



US010393806B2

(12) **United States Patent**
Lee et al.

(10) **Patent No.:** **US 10,393,806 B2**
(45) **Date of Patent:** **Aug. 27, 2019**

(54) **ORGANIC LIGHT EMITTING DISPLAY
DEVICE AND METHOD OF
MANUFACTURING THE SAME**

(71) Applicant: **LG DISPLAY CO., LTD.**, Seoul (KR)

(72) Inventors: **JaeSung Lee**, Seoul (KR); **Joonsuk
Lee**, Seoul (KR)

(73) Assignee: **LG DISPLAY CO., LTD.**, Seoul (KR)

(*) Notice: Subject to any disclaimer, the term of this
patent is extended or adjusted under 35
U.S.C. 154(b) by 0 days.

(21) Appl. No.: **15/923,114**

(22) Filed: **Mar. 16, 2018**

(65) **Prior Publication Data**

US 2018/0203062 A1 Jul. 19, 2018

Related U.S. Application Data

(63) Continuation of application No. 15/336,073, filed on
Oct. 27, 2016, now Pat. No. 9,952,284.

(30) **Foreign Application Priority Data**

Oct. 30, 2015 (KR) 10-2015-0152620

(51) **Int. Cl.**
H01L 51/52 (2006.01)
G01R 31/3177 (2006.01)

(Continued)

(52) **U.S. Cl.**
CPC ... **G01R 31/3177** (2013.01); **G01R 31/31723**
(2013.01); **G01R 31/31727** (2013.01); **G01R**
31/318555 (2013.01); **G01R 31/318572**
(2013.01); **G06F 11/26** (2013.01); **H01L**
27/3246 (2013.01); **H01L 27/3248** (2013.01);
H01L 27/3258 (2013.01); **H01L 27/3262**

(2013.01); **H01L 51/5212** (2013.01); **H01L**
51/5215 (2013.01); **H01L 51/5228** (2013.01);
H01L 51/5253 (2013.01); **H01L 51/56**
(2013.01); **H01L 27/1222** (2013.01); **H01L**
27/1225 (2013.01); **H01L 27/1248** (2013.01);
H01L 2227/323 (2013.01);

(Continued)

(58) **Field of Classification Search**

CPC **H01L 27/3258**; **H01L 27/3246**; **H01L**
51/5228; **H01L 27/1222**; **H01L 27/1248**
See application file for complete search history.

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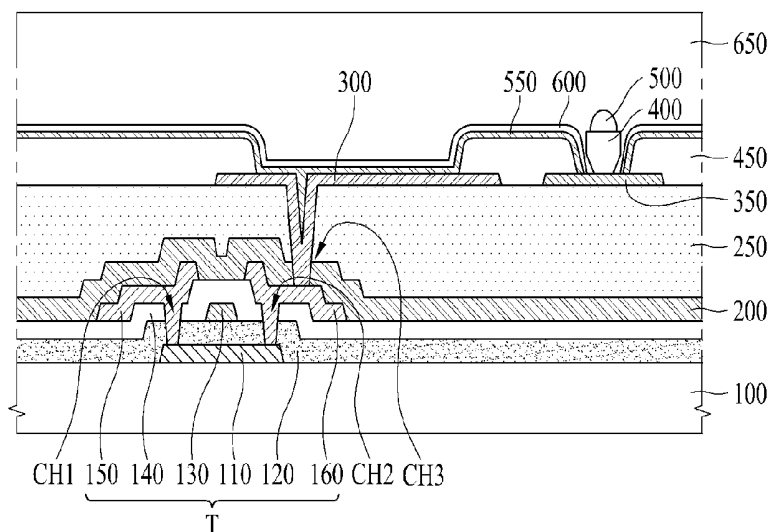
Primary Examiner — Donald L Raleigh

(74) *Attorney, Agent, or Firm* — Dentons US LLP

(57) **ABSTRACT**

Disclosed is an organic light emitting display (OLED)
device that may include a thin film transistor on a substrate;
a first electrode electrically connected with the thin film
transistor; an organic emitting layer on the first electrode, the
organic emitting layer separated by a partition; a partition
cover on the partition; a second electrode on the organic
emitting layer; and an encapsulation layer on the second
electrode, wherein a width of an upper surface of the
partition cover is smaller than a width of a lower surface of
the partition cover.

13 Claims, 5 Drawing Sheets



(51) **Int. Cl.**

G01R 31/317 (2006.01)
G01R 31/3185 (2006.01)
G06F 11/26 (2006.01)
H01L 27/32 (2006.01)
H01L 51/56 (2006.01)
H01L 27/12 (2006.01)

(52) **U.S. Cl.**

CPC .. *H01L 2251/301* (2013.01); *H01L 2251/308*
 (2013.01); *H01L 2251/5315* (2013.01)

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FIG. 1
RELATED ART

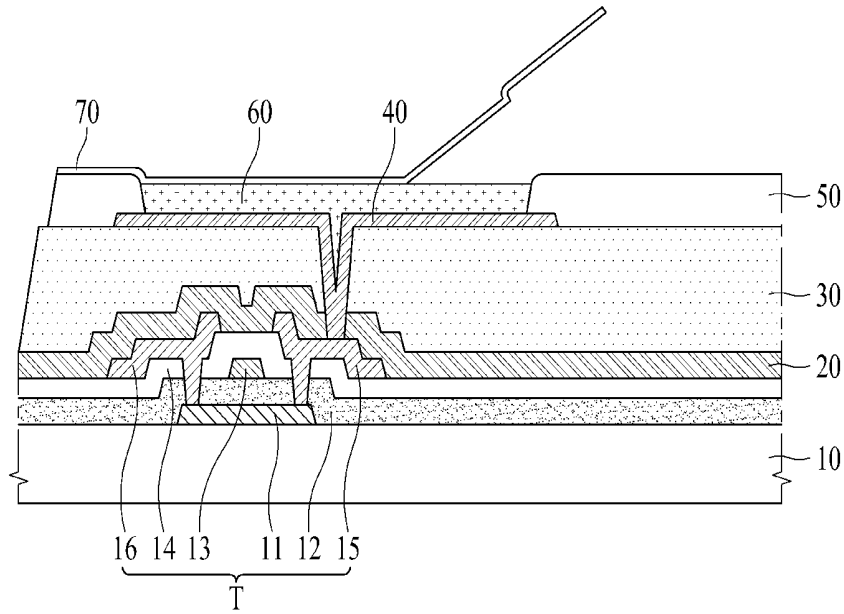
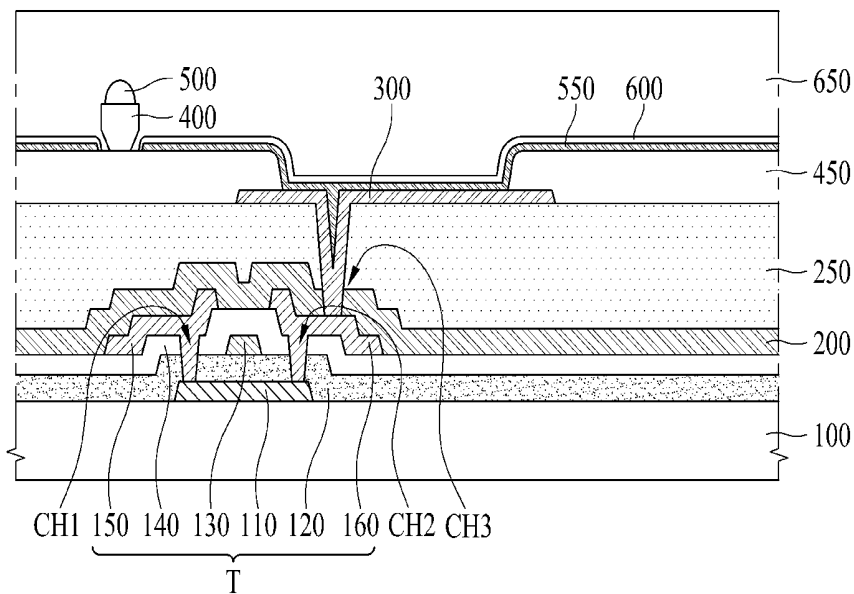


FIG. 2



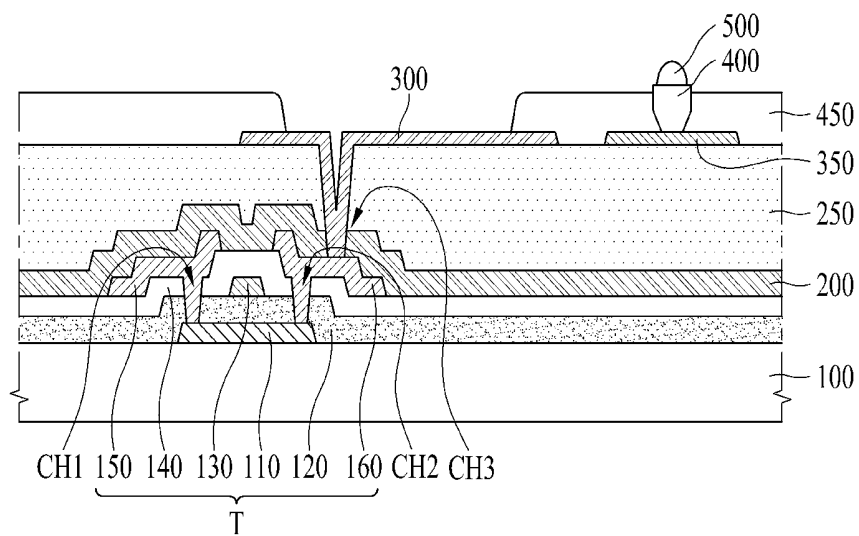
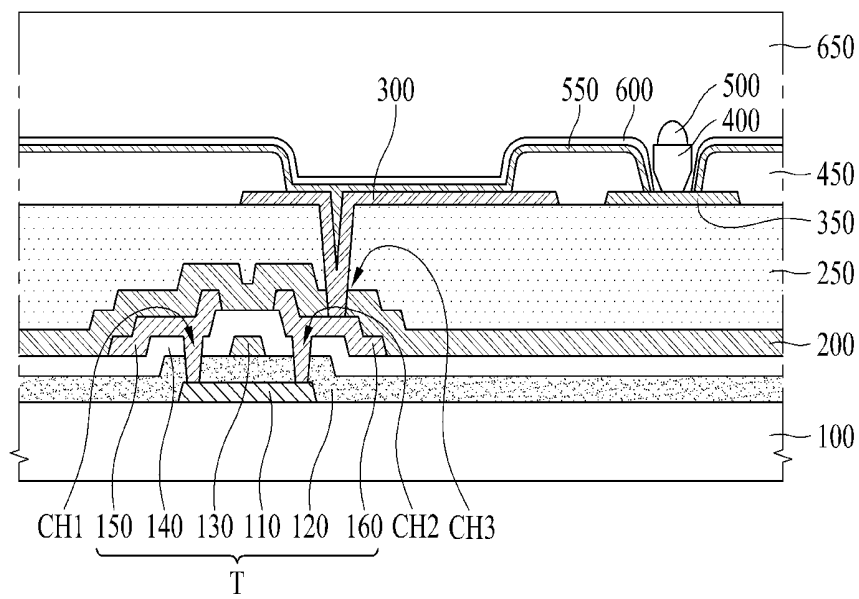


FIG. 4F



ORGANIC LIGHT EMITTING DISPLAY DEVICE AND METHOD OF MANUFACTURING THE SAME

CROSS REFERENCE TO RELATED APPLICATIONS

This application is a Continuation Application of U.S. patent application Ser. No. 15/336,073 filed on Oct. 27, 2016, which claims the benefit of Korean Patent Application No. 10-2015-0152620, filed on Oct. 30, 2015, which is incorporated by reference as if fully set forth herein.

BACKGROUND

Field of the Disclosure

Embodiments of the present invention relate to an organic light emitting display device, and more particularly, to a top emission type organic light emitting display device.

Discussion of the Related Art

An organic light emitting display (OLED) device, which is a self light emitting display device, has advantages of low power consumption, rapid response speed, high emission efficiency, high luminance and wide viewing angle.

According to a direction of the light emitted from an OLED device, the OLED device may be largely classified into a top emission type and a bottom emission type. In case of the bottom emission type, a circuit device is disposed between a light emitting layer and an image displaying surface, which may lower aperture ratio due to the circuit device. Meanwhile, in case of the top emission type, a circuit device is typically not disposed between a light emitting layer and an image displaying surface and thus, is more advantageous from an aperture ratio standpoint.

FIG. 1 is a cross sectional view of a top emission type OLED device according to the related art.

As shown in FIG. 1, a thin film transistor layer (T) including an active layer 11, a gate insulating film 12, a gate electrode 13, an insulating interlayer 14, a source electrode 15, and a drain electrode 16 is provided on a substrate 10, and then a passivation layer 20 and a planarization layer 30 are sequentially provided on the thin film transistor layer (T).

An anode electrode 40 is then provided on the planarization layer 30. On the anode electrode 40, a bank 50 is provided to define a pixel region. Also, an organic emitting layer 60 is provided in the pixel region defined by the bank 50, and a cathode electrode 70 is provided on the organic emitting layer 60.

In case of the top emission type, the light emitted from the organic emitting layer 60 passes through the cathode electrode 70. To do so, the cathode electrode 70 is typically formed of a transparent conductive material.

However, when the OLED device according the related art is subject to impact by repetitive bending actions, the organic emitting layer 60 may be separated from the cathode electrode 70, to thereby lower reliability of the OLED device.

SUMMARY

Accordingly, embodiments of the present invention are directed to an organic light emitting display device and a

method of manufacturing the same that substantially obviate one or more problems due to limitations and disadvantages of the related art.

An aspect of embodiments of the present invention is directed to provide a top emission type organic light emitting display device with enhanced reliability, and a method of manufacturing the same.

Additional features and advantages of the present invention will be set forth in the description which follows, and in part will be apparent from the description, or may be learned by practice of the invention. These and other advantages of the present invention will be realized and attained by the structure particularly pointed out in the written description and claims hereof as well as the appended drawings.

To achieve these and other advantages and in accordance with the purpose of embodiments of the invention, as embodied and broadly described herein, an OLED device may, for example, include a thin film transistor on a substrate; a first electrode electrically connected with the thin film transistor; an organic emitting layer on the first electrode, organic emitting layer separated by a partition; a partition cover on the partition; a second electrode on the organic emitting layer; and an encapsulation layer on the second electrode, wherein a width of an upper surface of the partition cover is smaller than a width of a lower surface of the partition cover.

In another aspect, a method of manufacturing an OLED device may, for example, include providing a thin film transistor on a substrate; providing a first electrode electrically connected with the thin film transistor, and providing an auxiliary electrode in the same layer as the first electrode; providing a partition on the auxiliary electrode; providing a bank at a lateral side of the first electrode and the auxiliary electrode; providing a partition cover on the partition; providing an organic emitting layer on the first electrode; providing a second electrode on the organic emitting layer; and providing an encapsulation layer on the second electrode, wherein a width of an upper surface of the partition cover is smaller than a width of a lower surface of the partition cover.

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

BRIEF DESCRIPTION OF THE DRAWINGS

The accompanying drawings, which are included to provide a further understanding of embodiments 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 embodiments of the invention. In the drawings:

FIG. 1 is a cross-sectional view illustrating a top emission type OLED device according to the related art;

FIG. 2 is a cross-sectional view illustrating an OLED device according to one embodiment of the present invention;

FIG. 3 is a cross-sectional view illustrating an OLED device according to another embodiment of the present invention; and

FIGS. 4A to 4F are cross-sectional views illustrating a method of manufacturing the OLED device according to another embodiment of the present invention.

DETAILED DESCRIPTION OF THE
ILLUSTRATED EMBODIMENTS

Terms disclosed in this specification should be understood as follows. The term of a singular expression should be understood to include a multiple expression as well as the singular expression if there is no specific definition in the context. The terms such as “the first” and “the second” are used only to differentiate one element from other elements. Thus, a scope of claims is not limited by these terms. Also, it should be understood that the term such as “include” or “have” does not preclude existence or possibility of one or more features, numbers, steps, operations, elements, parts or their combinations. It should be understood that the term “at least one” includes all combinations related with any one item. For example, “at least one among a first element, a second element and a third element” may include all combinations of two or more elements selected from the first, second and third elements as well as each element of the first, second and third elements. Also, if it is mentioned that a first element is positioned “on or above” a second element, it should be understood that the first and second elements may be brought into contact with each other, or a third element may be interposed between the first and second elements.

Hereinafter, reference will now be made in detail to embodiments of the present disclosure, 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. Also, in the following description of the present disclosure, if detailed description of elements or functions known is determined to make the subject matter of the present disclosure unnecessarily obscure, the detailed description thereof will be omitted.

FIG. 2 is a cross-sectional view illustrating an OLED device according to one embodiment of the present invention.

Referring to FIG. 2, the OLED device includes a thin film transistor (T), a passivation layer 200, a planarization layer 250, a first electrode 300, a partition 400, a bank 450, a partition cover 500, an organic emitting layer 550, a second electrode 600 and an encapsulation layer 650 on a substrate 100.

The thin film transistor (T) may include an active layer 110, a gate insulating film 120, a gate electrode 130, an insulating interlayer 140, a source electrode 150, and a drain electrode 160.

The active layer 110 is provided on the substrate 100, and is overlapped with the gate electrode 130. The active layer 110 may be formed of a silicon-based semiconductor material, or an oxide-based semiconductor material. Although not shown, a light-shielding layer may be additionally provided between the substrate 100 and the active layer 110.

The gate insulating film 120 is disposed on the active layer 110. The gate insulating film 120 is provided to insulate the active layer 110 and the gate electrode 130 from each other. In this case, the gate insulating film 120 may be formed in a single layer of an inorganic insulating material such as silicon oxide (SiOx) or silicon nitride (SiNx), or a multi-layered structure including one or more of silicon oxide (SiOx) and silicon nitride (SiNx), but the embodiment is not limited to these structures.

The gate electrode 130 is provided on the gate insulating film 120. The gate electrode 130 overlaps with the active layer 110, and the gate insulating film 120 is interposed between the gate electrode 130 and the active layer 110

being overlapped with each other. The gate electrode 130 may be formed in a single layer or a multi-layered structure including, for example, one or more of molybdenum (Mo), aluminum (Al), chrome (Cr), aurum (Au), titanium (Ti), nickel (Ni), neodymium (Nd), copper (Cu) and their alloys, but the embodiment is not limited to these materials.

The insulating interlayer 140 is provided on the gate electrode 130. The insulating interlayer 140 is formed of the same material as the gate insulating film 120. For example, the insulating interlayer 140 may be formed in a single layer of an inorganic insulating material such as silicon oxide (SiOx) or silicon nitride (SiNx), or a multi-layered structure including one or more of silicon oxide (SiOx) and silicon nitride (SiNx), but the embodiment is not limited to these materials and structures.

The source electrode 150 and the drain electrode 160 confronting each other are provided on the insulating interlayer 140. A first contact hole (CH1) for exposing one end of the active layer 110 is provided in the gate insulating film 120 and the insulating interlayer 140, and a second contact hole (CH2) for exposing the other end of the active layer 110 is provided in the gate insulating film 120 and the insulating interlayer 140. The source electrode 150 is connected with the other end of the active layer 110 via the first contact hole (CH1), and the drain electrode 160 is connected with one end of the active layer 110 via the second contact hole (CH2).

The thin film transistor layer (T) is not limited to the above-described structure, and the thin film transistor layer (T) may be changed to various structures and shapes generally known to those in the art. For example, FIG. 2 illustrates a top gate structure where the gate electrode 130 is provided on the active layer 110, but it is possible to provide, for example, a bottom gate structure where the gate electrode 130 is provided below the active layer 110.

The passivation layer 200 is provided on the thin film transistor layer (T) to protect the thin film transistor layer (T). The passivation layer 200 may be formed of an inorganic insulating material, for example, silicon oxide film (SiOx) or silicon nitride film (SiNx), but is not limited to these materials.

The planarization layer 250 is provided on the passivation layer 200 to planarize an upper surface of the substrate 100 with the thin film transistor layer (T). The planarization layer 250 may be formed of an organic insulating material, for example, acryl resin, epoxy resin, phenolic resin, polyamide resin, polyimide resin, and etc., but is not limited to these materials.

The first electrode 300 is disposed on the planarization layer 250. A third contact hole (CH3) for exposing the drain electrode 160 is prepared in the passivation layer 200 and the planarization layer 250, and the first electrode 300 is connected with the drain electrode 160 via the third contact hole (CH3). That is, the first electrode 300 is electrically connected with the thin film transistor (T). In this case, the first electrode 300 is separately disposed in every pixel. For example, the first electrode 300 may function as an anode electrode. The first electrode 300 may be formed of indium-tin-oxide (ITO) or indium-zinc-oxide (IZO). Also, the first electrode 300 may be formed to have a multi-layered structure including metal materials with high reflection efficiency, for example, molybdenum (Mo), alloy (MoTi) of molybdenum (Mo) and titanium (Ti), aluminum (Al), argents (Ag), APC (Ag;Pb;Cu), and etc.

The partition 400 is disposed on the bank 450 to separate the organic emitting layer 550. In order to provide the partition 400 whose upper surface serves as eaves, a width

of an upper surface of the partition **400** is larger than a width of a lower surface of the partition **400**. During a process of depositing the organic emitting layer **550**, the upper surface of the partition **400** serves as the eaves so that the organic emitting layer **550** is not deposited on an area below the eaves. That is, there may be no need for a mask pattern covering the upper surface of the bank **450**. If the gap space is covered by the upper surface of the partition **400** serving as the eaves, it is possible to reduce or prevent the organic emitting layer **550** from being permeated into the gap space. Since the organic emitting layer **550** can be manufactured by a deposition process using a deposition material with superior straightness, the organic emitting layer **550** may not be deposited in the gap space during the deposition process. The partition **400** may be formed of a photo-sensitive material whose portion exposed to light is cured.

The bank **450** is provided on the first electrode **300**. The bank **450** is partially overlapped with the first electrode **300**. That is, the bank **450**, which exposes the upper surface of the first electrode **300**, is provided on one side and the other side of the first electrode **300** so as to cover a lateral surface of the first electrode **300**. As the bank **450** is provided to expose the upper surface of the first electrode **300**, it is possible to secure an image-displaying area. The bank **450** may be formed of an organic insulating material, for example, polyimide resin, acryl resin, benzocyclobutene BCB, and etc., but is not limited to these materials.

The partition cover **500** is disposed on the partition **400**. The partition cover **500** and the bank **450** may be formed of the same material and at the same time. In order to reduce a contact with a mask for a manufacturing process, a width of an upper surface of the partition cover **500** is smaller than a width of a lower surface of the partition cover **500**. During a deposition process of the organic emitting layer **550**, the upper surface of the partition cover **500** serves as a supporter of the mask, so that it is possible to reduce or prevent the supporter from being in contact with the upper surface of the partition **400**.

In case of the related art OLED device, the partition cover **500** is not provided on the partition **400**, and thus, the mask for depositing the organic emitting layer **550** may be in contact with the upper surface of the partition **400**. If the mask is in contact with the partition **400** with the upper surface having a relatively-large width, the mask may be contaminated by foreign matters of the partition **400**. Also, the first electrode **300** may be contaminated by the foreign matters during a process of transferring the mask. In the OLED device according to one embodiment of the present disclosure, the partition cover **500** with the upper surface having a relatively-small width is disposed on the partition **400** so that it is possible to reduce or minimize a contact area with the mask, and furthermore, to reduce or prevent defects caused by the foreign matters of the mask.

The organic emitting layer **550** is disposed on the first electrode **300**. The organic emitting layer **550** may include a hole injecting layer, a hole transporting layer, an emitting layer, an electron transporting layer, and an electron injecting layer. A structure of the organic emitting layer **550** may be changed to various shapes generally known to those in the art. The organic emitting layer **550** may extend to the upper surface of the bank **450**. However, when the organic emitting layer **550** extends to the upper surface of the bank **450**, the organic emitting layer **550** is not formed in the gap space prepared between the lower surface of the partition **400** and the bank **450** by the partition **400**.

The second electrode **600** is provided on the organic emitting layer **550**. In this case, if the first electrode **300**

functions as an anode electrode, the second electrode **600** functions as a cathode electrode. As the second electrode **600** is provided on a surface from which light is emitted, the second electrode **600** is formed of a transparent conductive material. In the same manner as the organic emitting layer **550**, the second electrode **600** is not formed in the gap space prepared between the lower surface of the partition **400** and the bank **450** by the partition **400**. If the second electrode **600** is manufactured by a sputtering process using a deposition material with less straightness, the second electrode **600** may be deposited in the gap space during the deposition process.

The encapsulation layer **650** for preventing a permeation of moisture may be entirely provided on the second electrode **600**. The encapsulation layer **650** may be formed of various materials generally known to those in the art. The encapsulation layer **650** may be prepared in the gap space between the partition **400** and the bank **450**. That is, the encapsulation layer **650** is prepared in the gap space, and is disposed while being inserted into the space between the lower surface of the partition **400** and the bank **450**, whereby the encapsulation layer **650** is not separated from the second electrode **600**. Also, the encapsulation layer **650** is provided in the gap space so that it is possible to fixedly provide the second electrode **600** and the organic emitting layer **550** without separation.

In the OLED device according to one embodiment of the present invention, the partition **400** is disposed in-between the organic emitting layer **550** and also disposed in-between the second electrode **600**, and the encapsulation layer **650** is provided in the space between the partition **400** and the bank **450**, to thereby fixedly provide the encapsulation layer **650**. Accordingly, the encapsulation layer **650** of the OLED device according to one embodiment of the present invention presses the organic emitting layer **550** and the second electrode **600**, to thereby enhance an adhesive strength between the organic emitting layer **550** and the second electrode **600**. Accordingly, even when an impact is applied by repetitive bending actions, it is possible to reduce or prevent the organic emitting layer **550** from being separated from the cathode electrode **600**, to thereby improve reliability.

FIG. 3 is a cross-sectional view illustrating an OLED device according to another embodiment of the present invention. Except an auxiliary electrode, a partition, and a bank, the OLED device of FIG. 3 is the same as the OLED device of FIG. 2. Hereinafter, the auxiliary electrode, partition, and bank will be described in detail, and a detailed description for the same parts will be omitted.

An auxiliary electrode **350** is disposed on a planarization layer **250**. That is, the auxiliary electrode **350** is disposed in the same layer as a first electrode **300**. In order to reduce a resistance of a second electrode **600**, the auxiliary electrode **350** is electrically connected with the second electrode **600**. The auxiliary electrode **350** is connected with the second electrode **600** through an area without the bank **450**, and an area exposed to a lower side of a partition **400**.

The partition **400** is disposed on the auxiliary electrode **350**, wherein the partition **400** is provided to separate an organic emitting layer **550**. In order to provide the partition **400** whose upper surface serves as eaves, a width of an upper surface of the partition **400** is larger than a width of a lower surface of the partition **400**. During a process of depositing the organic emitting layer **550**, the upper surface of the partition **400** serves as the eaves so that the organic emitting layer **550** is not deposited on an area below the eaves. That is, there may be no need for a mask pattern covering the

upper surface of the auxiliary electrode **350**. If the gap space is covered by the upper surface of the partition **400** serving as the eaves, it is possible to reduce or prevent the organic emitting layer **550** from being permeated into the gap space. Since the organic emitting layer **550** is manufactured by a deposition process using a deposition material with superior straightness, the organic emitting layer **550** is not deposited in the gap space between the partition **400** and the auxiliary electrode **350** during the deposition process. The partition **400** may be formed of a photo-sensitive material whose portion exposed to light is cured.

The bank **450** is disposed on the first electrode **300** and the auxiliary electrode **350**. The bank **450** is partially overlapped with the first electrode **300** and the auxiliary electrode **350**. That is, the bank **450**, which exposes the upper surface of the first electrode **300** and the auxiliary electrode **350**, is provided on one side and the other side of the first electrode **300** and the auxiliary electrode **350** so as to cover the lateral surface of the first electrode **300** and the auxiliary electrode **350**. According as the bank **450** is provided to expose the upper surface of the first electrode **300**, it is possible to secure an image-displaying area. Also, as the bank **450** is provided to expose the upper surface of the auxiliary electrode **350**, it is possible to secure an electrical connection space between the auxiliary electrode **350** and the second electrode **600**. The bank **450** is disposed between the first electrode **300** and the auxiliary electrode **350**, to thereby electrically insulate the first electrode **300** and the auxiliary electrode **350** from each other. The bank **450** may be formed of an organic insulating material, for example, polyimide resin, acryl resin, benzocyclobutene BCB, and etc., but is not limited to these materials.

In the OLED device according to another embodiment of the present invention, the partition **400** is disposed on the auxiliary electrode **350**, and the auxiliary electrode **350** is exposed to and connected with the second electrode **600** without using a mask pattern. A partition cover **500** is disposed on the partition **400**, wherein a width of an upper surface of the partition cover **500** is relatively small, so that it is possible to reduce or minimize a contact area with the mask, to reduce or prevent the mask from being contaminated by foreign matters, and thus, to reduce or prevent defects caused by the foreign matters of the mask.

Also, in the OLED device according to another embodiment of the present invention, the partition **400** is disposed in-between the organic emitting layer **550** to separate the organic emitting layer **550**, and also disposed in-between the second electrode **600** to separate the second electrode **600**, and an encapsulation layer **650** is provided in the space between the partition **400** and the bank **450**, to thereby fixedly provide the encapsulation layer **650**. The encapsulation layer **650** presses the organic emitting layer **550** and the second electrode **600**, to thereby enhance an adhesive strength between the organic emitting layer **550** and the second electrode **600**. Accordingly, even when an impact is applied by repetitive bending actions, it is possible to reduce or prevent the organic emitting layer **550** from being separated from the cathode electrode **600**, to thereby improve reliability.

FIGS. 4A to 4F are cross-sectional views illustrating a method of manufacturing an OLED device according to another embodiment of the present invention, as applied to the OLED device illustrated in FIG. 3. Thus, the same reference numbers will be used throughout the drawings to refer to the same or like parts, and a repetitive explanation for the material and structure of each of the elements will be omitted.

First, as illustrated in FIG. 4A, the thin film transistor (T) is formed on the substrate **100**, the passivation layer **200** is provided on the thin film transistor (T), and the planarization layer **250** is provided on the passivation layer **200**.

The process of forming the thin film transistor (T) may include providing the active layer **110** on the substrate **100**, providing the gate insulating film **120** on the active layer **110**, providing the gate electrode **130** on the gate insulating film **120**, providing the insulating interlayer **140** on the gate electrode **130**, providing the first and second contact holes (CH1, CH2) in the insulating interlayer **140** and the gate insulating film **120**, and providing the source and drain electrodes **150** and **160** on the insulating interlayer **140** and connecting the source and drain electrodes **150** and **160** with the active layer **110** via the first and second contact holes (CH1, CH2). However, it should be appreciated that various methods generally known to those in the art can be applied to form the thin film transistor (T).

After providing the passivation layer **200** and the planarization layer **250**, the third contact hole (CH3) for exposing the drain electrode **160** of the thin film transistor (T) is provided in the passivation layer **200** and the planarization layer **250**, and then the first electrode **300** is electrically connected with the drain electrode **160** via the third contact hole (CH3).

The process of providing the first electrode **300** on the planarization layer **250** and the process of the auxiliary electrode **350** on the planarization layer **250** may be carried out at the same time. That is, the first electrode **300** and the auxiliary electrode **350** may be simultaneously manufactured on the same layer, that is, the planarization layer **250**.

Then, as illustrated in FIG. 4B, the partition **400** is provided on the auxiliary electrode **350**. The partition **400** is formed of the photo-sensitive material whose portion exposed to light is cured, which may be formed of negative type photoresist (PR). In case of a negative photoresist process, a portion exposed to light remains by a chemical combination, and another portion which is not exposed to light is removed by a developing solution. Accordingly, under the condition that a partition material is deposited on the auxiliary electrode **350**, and that the mask is disposed above the partition material, light is irradiated thereon, whereby the partition material covered by the mask is removed, and the partition material exposed to light remains to be the partition **400**. At this time, if the partition material is laterally irradiated with light, the lower surface of the partition **400** may be formed in a reverse-tapered shape. Accordingly, the width of the upper surface of the partition **400** is larger than the width of the lower surface of the partition **400**.

Then, as illustrated in FIG. 4C, the bank **450** is provided at a lateral side of the first electrode **300** and the auxiliary electrode **350**, and the partition cover **500** is provided on the partition **400**.

The process of providing the partition cover **500** on the partition **400** and the process of providing the bank **450** at the lateral side of the first electrode **300** and the auxiliary electrode **350** may be carried out at the same time. The partition cover **500** and the bank **450** may be formed of the same material. In this case, the width of the upper surface of the partition cover **500** is smaller than the width of the lower surface of the partition cover **500**.

Then, the bank **450** is laterally irradiated with light, whereby the bank **450** is removed from the space between the partition **400** and the auxiliary electrode **350**. Thus, it is possible to prepare the gap space between the lower surface of the partition **400** and the auxiliary electrode **350**, whereby

the second electrode **600** and the encapsulation layer **650** may be prepared in the gap space for the following process.

As illustrated in FIG. 4D, a mask is disposed above the partition cover **500**. As illustrated in FIG. 4E, the organic emitting layer **550** is provided on the first electrode **300**. The organic emitting layer **550** may be provided on an entire surface of the substrate **100**, and then the second electrode **600** may be provided on the organic emitting layer **550**.

As illustrated in FIG. 4F, the encapsulation layer **650** is provided on the second electrode **600**. At this time, the encapsulation layer **650** may be provided in the space between the partition **400** and the auxiliary electrode **350** and the space between the partition **400** and the bank **450**.

In the OLED device according to another embodiment of the present invention, the partition cover **500** is disposed on the partition **400**, wherein the width of the upper surface of the partition cover **500** is relatively small, so that it is possible to reduce or minimize a contact area with the mask, to reduce or prevent the mask from being contaminated by foreign matters, and to thereby reduce or prevent defects caused by the foreign matters of the mask. Also, in the method of manufacturing the OLED device according to another embodiment of the present invention, the bank **450** and the partition cover **500** for preventing the mask from being contaminated by foreign matters are manufactured at the same time so that the partition cover **500** is provided on the partition **400** without increasing the number of masks, to thereby improve reliability of the OLED device.

According to the embodiment of the present invention, the partition cover **500** with the upper surface having a relatively-small width is disposed on the partition **400** so that it is possible to reduce or minimize the contact area with the mask, to reduce or prevent the mask from being contaminated by foreign matters, and to thereby reduce or prevent defects caused by the foreign matters of the mask.

Also, the bank **450** and the partition cover **500** for preventing the mask from being contaminated by foreign matters are manufactured at the same time so that the partition cover **500** is provided on the partition **400** without increasing the number of masks, to thereby improve reliability of the OLED device.

Also, the adhesive strength between the organic emitting layer **550** and the second electrode **600** is improved by the partition **400** so that it is possible to reduce or prevent separation between the organic emitting layer **550** and the cathode electrode, thereby improving reliability of the OLED device.

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 spirit or scope of the inventions. 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 and their equivalents.

What is claimed is:

1. An organic light emitting display (OLED) device comprising:

- a thin film transistor on a substrate;
- a first electrode electrically connected with the thin film transistor;
- an organic emitting layer on the first electrode, the organic emitting layer separated by a partition;

a plurality of banks at a lateral side of the first electrode; a gap between the partition and the banks;

a partition cover on the partition;

a second electrode on the organic emitting layer; and

an encapsulation layer on the second electrode;

wherein the encapsulation layer is provided in the gap between the lower surface of the partition and the upper surface of the bank, and

wherein a width of an upper surface of the partition cover is smaller than a width of a lower surface of the partition cover.

2. The OLED device according to claim 1, further comprising an auxiliary electrode disposed in the same layer as the first electrode, wherein the partition is disposed on the auxiliary electrode.

3. The OLED device according to claim 2, wherein the second electrode is electrically connected with the auxiliary electrode.

4. The OLED device according to claim 1, wherein a width of an upper surface of the partition is larger than a width of a lower surface of the partition.

5. The OLED device according to claim 1, wherein the thin film transistor includes an active layer, a gate insulating film, a gate electrode, an insulating interlayer, a source electrode, and a drain electrode.

6. The OLED device according to claim 5, wherein the active layer is formed of a silicon-based semiconductor material or an oxide-based semiconductor material.

7. The OLED device according to claim 5, wherein a first contact hole for exposing a first end of the active layer is provided in the gate insulating film and the insulating interlayer, and wherein a second contact hole for exposing a second end of the active layer is provided in the gate insulating film and the insulating interlayer.

8. The OLED device according to claim 7, wherein the source electrode is connected with the first end of the active layer via the first contact hole, and the drain electrode is connected with the second end of the active layer via the second contact hole.

9. The OLED device according to claim 7, further comprising a passivation layer on the film transistor, and a planarization layer on the passivation layer,

wherein a third contact hole for exposing the drain electrode is prepared in the passivation layer and the planarization layer.

10. The OLED device according to claim 9, wherein the first electrode on the planarization layer, and the first electrode is connected with the drain electrode via the third contact hole.

11. The OLED device according to claim 1, wherein the first electrode is formed of indium-tin-oxide (ITO) or indium-zinc-oxide (IZO).

12. The OLED device according to claim 1, wherein the first electrode has a multi-layered structure including one or more metal materials of molybdenum (Mo), alloy (MoTi) of molybdenum (Mo) and titanium (Ti), aluminum (Al), argon-tum (Ag) and APC (Ag;Pb;Cu).

13. The OLED device according to claim 1, wherein the partition cover and the bank is formed of a same material including one or more organic insulating materials of polyimide resin, acryl resin and benzocyclobutene BCB.

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专利名称(译)	有机发光显示装置及其制造方法		
公开(公告)号	US10393806	公开(公告)日	2019-08-27
申请号	US15/923114	申请日	2018-03-16
[标]申请(专利权)人(译)	乐金显示有限公司		
申请(专利权)人(译)	LG DISPLAY CO. , LTD.		
当前申请(专利权)人(译)	LG DISPLAY CO. , LTD.		
[标]发明人	LEE JAESUNG LEE JOONSUK		
发明人	LEE, JAESUNG LEE, JOONSUK		
IPC分类号	H01L51/52 G01R31/3177 G01R31/317 G01R31/3185 G06F11/26 H01L27/32 H01L51/56 H01L27/12		
CPC分类号	H01L27/3244 H01L51/52 H01L2251/5315 H01L27/3246 H01L51/5228 H01L51/5253 H01L51/56 G01R31/31723 G01R31/31727 G01R31/3177 G01R31/318555 G01R31/318572 G06F11/26 H01L27/1222 H01L27/1225 H01L27/1248 H01L27/3248 H01L27/3258 H01L27/3262 H01L51/5212 H01L51/5215 H01L2227/323 H01L2251/301 H01L2251/308		
代理机构(译)	DENTONS美国律师事务所		
优先权	1020150152620 2015-10-30 KR		
其他公开文献	US20180203062A1		
外部链接	Espacenet		

摘要(译)

公开了一种有机发光显示 (OLED) 器件，其可以包括在基板上的薄膜晶体管;第一电极与薄膜晶体管电连接;第一电极上的有机发光层，有机发光层由隔板隔开;隔板上的隔板盖;有机发光层上的第二电极;和在第二电极上的封装层，其中分隔盖的上表面的宽度小于分隔盖的下表面的宽度。

