Appeal decision

Appeal No. 2010-27554

KOREA
Appellant SAMSUNGMOBILEDISPLAYCO.LTD.

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The case of appeal against the examiner's decision of refusal of Japanese Patent Application No. 2006-317644, entitled "ORGANIC ELECTROLUMINESCENCE DISPLAY DEVICE" (the application published on April 3, 2008, Japanese Unexamined Patent Application Publication No. 2008-77032) has resulted in the following appeal decision.

Conclusion

The appeal of the case was groundless.

Reason

No. 1 History of the procedures

The brief history of the procedures of the application of the case is as follows.

Patent application : November 24, 2006
Notice of reasons for refusal (first) : March 5, 2009 (drafting date)
Written opinion : June 24, 2009
Amendment : June 24, 2009
Notice of reasons for refusal (final) : July 28, 2009 (drafting date)
Written opinion : November 4, 2009
Amendment : November 4, 2009
Decision to dismiss amendment : August 3, 2010 (drafting date)
Decision of refusal : August 3, 2010 (drafting date)
Appeal against the examiner's decision of refusal : December 6, 2010
Amendment : December 6, 2010
Inquiry : July 14, 2011 (drafting date)

Written reply : October 19, 2011

No. 2 The Invention

The amendment of the scope of claims by the amendment as of December 6, 2010, which deletes Claim 1 of the scope of claims of the written amendment as of June 24, 2009, and defines Claim 5 citing the Claim 1, as a new Claim 1, aims at deletion of claim, and is legitimate. Therefore, the invention relating to Claim 1 of the application (hereinafter referred to as "The Invention") is recognized as follows, which is specified by the matters described in Claim 1 of the scope of claims of the written amendment as of December 6, 2010.

"[Claim 1]

An organic electroluminescence display device comprising:

a first substrate on which organic electroluminescence elements are formed;

a second substrate disposed over the first substrate;

a display panel comprising a sealant for adhering the first substrate and the second substrate;

a bezel having a lower surface and a plurality of sidewalls extending from the end of the lower surface, to define a space for accommodating the display panel by the lower surface and the sidewalls; and

a reinforcing truss disposed between the display panel and the bezel,

the sidewalls of the bezel being formed as a double structure,

and the reinforcing truss being formed by one of stainless steel, magnesium, magnesium alloy, aluminum, polyethylene, protactinium, polymethylmethacrylate, ABS resin, LCP, polycarbonate, and polyurethane."

The application of the case claimed priority under the Paris Convention (Priority No. 10-2006-0091834, Priority date: September 21, 2006, South Korea). However, the specification of the application as a basis for claiming priority does not include the description, "reinforcing truss disposed between the display panel and the bezel" in the Invention, at least. Accordingly, the priority claim for the Invention cannot be approved. However, the following cited documents were disclosed before the priority date, and have eligibility for citation regardless of whether or not the priority claim is approved.

No. 3 Cited Documents

1 Cited Document 1

Japanese Unexamined Patent Application Publication No. 2005-141194 (hereinafter referred to as "Cited document 1"), which was cited in the reasons for refusal of the examiner's decision and distributed before filing the application of the case and before the priority date, describes the following technical matters (underlines are added by the body).

(1a) "[Background Art]
[0002]

An organic EL display device in which pixels are contributed with organic electroluminescence elements (organic electroluminescence device; organic EL device) has been developed and manufactured as a significantly thin flat panel display which does not requires a backlight. When the organic EL display device is applied to a television set or a video monitor, a screen size is expected to exceed 20 inches (length of the diagonal is about 51 cm) up to 50 inches (length of the diagonal is about 127 cm). Panel thickness of the organic EL display is about 2 mm, and so, when organic EL display device with this thickness is fabricated as a 50-inch panel, for example, flatness cannot be maintained by itself, and the panel may be bent, deformed, or damaged in some cases if no measure is taken.

A flat panel display with a reinforcing structure which can be adapted to enlargement of a screen size is disclosed in Patent Document 1, for example.

[Patent Document 1] Japanese Unexamined Patent Application Publication No. 2002-216948

[Disclosure of invention]

[Problem to be solved by the invention]

[0003]

The organic EL device is a device which emits light with a current, and increases the temperature of a display by Joule heat generated in wiring. Especially, the temperature increases significantly in a large-screen panel, and positive heat radiation may be needed. However, there is no consideration about the heat generated in the panel, in the above Patent Document 1."

(1b) "[0004]

In view of the above problem of the prior art, this invention provides a highly reliable display device which can support a large display panel properly, and dissipate the heat generated in the display panel properly. This invention also provides a reinforcing structure suitable for the large display panel.

[Means for solving the problem]

[0005]

In order to solve the above problem, this invention provides a display device including a display panel, and a reinforcing structure arranged on the back side of the display panel. The reinforcing structure includes a supporting substrate that forms a bonding part to be bonded with the display panel back side, and a heat radiation member arranged on the supporting substrate.

The display device having the reinforcing structure arranged on the back side of the display panel can properly support a display panel formed with a thin substrate (glass substrate with a thickness of 2 mm, for example), and can also properly support a large panel, such as a video display, vertically. Since the heat generated in the display panel can be dissipated by means of the heat radiation member, the display device can effectively prevent reduction of reliability due to overheating even when it is used for a large-screen display device which generates much more heat."

(1c) "[0006]

In the display device of the invention, the heat radiation member member preferably includes a plurality of beam members intersecting with each other and arranged on the supporting substrate. In this configuration, the beam members arranged to cross each other exhibit excellent deformation resistance in a plane direction

of the supporting substrate, and implement an excellent support structure of the display panel. The display device also contributes to increase of surface area of the heat radiation member member, thereby obtaining excellent heat radiation member characteristics.

[0007]

In the display device of the invention, the beam members can be arranged on the supporting substrate in a substantial grid shape in plan view.

In the display device of the invention, the beam members can be arranged on the supporting substrate in a substantial triangle or honeycomb shape in plan view.

The above configuration can provide a display device with a simple configuration including a reinforcing structure having a heat radiation member member with improved strength for supporting a display panel."

(1d) "[0010]

In the display device of the invention, the beam members constituting the heat radiation member member preferably include heat radiation holes penetrating through the side faces of the beam members. Accordingly, warm air in the space surrounded by the beam members can be discharged through the heat radiation holes, thereby providing a reliable display device including a heat radiation member with excellent heat radiation characteristics.

[0011]

In the display device of the invention, a plurality of the heat radiation holes are preferably arranged so that a plurality of areas formed with the beam members on the supporting substrate may communicate with each other. Accordingly, even when the back side of the heat radiation member (opposite the display panel) is closed by the chassis or the like of an electronic device, warm air in the area surrounded by the beam members can be discharged to the outside of the heat radiation member through the heat radiation holes, thereby obtaining excellent heat radiation characteristics."

(1e) "[0017]

In the display device of the invention, the beam members may be arranged more densely on the supporting substrate corresponding to the display panel edge part. Accordingly, panel support strength by means of the reinforcing structure can be improved without increasing the number of beam members.

... (omitted) ...

[0019]

In the display device of the invention, the heat radiation member is preferably made of metal. A metal heat radiation member can provide a reinforcing structure excellent in both support strength of display panel and heat radiation performance.

... (omitted)...

[0021]

In the display device of the invention, the display panel can be configured as a display panel having organic electroluminescence elements. In this configuration, an organic EL (electroluminescence) display device excellent in panel support strength and heat radiation performance can be provided."

(1f) "[0027]

The embodiments of the invention are described as follows, with reference to the drawings.

(The first embodiment)

FIG. 1 is a perspective view of an organic EL display device which is one embodiment of the display device according to the invention. FIG. 2 is a cross-sectional view along a line A-A' in FIG. 1. An organic EL display device 100 shown in FIG. 1 and FIG. 2 is mainly constituted by an organic electroluminescence panel (organic EL panel) 150 and a reinforcing structure 160 arranged on the back side thereof (front side in the figure).

The organic EL panel 150 is mainly constituted by a light-transmissive substrate 110, a plurality of organic EL elements (light-emitting elements) 120 formed on the substrate 110, and a sealing member 130 covering the organic EL elements 120... and bonded to the substrate 110 hermetically via a sealant 141. The organic EL panel 150 according to the embodiment is a so-called bottom-emission type which radiates emitted light from the substrate 110 side.

[0028]

The reinforcing structure 160 includes a metal base plate (supporting substrate) 161 bonded to the back side of the organic EL panel 150, and a metal heat radiation member 170 formed integrally with an outer face (top face in FIG. 2) of the base plate 161. The heat radiation member 170 includes multiple (three in the figure) first beam members 171 extending in the x-direction in the figure, and multiple (four in the figure) second beam members 172 extending in the y-direction in the figure, which are integrated with each other in grid shape in plan view. The first beam members 171 ... and the second beam members 172 ... are substantially rectangular plate members, and are erected substantially vertically with respect to the face of the base plate 161.

As shown in FIG. 2, the organic EL panel 150 is supported by being bonded to the sealing member 130 of the organic EL panel 150 with a bonding layer 142. A thermally-conductive sheet with a sticking material applied on both sides can be used as the bonding layer 142. After bonding the base plate 161 and the sealing member 130, joint parts thereof can be reinforced by caulking an outer periphery of the base plate 161.

[0029]

In this embodiment, screen size of the organic EL panel 150 is 30-inches diagonal (about 762 mm), and outer dimensions are about 610 mm (x-direction) x about 460 mm (y-direction). Planar dimensions of the base plate 161 are 670 mm (x-direction) x 520 mm (y-direction). Each of the beam members 171, 172 constituting the heat radiation member 170 has a height of 15 mm and a thickness of 2 mm. Distance between adjacent beam members 171, 171 and distance between adjacent beam members 172, 172 are both 30 mm. In FIG. 1, although only 3 first beam members 171 ... and 4 second beam members ... are shown, 17 first beam members 171 and 21 second beam members 172 are disposed actually.

[0030]

In the organic EL display device 100 of the embodiment having the above configuration, the reinforcing structure 160 supporting the organic EL panel 150 includes the heat radiation member 170 having the first beam members 171 ... and the second beam members 172 ... assembled in grid shape in plan view, thereby implementing an excellent panel support structure which prevents deformation in both x-direction and y-direction in the figure. Accordingly, even if the organic EL panel

150 has a screen size of about 50 inches, an organic EL display device with improved durability and reliability can be provided while preventing bending or deformation of the organic EL panel 150. This embodiment includes the heat radiation member 170 formed of the beam members 171 ... and 172 ... assembled in grid shape, thereby effectively dissipating the heat generated in the organic EL panel 150, effectively preventing malfunction of the organic EL elements 120 ... or a drive control circuit (not shown) due to overheating of the panel.

[0031]

Therefore, the reinforcing structure 160 according to the embodiment can properly support the organic EL panel 150 using a thin substrate 110, and can dissipate the heat generated in the organic EL panel 150 with high efficiency, thereby providing the organic EL display device with excellent structural durability and reliability which can be easily adapted to enlargement of screen size, inexpensively.

[0032]

In this embodiment, the base plate 161 of the reinforcing structure 160 is integrated with the heat radiation member 170. However, the base plate 161 can be separated from the heat radiation member 170, and they can be bonded to manufacture the reinforcing structure 160, of course. The base plate 161 and the heat radiation member 170 according to the embodiment are made of metal, and preferably are constituted by, for example, aluminum or copper, while a metal material with a small thermal expansion coefficient or an alloy material is preferably used in order to prevent separation between the EL panel 150 and the reinforcing structure 160 due to a difference of thermal expansion coefficient when heat is applied. Not only metal materials but also various materials in the range of providing excellent thermal conductivity (heat radiation performance) and panel support strength can be used.

[0033]

Although, in this embodiment, the beam members 171 ... and 172 ... of the heat radiation member 170 are arranged to cross orthogonally and at equal intervals, the beam members 171 ... and 172 ... can be arranged unevenly. For example, when the beam members 171 ... and 172 ... are arranged relatively densely in an edge part of the base plate 161 and coarsely in the central part, a reinforcing structure 160 with excellent support strength can be obtained without using many beam members. In emphasizing heat discharge performance of the heat radiation member 170, the beam members 171 ... and 172 may be arranged densely in the panel central part where much more heat is generated.

[0034]

In this embodiment, the beam members 171 ... and 172 ... are arranged so that the areas 175 ... formed by the beam members 171 ... and 172 ... on the base plate 161 may be formed in a rectangular shape in plan view. For example, a plurality of beam members may be arranged on the base plate 161 so that the plane shape of the area 175 may be formed in a triangle, honeycomb (hexagonal), or other polygonal shape. In each case, the heat radiation member 170 is constituted by the beam members extending and crossing each other on the base plate 161, thereby properly supporting the large-screen organic EL panel 150 while preventing deformation in both x-direction and y-direction in the figure.

[0035]

The configuration of the organic EL panel 150 is described in detail below.

Each of the organic EL elements 120 arranged on the substrate 110 is, as shown in FIG. 2, formed by sequentially laminating an anode 121, a hole-injection layer 122, a light-emitting layer 123, and a cathode 124, from the substrate 110 side. The light-emitting layers 123 of the organic EL elements 120 ... arranged on the substrate 110 include red (R), green (G), and blue (B) light-emitting layers. The organic EL elements 120 (dots) of the 3 colors, red, green, and blue, constitute one pixel of the organic EL display device 100.

[0036]

For each of the organic EL elements 120, a switching element (not shown), such as a TFT (thin-film transistor) is arranged. The switching element active-matrix drives each dot (organic EL element 120).

In FIG. 2, the organic EL elements 120 ... are arranged apart from each other in a plane. Partitioning walls for the organic EL elements 120 may be arranged between the organic EL elements 120, 120. The organic EL elements 120 ... constituting pixels may be driven by a simple matrix system.

[0037]

The substrate 110 is a light-transmissive substrate, such as transparent glass or quartz, so as to transmit and radiate emitted light.

The anode 121 is formed of a transparent conductive material, as described below, so as to transmit light emitted in the light-emitting layer 123. As a transparent conductive material, ITO can be used preferably. The surface of the ITO (anode 121) is subjected to O_2 plasma treatment as necessary, thereby cleaning the electrode surface and adjusting work function, as well as imparting lipophilicity.

[0038]

The hole-injection layer 122 formed on the anode 121 is formed of a material obtained by adding polystyrene sulfonate to polythiophene derivative, for example. Specifically, polyethylenedioxythiophene/polystyrene sulfonate or the like is preferably used as a material for forming the hole-injection layer 122.

[0039]

Not only the above material but also various other materials can be used for a material for forming the hole-injection layer 122. For example, a material obtained by dispersing polystyrene, polypyrrole, polyaniline, polyacetylene, or a derivative thereof to an appropriate dispersing medium together with the polystyrene sulfonate can be used.

[0040]

The light-emitting layer 123 is formed of a known polymeric light-emitting material which can emit fluorescence or phosphor.

When a polymeric material is used as a light-emitting material, it is made into solution with a solvent which does not dissolve the hole-injection layer 122, to form a film by means of a droplet ejection method, such as spin coating or an inkjet method.

As a material for forming the light-emitting layer 123, a light-emitting material formed of a low-molecular-weight material can be used. However, when the light-emitting layer 123 is formed of a low-molecular-weight material, an organic EL element 120 is formed by laminating a hole transport layer formed of a low-molecular-weight material, a light-emitting layer, and an electron transport layer, in this order, from the anode 121 side.

The cathode 124 can be formed of a metal electrode made of calcium or

magnesium.
[0041]
On each of the layers laminated on the substrate 110, a sealing member 130 covering the organic EL elements 120 ... formed of the layers is arranged. The sealing member 130 is bonded to the substrate 110 via a sealant 141. As the sealing member 130, a platy sealing substrate having electrical insulation property is used, for example. The sealing substrate, which covers the organic EL elements 120, is fixed to the substrate 110 with sealing resin. As the sealing resin, thermosetting resin or UV-curable resin is used, for example. The organic EL elements may be covered only with the sealing resin without using the sealing substrate."

(1g) "[0047]
(The third embodiment)
The third embodiment of the invention is described as follows, with reference to FIG. 4.
FIG. 4 is a perspective view of an organic EL display device (display device) 300 of the embodiment. The organic EL display device 300 is mainly configured by an organic EL panel 150, and a reinforcing structure 360 arranged on the back side thereof. The organic EL panel 150 is configured in the same way as the organic EL panel in the above first embodiment, and detail description thereof is omitted.
[0048]
The reinforcing structure 360 is mainly constituted by a platy metal base plate (supporting substrate) 361 bonded on the back side of the organic EL panel 150, and a metal heat radiation member 370 formed integrally on the outer face (front side in the figure) of the base plate 361. The heat radiation member 370 is constituted by multiple (three in the figure) first beam members 371 extending in the x-direction in the figure and multiple (four in the figure) second beam members 372 extending in the y-direction in the figure, which are integrally formed in grid shape in plan view. The first beam members 371 ... and the second beam members 372 ... are substantially rectangular platy members, and erected substantially vertically with respect to the outer face of the base plate 361. In this embodiment, a heat radiation hole 371a penetrating through the beam member 371 extending in the x-direction is arranged to allow the areas 375 ... formed by the beam members 371... and 372 ... to communicate with each other in the y-direction in the figure. Thus, a circular heat radiation hole 371a is formed in each of the beam members 371, 371 arranged vertically in the planarly rectangular area 375 so as to penetrate therethrough.
[0049]
The reinforcing structure 360 according to the embodiment is configured, in the same way as the organic EL display device of the above first embodiment, as shown in FIG. 2, to be bonded with a sealing member 130 and an adhesive layer 142 of the organic EL panel 150 to support the organic EL panel 150.
[0050]
In the organic EL display device 300 of this embodiment having the above configuration, the heat radiation holes 371a penetrating through the first beam members 371 of the reinforcing structure 360 are formed in a row in the y-direction in the figure, thereby effectively dissipating the heat generated in the organic EL panel 150. In FIG. 4, the back side of the heat radiation member 370 is opened; however, when mounted

actually on a display unit of an electronic device or the like, the heat radiation member 370 is close to or in contact with the chassis, and closed by the housing, resulting in substantially stopping an airflow in the areas 375 ... formed by the beam members. In this embodiment, the heat radiation holes 371a ... are formed on the beam members 371 ... forming the areas 375 ... to allow the areas 375 ... to communicate with each other, thereby allowing the areas 375, 375 adjacent in the y-direction in the figure to communicate with each other, and discharging the air heated by the heat generated in the organic EL panel 150 to the outside of the heat radiation member 370. The air (warm air) warmed by the heat generated in the panel goes upward in the y-direction in the figure. The heat radiation holes 371a ...formed in a row in the y-direction, as shown in FIG. 4, can improve the efficiency of discharging warm air.

(1h) "[0071]
(The seventh embodiment)

The seventh embodiment of the invention is described as follows, with reference to FIG. 10. This embodiment is configured to include the chassis which is suitably used with the organic EL display devices according to the above third to sixth embodiments.

In this embodiment, an organic EL display device 700 is illustrated in a configuration where an organic EL display device 600 is accomodated in the chassis 710. In place of the organic EL display device 600, the organic EL display devices of the third to fifth embodiments may be housed in the housing 710, of course. Even when the organic EL display devices of the first or second embodiment having no heat radiation hole or notch are housed, a warm-air flow channel can be secured by spacing the housing from a heat radiation member at some distance, thereby obtaining proper heat radiation effect.

[0072]

FIG. 10(a) is a side view of the organic EL display device 700 of this embodiment, and is also a cross-sectional view showing the organic EL display device 600 housed in the housing 710. (b) is a back view thereof. As shown in FIG. 10, the housing 710 is formed in a substantially box shape having an opening which can expose a display surface of the organic EL panel 150 to the front (left side in FIG. (a), back side in FIG. (b)). On the back face of the housing 710, a plurality of fans (intake means/exhaust means) 711 are arranged, and many through-holes (exhaust means/intake means) 712 are arranged.

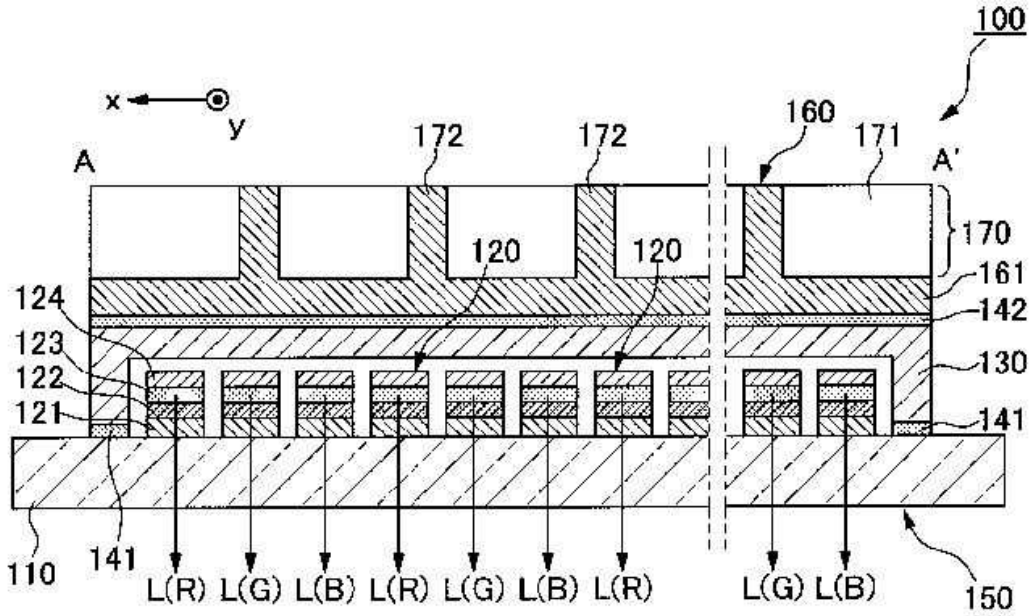
[0073]

The organic EL display device 600 is stored in the housing 710, as shown in the figure, with the organic EL panel 150 facing outside and the reinforcing structure 660 facing the fan 711. When the organic EL display device 600 is in operation, the fan 711 starts exhaust operation, to intake outside air through the through-holes 712, thereby forming an airflow W in the housing, as shown in the figure, so as to discharge the air flowing in the notches 671a formed in series in the heat radiation member 670 on the back side of the display device, from the fan 711. Accordingly, the heat of the heat radiation member 670 can be efficiently discharged from the fan 711 to the outside.

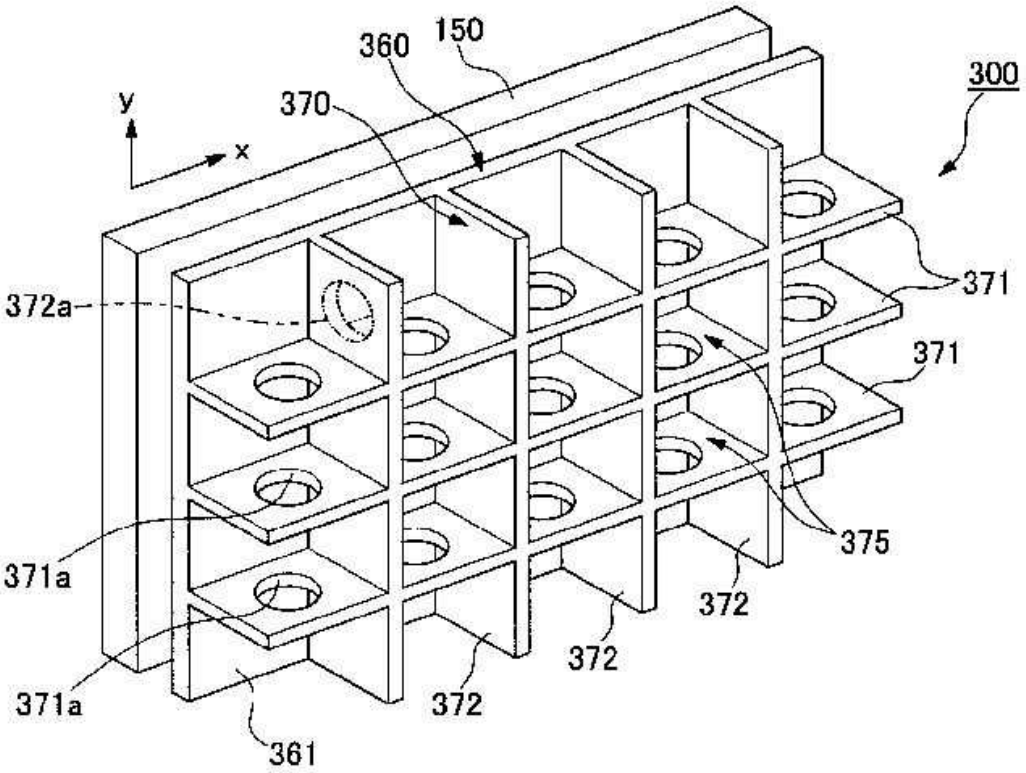
In this embodiment, the notches 671a, 672a are formed in vertical and horizontal beam members constituting the heat radiation member 670, thereby allowing warm air to flow also in the horizontal direction in FIG. (a) (vertical direction in FIG. (b)),

resulting in more efficient heat radiation operation."

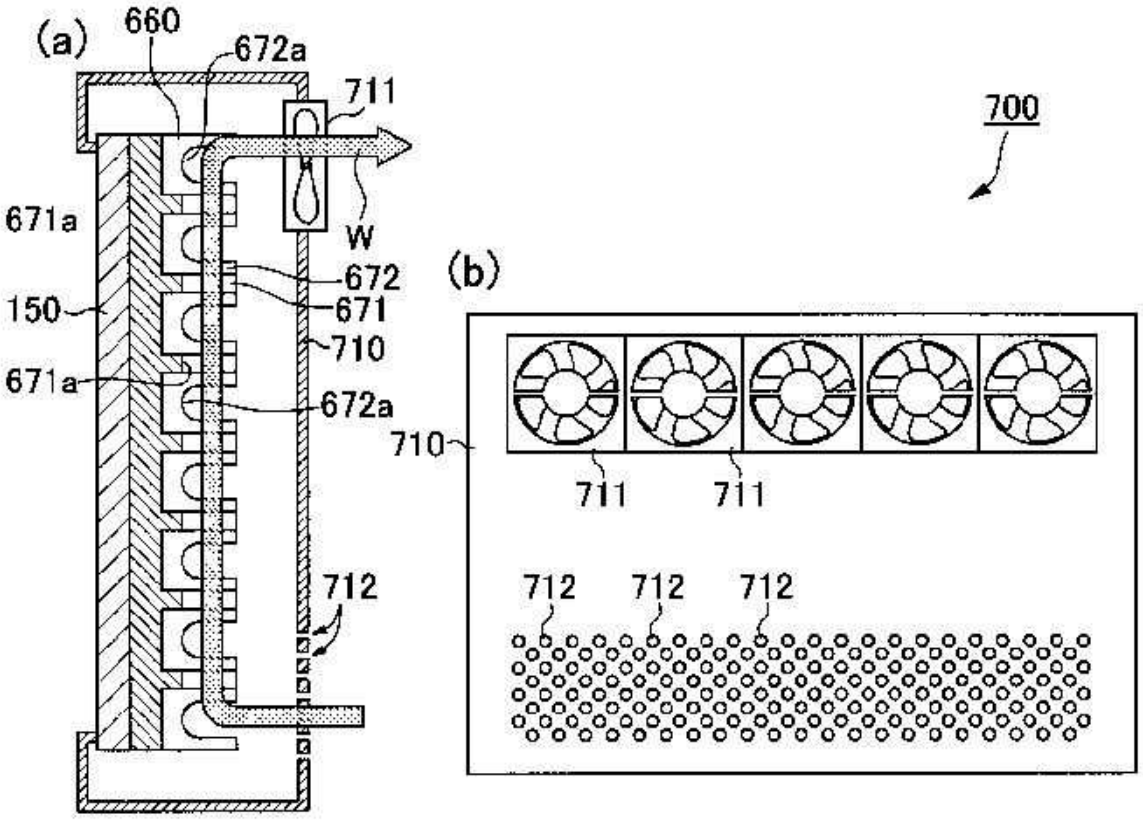
(1i) FIG. 2



(1j) FIG. 4



(1k) FIG. 10



[Invention described in Cited document]

According to the described matters, Cited document 1 describes the following invention (hereinafter referred to as "Cited invention"):

"An organic EL display device comprising:

an organic EL panel (150) comprising a substrate (110) with organic EL elements (120) arranged thereon,

a sealing member (130) formed of a sealing substrate for covering the organic EL elements (120), and a sealant (141) for bonding the substrate (110) and the sealing member (130);

a substantially box-shaped housing (710) having an opening for exposing a display surface of the organic EL panel (150) to the front side; and

a reinforcing structure (360) having a heat radiation member (370) comprising a plurality of beam members (371, 372) arranged on a base plate (361) to cross each other in a substantially grid shape in plan view, and exhibiting excellent deformation resistance in a plane direction of the base plate (361) and implementing an excellent support structure of the display panel due to the crossing beam members (371, 372),

the reinforcing structure (360) being bonded on the back side of the organic EL panel (150), the back side of the heat radiation member (370) of the reinforcing structure (360) being opened; however, when actually mounted on a display unit of an electronic device or the like, the heat radiation member (370) being close to or in

contact with the housing (710), and closed by the housing (710), the base plate (361) of the reinforcing structure (360) and the heat radiation member (370) being preferably constituted by aluminum."

2 Cited Document 2

Japanese Unexamined Patent Application Publication No. 2002-215051 (hereinafter referred to as "Cited document 2"), which was cited in the reasons for refusal of the examiner's decision and distributed before filing the application of the case and before the priority date, describes the following technical matters.

(2a) "[0013]
[Embodiments of the invention] FIG. 4 is a perspective view of a structure-enhanced bezel for a flat panel display of a first preferred embodiment of the invention described in the scope of claims. As shown, the structure-enhanced bezel 1 includes a bezel body 11. The bezel body 11 is formed continuously by two facing first side parts 12, 12 and two facing second side parts 13, 13. The first side part 12 is longer than the second side part 13. The bezel body 11 is nearly rectangular. Each of the first side parts 12 includes a first end wall 121 and a first side wall 122 nearly perpendicular to the first end wall 121 and extending from the first end wall 121. Each of the second side parts 13 includes a second end wall 131 and a second side wall 132 nearly perpendicular to the second end wall 131 and extending from the second end wall 131. The first side wall 122 and the second side wall 132 extend in the same direction.
[0014] One of the first side walls 122 is bent inward, and forms an outside wall 123 and an inside wall 124 which is nearly parallel to the outside wall 123 and faces the outside wall 123 (see FIG. 5 (a) and FIG. 5(b)). The inside wall 124 and the outside wall 123 are spaced from each other with a gap part.
[0015] FIG. 6 is a cross-sectional view of the structure-enhanced bezel for a flat panEL display device of a second preferred embodiment of the invention described in the scope of claims. As shown, in this embodiment, the structure-enhanced bezel 2 has substantially the same structure as the structure-enhanced bezel 1 of the first preferred embodiment. However, the inside wall 224, which is in contact with the outside wall 223 facing the corresponding inside wall 224, increases the space useful for receiving constituent components in a display module by use of the bezel 2.
[0016] In some applications, a hole is needed in the bezel body. FIG. 7 and FIG. 8 show third and fourth preferred embodiments of the invention described in the scope of claims. In the third and fourth preferred embodiments, the structure-enhanced bezels 3 and 4 have substantially the same structure as the structure-enhanced bezel 1 of the first preferred embodiment.
[0017] As shown in FIG. 7, at least one rectangular hole 325 is formed on the inside wall 324 of the bezel body 31. In FIG. 8, at least one rectangular recess 425 is formed on the inside wall 424 of the bezel body 4. The recess 425 is opened in an edge of the inside wall 424 of the bezel body 41."

(2b) FIG. 4

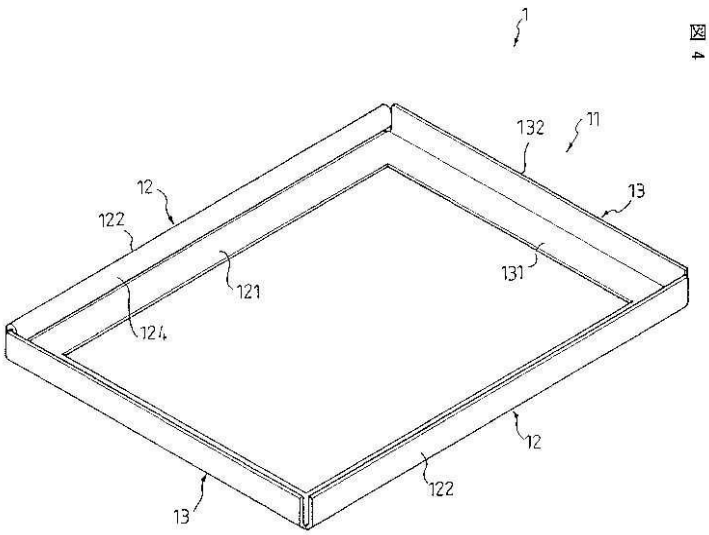


図４　FIG. 4

(2c) FIG. 5

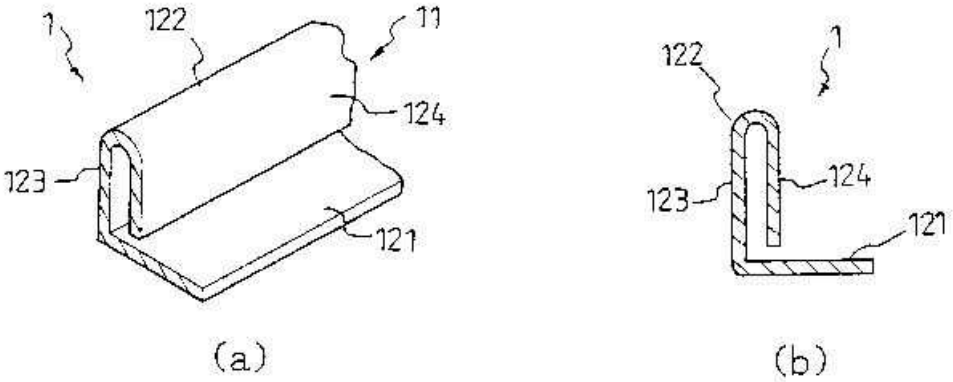


図５　FIG. 5

(2d) FIG. 6

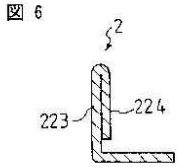


図 6　FIG. 6

(2e) FIG. 7

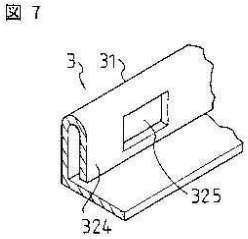


図 7　FIG. 7

(2f) FIG. 8

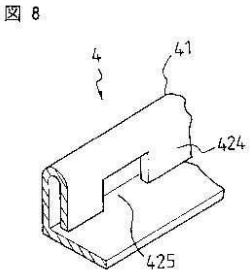


図 8　FIG. 8

No. 4 Comparison between the Invention and the Cited invention

The Invention and the Cited Invention are compared.

<Correspondence A>

The "organic EL elements (120)," "substrate (110)," "sealing member (130) formed of a sealing substrate," "sealant (140)," "organic EL panel (150)," and "organic EL display device" in the Cited invention correspond to the "organic

electroluminescence elements," "first substrate," "second substrate," "sealant," "display panel," and "organic electroluminescence display device" in the Invention, respectively.

<Correspondence B>

The "substantially box-shaped housing (710) having an opening for exposing a display surface of the organic EL panel (150) to the front side" in the Cited invention is, on the basis of the technical common sense, formed of a box with open front and back and side faces formed of plate members, has a space for housing the organic EL panel inside, and corresponds to the "bezel having a lower surface and a plurality of sidewalls extending from the end of the lower surface, to define a space for accommodating the display panel by the lower surface and the sidewalls" in the Invention.

<Correspondence C>

It can be said that the "plurality of beam members (371, 372) arranged on a base plate (361) to cross each other in a substantially grid shape in plan view" in the Cited invention is a member for reinforcing the structure of the "organic EL device" "exhibiting excellent deformation resistance in a plane direction of the base plate (361) and implementing an excellent support structure of the display panel due to the crossing beam members (371, 372)".

Therefore, the "plurality of beam members arranged on a supporting substrate (361) to cross each other in a substantially grid shape in plan view", in the Cited invention, constituting the "heat radiation member (370)" of the "reinforcing structure (360)", which is "bonded to the back side of the organic EL panel (150)" with the "back side" in contact with the "housing (710)" and the "reinforcing truss disposed between the display panel and the bezel" in the Invention correspond to each other in the point of a "reinforcement member arranged between a display panel and a bezel."

<Correspondence D>

The point that "aluminum" is preferably used for a "constituent component" of the "plurality of beam members arranged on a supporting substrate (361) to cross each other in a substantially grid shape in plan view" constituting the "heat radiation member (370)" of the "reinforcing structure (360)" in the Cited invention, and the point that "the reinforcing truss being formed by one of stainless steel, magnesium, magnesium alloy, aluminum, polyethylene, protactinium, polymethylmethacrylate, ABS resin, LCP, polycarbonate, and polyurethane" in the Invention are identical to each other in the point that "a reinforcement member being formed by one of stainless steel, magnesium, magnesium alloy, aluminum, polyethylene, protactinium, polymethylmethacrylate, ABS resin, LCP, polycarbonate, and polyurethane."

According to the above correspondences, the Invention and the Cited invention are identical to each other in the following point:

"an organic electroluminescence display device comprising:

a first substrate on which organic electroluminescence elements are formed;

a second substrate disposed over the first substrate;

a display panel comprising a sealant for adhering the first substrate and the second substrate;

a bezel having a lower surface and a plurality of sidewalls extending from the

end of the lower surface, to define a space for accommodating the display panel by the lower surface and the sidewalls; and

a reinforcement member disposed between the display panel and the bezel,

the reinforcement member being formed by one of stainless steel, magnesium, magnesium alloy, aluminum, polyethylene, protactinium, polymethylmethacrylate, ABS resin, LCP, polycarbonate, and polyurethane", and are different from each other in the following points:

(The different feature 1)

As for the "reinforcement member," the Invention employs the "reinforcing truss," while the Cited invention employs the "beam members (371, 372) arranged on a base plate (361) to cross each other in a substantially grid shape in plan view";

(The different feature 2)

As for the "sidewall of the bezel," "the sidewall of the bezel is formed as a double structure" in the Invention, while the Cited invention has no such limitation.

No. 5 Examination/Judgment

1 Easily-conceived property of the different features

The above-mentioned different features are examined.

(1) Regarding the different feature 1

The "reinforcing truss" in the Invention is described in the detailed description of the invention of the specification, as follows

"[0006]

This invention, which is to solve the prior problems, aims to provide an organic electroluminescence display device including a reinforcing truss arranged between a display panel and a bezel for storing the display panel, and to significantly reduce the impact to be applied to the display panel."

"[0009]

According to the invention, a reinforcing truss is arranged between a display panel and a bezel for storing the display panel, to protect the display panel from external impact. In addition, there is an effect of significantly reducing the impact to be applied to the display panel and preventing deformation or damage of the display panel."

"[0019]

Meanwhile, a reinforcing truss 120 is arranged between a display panel 160 and a bezel 110. The reinforcing truss 120, which improves durability of the bezel 110 storing the display panel 160, is formed by assembling transverse trusses 122 and vertical trusses 123 so as to be perpendicular to each other in a grid shape. The reinforcing truss 120 is formed by transverse trusses 122, vertical trusses 123 perpendicularly crossing the transverse trusses 122, and a frame 121 for connecting the transverse trusses 122 and the vertical trusses 123 longitudinally. The reinforcing truss 120 is formed by spacing the transverse trusses 122 and the vertical trusses 123 at a predetermined distance. The frame 121 is formed in a square shape. The transverse trusses 122, the vertical trusses 123, and the frame 121 may be formed in a bar shape having a square cross section."

"[0020]

The reinforcing truss 120 may be formed by at least one of a group including stainless steel (STS-KS standard: D3706), magnesium, magnesium alloy, aluminum, polyethylene (PE), protactinium (PA), polymethylmethacrylate (PMMA), ABS resin (acrylonitrile butadiene styrene copolymer), LCP (Aromatic Liquid Crystal Polymer), polycarbonate (PC), and polyurethane. The reinforcing truss 120 is formed to have a width of 0.03 to 0.15 mm. The reason for this is that a reinforcing truss 120 having a width of less than 0.03 mm cannot protect a display panel sufficiently from external force, and a reinforcing truss 120 having a width of more than 0.15 mm increases the thickness of an organic electroluminescence display device 100, which is not suitable for reduction in thickness and weight of the display."

In light of the above description, it can be understood that the "reinforcing truss" in the Invention is a structure arranged between a "display panel" and a "bezel", which protects the "display panel" from the impact applied from the outside, and is configured, as one embodiment of the structure, by arranging transverse trusses and vertical trusses so as to be perpendicular to each other in a grid shape.

According to the above description, the "reinforcing truss" in the Invention functions only by being "arranged", without employing special arrangement, between the "display panel" and the "bezel".

Therefore, the "beam members (371, 372) arranged on a base plate (361) to cross each other in a substantially grid shape in plan view," which is the "reinforcement member" in the Cited invention, are "in contact with the housing (710)" on the back side, at least, so that the member is a structure arranged between the "display panel" and the "bezel" as with the "reinforcing truss" in the Invention, and has the same structure as the "reinforcing truss" in the Invention.

It is obvious, based on the technical common sense, that the "beam members (371, 372)" in the Cited invention having the same arrangement and structure as the "reinforcing truss" in the Invention exhibit an effect of protecting the "organic EL panel (150)" from the impact applied from the outside, as with the "reinforcing truss" in the Invention.

Therefore, the Different feature 1 is not a substantial different feature, but a configuration which can be easily conceived by a person skilled in the art on the basis of the Cited invention.

(2) Regarding the different feature 2

The Cited document 2 describes, as shown in the descriptions (2a) to (2f), the technology of enhancing the structure of the bezel by bending the side wall of the bezel inwardly.

If the housing/bezel for protecting the display panel is made stronger, it is obvious that the display panel can be protected. Therefore, a person skilled in the art can easily conceive of enhancing the plate member of the side face of the "housing" by employing the technology described in the Cited document 2 to the "housing" in the Cited invention.

Thus, a person skilled in the art can easily obtain the configuration according to the Different feature 2 by employing the technology described in the Cited document 2 to the Cited invention.

The idea of employing a double-wall structure to the side wall of the housing is merely a well-known technology for enhancing the structure of the housing of an electronic device (see, for example, the above Cited document 2, microfilm of Japanese Utility Model Application No. S57-198395 (Japanese Unexamined Utility Model Application Publication No. S59-104595) Specification p. 8 l. 18-l. 20 and FIG. 6, Japanese Unexamined Patent Application Publication No. 2002-65945, Japanese Unexamined Patent Application Publication No. 2004-41468, Japanese Unexamined Patent Application Publication No. 2005-196084).

2 Working effect of the Invention

The working effect of the Invention could be predicted by a person ordinarily skilled in the art from the Cited invention and the technology described in Cited document 2.

3 Summary

Thus, the Invention could be easily invented by a person skilled in the art on the basis of the Cited invention and the technology described in Cited document 2.

In the written reply as of October 19, 2011, although a written amendment which clarifies the point "the reinforcing truss is brought into contact with a lower surface of the bezel and the display panel" was submitted, the "heat radiation member (370)" in the Cited invention is "in contact with the housing (710)", so that the point alleged by the appellant is not a substantial different feature, and no inventive step is found in the written amendment.

No. 6 Closing

As described above, the appellant should not be granted a patent for the invention in accordance with the provisions of Article 29(2) of the Patent Act.

Therefore, the present application should be rejected without mentioning other claims.

Therefore, the appeal decision shall be made as described in the conclusion.

February 28, 2012

Chief administrative judge: MURATA, Naohide
Administrative judge: HASHIMOTO, Naoaki
Administrative judge: MORIBAYASHI, Katsuro