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Published:
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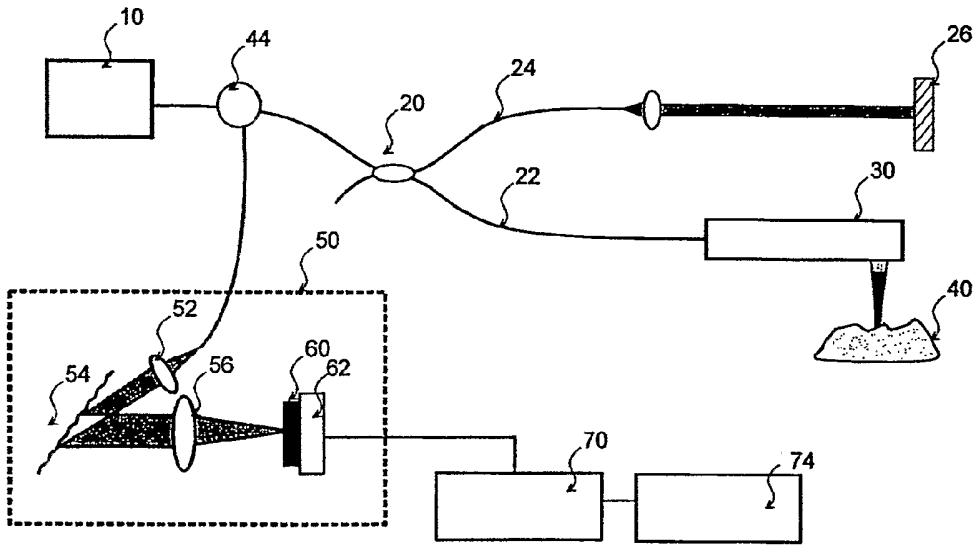
[Continued on next page]

(54) Title: SYSTEM AND METHOD FOR OPTICAL COHERENCE IMAGING



(57) Abstract: A system and method for imaging of a sample, e.g., biological sample, are provided. In particular, at least one source electro-magnetic radiation forwarded to the sample and a reference may be generated. A plurality of detectors may be used, at least one of the detectors capable of detecting a signal associated with a combination of at least one first electro-magnetic radiation received from the sample and at least one second electro-magnetic radiation received from the reference. At least one particular detector may have a particular electrical integration time, and can receive at least a portion of the signal for a time duration which has a first portion with a first power level greater than a predetermined threshold and a second portion immediately preceding or following the first portion. The second portion may have a second power level that is less than the predetermined threshold, and extends for a time period which may be, e.g., approximately more than 10% of the particular electrical integration time.

WO 2006/039091 A3

— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*

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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

Intern: plication No
PCT/US2005/032422

A. CLASSIFICATION OF SUBJECT MATTER
INV. G01N21/47

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)
G01N A61B G01B

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, INSPEC, PAJ, BIOSIS

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P,X	YUN S H ET AL: "Pulsed-source and swept-source spectral-domain optical coherence tomography with reduced motion artifacts" OPTICS EXPRESS OPT. SOC. AMERICA USA, vol. 12, no. 23, November 2004 (2004-11), XP002373645 ISSN: 1094-4087 figure 4	1-13, 25-43, 55-60
X	US 6 556 305 B1 (AZIZ DAVID J ET AL) 29 April 2003 (2003-04-29) figure 5	1-13, 25-43, 55-60

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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 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

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Date of the actual completion of the international search	Date of mailing of the international search report
23 March 2006	09. 06. 2006

Name and mailing address of the ISA/	Authorized officer
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	Mason, W

Form PCT/ISA/210 (second sheet) (April 2005)

INTERNATIONAL SEARCH REPORT

Intern: application No
PCT/US2005/032422

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DUBOIS A ET AL: "High-resolution full-field optical coherence tomography with a Linnik microscope" APPLIED OPTICS OPT. SOC. AMERICA USA, vol. 41, no. 4, 1 February 2002 (2002-02-01), pages 805-812, XP002373646 ISSN: 0003-6935 figure 1	1-13, 25-43, 55-60
X	PATENT ABSTRACTS OF JAPAN vol. 2003, no. 12, 5 December 2003 (2003-12-05) & JP 2004 037165 A (FUJI PHOTO OPTICAL CO LTD), 5 February 2004 (2004-02-05) abstract; figure 1	1-13, 25-43, 55-60
A	TEARNEY G J ET AL: "RAPID ACQUISITION OF IN VIVO BIOLOGICAL IMAGES BY USE OF OPTICAL COHERENCE TOMOGRAPHY" OPTICS LETTERS, OSA, OPTICAL SOCIETY OF AMERICA, WASHINGTON, DC, US, vol. 21, no. 17, 1 September 1996 (1996-09-01), pages 1408-1410, XP000627774 ISSN: 0146-9592 figure 1	1-13, 25-43, 55-60
A	DREXLER W ET AL: "IN VIVO ULTRAHIGH-RESOLUTION OPTICAL COHERENCE TOMOGRAPHY" OPTICS LETTERS, OSA, OPTICAL SOCIETY OF AMERICA, WASHINGTON, DC, US, vol. 24, no. 17, 1 September 1999 (1999-09-01), pages 1221-1223, XP000873625 ISSN: 0146-9592 figure 1	1-13, 25-43, 55-60
A	CENSE B ET AL: "Ultrahigh-resolution high-speed retinal imaging using spectral-domain optical coherence tomography" OPTICS EXPRESS OPT. SOC. AMERICA USA, vol. 12, no. 11, 31 May 2004 (2004-05-31), XP002373647 ISSN: 1094-4087 page 2240	1-13, 25-43, 55-60

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Internat(application No
PCT/US2005/032422

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	KWON O: "Pulsed laser interferometry" PROCEEDINGS OF THE SPIE - THE INTERNATIONAL SOCIETY FOR OPTICAL ENGINEERING USA, vol. 1319, 1990, page 250, XP002373648 ISSN: 0277-786X figure 1	1-13, 25-43, 55-60
A	CHOMA M A ET AL: "Real-Time OCT Imaging of the Retina." ARVO ANNUAL MEETING ABSTRACT SEARCH AND PROGRAM PLANNER, vol. 2002, 2002, page Abstract No. 4372, XP009063926 & ANNUAL MEETING OF THE ASSOCIATION FOR RESEARCH IN VISION AND OPHTHALMOLOGY; FORT LAUDERDALE, FLORIDA, USA; MAY 05-10, 2002 the whole document	1-13, 25-43, 55-60
A	US 5 459 570 A (SWANSON ET AL) 17 October 1995 (1995-10-17) figure 1	1-13, 25-43, 55-60
A	US 6 396 587 B1 (KNUPFER KLAUS ET AL) 28 May 2002 (2002-05-28) figure 1	1-13, 25-43, 55-60

INTERNATIONAL SEARCH REPORT

Int tional application No.
PCT/US2005/032422

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.:
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).

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.:

1-13, 25-43, 55-60

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: 1-13, 25-43, 55-60

A system / method for imaging a sample using a combined signal from reference and sample beams and in which the detector has a particular integration time so as to receive a signal for a time duration during which a first power level is greater than a predetermined threshold and at least a second duration in which a second power level is less than the predetermined threshold and the second duration is extended for a time period which is approximately at least 10% of the integration time.

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2. claims: 14-24, 44-54

A system / method for imaging a sample using a combined signal from reference and sample beams and in which the frequency of the source varies over time i.e. a wavelength swept source is used.

INTERNATIONAL SEARCH REPORT

Information on patent family members

Interna l application No
PCT/US2005/032422

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