



(12) **EUROPEAN PATENT APPLICATION**

(88) Date of publication A3:  
**18.09.2002 Bulletin 2002/38**

(51) Int Cl.7: **A61N 1/34**, A61N 1/372,  
A61B 5/00

(43) Date of publication A2:  
**27.02.2002 Bulletin 2002/09**

(21) Application number: **01119556.7**

(22) Date of filing: **14.08.2001**

(84) Designated Contracting States:  
**AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU  
MC NL PT SE TR**  
Designated Extension States:  
**AL LT LV MK RO SI**

(71) Applicant: **Borkan, William N.**  
**North Miami Beach, Florida 33160 (US)**

(72) Inventor: **Borkan, William N.**  
**North Miami Beach, Florida 33160 (US)**

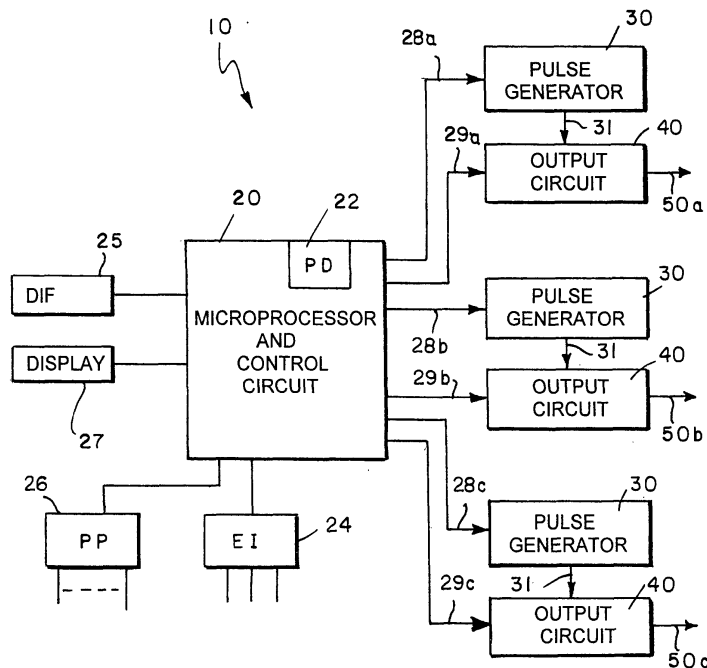
(30) Priority: **17.08.2000 US 225731 P**

(74) Representative: **Strehl Schübel-Hopf & Partner**  
**Maximilianstrasse 54**  
**80538 München (DE)**

(54) **Multichannel stimulator electronics**

(57) A tissue stimulation system includes an electrode assembly having at least three electrodes spaced to be stimulated in a patient. A programmable stimulator is connected to and provides stimulation pulses to the

electrode assembly. A programming data in the stimulator defines, for each of the at least three electrodes, individual stimulation pulses of varying polarity and at least one of amplitude, frequency, pulse width and pulse shape.



*FIG. 1*



European Patent  
Office

EUROPEAN SEARCH REPORT

Application Number  
EP 01 11 9556

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	US 5 895 416 A (BARRERAS SR FRANCISCO J ET AL) 20 April 1999 (1999-04-20)	1-8,15	A61N1/34 A61N1/372 A61B5/00
Y	* column 1 - column 10 * ---	11	
X	US 5 913 882 A (KING GARY WILLIAM) 22 June 1999 (1999-06-22)	1,15,16,18	
Y	* column 1 - column 6 * ---	17,19-21	
X	US 5 649 970 A (LOEB GERALD E ET AL) 22 July 1997 (1997-07-22)	9,10,12-14	
Y	* column 1 - column 13 * ---	11,19	
Y	US 4 935 345 A (GUILBEAU ERIC J ET AL) 19 June 1990 (1990-06-19)	17	TECHNICAL FIELDS SEARCHED (Int.Cl.7)  A61N A61B
Y	* column 1 - column 4 * ---		
Y	US 6 052 624 A (MANN CARLA M) 18 April 2000 (2000-04-18)	20,21	
Y	* column 1 - column 5 * ---		
D,A	US 4 459 989 A (BORKAN WILLIAM N) 17 July 1984 (1984-07-17)	1-35	
D,A	* the whole document * ---		
D,A	US 3 449 768 A (DOYLE JAMES H) 17 June 1969 (1969-06-17)	1-35	
D,A	* the whole document * ---		
D,A	US 3 727 616 A (LENZKES H) 17 April 1973 (1973-04-17)	1-35	
D,A	* the whole document * ---		
D,A	US 4 612 934 A (BORKAN WILLIAM N) 23 September 1986 (1986-09-23)	1-35	
D,A	* the whole document * -----		
The present search report has been drawn up for all claims			
Place of search <b>MUNICH</b>		Date of completion of the search <b>9 July 2002</b>	Examiner <b>Kurze, V</b>
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

EPO FORM 1503 03 82 (P04001)

**ANNEX TO THE EUROPEAN SEARCH REPORT  
ON EUROPEAN PATENT APPLICATION NO.**

EP 01 11 9556

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on  
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

09-07-2002

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5895416	A	20-04-1999	NONE
US 5913882	A	22-06-1999	US 5814092 A 29-09-1998 US 5702429 A 30-12-1997
US 5649970	A	22-07-1997	NONE
US 4935345	A	19-06-1990	NONE
US 6052624	A	18-04-2000	US 6393325 B1 21-05-2002
US 4459989	A	17-07-1984	CA 1259664 A1 19-09-1989 DE 3274804 D1 05-02-1987 EP 0072611 A1 23-02-1983 US 4612934 A 23-09-1986 US 4793353 A 27-12-1988
US 3449768	A	17-06-1969	NONE
US 3727616	A	17-04-1973	NONE
US 4612934	A	23-09-1986	US 4459989 A 17-07-1984 CA 1259664 A1 19-09-1989 DE 3274804 D1 05-02-1987 EP 0072611 A1 23-02-1983 US 4793353 A 27-12-1988

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

专利名称(译)	多通道刺激器电子设备		
公开(公告)号	<a href="#">EP1181949A3</a>	公开(公告)日	2002-09-18
申请号	EP2001119556	申请日	2001-08-14
[标]申请(专利权)人(译)	BORKAN WILLIAMñ		
申请(专利权)人(译)	BORKAN , WILLIAM N.		
当前申请(专利权)人(译)	BORKAN , WILLIAM N.		
[标]发明人	BORKAN WILLIAM N		
发明人	BORKAN, WILLIAM N.		
IPC分类号	A61N1/05 A61N1/08 A61N1/34 A61N1/372 A61B5/00		
CPC分类号	A61N1/056 A61N1/36003 A61N1/36067 A61N1/36135 A61N1/36185		
优先权	60/225731 2000-08-17 US		
其他公开文献	EP1181949B1 EP1181949A2		
外部链接	<a href="#">Espacenet</a>		

摘要(译)

组织刺激系统包括电极组件，该电极组件具有间隔开的至少三个电极以在患者体内受到刺激。可编程刺激器连接到电极组件并向电极组件提供刺激脉冲。刺激器中的编程数据为至少三个电极中的每一个定义具有变化极性和幅度，频率，脉冲宽度和脉冲形状中的至少一个的各个刺激脉冲。

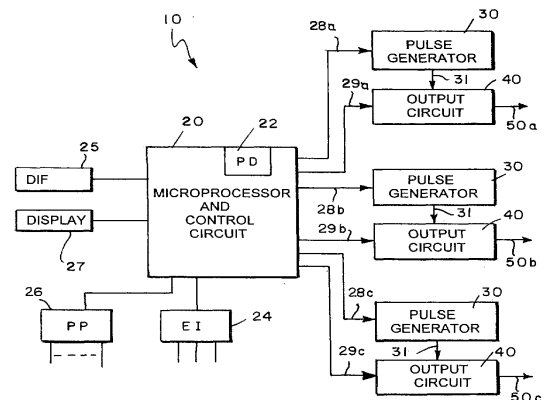


FIG. 1