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United States Patent [19]
Jayaraman

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[45] **Date of Patent:** **Jan. 5, 1999**

[54] **STENT VALVE AND STENT GRAFT FOR PERCUTANEOUS SURGERY**

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[57] **ABSTRACT**

[21] Appl. No.: **852,240**

A star-shaped stent and replacement valve or replacement graft for use in repairing a damaged cardiac valve includes two to eight star-shaped members interconnected into a "chain". Once this "chain" has been created through interconnection of the star-shaped members, a central opening through all of the interconnected star-shaped members receives a replacement aortic valve tri-cuspid made of any suitable flexible and bio-compatible material. A catheter delivery system is used to deliver the stent with the aortic valve tri-cuspid to the desired site. The star-shaped stents are made by using a laser to cut out a plurality of flat star-shaped members with a plurality of outwardly and inwardly directed points. The outwardly directed points are bent so that they face away from a plane defined by the inwardly directed points and then a series of such stents are fastened together in a chain.

[22] Filed: **May 7, 1997**

[51] **Int. Cl.⁶** **A61F 2/06**

[52] **U.S. Cl.** **623/1**

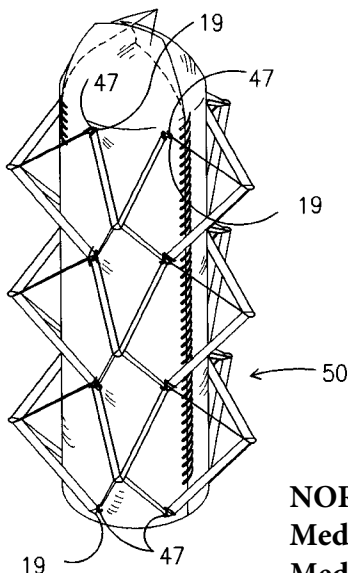
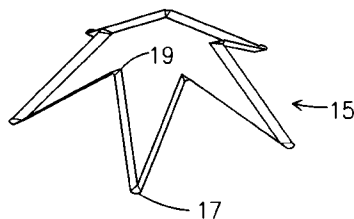
[58] **Field of Search** 623/1, 12

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27 Claims, 10 Drawing Sheets



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Medtronic, Inc., Medtronic Vascular, Inc.,
Medtronic Corevalve, LLC

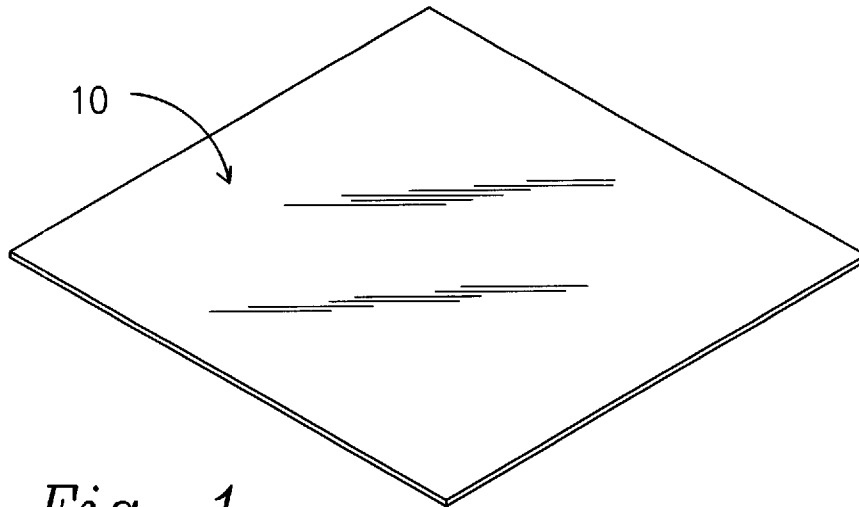


Fig. 1

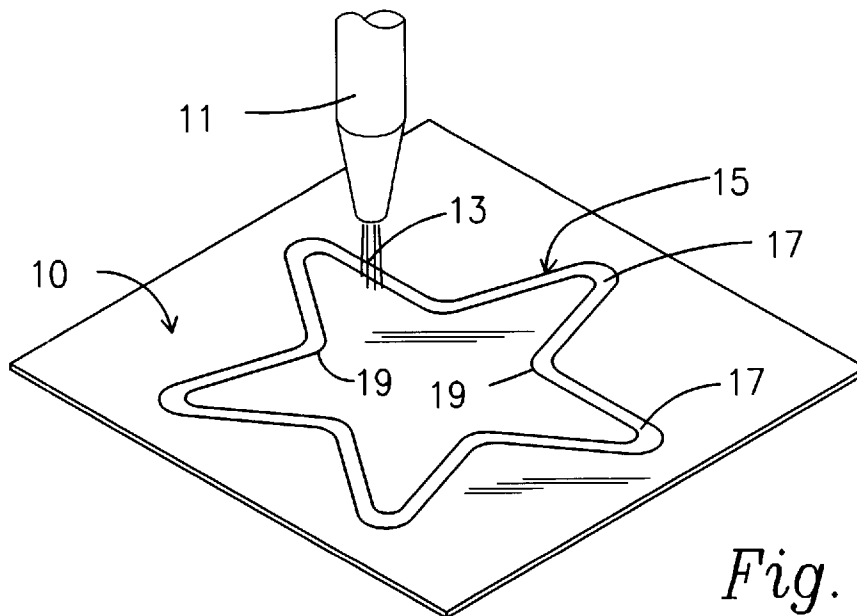


Fig. 2

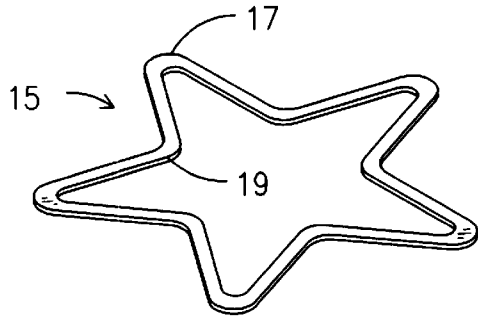


Fig. 3

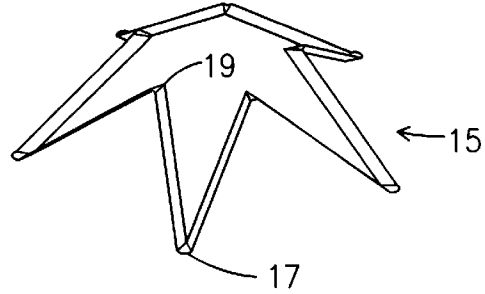


Fig. 4

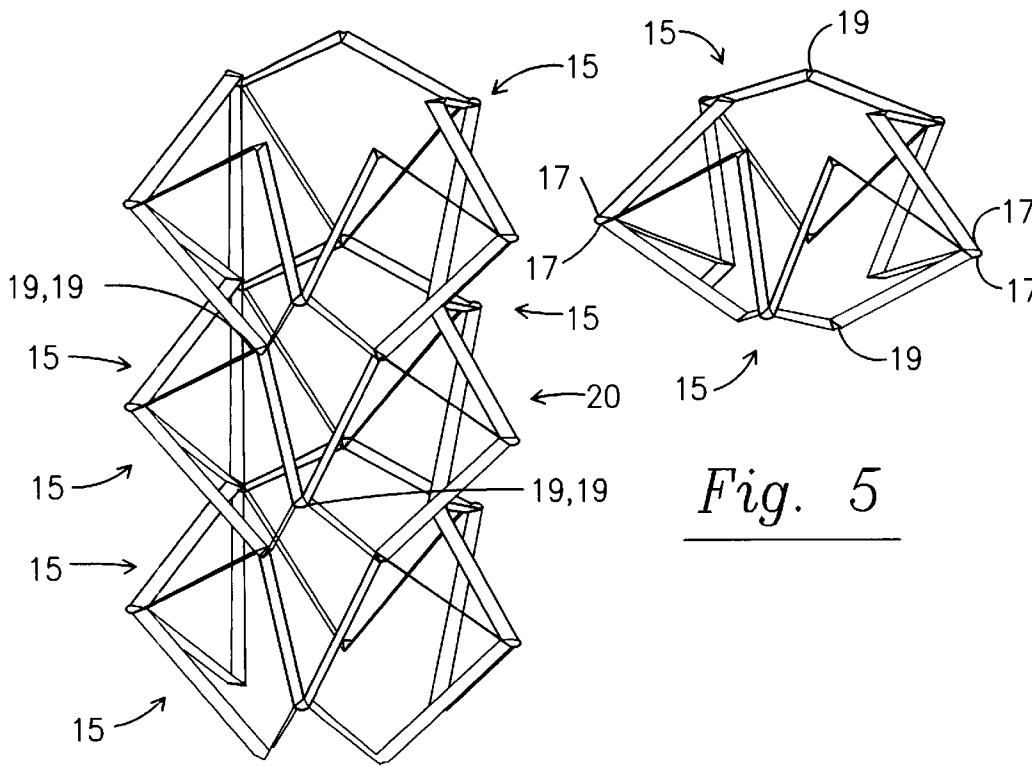


Fig. 5

Fig. 6

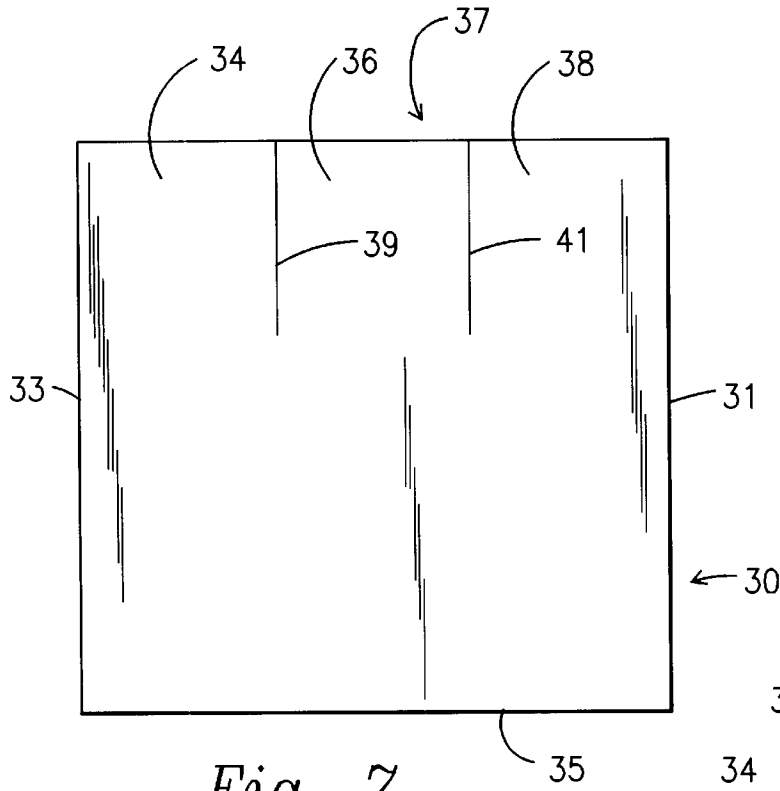


Fig. 7

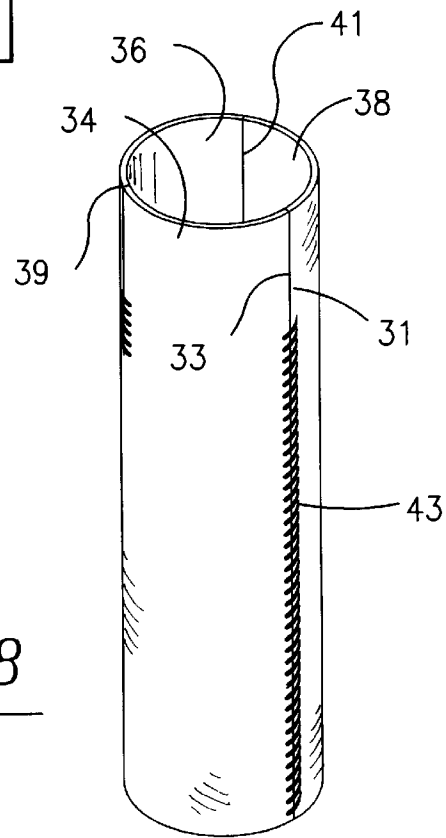


Fig. 8

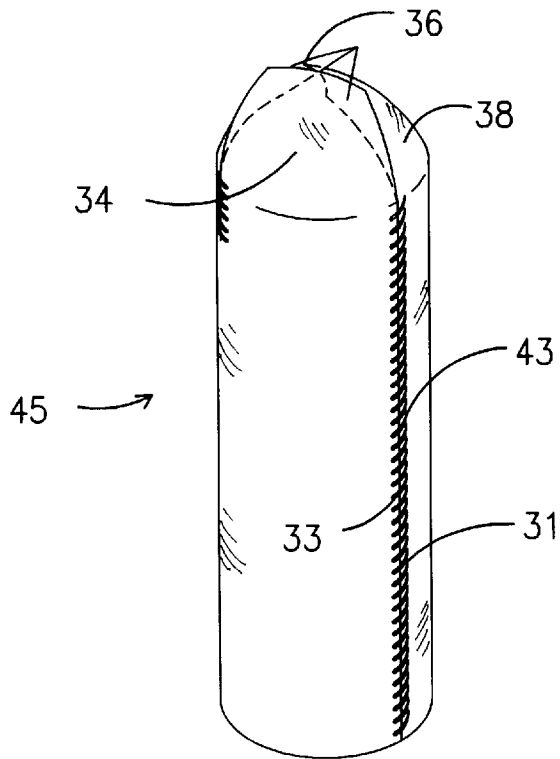


Fig. 9

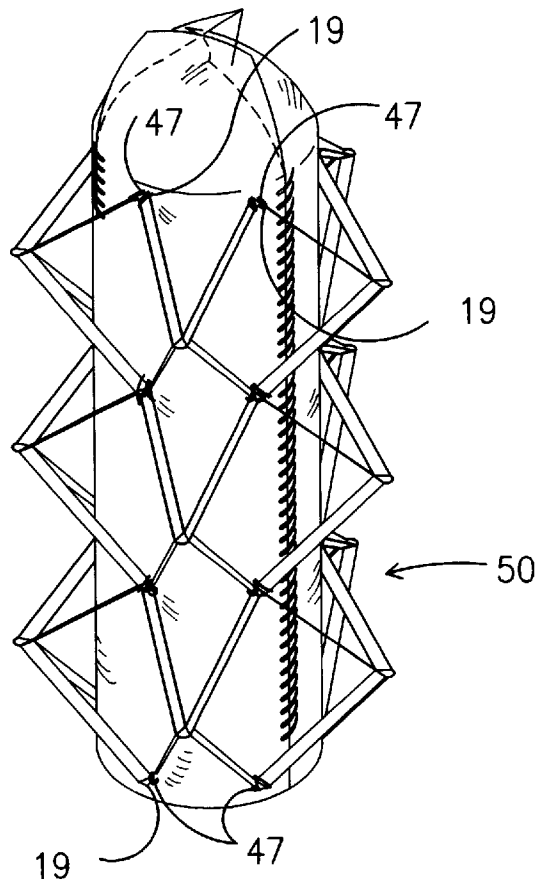


Fig. 10

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