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(54) Title: FLEXIBLE CIRCUIT ELECTRODE ARRAY

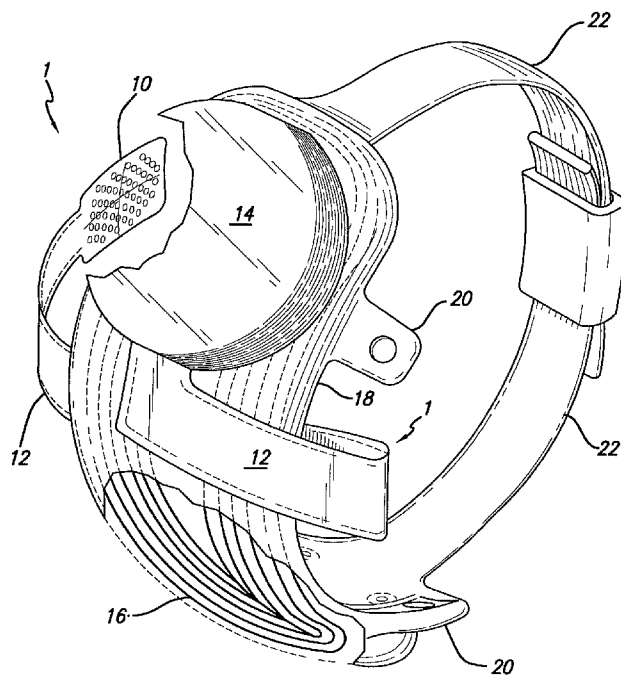


FIG. 1

(57) Abstract: A flexible circuit electrode array with more than one layer of metal traces comprising a polymer base layer, more than one layer of metal traces, separated by polymer layers, deposited on said polymer base layer, including electrodes suitable to stimulate neural tissue, and a polymer top layer deposited on said polymer base layer and said metal traces. Polymer materials are useful as electrode array bodies for neural stimulation. They are particularly useful for retinal stimulation to create artificial vision, cochlear stimulation to create artificial hearing, or cortical stimulation for many purposes. The pressure applied against the retina, or other neural tissue, by an electrode array is critical. Too little pressure causes increased electrical resistance, along with electric field dispersion. Too much pressure may block blood flow.



PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SV, SY,
TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA,
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A. CLASSIFICATION OF SUBJECT MATTER

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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)

A61N H05K

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
P, X	<p>WO 2007/035774 A (SECOND SIGHT MEDICAL PRODUCTS [US]; GREENBERG ROBERT J [US]; MCMAHON M) 29 March 2007 (2007-03-29) abstract; figures 8, 28, 41</p> <p>page 4, line 22 - page 5, line 22</p> <p>page 50, line 27 - page 51, line 4</p> <p>page 32, lines 9, 10</p> <p>page 15, line 29 - page 16, line 1</p> <p>page 8, line 6</p> <p>page 21, lines 27-30</p> <p>page 12, lines 1-11</p> <p style="text-align: center;">----- -/--</p>	<p>1-9, 12-20</p>



Further documents are listed in the continuation of Box C



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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
X	WO 2005/114720 A (CALIFORNIA INST OF TECHN [US]; UNIV SOUTHERN CALIFORNIA [US]; RODGER D) 1 December 2005 (2005-12-01) abstract paragraphs [0007], [0023] - [0029], [0036]	1,2,8,9, 12, 14-17, 19,20
Y		7,10,11, 13,18
X	----- US 2006/042830 A1 (MAGHRIBI MARIAM N [US] ET AL) 2 March 2006 (2006-03-02) abstract; figure 3 paragraphs [0010], [0011], [0020], [0040], [0041], [0052] -----	1-6,8,9
Y	WO 2004/061954 A (UNIV CALIFORNIA [US]) 22 July 2004 (2004-07-22) abstract; figure 8 paragraphs [0040], [0042] -----	7,10,11, 18
Y	US 2003/097165 A1 (KRULEVITCH PETER [US] ET AL) 22 May 2003 (2003-05-22) abstract paragraph [0105] -----	13

INTERNATIONAL SEARCH REPORT

Information on patent Family members

International application No

PCT/US2007/083523

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
wo 2007035774	A	29-03-2007	AU 2006292220 A1
		EP 1926526 A1	29-03-2007
			04-06-2008
WO 2005114720	A	01-12-2005	EP 1766672 A2
			28-03-2007
US 2006042830	A1	02-03-2006	NONE
WO 2004061954	A	22-07-2004	AU 2003294569 A1
			29-07-2004
		US 2004121528 A1	24-06-2004
		US 2004209396 A1	21-10-2004
		US 2005030698 A1	10-02-2005
US 2003097165	A1	22-05-2003	AU 2002352687 A1
			10-06-2003
		WO 03043529 A2	30-05-2003
		US 2003097166 A1	22-05-2003