(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 2 482 123 B1**

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention of the grant of the patent:
03.05.2017 Bulletin 2017/18

(21) Application number: **12152428.4**

(22) Date of filing: **25.01.2012**

(51) Int Cl.:
G02F 1/1335 *(2006.01)* ***G02F 1/13363*** *(2006.01)*
H05K 7/20 *(2006.01)* ***G02F 1/1333*** *(2006.01)*

(54) **Outdoor display apparatus**

Anzeigevorrichtung zur Verwendung im Freien

Appareil d'affichage extérieur

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR

(30) Priority: **01.02.2011 KR 20110010313**

(43) Date of publication of application:
01.08.2012 Bulletin 2012/31

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Printed by Jouve, 75001 PARIS (FR)

Description

BACKGROUND OF THE INVENTION

1. Field of the Invention

[0001] Embodiments of the present general inventive concept relate to an outdoor display apparatus.

2. Description of the Related Art

[0002] An outdoor display apparatus is an apparatus disposed outside a building to display an image. An example of an outdoor display apparatus includes a signboard.

[0003] Generally, an outdoor display apparatus includes a housing, a transparent member disposed at one side of the housing, and a display panel disposed inside the transparent member to display an image. Recently, an outdoor display apparatus using a liquid crystal display panel as a display panel has been used.

SUMMARY OF THE INVENTION

[0004] The present general inventive concept provides an outdoor display apparatus that improves visibility of an image displayed on a liquid crystal display panel and prevents the liquid crystal display panel from deteriorating.

[0005] Additional aspects and advantages of the present general inventive concept will be set forth in part in the description which follows and, in part, will be obvious from the description, or may be learned by practice of the general inventive concept.

[0006] The foregoing and/or other features and utilities of the present general inventive concept are achieved by providing an outdoor display apparatus according to claim 1. Further preferred developments are defined in the dependent claims.

BRIEF DESCRIPTION OF THE DRAWINGS

[0007] These and/or other aspects and advantages of the present general inventive concept will become apparent and more readily appreciated from the following description taken in conjunction with the accompanying drawings of which:

FIG. 1 is a perspective view illustrating an outdoor display apparatus ;

FIG. 2 is a sectional view illustrating an outdoor display apparatus ; and

FIG. 3 is an enlarged view of a portion A of FIG. 2 to illustrate an example of a transparent member of an outdoor display apparatus according to the embodiment of the present general inventive concept.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0008] Reference will now be made in detail to examples and the embodiment of the present general inventive concept, examples of which are illustrated in the accompanying drawings, wherein like reference numerals refer to the like elements throughout. The examples and the embodiment are described below in order to explain the present general inventive concept while referring to the figures.

[0009] As illustrated in FIGS. 1 and 2, an outdoor display apparatus includes a housing 10 forming an external appearance of the outdoor display apparatus, the housing 10 having an opening 10a formed at a front portion thereof, a transparent member 20 formed of a transparent material and disposed in the opening 10a, and a display unit, for example, a liquid crystal display panel module 30 disposed in the housing 10 to generate an image. The display unit may be another type of a display panel module to generate or display an image on a screen of a display panel. The outdoor display apparatus may be a display apparatus disposed in an outside environmental area, that is, a non-air controlled area , a low temperature area, a high humid area, and so on.

[0010] The housing 10 is formed in a shape of a hexahedral box or a box-like shape. The opening 10a is provided at an upper part of the front portion of the housing 10.

[0011] The transparent member 20 is formed of a transparent material to have a high strength, like reinforced glass. The transparent member 20 may be disposed at the upper part of the front portion of the housing 10 so that the transparent member 20 corresponds to the liquid crystal display panel module 30 disposed in the housing 10. An image is generated by and/or displayed on the liquid crystal display panel module 30 and then is viewed from an outside of the housing 10 through the transparent member 20. The housing may have a coupling element 10a to connect the transparent member 20 to the housing 10. The coupling element may be formed at an area to define the opening of the housing 10.

[0012] The liquid crystal display panel module 30 may be disposed at an upper part of the housing 10 therewithin. The liquid crystal display panel module 30 may include a liquid crystal display panel 31 to display an image and a backlight unit 32 disposed at a rear portion of the liquid crystal display panel 31 to irradiate light to the liquid crystal display panel 31. A circuit 33 is disposed at the rear portion of the liquid crystal display panel module 30 to control operations of the liquid crystal display panel 31 and the backlight unit 32. The liquid crystal display panel 31 of the liquid crystal display panel module 30 is spaced-apart from the transparent member 20 by a distance to define a gap, through which air flows.

[0013] A screen of the liquid crystal display panel 31 of the liquid crystal display panel module 30 may be disposed parallel to a major surface of the transparent mem-

ber 20. In this case, the distance between the transparent member 20 and the liquid crystal display panel 31 of the liquid crystal display panel module 30 may be constant. However, it is possible that the transparent member 20 can form an angle with a screen of the liquid crystal display panel 31 of the liquid crystal display panel module 30. In this case, the distance between the transparent member 20 and the liquid crystal display panel 31 of the liquid crystal display panel module 30 may not be constant but may be variable according to a distance from a bottom the housing 10 or according to a distance from a side of the housing 10.

[0014] A direct type backlight unit, having a light source disposed at the rear of the liquid crystal display panel 31, to directly irradiate light to the liquid crystal display panel 31 or an edge type backlight unit, having a light source disposed at the edge of the liquid crystal display panel 31, to disperse light through a light guide plate and indirectly irradiate light to the liquid crystal display panel 31 may be used as the backlight unit 32. In this example, a direct type backlight unit is used as the backlight unit 32.

[0015] The circuit 33 includes a drive unit 33a to drive the liquid crystal display panel 31 and the backlight unit 32, a signal processing unit 33b to receive an external signal and display an image according to the external signal on the liquid crystal display panel 31, and a power supply unit 33c connected to an external power source to convert power received from the external power source and distribute the converted power to the drive unit 33a and the signal processing unit 33b.

[0016] It is also possible that the signal processing unit 33b may have an image reproducing unit (not illustrated) to generate a signal to correspond to an image to be displayed on the liquid crystal display panel 31. It is also possible that the signal processing unit 33b may have a terminal (not illustrated) to be connected to an external device to receive a signal to correspond to the image to be displayed on the liquid crystal display panel 31. The signal processing unit 33b may have a controller to process the signal to drive the drive unit and also control the power supply unit 33c according to a state of the signal corresponding to the image.

[0017] Since the outdoor display apparatus is installed in an outdoor space, the liquid crystal display panel 31 is heated by sunlight reaching the liquid crystal display panel 31 through the transparent panel 20. In this case, the liquid crystal display panel 31 may deteriorate or a performance thereof is lowered. The sunlight or other light may be directly or indirectly reached to the liquid crystal display panel 31 through the transparent panel 20 to affect the performance of the liquid crystal display panel module 30.

[0018] In this example, the outdoor display apparatus may include an air circulation device 40 to circulate external air in the housing 10 to maintain an internal temperature of the housing 10 within a predetermined temperature range. To this end, the housing 10 is provided at a lower part of the rear thereof with an inlet port 10b, through which air is introduced into the housing 10 and at an upper part of the rear portion thereof with an outlet port 10c, through which air having being circulated in the housing 10 is discharged from the housing 10.

[0019] Inside the inlet port 10b is disposed a first filter 11 to filter a foreign material contained in air introduced through the inlet port 10b. Inside the outlet port 10c is disposed a second filter 12 to filter out foreign material contained in air discharged through the outlet port 10c.

[0020] Between the air circulation device 40 and the first filter 11 is disposed a heater 13 to heat air introduced through the inlet port 10b, thereby preventing the liquid crystal display panel 31 from being frozen at a low temperature, for example, a temperature in winter. The heater 13 may be selectively, manually, and/or automatically activated to raise the temperature of the inside of the housing 10 according to an environmental condition of a sensor (not illustrated), a manipulation of a switch (not illustrated) formed on the housing, and/or a command to operate the heater 13, respectively.

[0021] The air circulation device 40 includes a blowing fan 41 to disposed at the lower part of the housing 10 inside the housing 10 to generate a suction force and a blowing force through a rotation thereof, a drive motor 42 to generate a rotational force to rotate the blowing fan 41, and a guide duct 43, in which the blowing fan 41 is disposed, to guide air suctioned into the blowing fan 41 and air discharged from the blowing fan 41. Accordingly, external air is introduced into the housing 10 through the inlet port 10b, is circulated in the housing 10, and is discharged from the housing 10 through the outlet port 10c.

[0022] In this example, the blowing fan 41 may be a centrifugal fan, for example, to receive air in an axial direction and discharge the received air in a radial direction.

[0023] The guide duct 43 includes a suction port 43a provided in the axial direction of the blowing fan 41 so that air introduced through the inlet port 10b of the housing 10 is suctioned into the blowing fan 41 through the suction port 43a, and discharge ports 43b and 43c disposed outside the blowing fan 41 in the radial direction of the blowing fan 41 so that air discharged from the blowing fan 41 is supplied to the liquid crystal display panel module 30 through the discharge ports 43b and 43c.

[0024] In this example, the air circulation device 40 cools the liquid crystal display panel 31 heated by sunlight and removes heat generated from the circuit 33.

[0025] The air circulation device 40 may distribute the air discharged from the blowing fan 41 such that a first portion of the air is supplied to the gap between the liquid crystal display panel 31 and the transparent member 20 and a second portion of the air is supplied to a second gap where the circuit 33 is disposed so as to simultaneously cool the liquid crystal display panel 31 and the circuit 33.The air circulate device 40 may include a divider structure (not illustrated) to define or form the discharge ports 43b and 43c to direct the air supplied from the blowing fan 41 to one or both of the gap and the second gap.

[0026] To this end, the discharge ports 43b and 43c

include a first discharge port 43b to discharge the first portion of the air discharged from the blowing fan 41 to the gap between the transparent member 20 and the liquid crystal display panel 31 and a second discharge port 43c to discharge the second portion of the air discharged from the blowing fan 41 to the circuit 33. Accordingly, the first portion of the air discharged from the blowing fan 41 passes through the gap between the transparent member 20 and the liquid crystal display panel 31 through the first discharge port 43b to cool the liquid crystal display panel 31 and is discharged through the outlet port 10c, thereby preventing deterioration of the liquid crystal display panel 31, and the second portion of the air discharged from the blowing fan 41 is supplied to the second gap corresponding to the circuit 33 through the second discharge port 43c to cool the circuit 33 and is discharged through the outlet port 10c, thereby preventing overheating of the circuit 33. That is, the liquid crystal display panel 31 and the circuit 33 may be simultaneously cooled by the air circulation device 40.

[0027] In the outdoor display apparatus, deterioration of the liquid crystal display panel 31 via interaction with sunlight is prevented. In this example, the first portion may be, for example, 70 % of the air discharged from the blowing fan 41 to be supplied to the gap between the transparent member 20 and the liquid crystal display panel 31 through the first discharge port 43b, and the second portion may be, for example, 30 % of the air discharged from the blowing fan 41 to be supplied to the second gap corresponding to the rear portion of the liquid crystal display panel 31, i.e., the backlight unit 32 and the circuit 33, through the second discharge port 43c.

[0028] In this example, the first discharge port 43b and the second discharge port 43c are designed so that 70 % of the air discharged from the blowing fan 41 is supplied to the gap between the transparent member 20 and the liquid crystal display panel 31 through the first discharge port 43b and 30 % of the air discharged from the blowing fan 41 is supplied to the circuit 33 through the second discharge port 43c. When sufficient air is not supplied to the gap between the transparent member 20 and the liquid crystal display panel 31 due to flow resistance, an auxiliary blowing fan (not illustrated) may be disposed in the first discharge port 43b.

[0029] The outdoor display apparatus may have a sensor (not illustrated) to detect at least one of an inside temperature and an outside temperature and a controller (not illustrated) to control the heater 13 and/or the air circulation device 40. The sensor (not illustrated) may be disposed on the housing 10 or an inside of the housing 10. The controller (not illustrated) may be disposed in the air circulation device 40 or may be embodied in the circuit 33 of the liquid crystal display panel module 30 such that the circuit 33 of the liquid crystal display panel 31 can control the liquid crystal display panel 31 and the air circulation device 40. The controller (not illustrated) may control the heater 13 according to the detected temperature. It is possible that the controller may control the heater 13 according to a command included in the signal received at the circuit 33 from an external device.

[0030] The outdoor display apparatus may perform a heating mode to operate the heater 13 and an air circulating mode to operate the motor 42 and the blowing fan 41. The air circulating mode may not include the heating mode.

[0031] It is possible that the outdoor display apparatus may include a sensor (not illustrated) to detect a humidity at an inside of the housing 10 and/or an outside of the housing 10 such that the heating mode and/or the air circulating mode can be performed according to the detected humidity and/or the detected temperature. When humidity is high, vapor condensation may be formed on the transparent member 20 or the liquid crystal display panel module 30. In this case, the water or vapor condensation may be removed from the transparent member 20 and/or the liquid crystal display panel module 30 or from the gap and/or the second gap by selectively performing the heating mode and/or the air circulating mode.

[0032] When sunlight is reached the liquid crystal display panel 31 through the transparent member 20, is reflected by the liquid crystal display panel 31, and/or is transmitted back to the outside thereof, contrast of an image displayed on the liquid crystal display panel 31 may be lowered.

[0033] In the embodiment, as illustrated in FIG. 3, an optical film is disposed between the transparent 20 and the liquid crystal display panel 31 to prevent contrast of the image displayed on the liquid crystal display panel 31 from being lowered. The optical film may include a polarizing film 21 having the same optical axis as the image displayed on the liquid crystal display panel 31 and a 1/4 wavelength plate 22 to convert the optical axis of the image displayed on the liquid crystal display panel 31 into circular polarized light. It is possible that the optical film may change a first characteristic of the light into a second characteristic.

[0034] The polarizing film 21 and the 1/4 wavelength plate 22 are sequentially disposed in an advancing direction of the light. In this embodiment, the polarizing film 21 and the 1/4 wavelength plate 22 are sequentially disposed on or inside the transparent member 20. That is, the polarizing film 21 is disposed inside the transparent member 20, and the 1/4 wavelength plate 22 is disposed inside the polarizing film 21. Also, the polarizing film 21 and the 1/4 wavelength plate 22 have a surface area equal to or greater than that of an effective display area of the liquid crystal display panel 31 and equal to or less than that of the transparent member 20 to efficiently block transmission and/or reflection of light in the effective display area of the liquid crystal display panel 31.

[0035] The polarizing film 21 transmits only a specific optical axis component of the polarized light and absorbs the remainder of the polarized light. The 1/4 wavelength plate 22 may have an optical axis with an inclination of 45 degrees to the optical axis of the polarizing film 21.

[0036] The polarizing film 21 and the 1/4 wavelength

plate 22 are operated as follows. In the following description, it is assumed that the optical axis of the polarizing film 21 is a Y axis, and the optical axis perpendicular to the optical axis of the polarizing film 21 is an X axis for convenience of description.

[0037] When sunlight is incident upon the transparent member 20 of the outdoor display apparatus, a portion of the sunlight is reflected by the transparent member 20, and the remaining portion of the sunlight is transmitted through the transparent member 20 and is incident upon the polarizing film 21. The polarizing film 21 transmits only Y-axis polarized light corresponding to the optical axis of the polarizing film 21, i.e., the Y axis, and absorbs the remainder of the polarized light. The polarized light, having passed through the polarizing film 21, is incident upon a front portion of the 1/4 wavelength plate 22 and is converted into circular polarized light while passing through the 1/4 wavelength plate 22.

[0038] The circular polarized light, having passed through the 1/4 wavelength plate 22, is reflected by the liquid crystal display panel 31 and is incident upon the rear of the 1/4 wavelength plate 22. While passing through the 1/4 wavelength plate 22, the reflected light is converted into X-axis polarized light perpendicular to the optical axis of the polarizing film 21, i.e., the Y axis. The X-axis polarized light is incident upon the polarizing film 21. Since the optical axis of the polarizing film 21 is the Y axis, the X-axis polarized light is not transmitted. The X-axis polarized light may be absorbed by the polarizing film 21. Although sunlight passes through the transparent member 20 and reaches the liquid crystal display panel 31, light reflected by the liquid crystal display panel 31 is absorbed by the polarizing film 21, thereby preventing the light from being transmitted to the outside thereof.

[0039] Consequently, contrast of an image displayed on the liquid crystal display panel 31 is prevented from being lowered by sunlight, thereby improving visibility of an image displayed on the liquid crystal display panel 31.

[0040] Although FIG 3 illustrates only the polarizing film 21 and the 1/4 wavelength plate 22 are provided, the present general inventive concept is not limited thereto. In addition to the polarizing film 21 and the 1/4 wavelength plate 22, a functional film may be attached to the front and/or rear portions of the transparent member 20 or the front portion of the liquid crystal display panel 31 to improve visibility of an image displayed on the liquid crystal display panel 31. The functional film may include an anti-static film to restrain generation of static electricity, preventing dust from sticking to the front of the transparent member 20 or the liquid crystal display panel 31 and an anti-reflection film disposed at the transparent member 20 or the liquid crystal display panel 31 to reduce reflection of light.

[0041] In this embodiment, the polarizing film 21 and the 1/4 wavelength plate 22 are disposed inside the transparent member 20, to which, however, embodiments of the present general inventive concept are not limited. When the polarizing film 21 and the 1/4 wavelength plate 22 may be disposed at the front portion of the liquid crystal display panel 31 or when the polarizing film 21 and the 1/4 wavelength plate 22 may be disposed in the gap between transparent member 20 and the liquid crystal display panel 31, the polarizing film 21 and the 1/4 wavelength plate 22 may be spaced apart from the transparent member 20 and the liquid crystal display panel 31 to improve the visibility and other factors of the image.

[0042] The transparent member 20 may have a first area, the optical film may have a second area, and the liquid crystal display panel 31 may have a third area to display an image. The image displayed in the third area of the liquid crystal display panel 31 may be transmitted to an outside of the housing 10 through the second area of the optical film and the first area of the transparent member 20. Although the liquid crystal display panel 31 is spaced apart from the transparent member 20, the image of the liquid crystal display panel 31 can be displayed to a viewer at a predetermined viewing angle since the first area is larger than the third area.

[0043] The sunlight may be transmitted through the first area of the transparent member 20, the second area of the optical film, and the third area of the liquid crystal display panel 31. Since the liquid crystal display panel 31 is spaced apart from the transparent member 20, all of the sunlight incident on the first area of the transparent member 20 may not be transmitted to the optical film and/or the liquid crystal display panel 31 depending on an incident angle. As is apparent from the above description, air flows via the gap between the liquid crystal display panel and the transparent member and to the circuit to prevent the liquid crystal display panel from deteriorating by sunlight and to prevent the circuit from being overheated by sunlight or by an operation thereof, and the optical film is disposed between the transparent member and the liquid crystal display panel to prevent contrast of an image displayed on the liquid crystal display panel from being lowered by sunlight, thereby improving visibility of the image displayed on the liquid crystal display panel.

[0044] It will be appreciated by those skilled in the art that changes may be made in the embodiment without departing from the principles the general inventive concept, the scope of which is defined in the appended claims.

Claims

1. An outdoor display apparatus comprising:

a housing (10) having an opening (10a) formed at a front portion thereof, an inlet port (10b) through which air is introduced, and an outlet port (10c) through which air is discharged;

a transparent member (20) disposed in the opening (10a);

a liquid crystal display panel module (30) disposed in the housing, spaced apart from the transparent member (20) to define a gap therebetween, and provided with a liquid crystal display panel (31) at a front side thereof to display an image;
a circuit (33) disposed at a rear portion of the liquid crystal display panel module (30) and spaced apart from the rear portion of the housing (10) to defined a second gap;
an optical film disposed inside the transparent member at a position corresponding to the liquid crystal display panel (31) of the liquid crystal display panel module; and
an air circulation device (40) to distribute air introduced through the inlet port (10b) so that the distributed air passes through the gap between the transparent member (20) and the liquid crystal display panel (31) and through the circuit and is discharged through the outlet port (10c); **characterised in that** the air circulation device (40) includes a blowing fan (41) and a divider structure to define or form a first and a second discharge port (43b, 43c) to direct air supplied from the blowing fan (41) to either or both of the gap and the second gap.

2. Apparatus as claimed in claim 1, wherein the optical film comprises a polarizing film (21) having the same optical axis as light of an image displayed on the liquid crystal display panel (31) and a ¼ wavelength plate (22) to convert an optical axis of an image displayed on the liquid crystal display panel (31) into circular polarized light.

3. Apparatus as claimed in claim 2, wherein the polarizing film (21) and the ¼ wavelength plate (22) are sequentially disposed in an advancing direction of the light entering the housing.

4. Apparatus as claimed in claim 2, wherein the polarizing film (21) and the ¼ wavelength plate (22) are sequentially disposed on or inside the transparent member (20).

5. Apparatus as claimed in any of the claims 2-4, wherein the ¼ wavelength plate (22) has an optical axis with an inclination of 45 degrees to the optical axis of the polarizing film (21).

6. Apparatus as claimed in any of the claims 2-5, wherein the polarizing film (21) and ¼ wavelength plate (22) are arranged relative to the liquid crystal display panel (31) so as to have the polarizing film (21) absorb light reflected by the liquid crystal display panel 31.

7. Apparatus as claimed in any of the preceding claims, wherein the polarizing film (21) has a surface area equal to or greater than that of an effective display area of the liquid crystal display panel (31) and equal to or less than that of the transparent member (20).

8. The outdoor display apparatus according to any of the preceding claims, wherein the polarizing film (21) and the 1/4 wavelength plate (22) have a surface area equal to or greater than that of an effective display area of the liquid crystal display panel (31) and equal to or less than that of the transparent member (20).

9. The outdoor display apparatus according to any of the preceding claims, further comprising:

an anti-static film disposed at the transparent member (20) and/or the liquid crystal display panel (31) to restrain generation of static electricity.

10. The outdoor display apparatus according to any of the preceding claims, further comprising:

an anti-reflection film disposed at the transparent member and/or the liquid crystal display panel to reduce reflection of light.

11. The outdoor display apparatus according to any of the preceding claims, wherein
the liquid crystal display panel module further comprises a backlight unit disposed to irradiate light to the liquid crystal display panel, and
the circuit comprises a drive unit to drive the liquid crystal display panel and the backlight unit, a signal processing unit to receive an external signal on the liquid crystal display panel and to control the liquid crystal display panel to display the image corresponding to the external signal, and a power supply unit to convert and distribute external power to the drive unit and the signal processing unit.

12. The outdoor display apparatus according to any of the preceding claims, wherein
the air circulation device is disposed at a lower part of the housing,
the inlet port is provided at the lower part of the housing, and
the outlet port is provided at an upper part of the housing; and/or
wherein the air introduced through the inlet port is distributed so that a first portion of the air passes through the gap between the transparent member and the liquid crystal display panel and is discharged through the outlet port and so that a second portion of the air passes through the circuit and is discharged through the outlet port.

13. The outdoor display apparatus according to any of the preceding claims, wherein the air circulation device comprises a drive motor to rotate the blowing fan, and a guide duct, in which the blowing fan is disposed, having the first discharge port to guide a first portion of air discharged from the blowing fan to the gap between the transparent member and the liquid crystal display panel, wherein the guide duct comprises the second discharge port to guide a second portion of the air discharged from the blowing fan to the circuit.

14. The outdoor display apparatus according to claim 12, wherein the first portion of the air guided by the first discharge port is about 70 % of the air discharged from the blowing fan, and the second portion of the air guided by the second discharge port is about 30 % of the air discharged from the blowing fan.

15. The outdoor display apparatus according to any of the preceding claims, further comprising:

a first filter disposed inside the inlet port to remove dust from air introduced through the inlet port; and
a second filter disposed inside the outlet port to remove dust from air discharged through the outlet port.

Patentansprüche

1. Anzeigevorrichtung zur Verwendung im Freien, die umfasst:

ein Gehäuse (10) mit einer Öffnung (10a), die an einem vorderen Abschnitt davon ausgeformt ist, einen Einlassanschluss (10b), durch den Luft eingelassen wird, und einen Auslassanschluss (10c), durch den Luft ausgelassen wird;
ein transparentes Element (20), das in der Öffnung (10a) angeordnet ist;
ein in dem Gehäuse angeordnetes Flüssigkristallanzeigefeldmodul (30), das von dem transparenten Element (20) beabstandet ist, um eine Lücke dazwischen zu definieren, und das mit einem Flüssigkristallanzeigefeld (31) an einer Vorderseite davon ausgestattet ist, um ein Bild anzuzeigen;
eine Schaltung (33), die an einem hinteren Abschnitt des Flüssigkristallanzeigefeldmoduls (30) angeordnet ist und von dem hinteren Abschnitt des Gehäuses (10) beabstandet ist, um eine zweite Lücke zu definieren;
einen optischen Film, der im Inneren des transparenten Elements an einer Position, die mit dem Flüssigkristallanzeigefeld (31) des Flüssigkristallanzeigefeldmoduls korrespondiert, angeordnet ist;
und
eine Luftzirkulationseinrichtung (40), um die durch den Einlassanschluss (10b) eingelassene Luft zu verteilen, so dass die verteilte Luft durch die Lücke zwischen dem transparenten Element (20) und dem Flüssigkristallanzeigefeld (31) sowie durch die Schaltung zirkuliert und durch den Auslassanschluss (10c) ausgelassen wird;
dadurch gekennzeichnet, dass
die Luftzirkulationseinrichtung (40) umfasst: einen Lüfter (41) und eine Unterteilungsstruktur, um eine erste und eine zweite Ausstoßöffnung (43b, 43c) zu definieren oder zu formen, um die von dem Lüfter (41) zugeführte Luft an die erste und/oder die zweite Lücke zu leiten.

2. Vorrichtung gemäß Anspruch 1, wobei der optische Film umfasst: einen Polarisationsfilm (21), der die gleiche optische Achse wie das Licht eines auf dem Flüssigkristallanzeigefeld (31) angezeigten Bildes aufweist, und eine Viertelwellenlängenplatte (22), um eine optische Achse eines auf dem Flüssigkristallanzeigefeld (31) angezeigten Bildes in zirkular polarisiertes Licht umzuwandeln.

3. Vorrichtung gemäß Anspruch 2, wobei der Polarisationsfilm (21) und die Viertelwellenlängenplatte (22) in Reihe in einer Vorwärtsrichtung des in das Gehäuse eindringenden Lichts angeordnet sind.

4. Vorrichtung gemäß Anspruch 2, wobei der Polarisationsfilm (21) und die Viertelwellenlängenplatte (22) in Reihe an dem oder im Inneren des transparenten Elements (20) angeordnet sind.

5. Vorrichtung gemäß einem der Ansprüche 2 bis 4, wobei die Viertelwellenlängenplatte (22) eine optische Achse mit einer Neigung von 45 Grad zu der optischen Achse des Polarisationsfilms (21) aufweist.

6. Vorrichtung gemäß einem der Ansprüche 2 bis 5, wobei der Polarisationsfilm (21) und die Viertelwellenlängenplatte (22) derart in Relation zu dem Flüssigkristallanzeigefeld (31) ausgerichtet sind, dass der Polarisationsfilm (21) von dem Flüssigkristallanzeigefeld (31) reflektiertes Licht absorbiert.

7. Vorrichtung gemäß einem der vorangegangenen Ansprüche, wobei der Polarisationsfilm (21) einen Oberflächenbereich aufweist, der genauso groß wie oder größer als ein effektiver Anzeigebereich des Flüssigkristallanzeigefelds (31) und genauso groß wie oder kleiner als der des transparenten Elements (20) ist.

8. Anzeigevorrichtung zur Verwendung im Freien ge-

mäß einem der vorangegangenen Ansprüche, wobei der Polarisationsfilm (21) und die Viertelwellenlängenplatte (22) einen Oberflächenbereich aufweisen, der genauso groß wie oder größer als ein effektiver Anzeigebereich des Flüssigkristallanzeigefelds (31) und genauso groß wie oder kleiner als der des transparenten Elements (20) ist.

9. Anzeigevorrichtung zur Verwendung im Freien gemäß einem der vorangegangenen Ansprüche, wobei die Vorrichtung weiterhin umfasst:

einen antistatischen Film, der an dem transparenten Element (20) und/oder an dem Flüssigkristallanzeigefeld (31) angeordnet ist, um eine Erzeugung von statischer Aufladung zu verhindern.

10. Anzeigevorrichtung zur Verwendung im Freien gemäß einem der vorangegangenen Ansprüche, wobei die Vorrichtung weiterhin umfasst:

einen entspiegelnden Film, der an dem transparenten Element und/oder an dem Flüssigkristallanzeigefeld angeordnet ist, um Lichtreflexionen zu verringern.

11. Anzeigevorrichtung zur Verwendung im Freien gemäß einem der vorangegangenen Ansprüche, wobei:

das Flüssigkristallanzeigefeldmodul weiterhin eine Hintergrundbeleuchtungseinheit umfasst, die dazu angeordnet ist, Licht an das Flüssigkristallanzeigefeld abzustrahlen, und
die Schaltung umfasst: eine Antriebseinheit, um das Flüssigkristallanzeigefeld und die Hintergrundbeleuchtungseinheit zu betreiben, eine Signalverarbeitungseinheit, um ein externes Signal auf dem Flüssigkristallanzeigefeld zu empfangen und das Flüssigkristallanzeigefeld derart zu steuern, dass es das mit dem externen Signal korrespondierende Bild anzeigt, sowie eine Stromversorgungseinheit, um externen Strom umzuwandeln und an die Antriebseinheit und die Signalverarbeitungseinheit zu verteilen.

12. Anzeigevorrichtung zur Verwendung im Freien gemäß einem der vorangegangenen Ansprüche, wobei:

die Luftzirkulationseinrichtung an einem unteren Teil des Gehäuses angeordnet ist,
der Einlassanschluss an dem unteren Teil des Gehäuses angeordnet ist, und
der Auslassanschluss an einem oberen Teil des Gehäuses angeordnet ist; und/oder die durch den Einlassanschluss eingelassene Luft derart verteilt wird, dass ein erster Teil der Luft durch die Lücke zwischen dem transparenten Element und dem Flüssigkristallanzeigefeld zirkuliert und durch den Auslassanschluss ausgelassen wird, und dass ein zweiter Teil der Luft durch die Schaltung zirkuliert und durch den Auslassanschluss ausgelassen wird.

13. Anzeigevorrichtung zur Verwendung im Freien gemäß einem der vorangegangenen Ansprüche, wobei die Luftzirkulationseinrichtung umfasst: einen Antriebsmotor, um den Lüfter zu drehen, und einen Luftleitkanal, in dem der Lüfter angeordnet ist, wobei der Luftleitkanal die erste Ausstoßöffnung umfasst, um einen ersten Teil der Luft, die von dem Lüfter ausgelassen wird, zu der Lücke zwischen dem transparenten Element und dem Flüssigkristallanzeigefeld leiten, und wobei der Luftleitkanal die zweite Ausstoßöffnung umfasst, um einen zweiten Teil der Luft, die von dem Lüfter ausgelassen wird, zu der Schaltung zu leiten.

14. Anzeigevorrichtung zur Verwendung im Freien gemäß Anspruch 12, wobei es sich bei dem ersten Teil der Luft, der von der ersten Ausstoßöffnung geleitet wird, um etwa 70 % der von dem Lüfter ausgelassenen Luft handelt, und es sich bei dem zweiten Teil der Luft, der von der zweiten Ausstoßöffnung geleitet wird, um etwa 30 % der von dem Lüfter ausgelassenen Luft handelt.

15. Anzeigevorrichtung zur Verwendung im Freien gemäß einem der vorangegangenen Ansprüche, wobei die Vorrichtung weiterhin umfasst:

einen ersten Filter, der im Inneren des Einlassanschlusses angeordnet ist, um Staub aus der durch den Einlassanschluss eingelassenen Luft zu entfernen; und
einen zweiten Filter, der im Inneren des Auslassanschlusses angeordnet ist, um Staub aus der durch den Auslassanschluss ausgelassenen Luft zu entfernen.

Revendications

1. Appareil d'affichage extérieur comprenant :

un boîtier (10) présentant une ouverture (10a) constituée sur une partie avant de celui-ci, un orifice d'entrée (10b) par lequel de l'air est introduit, et un orifice de sortie (10c) par lequel de l'air est évacué,
un élément transparent (20) disposé dans l'ouverture (10a),
un module d'écran à cristaux liquides (30) disposé dans le boîtier, à l'écart de l'élément trans-

parent (20) en définissant un espace entre eux, et pourvu d'un écran à cristaux liquides (31) sur une face avant de celui-ci pour l'affichage d'une image,
un circuit (33) disposé sur une partie arrière du module d'écran à cristaux liquides (30) et à l'écart de la partie arrière du boîtier (10) en définissant un second espace,
un film optique disposé à l'intérieur de l'élément transparent en un emplacement correspondant à l'écran à cristaux liquides (31) du module d'écran à cristaux liquides, et
un dispositif de circulation d'air (40) destiné à distribuer l'air introduit par l'orifice d'entrée (10b) pour que l'air distribué traverse l'espace existant entre l'élément transparent (20) et l'écran à cristaux liquides (31) et traverse le circuit pour être évacué par l'orifice de sortie (10c) ;
caractérisé en ce que
le dispositif de circulation d'air (40) comporte un ventilateur soufflant (41) et une structure séparatrice pour définir ou former un premier et un second orifice d'évacuation (43b, 43c) visant à diriger l'air fourni par le ventilateur soufflant (41) vers l'espace et/ou le second espace.

2. Appareil selon la revendication 1, dans lequel le film optique comprend un film polarisateur (21) présentant le même axe optique que la lumière d'une image affichée sur l'écran à cristaux liquides (31) et une lame quart d'onde (22) destinée à transformer l'axe optique d'une image affichée sur l'écran à cristaux liquides (31) en une lumière à polarisation circulaire.

3. Appareil selon la revendication 2, dans lequel le film polarisateur (21) et la lame quart d'onde (22) sont disposés successivement dans le sens d'avancée de la lumière pénétrant dans le boîtier.

4. Appareil selon la revendication 2, dans lequel le film polarisateur (21) et la lame quart d'onde (22) sont disposés successivement sur ou à l'intérieur de l'élément transparent (20).

5. Appareil selon l'une quelconque des revendications 2 à 4, dans lequel la lame quart d'onde (22) présente un axe optique possédant une inclinaison de 45 degrés par rapport à l'axe optique du film polarisateur (21).

6. Appareil selon l'une quelconque des revendications 2 à 5, dans lequel le film polarisateur (21) et la lame quart d'onde (22) sont agencés par rapport à l'écran à cristaux liquides (31) de manière que le film polarisateur (21) absorbe la lumière réfléchie par l'écran à cristaux liquides (31).

7. Appareil selon l'une quelconque des revendications précédentes, dans lequel le film polarisateur (21) présente une superficie égale ou supérieure à celle de la surface d'affichage effective de l'écran à cristaux liquides (31) et égale ou inférieure à celle de l'élément transparent (20).

8. Appareil d'affichage extérieur selon l'une quelconque des revendications précédentes, dans lequel le film polarisateur (21) et la lame quart d'onde (22) présentent une superficie égale ou supérieure à celle de la surface d'affichage effective de l'écran à cristaux liquides (31) et égale ou inférieure à celle de l'élément transparent (20).

9. Appareil d'affichage extérieur selon l'une quelconque des revendications précédentes, comprenant en outre :

un film antistatique disposé sur l'élément transparent (20) et/ou l'écran à cristaux liquides (31) pour limiter la production d'électricité statique.

10. Appareil d'affichage extérieur selon l'une quelconque des revendications précédentes, comprenant en outre :

un film antiréfléchissant disposé sur l'élément transparent et/ou l'écran à cristaux liquides pour réduire la réflexion de la lumière.

11. Appareil d'affichage extérieur selon l'une quelconque des revendications précédentes, dans lequel :

le module d'écran à cristaux liquides comprend en outre une unité de rétroéclairage disposée pour diffuser de la lumière vers l'écran à cristaux liquides, et
le circuit comprend une unité de pilotage destinée à piloter l'écran à cristaux liquides et l'unité de rétroéclairage, une unité de traitement de signaux destinée à recevoir un signal externe sur l'écran à cristaux liquides et à commander à l'écran à cristaux liquides d'afficher l'image correspondant au signal externe, et une unité d'alimentation destinée à transformer et à distribuer de l'énergie externe auprès de l'unité de pilotage et de l'unité de traitement de signaux.

12. Appareil d'affichage extérieur selon l'une quelconque des revendications précédentes, dans lequel :

le dispositif de circulation d'air est disposé sur une partie inférieure du boîtier,
l'orifice d'entrée est prévu dans la partie inférieure du boîtier, et
l'orifice de sortie est prévu dans une partie supérieure du boîtier, et/ou
l'air introduit par l'orifice d'entrée est distribué

pour qu'une première partie de l'air traverse l'espace existant entre l'élément transparent et l'écran à cristaux liquides et soit évacuée par l'orifice de sortie, et pour qu'une seconde partie de l'air traverse le circuit et soit évacuée par l'orifice de sortie.

13. Appareil d'affichage extérieur selon l'une quelconque des revendications précédentes, dans lequel le dispositif de circulation d'air comprend un moteur d'entraînement destiné à faire tourner le ventilateur soufflant, et un conduit de guidage dans lequel est disposé le ventilateur soufflant et présentant le premier orifice d'évacuation destiné à guider une première partie de l'air évacué par le ventilateur soufflant vers l'espace existant entre l'élément transparent et l'écran à cristaux liquides,
le conduit de guidage comprenant le second orifice d'évacuation destiné à guider une seconde partie de l'air évacué par le ventilateur soufflant vers le circuit.

14. Appareil d'affichage extérieur selon la revendication 12, dans lequel la première partie de l'air guidée par le premier orifice d'évacuation constitue environ 70 % de l'air évacué par le ventilateur soufflant, et la seconde partie de l'air guidée par le second orifice d'évacuation constitue environ 30 % de l'air évacué par le ventilateur soufflant.

15. Appareil d'affichage extérieur selon l'une quelconque des revendications précédentes, comprenant en outre :

un premier filtre disposé à l'intérieur de l'orifice d'entrée afin d'éliminer la poussière de l'air introduit par l'orifice d'entrée, et
un second filtre disposé à l'intérieur de l'orifice de sortie afin d'éliminer la poussière de l'air évacué par l'orifice de sortie.

FIG. 1

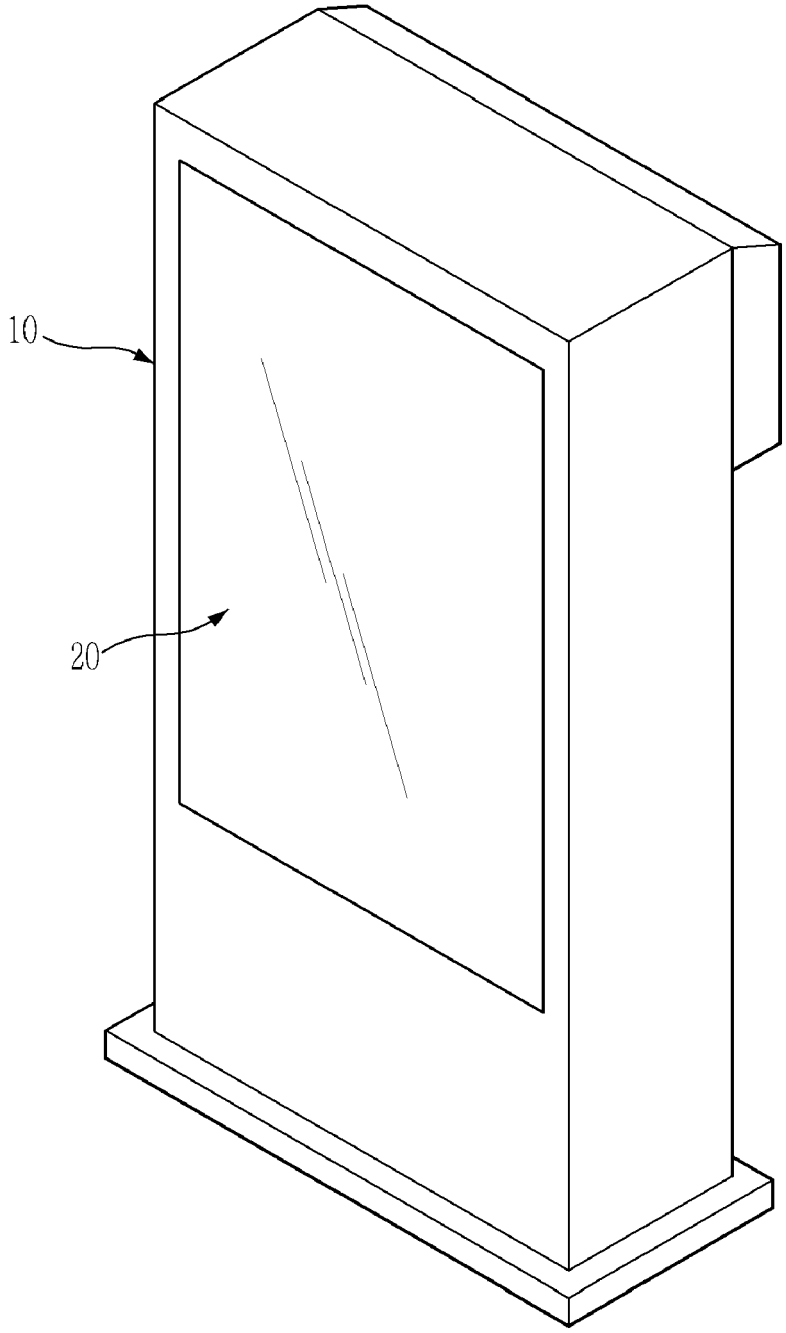


FIG. 2

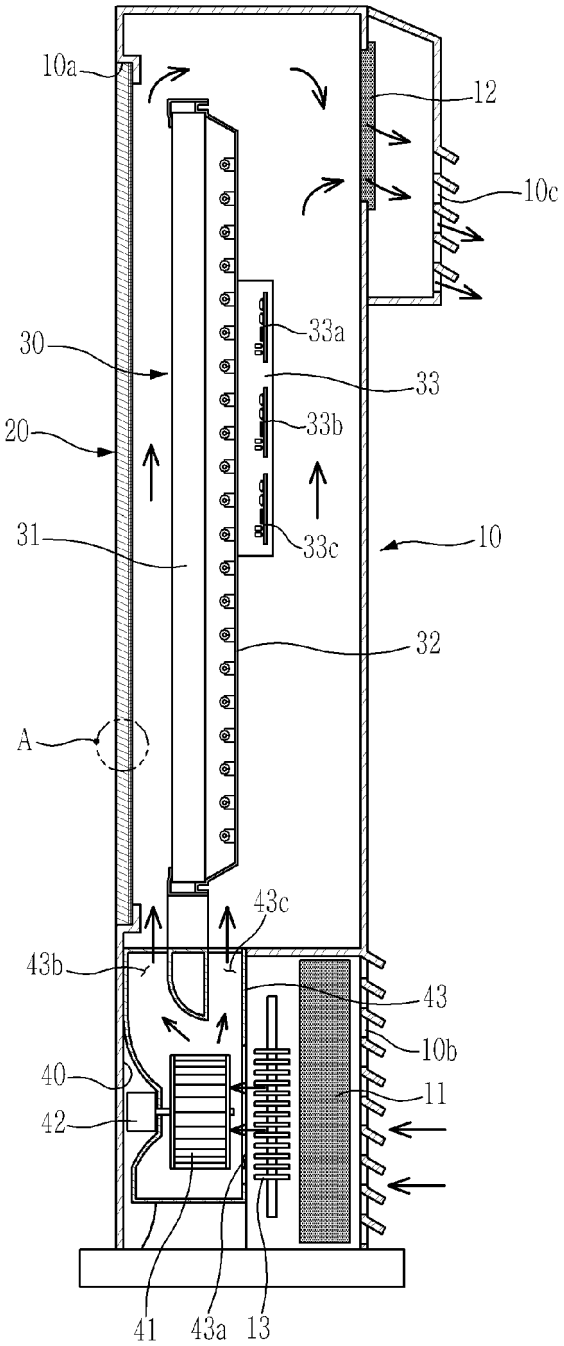
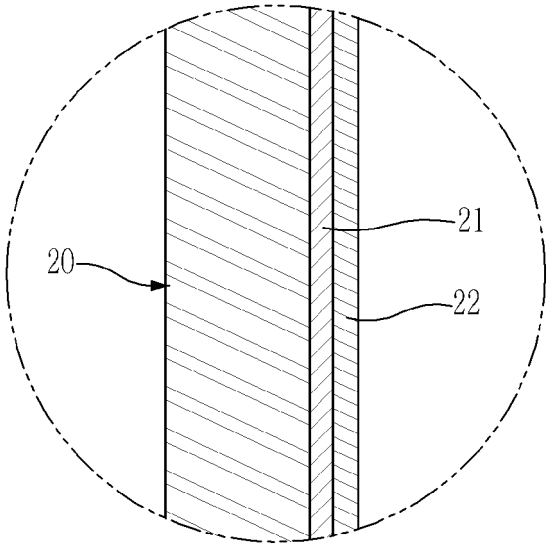

10a
12
10c
30
33a
33
20
33b
31
33c
10
32
A
43c
43b
43
10b
40
11
42
41
43a
13

FIG. 3



专利名称(译)	户外显示装置		
公开(公告)号	EP2482123B1	公开(公告)日	2017-05-03
申请号	EP2012152428	申请日	2012-01-25
[标]申请(专利权)人(译)	三星电子株式会社		
申请(专利权)人(译)	三星电子有限公司		
当前申请(专利权)人(译)	SAMSUNG ELECTRONICS CO.，LTD.		
[标]发明人	CHO JIN HYUN		
发明人	CHO, JIN HYUN		
IPC分类号	G02F1/1335 G02F1/13363 H05K7/20 G02F1/1333		
CPC分类号	G02F1/133385 G02F1/133308 G02F1/133502 G02F1/133528 G02F1/13363 G02F2001/133331 G02F2001/133531 G02F2001/133541 G02F2001/133562 G02F2001/133638 G02F2202/22 H05K7/20972		
优先权	1020110010313 2011-02-01 KR		
其他公开文献	EP2482123A3 EP2482123A2		
外部链接	Espacenet		

摘要(译)

一种户外显示装置，包括具有开口（10a）的壳体（10），入口（10b）和出口（10c），设置在开口中的透明构件（20），液晶显示面板模块（30））设置在壳体内，使得液晶显示面板模块与透明构件间隔开以在它们之间形成间隙，液晶显示面板模块在其前面设置有液晶显示面板（31）以显示图像，设置在液晶显示面板模块后部的电路（33），设置在透明部件（20）内部的光学膜（21,22），位于与液晶显示面板的液晶显示面板对应的位置模块和空气循环装置（40），用于分配通过入口引入的空气，使得分配的空气穿过透明构件和液晶显示板之间的间隙并通过电路并被排出。呃出口。光学膜包括线性偏振器（21）和1/4波长板（22），用于防止对比度被环境光降低。

FIG. 1