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(71) Applicant: **RADIOVASCULAR, INC.** [US/US]; 6132  
Western Avenue, Chevy Chase, MD 20815 (US).

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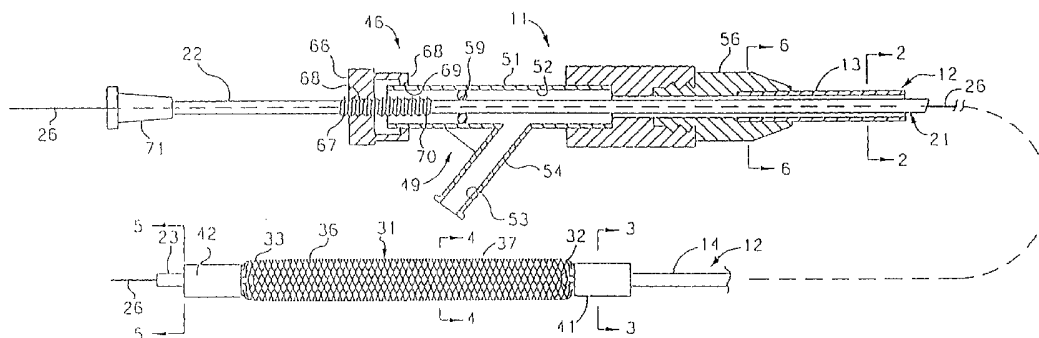
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(72) Inventors: **SEGAL, Jerome**; 6132 Western Avenue, Chevy Chase, MD 20815 (US). **HAMPIKIAN, Janet, M.**; 2389 Sagemore Hills Drive, Decatur, GA 30033 (US). **SCOTT, Neal, A.**; 1833 Kanawha Drive, Stone Mountain, GA 30087 (US).

(74) Agents: **GARRETT, Arthur, S.** et al.; Finnegan, Henderson, Farabow, Garrett & Dunner, L.L.P., 1300 I Street, N.W., Washington, DC 20005-3315 (US).

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: DEVICE FOR DILATING AND IRRADIATING A VASCULAR SEGMENT OR BODY PASSAGEWAY



(57) Abstract: The present invention is directed to a device for dilating and irradiating a vascular segment, body passageway or an obstruction in a vascular segment or body passageway. The device comprises electroless deposition, electro-deposition or ion implantation of a radioactive coating on an expansion member. The radioactive coating may be deposited such that it has a total radioactivity that varies in at least one dimension of the expansion member. The expansion member may be substantially cylindrical and/or an expandable mesh. The radioactive expansion member, which is moveable between a radially contracted configuration and a radially expanded configuration, is radially contracted and placed into a vascular segment or body passageway. After advancing the contracted expansion member to a predetermined site in the vascular segment or body passageway, the expansion member is radially expanded to dilate and irradiate the predetermined site, while allowing fluid to flow through the expansion member. The expansion member is then radially contracted and removed from the vascular segment or body passageway.

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## INTERNATIONAL SEARCH REPORT

International classification No

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## A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 A61N5/10 A61M29/00 A61M25/00 A61M25/10

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 7 A61M A61N

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)

EPO-Internal

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 6 059 752 A (SEGAL JEROME) 9 May 2000 (2000-05-09) the whole document ----	15-32
Y	WO 00 29501 A (RADIOVASCULAR SYSTEMS L L C ;UNIV EMORY (US)) 25 May 2000 (2000-05-25) cited in the application the whole document ----	15-32
A	US 5 199 939 A (DAKE MICHAEL D ET AL) 6 April 1993 (1993-04-06) cited in the application abstract ----	15-32
A	US 5 342 283 A (GOOD ROGER R) 30 August 1994 (1994-08-30) abstract ----- -/--	15-32



Further documents are listed in the continuation of box C.



Patent family members are listed in annex.

° Special categories of cited documents:

\*A\* document defining the general state of the art which is not considered to be of particular relevance

\*E\* earlier document but published on or after the international filing date

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\*P\* document published prior to the international filing date but later than the priority date claimed

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\*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.

\*&amp;\* document member of the same patent family

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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

Nielsen, M

# INTERNATIONAL SEARCH REPORT

International Application No  
PCT/US 01/47945

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<p>US 5 176 617 A (FISCHELL ROBERT E ET AL)  5 January 1993 (1993-01-05)  cited in the application  abstract</p> <p>-----</p>	15-32

## INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US 01/47945

### 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.: 1-14, 33-36  
because they relate to subject matter not required to be searched by this Authority, namely:  
Rule 39.1(iv) PCT - Method for treatment of the human or animal body by therapy
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:

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.:

#### 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

Information on patent family members

International Application No

PCT/US 01/47945

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 6059752	A	09-05-2000	US 5755708 A	26-05-1998
			US 5695469 A	09-12-1997
			US 5527282 A	18-06-1996
			AU 703089 B2	18-03-1999
			AU 4467796 A	26-06-1996
			CA 2207211 A1	13-06-1996
			EP 0843571 A1	27-05-1998
			JP 10510188 T	06-10-1998
			WO 9617645 A1	13-06-1996
WO 0029501	A	25-05-2000	AU 6495599 A	05-06-2000
			EP 1157076 A1	28-11-2001
			WO 0029501 A1	25-05-2000
			US 2002077520 A1	20-06-2002
US 5199939	A	06-04-1993	NONE	
US 5342283	A	30-08-1994	AT 177018 T	15-03-1999
			AU 8920791 A	17-03-1992
			CA 2067804 A1	14-02-1992
			DE 69130944 D1	08-04-1999
			DE 69130944 T2	01-07-1999
			EP 0500928 A1	02-09-1992
			JP 5503303 T	03-06-1993
			WO 9203179 A1	05-03-1992
			US 6099457 A	08-08-2000
US 5176617	A	05-01-1993	US 5059166 A	22-10-1991
			CA 2080876 A1	22-04-1993
			EP 0539165 A1	28-04-1993
			AT 108635 T	15-08-1994
			AT 149365 T	15-03-1997
			AU 624310 B2	04-06-1992
			AU 6795390 A	13-06-1991
			CA 2031891 A1	12-06-1991
			DE 69010864 D1	25-08-1994
			DE 69010864 T2	10-11-1994
			DE 69030118 D1	10-04-1997
			DE 69030118 T2	12-06-1997
			DK 433011 T3	31-10-1994
			EP 0433011 A1	19-06-1991
			EP 0593136 A1	20-04-1994
			ES 2058822 T3	01-11-1994
			ES 2097972 T3	16-04-1997
			JP 2803366 B2	24-09-1998
			JP 4126139 A	27-04-1992