



- (51) International Patent Classification:
F21V 9/00 (2006.01)
- (21) International Application Number:
PCT/US2012/022351
- (22) International Filing Date:
24 January 2012 (24.01.2012)
- (25) Filing Language:
English
- (26) Publication Language:
English
- (30) Priority Data:
61/439,224 3 February 2011 (03.02.2011) US
13/042,959 8 March 2011 (08.03.2011) US
- (71) Applicant (for all designated States except US): **CREE, INC.** [US/US]; 4600 Silicon Drive, Durham, North Carolina 27703 (US).
- (72) Inventor; and
- (75) Inventor/Applicant (for US only): **CASH, Mark Charles** [US/US]; 10211 Brokers Tip Lane, Apt. 203, Raleigh, North Carolina 27617 (US).

(74) Agent: **SABAPATHYPILLAI, Rohan G.**; MYERS BIGEL SIBLEY & SAJOVEC, P.A., P.O. Box 37428, Raleigh, North Carolina 27627 (US).

(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, QA, RO, RS, RU, RW, 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.

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

[Continued on next page]

(54) Title: LIGHTING APPARATUS PROVIDING INCREASED LUMINOUS FLUX WHILE MAINTAINING COLOR POINT AND CRI

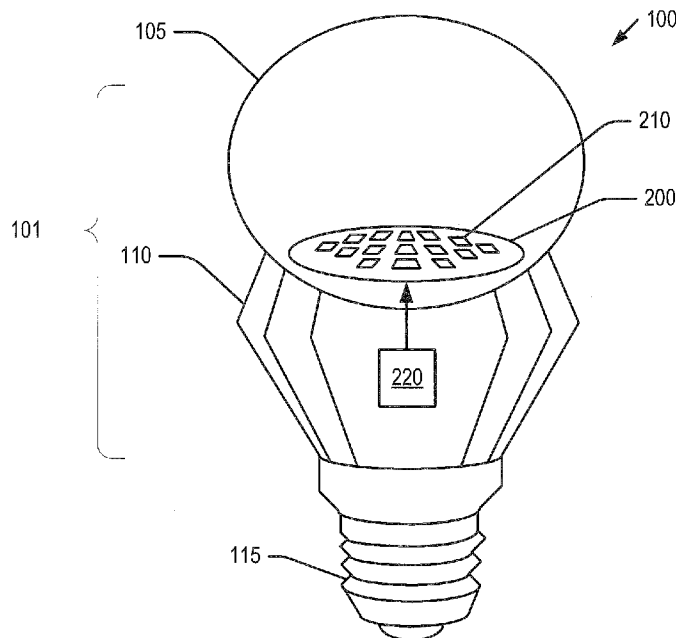


FIGURE 1

(57) Abstract: A lighting module includes a plurality of solid state light emitting components configured to collectively emit light having a desired white point and a color rendering index (CRI) of greater than about 90. The module further includes at least one additional solid state light emitting component configured to individually emit light having a white point substantially similar to the desired white point. The at least one additional light emitting component may increase a lumen output of the lighting module without substantially altering the desired white point of the light collectively emitted by the plurality of light emitting components.





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))*

Published:

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

(88) Date of publication of the international search report:

13 February 2014

INTERNATIONAL SEARCH REPORT		International application No. PCT/US12/22351															
A. CLASSIFICATION OF SUBJECT MATTER IPC: F21V 9/00(2006.01) USPC: 362/231 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. : 362/231																	
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 2010/0001648 A1 (DECLERCQ ET AL) 07 January 2010 (07.01.2010)	1-30															
<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: <table style="width: 100%; border: none;"> <tr> <td style="width: 40%; border: none;">"A" document defining the general state of the art which is not considered to be of particular relevance</td> <td style="width: 10%; border: none; text-align: center;">"T"</td> <td style="border: none;">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</td> </tr> <tr> <td style="border: none;">"E" earlier application or patent published on or after the international filing date</td> <td style="border: none; text-align: center;">"X"</td> <td style="border: none;">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</td> </tr> <tr> <td style="border: none;">"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)</td> <td style="border: none; text-align: center;">"Y"</td> <td style="border: none;">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</td> </tr> <tr> <td style="border: none;">"O" document referring to an oral disclosure, use, exhibition or other means</td> <td style="border: none; text-align: center;">"&"</td> <td style="border: none;">document member of the same patent family</td> </tr> <tr> <td style="border: none;">"P" document published prior to the international filing date but later than the priority date claimed</td> <td style="border: none;"></td> <td style="border: none;"></td> </tr> </table>			"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		
"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 09 December 2013 (09.12.2013)		Date of mailing of the international search report 12 DEC 2013															
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 Facsimile No. (571) 273-3201		Authorized officer Brian Sircus Telephone No. 571-272-2058															