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(54) **Organic light emitting display**

Organische lichtemittierende Anzeige

Affichage électroluminescent organique

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Description

BACKGROUND

1. **Field**

[0001] The present invention relates to an organic light emitting display, and more particularly, to an organic light emitting display capable of improving an aperture ratio.

2. **Description of the Related Art**

[0002] Recently, various flat panel displays (FPDs) capable of reducing weight and volume as compared to cathode ray tubes (CRT) have been developed. The FPDs include liquid crystal displays (LCDs), field emission displays (FEDs), plasma display panels (PDPs), and organic light emitting displays.

[0003] Among the FPDs, the organic light emitting display displays an image with set or predetermined brightness using pixels formed in a pixel region. For example, the organic light emitting display includes red, green, and blue pixels to display various colored images.

[0004] In various fields, including that of portable display devices, panels having a high resolution, (e.g. no less than 400 ppi), are used. However, since the size of a pixel is reduced when the resolution is increased, the aperture ratio of the pixel is reduced. For example, when the resolution is 410 ppi, the aperture ratio is no more than about 5%.

[0005] A pixel typically includes a red, green, or blue emission region, and the emission regions are symmetrically arranged in the pixels. Often, the emission regions are arranged at uniform intervals in a vertical line. However, when the emission regions are symmetrically arranged in the pixel, the emission regions are formed only in a partial area of a usable area so that the aperture ratio deteriorates.

[0006] In addition, various other components including a via hole are typically provided in a pixel. Therefore, when the emission regions are symmetrically formed, the areas in which they may be located are reduced so that the aperture and the degree of freedom of design deteriorate.

[0007] US 2009/0121983 discloses a display device in which the red pixels are evenly spaced, as are the green pixels. In the blue pixels, the blue emission region extends over two pixels.

[0008] US 2012/133682 discloses a display in which the emission regions have a delta arrangement and wherein some light emitting regions are provided with lenses to provide a wide viewing angle.

[0009] Intermediate patent application EP2595192 shows a delta arrangement of hexagonal pixels in which all the red and all the green emission regions of horizontal lines along the y-axis are arranged in an upper or lower portion of the pixel, so that the distance between the emission regions of all colours in the ith and (i+1)th horizontal row are constant.

SUMMARY

[0010] The present invention sets out to provide an organic light emitting display capable of improving an aperture ratio.

[0011] In one embodiment, there is provided an organic light emitting display according to claim 1.

[0012] The blue emission regions positioned in i-th (i is a natural number) horizontal lines may be arranged at upper sides of corresponding ones of the blue pixels. The blue emission regions positioned in (i+1)th horizontal lines may be arranged at lower sides of corresponding ones of the blue pixels.

[0013] The red emission regions positioned in i-th (i is a natural number) horizontal lines may be arranged at upper sides of corresponding ones of the red pixels. The red emission regions positioned in (i+1)th horizontal lines may be arranged at lower sides of corresponding ones of the red pixels.

[0014] In another embodiment, there is provided an organic light emitting display according to Claim 4.

[0015] The blue emission regions positioned in i-th (i is a natural number) horizontal lines may be arranged at upper sides of corresponding ones of the blue pixels. The blue emission regions positioned in (i+2)th horizontal lines may be arranged at lower sides of corresponding ones of the blue pixels. The red emission regions positioned in i-th (i is a natural number) horizontal lines may be arranged at upper sides of corresponding ones of the red pixels. The red emission regions positioned in (i+2)th horizontal lines may be arranged at lower sides of corresponding ones of the red pixels.

[0016] In the organic light emitting display according to embodiments of the present invention, the red emission and/or the blue emission region are non-symmetrically arranged in the pixel. In this case, it is possible to secure the degree of freedom of design and to increase the area in which the emission regions are formed so that it is possible to secure a high aperture ratio.

[0017] At least some of the above and other features of the invention are set out in the claims.

BRIEF DESCRIPTION OF THE DRAWINGS

[0018] The accompanying drawings illustrate embodiments of the present invention, and, together with the description, serve to explain the principles of the present invention.

FIG. 1 is a view illustrating a recognition resolution of a pixel;

FIG. 2 is a view illustrating an embodiment of non-symmetrical arrangement of a green emission region;

FIG. 3 is a view illustrating a pixel structure of an organic light emitting display according to a first em-

bodiment of the present invention;

FIG. 4 is a view illustrating a pixel structure of an organic light emitting display according to a second embodiment of the present invention;

FIG. 5 is a view illustrating a pixel structure of an organic light emitting display according to a third embodiment of the present invention; and

FIG. 6 is a view illustrating a pixel structure of an organic light emitting display according to a fourth embodiment of the present invention.

DETAILED DESCRIPTION

[0019] Hereinafter, certain embodiments according to the present invention will be described with reference to the accompanying drawings. Here, when a first element is described as being coupled to a second element, the first element may be directly coupled to the second element, or indirectly coupled to the second element via a third element. Further, some of the elements that are not essential to the complete understanding of the invention may be omitted for clarity. Also, like reference numerals refer to like elements throughout.

[0020] FIG. 1 is a view illustrating a recognition resolution of a pixel. In FIG. 1, a characteristic in a visual range is 25 cm.

[0021] Referring to FIG. 1, experimentally, a green pixel is most sensitive in terms of visibility. When green emission regions G are arranged at uniform intervals in a vertical line, noise in the form of horizontal stripes is generally not recognized at a resolution of no less than 350 ppi. In the case of red pixels, when red emission regions R are arranged at uniform intervals, noise in the form of horizontal stripes is generally not recognized at a resolution of no less than 209 ppi. In the case of blue pixels, when blue emission regions B are arranged at uniform intervals, noise in the form of horizontal stripes is generally not recognized at a resolution of no less than 70 ppi.

[0022] Considering the above characteristic, according to the present invention, the emission regions B and R of the blue and/or red pixels are non-symmetrically arranged to improve an aperture ratio. On the other hand, the emission regions G of the green pixels are symmetrically arranged to prevent or reduce noise in the form of stripes from being recognized.

[0023] As illustrated in FIG. 2, in a panel having a resolution of 440 ppi, the emission regions G of the green pixels may be non-symmetrically arranged. For example, the green emission regions G may be provided at the lower sides of the pixels in j-th (j is 1, 3, 5, ...) horizontal lines and may be arranged at the upper sides of the pixels in (j+1)th horizontal lines. In this case, the green emission regions G positioned at two horizontal lines are symmetrical with the green emission regions G positioned at adjacent two horizontal lines so that resolution is symmetrically set as 220 ppi that is half of 440 ppi. Therefore, when the emission regions G are non-symmetrically arranged in the green pixels at the resolution of 440 ppi, green pixels are recognized as noise in the form of horizontal stripes. That is, it is difficult to symmetrically arrange the green pixels at currently used resolution. Therefore, according to the present invention, the emission regions G of the green pixels are arranged at uniform intervals.

[0024] FIG. 3 is a view illustrating a pixel structure of an organic light emitting display according to a first embodiment of the present invention.

[0025] Referring to FIG. 3, the organic light emitting display according to the first embodiment of the present invention includes red pixels 10R, green pixels 10G, and blue pixels 10B. The red pixels 10R, the green pixels 10G, and the blue pixels 10B are repeatedly arranged in horizontal lines, and the pixels 10R, 10G, and 10B that emit light components of the same color are repeatedly arranged in vertical lines. That is, the organic light emitting display of FIG. 3 has a structure in the form of stripes.

[0026] The red pixels 1 0R include red emission regions R for generating red light. The green pixels 10G include green emission regions G for generating green light. The blue pixels 10B include blue emission regions B for generating blue light. Here, the green emission regions G are arranged at substantially uniform intervals, and the blue emission regions B are arranged at different intervals (e.g., non-uniform intervals). The red emission regions R are arranged at different intervals (e.g., non-uniform intervals).

[0027] In more detail, the distance between a red emission region R and an adjacent red emission region R above the red emission region R, is different from the distance between the red emission region R and another adjacent red emission region R below the red emission region R. For example, a specific red emission region R is separated from an adjacent red emission region R above the red emission region R at a first distance W1, and is separated from another adjacent red emission region R below the red emission region R at a second distance W2 different from the first distance W1. Therefore, the red emission regions R positioned in i-th (i is a natural number) horizontal lines are formed at the upper portions of the pixels 10R, and the red emission regions R positioned in (i+1)th horizontal lines are formed at the lower portions of the pixels 10R.

[0028] The distance between a blue emission region B and an adjacent blue emission region B above the blue emission region B is different from the distance between the blue emission region B and another adjacent blue emission region B below the blue emission region B. For example, a specific blue emission region B is separated from an adjacent blue emission region B above the blue emission region B at a fourth distance W4 and is separated from another adjacent blue emission region B below the blue emission region B at a fifth distance W5 different from the fourth distance W4. Therefore, the blue emission regions B positioned in the i-th horizontal lines are formed at the upper portions of the pixels 10B, and the blue emission regions B positioned in the $(i+1)^{th}$ hor-

izontal lines are formed at the lower portions of the pixels 10B.

[0029] As described above, the red emission regions R and the blue emission regions B are not arranged at uniform intervals in vertical lines. In this case, the degree of freedom of design may be secured in forming the red and blue pixels 10R and 10B. In addition, the space of the pixels 10R and 10B may be maximally used so that the aperture ratio of the pixels 10R and 10B may be increased. In addition, the first distance W1, the second distance W2, the fourth distance W4, and the fifth distance W5 may be variously set in consideration of the resolution and size of the panel. For example, the first distance W1 and the fourth distance W4 may be set to be the same, and the second distance W2 and the fifth distance W5 may be set to be the same.

[0030] A green emission region G is separated from an adjacent green emission region G above the green emission region G, and is separated from another adjacent green emission region G below the green emission region G at a third distance W3. When the green emission regions G are formed at uniform intervals, it is possible to prevent or reduce noise in the form of horizontal stripes from being generated. In addition, in general, since the green emission regions G have high emission efficiency relative to the red and blue emission regions, although the aperture ratio is small, a high quality image may be displayed.

[0031] On the other hand, in FIG. 3, the red emission regions R and the blue emission regions B are non-symmetrically formed. However, the present invention is not limited to the above. For example, as illustrated in FIG. 4, at a resolution of no more than 420 ppi, the red emission regions R may be arranged at uniform intervals to prevent or reduce noise in the form of stripes from being generated.

[0032] FIG. 4 is a view illustrating a pixel structure of an organic light emitting display according to a second embodiment of the present invention.

[0033] Referring to FIG. 4, the organic light emitting display according to the second embodiment includes red pixels 20R, green pixels 20G, and blue pixels 20B. The organic light emitting display of FIG. 4 according to the present invention has a structure in the form of stripes.

[0034] The red pixels 20R include red emission regions R for generating red light. The green pixels 20G include green emission regions G for generating green light. The blue pixels 20B include blue emission regions B for generating blue light.

[0035] Here, a specific red emission region R is separated from an adjacent red emission region R above the red emission region R, and is separated from another adjacent red emission region R below the red emission region R at the tenth distance W10. A specific green emission region G is separated from an adjacent green emission region G above the green emission region G, and is separated from another adjacent green emission region G below the green emission region G at the third distance W3.

[0036] In more detail, the distance between a blue emission region B and an adjacent blue emission region B above the blue emission region B is different from the distance between the blue emission region B and another adjacent blue emission region B below the blue emission region B. For example, a specific blue emission region B is separated from an adjacent blue emission region B above the blue emission region B at the fourth distance W4, and is separated from another adjacent blue emission region B below the blue emission region B at the fifth distance W5 different from the fourth distance W4. Therefore, the blue emission regions B positioned in i-th (i is a natural number) horizontal lines are formed at the upper portions of the pixels 20B, and the blue emission regions B positioned in (i+1)th horizontal lines are formed at the lower portions of the pixels 20B.

[0037] When the blue emission regions B are not arranged at uniform intervals, it is possible to secure the degree of freedom of design and to increase the aperture ratio.

[0038] FIG. 5 is a view illustrating a pixel structure of an organic light emitting display according to a third embodiment of the present invention.

[0039] Referring to FIG. 5, the organic light emitting display according to the third embodiment of the present invention has a delta structure (e.g., a hexagon structure) in which pixels 30R, 30G, and 30B of one unit pixel are positioned in two horizontal lines.

[0040] The red pixels 30R include red emission regions R for generating red light. The green pixels 30G include green emission regions G for generating green light. The blue pixels 30B include blue emission regions B for generating blue light. Here, the green emission regions G are arranged at uniform intervals, and the blue emission regions B are arranged at different intervals. The red emission regions R are arranged at different intervals.

[0041] In more detail, the distance between a red emission region R and an adjacent red emission region R above the red emission region R is different from the distance between the red emission region R and another adjacent red emission region R below the red emission region R. For example, a specific red emission region R is separated from an adjacent red emission region R above the red emission region R at the first distance W1, and is separated from another adjacent red emission region R below the red emission region R at the second distance W2 different from the first distance W1. Therefore, the red emission regions R positioned in the i-th (i is a natural number) horizontal lines are formed at the upper portions of the pixels 30R, and the red emission regions R positioned in (i+2)th horizontal lines are formed at the lower portions of the pixels 30R.

[0042] The distance between a blue emission region B and an adjacent blue emission region B above the blue emission region B is different from the distance between the blue emission region B and another adjacent blue emission region B below the blue emission region B. For

example, a specific blue emission region B is separated from an adjacent blue emission region B above the blue emission region B at the fourth distance W4, and is separated from another adjacent blue emission region B below the blue emission region B at the fifth distance W5 different from the fourth distance W4. Therefore, the blue emission regions B positioned in the i-th horizontal lines are formed at the upper portions of the pixels 30B, and the blue emission regions B positioned in the (i+2)th horizontal lines are formed at the lower portions of the pixels 30B.

[0043] As described above, the red emission regions R and the blue emission regions B are not arranged at uniform intervals in vertical lines. In this case, the degree of freedom of design may be secured in forming the pixels 30R and 30B. In addition, the space of the pixels 30R and 30B may be maximally used so that the aperture ratio of the pixels 30R and 30B may be increased. In addition, the first distance W1, the second distance W2, the fourth distance W4, and the fifth distance W5 may be variously set in consideration of the resolution and size of the panel. For example, the first distance W1 and the fourth distance W4 may be set to be the same, and the second distance W2 and the fifth distance W5 may be set to be the same.

[0044] A green emission region G is separated from an adjacent green emission region G above the green emission region G, and is separated from another adjacent green emission region G below the green emission region G at the third distance W3. When the green emission regions G are formed at uniform intervals, it is possible to prevent or reduce noise in the form of horizontal stripes from being generated. In addition, in general, since the green emission regions G have high emission efficiency relative to the red and blue emission regions, although the aperture ratio is small, a high quality image may be displayed.

[0045] On the other hand, in FIG. 5, the red emission regions R and the blue emission regions B are non-symmetrically formed. However, the present invention is not limited to the above. For example, as illustrated in FIG. 6, at a resolution of no more than 420 ppi, the red emission regions R may be arranged at uniform intervals to prevent or reduce noise in the form of stripes from being generated.

[0046] FIG. 6 is a view illustrating a pixel structure of an organic light emitting display according to a fourth embodiment of the present invention.

[0047] Referring to FIG. 6, the organic light emitting display according to the fourth embodiment includes red pixels 40R, green pixels 40G, and blue pixels 40B. The organic light emitting display according to the present invention has a delta structure.

[0048] The red pixels 40R include red emission regions R for generating red light. The green pixels 40G include green emission regions G for generating green light. The blue pixels 40B include blue emission regions B for generating blue light.

[0049] Here, a specific red emission region R is separated from an adjacent red emission region R above the red emission region R, and is separated from another adjacent red emission region R below the red emission region R at the tenth distance W10. A specific green emission region G is separated from an adjacent green emission region G above the green emission region G, and is separated from another adjacent green emission region G below the green emission region G at the third distance W3.

[0050] In more detail, the distance between a blue emission region B and an adjacent blue emission region B above the blue emission region B is different from the distance between the blue emission region B and another adjacent blue emission region B below the blue emission region B. For example, a specific blue emission region B is separated from an adjacent blue emission region B above the blue emission region B at the fourth distance W4, and is separated from another adjacent blue emission region B below the blue emission region B at the fifth distance W5 different from the fourth distance W4. Therefore, the blue emission regions B positioned in the i-th (i is a natural number) horizontal lines are formed at the upper portions of the pixels 40B, and the blue emission regions B positioned in the (i+2)th horizontal lines are formed at the lower portions of the pixels 40B.

[0051] When the blue emission regions B are not arranged at uniform intervals, it is possible to secure the degree of freedom of design and to increase the aperture ratio.

[0052] While the present invention has been described in connection with certain exemplary embodiments, it is to be understood that the invention is not limited to the disclosed embodiments, but, on the contrary, is intended to cover various modifications and equivalent arrangements included within the scope of the appended claims, and equivalents thereof.

Claims

1. An organic light emitting display comprising:

a plurality of red pixels (10R, 20R, 30R, 40R), each of which comprises a respective red emission region;
a plurality of green pixels (10G, 20G, 30G, 40G), each of which comprises a respective green emission region; and
a plurality of blue pixels (10B, 20B, 30B, 40B), each of which comprises a respective blue emission region,
wherein the pixels have an RGB stripe arrangement wherein the red, green and blue pixels are repeatedly arranged in horizontal lines and pixels that emit light of the same colour are arranged in vertical lines,
wherein, in at least one of the plurality of red

emission regions, and the plurality of the blue emission regions, the emission regions positioned in i-th horizontal lines, where i is a natural number, are arranged in upper portions of corresponding ones of the pixels and the emission regions positioned in (i+1)th horizontal lines are arranged in lower portions of corresponding ones of the pixels such that the emission regions are vertically spaced at non uniform intervals, wherein a distance between a first emission region and an adjacent second emission region situated above the first emission region is different from a distance between the first emission region and an adjacent third emission region situated below the first emission region; and
wherein the green emission regions are arranged at uniform intervals in the vertical direction.

2. An organic light emitting display as claimed in claim 1,
wherein the blue emission regions positioned in i-th horizontal lines are arranged in upper portions of corresponding ones of the blue pixels; and
wherein the blue emission regions positioned in (i+1)th horizontal lines are arranged in lower portions of corresponding ones of the blue pixels.

3. An organic light emitting display as claimed in claim 1 or 2,
wherein the red emission regions positioned in i-th horizontal lines are arranged in upper portions of corresponding ones of the red pixels; and
wherein the red emission regions positioned in (i+1)th horizontal lines are arranged in lower portions of corresponding ones of the red pixels.

4. An organic light emitting display comprising:

a plurality of red pixels (10R, 20R, 30R, 40R), each of which comprises a respective red emission region;
a plurality of green pixels (10G, 20G, 30G, 40G), each of which comprises a respective green emission region; and
a plurality of blue pixels (10B, 20B, 30B, 40B), each of which comprises a respective blue emission region,
wherein the red pixels, the green pixels, and the blue pixels are hexagonal and arranged in a delta structure where one unit pixel comprises one of the red pixels, one of the green pixels, and one of the blue pixels, and the pixels of each unit pixel are positioned in two horizontal lines, wherein, in at least one of the plurality of red emission regions, and the plurality of the blue emission regions, the emission regions positioned in i-th horizontal lines, where i is a natural number, are arranged in upper portions of corresponding ones of the pixels and the emission regions positioned in (i+2)th horizontal lines are arranged in lower portions of corresponding ones of the pixels such that the emission regions are vertically spaced at non uniform intervals, wherein a distance between a first emission region and an adjacent second emission region situated above the first emission region is different from a distance between the first emission region and an adjacent third emission region situated below the first emission region; and
wherein the green emission regions are arranged at uniform intervals in the vertical direction.

5. An organic light emitting display as claimed in claim 4,
wherein the blue emission regions positioned in i-th horizontal lines are arranged in upper portions of corresponding ones of the blue pixels; and
wherein the blue emission regions positioned in (i+2)th horizontal lines are arranged in lower portions of corresponding ones of the blue pixels.

6. An organic light emitting display as claimed in claim 4 or claim 5,
wherein the red emission regions positioned in i-th horizontal lines are arranged in upper portions of corresponding ones of the red pixels; and
wherein the red emission regions positioned in (i+2)th horizontal lines are arranged in lower portions of corresponding ones of the red pixels.

Patentansprüche

1. Organische lichtemittierende Anzeige, Folgendes beinhaltend:

eine Vielzahl von roten Pixeln (10R, 20R, 30R, 40R), wobei ein jeder davon einen jeweiligen roten Emissionsbereich beinhaltet;
eine Vielzahl von grünen Pixeln (10G, 20G, 30G, 40G), wobei ein jeder davon einen jeweiligen grünen Emissionsbereich beinhaltet;
eine Vielzahl von blauen Pixeln (10B, 20B, 30B, 40B), wobei ein jeder davon einen jeweiligen blauen Emissionsbereich beinhaltet;
wobei die Pixel eine RGB-Streifenanordnung aufweisen, bei welcher die roten, grünen und blauen Pixel wiederholt in horizontalen Zeilen angeordnet sind, und Pixel, welche Licht derselben Farbe abgeben, in vertikalen Zeilen angeordnet sind,
wobei in mindestens einem der Vielzahl von roten Emissionsbereichen und in der Vielzahl der blauen Emissionsbereiche, die Emissionsberei-

che, welche in i. horizontalen Zeilen positioniert sind, wobei i eine natürliche Zahl ist, in oberen Abschnitten der entsprechenden Pixel angeordnet sind, und die Emissionsbereiche, welche in (i+1). horizontalen Zeilen positioniert sind, in unteren Abschnitten entsprechender Pixel in einer Weise angeordnet sind, dass die Emissionsbereiche vertikal in nicht einheitlichen Intervallen beabstandet sind, wobei ein Abstand zwischen einem ersten Emissionsbereich und einem angrenzenden zweiten Emissionsbereich, welcher oberhalb des ersten Emissionsbereichs befindlich ist, sich von einem Abstand zwischen dem ersten Emissionsbereich und einem angrenzenden dritten Emissionsbereich unterscheidet, welcher sich unterhalb des ersten Emissionsbereichs befindet; und
wobei die grünen Emissionsbereiche in einheitlichen Intervallen in der vertikalen Richtung angeordnet sind.

2. Organische lichtemittierende Anzeige nach Anspruch 1,
bei welcher die blauen Emissionsbereiche, welche in i. horizontalen Zeilen positioniert sind, in oberen Abschnitten von entsprechenden der blauen Pixel angeordnet sind; und
bei welcher die blauen Emissionsbereiche, welche in (i+1). horizontalen Zeilen positioniert sind, in unteren Abschnitten von entsprechenden der blauen Pixel angeordnet sind.

3. Organische lichtemittierende Anzeige nach Anspruch 1 oder 2,
bei welcher die roten Emissionsbereiche, welche in i. horizontalen Zeilen positioniert sind, in oberen Abschnitten von entsprechenden der roten Pixel angeordnet sind; und
bei welcher die roten Emissionsbereiche, welche in (i+1). horizontalen Zeilen positioniert sind, in unteren Abschnitten von entsprechenden der roten Pixel angeordnet sind.

4. Organische lichtemittierende Anzeige, Folgendes beinhaltend:

eine Vielzahl von roten Pixeln (10R, 20R, 30R, 40R), wobei ein jeder davon einen jeweiligen roten Emissionsbereich beinhaltet;
eine Vielzahl von grünen Pixeln (10G, 20G, 30G, 40G), wobei ein jeder davon einen jeweiligen grünen Emissionsbereich beinhaltet;
eine Vielzahl von blauen Pixeln (10B, 20B, 30B, 40B), wobei ein jeder davon einen jeweiligen blauen Emissionsbereich beinhaltet;
wobei die roten Pixel, die grünen Pixel und die blauen Pixel sechseckig und in einer Deltastruktur angeordnet sind, wobei eine Pixeleinheit einen der roten Pixel, einen der grünen Pixel und einen der blauen Pixel beinhaltet und die Pixel einer jeden Pixeleinheit in zwei horizontalen Zeilen positioniert sind,
wobei in mindestens einem der Vielzahl von roten Emissionsbereichen und in der Vielzahl der blauen Emissionsbereiche, die Emissionsbereiche, welche in i. horizontalen Zeilen positioniert sind, wobei i eine natürliche Zahl ist, in oberen Abschnitten der entsprechenden Pixel angeordnet sind, und die Emissionsbereiche, welche in (i+2). horizontalen Zeilen positioniert sind, in unteren Abschnitten entsprechender Pixel in einer Weise angeordnet sind, dass die Emissionsbereiche vertikal in nicht einheitlichen Intervallen beabstandet sind, wobei ein Abstand zwischen einem ersten Emissionsbereich und einem angrenzenden zweiten Emissionsbereich, welcher oberhalb des ersten Emissionsbereichs befindlich ist, sich von einem Abstand zwischen dem ersten Emissionsbereich und einem angrenzenden dritten Emissionsbereich unterscheidet, welcher sich unterhalb des ersten Emissionsbereichs befindet; und
wobei die grünen Emissionsbereiche in einheitlichen Intervallen in der vertikalen Richtung angeordnet sind.

5. Organische lichtemittierende Anzeige nach Anspruch 4,
bei welcher die blauen Emissionsbereiche, welche in i. horizontalen Zeilen positioniert sind, in oberen Abschnitten von entsprechenden der blauen Pixel angeordnet sind; und
bei welcher die blauen Emissionsbereiche, welche in (i+2). horizontalen Zeilen positioniert sind, in unteren Abschnitten von entsprechenden der blauen Pixel angeordnet sind.

6. Organische lichtemittierende Anzeige nach Anspruch 4 oder 5,
bei welcher die roten Emissionsbereiche, welche in i. horizontalen Zeilen positioniert sind, in oberen Abschnitten von entsprechenden der roten Pixel angeordnet sind; und
bei welcher die roten Emissionsbereiche, welche in (i+2). horizontalen Zeilen positioniert sind, in unteren Abschnitten von entsprechenden der roten Pixel angeordnet sind.

Revendications

1. Affichage électroluminescent organique comprenant :

une pluralité de pixels rouges (10R, 20R, 30R, 40R) dont chacun comprend une région d'émis-

sion de rouge respective ;
une pluralité de pixels verts (10G, 20G, 30G, 40G) dont chacun comprend une région d'émission de vert respective ; et
une pluralité de pixels bleus (10B, 20B, 30B, 40B) dont chacun comprend une région d'émission de bleu respective ;
dans lequel les pixels présentent un agencement selon des bandes RGB selon lequel les pixels rouges, verts et bleus sont agencés de façon répétée selon des lignes horizontales et les pixels qui émettent de la lumière de la même couleur sont agencés selon des lignes verticales ;
dans lequel, dans au moins l'une de la pluralité de régions d'émission de rouge et de la pluralité de régions d'émission de bleu, les régions d'émission qui sont positionnées dans les i-ièmes lignes horizontales, où i est un nombre naturel, sont agencées dans des parties supérieures de ceux correspondants des pixels et les régions d'émission qui sont positionnées dans les (i + 1)-ièmes lignes horizontales, sont agencées dans des parties inférieures de ceux correspondants des pixels de telle sorte que les régions d'émission soient espacées verticalement selon des intervalles non uniformes, dans lequel une distance entre une première région d'émission et une deuxième région d'émission adjacente qui est située au-dessus de la première région d'émission est différente d'une distance entre la première région d'émission et une troisième région d'émission adjacente qui est située au-dessous de la première région d'émission ; et
dans lequel les régions d'émission de vert sont agencées selon des intervalles uniformes dans la direction verticale.

2. Affichage électroluminescent organique selon la revendication 1,
dans lequel les régions d'émission de bleu qui sont positionnées dans les i-ièmes lignes horizontales, sont agencées dans des parties supérieures de ceux correspondants des pixels bleus ; et
dans lequel les régions d'émission de bleu qui sont positionnées dans les (i + 1)-ièmes lignes horizontales, sont agencées dans des parties inférieures de ceux correspondants des pixels bleus.

3. Affichage électroluminescent organique selon la revendication 1 ou 2,
dans lequel les régions d'émission de rouge qui sont positionnées dans les i-ièmes lignes horizontales, sont agencées dans des parties supérieures de ceux correspondants des pixels rouges ; et
dans lequel les régions d'émission de rouge qui sont positionnées dans les (i + 1)-ièmes lignes horizontales, sont agencées dans des parties inférieures de ceux correspondants des pixels rouges.

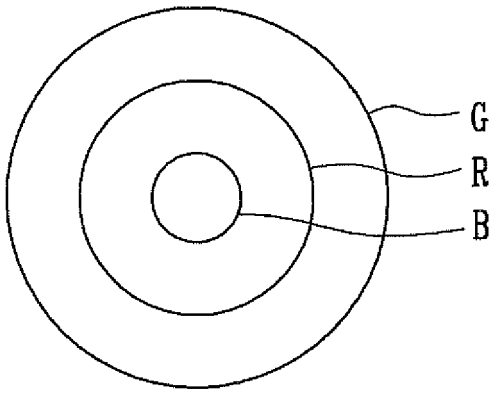
4. Affichage électroluminescent organique comprenant :

une pluralité de pixels rouges (10R, 20R, 30R, 40R) dont chacun comprend une région d'émission de rouge respective ;
une pluralité de pixels verts (10G, 20G, 30G, 40G) dont chacun comprend une région d'émission de vert respective ; et
une pluralité de pixels bleus (10B, 20B, 30B, 40B) dont chacun comprend une région d'émission de bleu respective ;
dans lequel les pixels rouges, les pixels verts et les pixels bleus sont hexagonaux et sont agencés selon une structure delta selon laquelle un pixel unitaire comprend l'un des pixels rouges, l'un des pixels verts et l'un des pixels bleus, et les pixels de chaque pixel unitaire sont positionnés dans deux lignes horizontales ;
dans lequel, dans au moins l'une de la pluralité de régions d'émission de rouge et de la pluralité de régions d'émission de bleu, les régions d'émission, qui sont positionnées dans les i-ièmes lignes horizontales, où i est un nombre naturel, sont agencées dans des parties supérieures de ceux correspondants des pixels, et les régions d'émission, qui sont positionnées dans les (i + 2)-ièmes lignes horizontales, sont agencées dans des parties inférieures de ceux correspondants des pixels de telle sorte que les régions d'émission soient espacées verticalement selon des intervalles non uniformes, dans lequel une distance entre une première région d'émission et une deuxième région d'émission adjacente qui est située au-dessus de la première région d'émission est différente d'une distance entre la première région d'émission et une troisième région d'émission adjacente qui est située au-dessous de la première région d'émission ; et
dans lequel les régions d'émission de vert sont agencées selon des intervalles uniformes dans la direction verticale.

5. Affichage électroluminescent organique selon la revendication 4,
dans lequel les régions d'émission de bleu qui sont positionnées dans les i-ièmes lignes horizontales, sont agencées dans des parties supérieures de ceux correspondants des pixels bleus ; et
dans lequel les régions d'émission de bleu qui sont positionnées dans les (i + 2)-ièmes lignes horizontales, sont agencées dans des parties inférieures de ceux correspondants des pixels bleus.

6. Affichage électroluminescent organique selon la revendication 4 ou la revendication 5,
dans lequel les régions d'émission de rouge qui sont positionnées dans les i-ièmes lignes horizontales, sont agencées dans des parties supérieures de ceux correspondants des pixels rouges ; et
dans lequel les régions d'émission de rouge qui sont positionnées dans les (i + 2)-ièmes lignes horizontales, sont agencées dans des parties inférieures de ceux correspondants des pixels rouges.

FIG. 1



B:70ppi R:209ppi G:350ppi

FIG. 2

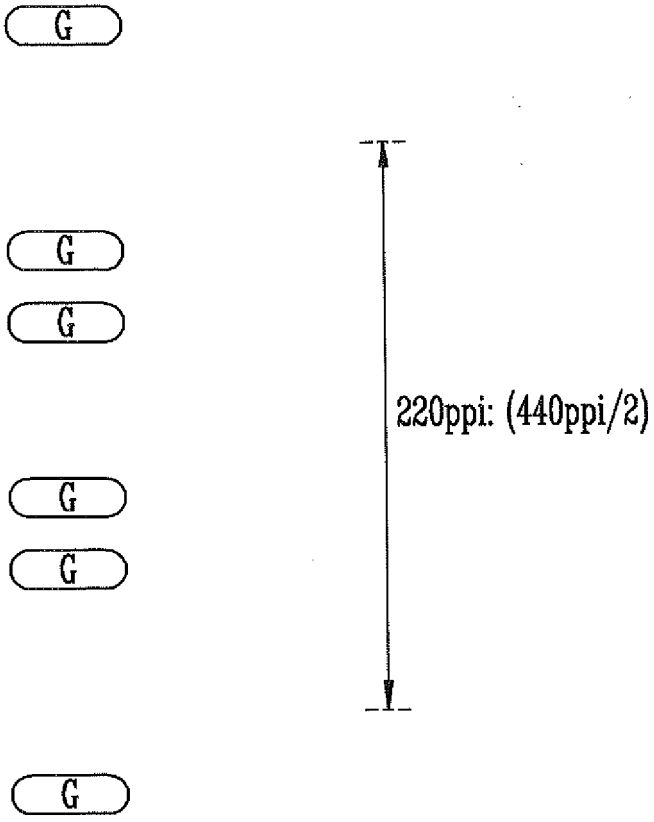


FIG. 3

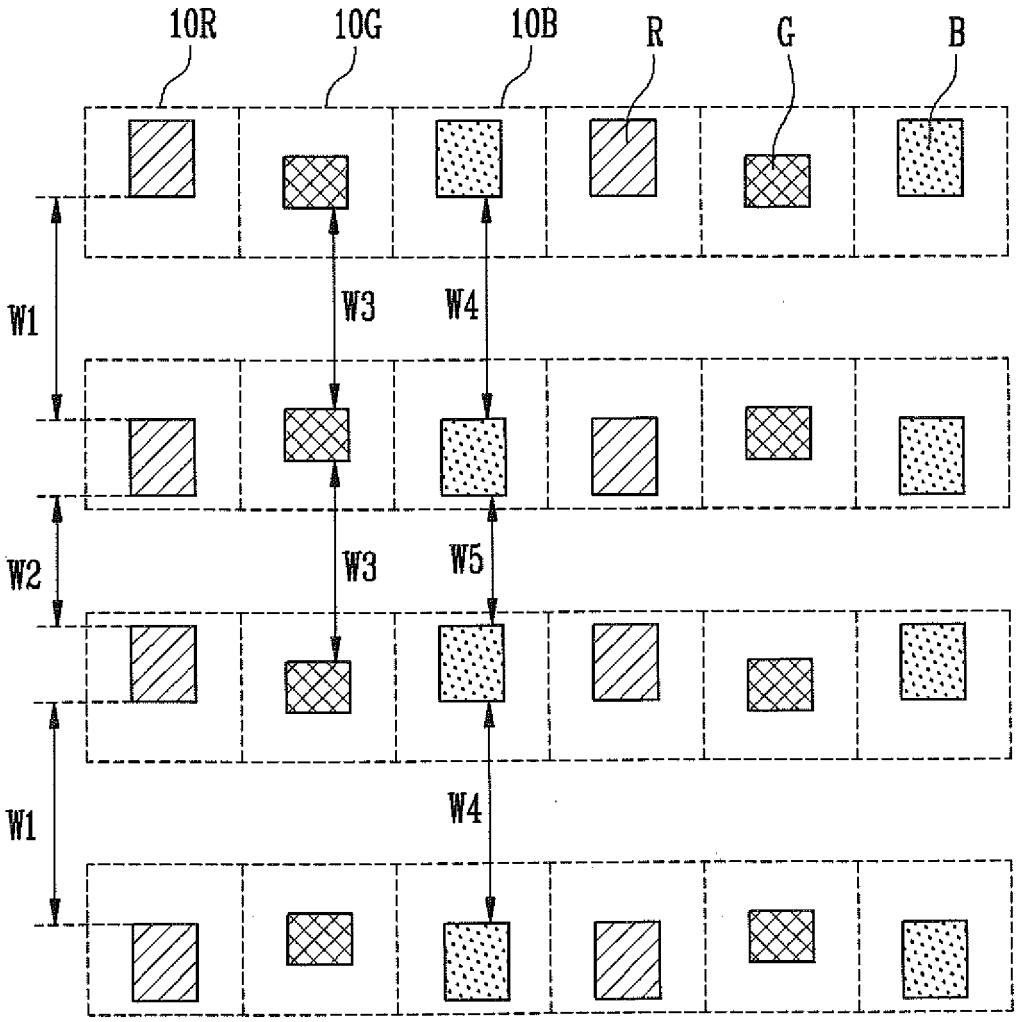


FIG. 4

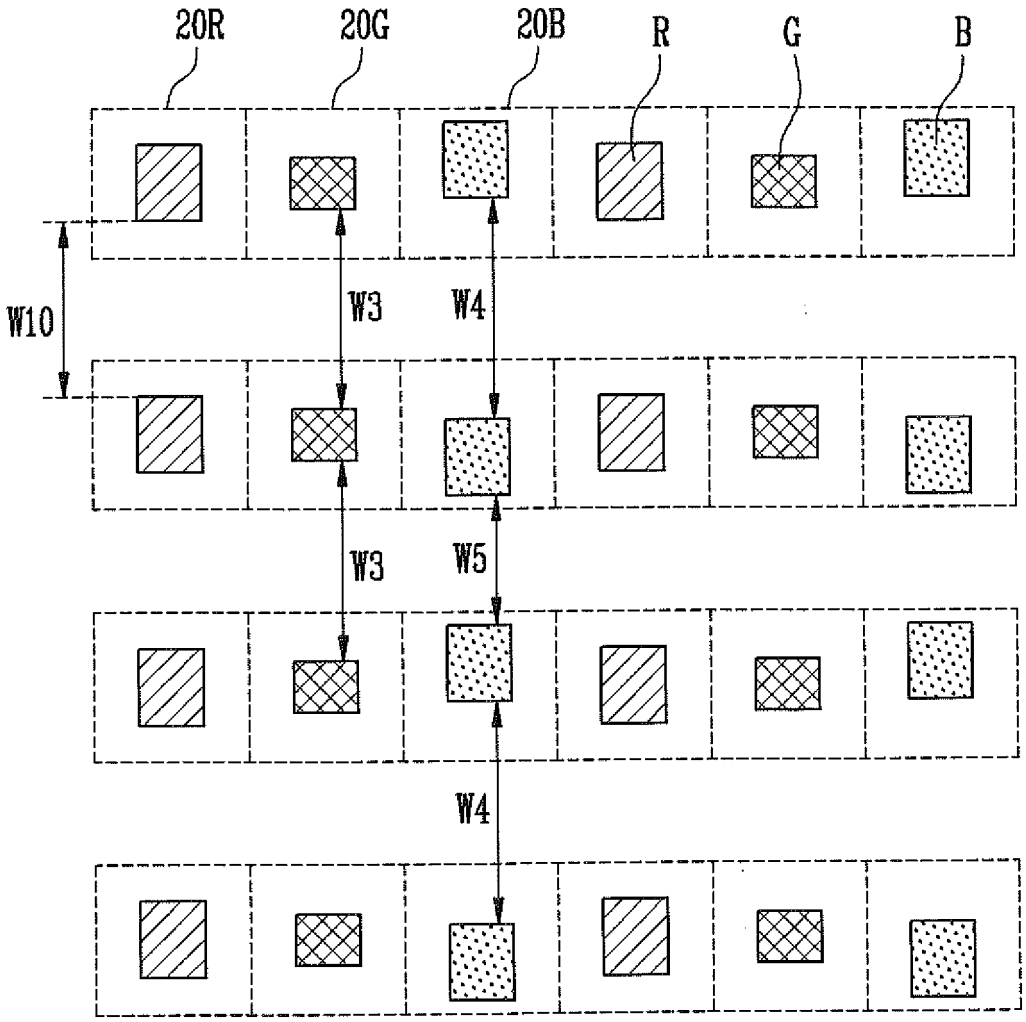


FIG. 5

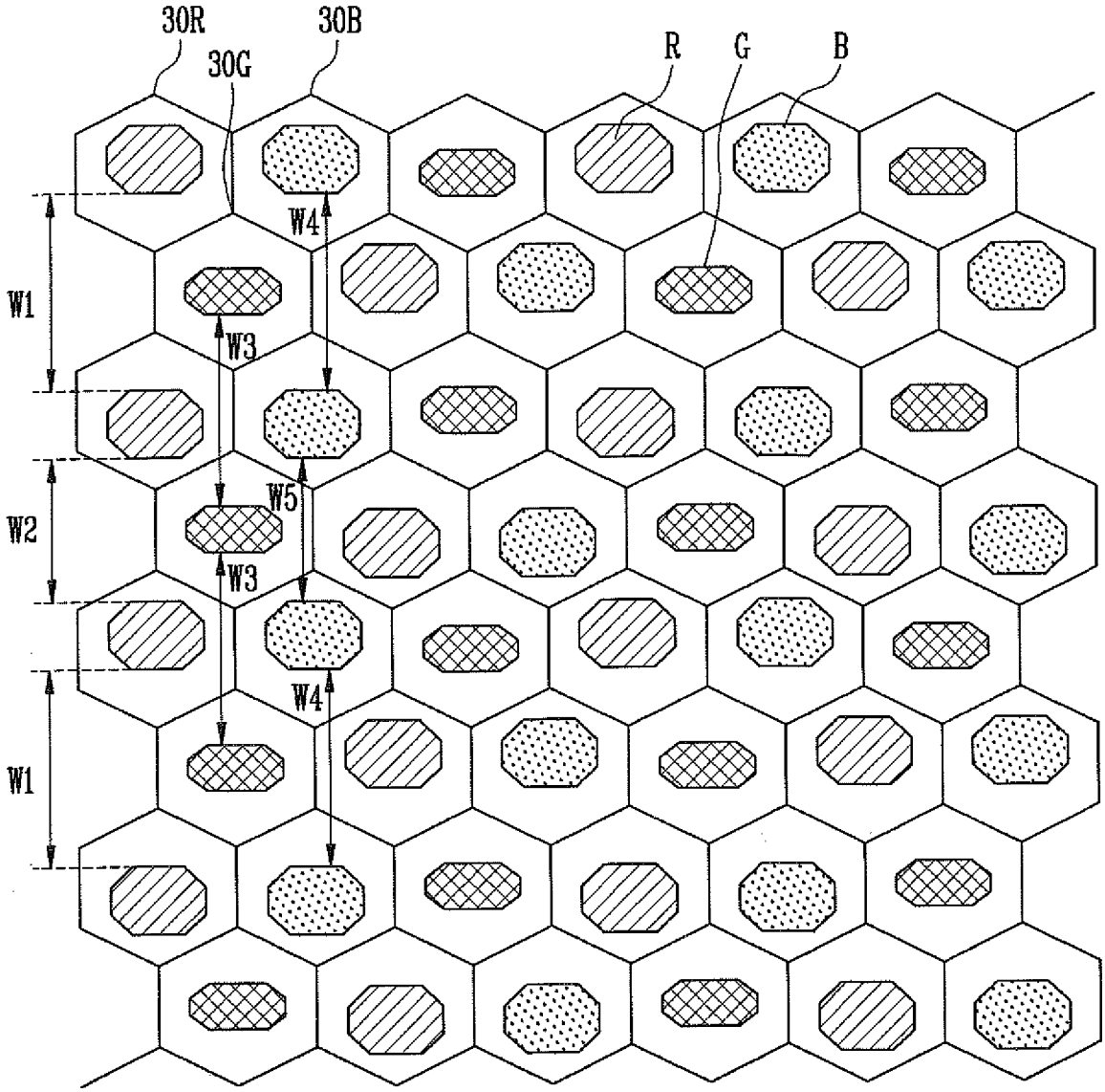
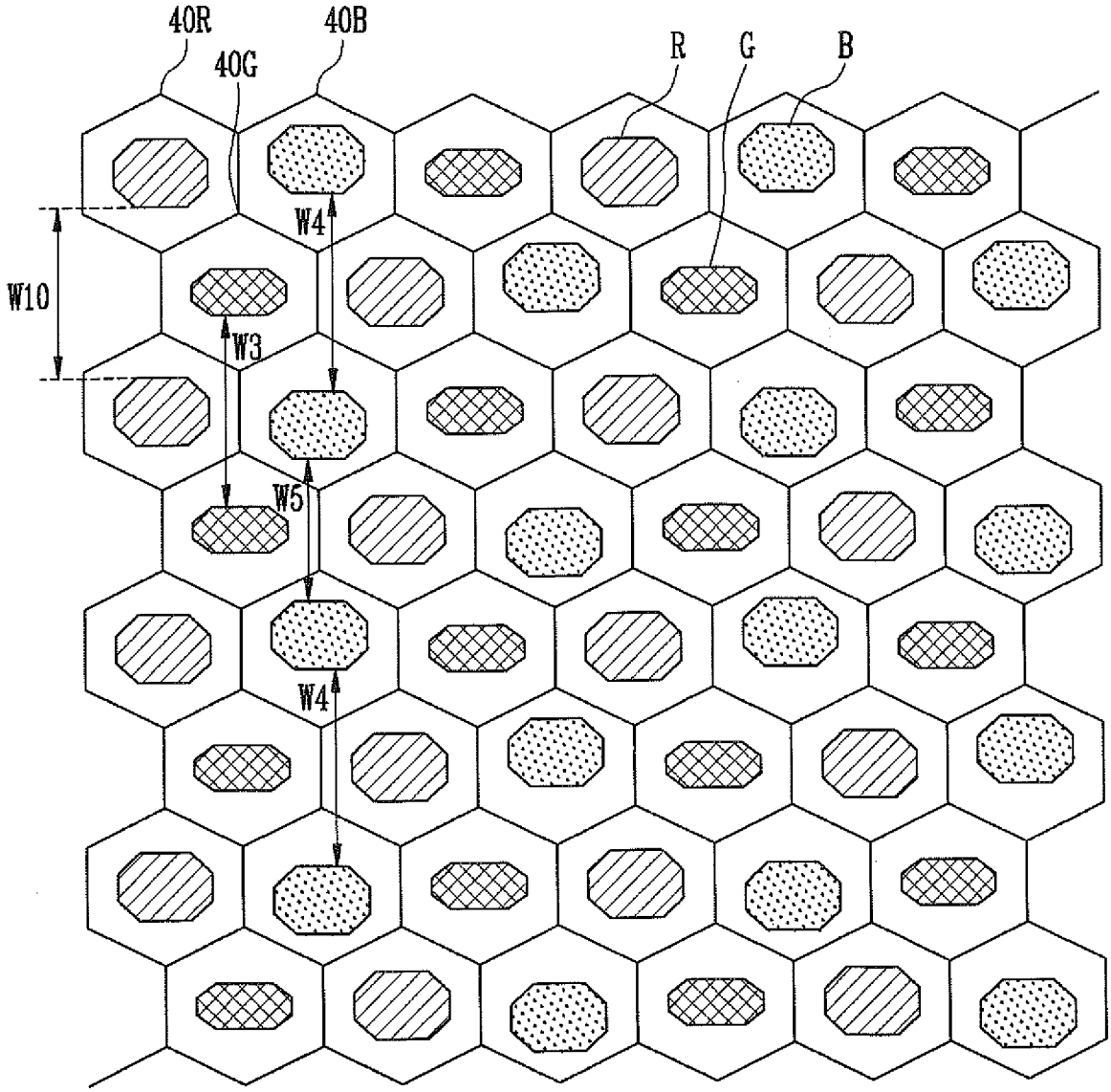


FIG. 6



REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- US 20090121983 A **[0007]**
- US 2012133682 A **[0008]**
- EP 2595192 A **[0009]**

专利名称(译)	有机发光显示器		
公开(公告)号	EP2680310B1	公开(公告)日	2020-05-06
申请号	EP2013153912	申请日	2013-02-04
[标]申请(专利权)人(译)	三星显示有限公司		
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IPC分类号	H01L27/32		
CPC分类号	H01L27/3218 H01L27/322		
优先权	1020120069258 2012-06-27 KR		
其他公开文献	EP2680310A1		
外部链接	Espacenet		

摘要(译)

提供了一种能够增加开口率的有机发光显示器。 有机发光显示器包括包括红色发射区域的红色像素，包括绿色发射区域的绿色像素和包括蓝色发射区域的蓝色像素。 在红色发射区域，绿色发射区域和蓝色发射区域中的至少一个中，发射区域与发射区域上方的相邻发射区域之间的距离不同于发射区域与另一个相邻发射区域之间的距离。 低于发射区域。

FIG. 1

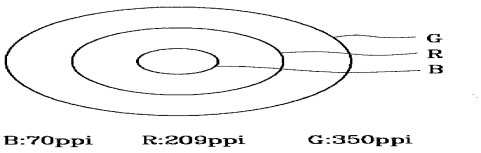

FIG. 2