembly of claim ~~87~~, wherein the capsular device is comprised of a plurality of sleeves having different diameters and disposed concentrically and at least one sleeve is concentric and slidable around another.

~~109.~~ The bioprosthetic valve assembly of claim 1, wherein the stent structure is comprised of a first ring of winglets and a second ring of winglets spaced apart to form an annular space therebetween when the stent is in the expanded configuration and sized to accommodate a native annulus of an atrioventricular heart valve.

~~110.~~ The bioprosthetic valve assembly of claim ~~109~~, wherein a most interior extension of the plurality of winglets is a rounded and atraumatic length of a memory metal.

~~1211.~~ The bioprosthetic valve assembly of claim ~~109~~, wherein ~~a distance from the ring of winglets are disposed proximate to the inferior edge of the stent~~ the gap between the first and second ring winglets is located proximately to the edge of the lower end of the stent.

~~1312.~~ The bioprosthetic valve assembly of claim 1, wherein a holder is disposed at the distal end of a catheter and the stent member is ~~releasably~~ releasably attached to a distal end of the holder and held in a configuration that is partially expanded.

~~1413.~~ The bioprosthetic valve assembly of claim ~~1312~~, wherein the exit opening of the stent member is releasably ~~releasably~~ attached to the holder ~~of the entry opening.~~

~~1514.~~ The bioprosthetic heart valve assembly of claim ~~1312~~, wherein the stent member is releasably attached to the holder ~~at the exit opening.~~