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United States Patent [19]

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Leonhardt et al.

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- [54] **PERCUTANEOUS PLACEMENT VALVE STENT**
- [75] Inventors: **Howard J. Leonhardt; Trevor Greenan**, both of Sunrise, Fla.
- [73] Assignee: **World Medical Manufacturing Corp.**, Sunrise, Fla.
- [21] Appl. No.: **08/848,892**
- [22] Filed: **May 1, 1997**
- [51] Int. Cl.⁶ **A61M 29/00**
- [52] U.S. Cl. **606/194; 606/108; 606/195; 606/198; 623/1; 623/2; 623/12**
- [58] Field of Search **606/108, 194, 606/195, 198, 200; 623/1, 2, 12**

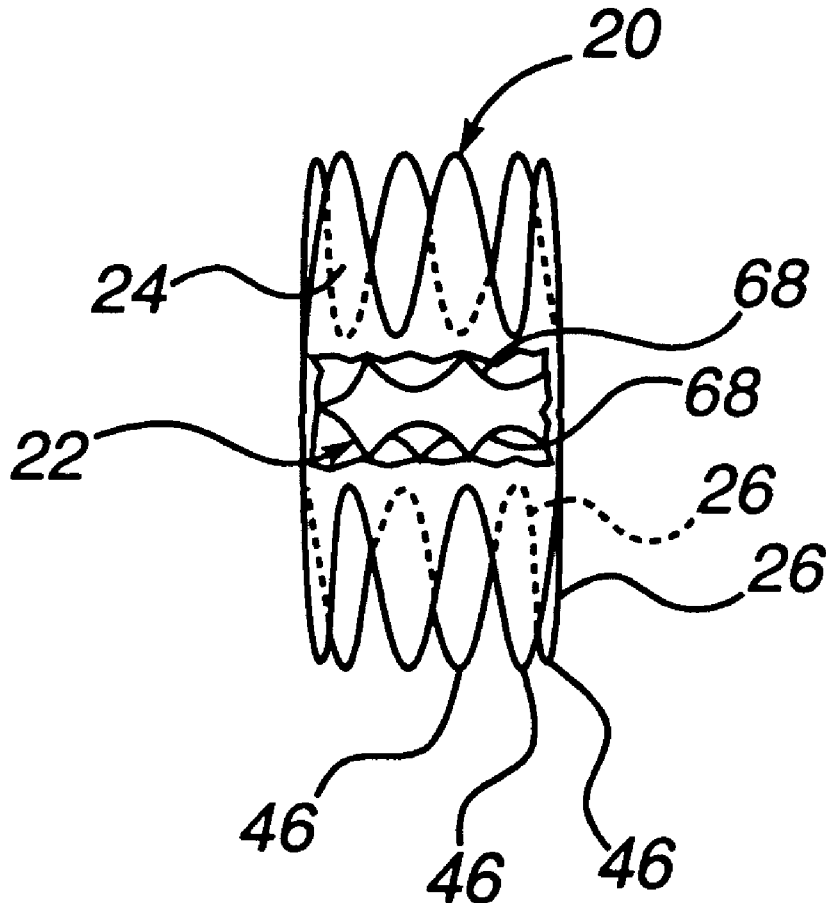
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Attorney, Agent, or Firm—Paul F. Bawel

[57] **ABSTRACT**

An artificial valve stent for maintaining patent one way flow within a biological passage is disclosed. The artificial valve includes a tubular graft having radially compressible annular spring portions for biasing proximal and distal ends of the graft into conforming fixed engagement with the interior surface of a generally tubular passage. Also disclosed is a deployment catheter including an inner catheter having a nitinol core wire, a controllable tip balloon at its the distal end for dilation and occlusion of the passage, and a controllable graft balloon in the vicinity of and proximal to the tip balloon for fixedly seating the spring portions in conformance with the interior surface of the passage. A spool apparatus for adjusting or removing an improperly placed or functioning artificial valve, and a microembolic filter tube are usable with the deployment catheter. The artificial valve may be completely sealed to the living tissue by light activated biocompatible tissue adhesive between the outside of the tubular graft and the living tissue. A method of implanting the artificial valve is also disclosed.

- [56] **References Cited**
- U.S. PATENT DOCUMENTS
- | | | | |
|-----------|---------|-------------------|---------|
| 4,733,665 | 3/1988 | Palmaz | 606/108 |
| 5,163,953 | 11/1992 | Vince | 623/2 |
| 5,411,552 | 5/1995 | Andersen et al. | 623/2 |
| 5,591,195 | 1/1997 | Taheri et al. | 606/194 |
| 5,665,103 | 9/1997 | Lafontaine et al. | 606/194 |
| 5,667,523 | 9/1997 | Bynon et al. | 606/194 |

17 Claims, 8 Drawing Sheets



Medtronic Exhibit 1006

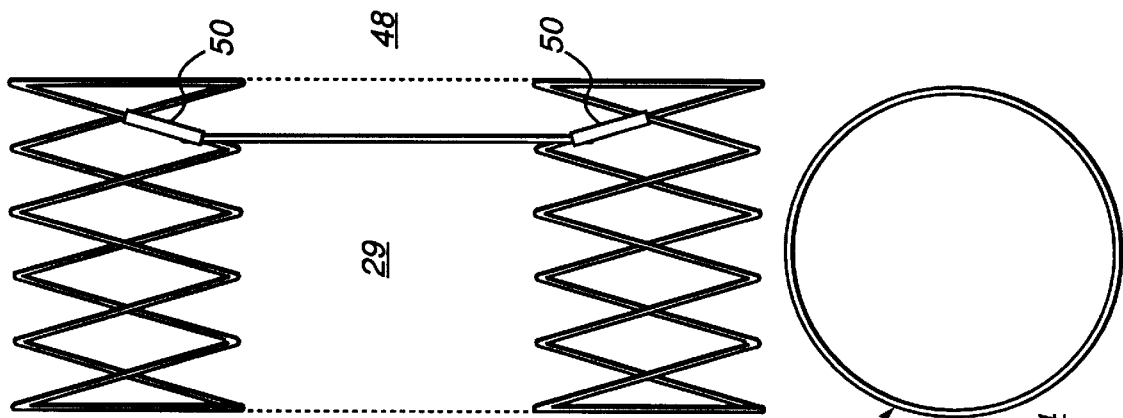


FIG. 1B

FIG. 1C

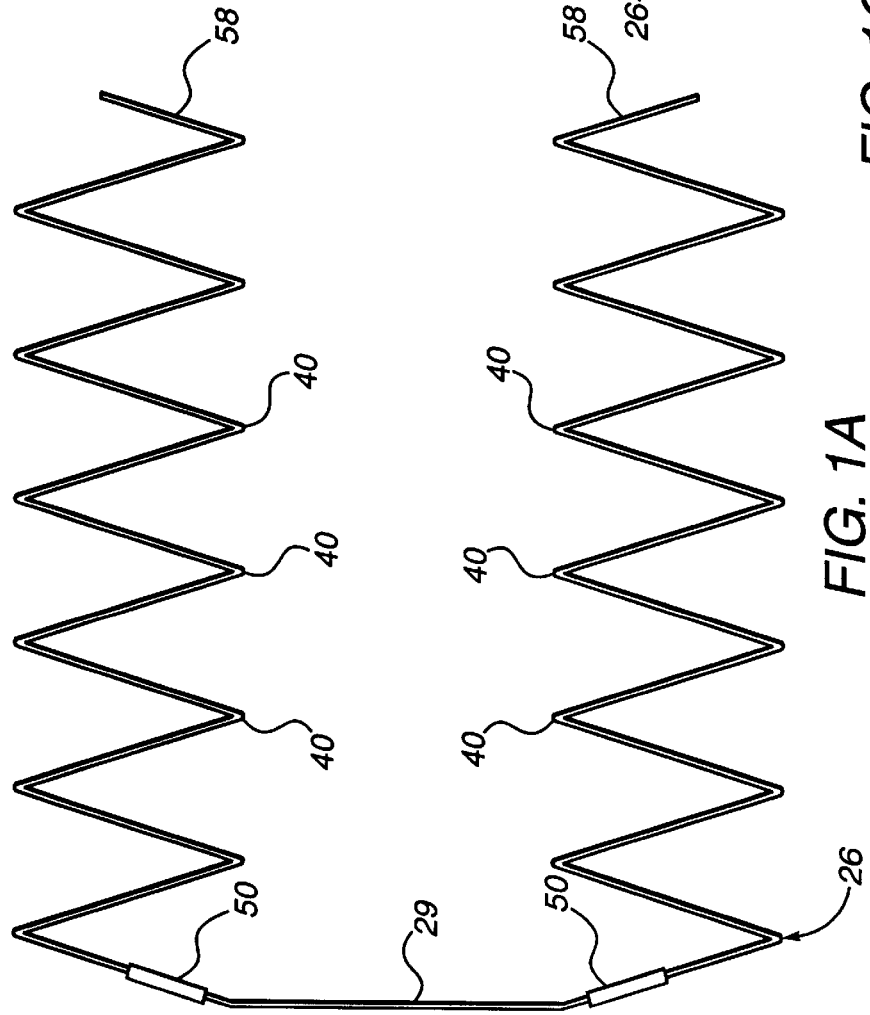


FIG. 1A

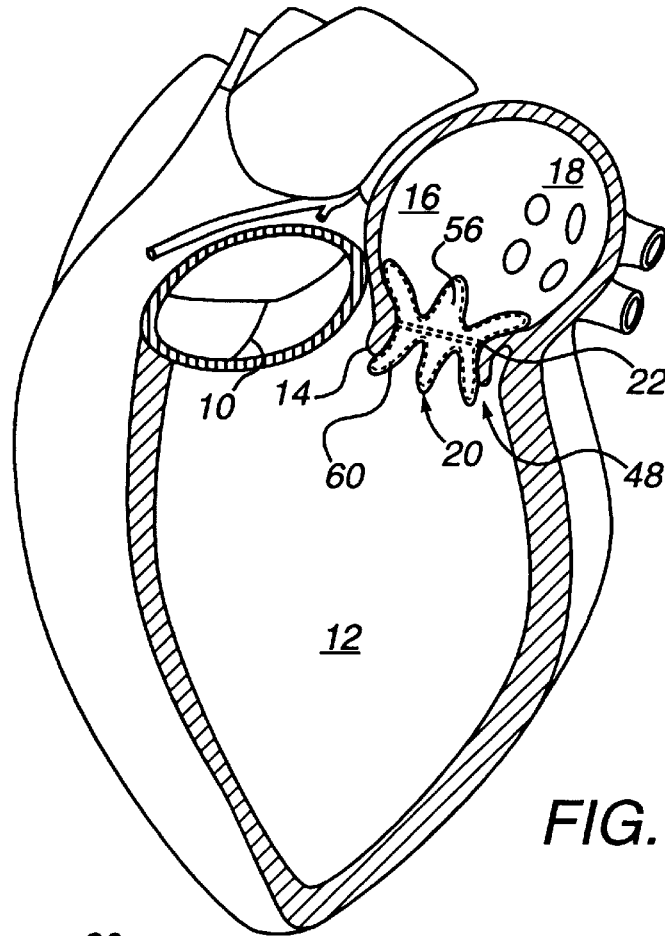


FIG. 2

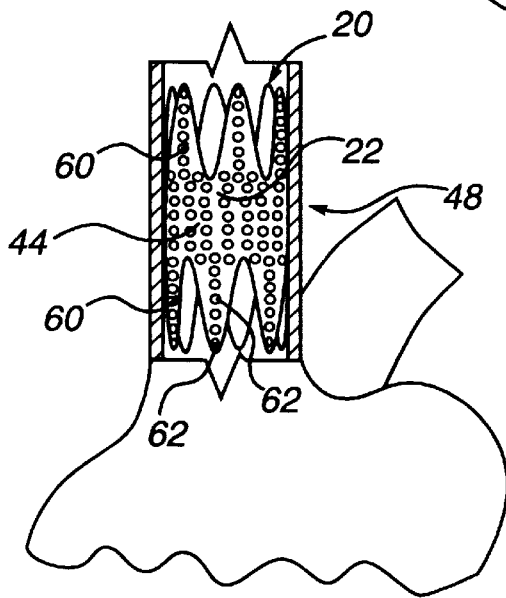


FIG. 3

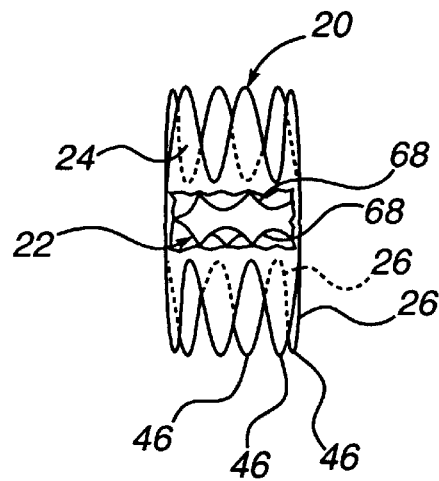


FIG. 4

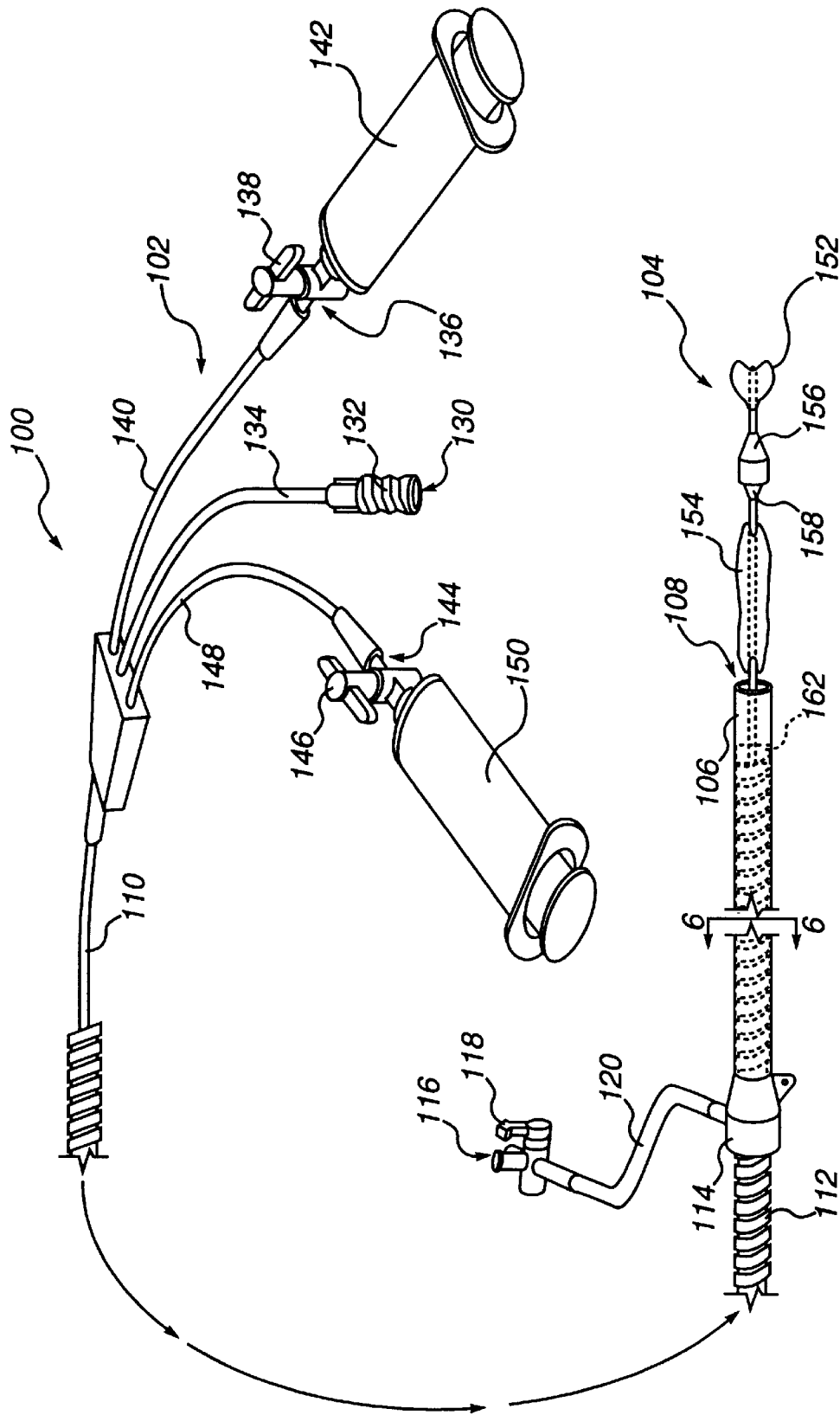


FIG. 5

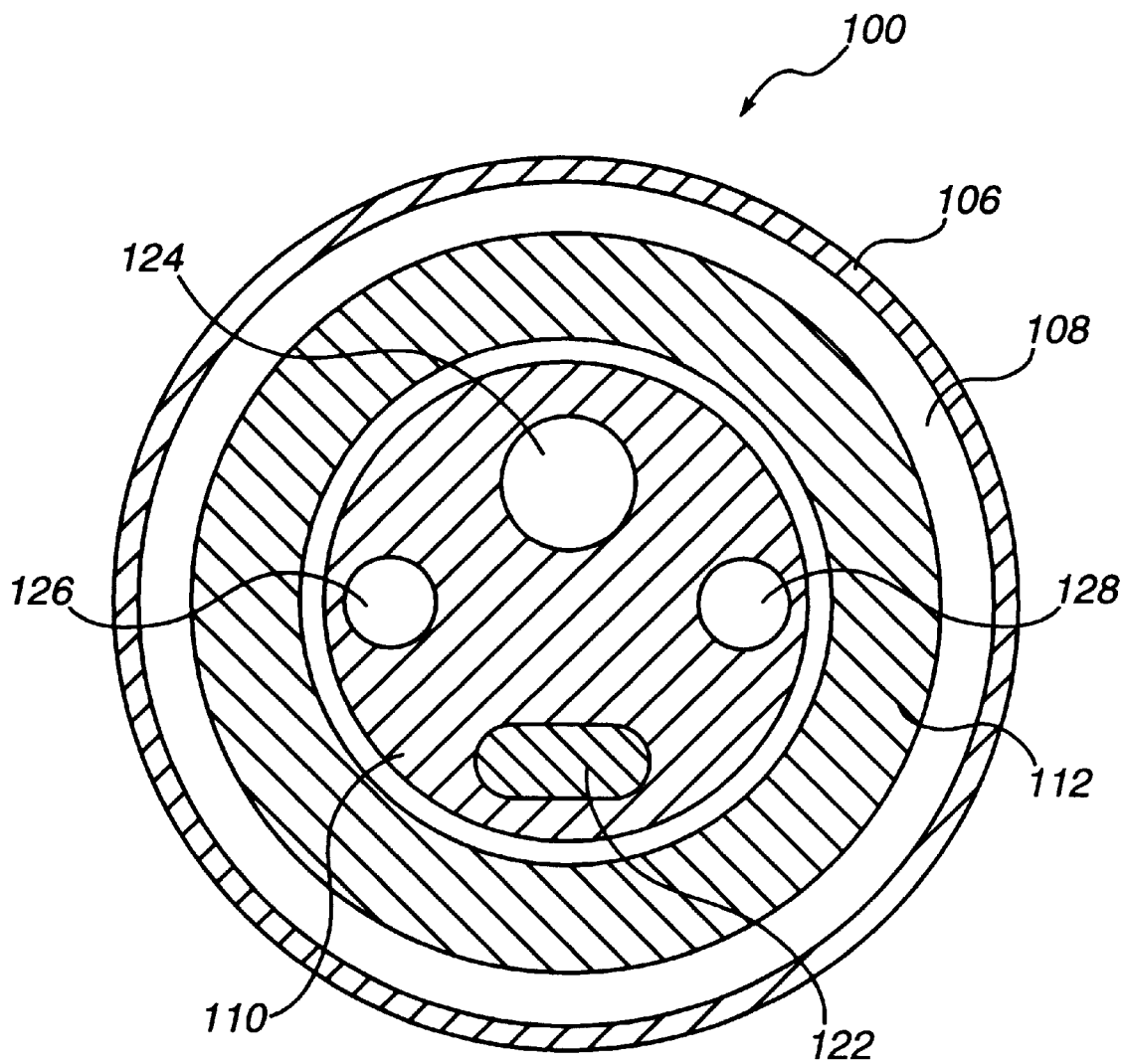


Fig. 6

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