

(19) World Intellectual Property Organization  
International Bureau



(10) International Publication Number  
**WO 2011/008437 A3**

(43) International Publication Date  
20 January 2011 (20.01.2011)

(51) International Patent Classification:  
**G02B 7/04** (2006.01)      **G03B 3/00** (2006.01)  
**G02B 3/14** (2006.01)

**David, P.** [US/US]; 10616 NE 153rd Street, Bothell, WA 98011 (US). **FADLOVICH, Chace, H.** [US/US]; 627 221st Street, Bothell, WA 98021 (US).

(21) International Application Number:  
PCT/US2010/039549

(74) Agents: **VINCENT, Lester, J.** et al.; Blakely, Sokoloff, Taylor & Zafman LLP, 1279 Oakmead Parkway, Sunnyvale, CA 94085-4040 (US).

(22) International Filing Date:  
22 June 2010 (22.06.2010)

(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, RO, RS, RU, 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.

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
12/504,531      16 July 2009 (16.07.2009)      US

(71) Applicant (for all designated States except US): **MI-CROSCAN SYSTEMS, INC.** [US/US]; 700 SW 39th Street, Renton, WA 98057 (US).

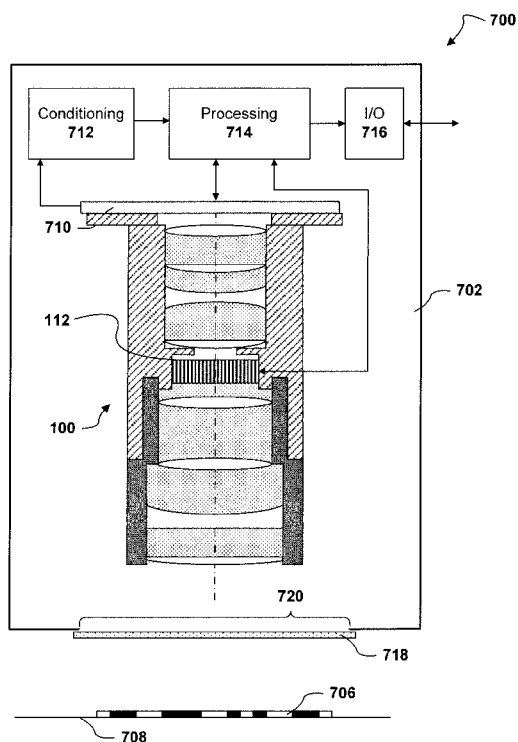
(72) Inventors; and

(75) Inventors/Applicants (for US only): **BARNES, Danny, S.** [US/US]; 21012 SE 256th PL, Maple Valley, WA 98038 (US). **STOCKINGER, Erik, R.** [US/US]; 3209 15th Ave S., Seattle, WA 98144 (US). **BAJORINS,**

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ,

[Continued on next page]

(54) Title: OPTICAL ASSEMBLIES FOR ADJUSTING WORKING DISTANCE AND FIELD OF VIEW IN AN IMAGING SYSTEM



(57) Abstract: Embodiments of an apparatus comprising a base including a proximal end, a distal end, and a receptacle in the distal end that is adapted to interchangeably receive a lens adapter; a set of base optics positioned in the proximal end of the base; and adjustable-focus optics positioned in the base and optically coupled to the base optics and, when the lens adapter is present, to the lens adapter. Embodiments of a process including forming a base including a proximal end, a distal end, and a receptacle in the distal end that is adapted to interchangeably receive any one of a plurality of lens adapters; positioning a set of base optics in the proximal end of the base; and positioning adjustable-focus optics positioned in the base such that they are optically coupled to the base optics and, when the lens adapter is present, to the lens adapter. Other embodiments are disclosed and claimed.

Fig. 7

WO 2011/008437 A3



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, 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:**  
31 March 2011

**Published:**

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

## INTERNATIONAL SEARCH REPORT

International application No.  
**PCT/US2010/039549****A. CLASSIFICATION OF SUBJECT MATTER****G02B 7/04(2006.01)i, G02B 3/14(2006.01)i, G03B 3/00(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)

G02B 7/04; G02B 26/02; G02B 7/18; G02B 3/12; G03B 17/00; G02B 7/02; G02B 3/14; G02B 15/14

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: adjustable-focus opites, lens adapter, base optics

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

| Category* | Citation of document, with indication, where appropriate, of the relevant passages  | Relevant to claim No. |
|-----------|---|-----------------------|
| A         | US 2006-0056041 A1 (TAKASHI KATO et al.) 16 March 2006<br>See paragraph 53-55; claims 1-4; figures 1(A),1(B),3.             | 1-27                  |
| A         | US 2008-0158678 A1 (COSTIGAN GEORGE et al.) 03 July 2008<br>See paragraph 42-42; claim 1; figure 2.                         | 1-27                  |
| A         | US 2009-0021823 A1 (HEIM JONATHAN R. et al.) 22 January 2009<br>See paragraph 47-49; claims 1; figure 6.                    | 1-27                  |
| A         | US 2004-0066563 A1 (JAMES S. VOSS et al.) 08 April 2004<br>See paragraph 32-35, paragraph 44-45; claims 15-18; figures 1,3. | 1-27                  |

 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

21 JANUARY 2011 (21.01.2011)

Date of mailing of the international search report

**25 JANUARY 2011 (25.01.2011)**

Name and mailing address of the ISA/KR

Korean Intellectual Property Office  
Government Complex-Daejeon, 139 Seonsa-ro, Seo-  
gu, Daejeon 302-701, Republic of Korea

Facsimile No. 82-42-472-7140

Authorized officer

AHN, Young Woong

Telephone No. 82-42-481-8720



**INTERNATIONAL SEARCH REPORT**

Information on patent family members

International application No.

**PCT/US2010/039549**

| Patent document cited in search report | Publication date | Patent family member(s)           | Publication date         |
|--|------------------|-----------------------------------|--------------------------|
| US 2006-0056041 A1                     | 16.03.2006       | JP 2006-064948 A<br>US 7180678 B2 | 09.03.2006<br>20.02.2007 |
| US 2008-0158678 A1                     | 03.07.2008       | US 2008-158678 A1                 | 03.07.2008               |
| US 2009-0021823 A1                     | 22.01.2009       | None                              |                          |
| US 2004-0066563 A1                     | 08.04.2004       | JP 2004-126574 A<br>US 6747808 B2 | 22.04.2004<br>08.06.2004 |