

(19) World Intellectual Property Organization  
International Bureau



(43) International Publication Date  
14 March 2002 (14.03.2002)

PCT

(10) International Publication Number  
WO 02/19906 A3

(51) International Patent Classification<sup>7</sup>: A61B 5/107, 5/05

(72) Inventor; and

(21) International Application Number: PCT/EP01/10392

(75) Inventor/Applicant (for US only): DIAMANTOPOULOS, Leonidas [BE/BE]; Axxes Business Park, Gulden-sporenpark 32, B-9820 Merelbeke (BE).

(22) International Filing Date:  
7 September 2001 (07.09.2001)

(74) Agent: GILL JENNINGS & EVERY; Broadgate House, 7 Eldon Street, London EC2M 7LH (GB).

(25) Filing Language: English

(81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.

(26) Publication Language: English

(30) Priority Data:  
00870197.1 8 September 2000 (08.09.2000) EP

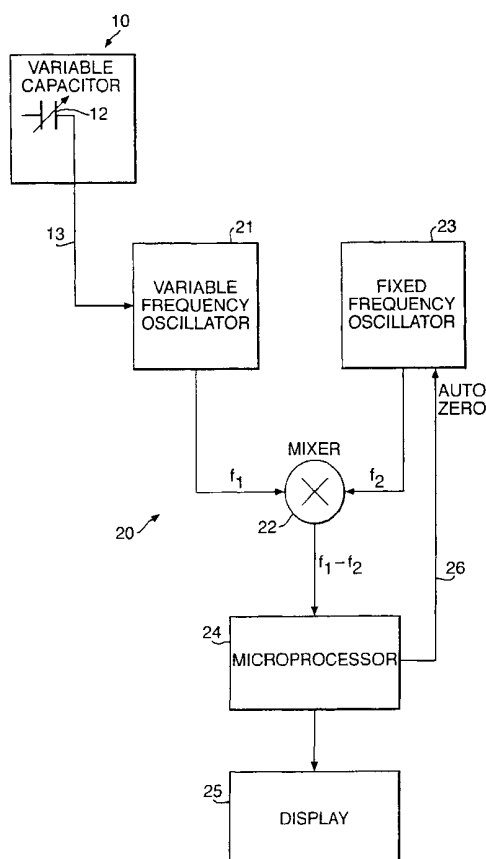
(71) Applicant (for all designated States except US): NV THERMOCORE MEDICAL SYSTEMS S.A. [BE/BE]; Axxes Business Park, Gulden-sporenpark 32, B-9820 Merelbeke (BE).

(84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian

[Continued on next page]

(54) Title: A CATHETER

(57) Abstract: In a present invention the physiology of a vessel wall is investigated using the frequency shifting of an oscillator (21) due to capacitance variations of a capacitor formed between a metallic plate (12) carried by a catheter (10) and an adjacent section of the vessel wall in which the catheter (10) is inserted. Changes in capacitance presented by this variable are detected by the frequency shifting of an associated variable frequency oscillator (21) which is mixed with the output of a fixed frequency oscillator (23).



WO 02/19906 A3



patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

**Published:**

- *with international search report*
- *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*

**(88) Date of publication of the international search report:**

6 June 2002

*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

**INTERNATIONAL SEARCH REPORT**

International Application No

PCT/EP 01/10392

**A. CLASSIFICATION OF SUBJECT MATTER**  
 IPC 7 A61B5/107 A61B5/05

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)  
 IPC 7 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	US 5 800 443 A (SHAH) 1 September 1998 (1998-09-01)	1,2,4,5
Y	column 8, line 45 -column 9, line 28; figures 1-9	6-8
A		3
Y	WO 90 00030 A (KOCH ELEKTRONIK + APPARATEBAU AG) 11 January 1990 (1990-01-11) abstract; figure 3	6-8
X	WO 97 45157 A (ADVANCED CORONARY INTERVENTION) 4 December 1997 (1997-12-04) page 32, line 14 -page 36, line 11; figures 1-30	1
	-/--	

Further documents are listed in the continuation of box C.

Patent family members are listed in 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

Date of the actual completion of the international search

5 April 2002

Date of mailing of the international search report

11/04/2002

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2  
 NL - 2280 HV Rijswijk  
 Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,  
 Fax: (+31-70) 340-3016

Authorized officer

Hunt, B

## INTERNATIONAL SEARCH REPORT

International Application No

PCT/EP 01/10392

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 665 103 A (LAFONTAINE ET AL.) 9 September 1997 (1997-09-09) column 7, line 53 -column 8, line 40; figures 1-7 ---	1
A	WO 98 35611 A (TECHNION RESEARCH AND DEVELOPMENT FOUNDATION LTD.) 20 August 1998 (1998-08-20) the whole document ---	1
A	WO 96 12439 A (TRANSSCAN RESEARCH & DEVELOPMENT CO. LTD.) 2 May 1996 (1996-05-02) the whole document ---	1
A	US 4 852 580 A (WOOD) 1 August 1989 (1989-08-01) the whole document ---	1
A	US 5 553 611 A (BUDD ET AL.) 10 September 1996 (1996-09-10) the whole document ---	1
A	US 5 063 937 A (EZENWA ET AL.) 12 November 1991 (1991-11-12) the whole document ---	1
A	US 5 447 529 A (MARCHLINSKI ET AL.) 5 September 1995 (1995-09-05) the whole document -----	1

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/EP 01/10392

Patent document cited in search report	A	Publication date	Patent family member(s)	Publication date
US 5800443	A	01-09-1998	EP 1011565 A1 JP 2002503120 T WO 9843565 A1	28-06-2000 29-01-2002 08-10-1998
WO 9000030	A	11-01-1990	AU 3696389 A WO 9000030 A1 EP 0382802 A1	23-01-1990 11-01-1990 22-08-1990
WO 9745157	A	04-12-1997	US 5749914 A AU 1077197 A EP 0904126 A1 JP 2001510354 T WO 9745157 A1	12-05-1998 05-01-1998 31-03-1999 31-07-2001 04-12-1997
US 5665103	A	09-09-1997	EP 0886500 A1 WO 9732545 A1	30-12-1998 12-09-1997
WO 9835611	A	20-08-1998	AU 5877098 A WO 9835611 A1	08-09-1998 20-08-1998
WO 9612439	A	02-05-1996	AU 705041 B2 AU 2591095 A CA 2203405 A1 CN 1166779 A EP 0788329 A1 HU 77227 A2 JP 10512462 T NZ 287251 A WO 9612439 A1 US 6055452 A US 6308097 B1 US 5810742 A US 2002026123 A1	13-05-1999 15-05-1996 02-05-1996 03-12-1997 13-08-1997 02-03-1998 02-12-1998 24-09-1998 02-05-1996 25-04-2000 23-10-2001 22-09-1998 28-02-2002
US 4852580	A	01-08-1989	NONE	
US 5553611	A	10-09-1996	NONE	
US 5063937	A	12-11-1991	NONE	
US 5447529	A	05-09-1995	AU 1435895 A CA 2179058 A1 WO 9520361 A1 US 5562721 A US 5673704 A	15-08-1995 03-08-1995 03-08-1995 08-10-1996 07-10-1997