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(21) International Application Number: PCT/US97/23103 (22) International Filing Date: 3 December 1997 (03.12.97) (30) Priority Data: 08/759,877 3 December 1996 (03.12.96) US 08/760,113 3 December 1996 (03.12.96) US 08/760,115 3 December 1996 (03.12.96) US (71) Applicant: ATRIUM MEDICAL CORPORATION [US/US]; 4 Wentworth Drive, Hudson, NH 03051 (US). (72) Inventors: KARWOSKI, Theodore; 61 Hannah Drive, Hollis, NH 03049 (US). GINGRAS, Peter; 24 Hillside Avenue, Bedford, MA 01730 (US). MARTAKOS, Paul; 7 Tina Avenue, Pelham, NH 03076 (US). HERWECK, Steve, A.; 12 Lansing Drive, Nashua, NH 03062 (US). (74) Agents: FALKOFF, Michael, I. et al.; Lahive & Cockfield, LLP, 28 State Street, Boston, MA 02109 (US).		(81) Designated States: AU, CA, JP, NZ, European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE). Published <i>With international search report.</i> <i>Before the expiration of the time limit for amending the claims</i> <i>and to be republished in the event of the receipt of amendments.</i> (88) Date of publication of the international search report: 29 July 1999 (29.07.99)
(54) Title: MULTI-STAGE PROSTHESIS (57) Abstract <p>A porous fluoropolymer article forms an artificial internal organ, for example, a vascular bypass, vascular access, or endovascular prosthesis. PTFE having a fibrous structure of nodes, and fibers connecting the nodes together forming a wall with radial zones of differing porosity in a porous tube. In one aspect an integrated intrawall (20) circumferential support adjacent to areas of variable porosity provides enhanced tunneling and cannulation. In another aspect, the wall (1, 2) of a prosthesis has a region (a, b, c) which modulates communication through the porosity of the wall. In another embodiment a two tube (14, 16) construction is cuffed, assembled into a similarly unitized, and seamless stent.</p>		

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US97/23103

A. CLASSIFICATION OF SUBJECT MATTER

IPC(6) :A61F 2/02, 2/04, 2/06; A61M 29/00

US CL :623/1, 11, 12; 606/ 191, 194, 195, 198; 600/36

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 623/1, 11, 12; 606/ 191, 194, 195, 198; 600/36

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

APS

search terms: stent, porous, membrane, PTFE, cuff, coalesce, fluoropolymer

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5,123,917 A (LEE) 23 June 1992, Figs. 1 and 4; and col. 5 lines 27-31 and 49-61.	1-10, 14-21
X	US 3,993,078 A (BERGENTZ et al) 23 November 1976, col. 4 lines 22-28, col. 6 lines 24-30, and Fig. 7.	1, 3, 4, 7-10
Y	US 4,731,073 A (ROBINSON) 15 March 1988, Figs. 4 and 10-17.	1, 2, 5, 11-13
X	US 5,354,329 A (WHALEN) 11 October 1994, Fig. 7, cols. 5 and 6.	22-37
Y	US 5,163,951 A (PINCHUK et al) 17 November 1992, entire document.	22-37

☒ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

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International application No.
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C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5,556,414 A (TURI) 17 September 1996, Figs. 19 and 20.	38-49
Y,P	US 5,591,195 A (TAHERI et al) 7 January 1997, Figs. 1 and 1A.	38-49
X,E	US 5,735,892 A (MYERS et al) 7 April 1998, entire document.	38-49