

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
25 January 2007 (25.01.2007)

PCT

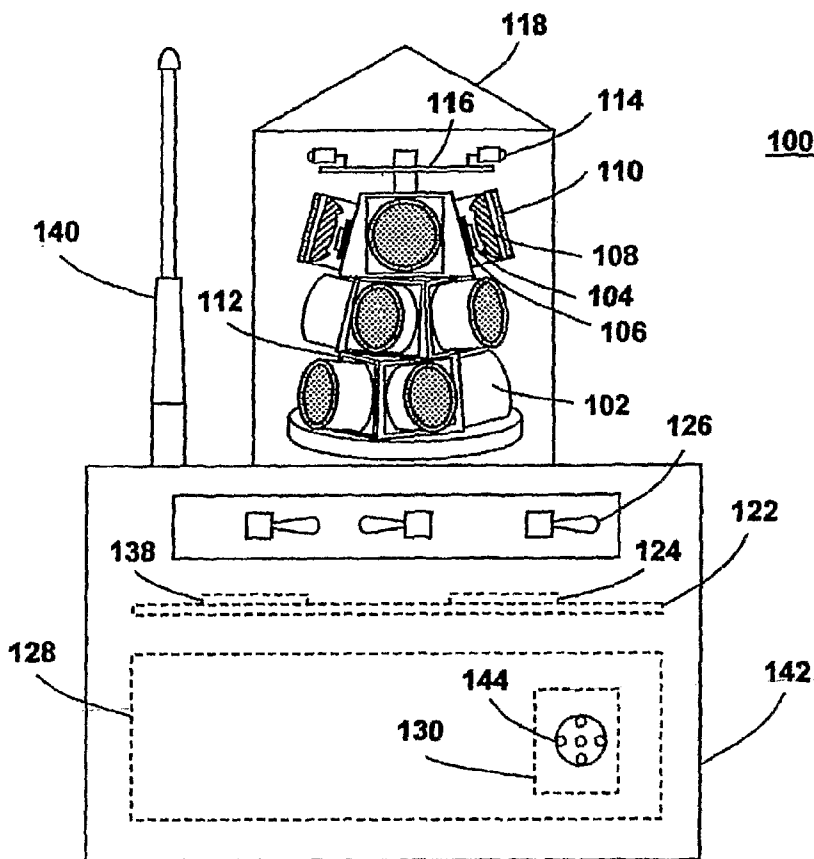
(10) International Publication Number
WO 2007/011852 A3

- (51) International Patent Classification:
F21V 7/04 (2006.01)
- (21) International Application Number:
PCT/US2006/027633
- (22) International Filing Date: 15 July 2006 (15.07.2006)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
60/595,566 15 July 2005 (15.07.2005) US
60/767,489 11 April 2006 (11.04.2006) US
11/457,528 14 July 2006 (14.07.2006) US
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- (81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LV, LY, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SY, 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, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).
- Published:**
— with international search report

[Continued on next page]

(54) Title: NOVEL LIGHTING APPARATUS FOR NAVIGATIONAL AIDS



(57) Abstract: A quickly deployable and reconfigurable light emitting diode (LED) lighting apparatus with high output intensity and precisely controlled beam property is disclosed for navigational aids. The lighting apparatus comprises an array of high intensity LED units with their light beams individually controlled by secondary optical systems. The transformed light beams mix in a pre-determined manner to produce an illumination pattern with desired intensity distribution. The LED lighting apparatus may further comprise a micro-controller, a plurality of sensor elements, and a wireless transceiver for remote monitoring and control. The lighting apparatus can be powered by rechargeable batteries for temporary or semi-permanent lighting. It can also be powered by standard power lines for permanent lighting.



WO 2007/011852 A3



— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*

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.

(88) Date of publication of the international search report:
30 August 2007

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 06/27633

A. CLASSIFICATION OF SUBJECT MATTER

IPC(8) - F21V 7/04 (2007.01)

USPC - 362/555

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)

USPC - 362/555

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

USPC - 362/464, 466, 467, 470, 227; 340/942, 945, 953 (text search - see terms below)

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

PubWEST(USPT,PGPB,EPAB,JPAB); Google Scholar; IEEE Xplore

Search Terms: LED, diffuser, lens, controller, micro-controller, power supply

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2003/0076281 A1 (Morgan et al.) 24 April 2003 (24.04.2003), entire document, especially paragraphs [0120], [0122], [0130], [0215], [0361] and claims 3 and 10	1-4, 6-7, 10-16
----- Y		5, 8, 9
Y	US 2005/0040773 A1 (Lebens et al.) 24 February 2005 (24.02.2005), entire document, especially paragraph [0009]	5
Y	US 6,900,437 B2 (Remillard et al.) 31 May 2005 (31.05.2005), entire document, especially Column 7, Lines 24-4	8, 9
A	US 6,483,254 B2 (Vo et al.) 19 November 2002 (19.11.2002), entire document	1, 16
A	US 2004/0240217 A1 (Rice) 2 December 2004 (02.12.2004), entire document	1, 16

Further documents are listed in the continuation of Box C.

* Special categories of cited documents:	"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
"A" document defining the general state of the art which is not considered to be of particular relevance	"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
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"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 member of the same patent family
"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	

Date of the actual completion of the international search
9 April 2007 (09.04.2007)

Date of mailing of the international search report
10 JUL 2007

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