



- (51) International Patent Classification:  
*G01B 11/00* (2006.01)    *G01N 21/00* (2006.01)
- (21) International Application Number:  
PCT/US2012/028328
- (22) International Filing Date:  
8 March 2012 (08.03.2012)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:  
61/450,718    9 March 2011 (09.03.2011)    US
- (71) Applicant (for all designated States except US): **CALIFORNIA INSTITUTE OF TECHNOLOGY** [US/US];  
1200 East California Blvd, Pasadena, California 91125 (US).
- (72) Inventors; and
- (75) Inventors/Applicants (for US only): **PANG, Shuo** [CN/US]; 307 S. Wilson Ave., Apt. 4, Pasadena, California

91106 (US). **YANG, Changhui** [SG/US]; 1269 E. Elizabeth St., Pasadena, California 91104 (US).

- (74) Agent: **MARTINEZ-LEMKE, Sheila**; 110 Pacific Avenue, Suite 240, San Francisco, California 94111 (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, 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, 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, MD, RU,

[Continued on next page]

(54) Title: TALBOT IMAGING DEVICES AND SYSTEMS

10

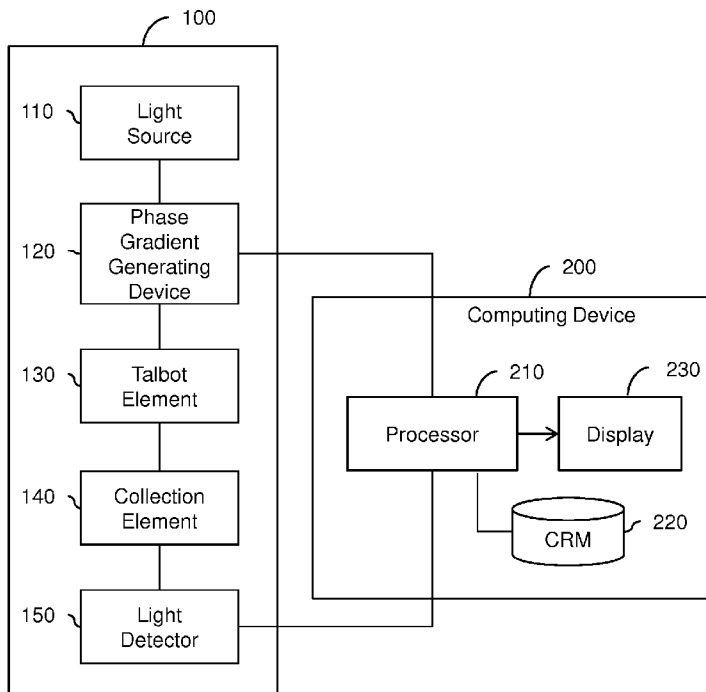


FIG. 1

(57) Abstract: A Talbot imaging system comprising a Talbot element, a phase gradient generating device, a light detector, and a processor. The Talbot element repeats a Talbot image at a distance from the Talbot element. The phase gradient generating device scans the Talbot image at a plane at the distance from the Talbot element by incrementally changing a phase gradient of a light field incident the Talbot element. As the Talbot image is scanned, the light detector captures time varying data associated with light altered by an object located at the distance from the Talbot element. The processor reconstructs an image of the object based on the time-varying light data.

WO 2012/122398 A3



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).

— *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))*

**(88) Date of publication of the international search report:**  
1 November 2012

**Published:**

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

**A. CLASSIFICATION OF SUBJECT MATTER****G01B 11/00(2006.01)i, G01N 21/00(2006.01)i**

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)

G01B 11/00; G01B 11/30; G01B 11/24; G01B 9/02

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

Korean utility models and applications for utility models

Japanese utility models and applications for utility models

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

eKOMPASS(KIPO internal) &amp; Keywords: Talbot, image

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 6731391 B1 (IMIN KAO et al.) 04 May 2004 See column 3, line 57 - column 13, line 24; abstract and figures 1-9.	1-20
A	US 2005-0190376 A1 (ULRICH WEGMANN et al.) 01 September 2005 See paragraph [0050] - paragraph [0079]; abstract and figures 1-17.	1-20
A	US 2007-0086020 A1 (BONGTAE HAN et al.) 19 April 2007 See abstract and figures 1-5.	1-20

 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 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

"&amp;" document member of the same patent family

Date of the actual completion of the international search

09 JULY 2012 (09.07.2012)

Date of mailing of the international search report

**03 SEPTEMBER 2012 (03.09.2012)**

Name and mailing address of the ISA/KR

Korean Intellectual Property Office  
189 Cheongsu-ro, Seo-gu, Daejeon Metropolitan  
City, 302-701, Republic of Korea

Facsimile No. 82-42-472-7140

Authorized officer

PARK, TAE WOOK

Telephone No. 82-42-481-8420



**INTERNATIONAL SEARCH REPORT**

Information on patent family members

International application No.

**PCT/US2012/028328**

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 6731391 B1	04.05.2004	WO 99-58952 A1	18.11.1999
US 2005-0190376 A1	01.09.2005	US 2008-0130012 A1 US 7301646 B2	05.06.2008 27.11.2007
US 2007-0086020 A1	19.04.2007	US 7230722 B2 WO 2007-047123 A2 WO 2007-047123 A3	12.06.2007 26.04.2007 04.09.2008