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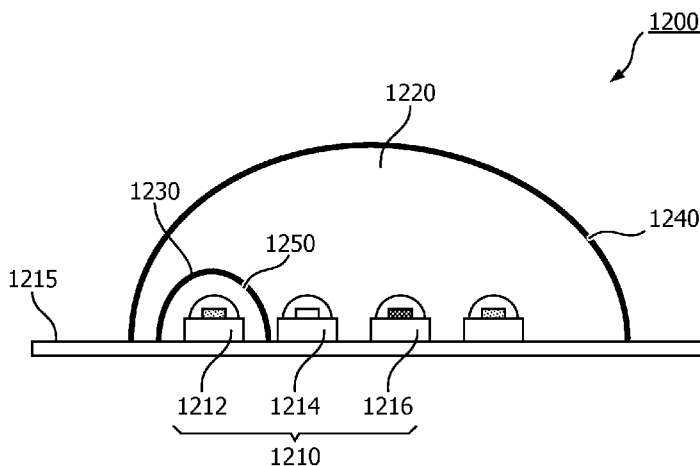
- as to applicant's entitlement to apply for and be granted a  
patent (Rule 4.17(ii))
- as to the applicant's entitlement to claim the priority of the  
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(54) Title: TUNABLE CORRELATED COLOR TEMPERATURE LED-BASED WHITE LIGHT SOURCE WITH MIXING CHAMBER AND REMOTE PHOSPHOR EXIT WINDOW



**FIG. 12**

(57) Abstract: A light source (600) includes: a plurality of LEDs (610), including one or more first LEDs (612) configured to emit first light having a first color, one or more second LEDs (614) configured to emit second light having a second color, and one or more third LEDs (616) configured to emit third light having a third color; a mixing device (620) configured to mix the first light, the second light, and the third light into a mixed light, wherein the mixing device includes an exit window (640) configured such that the mixed light is emitted from the mixing device through the exit window; and a light-conversion material (6300) provided at the exit window, wherein the light-conversion material is configured to convert the first light from the first color to a lime color.



INTERNATIONAL SEARCH REPORT

International application No  
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A. CLASSIFICATION OF SUBJECT MATTER  
INV. H05B33/08  
ADD.

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)  
H05B A61N F21K H01L

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)

EPO-Internal, WPI Data, INSPEC, COMPENDEX, IBM-TDB

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 2008/071206 A1 (INVERTO NV [BE]; DE CLERCQ JOHN [BE]; THIELEMANS ROBBIE [BE]) 19 June 2008 (2008-06-19)	1,2, 4-16,18, 19
Y	the whole document	3,17,20
Y	----- LEI CHEN ET AL: "Light Converting Inorganic Phosphors for White Light-Emitting Diodes", MATERIALS, vol. 3, no. 3, 22 March 2010 (2010-03-22), pages 2172-2195, XP055033041, DOI: 10.3390/ma3032172 abstract page 2173, paragraph 1 - page 2174, paragraph 1 page 2183, paragraph 1 - page 2184, paragraph 1 ----- -/--	3,17,20

Further documents are listed in the continuation of Box C.

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
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## INTERNATIONAL SEARCH REPORT

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C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2008/231214 A1 (KIM DO HYUNG [KR] ET AL) 25 September 2008 (2008-09-25) abstract; figures 2, 15 page 1, paragraph 1 page 3, paragraph 41 - page 4, paragraph 44 page 4, paragraph 71-73 page 8, paragraph 107-111 -----	1-20
A	DE 20 2011 000007 U1 (ZUMTOBEL LIGHTING GMBH [AT]) 5 April 2012 (2012-04-05) the whole document -----	1-20

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No PCT/IB2013/055891
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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2008071206 A1	19-06-2008	AT 469530 T	15-06-2010
		DK 2103187 T3	27-09-2010
		EP 2103187 A1	23-09-2009
		ES 2346569 T3	18-10-2010
		US 2010001648 A1	07-01-2010
		WO 2008071206 A1	19-06-2008
-----			
US 2008231214 A1	25-09-2008	JP 2008235903 A	02-10-2008
		KR 20080085360 A	24-09-2008
		US 2008231214 A1	25-09-2008
-----			
DE 202011000007 U1	05-04-2012	CN 103283021 A	04-09-2013
		DE 202011000007 U1	05-04-2012
		EP 2661772 A1	13-11-2013
		WO 2012093065 A1	12-07-2012
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