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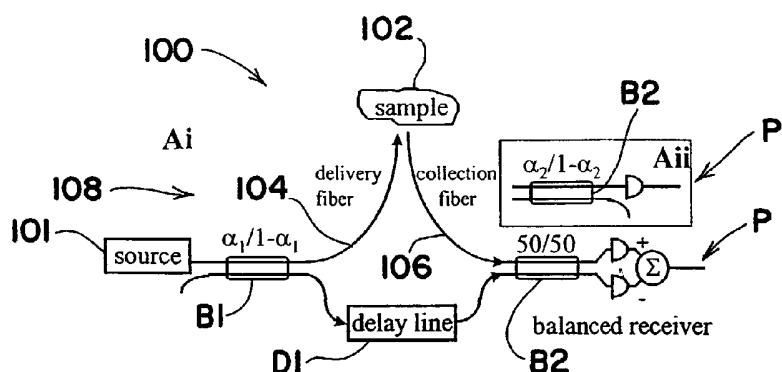
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- (71) Applicants and
(72) Inventors: **ROLLINS, Andrew, M.** [US/US]; 534 Miner Road, Highland Heights, OH 44143 (US). **IZATT, Joseph, A.** [US/US]; 10505 Leslie Drive, Raleigh, NC 27615 (US). **WESTPHAL, Volker** [DE/DE]; Angerstrasse 11, 30161 Hannover (DE). **YAZDANFAR, Siavash** [IR/US]; 1916 Snowcrest Trail, Durham, NC 27707 (US).
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- (74) Agents: **SKLAR, Warren, A.** et al.; Renner, Otto, Boisselle & Sklar, LLP, 1621 Euclid Avenue, 19th Floor, Cleveland, OH 44115 (US).
- 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.

(54) Title: ASPECTS OF BASIC OCT ENGINE TECHNOLOGIES FOR HIGH SPEED OPTICAL COHERENCE TOMOGRAPHY AND LIGHT SOURCE AND OTHER IMPROVEMENTS IN OCT



(57) Abstract: An optical coherence tomography (OCT) system including an interferometer (108;110;110') provides illuminating light along a first optical path (104;120;204;204') to a sample (102) and an optical delay line (D) and collects light from the sample (102) along a second optical path (106;106a; 128a, 128b, 128c, 206;206') remitted at several scattering angles to a detector (P). In one embodiment, illuminating light is directed along a number of incident light paths (154a, 154b, 154c) through a focusing lens (158) to a sample (102). The light paths (154a, 154b, 154c) and focusing lens (158) are related to the sample (102) and to both the incident light source (101) and the detector (P). In another embodiment, a focusing system (252, 262) directs light to a location in the sample (102). A transmission grating (256) or acousto-optic modulator (256') directs light from the sample (102) at an angle representative of the wavelength of the incident light on the transmission grating (256) or acousto-optic modulator (256').

INTERNATIONAL SEARCH REPORT

International Application No.

PCT/US 02/24880

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 G01N21/17 G01B11/24

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)

IPC 7 G01N 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, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 6 191 862 B1 (SWANSON ERIC A ET AL) 20 February 2001 (2001-02-20) column 1, line 6 -column 2, line 31 column 8, line 10 -column 9, line 3; figure 1A	1,4
A	EP 0 421 279 A (TERUMO CORP) 10 April 1991 (1991-04-10) column 4, line 50 -column 6, line 16; figures 1,5,8	1,4



Further documents are listed in the continuation of box C.



Patent family members are listed in 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

"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

24 March 2003

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Name and mailing address of the ISA

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

Authorized officer

Stuebner, B

INTERNATIONAL SEARCH REPORT

International Application No
PCT/US 02/24880

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	PODOLEANU A G ET AL: "Simultaneous low coherence interferometry imaging at two depths using an integrated optic modulator" OPTICS COMMUNICATIONS, NORTH-HOLLAND PUBLISHING CO. AMSTERDAM, NL, vol. 191, no. 1-2, 1 May 2001 (2001-05-01), pages 21-30, XP004234990 ISSN: 0030-4018 page 22, column 2, paragraph 3 -page 23, column 2, paragraph 1; figure 1	1,4
A	BOER DE J F ET AL: "POLARIZATION EFFECTS IN OPTICAL COHERENCE TOMOGRAPHY OF VARIOUS BIOLOGICAL TISSUES" IEEE JOURNAL OF SELECTED TOPICS IN QUANTUM ELECTRONICS, IEEE SERVICE CENTER, US, vol. 5, no. 4, July 1999 (1999-07), pages 1200-1203, XP000893469 ISSN: 1077-260X page 1202, column 1, paragraph 2 -page 1203, column 1, paragraph 2	1,4
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INTERNATIONAL SEARCH REPORT

International Application No
PCT/US 02/24880

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 02/24880

Box I Observations where certain claims were found unsearchable (Continuation of item 1 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 II Observations where unity of invention is lacking (Continuation of item 2 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.:
1-4, 11-19, 50-71
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.

☒ 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: 1-4 (A-D)

Transformation device for an OCT system... comprising plural buffers...

2. Claims: 5-10 (A-F)

An OCT system including an interferometer and an optical delay line

3. Claims: 11-19 (A-I)

An OCT system comprising an imaging system...and a control

4. Claims: 20-22 (A-C)

A method of preserving signal to noise ratio in the case of nonlinear scan rate in operation of an OCT system

5. Claims: 23-40 (A-S)

An OCT system including an interferometer... comprising optical paths to a sample and... to a detector

6. Claims: 41-43 (A-C)

A device for simultaneously collecting light from a sample; OCT not being disclosed

7. Claims: 44, 45

A device for simultaneously illuminating and collecting light from a sample... comprising a fiber optic member for illuminating the sample..;
OCT not being disclosed

8. Claims: 46-49 (A-D)

An interferometer comprising a low coherence source, a beamsplitter.., a scanning system..., a detector system..;
OCT not being disclosed

9. Claims: 50-54 (A-E)

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

A device for simultaneously illuminating and collecting light from a sample.. comprising a focusing lens for directing light..;
OCT not being disclosed

10. Claims: 55-64 (A-I)

A device for illuminating a sample and for receiving light from the sample for analysis, comprising, a focusing system.., a light path for scattered light..., a transmission grating...;
OCT not being disclosed

11. Claims: 65-71 (A-G)

An interferometer system, comprising at least two light sources, a combiner..., sample and optical delay line light paths, a detector...;
OCT mentioned in dependent claims

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 02/24880

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

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