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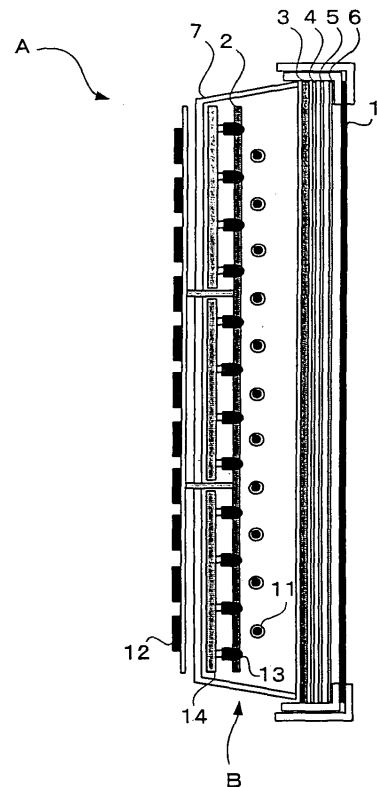
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(54) **Backlight unit and liquid crystal display device**

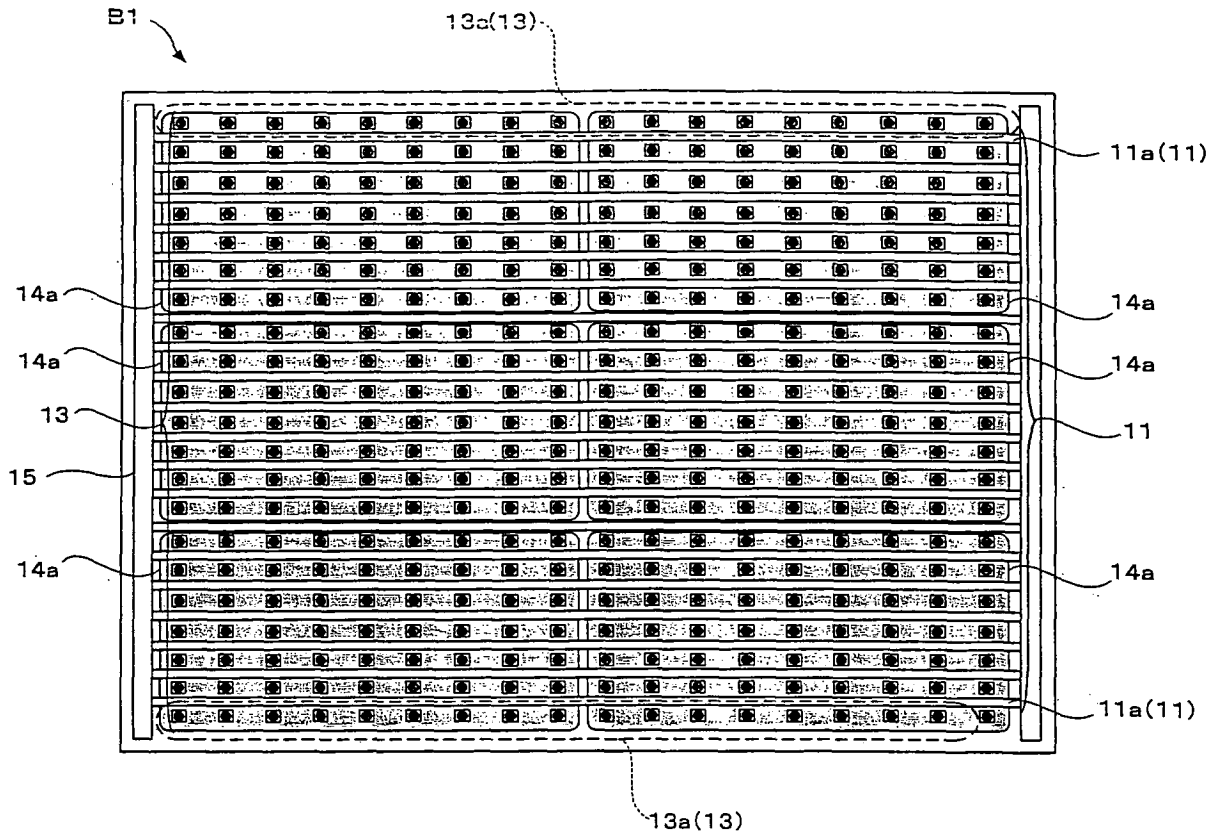
(57) To provide a backlight unit capable of improving color purity of a prescribed emission color as well as obtaining a uniform emission colors in the entire device, and a liquid crystal display device comprising thereof. A backlight unit (B) comprises: a LED (13) for compensating emission intensity of red wavelength light of a fluorescent tube (11), being arranged in between each of a plurality of said fluorescent tubes (11) arrayed in up and down directions, and a LED (13a) for compensating emission intensity of red wavelength light of a fluorescent tube (11a), being arranged in the outside of each of two fluorescent tubes (11a) arranged in the outermost of a plurality of said fluorescent tubes (11).

Fig. 1



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Fig. 4





DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	JP 2002 258281 A (FURUNO ELECTRIC CO) 11 September 2002 (2002-09-11)	1,4,10	INV. G09G3/34
Y	* abstract; figure 7 * * paragraph [0021] - paragraph [0023] *	2,3,5	
X,D	JP 2004 139876 A (SHARP KK) 13 May 2004 (2004-05-13)	1,4,10	
Y	* abstract; figure 7 * * paragraph [0014] - paragraph [0024] * * paragraph [0032] - paragraph [0034] *	2,3,5	
A	JP 2001 135118 A (TOKYO SHIBAURA ELECTRIC CO) 18 May 2001 (2001-05-18) * abstract *	1-5,10	
A	US 2005/140636 A1 (CHUNG IN J [KR] ET AL) 30 June 2005 (2005-06-30) * abstract; figure 7 *	1-5,10	
			TECHNICAL FIELDS SEARCHED (IPC)
			G09G
-The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 1 May 2007	Examiner Wolfrum, Georg
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

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EPO FORM 1503 03.82 (P04C01)

**CLAIMS INCURRING FEES**

The present European patent application comprised at the time of filing more than ten claims.

- Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims and for those claims for which claims fees have been paid, namely claim(s):
- No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims.

LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

- All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.
- As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.
- Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:
- None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:

1-5, 10



The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. claims: 1-5,10

A backlight unit comprising a first compensating light source for compensating emission intensity of a prescribed wavelength light of a fluorescent tube, being arranged in between each of a plurality of said fluorescent tubes arrayed in a prescribed direction, wherein said backlight unit further comprises a second compensating light source for compensating emission intensity of a prescribed wavelength light of said fluorescent tube, being arranged in the outside of each of two fluorescent tubes arranged in the outermost of said plurality of fluorescent tubes, wherein emission intensity of said second compensating light source is lower than emission intensity of said first compensating light source.

2. claims: 6-9

A backlight unit comprising a first compensating light source for compensating emission intensity of a prescribed wavelength light of a fluorescent tube, being arranged in between each of a plurality of said fluorescent tubes arrayed in a prescribed direction, wherein said backlight unit further comprises a second compensating light source for compensating emission intensity of a prescribed wavelength light of said fluorescent tube, being arranged in the outside of each of two fluorescent tubes arranged in the outermost of said plurality of fluorescent tubes, wherein said first compensating light source and/or said second compensating light source have a plurality of light-emitting elements arrayed in the longitudinal direction of said fluorescent tube, wherein a light source substrate in which said first and second compensating light sources are mounted is constituted to include a plurality of segmented substrates segmented in an array direction of said fluorescent tubes, wherein said light-emitting elements are arrayed in a zigzag manner in said segmented substrate and wherein said light-emitting elements are arrayed so as to be arranged not in the both ends of one diagonal line in said segmented substrate but in the both ends of the other diagonal line in said segmented substrate.

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 06 01 8693

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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01-05-2007

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
JP 2002258281	A	11-09-2002	NONE	
JP 2004139876	A	13-05-2004	JP 3935045 B2	20-06-2007
JP 2001135118	A	18-05-2001	NONE	
US 2005140636	A1	30-06-2005	CN 1637825 A	13-07-2005
			JP 2005196110 A	21-07-2005
			KR 20050070193 A	07-07-2005

专利名称(译)	背光单元和液晶显示装置		
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CPC分类号	G09G3/3413 G09G2310/0221 G09G2320/0242		
优先权	2005257718 2005-09-06 JP		
其他公开文献	EP1760686A2		
外部链接	Espacenet		

摘要(译)

提供一种能够改善规定发光颜色的色纯度以及在整个装置中获得均匀发光颜色的背光单元，以及包括该背光单元的液晶显示装置。背光单元 (B) 包括：LED (13)，用于补偿荧光管 (11) 的红色波长光的发射强度，布置在沿上下方向排列的多个所述荧光管 (11) 中的每一个之间用于补偿荧光管 (11a) 的红色波长光的发射强度的LED (13a)，布置在布置在多个所述荧光管 (11) 的最外侧的两个荧光管 (11a) 的每一个的外侧。)。

Fig. 1

