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(54) Organic electro-luminescence display device and fabricating method thereof

Organische elektrolumineszente Anzeigevorrichtung und Herstellungsverfahren

Dispositif d'affichage électroluminescent organique et méthode de fabrication

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Description

[0001] This application claims the benefit of Korean Patent Application No. P2009-43716 filed in Korea on June 14, 2004, which is hereby incorporated by reference

BACKGROUND OF THE INVENTION

FIELD OF THE INVENTION

[0002] This invention relates to an organic electro luminescence display device, and more particularly to an organic electro luminescence display device that is adaptive for improving luminous brightness and reducing power consumption, and a fabricating method thereof.

DESCRIPTION OF THE RELATED ART

[0003] Recently, there have been developed a variety of flat panel display devices that can reduce their weight and size, which are a disadvantage of a cathode ray tube CRT. The flat panel display device includes a liquid crystal display LCD, a field emission display FED, a plasma display panel PDP and an electro luminescence EL display device. Particularly, the EL display device has electrodes stuck to both of the sides of an organic light emitting layer basically composed of a hole transport layer, a light emitting layer and an electron transport layer, and becomes the center of attention as a next generation flat panel display device because or its characteristics such as wide viewing angle, high aperture ratio and high chromaticity.

[0004] The EL display device is largely divided into an inorganic EL display device and an organic EL display device in accordance with a material used. In the organic EL display device, electrons and holes form a pair and then become extinct to emit light if electric charges are injected into an organic EL layer which is formed between a hole injection electrode and an electron injection electrode, thus there is an advantage in that it can be driven at a lower voltage than the inorganic EL display device. Further, the organic EL display device can drive at a low voltage of not greater than 10V in comparison with the PDP or the inorganic ELD as well as forming the device on a flexible transparent substrate like plastics, and its power consumption is relative low and its color impression is excellent.

[0005] FIG. 1 is a perspective view representing a related art organic EL display device, and FIG. 2 is a sectional diagram representing the organic EL display device shown in FIG. 1, taken along the line " I-I'

[0006] The organic EL display device shown in FIGs. 1 and 2 has an anode electrode 4 and a cathode electrode formed in a direction of crossing each other on a substrate 2.

[0007] A plurality of anode electrodes 4 is formed to be separate from one another with a designated distance therebetween. An insulating film 6 having a hollow part for each EL cell (p) area is formed on the substrate 2 where the anode electrode 4 is formed. A barrier rib 8 is located on the insulating film 6, wherein the barrier rib separates an organic light emitting layer 10 and the cathode electrode 12 which are to be formed on the insulating film 6. The barrier rib 8 is formed in a direction of traversing the anode electrode 4 and has a reverse taper structure that an upper part has a wider width than a lower part. The organic light emitting layer 10 and the cathode electrode 12 composed of an organic compound are sequentially deposited on the whole surface of the insulating film where the barrier rib 8 is formed. The organic light emitting layer 10 is formed by depositing a hole related layer 10A inclusive of a hole injection layer and a hole transport layer; a light emitting layer 10C to realize color; and an electron related layer 10E inclusive of an electron transport layer and an electron injection layer.

[0008] In the organic EL display device, if a voltage is applied to the anode electrode 4 and the cathode electrode 12, the electron generated at the cathode electrode 12 moves to the light emitting layer 10C through the electron related layer 10E. Further, the holes generated at the anode electrode 4 moves to the light emitting layer 10C through the hole related layer 10A. Accordingly, in the light emitting layer 10C, the electron and the hole supplied from the electron related layer 10E and the hole related layer 10A are recombined to form an exiton, and the exiton is excited again to a ground state, thus a light of a fixed energy is emitted to the outside through the anode electrode 4.

[0009] The organic EL display device with such a configuration has the incident light from the outside almost completely transmitted through the anode electrode 4 and the organic light emitting layer 10. As a result, when the light is not emitted from the organic light emitting layer 10, an external light 40 which is incident from the surface of the substrate 2 is transmitted through the organic light emitting layer 10 and the anode electrode 4 of a transparent conductive material, and it is reflected by the cathode electrode 12 of a metal electrode, as shown in FIG. 3A. Accordingly, there is a problem in that the contrast ratio is deteriorated. In order to solve the problem, as shown in FIG. 3B, a reflection protective film 30 is used. The reflection protective film 30 is stuck to the substrate 2 of the organic EL display device to intercept the external light 40 from being emitted out of the organic EL display device by being reflected after the external light 40 is irradiated from the outside. Herein, the reflection protective film 30 includes a polarizer 30A which transmits a specific linear polarized light out of the external light 40 and intercepts the other polarization component, and a lambda /4 phase difference plate 30B for converting the linear polarized light into a circular polarized light.

[0010] However, the contrast ratio can be improved if such a polarizer 30A is used, but the transmittance cannot be over 50% due to the optical characteristics of the polarizer 30A in case that a polarization ratio is not less than 99%, thus a brightness loss of not less than 50% is

generated in the organic EL display panel. Accordingly, there arises a problem that the power consumption should be increased to get a desired brightness in the organic EL display device.

[0011] US 2001/024083 A1 describes a light-emitting apparatus including anodes on an insulator, cathodes orthogonal to the anodes, EL layers interposed between the anode and the cathodes, and auxiliary wirings which are electrically connected to the anodes and are non-transparent with respect to the visible light.

[0012] US 2003/218421 A1 describes an organic electroluminescent (EL) device comprising a first electrode formed on a substrate, a heat dissipation layer formed on the first electrode, wherein the heat dissipation layer comprises a plurality of contact windows exposing portions of the first electrode, an organic layer formed to cross the heat dissipation layer partially, covering the exposed portions of the contact windows to contact the first electrode, and a second electrode formed on the organic layer.

[0013] US 2005/116629 A1 describes an organic EL display panel including a plurality of anodes formed on a substrate, a plurality of auxiliary electrodes held in electrical contact with the anodes, an anode separator covering each auxiliary electrode and a part of the anodes, a plurality of organic EL strips formed to cover the anode separator, a plurality of cathodes layered over the organic El strips and extending to cross the anodes, and a plurality of cathode separators separating among the cathodes and extending to cross the anodes.

[0014] US 2003/096197 A1 describes a method for manufacturing an organic electroluminescence device wherein, at first, a transparent metal film is deposited on a transparent substrate. Then, the transparent metal film is wet-etched to form anodes respectively having a transverse section whose side profiles are tapered at an angle between 70 and 90 degrees. Thereafter, an organic layer is formed on the anodes and on the substrate, and then cathodes are formed on the organic layer.

[0015] EP 1107335 A2 describes an organic electroluminescent display device comprising a pair of electrodes and at least one organic layer interposed between the electrodes, wherein a metal electrode is formed and positioned in such a way as to cover an ITO pattern that is the transparent electrode and provided with an opening at a pixel-defining site, and an insulating layer is formed in such a way to cover these parts, wherein the insulating layer, in an ITO site defining the pixel area, has an opening slightly smaller than the metal electrode.

[0016] JP 2001/043981 A describes a display element including a guide electrode which is formed on a base electrode at both sides of an opening and which is covered by an insulating layer, wherein the boundary lines of the guide electrode and of the insulating layer on the same, such that the opening exposes parts of the base electrode.

SUMMARY OF THE INVENTION

[0017] Accordingly, it is an object of the present invention to provide an organic electro luminescence display device that is adaptive for improving luminous brightness and reducing power consumption, and a fabricating method thereof.

[0018] In order to achieve these and other objects of the invention, an organic electro luminescence display device according to an aspect of the present invention comprises the features of claim 1.

[0019] A fabricating method of an organic electro luminescence display device according to another aspect of the present invention comprises the features of claim 4.

[0020] Preferred embodiments of the invention are disclosed in the dependent claims.

BRIEF DESCRIPTION OF THE DRAWINGS

[0021] These and other objects of the invention will be apparent from the following detailed description of the embodiments of the present invention with reference to the accompanying drawings, in which:

FIG. 1 is a diagram briefly representing a related art organic EL display device;

FIG. 2 illustrates a sectional diagram taken along the line "I-I' " of FIG. 1;

FIG. 3A is a diagram for explaining a reflection by an external light of the organic EL display device;

FIG. 3B is a diagram for explaining a reflection protective film which is to prevent the reflection by the external light;

FIG. 4 is a diagram briefly representing an organic EL display device according to the present invention;

FIG. 5 is a diagram specifically representing a conductive light shielding film shown in FIG. 4; and

FIGs. 6A to 6D are diagrams representing a fabricating method of the organic EL display device shown in FIG. 4, step by step.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0022] There will be described in detail an organic electro luminescence display device according to the present invention in reference to the accompanying drawings.

[0023] Hereinafter, the preferred embodiments of the present invention will be described in detail with reference to FIGs. 4 to 6D.

[0024] FIG. 4 is a sectional diagram representing an organic EL display device according to the present invention.

[0025] The organic EL display device shown in FIG. 4 includes an anode electrode 104 and a cathode electrode 112 which are formed on a substrate 102 to cross each other with an organic light emitting layer 110; a barrier rib (not shown) formed to cross the anode electrode and

to be in parallel to the cathode electrode 112; a conductive light shielding film 106 which defines a light emitting area on the anode electrode 104 and intercepts an external light; and an insulating film 107 formed to cover the conductive light shielding film 106 and defining the light emitting area.

[0026] A plurality of anode electrodes 104 are formed on the substrate 102 in a stripe shape, and each of them is separated from one another with a designated distance therebetween. The barrier rib (not shown) is formed in a direction of traversing the anode electrode 4, and has a reverse taper structure that an upper part has a wider width than a lower part. The organic light emitting layer 110 is formed by depositing a hole related layer 110A inclusive of a hole injection layer and a hole transport layer; a light emitting layer 110C to realize color; and an electron related layer 110E inclusive of an electron transport layer and an electron injection layer.

[0027] The conductive light shielding film 106 partially exposes the anode electrode 104 to def ine a light emitting area, and intercepts and absorbs the external light, thereby acting to improve the contrast ratio of the device.

[0028] Further, the light shielding film 106 is formed of a conductive material, thereby improving the conductivity of the anode electrode 104.

[0029] To describe this more particularly, it is as follows.

[0030] The conductive light shielding film 106, as shown in FIG. 5, is formed with a wider width than the anode electrode to cover the anode electrode and has a hollow part 106A which exposes the anode electrode 104 partially. Further, the conductive light shielding film 106 is electrically separated from each other so that no conduction is made between the anode electrodes 104.

[0031] The conductive light shielding film 106 is formed of an opaque conductive material, thereby acting to intercept or absorb the external light which is incident by passing through the transparent substrate 102 and the anode electrode 104. Accordingly, the polarizer is not required in comparison with the related art, thus the transmittance increases when the device emits light, thereby increasing the brightness and enabling to reduce the power consumption.

[0032] Further, the conductive light shielding film 106 is formed of a conductive material, thus the conductive light shielding film 106 acts to improve the conductivity of the anode electrode 104 which is formed of a transparent electrode material. Accordingly, the voltage required in the anode electrode 104 is lowered to reduce the power consumption. Herein, the material of the conductive shielding film 106 is metal such as chrome Cr, molybdenum Mo, aluminum Al, nickel Ni, copper Cu, silver Ag, gold Au, indium In, tin Sn, zinc Zn and so on, or their compound.

[0033] In the organic EL display device, if a voltage is applied to the anode electrode 104 and the cathode electrode 112, the electrons generated at the cathode electrode 112 moves to the light emitting layer 10C through the electron related layer 110E. Further, the holes generated at the anode electrode 104 moves to the light emitting layer 110C through the hole related layer 110A. Accordingly, in the light emitting layer 110C, an exiton is formed by recombination of the electron and the hole which are supplied from the electron related layer 110E and the hole related layer 110A, and the exiton is excited again to a ground state to emit the light of a fixed energy to the outside through the anode electrode 104.

[0034] Hereinafter, in reference to FIGs. 6A to 6D, the fabricating method of the organic EL display device according to the present invention will be explained as follows.

[0035] Firstly, after a transparent conductive metal material is deposited on the substrate 102 which is formed by use of a sodalime or a tempered glass, the transparent conductive metal material is patterned by a photolithography process and an etching process, thereby forming the anode electrode 104, as shown in FIG. 6A. Herein, the metal material is of indium tin oxide ITO or Sn02.

[0036] An opaque conductive metal material is deposited on the substrate where the anode electrode 104 is formed, the opaque conductive metal material is patterned by the photolithography process and the etching process, thus the conductive light shielding film 106, as shown in FIG. 6B, is formed with a wider width than the anode electrode 104 to cover the anode electrode 104 and has the hollow part 106A which partially exposes the anode electrode 104. Herein, the opaque conductive metal material is metal such as chrome Cr, molybdenum Mo, aluminum Al, nickel Ni, copper Cu, silver Ag, gold Au, indium In, tin Sn, zinc Zn and so on, or their compound. And, the conductive light shielding film formed to cover each of the anode electrodes 104 is electrically separated.

[0037] After a photosensitive organic material is deposited on the substrate 102 where the conductive light shielding film 106 is formed, the photosensitive organic material is patterned by the photolithography process and so on, thereby forming an insulating film 107. And then, after a photosensitive organic material is deposited, the photosensitive organic material is patterned by the photolithography process, thereby forming a barrier rib, (not shown).

[0038] An organic light emitting layer 110, as shown in FIG. 6C, is formed on the substrate 102 where the barrier rib is formed, by a deposition method such as thermal deposition, vacuum deposition and so on using a common mask and a metal (or shadow) mask.

[0039] A metal material is deposited on the substrate 102 where the organic light emitting layer 110 is formed, thereby forming the cathode electrode 112, as shown in FIG. 6D.

[0040] In this way, the organic EL display device and the fabricating method thereof according to the present invention has the related art reflection protective film removed and the conductive light shielding film 106 formed. Accordingly, the light transmittance is improved when the

device emits light, thereby increasing the brightness.

[0041] Further, the conductive light shielding film 106 is formed of a material with conductivity to improve the conductivity of the anode electrode 104. Accordingly, the voltage applied to the anode electrode 104 is lowered, thereby enabling to reduce the power consumption.

[0042] As described above, the organic EL display device and the fabricating method thereof according to the present invention has the related art reflection protective film removed and forms the conductive light shielding film, thereby improving the brightness and reducing the power consumption.

Claims

1. An organic electro luminescence display device, comprising:

   a plurality of anode electrodes (104) formed on a substrate (102);
   a plurality of conductive light shielding films (106) which have conductivity and intercept and absorb the external light and are formed on the anode electrodes (104) in a separate pattern so that the anode electrodes (104) are insulated from one another, wherein each of the conductive light shielding films (106) is formed with a wider width than the anode electrodes (104) to cover the anode electrodes (104), and each of the conductive light shielding films (106) has a first hollow part that partially exposes the anode electrode (104) and defines a light emitting area;
   an insulating layer (107) formed on the conductive light shielding films (106) and the substrate (102) exposed between the conductive light shielding films (106) formed in the separate pattern, and having second hollow parts corresponding to the first hollow parts; and
   a plurality of light emitting layers (110) formed on the anode electrodes (104) exposed by the first hollow parts and the second hollow parts; **characterized in that** the plurality of light emitting layers are formed within the first hollow parts and the second hollow parts without a gap between the organic light emitting layer (110) and the conductive light shielding films (106) and the insulating layer (107),
   wherein a width of the first hollow part is the same as the width of the second hollow part.

2. The organic electro luminescence display device according to claim 1, further comprising:

   a barrier rib formed to cross the anode electrodes (104); and
   a cathode electrode (112) formed to cross the anode electrodes (104) with the organic light emitting layer (110) therebetween.

3. The organic electro luminescence display device according to claim 1, wherein the conductive light shielding films (106) include an opaque material.

4. A fabricating method of an organic electro luminescence display device, comprising the step of:

   forming a plurality of anode electrodes (104) on a substrate (102);
   forming a plurality of conductive light shielding films (106) on the anode electrodes (104) in a separate pattern, wherein each of the conductive light shielding films (106) has conductivity, intercepts and absorbs the external light and keeps the anode electrodes (104) insulated from one another, and is formed with a wider width than the anode electrodes (104) to cover the anode electrodes (104), and each of the conductive light shielding films (106) has a first hollow part that partially exposes the anode electrode (104);
   forming an insulating layer (107) on the conductive light shielding films (106) and the substrate (102) exposed between the conductive light shielding films (106) formed in the separate pattern, and having second hollow parts corresponding to the first hollow parts; **characterized in that** the fabricating method further comprises the step of
   forming an organic light emitting layer (110) on the anode electrodes (104) exposed by the first hollow parts and the second hollow parts to be disposed within the first hollow parts and the second hollow parts without a gap between the organic light emitting layer (110) and the conductive light shielding films (106) and the insulating layer (107),
   wherein a width of the first hollow part is the same as the width of the second hollow part.

5. The fabricating method according to claim 4, further comprising the steps of:

   forming a barrier rib to cross the anode electrodes (104) ; and
   forming a cathode electrode (112) to cross the anode electrodes (104) with the organic light emitting layer (110) therebetween.

6. The fabricating method according to claim 4, wherein the conductive light shielding films (106) include an opaque material.

Patentansprüche

1. Eine organische Elektrolumineszenz-Anzeigevorrichtung, aufweisend:

• eine Vielzahl von Anodenelektroden (104), welche auf einem Substrat (102) gebildet sind;
• eine Vielzahl von leitfähigen Lichtabschirmschichten (106), welche eine Leitfähigkeit aufweisen und das externe Licht abfangen sowie absorbieren, und welche auf den Anodenelektroden (104) in einem getrennten Muster gebildet sind, so dass die Anodenelektroden (104) voneinander isoliert sind, wobei jede der leitfähigen Lichtabschirmschichten (106) zum Abdecken der Anodenelektroden (104) mit einer größeren Breite als die Anodenelektroden (104) gebildet ist und jede der leitfähigen Lichtabschirmschichten (106) eine erste Aussparung aufweist, welche die Anodenelektrode (104) teilweise freilegt und einen Lichtemissionsbereich definiert;
• eine Isolierschicht (107), welche auf den leitfähigen Lichtabschirmschichten (106) und dem zwischen den in dem getrennten Muster gebildeten leitfähigen Lichtabschirmschichten (106) freigelegten Substrat (102) gebildet ist, und welche korrespondierend zu den ersten Aussparungen zweite Aussparungen aufweist;
• eine Vielzahl von Lichtemitterschichten (110), welche auf den durch die ersten Aussparungen und die zweiten Aussparungen freigelegten Anodenelektroden (104) gebildet sind, dadurch charakterisiert, dass: die Vielzahl von Lichtemitterschichten (110) in den ersten Aussparungen und den zweiten Aussparungen ohne einen Spalt zwischen der organischen Lichtemitterschicht (110) und den leitfähigen Lichtabschirmschichten (106) und der Isolierschicht (107) gebildet sind,
• wobei eine Breite der ersten Aussparung die gleiche ist wie die Breite der zweiten Aussparung.

2. Die organische Elektrolumineszenz-Anzeigevorrichtung gemäß Anspruch 1, ferner aufweisend:

eine Barriererippe, welche so gebildet ist, dass sie die Anodenelektroden (104) quert; und
eine Kathodenelektrode (112), welche so gebildet ist,
dass sie die Anodenelektroden (104) quert, mit der organischen Lichtemitterschicht (110) dazwischen.

3. Die organische Elektrolumineszenz-Anzeigevorrichtung gemäß Anspruch 1,
wobei die leitfähigen Lichtabschirmschichten (106) ein opakes Material aufweisen.

4. Ein Herstellungsverfahren einer organischen Elektrolumineszenz-Anzeigevorrichtung, aufweisend den Schritt:

• Bilden einer Vielzahl von Anodenelektroden (104) auf einem Substrat (102);
• Bilden einer Vielzahl von leitfähigen Lichtabschirmschichten (106) auf den Anodenelektroden (104) in einem getrennten Muster, wobei jede der leitfähigen Lichtabschirmschichten (106) eine Leitfähigkeit aufweist, das externe Licht abfängt sowie absorbiert, und die Anodenelektroden (104) voneinander isoliert lässt, und zum Abdecken der Anodenelektroden (104) mit einer größeren Breite gebildet ist als die Anodenelektroden (104), und wobei jede der leitfähigen Lichtabschirmschichten (106) eine erste Aussparung aufweist, welche die Anodenelektrode (104) teilweise freilegt;
• Bilden einer Isolierschicht (107) auf den leitfähigen Lichtabschirmschichten (106) und dem zwischen den in dem getrennten Muster gebildeten leitfähigen Lichtabschirmschichten (106) freigelegten Substrat (102), und welche korrespondierend zu den ersten Aussparungen zweite Aussparungen aufweist; dadurch charakterisiert, dass das Herstellungsverfahren ferner folgenden Schritt aufweist:
• Bilden einer organischen Lichtemitterschicht (110) auf den durch die ersten Aussparungen und die zweiten Aussparungen freigelegten Anodenelektroden (104), derart, dass sie in den ersten Aussparungen und den zweiten Aussparungen ohne einen Spalt zwischen der organischen Lichtemitterschicht (110) und den leitfähigen Lichtabschirmschichten (106) und der Isolierschicht (107) angeordnet ist,
• wobei eine Breite der ersten Aussparung die gleiche ist wie die Breite der zweiten Aussparung.

5. Das Herstellungsverfahren gemäß Anspruch 4, ferner folgende Schritte aufweisend:

Bilden einer Barriererippe so, dass sie die Anodenelektroden (104) quert; und
Bilden einer Kathodenelektrode (112) so, dass sie die Anodenelektroden (104) quert, mit der organischen Lichtemitterschicht dazwischen (110).

6. Das Herstellungsverfahren gemäß Anspruch 4,
wobei die leitfähigen Lichtabschirmschichten (106) ein opakes Material aufweisen.

Revendications

1. Dispositif d'affichage à électroluminescence organique, qui comprend :

une pluralité d'électrodes à anode (104) formées sur un substrat (102) ;
une plurality de films-écrans conducteurs (106) qui présentent une conductivité et qui interceptent et absorbent la lumière externe et sont formés sur les électrodes à anode (104) sous forme de motif distinct, de sorte que les électrodes à anode (104) soient isolées les unes des autres, chacun des fils-écrans conducteurs (106) étant formé avec une largeur supérieure à celle des électrodes à anode (104) afin de couvrir les électrodes à anode (104), et chacun des films-écrans conducteurs (106) ayant une première partie creuse qui expose partiellement l'électrode anode (104) et définit une zone d'émission de lumière ;
une couche d'isolation (107) formée sur les films-écrans conducteurs (106) et le substrat (102) exposé entre les films-écrans conducteurs (106) formés en motif distinct, et qui possèdent des secondes parties creuses qui correspondent aux premières parties creuses ; et
une pluralité de couches d'émission de lumière (110) formées sur les électrodes à anode (104) exposées par les premières parties creuses et les secondes parties creuses ; **caractérisé en ce que** la pluralité de couches d'émission de lumière est formée dans les premières parties creuses et les secondes parties creuses sans espace entre la couche d'émission de lumière organique (110) et les films-écrans conducteurs (106) et la couche d'isolation (107),
dans lequel la largeur de la première partie creuse est identique à celle de la seconde partie creuse.

2. Dispositif d'affichage à électroluminescence organique selon la revendication 1, qui comprend en outre :

une nervure-barrière formée pour croiser les électrodes à anode (104) ; et
une électrode cathode (112) formée pour croiser les électrodes à anode (104), avec la couche d'émission de lumière organique (110) entre celles-ci.

3. Dispositif d'affichage à électroluminescence organique selon la revendication 1, dans lequel les films-écrans conducteurs (106) comprennent un matériau opaque.

4. Procédé de fabrication d'un dispositif d'affichage à électroluminescence organique, qui comprend l'étape qui consiste à :

former une pluralité d'électrodes à anode (104) sur un substrat (102);
former une pluralité de films-écrans conducteurs (106) sur les électrodes à anode (104) en un motif distinct, chacun des films-écrans conducteurs (106) présentant une conductivité, interceptant et absorbant la lumière externe, et maintenant les électrodes à anode (104) isolées les unes des autres, et étant formé avec une largeur supérieure à celle des électrodes à anode (104) afin de couvrir les électrodes à anode (104), et chacun des films-écrans conducteurs (106) ayant une première partie creuse qui expose partiellement l'électrode anode (104) ;
former une couche d'isolation (107) sur les films-écrans conducteurs (106) et le substrat (102) exposé entre les films-écrans conducteurs (106) formés en motif distinct, et qui possèdent des secondes parties creuses qui correspondent aux premières parties creuses ; **caractérisé en ce que** le procédé de fabrication comprend en outre l'étape qui consiste à
former une couche d'émission de lumière organique (110) sur les électrodes à anode (104) exposées par les premières parties creuses et les secondes parties creuses, et disposée dans les premières parties creuses et les secondes parties creuses sans espace entre la couche d'émission de lumière organique (110) et les films-écrans conducteurs (106) et la couche d'isolation (107),
dans lequel la largeur de la première partie creuse est identique à celle de la seconde partie creuse.

5. Procédé de fabrication selon la revendication 4, qui comprend en outre les étapes qui consistent à :

former une nervure-barrière qui croise les électrodes à anode (104);
et
former une électrode cathode (112) qui traverse les électrodes à anode (104), avec la couche d'émission de lumière organique (110) entre celles-ci.

6. Procédé de fabrication selon la revendication 4, dans lequel les films-écrans conducteurs (106) comprennent un matériau opaque.

FIG. 1
RELATED ART

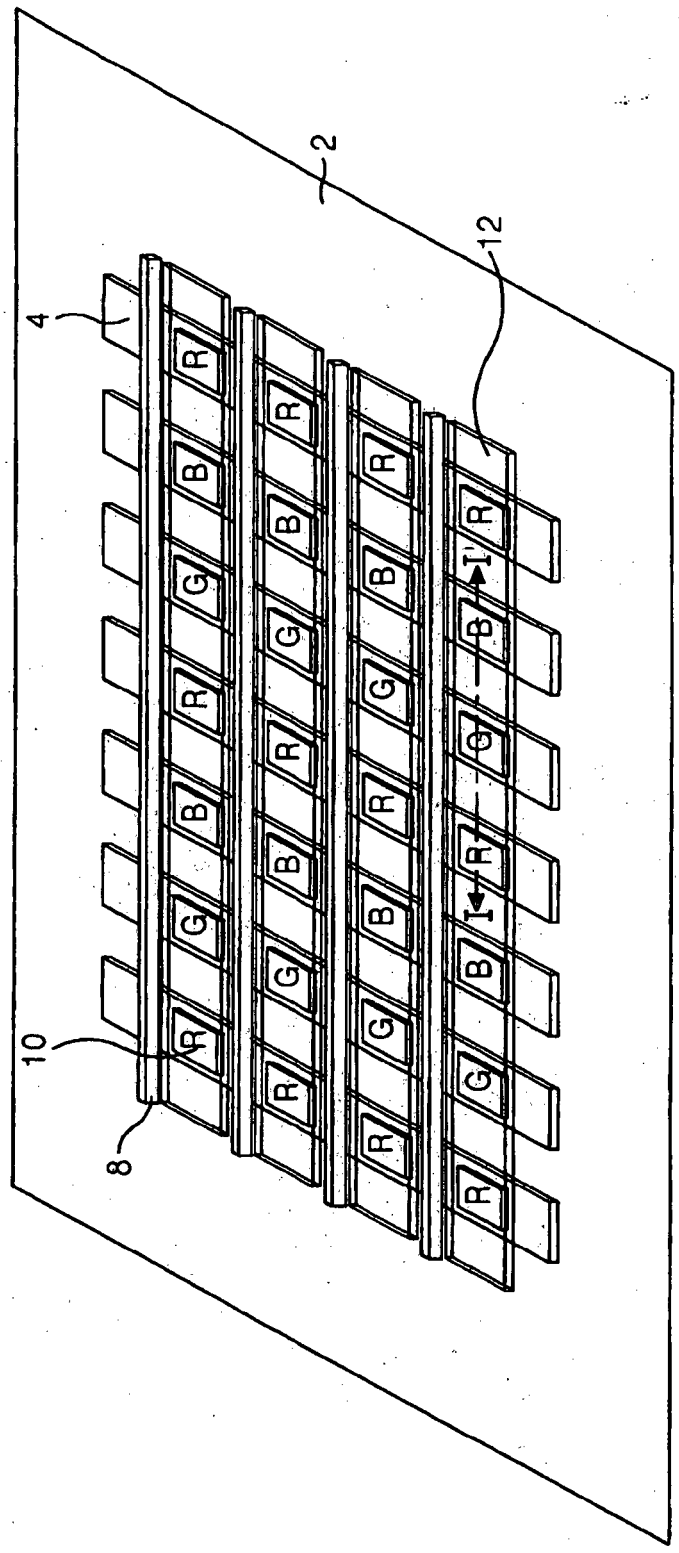
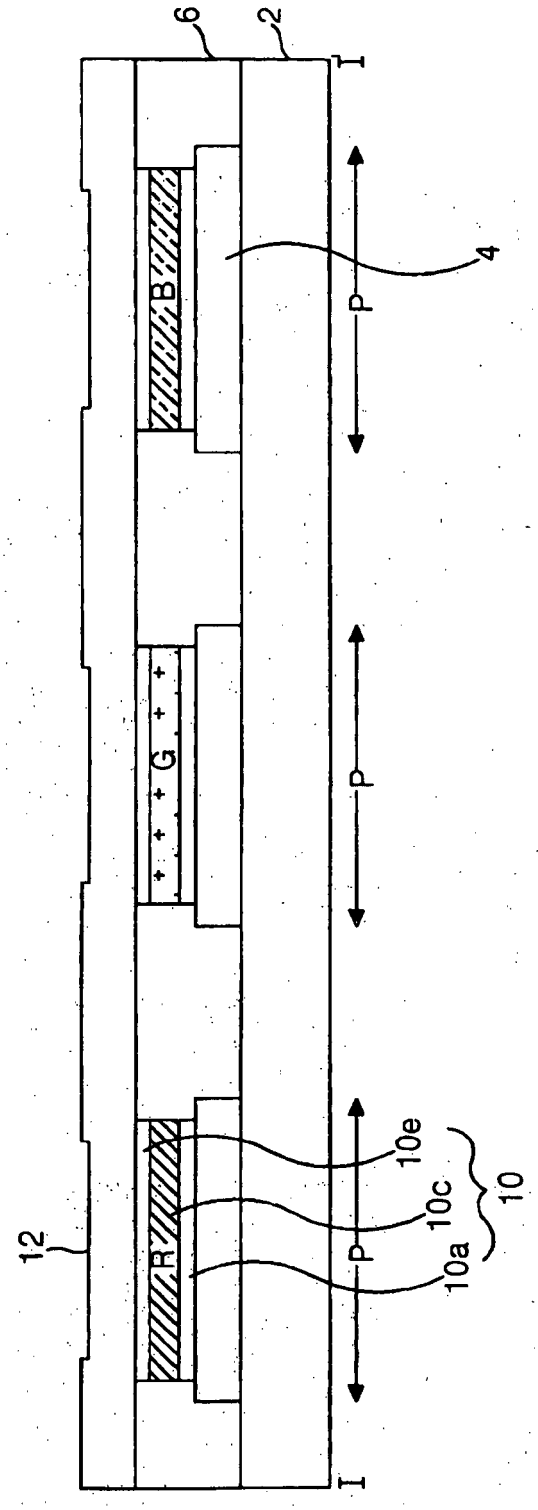


FIG.2
RELATED ART



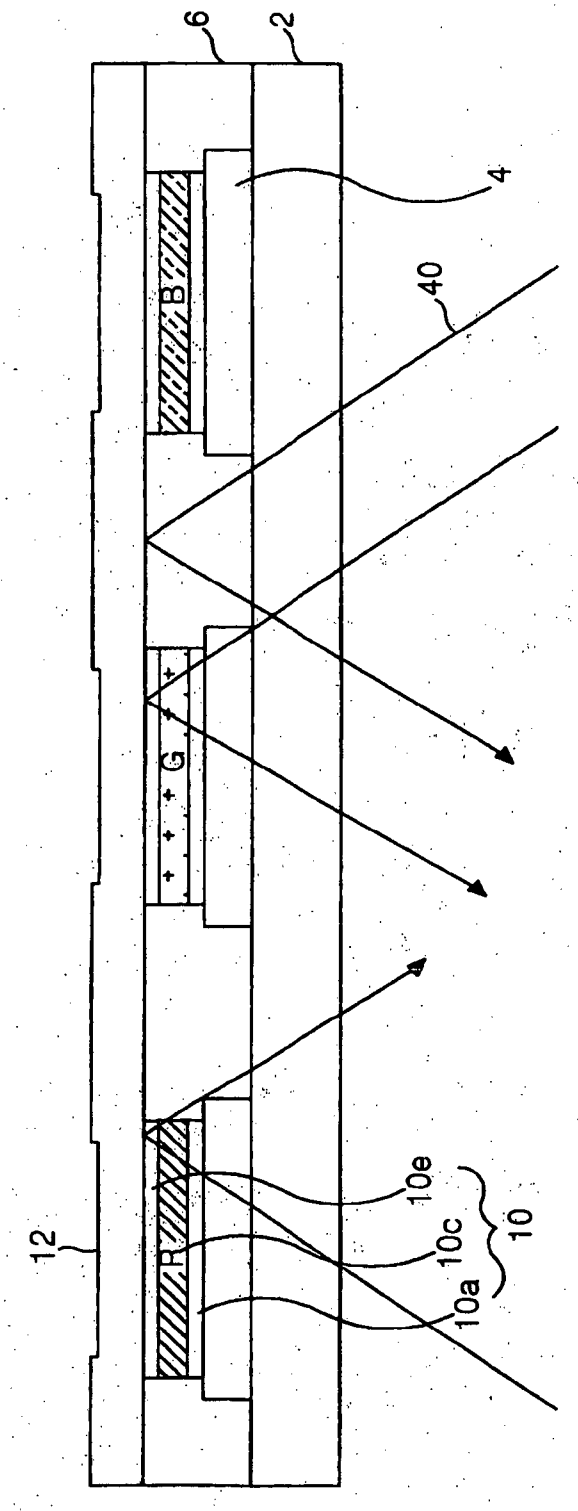


FIG.3A
RELATED ART

FIG.3B
RELATED ART

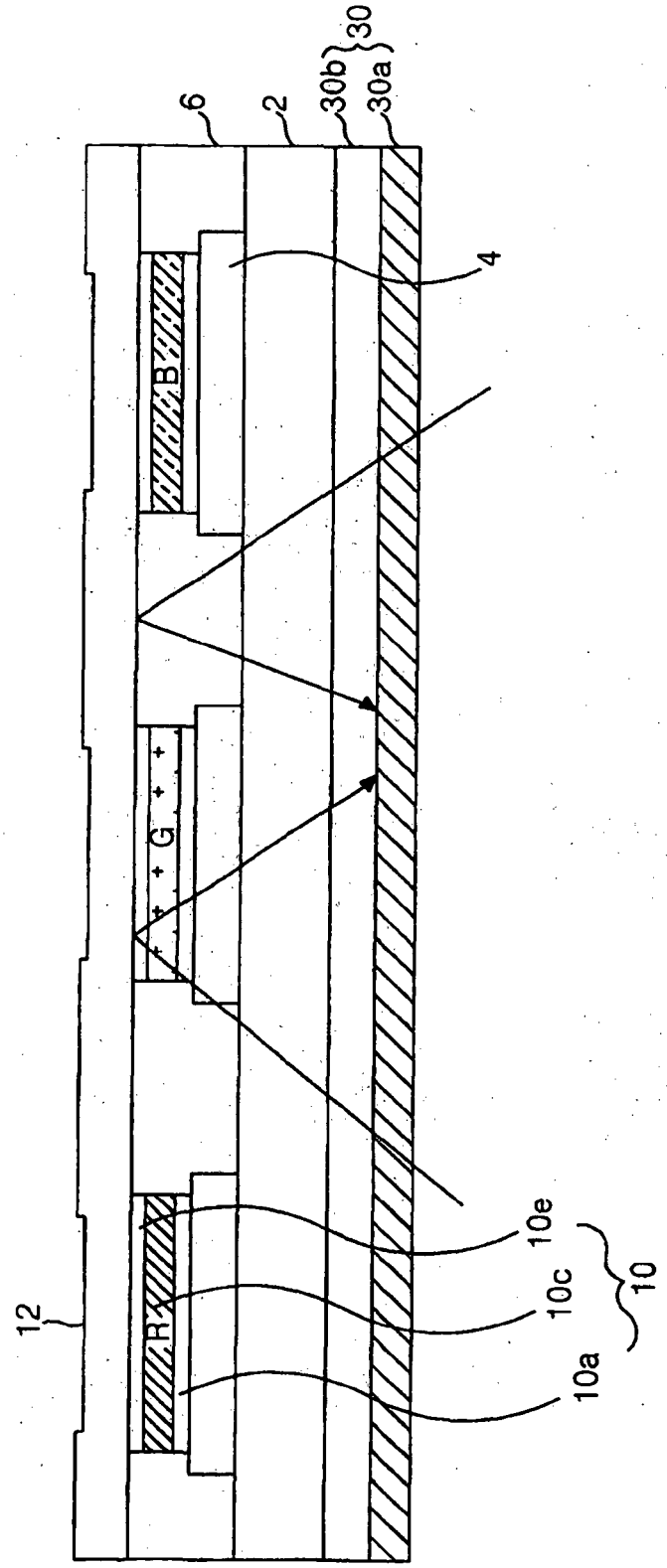


FIG. 4

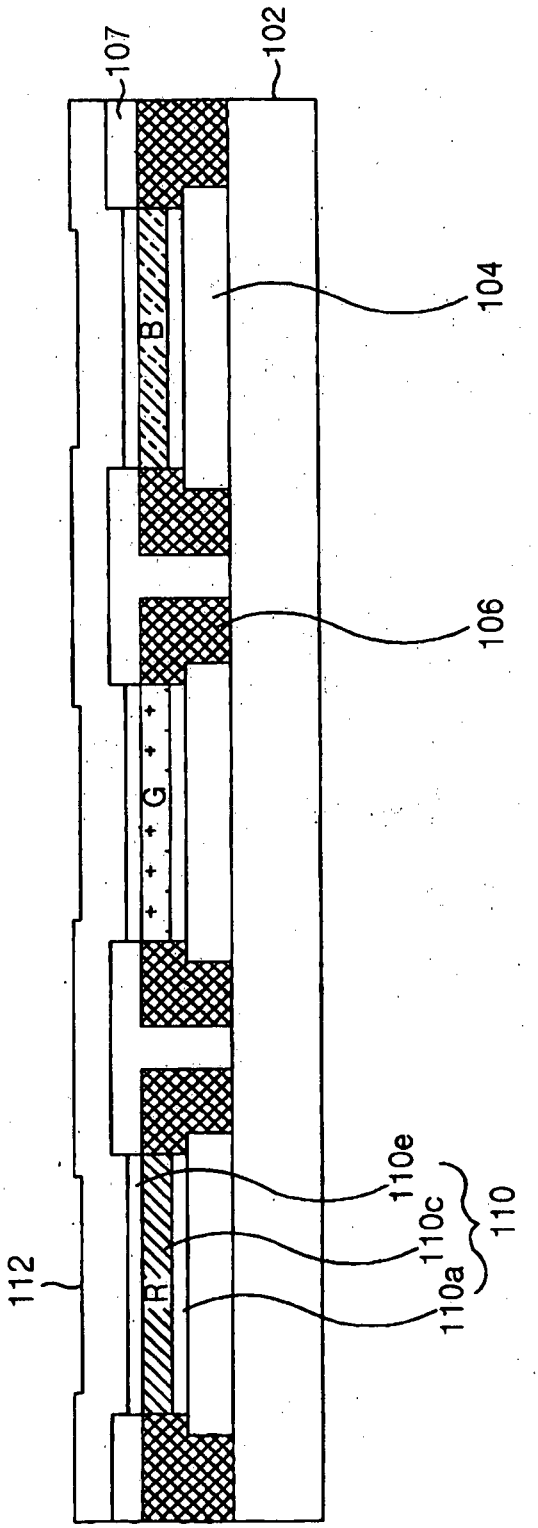
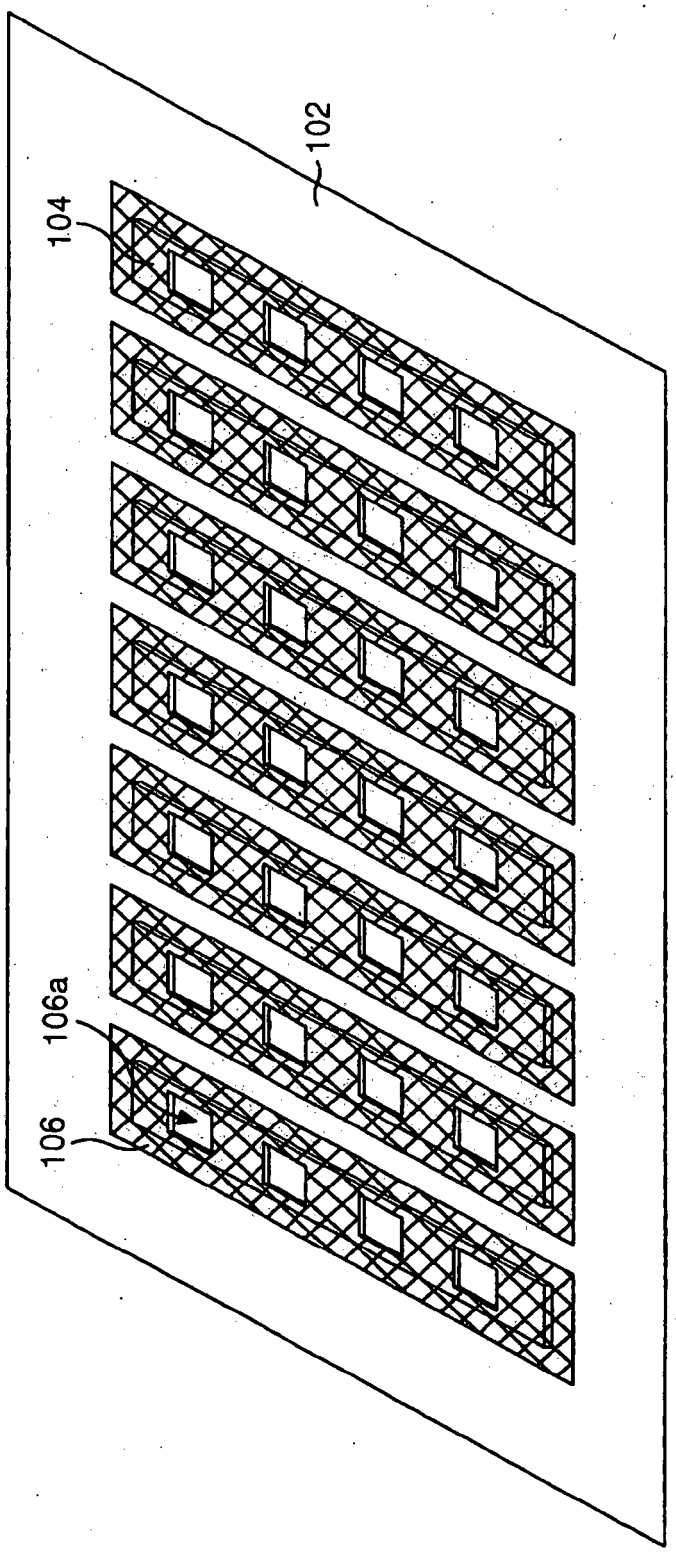


FIG.5



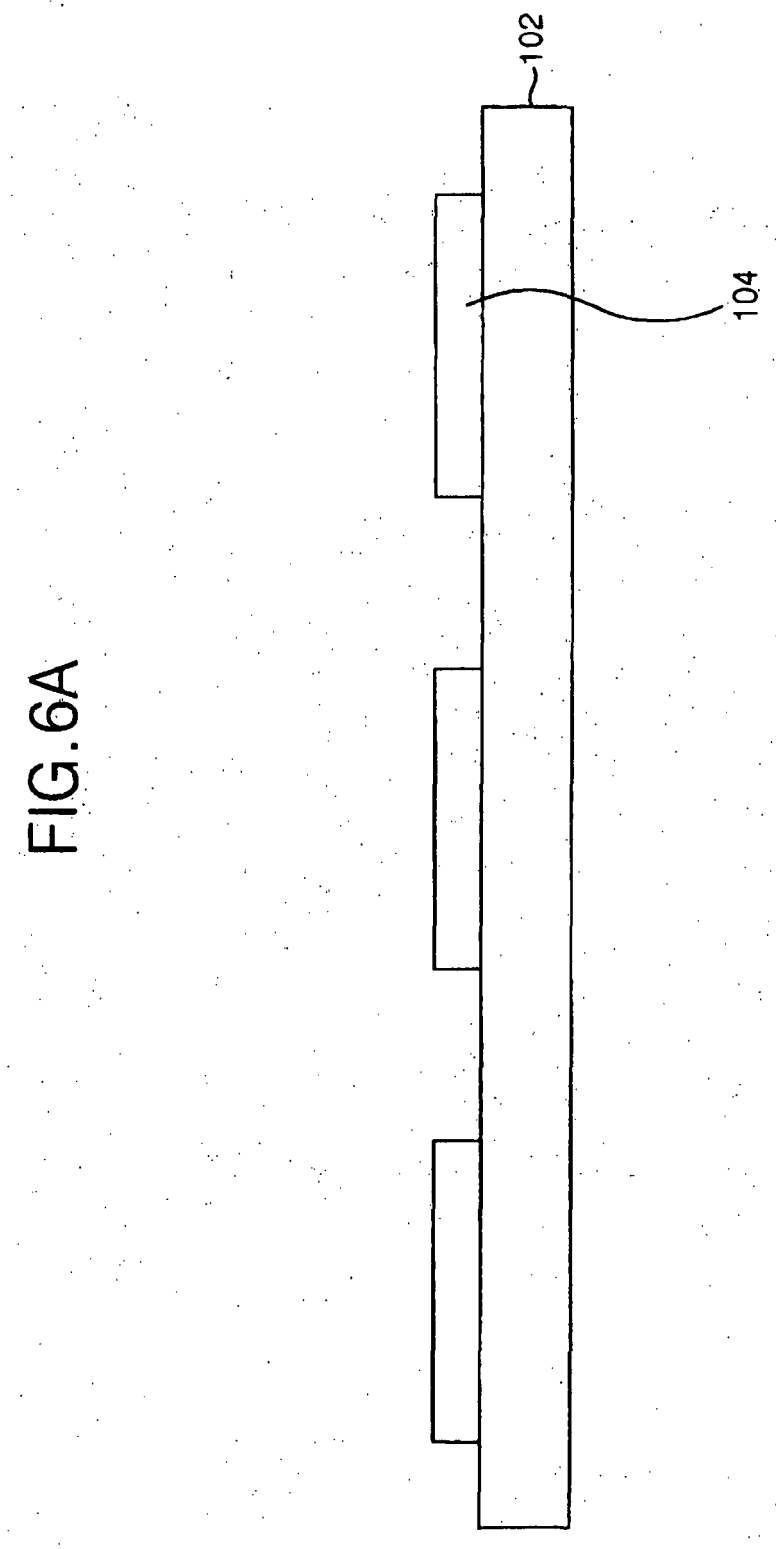


FIG.6A

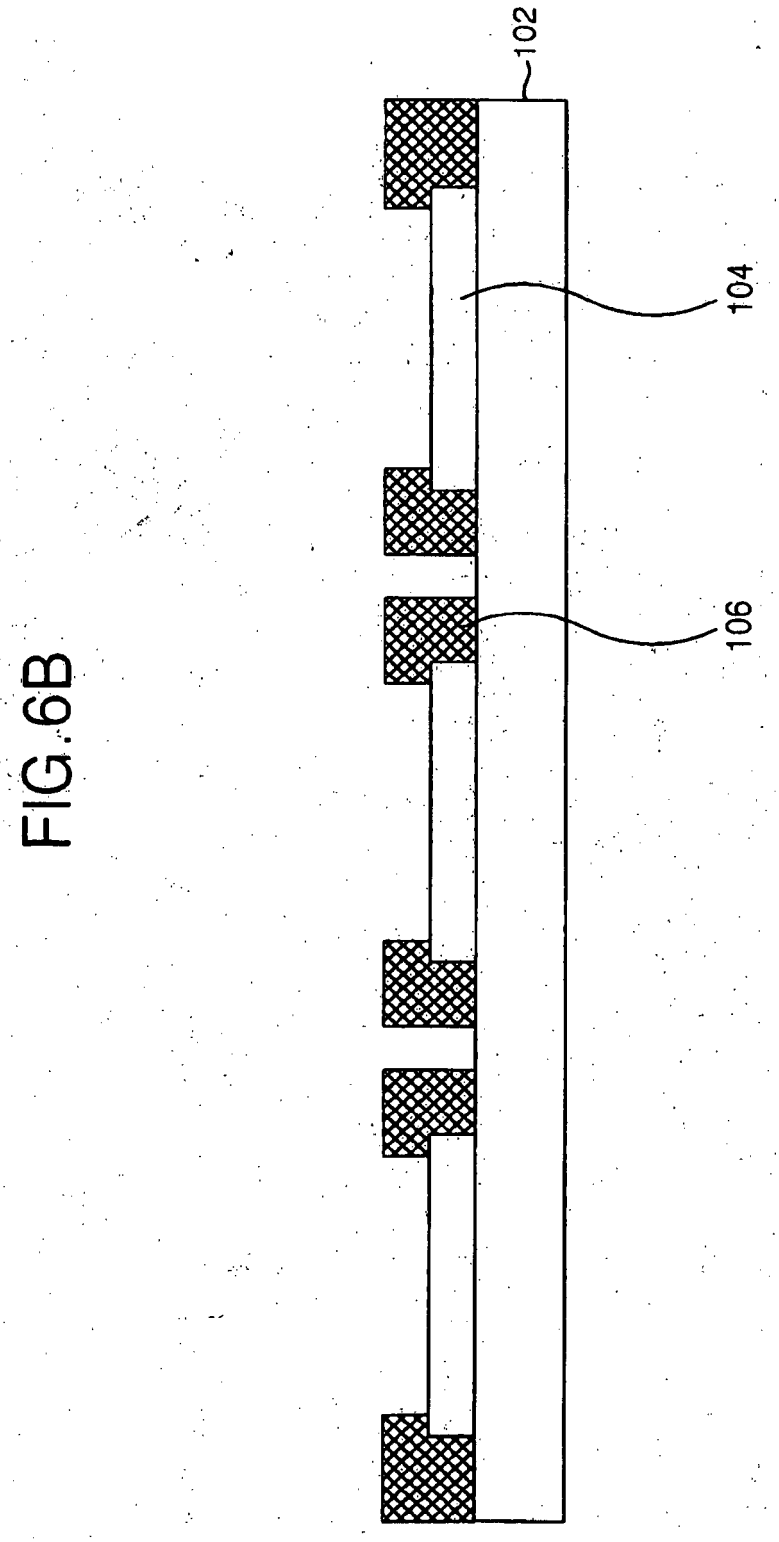


FIG.6B

FIG.6C

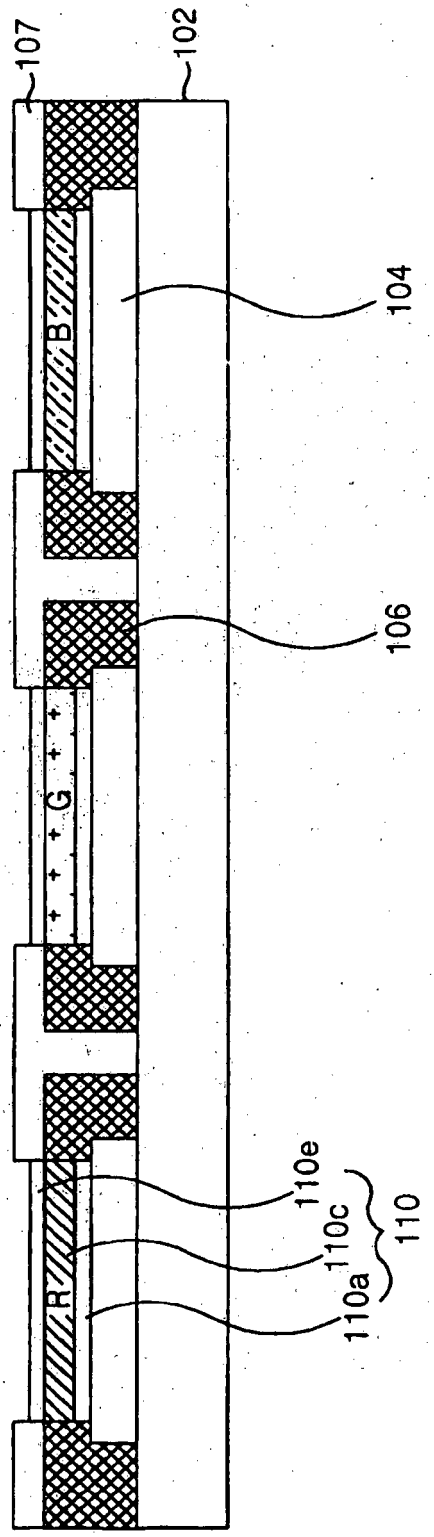
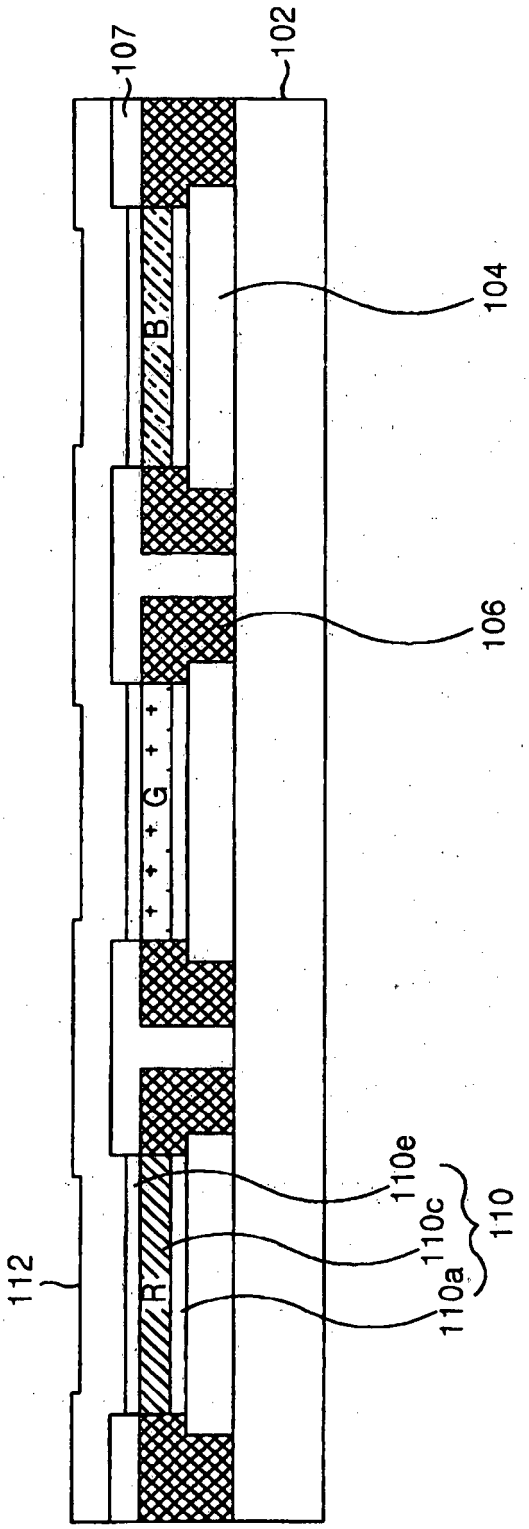


FIG.6D



REFERENCES CITED IN THE DESCRIPTION

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专利名称(译)	有机电致发光显示装置及其制造方法		
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申请(专利权)人(译)	LG电子株式会社.		
当前申请(专利权)人(译)	LG DISPLAY CO.，LTD.		
[标]发明人	KIM KWANG YOUNG KIM HAK SU BAIK KWANG HEUM		
发明人	KIM, KWANG YOUNG KIM, HAK SU BAIK, KWANG HEUM		
IPC分类号	H01L51/52 H01L27/32 H05B33/26 H01L27/00 H05B33/00		
CPC分类号	H01L51/5284 H01L27/3281 H01L51/5212		
优先权	1020040043716 2004-06-14 KR		
其他公开文献	EP1608017A3 EP1608017A2		
外部链接	Espacenet		

摘要(译)

公开了一种适用于改善发光亮度和降低功耗的有机EL显示装置及其制造方法。根据本发明的有机EL显示装置包括多个阳极;导电遮光膜具有导电性，并且以单独的图案形成在阳极上，使得阳极彼此绝缘。