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(71) Applicant: **GENERAL ELECTRIC COMPANY**
Schenectady, NY 12345 (US)

(72) Inventors:
- **Duggal, Anil Raj**
  Niskayuna,
  New York 12309 (US)
- **Srivastava, Alok Mani**
  Niskayuna,
  New York 12309 (US)

(74) Representative: **Szary, Anne Catherine et al**
London Patent Operation
General Electric International, Inc.
15 John Adam Street
London WC2N 6LU (GB)

(54) Luminescent display and method of making

(57) The invention relates to a luminescent display (100) comprising a first electrode (120), a second electrode (130), an organic light emitting layer (110) disposed between the first (120) and second electrodes (130), and a luminescent material (160) which receives light from the organic light emitting layer (110) and converts the light to a different wavelength, wherein the first (120) and second electrodes (130) together define an overlap region in which the organic light emitting layer (110) is activated to emit light, and the luminescent material (160) is disposed in a portion of the overlap region. The invention also relates to a method comprising the steps of creating an image and printing the image on a light emitting device comprising an organic light emitting layer after the light emitting device has been formed. The image may be created, for example on a personal computer, and printed with an inkjet printer. The image may be printed in phosphors which emit light of one wavelength upon absorbing light of a different wavelength from the organic light emitting layer.

Various embodiments of the invention allow customized luminescent displays to be easily fabricated by end users by applying a phosphor pattern to a preformed, encapsulated light emitting device.

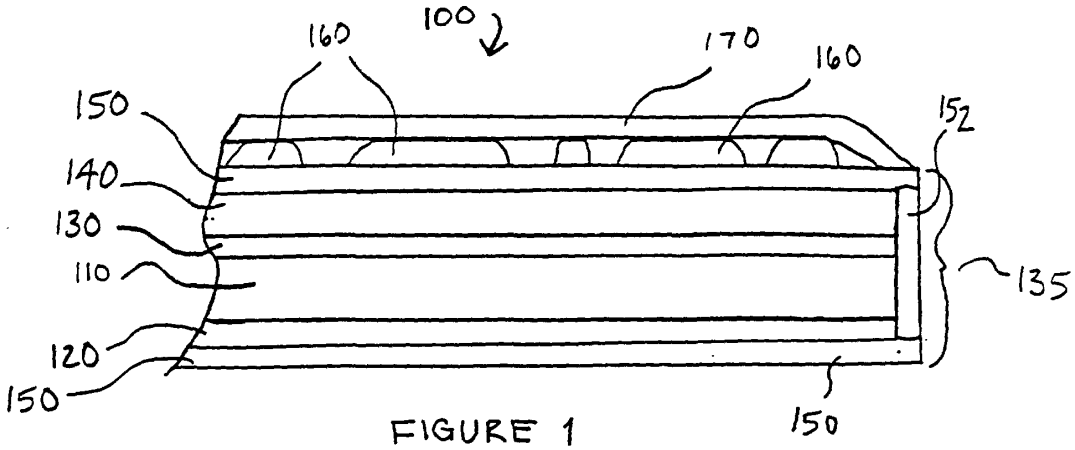

FIGURE 1

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EUROPEAN SEARCH REPORT

Application Number
EP 00 31 1246

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
The Hague	24 February 2006	Bakos, T

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 00 31 1246

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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TECHNICAL FIELDS SEARCHED (IPC)

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	24 February 2006	Bakos, T

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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& : member of the same patent family, corresponding document

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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:

European Patent Office

LACK OF UNITY OF INVENTION
SHEET B

Application Number
EP 00 31 1246

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: 1-14,22-25

   apparatus comprising an OLED and a wavelength downconversion luminescent layer and method of making the same

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2. claims: 15-19

   apparatus comprising a printer cartridge with phosphor in solution

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3. claims: 20,21

   apparatus comprising means for applying the phosphor on the OLED

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4. claims: 26-33

   method for creating an image and printing it on an OLED

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 00 31 1246

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.

24-02-2006

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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 00 31 1246

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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)	发光显示器和制造方法		
公开(公告)号	EP1111966A3	公开(公告)日	2006-04-19
申请号	EP2000311246	申请日	2000-12-15
[标]申请(专利权)人(译)	通用电气公司		
申请(专利权)人(译)	通用电气公司		
当前申请(专利权)人(译)	通用电气公司		
[标]发明人	DUGGAL ANIL RAJ SRIVASTAVA ALOK MANI		
发明人	DUGGAL, ANIL RAJ SRIVASTAVA, ALOK MANI		
IPC分类号	H05B33/14 H05B33/22 H05B33/12 H01L51/00 G09F13/22 B41J2/175 C09D11/02 H01L31/12 C09D11/00 G09F13/42 H01L27/32 H01L51/30 H01L51/40 H01L51/50 H01L51/52 H01L51/56 H05B33/02 H05B33/04 H05B33/10		
CPC分类号	H01L51/56 C09D11/328 G09F13/22 H01L27/3204 H01L27/3211 H01L27/322 H01L27/3239 H01L51/0005 H01L51/0037 H01L51/0042 H01L51/0059 H01L51/0062 H01L51/007 H01L51/0081 H01L51/5203 H01L51/5253 H01L2221/68359 H01L2251/5361 H01L2251/564 H05B33/12 H05B33/14 H05B33/22		
优先权	09/469702 1999-12-22 US		
其他公开文献	EP1111966A2		
外部链接	Espacenet		

摘要(译)

本发明涉及一种发光显示器，包括第一电极，第二电极，设置在第一和第二电极之间的有机发光层，以及接收来自有机发光层的光并将光转换成不同波长的发光材料。其中第一和第二电极一起限定重叠区域，其中有机发光层被激活以发光，并且发光材料设置在重叠区域的一部分中。本发明还涉及一种方法，该方法包括以下步骤：在形成发光器件之后，在包括有机发光层的发光器件上产生图像并印刷图像。可以例如在个人计算机上创建图像，并用喷墨打印机打印。图像可以以磷光体印刷，该磷光体在吸收与有机发光层不同波长的光时发射一种波长的光。本发明的各种实施例允许最终用户通过将磷光体图案应用于预先形成的封装的发光器件而容易地制造定制的发光显示器。

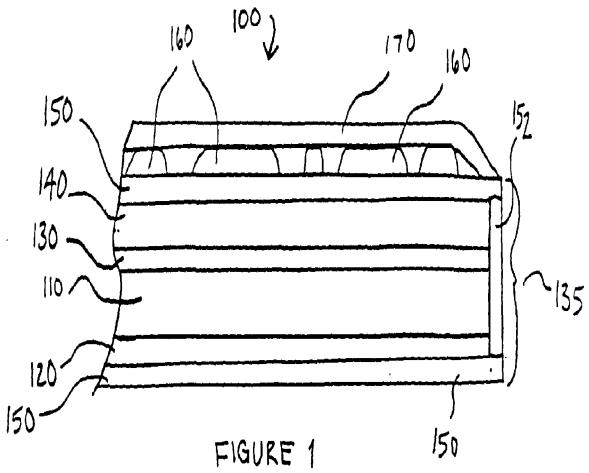

FIGURE 1