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(54) **Organic electroluminescence display and method for manufacturing the same**

Organische Elektrolumineszenzanzeige und Herstellungsverfahren dafür

Affichage électroluminescent organique et son procédé de fabrication

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Description

[0001] This application claims the benefit of Korean Patent Application No. 10-2004-0100360, filed on December 2, 2004.

BACKGROUND OF THE INVENTION

Field of the Invention

[0002] The present invention relates to an organic electroluminescence (EL) display, and more particularly, to an adhesive type organic EL display, and a method for manufacturing the same.

Discussion of the Related Art

[0003] Generally, an adhesive type organic EL display comprises a lower panel having a pixel switching element and a pixel driving element formed thereon, and an upper panel having organic materials stacked thereon, in which the lower board is electrically connected with the upper board by bonding the upper and lower panels, thereby embodying the display.

[0004] A method for manufacturing a conventional adhesive type organic EL display will be described as follows.

[0005] FIG. 1 shows a cross-sectional view illustrating a conventional adhesive type organic EL display.

[0006] In FIG. 1, the display comprises a lower panel having a thin transistor formed thereon, and an upper panel having an organic EL element formed thereon.

[0007] Referring to FIG. 1, the lower panel of the organic EL display is manufactured by the following process.

[0008] First, a semiconductor layer 2 is formed using a polycrystalline silicon on a transparent substrate 1, and is removed via patterning except for a region where the thin transistor will be formed.

[0009] Next, after sequentially forming a gate insulation layer 3, and a conductive layer for a gate electrode over the entire surface of the substrate 1, the conductive layer is patterned to form a gate electrode 4.

[0010] Then, impurity ions such as phosphorus (P) are implanted to the semiconductor layer 2 using the gate electrode 4 as a mask, and then source/drain regions are formed by annealing the substrate, thereby forming an N-MOS thin transistor.

[0011] At this time, portions of the semiconductor layer 2 where the impurity ions are not implanted become channel regions.

[0012] Next, an interlayer insulation layer 5 is formed over the entire surface of the substrate comprising the above components, and the interlayer insulation layer 5 and the gate insulation layer 3 are selectively removed such that the source/drain regions of the N-MOS transistor are exposed.

[0013] Then, an electrode line 6 is formed on the substrate such that the electrode line 6 is electrically connected with the source/drain regions, respectively, thereby completing manufacture of the lower panel.

[0014] Next, referring to FIG. 1, the upper panel of the organic EL display is manufactured by the following process.

[0015] First, an anode 8 composed of a transparent conductive material having a high work function such as ITO or IZO is formed on a transparent substrate 7.

[0016] Then, an insulation layer 9 is formed on some portion of the anode 8 using an insulation material such as polyimide, and a partition wall 10 is formed on the insulation layer 9.

[0017] Next, an island-shaped spacer 11 is formed in a pixel region using another insulation material.

[0018] Then, a cathode 13 composed of a conductive material having a low work function such as aluminum is deposited on an electron implantation layer, thereby completing manufacture of the upper panel.

[0019] The upper and lower panels manufactured as described above are attached to each other.

[0020] At this time, the upper and lower panels are electrically connected by contacting the cathode 13 formed on the spacer 11 of the upper panel with the electrode line 6 of the lower panel.

[0021] However, the adhesive type organic EL display manufactured as described above has the following problems.

[0022] In general, since the spacer has a higher profile than that of the partition wall, and must be formed to have a gentle side angle, it is difficult to form the spacer.

[0023] In addition, when forming the organic material using a shadow mask, the spacer is likely to be collapsed or damaged by the shadow mask.

[0024] Furthermore, since the spacer is formed in a light emitting region, an aperture ratio is reduced.

[0025] KR 10-2004-0007823 A discloses an organic EL display having a first substrate with thin film transistors formed thereon, a second substrate with a light emitting region and a non-light emitting region. The first and second substrates are arranged to face each other. A first electrode is formed over an entire surface of the second substrate. A plurality of partition walls are formed on the non-light emitting region of the second substrate and a light emitting layer is formed on the first electrode in the light emitting region. A second electrode is formed on the light-emitting layer as well as on side and upper surfaces of the partition walls so as to be electrically connected to the thin film transistors of the first substrate.

[0026] JP 2002-208489 A discloses an organic electroluminescence display panel and a manufacturing method of the same. The display panel comprises a substrate with a plurality of first electrodes extending in parallel with each other. Partition walls are provided on the first electrodes and the substrate so that the partition walls extend in parallel to each other perpendicular to the first electrodes. The side wall insulating layers are provided at the side surfaces of the partition walls. An

organic electroluminescence layer and a second electrode are formed in this order on the top of the partition walls, the side wall insulating layer, and the first electrodes.

[0027] US 5,952,037 A discloses another organic EL display panel that comprises a first substrate, having a thin film transistor formed thereon, and a second substrate, having a light-emitting region and a non-light-emitting region. The first and second substrates are facing each other. A first electrode is formed over an entire surface of the second substrate. A plurality of single partition walls is formed in non-light-emitting regions of the second substrate on the first electrode. An organic light-emitting layer is formed on the first electrode in the light-emitting region. A second electrode is formed on the organic light-emitting layer. To provide electrical contact between the thin film transistor and the corresponding second electrode, an anisotropic conductive adhesive is provided, which adheres both, the front and back substrates so that the non-linear elements, i.e. the thin film transistors are electrically connected only to the corresponding second display electrodes. The partition walls have overhanging portions projecting in a direction parallel to the substrate at an upper part thereof. The overhanging portion is formed along the extending edge of the partition wall.

[0028] KR 10-2004-0046173 A discloses an organic electroluminescence device, having a thin film transistor substrate and a second substrate with light-emitting and non-light-emitting regions. The second substrate is provided with a first electrode formed over an entire surface of the second substrate, a plurality of partition walls, an organic light-emitting layer on the first electrode between the partition walls and a second electrode formed on the organic light-emitting layer. An assistant electrode is formed on the non-light-emitting region of the second substrate below the first electrode.

SUMMARY OF THE INVENTION

[0029] Accordingly, the present invention is directed to an adhesive type organic EL display, and a method for manufacturing the same that substantially obviates one or more problems due to limitations and disadvantages of the related art.

[0030] An object of the present invention is to provide an adhesive type organic EL display, which does not comprise a spacer, and a method for manufacturing the same.

[0031] Another object of the present invention is to provide an adhesive type organic EL display, and a method for manufacturing the same, which can simplify a process, enhance reliability of the product, and has a high optical efficiency.

[0032] Additional advantages, objects, and features of the invention will be set forth in part in the description which follows and in part will become apparent to those having ordinary skill in the art upon examination of the following or may be learned from practice of the invention. The objectives and other advantages of the invention may be realized and attained by the structure particularly pointed out in the written description and claims hereof as well as the appended drawings.

[0033] These objects are achieved by the adhesive type organic EL display of claim 1 and the method of claim 9.

[0034] Another organic EL display comprising a first substrate having a thin film transistor formed thereon, and a second substrate having an organic EL element formed thereon, further comprises: a light emitting region, and a non-light emitting region provided to the second substrate; an assistant electrode formed on the second substrate of the non-light emitting region; a first electrode formed over an entire surface of the second substrate including the assistant electrode; at least two partition walls formed on the first electrode of the non-light emitting region; an insulation layer to cover a portion of each partition wall; a light emitting layer formed on the first electrode of the light emitting region; and a second electrode formed over the entire surface of the second substrate including the light emitting layer, and electrically connected to the thin transistor of the first substrate.

[0035] Yet another organic EL display comprising a first substrate having a thin film transistor formed thereon, and a second substrate having an organic EL element formed thereon, further comprises: a light emitting region, and a non-light emitting region provided to the second substrate; a first electrode formed on the second substrate; an assistant electrode formed on the first electrode of the non-light emitting region; partition walls formed on the assistant electrode; an insulation layer to cover a portion of each partition wall; a light emitting layer formed on the first electrode of the light emitting region; and a second electrode formed over an entire surface of the second substrate including the light emitting layer, and electrically connected to the thin transistor of the first substrate.

[0036] Further, a method for manufacturing an organic EL display comprises the steps of: forming an assistant electrode on a non-light emitting region of a second substrate; forming a first electrode over an entire surface of the second substrate including an upper or lower portion of the assistant electrode; forming partition walls on a region where the assistant electrode is formed; forming an insulation layer to cover a portion of each partition wall; forming a light emitting layer on the first electrode of the light emitting region; and forming a second electrode over the entire surface of the second substrate including the light emitting layer; and electrically connecting the second electrode with a thin transistor of a first substrate.

[0037] It is to be understood that both the foregoing general description and the following detailed description of the present invention are exemplary and explanatory and are intended to provide further explanation of the invention as claimed.

BRIEF DESCRIPTION OF THE DRAWINGS

[0038] The accompanying drawings, which are included to provide a further understanding of the invention and are incorporated in and constitute a part of this application, illustrate embodiment(s) of the invention and together with the description serve to explain the principle of the invention. In the drawings:

[0039] FIG. 1 is a cross-sectional view illustrating a conventional adhesive type organic EL display;

[0040] FIG. 2 is a cross-sectional view illustrating an example of an adhesive type organic EL display;

[0041] FIG. 3 is a cross-sectional view illustrating an adhesive type organic EL display in accordance with the present invention;

[0042] FIGs. 4A to 4E are cross-sectional views for illustrating steps of a method for manufacturing an adhesive type organic EL display in accordance with the example of fig. 2;

[0043] FIGs. 5A to 5D are cross-sectional views for illustrating steps of a method for manufacturing an adhesive type organic EL display in accordance with the invention; and

[0044] FIGs. 6A and 6B are views illustrating the shapes of partition walls of the adhesive type organic EL display in accordance with the present invention.

DETAILED DESCRIPTION OF THE INVENTION

[0045] Reference will now be made in detail to the preferred embodiments of the present invention, examples of which are illustrated in the accompanying drawings. Wherever possible, the same reference numbers will be used throughout the drawings to refer to the same or like parts.

[0046] FIG. 2 is a cross-sectional view illustrating an example of an adhesive type organic EL display.

[0047] As shown in Fig. 2, the organic EL display comprises a first substrate 31 having an a-Si thin transistor 39 formed thereon, and a second substrate 32 which has an organic EL element formed thereon, and is bonded to the first substrate 31.

[0048] An electrode of the thin transistor of the first substrate 31 is electrically connected with an electrode of the organic EL element of the second substrate 32.

[0049] The second substrate 32 has an assistant electrode 35, a first electrode 36 acting as an anode, at least two partition walls 33, an insulation layer 34, an organic light emitting layer 37, and a second electrode 38 acting as a cathode, formed thereon.

[0050] The at least two partition walls 33 are formed in a non-light emitting region of the second substrate 32, in which the first electrode 36, and the assistant electrode 35 are formed below each partition wall 33.

[0051] The insulation layer 34 is formed to cover a portion of each partition wall 33.

[0052] Here, the insulation layer 34 covering the portion of one partition wall 33 is symmetrical to the insulation layer covering the portion of the other partition wall 33 adjacent to the one partition wall 33.

[0053] In other words, the insulation layer 34 is formed on opposite sides of adjacent partition walls 33 in which the opposite sides do not face each other, and the organic light emitting layer 37 is formed between the sides of the adjacent partition walls 33 in which the sides face each other.

[0054] A method for manufacturing this organic EL display will be described as follows.

[0055] FIGs. 4A to 4E are cross-sectional views for illustrating steps of the method for manufacturing an adhesive type organic EL display in accordance with the first embodiment.

[0056] First, as shown in FIG. 4A, an assistant electrode 35 is formed on a non-light emitting region of a second substrate 32.

[0057] Here, the assistant electrode 35 is composed of a conductive material, and preferably, of Al, Mo, an AnNd alloy, Cr, Cu, and the like.

[0058] Next, as shown in FIG. 4B, a first electrode 36 is formed over the entire surface of the second substrate 32 including the assistant electrode 35.

[0059] The first electrode 36 acts as an anode, and is preferably composed of at least one of ITO and IZO.

[0060] Then, as shown in FIG. 4C, at least two partition walls 33 are formed on the first electrode 36 where the assistant electrode 35 is formed.

[0061] Here, as shown in FIG. 6A, each of the partition walls 33 preferably is a structure wherein a lower surface thereof is narrower than an upper surface thereof to be formed with the second electrode 38.

[0062] In addition, as shown in FIG. 6B, each of the partition walls 33 may comprise a first section 50, which has a lower surface thereof wider than an upper surface thereof to be formed with the second electrode 38, and a second section 51, which is formed on the upper surface of the first section 50 and wider than the lower surface of the first section 50.

[0063] Then, as shown in FIG. 4D, an insulation layer 34 is formed to cover a portion of each partition wall 33.

[0064] Here, the insulation layer 34 is formed on opposite sides of adjacent partition walls 33 in which the opposite sides do not face each other.

[0065] The insulation layer 34 can be composed of an organic material or an inorganic material, and is preferably composed of a polymeric material.

[0066] In particular, the insulation layer 34 advantageously comprises at least one of photosensitive polyimide, polyacryl, and novolac-based organic insulation layers.

[0067] In addition, as shown in FIG. 4E, an organic light emitting layer 37 is formed on the first electrode 36 of the light emitting region, and a second electrode 38 acting as a cathode is formed over the entire surface of the second substrate 32 including the organic light emitting layer 37.

[0068] Then, the first substrate 31 having the thin tran-

sistor is attached to the second substrate 32 having the organic EL element such that the second electrode 38 is electrically connected with the thin transistor of the first substrate 31, thereby completing the manufacture of the organic EL display.

[0069] At this time, the first substrate 31 is attached to the second substrate 32 using a sealant such that the organic EL display has an internal space formed to have a vacuum by the attachment of the first and second substrates 31 and 32.

[0070] In addition, a getter is added to the internal space of the organic EL display, and serves to adsorb moisture and oxygen.

[0071] At this time, a getter made of barium with high oxidizing properties can be used.

[0072] FIG. 3 is a cross-sectional view illustrating an adhesive type organic EL display in accordance with the present invention.

[0073] As shown in Fig. 3, the organic EL display of the invention comprises a first substrate 31 having a p-Si thin transistor 40 formed thereon, and a second substrate 32 which has an organic EL element formed thereon, and is bonded to the first substrate 31.

[0074] An electrode of the thin transistor of the first substrate 31 is electrically connected with an electrode of the organic EL element of the second substrate 32.

[0075] The second substrate 32 has an assistant electrode 35, a first electrode 36 acting as an anode, at least two partition walls 33, an insulation film 34, an organic light emitting layer 37, and a second electrode 38 acting as a cathode, formed thereon.

[0076] The at least two partition walls 33 are formed in a non-light emitting region of the second substrate 32, in which the island-shaped assistant electrode 35, and the first electrode 36 are formed below each partition wall 33.

[0077] The insulation layer 34 is formed to cover a portion of each partition wall 33.

[0078] Here, the insulation layer 34 covering the portion of one partition wall 33 is symmetrical to the insulation layer covering the portion of the other partition wall 33 adjacent to the one partition wall 33.

[0079] In other words, the insulation layer 34 is formed on sides of adjacent partition walls 33 in which the sides face each other, and the organic light emitting layer 37 is not formed between the adjacent partition walls 33.

[0080] A method for manufacturing the organic EL display of the invention will be described as follows.

[0081] FIGs. 5A to 5D are cross-sectional views for illustrating steps of the method for manufacturing the adhesive type organic EL display in accordance with the invention.

[0082] First, as shown in FIG. 5A, a first electrode 36 is formed on a second substrate 32, and an island-shaped assistant electrode 35 is formed on a non-light emitting region of the first electrode 36.

[0083] Here, the assistant electrode 35 can be composed of a conductive material, and is preferably composed of Al, Mo, an AnNd alloy, Cr, Cu, and the like.

[0084] In addition, the first electrode 36 acts as an anode, and is preferably composed of ITO or IZO.

[0085] Then, as shown in FIG. 5B, partition walls 33 are formed on the assistant electrode 35.

[0086] Next, as shown in FIG. 5C, an insulation layer 34 is formed to cover a portion of each partition wall 33.

[0087] Here, the insulation layer 34 is formed on sides of adjacent partition walls 33, which face each other.

[0088] In addition, as shown in FIG. 5D, an organic light emitting layer 37 is formed on the first electrode 36 in the light emitting region, and a second electrode 38 acting as a cathode is formed over the entire surface of the second substrate 32 including the organic light emitting layer 37.

[0089] Then, the first substrate 31 having the thin film transistor is attached to the second substrate 32 having the organic EL element such that the second electrode 38 is electrically connected with the thin film transistor of the first substrate 31, thereby completing the manufacture of the organic EL display.

[0090] As apparent from the above description, according to the present invention, since the organic EL display does not employ a spacer, it is possible to secure an aperture ratio, simplify the manufacturing process, enhance the reliability of the product, and improve optical efficiency.

[0091] It will be apparent to those skilled in the art that various modifications and variations can be made in the present invention without departing from the scope of the invention. Thus, it is intended that the present invention covers the modifications and variations of this invention provided they come within the scope of the appended claims.

Claims

1. An organic EL display comprising:

- a first substrate (31) having a thin film transistor (40) formed thereon;
- a second substrate (32) having a light emitting region and a non-light emitting region, wherein the first and second substrates (31, 32) facing to each other;
- a first electrode (36) formed on the second substrate (32);
- an assistant electrode (35) formed on the first electrode (36) in the non-light emitting region;
- pairs of partition walls (33) formed in the non-light emitting region of the second substrate (32) and on the assistant electrode (35);
- an insulation layer (34) formed on sides of adjacent partition walls in which the sides face each other;
- an organic light emitting layer (37) formed on the first electrode (36) in the light emitting region, wherein the organic light emitting layer is not

formed between the adjacent partition walls; and
- a second electrode (38) formed on the organic light emitting layer (37) and the partition walls (33), wherein the second electrode (38) on the partition walls is electrically connected to the thin film transistor (40) of the first substrate (31).

2. The organic EL display according to claim 1, wherein the first electrode (36) is an anode, and the second electrode (38) is a cathode.

3. The organic EL display according to claim 1, wherein the assistant electrode (35) comprises at least one of Al, Mo, an AnNd alloy, Cr and Cu, and the first electrode (36) comprises at least one of ITO and IZO.

4. The organic EL display according to claim 1, wherein the non-light emitting region has a structure of substrate/first electrode/second electrode or a structure of substrate/first electrode/assistant electrode/second electrode stacked between the partition walls.

5. The organic EL display according to claim 1, wherein each of the partition walls (33) is a structure wherein a lower surface thereof is narrower than an upper surface thereof.

6. The organic EL display according to claim 1, wherein each of the partition walls (33) comprises a first section (50) having a lower surface thereof wider than an upper surface thereof and a second section (51) being formed on the upper surface of the first section, and wider than the lower surface of the first section.

7. The organic EL display according to claim 1, wherein the insulation layer (34) covering the portion of one partition wall (33) is symmetrical to the insulation layer (34) covering the portion of the other partition wall (33) adjacent to the one partition wall (33).

8. The organic EL display according to claim 1, wherein the insulation layer (34) comprises at least one of photosensitive polyimide, polyacryl, and novolac-based organic insulation layers.

9. A method for manufacturing an organic EL display comprising a first substrate (31) having a thin film transistor (40) formed thereon, and a second substrate (32) having an organic EL element formed thereon, the method comprising the steps of:

- forming a first electrode (36) on the second substrate (32);
- forming an assistant electrode (35) on the first electrode (36) in a non-light emitting region;
- forming pairs of partition walls (33) formed in the non-light emitting region of the second substrate (32) and on the assistant electrode (35);
- forming an insulation layer (34) on sides of adjacent partition walls (33) in which the sides face each other;
- forming an organic light emitting layer (37) on the first electrode (36) in the light emitting region, wherein the organic light emitting layer is not formed between the adjacent partition walls; and
- forming a second electrode (38) on the organic light emitting layer (37) and the partition walls (33); and
- electrically connecting the second electrode (38) on the partition walls to the thin film transistor (40) of the first substrate (31).

Patentansprüche

1. Organische EL-Anzeige, die umfasst:

- ein erstes Substrat (31) mit einem darauf gebildeten Dünnschichttransistor (40);
- ein zweites Substrat (32) mit einem Lichtemissionsbereich und einem Nicht-Lichtemissionsbereich, wobei das erste und das zweite Substrat (31, 23) einander zugewandt sind;
- eine erste Elektrode (36), die auf dem zweiten Substrat (32) gebildet ist;
- eine Hilfselektrode (35), die auf der ersten Elektrode (36) in dem Nicht-Lichtemissionsbereich gebildet ist;
- Paare von Trennwänden (33), die in dem Nicht-Lichtemissionsbereich des zweiten Substrats (32) und auf der Hilfselektrode (35) gebildet sind;
- eine Isolierschicht (34), die auf Seiten von benachbarten Trennwänden gebildet sind, wobei die Seiten einander zugewandt sind;
- eine organische Lichtemissionsschicht (37), die auf der ersten Elektrode (36) in dem Lichtemissionsbereich gebildet ist, wobei die organische Lichtemissionsschicht nicht zwischen den benachbarten Trennwänden gebildet ist; und
- eine zweite Elektrode (38), die auf der organischen Lichtemissionsschicht (37) und den Trennwänden (33) gebildet ist, wobei die zweite Elektrode (38) auf den Trennwänden mit dem Dünnschichttransistor (40) des ersten Substrats (31) elektrisch verbunden ist.

2. Organische EL-Anzeige nach Anspruch 1, wobei die erste Elektrode (36) eine Anode ist und die zweite Elektrode (38) eine Kathode ist.

3. Organische EL-Anzeige nach Anspruch 1, wobei die Hilfselektrode (35) mindestens eines umfasst von: Al, Mo, einer AnNd-Legierung, Cr und Cu und die erste Elektrode (36) mindestens eines von ITO und IZO umfasst.

4. Organische EL-Anzeige nach Anspruch 1, wobei der Nicht-Lichtemissionsbereich eine Struktur von Substrat/erste Elektrode/zweite Elektrode oder eine Struktur von Substrat/erste Elektrode/Hilfselektrode/zweite Elektrode, die zwischen den Trennwänden gestapelt sind, besitzt.

5. Organische EL-Anzeige nach Anspruch 1, wobei jede der Trennwände (33) eine Struktur ist, wobei eine ihrer unteren Flächen schmaler als eine ihrer oberen Flächen ist.

6. Organische EL-Anzeige nach Anspruch 1, wobei jede der Trennwände (33) einen ersten Abschnitt (50), wobei eine ihrer unteren Flächen breiter als eine ihrer oberen Flächen ist, und einen zweiten Abschnitt (51), der auf der oberen Fläche des ersten Abschnitts gebildet ist und breiter als die untere Fläche des ersten Abschnitts ist, umfasst.

7. Organische EL-Anzeige nach Anspruch 1, wobei die Isolierschicht (34), die den Teil einer Trennwand (33) bedeckt, symmetrisch zu der Isolierschicht (34) ist, die den Teil der anderen Trennwand (33), die zu der einen Trennwand (33) benachbart ist, bedeckt.

8. Organische EL-Anzeige nach Anspruch 1, wobei die Isolierschicht (34) mindestens eines umfasst von: einem photoempfindlichen Polyimid, einem Polyakryl und auf No-volak basierenden organischen Isolierschichten.

9. Verfahren zum Herstellen einer organischen EL-Anzeige, die ein erstes Substrat (31) mit einem darauf gebildeten Dünnschichttransistor (40) und ein zweites Substrat (32) mit einem darauf gebildeten organischen EL-Element umfasst, wobei das Verfahren die Schritte umfasst:

- Bilden einer ersten Elektrode (36) auf dem zweiten Substrat (32);
- Bilden einer Hilfselektrode (35) auf der ersten Elektrode (36) in einem Nicht-Lichtemissionsbereich;
- Bilden von Paaren von Trennwänden (33), die in dem Nicht-Lichtemissionsbereich des zweiten Substrats (32) und auf der Hilfselektrode (35) gebildet sind;
- Bilden einer Isolierschicht (34) auf Seiten von benachbarten Trennwänden (33), wobei die Seiten einander zugewandt sind;
- Bilden einer organischen Lichtemissionsschicht (37) auf der ersten Elektrode (36) in dem Lichtemissionsbereich, wobei die organische Lichtemissionsschicht nicht zwischen den benachbarten Trennwänden gebildet ist; und
- Bilden einer zweiten Elektrode (38) auf der organischen Lichtemissionsschicht (37) und den Trennwänden (33); und
- elektrisches Verbinden der zweiten Elektrode (38) auf den Trennwänden mit dem Dünnschichttransistor (40) auf dem ersten Substrat (31).

Revendications

1. Affichage électroluminescent, EL, organique comprenant :

- un premier substrat (31) comportant un transistor à film mince (40) constitué sur celui-ci ;
- un deuxième substrat (32) comportant une région d'émission de lumière et une région de non-émission de lumière, dans lequel les premier et deuxième substrats (31, 32) se font face l'un à l'autre ;
- une première électrode (36) constituée sur le deuxième substrat (32) ;
- une électrode assistante (35) constituée sur la première électrode (36) dans la région de non-émission de lumière ;
- des paires de cloisons (33) constituées dans la région de non-émission de lumière du deuxième substrat (32) et sur l'électrode assistante (35) ;
- une couche d'isolation (34) constituée sur des côtés de cloisons adjacentes dont les côtés se font face l'un à l'autre ;
- une couche d'émission de lumière organique (37) constituée sur la première électrode (36) dans la région d'émission de lumière, dans lequel la couche d'émission de lumière organique n'est pas constituée entre les cloisons adjacentes ; et
- une deuxième électrode (38) constituée sur la couche d'émission de lumière organique (37) et les cloisons (33), dans lequel la deuxième électrode (38) sur les cloisons est reliée électriquement au transistor à film mince (40) du premier substrat (31).

2. Affichage EL organique selon la revendication 1, dans lequel la première électrode (36) est une anode, et la deuxième électrode (38) est une cathode.

3. Affichage EL organique selon la revendication 1, dans lequel l'électrode assistante (35) comprend au moins l'un de : Al, Mo, un alliage d'AnNd, Cr et Cu, et la première électrode (36) comprend au moins l'un de : ITO et IZO.

4. Affichage EL organique selon la revendication 1, dans lequel la région de non-émission de lumière comporte une structure de substrat/première électrode/deuxième électrode ou une structure de subs-

trat/première électrode/électrode assistante/deuxième électrode empilés entre les cloisons.

5. Affichage EL organique selon la revendication 1, dans lequel chacune des cloisons (33) est une structure dont une surface inférieure est plus étroite qu'une surface supérieure de celle-ci.

6. Affichage EL organique selon la revendication 1, dans lequel chacune des cloisons (33) comprend une première section (50) dont une surface inférieure est plus large qu'une surface supérieure de celle-ci et une deuxième section (51) étant constituée sur la surface supérieure de la première section et étant plus large que la surface inférieure de la première section.

7. Affichage EL organique selon la revendication 1, dans lequel la couche d'isolation (34) recouvrant la portion d'une cloison (33) est symétrique à la couche d'isolation (34) recouvrant la portion de l'autre cloison (33) adjacente à la cloison (33).

8. Affichage EL organique selon la revendication 1, dans lequel la couche d'isolation (34) comprend au moins l'une de couches d'isolation organiques à base de polyimide, polyacryle et novolac photosensibles.

9. Procédé de fabrication d'un affichage EL organique comprenant un premier substrat (31) comportant un transistor à film mince (40) constitué sur celui-ci, et un deuxième substrat (32) comportant un élément EL organique constitué sur celui-ci, le procédé comprenant les étapes de :

- la constitution d'une première électrode (36) sur le deuxième substrat (32) ;
- la constitution d'une électrode assistante (35) sur la première électrode (36) dans une région de non-émission de lumière ;
- la constitution de paires de cloisons (33) dans la région de non-émission de lumière du deuxième substrat (32) et sur l'électrode assistante (35) ;
- la constitution d'une couche d'isolation (34) sur des côtés de cloisons adjacentes (33) dont les côtés se font face l'un à l'autre ;
- la constitution d'une couche d'émission de lumière organique (37) sur la première électrode (36) dans la région d'émission de lumière, dans lequel la couche d'émission de lumière organique n'est pas constituée entre les cloisons adjacentes ; et
- la constitution d'une deuxième électrode (38) sur la couche d'émission de lumière organique (37) et les cloisons (33) ; et
- la liaison électrique de la deuxième électrode (38) sur les cloisons au transistor à film mince (40) du premier substrat (31).

FIG. 1
Related Art

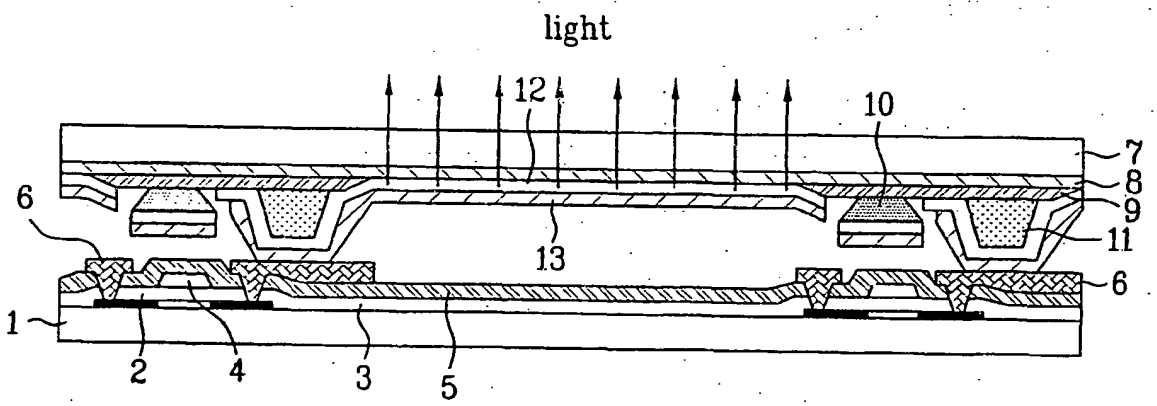


FIG. 2

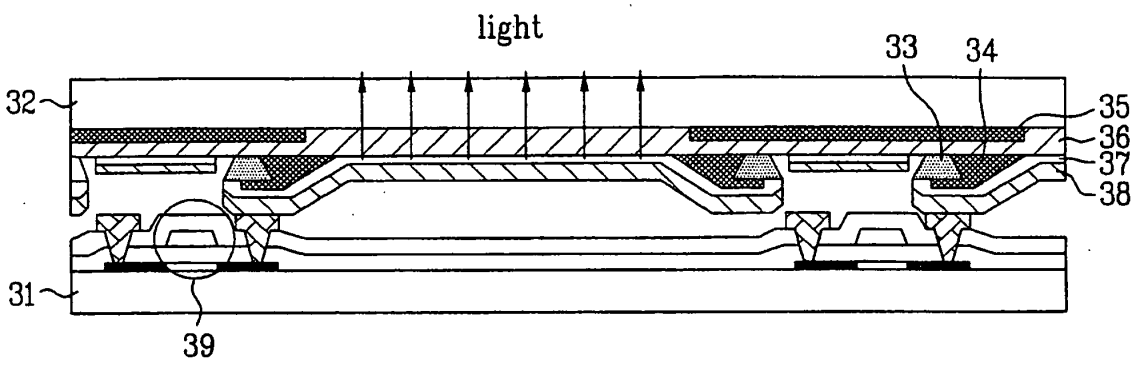


FIG. 3

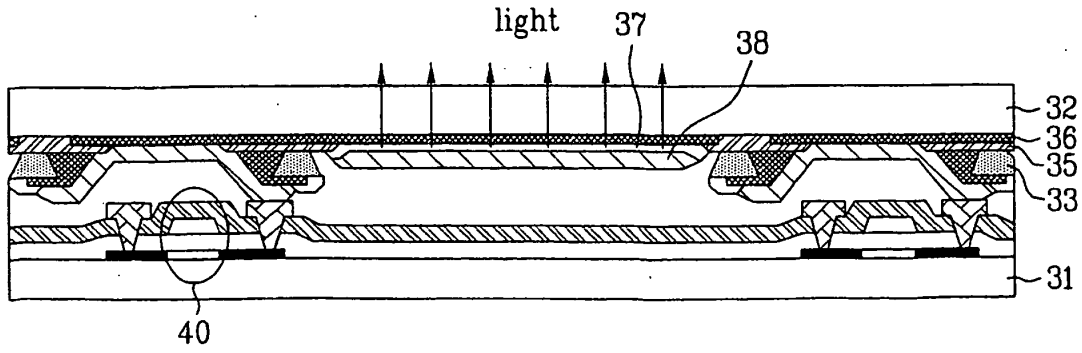


FIG. 4A

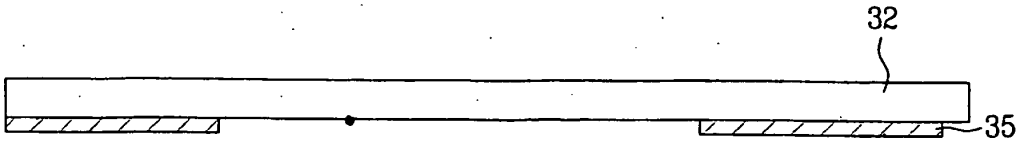


FIG. 4B

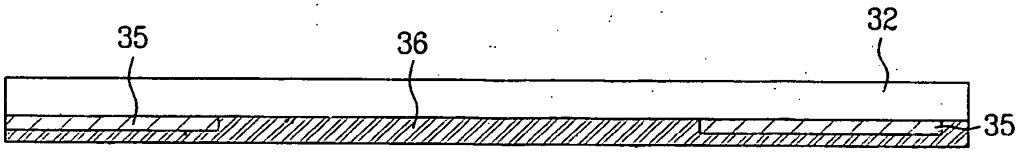


FIG. 4C

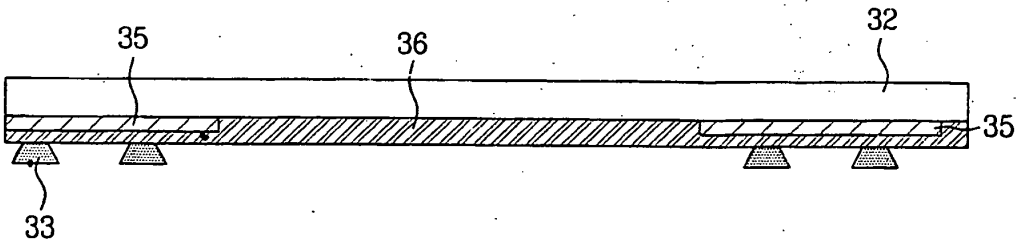


FIG. 4D

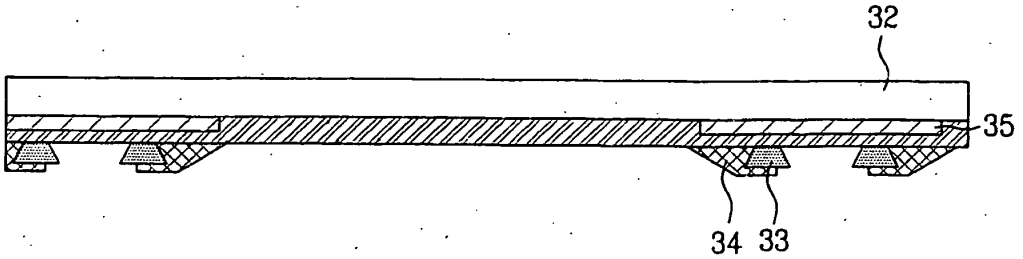


FIG. 4E

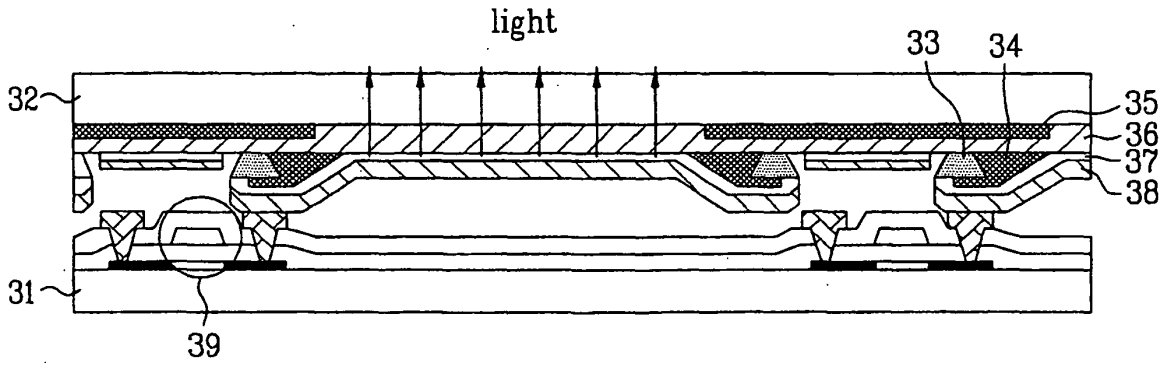


FIG. 5A

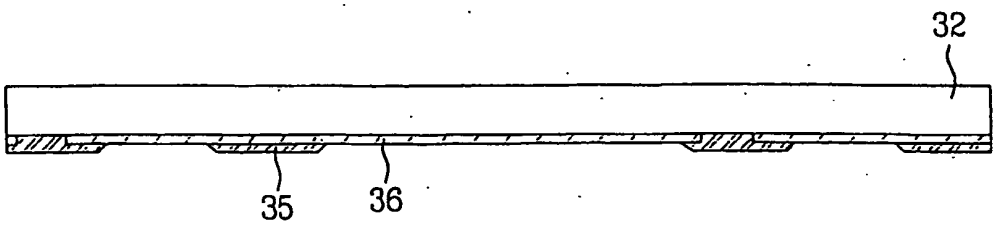


FIG. 5B

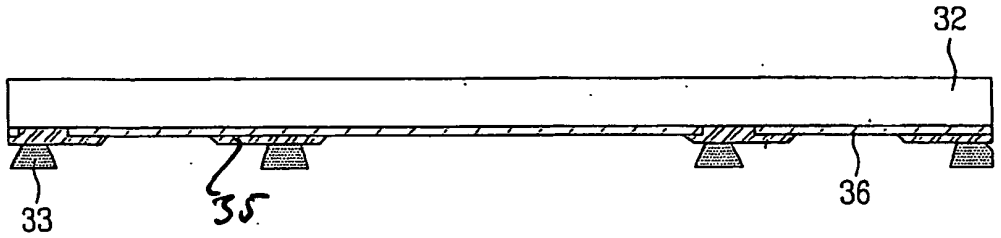


FIG. 5C

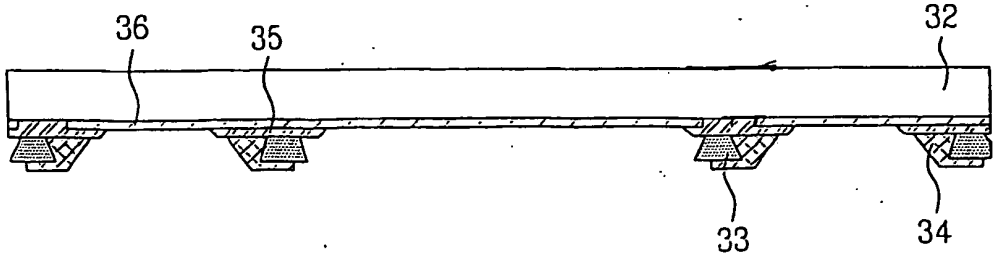


FIG. 5D

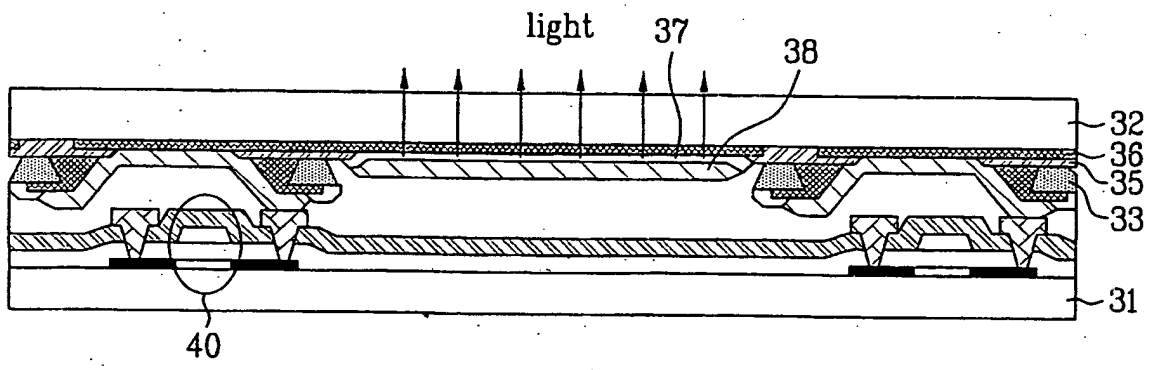


FIG. 6A

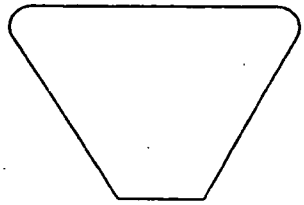
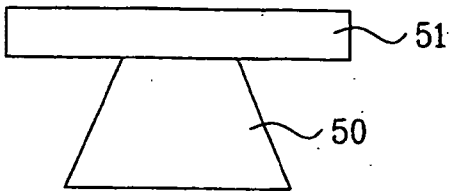


FIG. 6B



REFERENCES CITED IN THE DESCRIPTION

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- US 5952037 A **[0027]**
- KR 1020040046173 A **[0028]**

专利名称(译)	有机电致发光显示器及其制造方法		
公开(公告)号	EP1667245B1	公开(公告)日	2015-04-22
申请号	EP2005026100	申请日	2005-11-30
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 CHANG NAM		
发明人	KIM, CHANG NAM		
IPC分类号	H01L27/32		
CPC分类号	H01L27/3279 H01L27/3246 H01L27/3251 H01L51/0024		
优先权	1020040100360 2004-12-02 KR		
其他公开文献	EP1667245A3 EP1667245A2		
外部链接	Espacenet		

摘要(译)

公开了一种粘合型有机EL显示器及其制造方法。有机EL显示器包括：第一基板，其上形成有薄晶体管;以及第二基板，其上形成有有机EL元件。有机EL显示器还包括形成在第二基板的非发光区域中的至少两个分隔壁，形成为覆盖每个分隔壁的一部分的绝缘层，以及形成在分隔壁上的第二电极，并且电连接到第一衬底的薄晶体管。