(51) International Patent Classification:
G01R 33/56 (2006.01) G01R 33/563 (2006.01)


Declarations under Rule 4.17:
— as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(h))
— as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))

Published:
— with international search report (Art. 21(3))
— before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))

(88) Date of publication of the international search report: 17 April 2014

(54) Title: QUANTIFICATION OF MYOCARDIAL CONTRACTILE FUNCTION WITH MRI, CT OR US

(57) Abstract: A system (10) for quantification of uncertainty of contours includes a display (48) which displays a portion of a 4D image of at least a left ventricle over a plurality of cardiac phases. A measurement device (16) includes at least one processor (42) programmed to receive the 4D image (18) from an imaging device (12), receive a selected location on the myocardial wall of the left ventricle, cast a ray perpendicular to at least one of the myocardial wall or center of the left ventricle through the selected location, calculate a thickness the myocardial wall along the cast ray, evaluate myocardial wall motion over the range of the cardiac phases, calculate a quantification of the myocardial contractile function, and display the calculate a quantification of the myocardial contractile function on the display device (48).
INTERNATIONAL SEARCH REPORT

A. CLASSIFICATION OF SUBJECT MATTER

INV. G01R 33/56 G01R 33/563
ADD.

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)

G01R 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 practicable, search terms used)

EPO-Internal, BIOSIS, COMPENDEX, EMBASE, INSPEC, IBM-TDB, WPI Data

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>JP 2005 087594 A (HITACHI MEDICAL CORP)</td>
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<td>X</td>
<td>US 2010/022901 Al (BREEUWER MARCEL [NL])</td>
<td>1-4, 6-11, 13-15</td>
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<td></td>
<td>paragraph [0066] - paragraph [0079] figures 1, 2</td>
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[X] Further documents are listed in the continuation of Box C. [X] 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) one of 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

"A" document member of the same patent family

Date of the actual completion of the international search

19 November 2013

Date of mailing of the international search report

04/03/2014

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2

NL - 2280 HV Rijswijk

Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016

Authorized officer

Strei f, Jbrg Ulrich

Form PCT/ISA/210 (second sheet) (April 2005)
<table>
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<th>Category</th>
<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
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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.**: because they relate to subject matter not required to be searched by this Authority, namely:

   □

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).

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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. □ 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.:

   1-15

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

1. claims: 1-15

   A system for quantification of myocardial contractile function, a corresponding method, a corresponding processor and a corresponding computer-readable medium.
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2. claims: 16-20

   A system for quantification of uncertainty of contours.
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