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Declarations under Rule 4.17:

- as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))
- as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))

[Continued on next page]

(54) Title: PORTABLE SELF-ADMINISTERING RETINAL IMAGING DEVICE

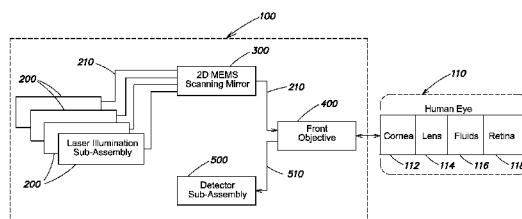


FIG. 1A

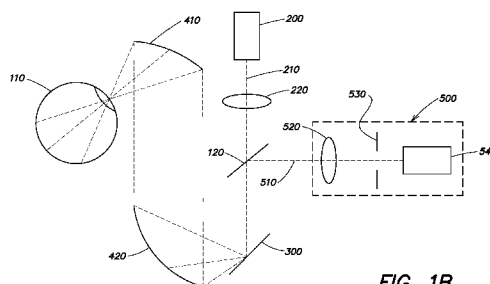


FIG. 1B

(57) Abstract: A portable MEMS-based scanning laser ophthalmoscope (MSLO). In one example, the MSLO includes a laser illumination sub-assembly, a two-dimensional MEMS scanning mirror, a conic front objective, and a detector sub-assembly all disposed within a portable housing. A battery configured to provide power to components of the MSLO may also be included within the housing. In one example, the laser illumination sub-assembly includes at least one laser configured to generate in each of two orthogonal dimensions one or more illumination beams separated from one another by a predetermined angle of separation. The MEMS scanning mirror and conic front objective are configured to produce a two-dimensional area of illumination from the one or more illumination beams in each dimension and to direct the illumination from the scanning mirror to the eye to illuminate the retina.

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- *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))*

INTERNATIONAL SEARCH REPORT

International application No

PCT/US2012/032344

A. CLASSIFICATION OF SUBJECT MATTER

INV. A61B3/12 A61B3/10 G02B26/08
 ADD. 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 G02B

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, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2009/149726 A1 (HYDE RODERICK A [US] ET AL) 11 June 2009 (2009-06-11) paragraph [0043] paragraphs [0083] - [0090] figure 1	1,42
X	DE 10 2008 011836 A1 (ZEISS CARL MEDITEC AG [DE]) 3 September 2009 (2009-09-03) paragraphs [0053] - [0056] paragraphs [0071] - [0073] paragraph [0076] figure 2	1,42



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 application or patent 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

6 July 2012

Date of mailing of the international search report

03/12/2012

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INTERNATIONAL SEARCH REPORT

International application No

PCT/US2012/032344

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	A. DUBRA, D. C. GRAY, J. I. W. MORGAN, D. R. WILLIAMS: "MEMS in adaptive optics scanning laser ophthalmoscopy: achievements and challenges", SPIE, PO BOX 10 BELLINGHAM WA 98227-0010 USA, vol. 6888, 2008, pages 688803-1-688803-13, XP040433901,	1,42
Y	Section 6 figure 8	2-5
X	----- US 2004/116811 A1 (KOSCHMIEDER INGO [DE]) 17 June 2004 (2004-06-17) figures 1-2 paragraphs [0020] - [0021] paragraphs [0012] - [0014]	1,42
X,P	----- WO 2012/001382 A1 (OPTOS PLC [GB]; GRAY DAN [GB]; PEMBERTON STEPHEN [GB]; SWAN DEREK [GB]) 5 January 2012 (2012-01-05) figures 1-3 page 11, line 21 - page 13, line 30 page 17, lines 1-5 page 15, lines 13-22	1,42
Y	----- NL 1 024 082 C1 (MENSINK MICHIEL HERMAN [NL]) 14 February 2005 (2005-02-14) page 1 page 6, line 19 - page 7, line 12 page 8, lines 3-20 figures 2, 3 -----	2-5

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2012/032344

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. ☐ 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. ☒ 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.:

1-5, 42

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/ISA/ 210

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

1. claims: 1-5, 42

MEMS-based scanning laser ophthalmoscope having a holed mirror and method of imaging a retina, wherein only one laser illumination beam is used

2. claims: 6, 7

MEMS-based scanning laser ophthalmoscope having multiple illumination laser beams spaced apart from each other by a predetermined angle of separation

3. claims: 8-11

MEMS-based scanning laser ophthalmoscope having a conic front objective

4. claims: 12, 13, 43, 44

MEMS-based scanning laser ophthalmoscope having laser source of particular wavelengths

5. claims: 14, 15

MEMS-based scanning laser ophthalmoscope having a battery power supply

6. claims: 16, 17, 45

MEMS-based scanning laser ophthalmoscope having a display for displaying a fixation target

7. claims: 18-29, 37-41

Portable MEMS-based scanning laser ophthalmoscope having a battery, and method of imaging a retina, wherein a plurality of laser illumination beams are used

8. claims: 30-36

Method of imaging a retina, wherein image feature analysis is performed for automatic adjustment of optical components of a scanning laser ophthalmoscope

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2012/032344

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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