Title: APPARATUS, SYSTEMS, AND METHODS FOR LOCALIZING MARKERS OR TISSUE STRUCTURES WITHIN A BODY

Abstract: Apparatus, systems, and methods are provided for localizing lesions within a patient's body, e.g., within a breast. The system may include one or more markers implantable within or around the target tissue region, and a probe for transmitting and receiving electromagnetic signals to detect the one or more markers. During use, the marker(s) are into a target tissue region, and the probe is placed against the patient's skin to detect and localize the marker(s). A tissue specimen, including the lesion and the marker(s), is then removed from the target tissue region based at least in part on the localization information from the probe.
Date of publication of the international search report:
17 February 2011
INTERNATIONAL SEARCH REPORT

A. CLASSIFICATION OF SUBJECT MATTER

INV. A61B5/06 A61B19/00

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

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

Electronic database consulted during the international search (name of database and, where practical, search terms used)

EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

<table>
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<tr>
<th>Category</th>
<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
<th>Relevant to claim No.</th>
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<td>X</td>
<td>US 6 363 940 B1 (KRAG DAVID N [US]) 2 April 2002 (2002-04-02) cited in the application column 5, line 20 - column 7, line 15 column 9, line 56 - column 10, line 17 column 14, lines 26-50 column 16, line 16 - column 17, line 8</td>
<td>1,5,10, 11,20</td>
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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 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.

*Z* document member of the same patent family

Date of the actual completion of the international search 28 September 2010

Date of mailing of the international search report 27/12/2010

Name and mailing address of the ISA/

European Patent Office, P.B. 5618 Patentlaan 2
NL - 2280 HN Rijswijk
Tel. (+31-70) 340-2040,
Fax (+31-70) 340-3016

Authorized officer

Manschot, Jan

Form PCT/ISA210 (second sheet) (April 2005)
<table>
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<td>A</td>
<td>AMINEH R K ET AL: &quot;Ultra-wide band TEM horn antenna for microwave imaging of the breast&quot;</td>
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<td>ISBN: 978-1-4244-2979-0 the whole document</td>
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**INTERNATIONAL SEARCH REPORT**

**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. **X** Claims Nos.: 35-55 because they relate to subject matter not required to be searched by this Authority, namely:
   see FURTHER INFORMATION sheet PCT/ISA/210

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:

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 fees, this Authority did not invite payment of additional fees.

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. **X** 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.:
   1-11, 20(completely); 29, 30(partially)

**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.

Form PCT/ISA/210 (continuation of first sheet (2)) (April 2005)
This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-11, 20(completely); 29, 30(partially)
   System for localizing a tissue with active marker
   
2. claims: 12-19(completely); 29, 30(partially)
   Marker with elongate core and plurality of beads
   
3. claims: 21-28(completely); 29, 30(partially)
   System for localizing tissue region with localization wire and target
   
4. claims: 31-34
   System for localizing tissue region with marker delivery device
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<td>CA 2432625 A1</td>
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Continuation of Box II.1

Claims Nos.: 35-55

Rule 39.1(iv) PCT - Method for treatment of the human or animal body by surgery
Introducing a target (or marker) into the breast and/or removing a lesion concerns a substantial physical intervention on the body requiring professional medical expertise and which entails a substantial health risk. Consequently, the method of present claim 35-55 relates to a method for treatment of the human body by surgery (see Rule 39.1(iv) PCT) for which no search has to be carried out (Article 17.2(a)(i)).