



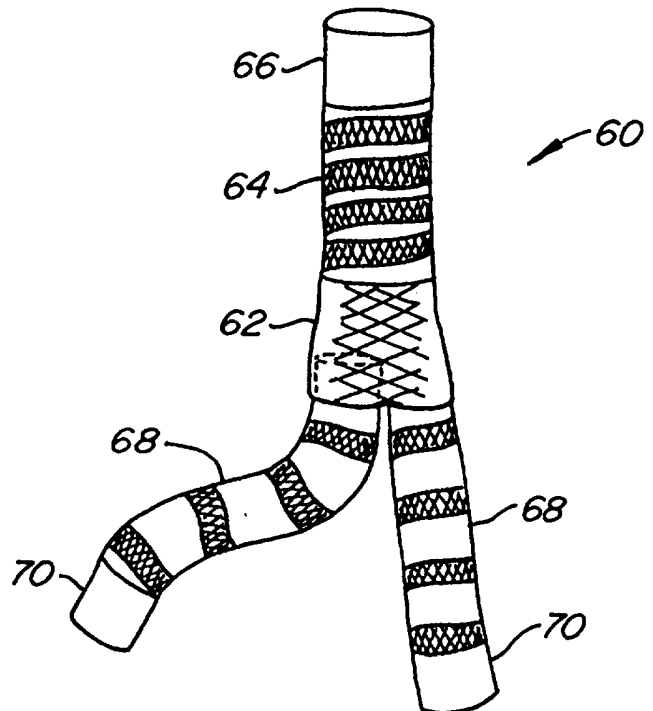
INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

<p>(51) International Patent Classification ⁶ : A61F 2/06</p>	<p>A3</p>	<p>(11) International Publication Number: WO 97/33532 (43) International Publication Date: 18 September 1997 (18.09.97)</p>
<p>(21) International Application Number: PCT/US97/03545 (22) International Filing Date: 7 March 1997 (07.03.97) (30) Priority Data: 08/615,697 13 March 1996 (13.03.96) US 60/028,928 7 October 1996 (07.10.96) US (60) Parent Application or Grant (63) Related by Continuation US 60/028,928 (CON) Filed on 7 October 1996 (07.10.96) (71) Applicant (for all designated States except US): MEDTRONIC, INC. [US/US]; 7000 Central Avenue, N.E., Minneapolis, MN 55432 (US). (72) Inventors; and (75) Inventors/Applicants (for US only): COX, Brian [US/US]; 10191 Lebanon Drive, Cupertino, CA 95104 (US). EVANS, Michael, A. [US/US]; 637 Webster Street, Palo Alto, CA 94301 (US). WILL, Allan [US/US]; 23 Belbrook Way, Atherton, CA 94027 (US). LENKER, Jay, A. [US/US]; 11195 Hooper Lane, Los Altos Hills, CA 94024 (US). FREISLINGER, Kirsten [US/US]; 1016 Henderson Avenue,</p>		<p>Menlo Park, CA 94025 (US). FOGARTY, Thomas, J. [US/US]; 3270 Alpine Road, Portola Valley, CA 94028 (US). (74) Agents: BARRISH, Mark, D. et al.; Townsend and Townsend and Crew L.L.P., 8th floor, Two Embarcadero Center, San Francisco, CA 94111-3834 (US). (81) Designated States: JP, US, 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 and to be republished in the event of the receipt of amendments.</i> (88) Date of publication of the international search report: 13 November 1997 (13.11.97)</p>

(54) Title: ENDOLUMINAL PROSTHESES AND THERAPIES FOR MULTIPLE-BRANCH BODY LUMEN SYSTEMS

(57) Abstract

In a first aspect, the present invention provides a branching intraluminal prostheses for use in a branching body lumen system that includes a trunk lumen and first and second branch lumens. The prostheses comprises a radially expandable tubular trunk portion having a prosthetic trunk lumen, and radially expandable tubular first and second branch portions with first and second prosthetic branch lumens, respectively. A radially expandable tubular lumen separation portion provides fluid communication between the prosthetic trunk lumen and the first and second prosthetic branch lumens. Surprisingly, the expanded trunk portion is preferably more axially flexible than the lumen separation portion.



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INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 97/03545

A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 A61F2/06

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)
IPC 6 A61F

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 practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 95 09586 A (EMORY UNIVERSITY) 13 April 1995 see abstract; figure 6 see page 17, line 5 - line 24	1-7,9
Y	see page 11, line 26 - page 13, line 2	8
Y	EP 0 357 003 A (CORVITA CORPORATION) 7 March 1990 see abstract; figures	8
X	WO 95 18585 A (MICROFIL INDUSTRIES) 13 July 1995	1,2
A	see page 6, line 1 - line 25; figures	9
A	EP 0 646 365 A (PARODI) 5 April 1995 see the whole document	1,2,9
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Further documents are listed in the continuation of box C.

Patent family members are listed in annex.

* Special categories of cited documents :

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- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

- *T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- *&* document member of the same patent family

Date of the actual completion of the international search 17 June 1997	Date of mailing of the international search report 30.09.97
Name and mailing address of the ISA European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+ 31-70) 340-2040, Tx. 31 651 epo nl, Fax (+ 31-70) 340-3016	Authorized officer STEENBAKKER, J

INTERNATIONAL SEARCH REPORT

International Application No
PCT/US 97/03545

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 95 23563 A (UNIVERSITE DE MONTREAL) 8 September 1995 see the whole document -----	1,2,9

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 97/03545

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. Claims Nos.: 45-56, 69-76
because they relate to subject matter not required to be searched by this Authority, namely:
Please see Rule 39.1(iv) PCT.
2. Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

PLEASE SEE ANNEX

1. As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

1-9

Remark on Protest

- The additional search fees were accompanied by the applicant's protest.
- No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

International Application No. PCT/US 97 03545

FURTHER INFORMATION CONTINUED FROM PCT/ISA210

1. Claims 1-9 : A branching endoluminal prosthesis including a trunk lumen, first and second branch lumens and a lumen separation portion. The expanded trunk portion is more axially flexible than the expanded lumen separation portion.
2. Claims 10-17 : An endoluminal prosthesis comprising a first and second prosthesis portion having a flexible joint between the first and second portions.
3. Claims 18-23,57 : An endoluminal prosthesis comprising a tubular liner provided with a helical coil supporting the liner and a method for producing such an endoluminal prosthesis.
4. Claims 24-30 : An endoluminal prosthesis comprising an expandable frame, the frame including a plurality of loops connected by deformable connector elements.
5. Claims 31-44 : A bifurcated endoluminal prosthesis having a trunk lumen, first and second branch lumens comprising a hub module and a tubular trunk module.
6. Claim 58 : A sealing structure for sealing an end of a tubular endoluminal prosthesis.
7. Claim 59 : An endoluminal prosthesis comprising a liner and a frame supporting the liner, the frame defining a plurality of loops having axially oriented apices wherein some of the adjacent apices of adjacent loops are offset.
8. Claims 60-68 : An endoluminal prosthetic system comprising a first and a second branching endoluminal prosthetic modules having a trunk lumen and first and second branch lumens.
9. Claims 77-78 : A bifurcated endoluminal prosthesis comprising a tubular liner having a trunk end and a branch end defining a first lumen and a second lumen being adjacent to each other and separated by a septum towards the trunk end from the branch end, the liner is provided with ring frames to hold the first and second ends open.

INTERNATIONAL SEARCH REPORT

Information on patent family members

Inter. Appl. No.

PCT/US 97/03545

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 9509586 A	13-04-95	AU 8012394 A	01-05-95

EP 357003 A	07-03-90	US 5019090 A	28-05-91
		CA 1328391 A	12-04-94
		DE 68924625 D	30-11-95
		DE 68924625 T	04-04-96
		JP 1858786 C	27-07-94
		JP 2068052 A	07-03-90
		US 5092877 A	03-03-92
		US 5226913 A	13-07-93

WO 9518585 A	13-07-95	FR 2714815 A	13-07-95
		EP 0688197 A	27-12-95

EP 646365 A	05-04-95	US 5578071 A	26-11-96
		AU 1661597 A	05-06-97
		AU 1661697 A	05-06-97
		AU 1661797 A	05-06-97
		AU 1661897 A	05-06-97
		AU 678511 B	29-05-97
		AU 7432894 A	13-04-95
		BR 9403662 A	27-06-95
		CA 2132815 A	02-04-95
		JP 8047503 A	20-02-96
		US 5571173 A	05-11-96
		US 5643208 A	01-07-97
		US 5591229 A	07-01-97
		ZA 9407492 A	15-05-95

WO 9523563 A	08-09-95	AU 1752195 A	18-09-95
