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(54) **Organic light emitting display, method of fabricating the same, and mobile display including the organic light emitting display**

Organische lichtemittierende Vorrichtung, Herstellungsverfahren dafür, und bewegliche Anzeigevorrichtung damit

Dispositif organique électroluminescent, son procédé de fabrication et afficheur mobile incluant le dispositif organique électroluminescent

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Description

BACKGROUND OF THE INVENTION

1. Field of the Invention

[0001] The present invention relates to an organic light emitting display, a method of fabricating the same, and a mobile display including the organic light emitting display. More particularly, the present invention relates to an organic light emitting display that is capable of preventing a dark point from being generated, a method of fabricating the same, and a mobile display including the organic light emitting display.

2. Description of the Related Art

[0002] A conventional organic light emitting display (OLED) may include a light emitting unit 120, as illustrated in FIG. 10, to be electrically connected to, e.g., a thin film transistor (TFT) (not shown) on a substrate 100. The light emitting unit 120 may include a lower electrode 121, an organic light emitting layer 122, and an upper electrode 123.

[0003] In the conventional OLED having the above-described structure, as illustrated in FIG. 10, the organic light emitting layer 122 may not be uniformly deposited due, e.g., to particles that may exist on the lower electrode 121. Therefore, the upper electrode 123 may be connected to the lower electrode 121 at a junction where the particles exist. Therefore, the light emitting unit 120 may short circuit, resulting in a dark spot. As a result, a light emitting region may be reduced, deteriorating picture quality.

[0004] US2004115859 discloses an organic electroluminescence device comprising a substrate; electrodes including a first electrode formed adjacent to the substrate, and a second electrode disposed to be spaced from the first electrode; a function layer formed between the electrodes and including a luminous layer.

[0005] JP 2002025769 discloses an organic EL panel with a laminate formed by pinching an organic layer having at least a light-emitting layer with a transparent electrode (first electrode). A back face electrode (second electrode) is provided on a glass board (transparent base board), whereon also a seal cap (sealing member) is installed so as to constitute an accommodation space for the laminate, where a sealing liquid consisting of an inert liquid having a prescribed oxygen concentration is encapsulated in the accommodation space.

[0006] US2005062414 discloses an organic electroluminescence display package that includes an organic electroluminescence element, a frame, and a transparent liquid. The frame includes a sealant layer and a transparent top cover, and the transparent liquid aims to prevent moisture and oxygen from permeating the package.

[0007] US2005/0110020 describes an electro-optical device having a buffer layer made of a polymer resin.

SUMMARY OF THE INVENTION

[0008] The present invention is therefore directed to an organic light emitting display, a method of fabricating the same, and a mobile display including the organic light emitting display, which substantially overcome one or more of the problems due to the limitations and disadvantages of the related art.

[0009] It is therefore an object of an embodiment of the present invention to insulate the upper and lower electrodes from each other to prevent a dark spot from being generated.

[0010] Embodiments of the invention therefore set out to provide a buffer layer on the upper electrode that can render a predetermined thickness of the upper electrode non-conductive.

[0011] Embodiments of the invention also set out to provide an organic light emitting display that is capable of reducing or preventing a dark spot from being generated.

[0012] Embodiments of the invention also set out to provide a method of fabricating an organic light emitting display that is capable of reducing or preventing a dark spot from being generated.

[0013] Embodiments of the invention also set out to provide a mobile display including the organic light emitting display that is capable of reducing or preventing a dark spot from being generated.

[0014] At least one of the above and other features and advantages of the present invention maybe realized by providing an organic light emitting display, as recited in claim 1.

[0015] The buffer layer may be about 10Å to 100Å thick. The predetermined thickness of the upper electrode may be about 10Å to 30Å. The non-conductive material of the predetermined thickness may be an oxide.

[0016] The upper electrode may have a smaller work function than the lower electrode.

[0017] The organic light emitting display may include at least one protective layer on the buffer layer. The protective layer may be a passivation layer or a capping layer.

[0018] The organic light emitting layer may include at least one organic layer having at least one of a hole injecting layer, a hole transporting layer, an electron transporting layer, and an electron injecting layer.

[0019] At least one of the above and other features and advantages may be realized by providing a method of fabricating an organic light emitting display, as recited in claim 9.

[0020] At least one of the above and other features and advantages may be realized by providing a mobile display including a display main body having a picture unit for displaying a picture, the picture unit including an organic light emitting display having any of the above elements.

BRIEF DESCRIPTION OF THE DRAWINGS

[0021] Embodiments of the invention will now be described by way of example and with reference to the accompanying drawings, in which:-

FIG. 1 is a cross-sectional view of an organic light emitting display according to a first embodiment of the present invention;
FIG. 2 is a cross-sectional view of an organic light emitting display according to a second embodiment of the present invention;
FIG. 3 is a cross-sectional view of an organic light emitting display according to a third embodiment of the present invention;
FIG. 4 is a cross-sectional view of an organic light emitting display according to a fourth embodiment of the present invention;
FIG. 5 is a cross-sectional view of an organic light emitting display according to a fifth embodiment of the present invention;
FIG. 6 is a cross-sectional view of an organic light emitting display according to a sixth embodiment of the present invention;
FIG. 7 is a detailed schematic cross-sectional diagram of a light emitting unit according to embodiments of the present invention;
FIG. 8 is as schematic a mobile display including an organic light emitting display according to an embodiment of the present invention;
FIG. 9 is an enlarged cross-sectional view of part A of FIG. 8; and
FIG. 10 is a detailed schematic cross-sectional diagram of a conventional light emitting unit for use in a conventional organic light emitting display.

DETAILED DESCRIPTION THE INVENTION

[0022] The present invention will now be described more fully hereinafter with reference to the accompanying drawings, in which various embodiments of the invention are illustrated. The invention may, however, be embodied in different forms and should not be construed as limited to the embodiments set forth herein.

[0023] In the figures, the dimensions of layers and regions may be exaggerated for clarity of illustration. It will also be understood that when a layer or element is referred to as being "on" another layer or substrate, it can be directly on the other layer or substrate, or intervening layers may also be present. Further, it will be understood that when a layer is referred to as being "under" another layer, it can be directly under, and one or more intervening layers may also be present. In addition, it will also be understood that when a layer is referred to as being "between" two layers, it can be the only layer between the two layers, or one or more intervening layers may also be present. Like reference numerals refer to like elements throughout.

[0024] As discussed in detail below, upper and lower electrodes of a light emitting unit for use in an organic light emitting display (OLED) may be insulated from each other, even when an organic light emitting layer does not completely insulate these electrodes, in accordance with various configurations, thus reducing or preventing formation of a dark spot, improving image quality. By converting a predetermined thickness of an upper electrode into a non-conductive material, any inadvertent contact between the upper and lower electrodes due to discontinuities in the organic light emitting layer may not resort in shorting the light emitting unit.

[0025] Referring to FIG. 1, an organic light emitting display (OLED) according to an embodiment of the present invention may include a thin film transistor (TFT) 210 formed on a substrate 201, and a light emitting unit 220. The TFT 210 may include a semiconductor layer 211, a gate electrode 212, and source-drain electrodes 213. The light emitting unit 220 may include a lower electrode 221 on the substrate electrically connected to the TFT 210, an organic light emitting layer 222 on the lower electrode, an upper electrode 223 on the organic light emitting layer, and a buffer layer, e.g., a polyol-based buffer layer 224, on the upper electrode 223. The polyol-based buffer layer 224 may render a predetermined thickness of the upper electrode to be non-conductive, i.e., may modify the predetermined thickness of the upper electrode to be a non-conductive material, e.g., to be an oxide.

[0026] In a first embodiment of the present invention, as illustrated in FIG. 1, the polyol-based buffer layer 224 may extend over an entire OLED structure, i.e., may be continuous. Alternatively, an OLED according to a second embodiment of the present invention, as illustrated in FIG. 2, a light emitting unit 220' may include a polyol-based buffer layer 224' that may only extend within a contact hole for each light emitting unit , i.e., may be discontinuous. All of the other elements of the OLED may be the same as those in FIG. 1, so discussion thereof will not be repeated.

[0027] Referring to FIGS. 3 and 4, an OLED according to third and fourth embodiments of the present invention may further include a capping layer 225 on the polyol-based buffer layer 224, 224' of FIGS. 2 and 3, respectively. All of the other elements of the OLED may be the same as those in FIGS. 2 and 3, so discussion thereof will not be repeated.

[0028] Referring to FIGS. 5 and 6, an OLED according to fifth and sixth embodiments of the present invention may further include a passivation layer 226 on the polyol-based buffer layer 224, 224' of FIGS. 2 and 3, respectively. All of the other elements of the OLED may be the same as those in FIGS. 1 and 2, respectively, so discussion thereof will not be repeated.

[0029] The thin film transistor 210 formed on the substrate 201 may be formed by a method that is common in the art to have a structure that is common in the art. For example, a buffer layer 202 may be selectively formed on the substrate 201. Then, a semiconductor lay-

er 211, including source-drain regions, may be formed on the buffer layer. After forming a gate insulating layer on the substrate including the semiconductor layer 211 and forming a gate electrode 212 on the gate insulating layer, source-drain electrodes 213 connected to the source-drain regions through contact holes may be formed on the interlayer insulating layer to form the thin film transistor 210.

[0030] A light emitting unit 220 electrically connected to the thin film transistor 210 may be formed on the substrate where the thin film transistor 210 is formed. To be specific, a lower electrode 221 may be electrically connected to one of the source-drain electrodes 213 of the thin film transistor 210 through a via hole formed on the passivation layer formed on the substrate 200.

[0031] A conventional substrate for an OLED, e.g., a glass substrate or a transparent plastic substrate having excellent transparency, surface flatness, and is easily dealt with and waterproof, may be used as the substrate 201.

[0032] The lower electrode 221 formed on the substrate may be an anode electrode or a cathode electrode, and may be a reflective electrode or a transmissive electrode in accordance with front surface emission or rear surface emission operation of the OLED.

[0033] The lower electrode 211 may be an anode electrode. When the lower electrode 221 is the anode electrode, the lower electrode 221 may be formed of a conductive material, e.g., a metal or an oxide, that has a high work function and into which holes may be easily injected, e.g., indium tin oxide (ITO), indium zinc oxide (IZO), Ni, Pt, Au, and Ir.

[0034] An organic light emitting layer 222 may be formed on the lower electrode 221. The organic light emitting layer 222 may include an emission layer and at least one organic layer in addition to the emission layer. The at least one organic layer may have at least one of a hole injecting layer, a hole transporting layer, a hole suppressing layer, an electron transporting layer, and an electron injecting layer. Any of the emission layer, the hole injecting layer, the hole transporting layer, the hole suppressing layer, the electron transporting layer, and the electron injecting layer may be formed with methods and materials commonly used in the art.

[0035] For example, the hole injecting layer may be formed of CuPc or Starburst type amine by deposition or spin coating, although not limited to the above. The hole transporting layer may be formed of materials having hole transporting properties, e.g., N'-diphenyl-N,N'-bis(3-methylphenyl) 1,1-biphenyl 4,4'-diamine (hereinafter, TPD) by deposition, spin coating, etc. The emission layer may be formed of light emitting materials, e.g., aluminum tris(8-hydroxyquinoline) (Alq3), by deposition, spin coating, etc. The electron transporting layer may be formed of oxadiazole-based derivative by deposition, spin coating, etc.

[0036] The upper electrode 223 may be formed on the organic light emitting layer 222. The upper electrode 223 may be an anode electrode or a cathode electrode. When the upper electrode 223 is the cathode electrode, the cathode electrode may be formed of metals, e.g., Li, Mg, Al, Al-Li, Ca, Mg-In, Mg-Ag, etc. Therefore, the structure of the light emitting unit 220, 220' may vary from the lower electrode/the organic light emitting layer/the upper layer to the lower electrode/the hole injecting layer/the hole transporting layer/the organic light emitting layer/the hole suppressing layer/the electron transporting layer/the electron injecting layer/the upper electrode.

[0037] A polyol-based buffer layer 224 may be formed on the upper electrode 223 by a method such as deposition, spin coating, etc., under the conditions similar to those used for forming the above layers. As illustrated in FIG. 8, in order to prevent the upper electrode 223 from being shorted due to a connection between the upper electrode 223 and the lower electrode 221 that may arise when the organic light emitting layer 222 is not uniformly deposited, e.g., due to particles that may exist on the lower electrode 221, the polyol-based buffer layer 224 modifies a predetermined thickness of the upper electrode 223 to be non-conductive, so that the upper and lower electrodes are insulated from each other. In order to modify the predetermined thickness of the upper electrode to be non-conductive, the predetermined thickness of the upper electrode 223 may be modified, e.g., to be an oxide or a nitride.

[0038] The predetermined thickness of the upper electrode 223 may be modified to be a non-conductive oxide by forming the polyol-based buffer layer 224 on the upper electrode 223. That is, the -OH group of polyol may oxidize the metal of the upper electrode 223. In this case, oxidation occurs during formation of the - OH group of the polyol-based buffer layer 224, 224'.

[0039] The thickness of the polyol-based buffer layer 224, 224' may be about 10Å to 100Å. Due to the oxidation of the upper electrode by the buffer layer having this thickness, the predetermined thickness of the non-conductive oxide layer will be less than 100Å, e.g., between 10Å to 30Å. The polyol-based buffer layer 224, 224' may be formed on the upper electrode 223 or may surround the sides and the front surface of the upper electrode 223.

[0040] The polyol of which the buffer layer is a compound having two or more -OH groups including, e.g., a monosaccharide such as glucose, fructose, mannose, galactose, or ribose, a disaccharide such as sucrose, maltose, or lactose, ethylene glycol, propylene glycol, 1,3-propandiol, 1,3- butanediol, 1,4-butanediol, 1,5-pentanediol, 1,6-hexanediol, neopentyl glycol, diethylene glycol, dipropylene glycol, triethylene glycol, tetraethylene glycol, dibutylene glycol, 2-methyl-1,3-pentanediol, 2,2,4-trimethyl-1,3-pentanediol, 1,4-cyclohexanedimethaneol, etc.

[0041] At least one protective layer for protecting the organic light emitting layer 222 may be formed on the polyol-based buffer layer 224, 224'. The capping layer 225 or the passivation layer 226 may be used as the protective layer. The capping layer 225 and the passiva-

tion layer 226 may be formed, e.g., by deposition or spin coating, transparent materials that are commonly used in the art.

[0042] Referring to FIGS. 8 and 9, a mobile display 1000 may include a picture unit 1100 for displaying a picture and a display main body including a plurality of operation button units 1200. As illustrated in the cross-sectional detail of FIG. 9, the OLED having the light emitting unit 220, 220' and the transistor 210 according to any of the exemplary embodiments of the present invention may be provided in the picture unit 1100.

[0043] The OLED according to the present-invention may be applied to various displays, e.g., a personal digital assistant (PDA), an electronic pager, a video camera, a workstation, a picture telephone etc., besides the mobile telephone 1000 illustrated in FIG. 9.

[0044] As described above, according to the present invention, the polyol-based buffer layer may be formed on the upper electrode so that the predetermined thickness of the upper electrode is rendered non-conductive. Thus, even if the organic light emitting layer is non-uniformly deposited, e.g., due to particles that may exist on the lower electrode, only the non-conductive surface of the upper electrode will contact the lower electrode. Therefore, it is possible to prevent the light emitting unit from being shorted, to prevent the dark point from being generated, and to improve picture quality.

[0045] Embodiments of the present invention have been disclosed herein, and although specific terms are employed, they are used and are to be interpreted in a generic and descriptive sense only and not for purpose of limitation. Accordingly, it will be understood by those of ordinary skill in the art that various changes in form and details may be made without departing from the scope of the present invention as set forth in the following claims.

Claims

1. An organic light emitting display, comprising:

a transistor (210) on a substrate (201);
a lower electrode (221) on the substrate (201), the lower electrode (221) being electrically connected to the transistor (210);
an organic light emitting layer (222) on the lower electrode (221);
an upper electrode (223) on the organic light emitting layer (222);
a predetermined thickness of the upper electrode is a non-conductive material forming thereby a non-conductive layer; and
a buffer layer (224) on the non-conductive layer, the buffer layer (224) being formed of a material capable of modifying a predetermined thickness of the upper electrode (223) to be a non-conductive material, **characterized in that** the buffer layer is formed of a compound selected from the group consisting of: a monosaccharide, a disaccharide, ethylene glycol, propylene glycol, 1,3-propandiol, 1,3- butanediol, 1,4- butanediol, 1,5-pentanediol, 1,6-hexanediol, neopentyl glycol, diethylene glycol, dipropylene glycol, triethylene glycol, tetraethylene glycol, dibutylene glycol, 2-methyl-1,3-pentanediol, 2,2,4-trimethyl-1,3-pentanediol, and 1,4-cyclohexanedimethaneol.

2. An organic light emitting display as claimed in claim 1, wherein a thickness of the buffer layer (224) is about 10Å to 100Å.

3. An organic light emitting display as claimed in claim 1 or 2, wherein the predetermined thickness of the upper electrode (223) is about 10Å to 30Å.

4. An organic light emitting display as claimed in any preceding claim, wherein the upper electrode (223) is a cathode.

5. An organic light emitting display as claimed in any preceding claim, further comprising at least one protective layer on the buffer layer (224).

6. An organic light emitting display as claimed in claim 7, wherein the protective layer is a passivation layer or a capping layer.

7. An organic light emitting display as claimed in any preceding claim, wherein the organic light emitting layer further comprises at least one organic layer including at least one of a hole injecting layer, a hole transporting layer, an electron transporting layer, and an electron injecting layer.

8. An organic light emitting display as claimed in any preceding claim, wherein the non-conductive material is an oxide.

9. A method of fabricating an organic light emitting display as claimed in claim 1, the method comprising:

forming a lower electrode (221) electrically connected to a transistor (220) on a substrate;
forming an organic light emitting layer (222) on the lower electrode (221);
forming an upper electrode (223) on the organic light emitting layer (222); and
forming a buffer layer (224) on the upper electrode (223), the buffer layer being formed of a material capable of modifying the upper electrode (223) to be a non-conductive material of a predetermined thickness so to form the non-conductive layer.

10. A mobile display including a display main body having a picture unit for displaying a picture, the picture unit including an organic light emitting display as set out in one of claims 1 to 8.

Patentansprüche

1. Organische lichtemittierende Anzeige, die Folgendes umfasst:

einen Transistor (210) auf einem Substrat (201);
eine untere Elektrode (221) auf dem Substrat (201), wobei die untere Elektrode (221) elektrisch mit dem Transistor (210) verbunden ist;
eine organische lichtemittierende Schicht (222) auf der unteren Elektrode (221);
eine obere Elektrode (223) auf der organischen lichtemittierenden Schicht (222);
eine vorbestimmte Dicke der oberen Elektrode ist ein nicht leitfähiges Material, das dadurch eine nicht leitfähige Schicht bildet; und
eine Pufferschicht (224) auf der nicht leitfähigen Schicht, wobei die Pufferschicht (224) aus einem Material gebildet ist, das in der Lage ist, eine vorbestimmte Dicke der oberen Elektrode (223) so zu modifizieren, dass es sich um ein nicht leitfähiges Material handelt, **dadurch gekennzeichnet, dass**
die Pufferschicht aus einer Verbindung gebildet ist, die aus der Gruppe ausgewählt ist, die aus Folgendem besteht: einem Monosaccharid, einem Disaccharid, Ethylenglykol, Propylenglykol, 1,3-Propandiol, 1,3-Butandiol, 1,4-Butandiol, 1,5-Pentandiol, 1,6-Hexandiol, Neopentylglykol, Diethylenglykol, Dipropylenglykol, Triethylenglykol, Tetraethylenglykol, Dibutylenglykol, 2-Methyl-1,3-Pentandiol, 2,2,4-Trimethyl-1,3-Pentandiol und 1,4-Cyclohexandimethaneol.

2. Organische lichtemittierende Anzeige nach Anspruch 1, wobei eine Dicke der Pufferschicht (224) ungefähr 10 Å bis 100 Å beträgt.

3. Organische lichtemittierende Anzeige nach Anspruch 1 oder 2, wobei die vorbestimmte Dicke der oberen Elektrode (223) ungefähr 10 Å bis 30 Å beträgt.

4. Organische lichtemittierende Anzeige nach einem der vorhergehenden Ansprüche, wobei die obere Elektrode (223) eine Kathode ist.

5. Organische lichtemittierende Anzeige nach einem der vorhergehenden Ansprüche, die ferner mindestens eine Schutzschicht auf der Pufferschicht (224) umfasst.

6. Organische lichtemittierende Anzeige nach Anspruch 7, wobei die Schutzschicht eine Passivierungsschicht oder eine Abdeckschicht ist.

7. Organische lichtemittierende Anzeige nach einem der vorhergehenden Ansprüche, wobei die organische lichtemittierende Schicht ferner mindestens eine organische Schicht umfasst, die mindestens eine Lochinjektionsschicht, eine Lochtransportschicht, eine Elektronentransportschicht und/oder eine Elektroneninjektionsschicht beinhaltet.

8. Organische lichtemittierende Anzeige nach einem der vorhergehenden Ansprüche, wobei das nicht leitfähige Material ein Oxid ist.

9. Verfahren zum Herstellen einer organischen lichtemittierenden Anzeige nach Anspruch 1, wobei das Verfahren Folgendes umfasst:

Bilden einer unteren Elektrode (221), die elektrisch mit einem Transistor (220) auf einem Substrat verbunden ist;
Bilden einer organischen lichtemittierenden Schicht (222) auf der unteren Elektrode (221);
Bilden einer oberen Elektrode (223) auf der organischen lichtemittierenden Schicht (222) und
Bilden einer Pufferschicht (224) auf der oberen Elektrode (223), wobei die Pufferschicht aus einem Material gebildet ist, das in der Lage ist, die obere Elektrode (223) so zu modifizieren, dass es sich um ein nicht leitfähiges Material einer vorbestimmten Dicke handelt, um die nicht leitfähige Schicht zu bilden.

10. Mobile Anzeige mit einem Anzeigenhauptkörper, der eine Bildeinheit zum Anzeigen eines Bildes aufweist, wobei die Bildeinheit eine organische lichtemittierende Anzeige nach einem der Ansprüche 1 bis 8 beinhaltet.

Revendications

1. Affichage émetteur de lumière organique, comprenant :

un transistor (210) sur un substrat (201) ;
une électrode inférieure (221) sur le substrat (201), l'électrode inférieure (221) étant connectée électriquement au transistor (210) ;
une couche émettrice de lumière organique (222) sur l'électrode inférieure (221) ;
une électrode supérieure (223) sur la couche émettrice de lumière organique (222) ;
une épaisseur prédéterminée de l'électrode supérieure est un matériau non conducteur, formant ainsi une couche non conductrice ; et

une couche tampon (224) sur la couche non conductrice, la couche tampon (224) étant formée en un matériau permettant de modifier une épaisseur prédéterminée de l'électrode supérieur (223) de telle sorte qu'elle soit un matériau non conducteur,
caractérisé en ce que :

la couche tampon est formée en un composé qui est sélectionné parmi le groupe qui est constitué par : un monosaccharide, un disaccharide, de l'éthylène glycol, du propylène glycol, du 1,3-propandiol, du 1,3-butanediol, du 1,4-butanediol, du 1,5-pentanediol, du 1,6-hexanediol, du néopentylglycol, du diéthylène glycol, du dipropylène glycol, du triéthylène glycol, du tétraéthylène glycol, du dibutylène glycol, du 2-méthyl-1,3-pentanediol, du 2,2,4-triméthyl-1,3-pentanediol et du 1,4-cyclohexanediméthanéol.

2. Affichage émetteur de lumière organique tel que revendiqué selon la revendication 1, dans lequel une épaisseur de la couche tampon (224) est d'environ 10 Å à 100 Å.

3. Affichage émetteur de lumière organique tel que revendiqué selon la revendication 1 ou 2, dans lequel l'épaisseur prédéterminée de l'électrode supérieure (223) est d'environ 10Å à 30Å.

4. Affichage émetteur de lumière organique tel que revendiqué selon l'une quelconque des revendications précédentes, dans lequel l'électrode supérieure (223) est une cathode.

5. Affichage émetteur de lumière organique tel que revendiqué selon l'une quelconque des revendications précédentes, comprenant en outre au moins une couche de protection sur la couche tampon (224).

6. Affichage émetteur de lumière organique tel que revendiqué selon la revendication 7, dans lequel la couche de protection est une couche de passivation ou une couche de recouvrement.

7. Affichage émetteur de lumière organique tel que revendiqué selon l'une quelconque des revendications précédentes, dans lequel la couche émettrice de lumière organique comprend en outre au moins une couche organique qui inclut au moins une couche prise parmi une couche d'injection de trous, une couche de transport de trous, une couche de transport d'électrons et une couche d'injection d'électrons.

8. Affichage émetteur de lumière organique tel que revendiqué selon l'une quelconque des revendications précédentes, dans lequel le matériau non conducteur est un oxyde.

9. Procédé de fabrication d'un affichage émetteur de lumière organique tel que revendiqué selon la revendication 1, le procédé comprenant :

la formation d'une électrode inférieure (221) connectée électriquement à un transistor (220) sur un substrat ;
la formation d'une couche émettrice de lumière organique (222) sur l'électrode inférieure (221) ;
la formation d'une électrode supérieure (223) sur la couche émettrice de lumière organique (222) ;
la formation d'une couche tampon (224) sur l'électrode supérieure (223), la couche tampon étant formée en un matériau permettant de modifier l'électrode supérieure (223) de telle sorte qu'elle soit un matériau non conducteur d'une épaisseur prédéterminée de manière à former la couche non conductrice.

10. Affichage mobile incluant un corps principal d'affichage qui comporte une unité d'image pour afficher une image, l'unité d'image incluant un affichage émetteur de lumière organique selon l'une des revendications 1 à 8.

FIG. 1

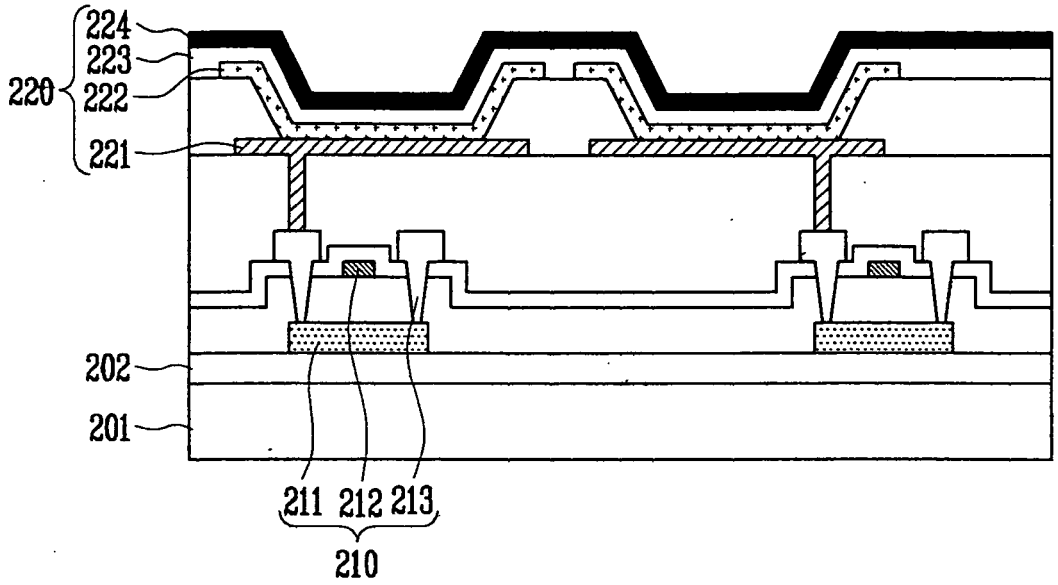

224
223
222
220
221
202
201
211 212 213
210

FIG. 2

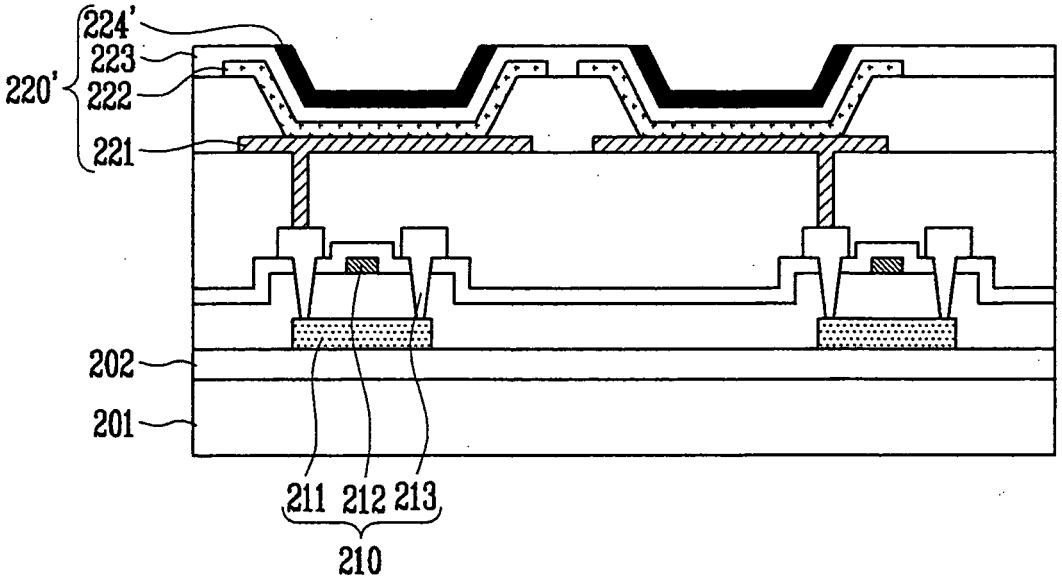

224'
223
222
220'
221
202
201
211 212 213
210

FIG. 3

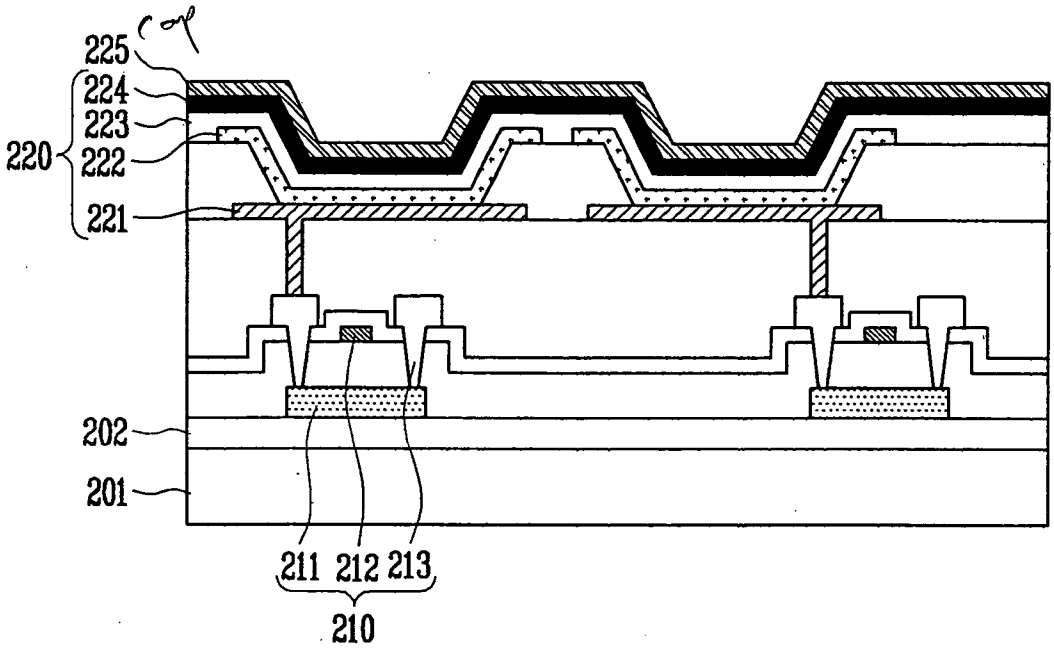

225
224
223
220
222
221
202
201
211 212 213
210

FIG. 4

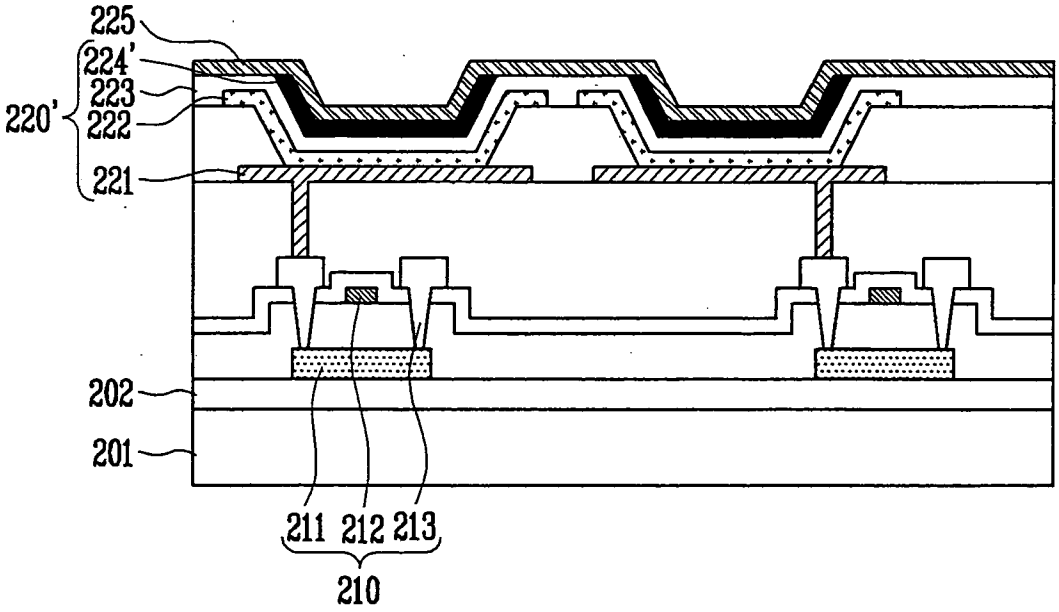

225
224'
223
220'
222
221
202
201
211 212 213
210

FIG. 5

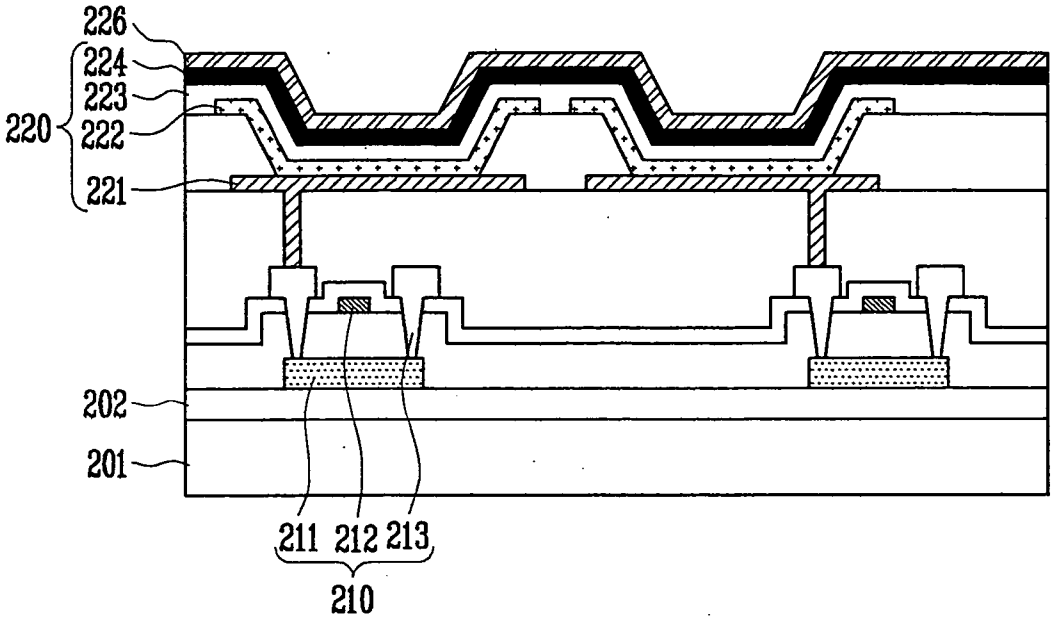

226
224
223
222
220
221
202
201
211 212 213
210

FIG. 6

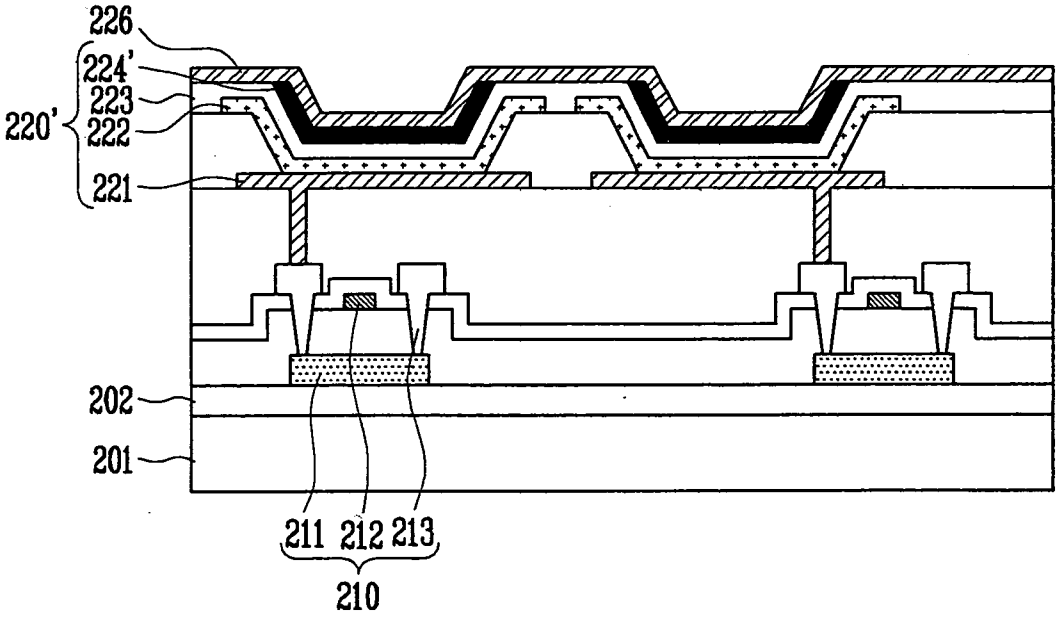

226
224'
223
222
220'
221
202
201
211 212 213
210

FIG. 7

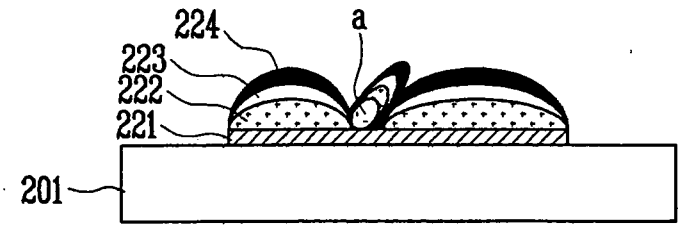


FIG. 8

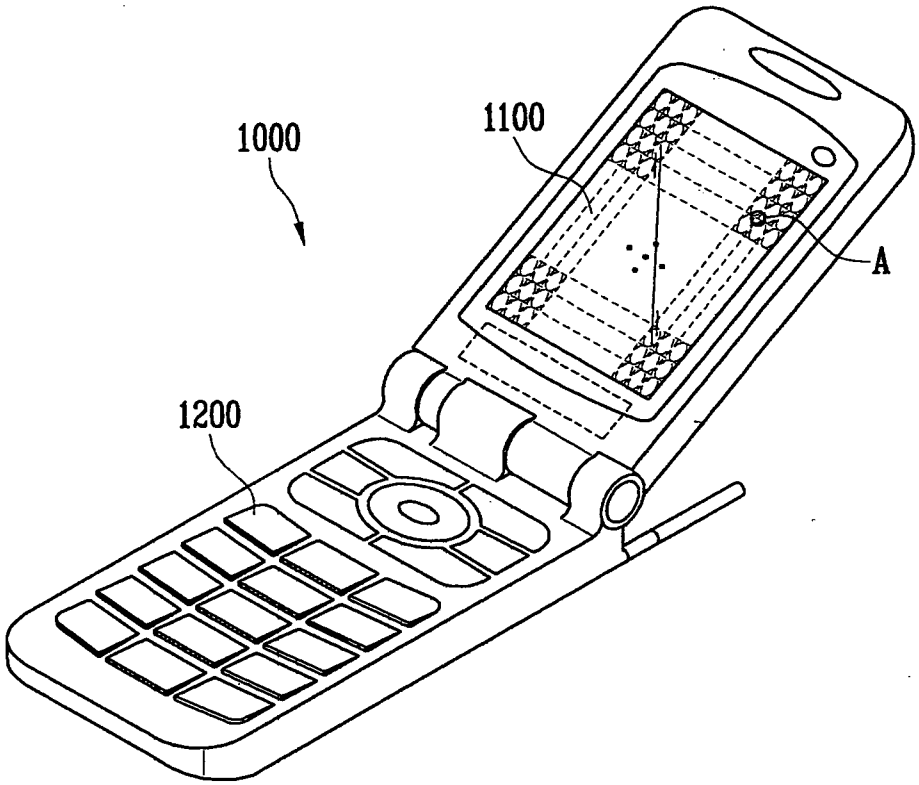


FIG. 9

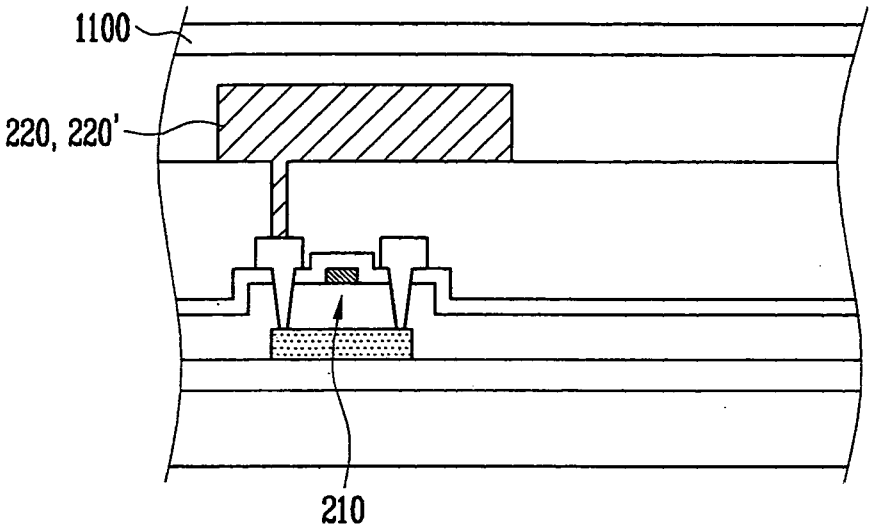
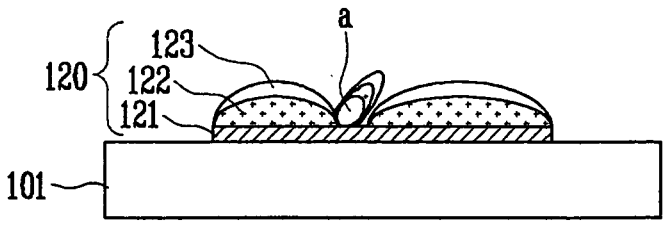


FIG. 10
(RELATED ART)



REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- US 2004115859 A **[0004]**
- JP 2002025769 B **[0005]**
- US 2005062414 A **[0006]**
- US 20050110020 A **[0007]**

专利名称(译)	有机发光显示器，其制造方法以及包括有机发光显示器的移动显示器		
公开(公告)号	EP1777759B1	公开(公告)日	2017-08-09
申请号	EP2006255407	申请日	2006-10-20
[标]申请(专利权)人(译)	三星斯笛爱股份有限公司		
申请(专利权)人(译)	三星SDI CO.，LTD.		
当前申请(专利权)人(译)	三星DISPLAY CO.，LTD.		
发明人	LEE, KWAN HEE, C/O SAMSUNG SDI CO., LTD.		
IPC分类号	H01L51/52 H01L27/32		
CPC分类号	H01L51/5203 H01L27/3244 H01L51/5221 H01L51/5253 H01L2251/5392		
优先权	1020050099381 2005-10-20 KR		
其他公开文献	EP1777759A2 EP1777759A3		
外部链接	Espacenet		

摘要(译)

有机发光显示器及其制造方法。有机发光显示器可包括基板上的晶体管（210），基板上的下电极（221），下电极电连接到晶体管，下电极上的有机发光层（222），在有机发光层上的上电极（223）和在上电极上形成的缓冲层（224），以将上电极的预定厚度修改为非导电材料。

FIG. 1

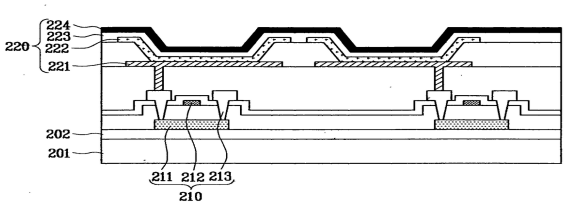

FIG. 2