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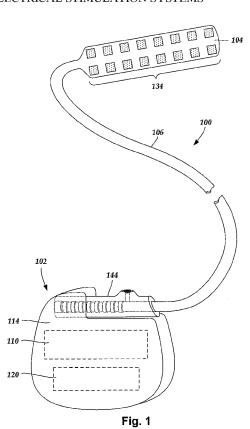
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[Continued on next page]

(54) Title: SYSTEMS, DEVICES, AND METHODS FOR ELECTRICALLY COUPLING TERMINALS TO ELECTRODES OF ELECTRICAL STIMULATION SYSTEMS



(57) Abstract: An implantable lead includes a first lead assembly with a distal tip and a medial end, a medial section with a first end and a second end, and a first intermediate assembly disposed between the first lead assembly and the first end of the medial section. The first lead assembly includes a plurality of external contacts and at least one conductive wire disposed in the first lead assembly. The at least one conductive wire extends from at least one external contact towards the medial end of the first lead assembly. The medial section includes a plurality of conductors extending from the first end to the second end. The first intermediate assembly includes a plurality of conductive elements. At least one of the conductive elements is configured and arranged to electrically couple the at least one conductive wire to at least one of the conductors.



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A. CLASSIFICATION OF SUBJECT MATTER INV. A61N1/05

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

B. FIELDS SEARCHED

 $\begin{tabular}{ll} \begin{tabular}{ll} Minimum documentation searched (classification system followed by classification symbols) \\ A61N & A61B \end{tabular}$

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	W0 03/063946 A2 (MEDTRONIC INC [US]) 7 August 2003 (2003-08-07) abstract page 7, line 27 - line 28 page 10, line 21 - page 11, line 16 figures 1,2,5-7	1-15, 17-20		
X	WO 2007/047966 A2 (SURGI VISION INC [US]; ATALAR ERGIN [TR]; ALLEN JUSTIN [US]; BOTTOMLEY) 26 April 2007 (2007-04-26) abstract paragraph [0110] - paragraph [0111] figures 14,18A	16		

X Further documents are listed in the continuation of Box C.	X See patent family annex.
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Date of the actual completion of the international search 19 February 2010	Date of mailing of the international search report $01/03/2010$
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 Marteau, Frédéric

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C(Continua	tion). DOCUMENTS CONSIDERED TO BE RELEVANT				
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.			
4	WO 2005/102447 A1 (MEDTRONIC INC [US]; WAHLSTRAND CARL D [US]; HRDLICKA ROBERT M [US]; CR) 3 November 2005 (2005-11-03) abstract paragraph [0049] figures 6-9,14	14-15, 18-20			

INTERNATIONAL SEARCH REPORT

Information on patent family members

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Patent document cited in search report		Publication date	Patent family member(s)		Publication date
WO 03063946	A2	07-08-2003	NONE	-	
WO 2007047966	A2	26-04-2007	AU CA EP US	2006304775 A1 2623453 A1 1933933 A2 2009171421 A1	26-04-2007 26-04-2007 25-06-2008 02-07-2009
WO 2005102447	A1	03-11-2005	NONE	-	