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(54) Title: RENAL NERVE ABLATION USING MILD FREEZING AND MICROWAVE ENERGY

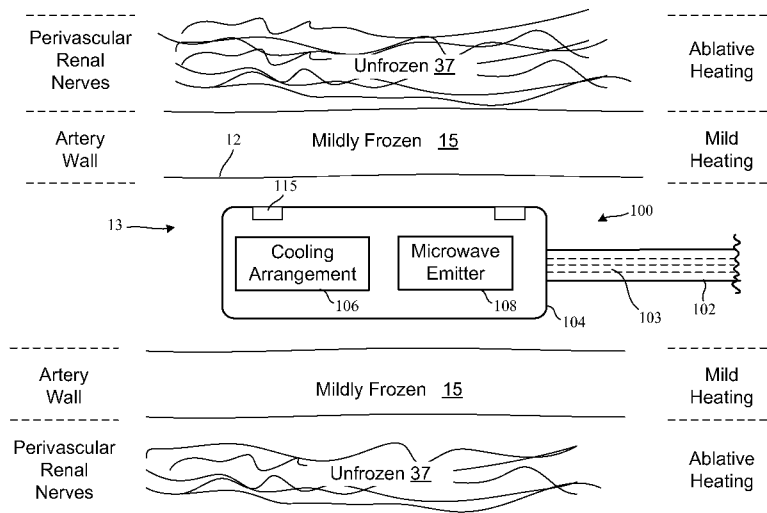
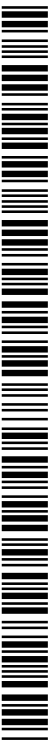


Figure 4A

(57) Abstract: A catheter arrangement includes a flexible shaft having a length sufficient to access a patient's renal artery relative to a percutaneous access location. A cooling arrangement is provided at a distal end of the shaft and dimensioned for deployment within a renal artery. The cooling arrangement is configured to freeze tissue of a wall of the renal artery while target tissue adjacent the renal artery wall including perivascular renal nerve tissue remains unfrozen. A microwave emitter is configured to propagate microwave energy through the frozen renal artery wall to heat the unfrozen target tissue to a temperature sufficient to ablate perivascular renal nerve tissue included within the target tissue with no or negligible thermal damage to at least an inner wall of the renal artery.



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# INTERNATIONAL SEARCH REPORT

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<b>A. CLASSIFICATION OF SUBJECT MATTER</b> INV. A61B18/18      A61N5/04 ADD. A61B17/00      A61B18/00      A61B18/02				
According to International Patent Classification (IPC) or to both national classification and IPC				
<b>B. FIELDS SEARCHED</b>				
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Electronic data base consulted during the international search (name of data base and, where practical, search terms used) EPO-Internal, WPI Data				
<b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>				
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.		
X	US 2009/076409 A1 (WU ANDREW [US] ET AL) 19 March 2009 (2009-03-19) paragraphs [0036] - [0037], [0040], [0056], [0065], [0067] - [0071], [0080], [0091], [0126], [0152]; figures 3B,5A-C, 6	1-3,6-8, 10-15		
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<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C. <input checked="" type="checkbox"/> See patent family annex.				
* Special categories of cited documents : <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border: none; vertical-align: top;">                     "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                 </td> <td style="width: 50%; border: none; vertical-align: top;">                     "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.                      "&amp;" document member of the same patent family                 </td> </tr> </table>			"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
"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  Link, Tatiana		

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Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
E	WO 2011/130534 A2 (BOSTON SCIENT SCIMED INC [US]; INGLE FRANK [US]; VRBA ANTHONY [US]) 20 October 2011 (2011-10-20) page 3, line 9 - page 5, line 25 page 14, line 23 - page 16, line 22 page 25, line 1 - page 26, line 9 page 43, line 20 - page 44, line 20; claim 33; figures 4A,6B,23A -----	1,2,6-8, 10-15

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Information on patent family members

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