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(71) Applicant: **Sony Corporation**
Minato-ku
Tokyo 108-0075 (JP)

(72) Inventors:
- **Oku, Takashi**
  Tokoy 108-0075 (JP)
- **Kobayashi, Naoto**
  Tokoy 108-0075 (JP)
- **Uba, Tomohisa**
  Tokoy 108-0075 (JP)

(74) Representative: **Müller - Hoffmann & Partner Patentanwälte,**
Innere Wiener Strasse 17
81667 München (DE)

(54) Light source apparatus, backlight apparatus, liquid crystal display apparatus, and manufacturing method of the backlight apparatus

(57) A light source apparatus (20) used in a backlight apparatus (10) is disclosed. The light source apparatus includes a plurality of light-emitting diode units (25) on a wiring board (22). Each light-emitting diode unit (25) is formed by light-emitting diodes (21) of red, green, and blue colors closely placed in a cross-shaped arrangement, at least the light-emitting diode of one color (e.g. green) out of the light-emitting diodes of the three colors being constituted by first and second light-emitting diodes having different chromaticities such that an average chromaticity of the first and second light-emitting diodes equals a predetermined chromaticity. On the wiring board (22), a plurality of light-emitting diode units (25) are arranged at predetermined intervals in a predetermined direction.

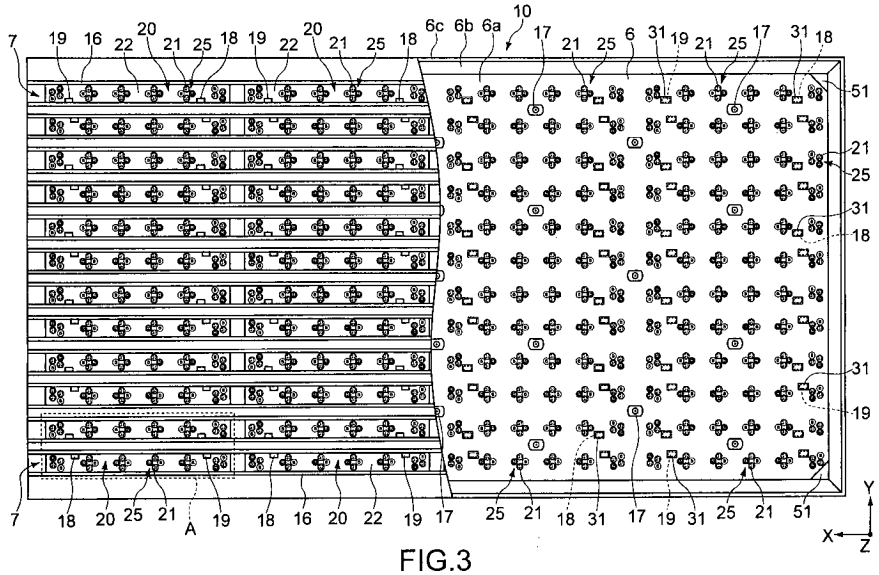

FIG.3

EP 1 925 971 A3

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EUROPEAN SEARCH REPORT

Application Number
EP 07 02 1651

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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	23 June 2008	Cossu, Alessandro

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

EPO FORM 1503 03.82 (P04C01)

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EUROPEAN SEARCH REPORT

Application Number
EP 07 02 1651

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
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Application Number
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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:

☐ The present supplementary 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 (Rule 164 (1) EPC).

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LACK OF UNITY OF INVENTION
SHEET B

Application Number
EP 07 02 1651

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: 1-5,7-8,13-14

The first group of claims is directed to a light source apparatus for use in a back-light, a back-light apparatus comprising the light source, a method of fabricating the back-light and a liquid crystal display apparatus incorporating the back-light.
The light source apparatus comprises a wiring board on which a plurality of light-emitting diode units are arranged, wherein each light-emitting diode unit is formed of a red, a green and a blue light-emitting diode, at least the light-emitting diodes of one among these three colours being constituted by a first and a second sub-diode, wherein the sub-diodes have a different chromaticity such that their average chromaticity equals a predetermined value.

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2. claims: 6,9-12

The second group of claims is directed to a light source apparatus for use in a back-light and a back-light apparatus comprising the light source.
The light source apparatus comprises a wiring board on which a plurality of light-emitting diode units are arranged, wherein each light-emitting diode unit is formed of a red, a green and a blue light-emitting diode, at least the light-emitting diodes of one among these three colours being constituted by a first and a second sub-diode, wherein the sub-diodes have a different luminance such that their average luminance equals a predetermined value.

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3. claims: 15-16

The third group of claims is directed to a back-light apparatus and a liquid crystal display apparatus incorporating the back-light. The back-light comprises a light source having a plurality of light-emitting diodes, a reflector plate covering the light source and provided with openings to expose the light-emitting diodes, wherein the reflector plate reflects light emitted from the diodes and has a reflectivity lowering section at its periphery allowing the reflectivity of the emitted light to be lowered.

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 07 02 1651

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
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

23-06-2008

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EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

专利名称(译)	光源装置，背光装置，液晶显示装置和背光装置的制造方法		
公开(公告)号	EP1925971A3	公开(公告)日	2008-08-06
申请号	EP2007021651	申请日	2007-11-07
[标]申请(专利权)人(译)	索尼公司		
申请(专利权)人(译)	索尼公司		
当前申请(专利权)人(译)	SATURN Licensing LLC的		
[标]发明人	OKU TAKASHI KOBAYASHI NAOTO UBA TOMOHISA		
发明人	OKU, TAKASHI KOBAYASHI, NAOTO UBA, TOMOHISA		
IPC分类号	G02F1/13357 H01L27/15 H01L33/60		
CPC分类号	G02F1/133609 G02F1/133603 G02F2001/133613		
优先权	2006314640 2006-11-21 JP		
其他公开文献	EP1925971A2		
外部链接	Espacenet		

摘要(译)

公开了一种用于背光装置（10）的光源装置（20）。光源装置包括在布线板（22）上的多个发光二极管单元（25）。每个发光二极管单元（25）由紧密排列成十字形排列的红色，绿色和蓝色发光二极管（21）形成，至少一种颜色的发光二极管（例如绿色）三种颜色的发光二极管中的一种由具有不同色度的第一和第二发光二极管构成，使得第一和第二发光二极管的平均色度等于预定的色度。在布线板（22）上，多个发光二极管单元（25）以预定间隔沿预定方向布置。

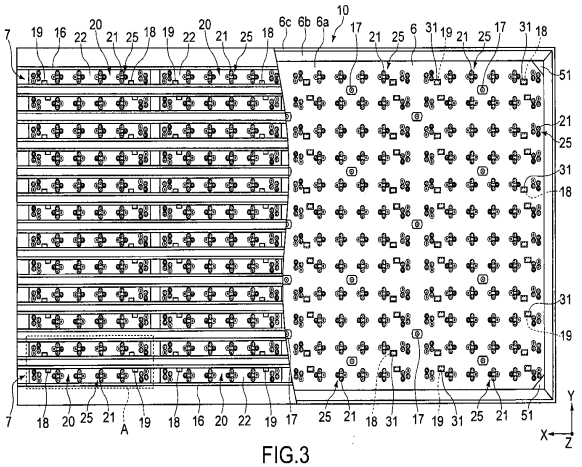

FIG.3