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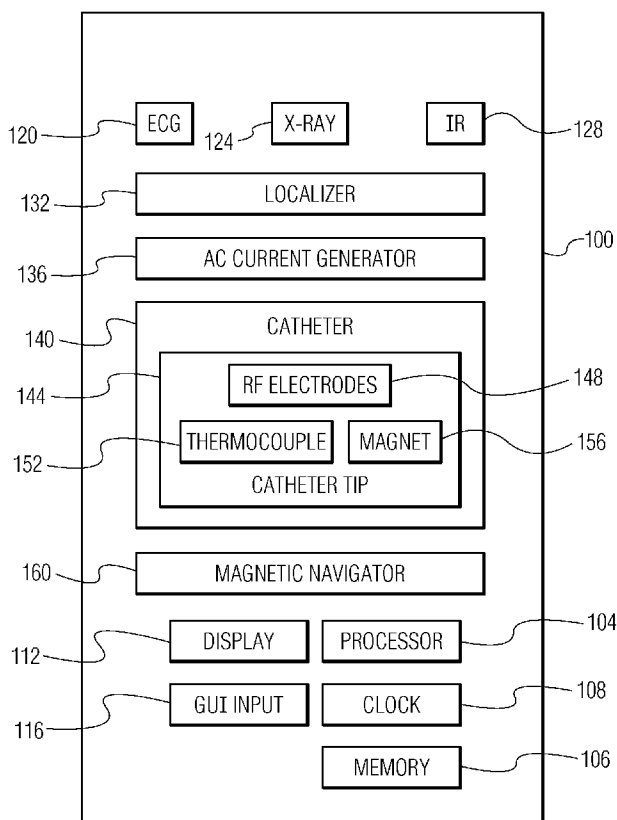
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[Continued on next page]

(54) Title: AUTOMATING THE ABLATION PROCEDURE TO MINIMIZE THE NEED FOR MANUAL INTERVENTION



(57) Abstract: Cardiac ablation is automated to require minimal user intervention, to thereby reduce X-ray exposure to staff and patients, increase patient throughput, simplify ablation and make ablation more precise. Steering between ablation points on the heart is automatic by use of a localizer system (132) and a magnetic navigator (160). Ablation is performed, interrupted and detected as complete automatically by monitoring system parameters (S630, S670). Ablation path planning automatically takes into account particular heart morphology of the patient and specifications of the catheter system (S310, S330), and automatically saves to storage an optimal ablation path from which ablation points are then selected (S340, S350).

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GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Declarations under Rule 4.17:

- *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))*

- *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))*

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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/IB2006/054269

A. CLASSIFICATION OF SUBJECT MATTER

INV. A61B18/14

ADD. A61M25/01

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)

A61B A61M

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.
Y	WO 02/38064 A (SUPER DIMENSION LTD [IL]; GILBOA PINHAS [IL]) 16 May 2002 (2002-05-16) page 4, lines 14-16 page 8, lines 3-16 page 11, line 3 - page 12, line 10 page 14, lines 11-27 example 1	16, 17, 20-22
Y	WO 00/16684 A (SUPER DIMENSION LTD [IL]; GILBOA PINHAS [IL]; TOLKOWSKY DAVID [IL]; HO) 30 March 2000 (2000-03-30) page 24, lines 8-30 page 43, lines 5-9 page 44, line 36 - page 47, line 13 ----- -/--	16, 17, 20-22



Further documents are listed in the continuation of Box C.



See patent family 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

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"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

10 April 2007

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16/07/2007

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INTERNATIONAL SEARCH REPORT

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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 01/21253 A (STEREOTAXIS INC [US]) 29 March 2001 (2001-03-29) page 2, line 9 - page 3, line 20 page 6, lines 1-7 -----	7,8
X	WO 01/58373 A (IOTEK INC [US]) 16 August 2001 (2001-08-16) page 4, line 4 - page 9, line 25 page 16, line 5 - page 17, line 30 page 31, line 33 - page 32, line 5 -----	7,8
X	US 2002/019644 A1 (HASTINGS ROGER N [US] ET AL) 14 February 2002 (2002-02-14) paragraphs [0061] - [0065] -----	7,8
X	US 2002/072662 A1 (HALL ANDREW F [US] ET AL) 13 June 2002 (2002-06-13) paragraph [0003] paragraphs [0030] - [0033] -----	7,8
X	WO 00/69353 A (STEREOTAXIS INC [US]) 23 November 2000 (2000-11-23) page 3, line 24 - page 4, line 27 -----	7,8
A	EP 1 554 986 A (BIOSENSE WEBSTER INC [US]) 20 July 2005 (2005-07-20) paragraphs [0007] - [0023] paragraphs [0025] - [0031] paragraphs [0043] - [0053]; claim 19 -----	7,8,16, 17,20-22
A	WO 02/32335 A (RITA MEDICAL SYSTEMS INC [US]; JOHNSON THEODORE [US]; BALBIERZ DANIEL) 25 April 2002 (2002-04-25) page 41, line 17 - page 42, line 18 -----	7,8,16, 17,20-22

INTERNATIONAL SEARCH REPORT

International application No.
PCT/IB2006/054269

Box II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☒ Claims Nos.: 1-6, 10-15, 18-19
because they relate to subject matter not required to be searched by this Authority, namely:
Rule 39.1(iv) PCT - Method for treatment of the human or animal body by therapy
2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this International application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:
7, 8, 16, 17, 20-22

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 7,8,16,17,20-22

An ablation system with automatic steering means to ablation points.

2. claim: 9

A method of preparing for cardiac ablation with creating, automatically and without user intervention, an ablation path based on a made electrophysiological map.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/IB2006/054269

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