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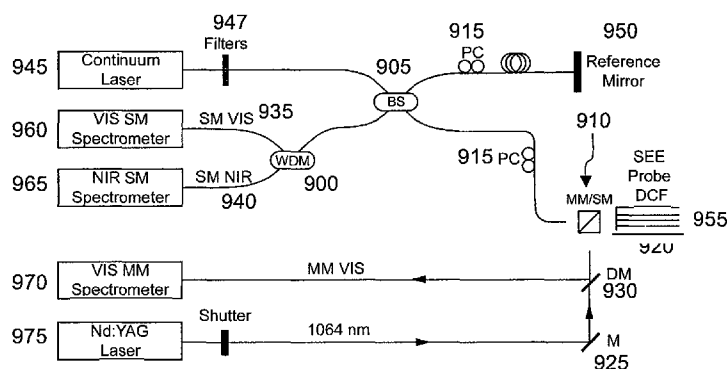
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60/862,205 19 October 2006 (19.10.2006) US
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 - with international search report
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- (88) Date of publication of the international search report:
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(54) Title: APPARATUS AND METHOD FOR OBTAINING AND PROVIDING IMAGING INFORMATION ASSOCIATED WITH AT LEAST ONE PORTION OF A SAMPLE AND EFFECTING SUCH PORTION(S)



(57) Abstract: Exemplary apparatus and process can be provided for imaging information associated with at least one portion of a sample. For example, (i) at least two first different wavelengths of at least one first electro-magnetic radiation can be provided within a first wavelength range provided on the portion of the sample so as to determine at least one first transverse location of the portion, and (ii) at least two second different wavelengths of at least one second electro-magnetic radiation are provided within a second wavelength range provided on the portion so as to determine at least one second transverse location of the portion. The first and second ranges can at least partially overlap on the portion. Further, a relative phase between at least one third electro-magnetic radiation electro-magnetic radiation being returned from the sample and at least one fourth electro-magnetic radiation returned from a reference can be obtained to determine a relative depth location of the portion. First information of the portion based on the first transverse location and the relative depth location, and second information of the portion based on the second transverse location and the relative depth location can be obtained. The imaging information may include the first and second information.



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INTERNATIONAL SEARCH REPORT

International Patent No

PCT/US2007/081982

A. CLASSIFICATION OF SUBJECT MATTER
INV. A61B5/00

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 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
X	US 6 538 817 B1 (FARMER OASON N [US] ET AL) 25 March 2003 (2003-03-25) claims 8,19; figure 2	1,3,6,18
X	GELIKONOV V M ET AL: "Two-wavelength optical coherence tomography" RADIOPHYSICS AND QUANTUM ELECTRONICS, KLUWER ACADEMIC PUBLISHERS-CONSULTANTS BUREAU, NE, vol. 47, no. 10-11, 1 October 2004 (2004-10-01), pages 848-859, XP019290800 ISSN: 1573-9120 page 851, lines 8,9 page 857, lines 3-5 figure 1 page 856 - page 858	1,2,4-7,18

-I-



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

'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

'&' document member of the same patent family

Date of the actual completion of the international search

11 July 2008

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09/10/2008

Name and mailing address of the ISA/

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INTERNATIONAL SEARCH REPORT

International application No
PCT/US2007/081982

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with Indication where appropriate of the relevant passages	Relevant to claim No
X	US 2006/146339 A1 (FUJITA HIROSHI [JP]) 6 July 2006 (2006-07-06) paragraph [0044] figures 1,4 <p style="text-align: center;">-----</p>	1, 2, 6, 7, 18
X	US 6 501 551 B1 (TEARNEY GUILLERMO [US] ET AL) 31 December 2002 (2002-12-31) column 15, lines 23-27 figure 16 <p style="text-align: center;">-----</p>	1, 6, 7, 18
X	US 2006/103850 A1 (ALPHONSE GERARD A [US] ET AL) 18 May 2006 (2006-05-18) figure 15 <p style="text-align: center;">-----</p>	1, 3, 6, 18

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2007/081982

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
because they relate to subject matter not required to be searched by this Authority, namely

2 **D** 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 allsearchable claims

2 As all searchable claims could be searched without effort justifying an additional fee, 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

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

1-7, 18

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

FURTHER INFORMATION CONTINUED FROM PCT/ASA/ 210

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

1. claims: 1-7,18

directed to an apparatus and process for providing imaging information comprising three different arrangements which (i) provide several electro-magnetic radiations each at a different wavelength, (ii) obtain a relative phase between two radiations, and (iii) provide information about the irradiated portion

2. claims: 8-14

directed to an apparatus for obtaining information comprising a fiber which guides one electro-magnetic radiation for irradiation and a second radiation for modifying the property of the irradiated area

3. claims: 15-17

directed to an apparatus for obtaining information for a structure comprising a dispersive arrangement to receive a plurality of electro-magnetic radiations and forward this dispersed radiation onto a sample

INTERNATIONAL SEARCH REPORT

International application No PCT/US2007/081982

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 6538817	B1	25-03-2003	NONE
<hr style="border-top: 1px dashed black;"/>			
US 2006146339	A1	06-07-2006	AT 365905 T 15-07-2007
			CN 1785122 A 14-06-2006
			DE 602005001494 T2 28-02-2008
			EP 1666838 A1 07-06-2006
			JP 2006162366 A 22-06-2006
<hr style="border-top: 1px dashed black;"/>			
US 6501551	B1	31-12-2002	US 6134003 A 17-10-2000
<hr style="border-top: 1px dashed black;"/>			
US 2006103850	A1	18-05-2006	NONE
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