

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
6 February 2003 (06.02.2003)

PCT

(10) International Publication Number
WO 2003/010560 A3

(51) International Patent Classification:
G01D 11/28 (2006.01) *G02F 1/335* (2006.01)
G09F 13/00 (2006.01) *G02B 6/00* (2006.01)

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, VN, YU, ZA, ZM, ZW.

(21) International Application Number:
PCT/IL2002/000565

(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).

(22) International Filing Date: 14 July 2002 (14.07.2002)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/307,204 23 July 2001 (23.07.2001) US

Declaration under Rule 4.17:
— *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))*

(71) Applicant and
(72) Inventor: INDITSKY, Ben, Zion [IL/IL]; 3 Nesi'im St., 58322 Holon (IL).

Published:
— *with international search report*

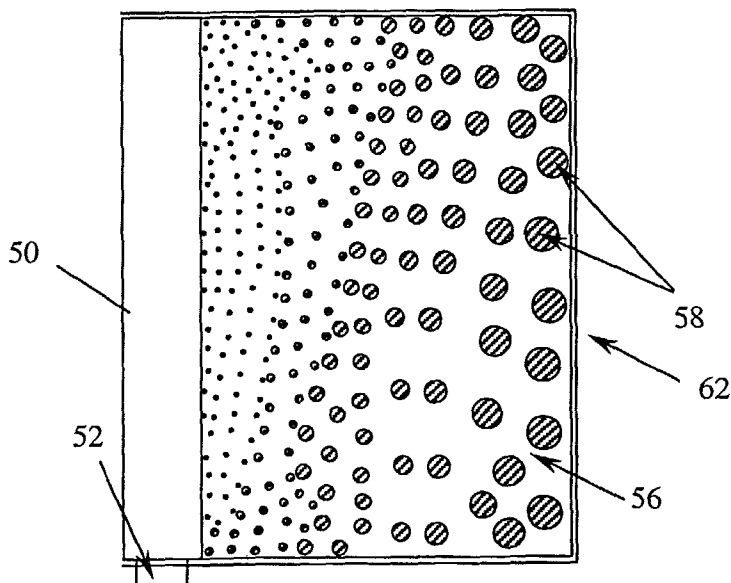
(74) Agent: RECHES, Oren; P.O. Box 913, 42823 Zoran (IL).

(88) Date of publication of the international search report:
24 May 2007

(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,

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: ULTRA THIN RADIATION MANAGEMENT AND DISTRIBUTION SYSTEMS WITH HYBRID OPTICAL WAVEGUIDE



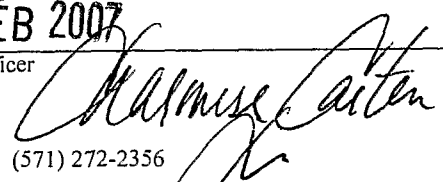
(57) Abstract: A thin-profile, optically efficient lighting device for use with, among other things, flat information displays, includes a combination of three optically coupled light propagating structures, fabricated of electromagnetic flux transmitting materials. The first structure (50) may be a generally elongated optical pipe adapted to receive light from at least one light source (52) such as a light emitting diode. Radiation from additional sources is coupled into the first structure by a second structure which injects the radiation therein. Light injected into the first structure is directed into the third structure (56) where it is redirected so that it propagates out of the third structure uniformly and efficiently and in a direction that is substantially perpendicular to the surface of the third structure. A device can include multiple bodies of any or all three structures.

WO 2003/010560 A3

INTERNATIONAL SEARCH REPORT

International application No.

PCT/IL02/00565

A. CLASSIFICATION OF SUBJECT MATTER		
IPC(7) : G01D 11/28; G09F 13/00; G02F 1/335; G02B 6/00		
US CL : 362/559-61; 385/146		
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. : 362/559-61, 582; 385/146, 147, 901		
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)		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5,359,691 A (TAI et al) 25 October 1994 (25.10.1994), columns 4-5.	1-46
A	US 5,835,661 A (TAI et al) 10 November 1998 (10.11.1998), columns 12-16.	1-46
A	US 6,222,971 B1 (VELIGDAN et al) 24 April 2001 (24.04.2001), columns 2-4.	1-46
A, P	US 6,286,970 B1 (EGWA et al) 11 September 2001 (11.09.2001), columns 7-8.	1-46
<input type="checkbox"/> Further documents are listed in the continuation of Box C. <input type="checkbox"/> 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	"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
"E"	earlier application or patent published on or after the international filing date	"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
"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)	"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
"O"	document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family
"P"	document published prior to the international filing date but later than the priority date claimed	
Date of the actual completion of the international search		Date of mailing of the international search report
16 April 2003 (16.04.2003)		15 FEB 2007
Name and mailing address of the ISA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231		Authorized officer
Facsimile No. (703)305-3230		Jerry T Rahll 
		Telephone No. (571) 272-2356