



US005716417A

# United States Patent [19]

Girard et al.

[11] Patent Number: **5,716,417**

[45] Date of Patent: **Feb. 10, 1998**

[54] **INTEGRAL SUPPORTING STRUCTURE FOR BIOPROSTHETIC HEART VALVE**

|           |         |                      |         |
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[75] Inventors: **Michael J. Girard**, Lino Lakes; **Todd D. Campbell**, White Bear; **M. William Mirsch, II**, Roseville; **Kristen Swanson**, St. Paul, all of Minn.

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[73] Assignee: **St. Jude Medical, Inc.**, St. Paul, Minn.

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*Assistant Examiner*—Bruce E. Snow  
*Attorney, Agent, or Firm*—Hallie A. Finucane

[21] Appl. No.: **472,744**

[22] Filed: **Jun. 7, 1995**

### [57] ABSTRACT

[51] Int. Cl.<sup>6</sup> ..... **A61F 2/24**

[52] U.S. Cl. .... **623/900; 623/2**

[58] Field of Search ..... **623/900, 2, 3, 623/66**

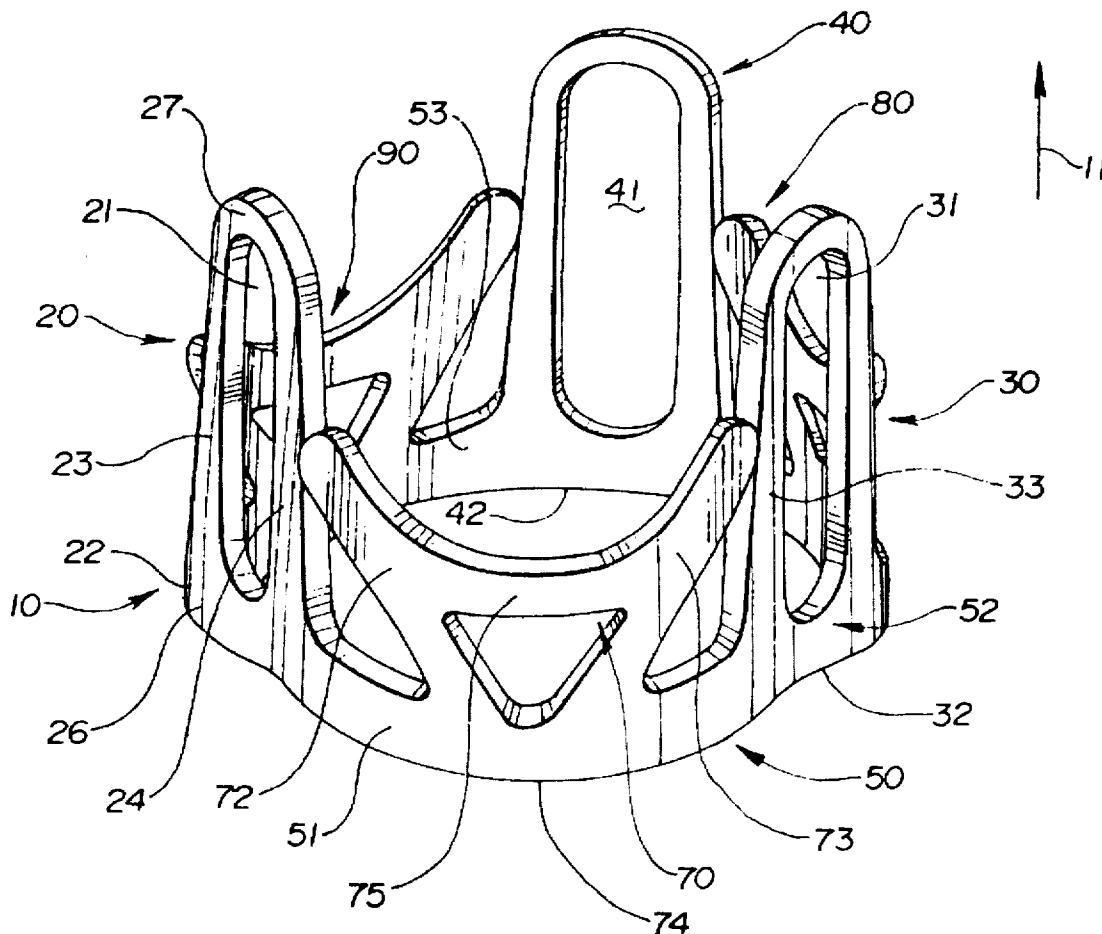
A stent for receiving and supporting a tissue heart valve for ultimate implantation into a human, the heart valve including tissue leaflets joined at circumferentially spaced commissures, wherein the stent includes at least one commissure support post and at least one sinus support structure each sinus support structure being disposed between but not functionally connected to an adjacent commissure support post.

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**3 Claims, 4 Drawing Sheets**



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Medtronic, Inc., Medtronic Vascular, Inc., &

Fig. 1

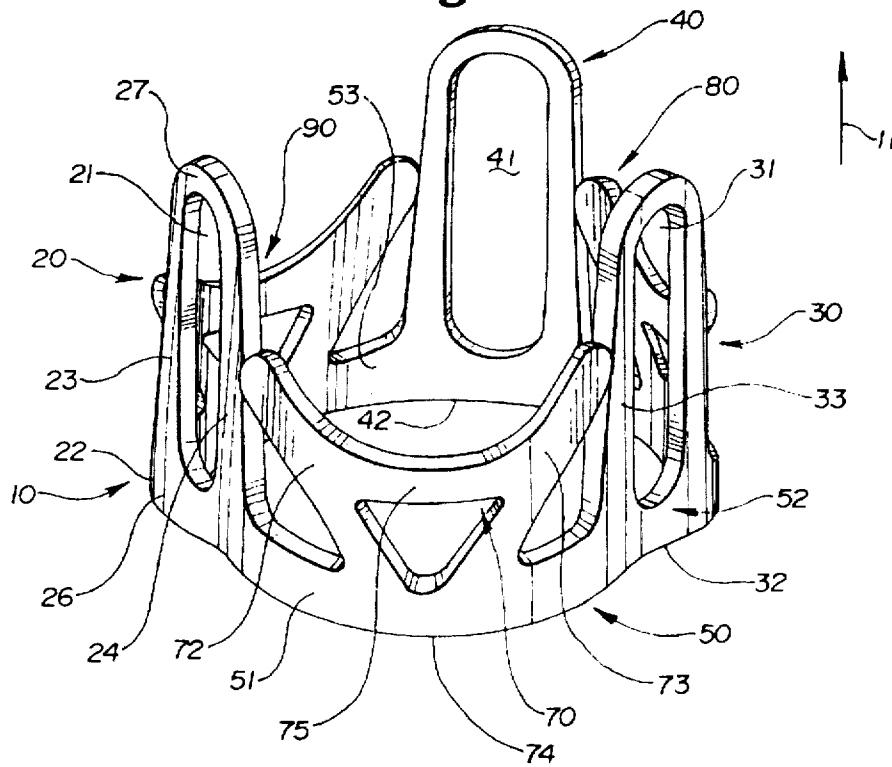
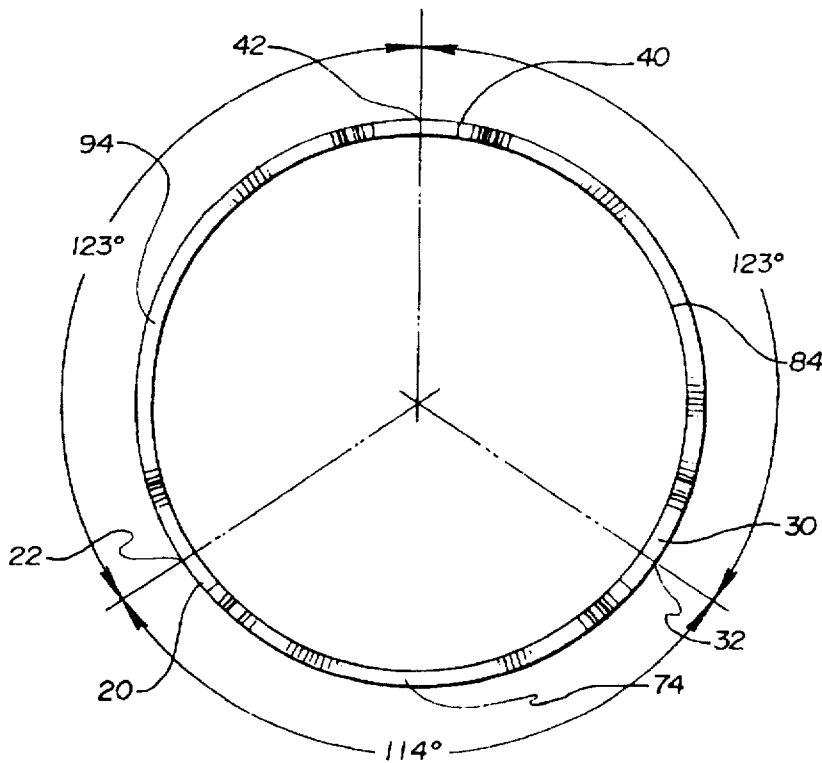
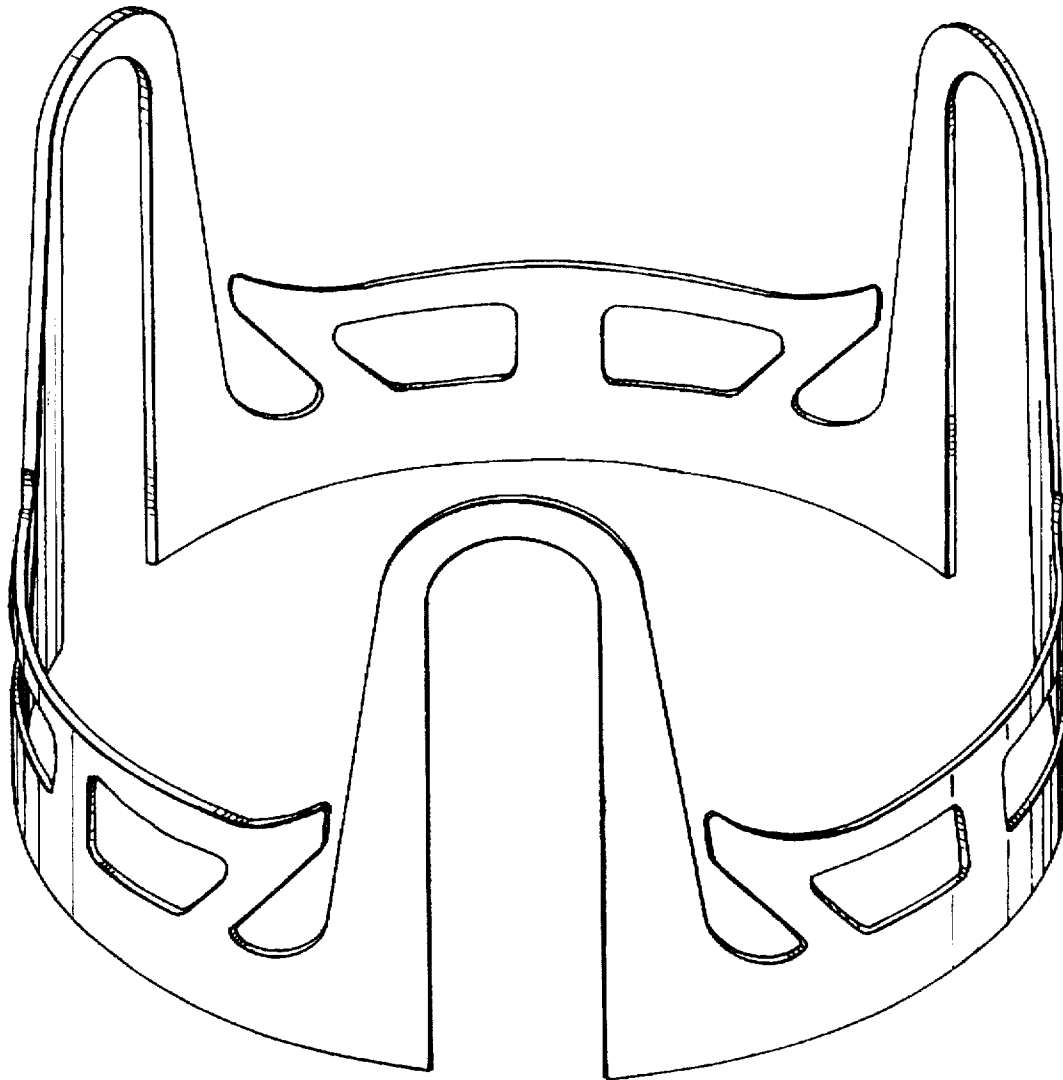


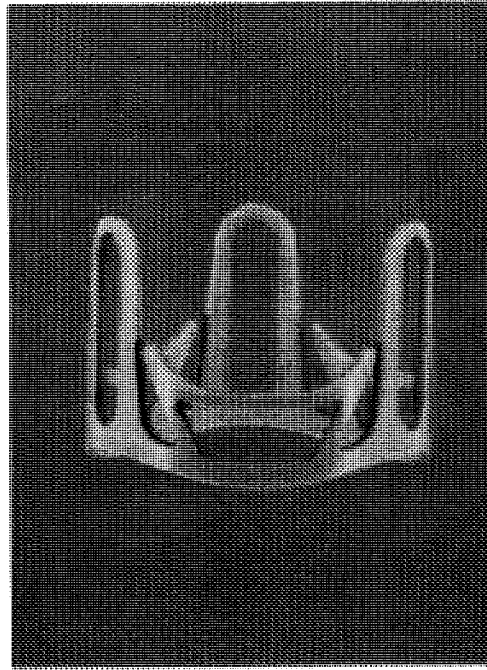
Fig. 2



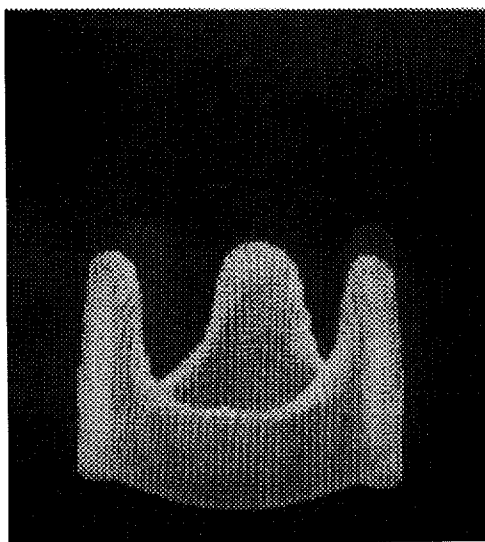
**Fig. 3**



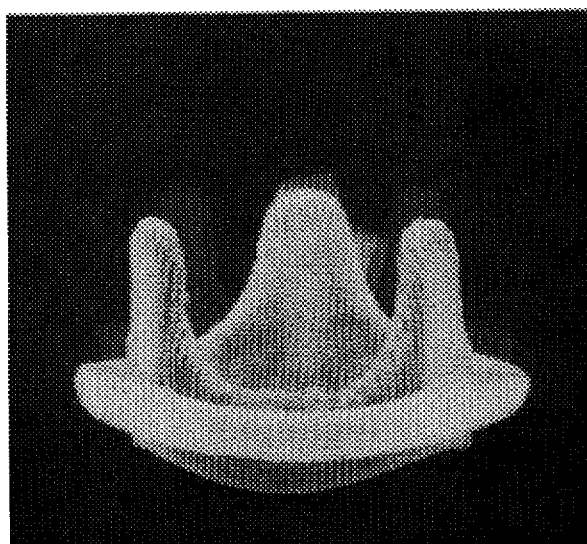
**Fig. 4**



**Fig. 5**



**Fig. 6**



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