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31 March 2011

(54) **Title:** ELECTRICALLY TUNABLE TISSUE ABLATION SYSTEM AND METHOD

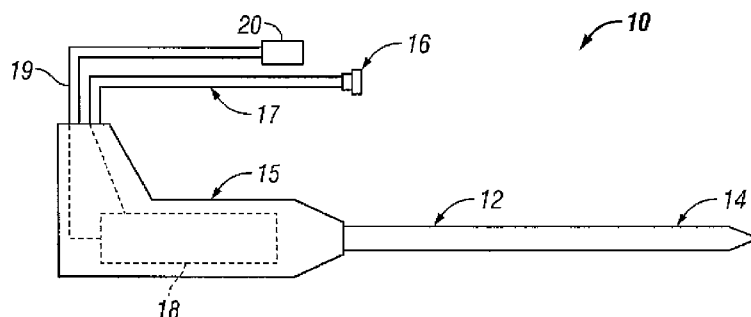


FIG. 1

(57) **Abstract:** An ablation system which transmits radio frequency (RF) energy for the ablation of biological tissues has a transmission line and an RF antenna disposed at the distal portion of the transmission line. An RF signal generator supplies RF energy to the proximal end of the cable for transmission to the antenna, and an electrically tunable transformer is connected between the signal generator and the antenna. The transformer is tuned based on detection of the reflected power level from the antenna so as to reduce or minimize reflected power, thereby increasing RF energy coupling between the antenna and tissue.



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A. CLASSIFICATION OF SUBJECT MATTER*A61B 18/18(2006.01)i, A61B 17/3205(2006.01)i*

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 18/18; A61B 17/39; A61B 17/36

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Korean utility models and applications for utility models

Japanese utility models and applications for utility models

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

eKOMPASS(KIPO internal) & Keywords: ablation, tunable, microwave, RF power, transformer

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5405346 A1 (GRUNDY; DAVID A. et al.) 11 April 1995 See col.3 lines 17-32, col.4 line 58-col.5 line 24, col.10 line 14-col.11 line 17, figs. 2, 6-7, 10	1-17
A	US 5693082 A1 (WARNER; GLEN GRANT et al.) 02 December 1997 See figs. 1-3, col.6 line 41-col.7 line 35	1-17
A	US 2003-0078573 A1 (CSABA TRUCKAI et al.) 24 April 2003 See abstract, fig. 3, paragraphs 51-53, claim1	1-17
A	US 6648883 B2 (FRANCISCHELLI; DAVID E. et al.) 18 November 2003 See abstract, col.3 line 43-col.4 line 41	1-17
A	US 7367972 B2 (FRANCISCHELLI DAVID E. et al.) 06 May 2008 See claim 1, col.2 line 25-61	1-17

 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 application or patent 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 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

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Box No. 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.: 18-22
because they relate to subject matter not required to be searched by this Authority, namely:
The subject matter of claim 18 is directed to a method for biological tissue ablation. It is believed that the entire steps of claim 18 define a therapeutic method practiced on the human body. The subject matter of claim 18, therefore, falls into the category of methods for treatment of the human body by surgery or therapy as well as diagnostic methods. The same reasoning applies to claims 19~22, which are dependent on claim 18 [Article 17(2)(a)(i), Rule 39.1(iv) PCT].
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 No. 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:

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.:

Remark on Protest

- The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/US2010/031259

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