

(51) International Patent Classification:
A61B 3/14 (2006.01)(21) International Application Number:
PCT/US2013/039395(22) International Filing Date:
3 May 2013 (03.05.2013)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
61/642,688 4 May 2012 (04.05.2012) US

(71) Applicant: TEARSCIENCE, INC. [US/US]; 5151 McCrimmon Parkway, Suite 250, Morrisville, NC 27560 (US).

(72) Inventors: GRENON, Stephen, M.; 9 Elam Court, Durham, NC 27705 (US). KORB, Donald, R.; 10 Brimmer Street, Boston, MA 02108 (US). WEBER, William, L.; 172 Acorn Hill Road, Olivebridge, NY 12461 (US). LIDDLE, Scott; 6036 Wild Orchid Trail, Raleigh, NC 27613 (US).

(74) Agent: TERRANOVA, Steven, N.; Withrow & Terranova, PLLc, 100 Regency Forest Drive, Suite 160, Cary, NC 27518 (US).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM,

AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— with international search report (Art. 21(3))

(88) Date of publication of the international search report:
9 July 2015

(54) Title: OPTICAL PHANTOMS FOR USE WITH OCULAR SURFACE INTERFEROMETRY (OSI) DEVICES AND SYSTEMS CONFIGURED TO MEASURE TEAR FILM LAYER THICKNESS(ES), AND RELATED USES FOR CALIBRATION

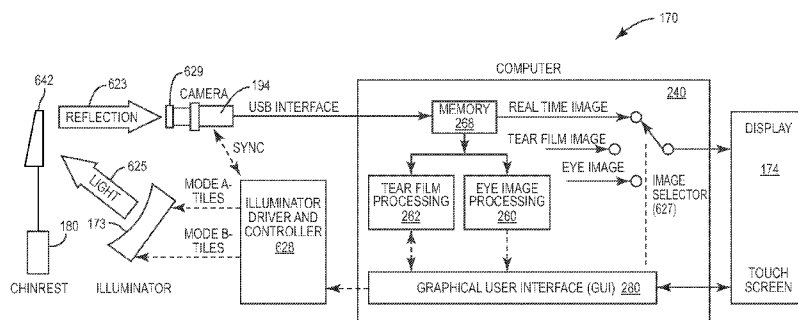


FIG. 59

(57) Abstract: Embodiments of the detailed description include optical phantoms for use with ocular surface interferometry (OSI) devices and systems configured to measure tear film layer thickness(es), and related use for calibration. The ocular surface interferometry (OSI) devices, systems, and methods can be used for imaging an ocular tear film and/or measuring a tear film layer thickness (TFLT) in a patient's ocular tear film. The OSI devices, systems, and methods can be used to measure the thickness of the lipid layer component (LLT) and/or the aqueous layer component (ALT) of the ocular tear film. "TFLT" as used herein includes LLT, ALT, or both LLT and ALT. "Measuring TFLT" as used herein includes measuring LLT, ALT, or both LLT and ALT. Imaging the ocular tear film and measuring TFLT can be used in the diagnosis of a patient's tear film, including but not limited to lipid layer and aqueous layer deficiencies.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US2013/039395

A. CLASSIFICATION OF SUBJECT MATTER

IPC(8) - A61B 3/14 (2013.01)

USPC - 351/206

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(8) - A61B 3/00, 3/10, 3/103, 3/14, 3/15; G01B 11/06 (2013.01)

USPC - 351/205, 206, 207, 208, 221, 246

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

CPC - A61B 3/00, 3/10, 3/14, 3/15, 3/152 (2013.01)

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

PatBase, Google Patents, Google

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2010/0253907 A1 (KORB et al) 07 October 2010 (07.10.2010) entire document	1-3, 7, 8, 10, 16-20, 24, 25, 27, 33-35, 39, 40, 42, 48-51, 55, 56, 58
Y		4-6, 9, 11-15, 21-23, 26, 28-32, 36-38, 41, 43-47, 52-54, 57, 59-63
Y	US 7,144,111 B1 (ROSS, III et al) 05 December 2006 (05.12.2006) entire document	4, 5, 21, 22, 36, 37, 52, 53
Y	US 2005/0186565 A1 (MALAK) 25 August 2005 (25.08.2005) entire document	6, 23, 38, 54
Y	US 5,494,829 A (SANDSTROM et al) 27 February 1996 (27.02.1996) entire document	9, 11-13, 26, 28-30, 41, 43-45, 57, 59-61
Y	US 2011/0181836 A1 (ROWE) 28 July 2011 (28.07.2011) entire document	14, 15, 31, 32, 46, 47, 62, 63

☐ Further documents are listed in the continuation of Box C.

* 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

03 October 2013

Date of mailing of the international search report

11 OCT 2013

Name and mailing address of the ISA/US

Mail Stop PCT, Attn: ISA/US, Commissioner for Patents
P.O. Box 1450, Alexandria, Virginia 22313-1450

Facsimile No. 571-273-3201

Authorized officer:

Blaine R. Copenheaver

PCT Helpdesk: 571-272-4300

PCT OSP: 571-272-7774