

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
15 May 2003 (15.05.2003)

PCT

(10) International Publication Number
WO 03/040802 A3

(51) International Patent Classification⁷: G02B 26/08,
H04N 9/31, 5/74

(21) International Application Number: PCT/US02/35570

(22) International Filing Date:
6 November 2002 (06.11.2002)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/333,178 6 November 2001 (06.11.2001) US
60/333,266 6 November 2001 (06.11.2001) US

(71) Applicant: KEYOTEE [US/US]; 6820 Cypress Point
North, No. 25, Austin, TX 78746 (US).

(72) Inventor: GRABERT, Michael; 6820 Cypress Point
North, No. 25, Austin, TX 78746 (US).

(74) Agents: HULSEY, William, N. et al.; Hulsey & Calkins,
LLP, Suite 3200, 8911 N. Capital of Texas Hwy., Austin,
TX 78759 (US).

(81) Designated States (national): AE, AG, AL, AM, AT, AU,
AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU,

CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH,
GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC,
LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW,
MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG,
SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC,
VN, YU, ZA, ZM, ZW.

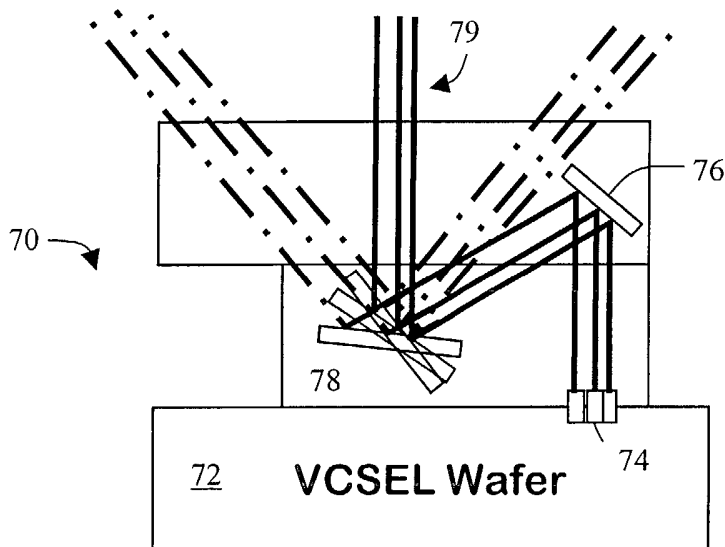
(84) Designated States (regional): ARIPO patent (GH, GM,
KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW),
Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),
European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE,
ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, SK,
TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ,
GW, ML, MR, NE, SN, TD, TG).

Published:
— with international search report
— before the expiration of the time limit for amending the
claims and to be republished in the event of receipt of
amendments

(88) Date of publication of the international search report:
20 November 2003

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: APPARATUS FOR IMAGE PROJECTION



(57) Abstract: The invention is directed to a solid-state projection device incorporating a light source, modulator, and control circuitry on a single chip. For example, projection device may include several sets of VCSELs, each associated with a set of MEMs mirrors and coupled to a control circuitry. The device may also include various Pyrex layers for sealing and angling layers. The device may further include detectors associated with the light source. These detectors may be useful in determining the shape and location of the projection surface, building a gesture interface, and determining the operability of proixels. The invention is also directed to methods for using the device for manipulating the image, producing zoom, masking, reverse images, positioning, and keystone correction, among others. The invention may be used in projection display devices, portable display devices,

heads-up displays, retinal displays, rear and front projection displays, and other display applications.

WO 03/040802 A3

INTERNATIONAL SEARCH REPORT

International Application No
PCT/US 02/35570

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 G02B26/08 H04N9/31 H04N5/74

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 G02B H04N

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, INSPEC, IBM-TDB, COMPENDEX

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 6 121 983 A (CONNELL G A NEVILLE ET AL) 19 September 2000 (2000-09-19) figures 1A,B,5A,B column 2, line 66 -column 4, line 1 column 5, line 60 -column 6, line 13 column 10, line 37 -column 11, line 57	1,2
X	TUANTRANONT A ET AL: "Optical beam steering using MEMS-controllable microlens array" SENSORS AND ACTUATORS A, ELSEVIER SEQUOIA S.A., LAUSANNE, CH, vol. 91, no. 3, 15 July 2001 (2001-07-15), pages 363-372, XP004255490 ISSN: 0924-4247 page 367, right-hand column, paragraph 3 -page 369, left-hand column, paragraph 1; figures 12,13	1,2,5

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
- *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.
- *Z* document member of the same patent family

Date of the actual completion of the international search 25 September 2003	Date of mailing of the international search report 01/10/2003
--	--

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 Jacobs, A
--	-------------------------------------

INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 02/35570

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 585 960 A (KATO MASAYUKI ET AL) 17 December 1996 (1996-12-17) column 8, line 6 - line 30; figures 13,19 -----	1
X	US 5 802 222 A (ROTTSCHALK MATTHIAS ET AL) 1 September 1998 (1998-09-01) figures 1,2,9,10,19 column 9, line 58 -column 10, line 14 column 13, line 66 -column 15, line 54 column 17, line 22 -column 18, line 43 column 22, line 2 - line 59	9,10,13, 14,16
A	-----	1
A	FR 2 805 092 A (CORNING INC) 17 August 2001 (2001-08-17) figures 5,9 page 6, line 21 -page 11, line 26 -----	1,20

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 02/35570

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.: 27-36
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:
see FURTHER INFORMATION sheet PCT/ISA/210

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:

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.:

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

Continuation of Box I.2

Claims Nos.: 27-36

The meaning of the claim 27 is obscure. In particular, it is not at all clear what is to be understood by the phrase "interpreting data associated with the image to form a set of regional data", especially the term "regional data", and what "interpreting data" implies. Further, the term "proxels" is obscure. Also, it is unclear what "uniquely associating" the regional data with the proxels defines. Therefore, a lack of clarity within the meaning of Article 6 PCT arises to such an extent as to render a meaningful search of claim 27 and its dependent claims impossible. Consequently, the search has been carried out for those parts of the application which do appear to be sufficiently clear for searching, namely claims 1-26.

The applicant's attention is drawn to the fact that claims, or parts of claims, relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 02/35570

Patent document cited in search report	A	Publication date	Patent family member(s)	Publication date
US 6121983	A	19-09-2000	NONE	
US 5585960	A	17-12-1996	JP 7209594 A	11-08-1995
US 5802222	A	01-09-1998	DE 19503929 A1	08-08-1996
			CA 2187199 A1	15-08-1996
			CN 1146841 A	02-04-1997
			DE 19549395 A1	31-10-1996
			WO 9625009 A1	15-08-1996
			EP 0754392 A1	22-01-1997
			JP 9512353 T	09-12-1997
FR 2805092	A	17-08-2001	FR 2805092 A1	17-08-2001
			US 2001050928 A1	13-12-2001