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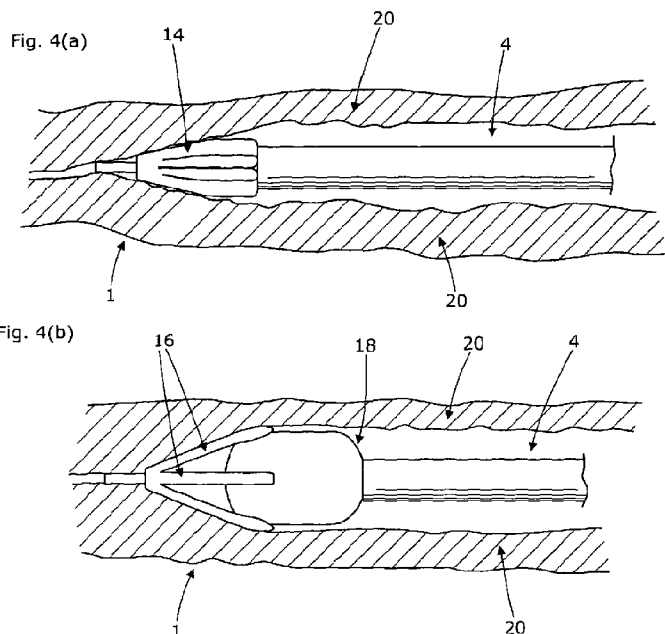
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- with international search report (Art. 21(3))
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))

[Continued on next page]

(54) Title: LUMENAL REMODELLING DEVICE AND METHODS



(57) Abstract: A device and method suitable for remodelling the internal surface of a hollow vessel at least partially occluded by a mass is provided. The device comprises an elongate body having a distal end and a proximal end, the distal end comprising a tip portion located at the distal terminus of the body, and at least one heating element located proximally to the tip portion within the distal end. The at least one heating element is configured to be greater in dimension proximally than distally and thereby tapers towards the distal end. Furthermore, the at least one heating element is arranged so that it can be deployed outwardly from the body of the device and in so doing exert an expansion force on the hollow vessel. The at least one heating element is capable of delivering sufficient energy to remodel the internal surface, and if necessary caused localised ablation, of the hollow vessel without inducing closure of the hollow vessel.

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INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER
INV. A61B18/14
ADD. A61B17/22 A61B18/18

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)
A61B

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.
X	WO 2009/121017 A1 (UNIV CALIFORNIA [US]; ANGIODYNAMICS INC [US]; RUBINSKY BORIS [IL]; MAO) 1 October 2009 (2009-10-01)	1,4-10, 27,28, 30,35-37
Y	abstract paragraphs [0008], [0016], [0084] - [0087], [0094], [0121], [0126] claim 1 figures 1-4	2,3, 14-19, 22-26, 31,33
X	US 2009/012513 A1 (UTLEY DAVID S [US] ET AL) 8 January 2009 (2009-01-08)	1,4, 9-13,29, 30,34
Y	paragraphs [0009] - [0031], [0127], [0136], [0163], [0168] figure 58B	14-19
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Further documents are listed in the continuation of Box C. See patent family 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

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"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

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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, Fax: (+31-70) 340-3016	Authorized officer Lohmann, Stefan

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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.
Y A	US 2001/001314 A1 (DAVISON PAUL O [US] ET AL) 17 May 2001 (2001-05-17) paragraphs [0114], [0139], [0149] - [0151]	2,3, 22-24 27,28
Y	----- WO 00/51511 A1 (ATRIONIX INC [US]) 8 September 2000 (2000-09-08) claims 12, 22-26 page 63, lines 6-8	31,33
X	----- US 2009/143705 A1 (DANEK CHRISTOPHER J [US] ET AL) 4 June 2009 (2009-06-04) claim 33 paragraphs [0141] - [0144], [0174], [0193]	1,10-12
X A	----- EP 1 790 305 A2 (VNUS MED TECH INC [US] TYCO HEALTHCARE [US]) 30 May 2007 (2007-05-30) paragraphs [0052], [0055] - [0059] figures	1,20,21 27,28
Y	----- WO 2005/041748 A2 (MINNOW MEDICAL LLC [US]; STEINKE TOM A [US]; STONE CORBETT W [US]; ROS) 12 May 2005 (2005-05-12) paragraph [0119] figure 31	25,26
Y A	----- EP 1 905 376 A2 (BARD INC C R [US]) 2 April 2008 (2008-04-02) paragraphs [0066] - [0069], [0166]	33 29
X	----- WO 01/22897 A1 (NOVASYS MEDICAL INC [US]) 5 April 2001 (2001-04-05) claim 15	1,32

INTERNATIONAL SEARCH REPORT

International application No.
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Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 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.: **38-48**
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 surgery
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 No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

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

see additional sheet

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 fees, this Authority did not invite payment of additional fees.
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 and, where applicable, the payment of a protest fee.
- The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/GB2010/051845

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-4, 9, 31, 34-37

A device for remodelling an internal vessel surface, comprising an elongate body having a tip and a tapering heating element for exerting an expansion force on and delivering energy to the vessel, capable of delivering said energy at a specific rate and/or for a specific time period.

2. claims: 5-8

A device for remodelling an internal vessel surface, comprising an elongate body having a tip and a tapering heating element for exerting an expansion force on and delivering energy to the vessel, said heating element being located on a bladder.

3. claims: 10-19

A device for remodelling an internal vessel surface, comprising an elongate body having a tip and a tapering heating element for exerting an expansion force on and delivering energy to the vessel, said heating element being selected from arrangements such as radiofrequency, microwaves, ultrasound, electroporation and electrical current.

4. claims: 20, 21

A device for remodelling an internal vessel surface, comprising an elongate body having a tip and a tapering heating element for exerting an expansion force on and delivering energy to the vessel, said heating element comprising an aperture.

5. claims: 22-28

A device for remodelling an internal vessel surface, comprising an elongate body having a tip and a tapering heating element for exerting an expansion force on and delivering energy to the vessel, said elongate body comprising a channel or a filter.

6. claims: 29, 30, 32, 33

A device for remodelling an internal vessel surface, comprising an elongate body having a tip and a tapering heating element for exerting an expansion force on and

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

delivering energy to the vessel, further comprising a steering member, radio-opaque material or a transmitter or being flexible.
