

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
26 February 2004 (26.02.2004)

PCT

(10) International Publication Number
WO 2004/017101 A3

- (51) International Patent Classification⁷: **G02B 27/02**
- (21) International Application Number:
PCT/US2003/023883
- (22) International Filing Date: 30 July 2003 (30.07.2003)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
10/222,050 16 August 2002 (16.08.2002) US
- (71) Applicant: **INFOCUS CORPORATION** [US/US];
27700 SW Parkway Avenue, Wilsonville, OR 97070 (US).
- (72) Inventor: **GOHMAN, Jeffrey, Alain**; 21525 Ornduff
Road, Hillsboro, OR 97123 (US).
- (74) Agents: **MCCOY, B. Anna** et al.; Kolisch Hartwell, P.C.,
200 Pacific Building, 520 S.W. Yamhill Street, Portland,
OR 97204 (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, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC,
SD, SE, SG, SK, SL, SY, 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, HU, IE, IT, LU, MC, NL, PT, RO,
SE, SI, 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
- (88) Date of publication of the international search report:
12 August 2004
- 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.*



WO 2004/017101 A3

(54) Title: WIDE ANGLE LENS SYSTEM HAVING A DISTORTED INTERMEDIATE IMAGE

(57) Abstract: The wide angle lens system described herein allows projection devices (e.g., rear projection display devices) to be more compact than would otherwise be possible. The lens system includes a wide angle lens stage (450) and relay lens stage (430). When operating as a projection device, the relay lens stage projects a distorted intermediate image located at an intermediate prism (440) to the wide angle lens stage, which projects the image for display. The distortion cause by the relay lens stage compensates (i.e., is approximately equal and opposite) for the distortion caused by the wide angle stage.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US03/23883

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : G02B 27/02
 US CL : 359/434

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)
 U.S. : 359/434,362,433,648-651; 353/30,98,99

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)
 Please See Continuation Sheet

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5,442,413 A (TEJIMA et al) 15 August 1995 (15.08.1995), see entire document.	1,4-33,36-46
A		2,3,34,35

Further documents are listed in the continuation of Box C.

See patent family annex.

* Special categories of cited documents:		"T"
"A"	document defining the general state of the art which is not considered to be of particular relevance	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
"E"	earlier application or patent published on or after the international filing date	"X"
"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)	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
"O"	document referring to an oral disclosure, use, exhibition or other means	"Y"
"P"	document published prior to the international filing date but later than the priority date claimed	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

18 December 2003 (18.12.2003)

Date of mailing of the international search report

11 MAR 2004

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

Authorized officer

Mark A. Robinson

Telephone No. (703) 308-0956

Facsimile No. (703)305-3230

INTERNATIONAL SEARCH REPORT

PCT/US03/23883

Continuation of B. FIELDS SEARCHED Item 3:

BRS

terms: distort\$, intermediate image