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(54) **HIGH BAY LIGHT**

(57) The present invention is a high bay light, comprising a heat dissipation disk (12), a lighting unit (14), and a driving module (16). The heat dissipation disk (12) has a plurality of heat dissipation modules (122) and an accommodating part (124). The accommodating part (124) is connected with the plurality of heat dissipation modules (122), wherein each the plurality of heat dissipation modules (122) further having a plurality of heat dissipation holes (1224). The lighting unit (14) has at least one of light emitting diodes (142). The light emitting di-

odes (142) generates a light ray, wherein the plurality of light emitting diodes (142) is arranged corresponding to the plurality of heat dissipation modules (122). The driving module (16) drives the plurality of light emitting diodes (142) for generating the light ray. Wherein an air flow passes through the plurality of heat dissipation holes (1224) for dissipating a heat generated from the lighting unit (14), the heat dissipation disk (12), and the driving module (16).

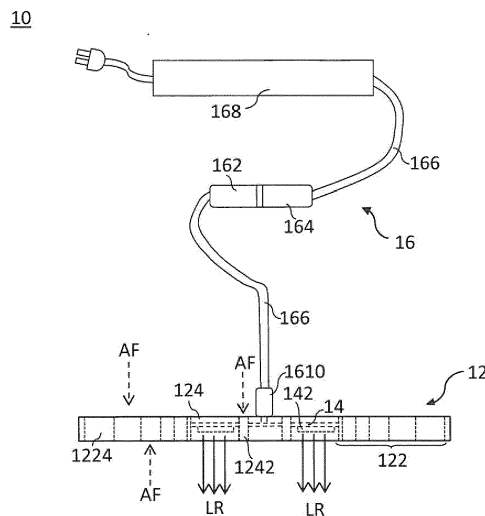


Fig. 1

## Description

### FIELD OF THE INVENTION

[0001] The present invention is related to the technical field of lamp body, in particularly to a high bay light can reach high heat dissipation efficiency and high luminous efficiency.

### BACKGROUND OF THE INVENTION

[0002] A conventional high bay light is used to provide lighting in high-ceiling areas such as industrial manufacturing areas, road, transportation garages and the like. Light sources (the life time is short) employed by the high bay light fixtures periodically need to be replaced. And the light sources used by the high bay light are located at high altitude that are not easily accessible and replacement cannot be easily performed.

[0003] Inasmuch as aforementioned, a high bay light is disclosed in the present invention to resolve the drawbacks of the prior arts.

### SUMMARY OF THE INVENTION

[0004] A first objective of the present invention is to provide a high bay light, comprising a heat dissipation disk, a lighting unit, and a driving module. The heat dissipation disk can provide a huge dissipating area for heat dissipation. Furthermore, the heat dissipation disk has a plurality of heat dissipation holes, the plurality of heat dissipation holes enhances an air circulation heat to reach a high dissipation efficiency.

[0005] A second objective of the present invention is to provide the aforementioned high bay light, wherein the lighting unit is combined with the heat dissipation disk, a heat generated by the lighting unit can be dissipated quickly. The life time of the lighting unit, such as a light emitting diode (LED) can be extended.

[0006] A third objective of the present invention is to provide the aforementioned high bay light, wherein the lighting unit utilizes at least one of light emitting diodes to generate enough illuminance for lighting. Wherein the plurality of light emitting diodes is arranged corresponding to the plurality of heat dissipation modules.

[0007] The fourth objective of the present invention is to provide the aforementioned high bay light, further comprises a plurality of trenches and a plurality of heat pipes, the plurality of heat pipes is configured in the plurality of trenches can boost the dissipation efficiency.

[0008] The fifth objective of the present invention is to provide the aforementioned high bay light, further comprises a platen to hide the plurality of heat pipes.

[0009] The sixth objective of the present invention is to provide the aforementioned high bay light, further comprises an optical unit, the optical unit is cover over the accommodating part of heat dissipation disk to protect the lighting unit or change a characterization of light ray

generated by the lighting module.

[0010] The seventh objective of the present invention is provide the aforementioned high bay light, further comprises a suspended unit, the suspended unit can suspend the heat dissipation disk from an object, such as ceiling. It can be easily installed and removable.

[0011] The eighth objective of the present invention is to provide the aforementioned high bay light, the driving module can be configured between the holder and the heat dissipation disk, the driving module can be hide.

[0012] The ninth objective of the present invention is to provide the aforementioned high bay light, further comprises a waterproofing material (such as plastic assembly), the waterproofing material improves a water resistance property for preventing a water, a vapor, a snow, and a moisture.

[0013] The tenth objective of the present invention is to provide the aforementioned high bay light, the high bay light can be installed in an outlet or inlet of air pipe, the high bay light can cool down for boosting the dissipation efficiency and extending the life time of the lighting unit.

[0014] The eleventh objective of the present invention is to provide the aforementioned high bay light, the driving module utilizes a pair of electrical plug to connection for easily to plug-in and plug-out to replace the driving module.

[0015] The twelfth objective of the present invention is to provide the aforementioned high bay light further comprises a plurality of voids, the plurality of voids are installed closely to the lighting unit (such as a central position) to improve the heat dissipation.

[0016] The thirteenth objective of the present invention is to provide the aforementioned high bay light, further comprises a plurality of heat dissipation pillar or heat dissipation block, the plurality of heat dissipation pillar or heat dissipation block is configured to a back side of lighting unit for dissipating the heat.

[0017] The fourteenth objective of the present invention is to provide the aforementioned high bay light, wherein a surface of heat dissipation disk has a coating layer to improve the heat dissipation.

[0018] The fifteenth objective of the present invention is to provide the aforementioned high bay light, further comprises a reflective layer, the reflective layer is configured to back side of light emitting diodes to improve a luminous efficiency.

[0019] To achieve the aforementioned and other objectives, the present invention is to provide a high bay light, comprising a heat dissipation disk, a lighting unit, and a driving module. The heat dissipation disk has a plurality of heat dissipation modules and an accommodating part. The plurality of heat dissipations modules is assembled each other or formed integrally. The accommodating part is connected with the plurality of heat dissipation modules, wherein each the plurality of heat dissipation modules further has a plurality of heat dissipation holes. The lighting unit is configured in the accommodating part. The lighting unit has at least one of light emitting

diodes. The light emitting diodes generates a light ray, wherein the light emitting diodes is arranged corresponding to the plurality of heat dissipation modules. The driving module is connected with the lighting unit. The driving module drives the plurality of light emitting diodes for generating the light ray. Wherein an air flow passes through the plurality of heat dissipation holes for dissipating a heat generated from the lighting unit, the heat dissipation disk, and the driving module.

## BRIEF DESCRIPTION OF THE DRAWINGS

### [0020]

Fig.1 is a schematic explosion diagram of a high bay light in a first embodiment of the present invention. Fig.2 illustrates the top view of heat dissipation disk in Fig.1 of the present invention.

Fig.3(a) and 3(b) illustrate the top view of lighting unit in Fig.1 of the present invention.

Fig.4 is a schematic explosion diagram of a high bay light in a second embodiment of the present invention.

Fig.5 is a schematic explosion diagram of a high bay light in a third embodiment of the present invention.

Fig.6 is a schematic explosion diagram of a high bay light in a fourth embodiment of the present invention.

Fig.7 is a schematic explosion diagram of a high bay light in a fifth embodiment of the present invention.

Fig.8 is a schematic diagram of a high bay light of the present invention.

## DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0021] In order to fully comprehend the objectives, features and efficacy of the present invention, a detailed description is described by the following substantial embodiments in conjunction with the accompanying drawings. The description is as below.

[0022] Refer to Fig. 1, which is an explosion diagram of a high bay light in a first embodiment of the present invention. The high bay light 10 comprises a heat dissipation disk 12, a lighting unit 14, and a driving module 16.

[0023] The heat dissipation disk 12 has a plurality of heat dissipation modules 122 and an accommodating part 124. It also can refer to Fig.2, it discloses that the shape of the heat dissipation disk 12 is round, and the shape of the plurality of heat dissipation modules 122 is sector. In other embodiment, the heat dissipation disk 12 and the heat dissipation modules 122 can be any shape. In addition, an amount of heat dissipation modules 122 is sixteen. The plurality of heat dissipations modules 122 is assembled each other or formed integrally. The accommodating part 124 is connected with the plurality of heat dissipation modules 122, in this embodiment, the accommodating part 124 is configured to a central part of the heat dissipation disk 12. In this embodiment, the

accommodating part 124 further comprises a plurality of voids 1242. Wherein each the plurality of heat dissipation modules 122 also further comprises a plurality of heat dissipation holes 1224.

[0024] An air flow AF pass through the plurality of heat dissipation holes 1242 and the plurality of voids 1242 for dissipating a heat (not shown) generated from the heat dissipation disk 12, the lighting unit 14 and the driving module 16. Especially, since the plurality of voids 1242 are installed closely to the lighting unit 14, such as central position of the lighting unit 14, the heat mainly generated of the lighting unit 14 can be dissipated quickly.

[0025] In other embodiment, the heat dissipation disk 12 can improve a rate of heat dissipation, such as coating or spraying a coating layer (not shown) on the surface of heat dissipation disk 12 or changing a thinness or a diameter of heat dissipation disk. Wherein the coating layer further comprises a copper powder can dissipate the heat more quickly.

[0026] Return to Fig.1, the lighting unit 14 is configured in the accommodating part 124. The lighting unit 14 has a plurality of light emitting diodes 142. Wherein the light emitting diodes 142 can be arrange as a strip light (refer to Fig.3 (a)) or a single light (refer to Fig.3 (b)). In Fig.3 (a), amount of strip lights is sixteen, and each of the strip lights is consisted of four light emitting diodes 142. In other embodiment, each of the strip lights can be a single light emitting diode 142. In Fig. 3(b), the single light can be installed in the central of the lighting unit 14, in this embodiment, the heat dissipation disk 12 can remove the plurality of voids 1242. The plurality of light emitting diodes 142 generate a light ray LR. In this embodiment, the plurality of light emitting diodes 142 is arranged corresponding to the plurality of heat dissipation modules 122. In other word, each of the plurality of light emitting diodes 142 is connected with one of heat dissipation modules 122.

[0027] In other embodiment, the lighting unit (14) can comprises a reflective layer (not shown), the reflective layer is configured to back side of light emitting diodes 142 for reflecting the light ray LR.

[0028] Return to Fig.1, the driving module 16 is connected with the lighting unit 14. The driving module 16 drives the plurality of light emitting diodes 142 for generating the light ray LR, such as the driving module 16 is consisted with a pair of electrical plug 162, 164, an electric cable 166, a transformers 168, and a connector 1610. The electric cable 166 is connected with the electrical plugs 164 and transformers 166, and the electric cable 166 is also connected with the electrical plugs 162 and the connector 1610. The connector 1610 is connected to the lighting unit 14. The electrical plug 162, 164 can easily to plug-in and plug-out for replacing the transformers 168, if the transformers 168 is broken. In other word, the electrical plug 162, 164 can be separated or be connected easily and quickly. The transformers 168 can convert the alternating current (AC) to a direct current (DC), the direct current can drive the plurality of light emitting

diodes 142. In worth to understand that the electric cable 166 can directly provide for the direct current without converting.

**[0029]** In other embodiment, the pair of electrical plug 162, 164 and the connector 1610 may be provided for waterproofing to prevent to damage the lighting unit 14 or other components.

**[0030]** Refer to Fig. 4, which is an explosion diagram of a high bay light in a second embodiment of the present invention. The high bay light 10' comprises the lighting unit 14, and the driving module 16 in the first embodiment, but a heat dissipation disk 12' is a little different.

**[0031]** The heat dissipation disk 12' comprises a plurality of trenches 126 and a plurality of heat pipes 128. The plurality of trenches 126 is formed on a side of the plurality of heat dissipation modules 122 for installing configured the plurality of heat pipes 128. Wherein the amount of plurality of heat pipes 128 can be chosen according to output power of lighting unit 14.

**[0032]** In addition, in this embodiment, each the plurality of heat pipes 128 is corresponded to each the plurality of light emitting diodes 142, namely, each heat pipes 128 can directly to dissipate the heat generated by each light emitting diodes 142 independently. In other embodiment, it is not limited condition. It worth to understanding that a platen (not shown) can hide the plurality of heat pipes 128.

**[0033]** Refer to Fig.5, which is an explosion diagram of a high bay light in a third embodiment of the present invention. The high bay light 10" comprises the heat dissipation disk 12', the lighting unit 14, and the driving module 16 in the second embodiment except for an optical unit 18.

**[0034]** The optical unit 18 is cover over the accommodating part 124 so as to the light ray LR can pass through. The optical unit 18 can protect the lighting unit 14 or change a characterization of light ray LR, such as refraction, diffraction, diffusion, etc. The material of optical unit 18 can be a plastic, a glass, etc.

**[0035]** In above-mention embodiments can further install some elements to reach a waterproofing. For example, a plastic assembly (not shown) is combined between the heat dissipation disk 12' and the lighting unit 14. The plastic assembly is resistant to water. It can be refer to Fig.8, a schematic diagram of a high bay light of the present invention.

**[0036]** Refer to Fig.6, which is an explosion diagram of a high bay light in fourth embodiment of the present invention. The high bay light 10''' comprises the heat dissipation disk 12', the lighting unit 14, the driving module 16, and the optical unit 18 in the third embodiment except for a suspended unit 20.

**[0037]** The suspended unit 20 is connected with the heat dissipation disk 12'. The suspended unit 20 is suspended from an object (not shown), such as an air pipe, a roof or a ceiling.

**[0038]** In this embodiment, the suspended unit 20 can comprise a holder 202 and a shackle 204. The holder

202 is combined with the shackle 204, the holder 202 is gripped the heat dissipation disk 12.

**[0039]** In addition, the driving module 16 is configured between the holder 202 and the heat dissipation disk 12.

5 The driving module 16 can be hidden.

**[0040]** Refer to Fig.7, which is an explosion diagram of a high bay light in fifth embodiment of the present invention. The high bay light 10'''' comprises the heat dissipation disk 12', the lighting unit 14, the driving module 16, the optical unit 18, and the suspended unit 20 in the fourth embodiment except for a plurality of heat dissipation pillars 22.

10 **[0041]** The plurality of heat dissipation pillars 22 is configured to a back side of heat dissipation disk 12' for dissipating the heat. Each the plurality of heat dissipation pillar 22 is corresponded to each the plurality of light emitting diodes 142 or the light emitting diode 1422, namely, each light emitting diodes 142 can directly to dissipate the heat generated by each light emitting diodes 142 or the light emitting diode 1422 independently. In other embodiment, it is not limited condition. For example, the heat dissipation pillar 22 can be replaced by a heat dissipation block (not shown).

15 **[0042]** In above-mention embodiments can further install a waterproofing material 182 to reach a waterproofing, such as a plastic assembly. For example, the plastic assembly is installed at a periphery of optical unit 18, such as O-ring. The plastic assembly is resistant to water. It can be refer to Fig.8, a schematic diagram of a high bay light of the present invention.

20 **[0043]** The present invention is disclosed by the preferred embodiment in the aforementioned description; however, it is contemplated for one skilled at the art that the embodiments are applied only for an illustration of the present invention rather than are interpreted as a limitation for the scope of the present invention. It should be noted that the various substantial alternation or replacement equivalent to these embodiments shall be considered as being covered within the scope of the present invention. Therefore, the protection scope of the present invention shall be defined by the claims.

## Claims

45 1. A high bay light, comprising:

a heat dissipation disk (12) having a plurality of heat dissipation modules (122) and an accommodating part (124), the plurality of heat dissipation modules (122) being assembled each other or formed integrally, the accommodating part (124) being connected with the plurality of heat dissipation modules (122), wherein each the plurality of heat dissipation modules (122) further having a plurality of heat dissipation holes (1224);  
a lighting unit (14) being configured in the ac-

- commodating part (124), the lighting unit (14) having at least one of light emitting diodes (142), the light emitting diodes (142) generating a light ray; and  
 a driving module (16) being connected with the lighting unit (14), the driving module (16) driving the plurality of light emitting diodes (142) for generating the light ray;  
 wherein an air flow pass through the plurality of heat dissipation holes (1224) for dissipating a heat generated from one of the lighting unit (14), the heat dissipation disk (12), and the driving module (16).
2. A high bay light according to claim 1, wherein the accommodating part (124) further comprises a plurality of voids (1242), the plurality of voids (1242) are installed closely to the lighting unit (14).
  3. A high bay light according to claim 1, wherein the heat dissipation disk (12) further comprises a plurality of trenches (126) and a plurality of heat pipes (128), the plurality of trenches (126) is formed on a side of the plurality of heat dissipation modules (122), the plurality of heat pipes (128) is configured in the plurality of trenches (126).
  4. A high bay light according to claim 2, wherein the heat dissipation disk further comprises a plurality of trenches (126) and a plurality of heat pipes (128), the plurality of trenches (126) is formed on a side of the plurality of heat dissipation modules (122), the plurality of heat pipes (128) is configured in the plurality of trenches (126).
  5. A high bay light according to claim 1, further comprises an optical unit (18), the optical unit (18) is cover over the accommodating part (124), the light ray pass through the optical glass (18).
  6. A high bay light according to claim 1, further comprises a suspended unit (20), the suspended unit (20) is connected with the heat dissipation disk (12), wherein the suspended unit (20) is suspended from an object.
  7. A high bay light according to claim 6, wherein the suspended unit (20) comprises a holder (202) and a shackle (204), the holder (202) is combined with the shackle (204), the holder (202) is gripped the heat dissipation disk (12).
  8. A high bay light according to claim 7, wherein the driving module (16) is configured between the holder (202) and the heat dissipation disk (12).
  9. A high bay light according to claim 1, wherein the driving module further comprises a waterproofing material (182), and the waterproofing material (182) is installed at a periphery of optical unit (18).
  10. A high bay light according to claim 1, further comprises a plurality of heat dissipation pillar (22), the plurality of heat dissipation pillar (22) is configured to a back side of heat dissipation disk (12) for dissipating the heat.
  11. A high bay light according to claim 1, further comprises a plurality of heat dissipation block, the plurality of heat dissipation block is configured to a back side of heat dissipation disk (12) for dissipating the heat.
  12. A high bay light according to claim 1, wherein a thinness or a diameter of heat dissipation disk (12) is changeable for adjusting a rate of heat dissipation.
  13. A high bay light according to claim 1, wherein a surface of heat dissipation disk (12) has a coating layer.
  14. A high bay light according to claim 1, wherein the coating layer comprises a copper powder.
  15. A high bay light according to claim 1, wherein the lighting unit (14) further comprises a reflective layer, the reflective layer is configured to back side of light emitting diodes (142) for reflecting the light ray.

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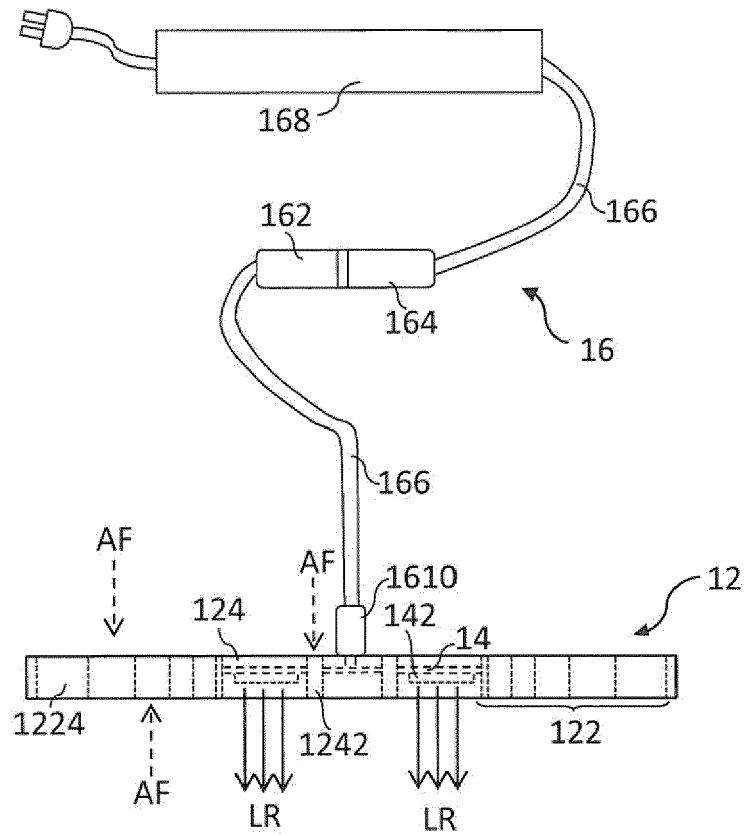


Fig. 1

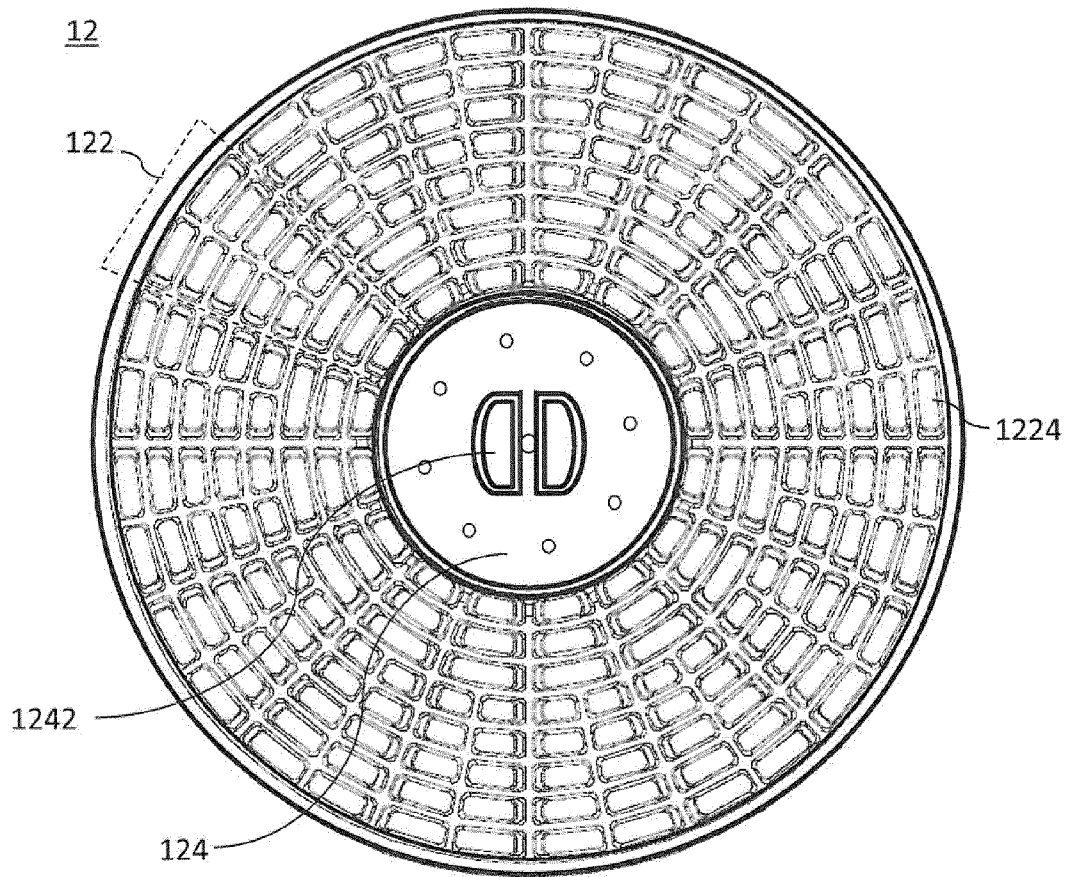


Fig. 2

14

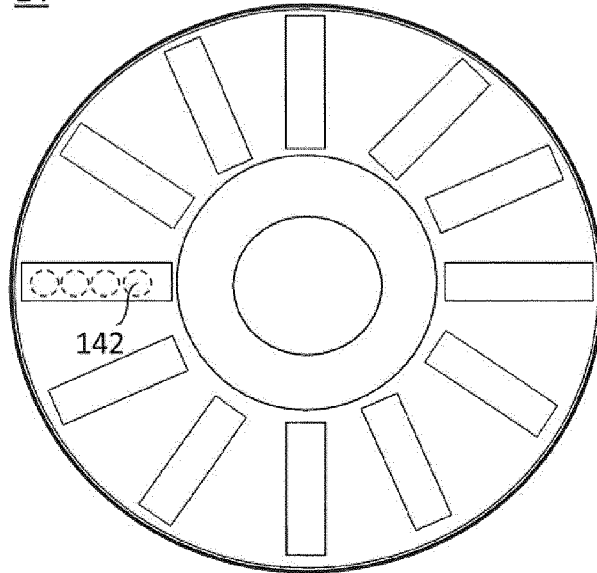


Fig. 3(a)

14

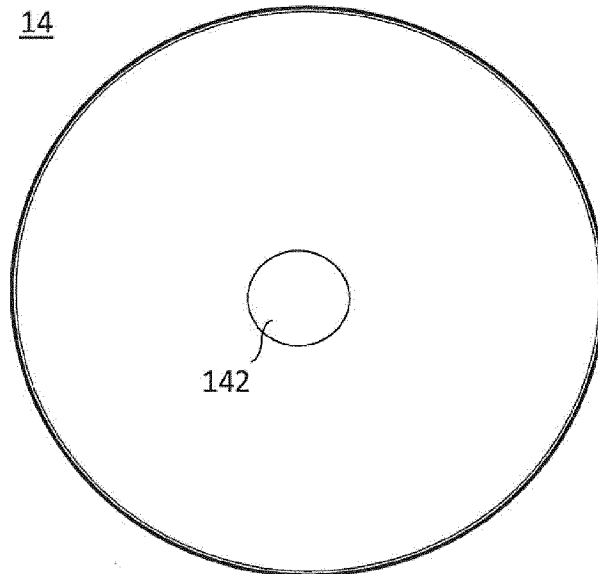


Fig. 3(b)

10'

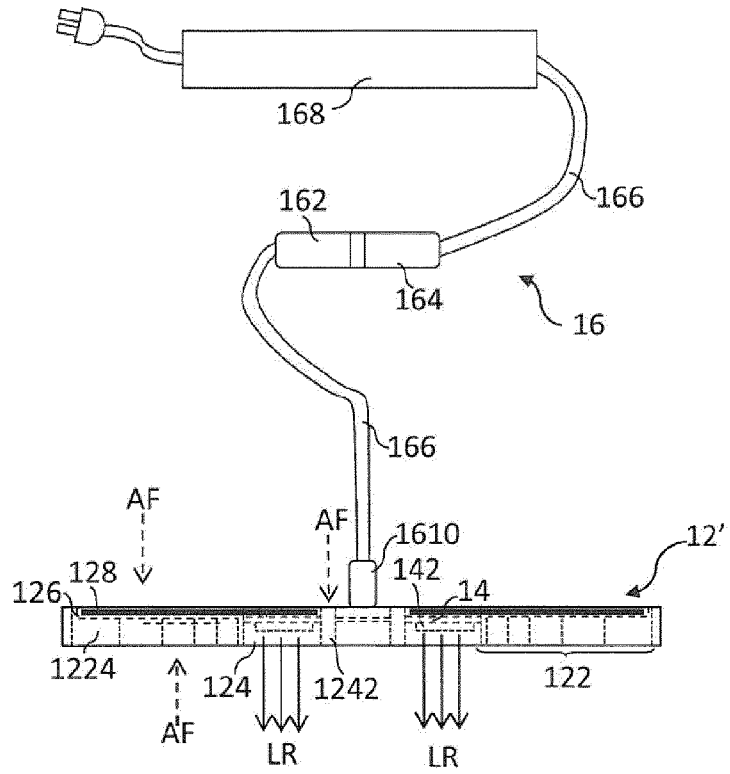


Fig. 4

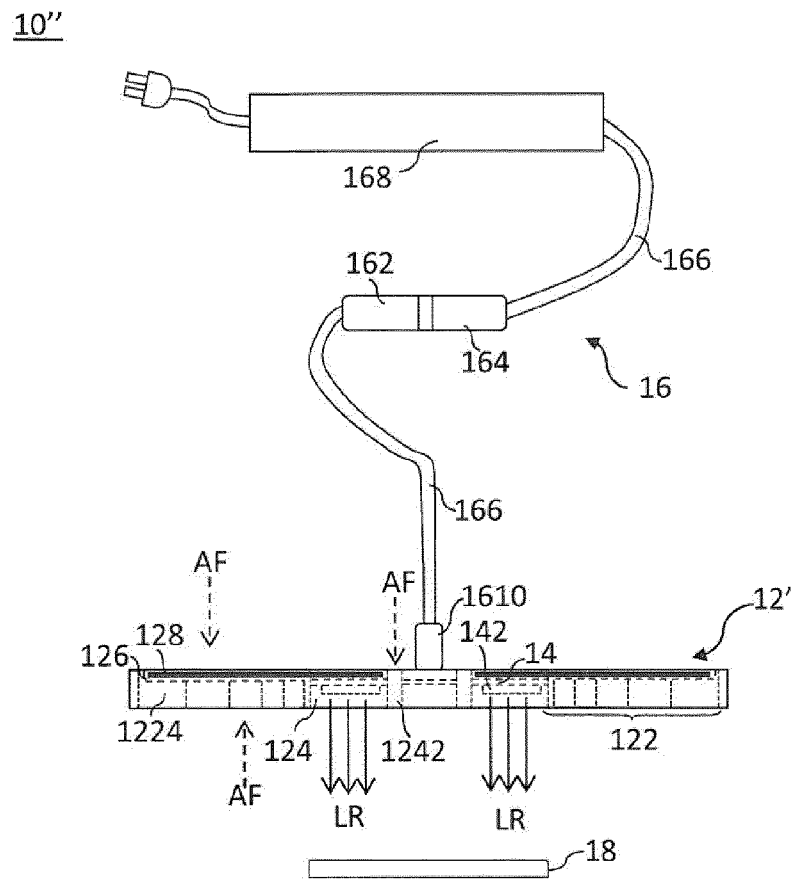


Fig. 5

10'''

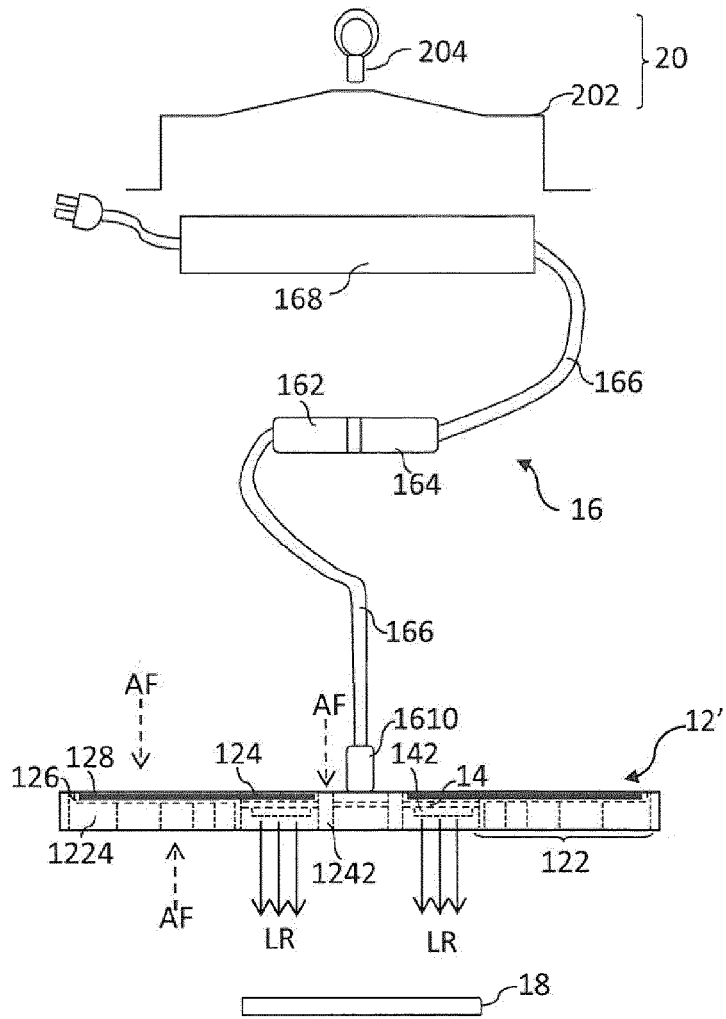


Fig. 6

10'''

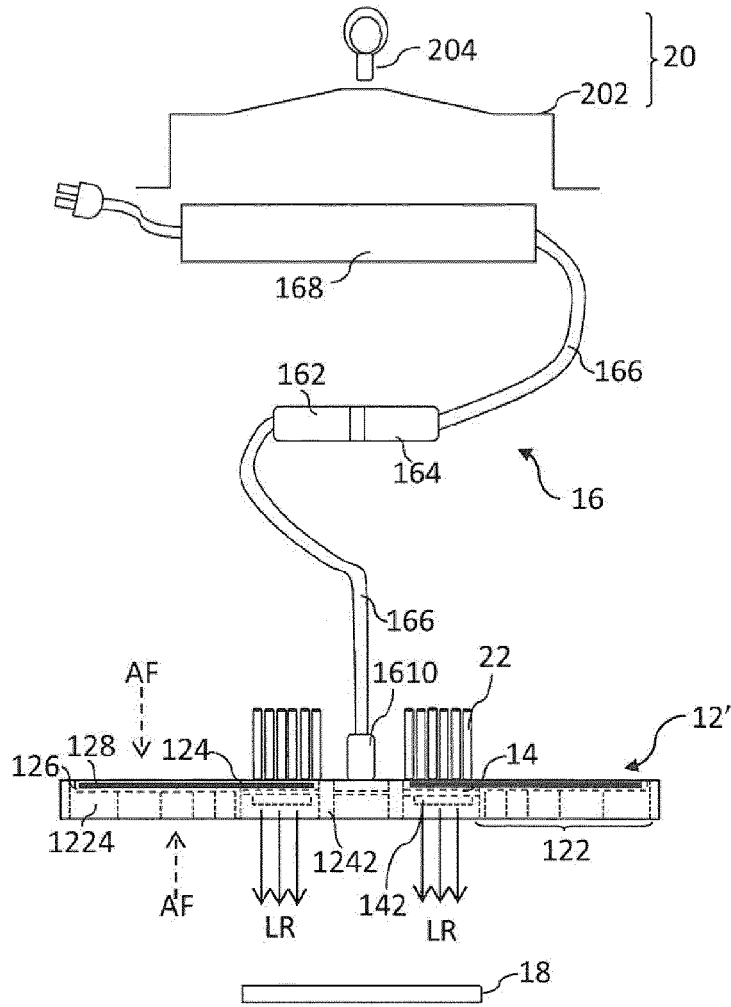


Fig. 7

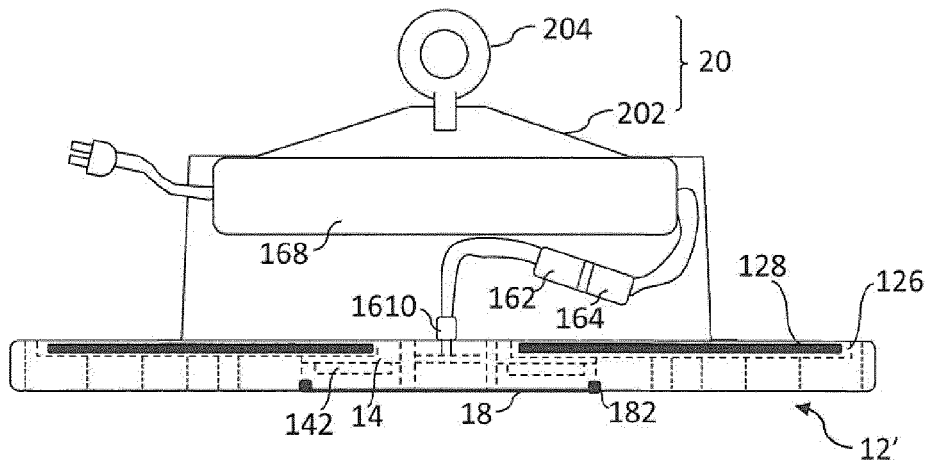


Fig. 8



EUROPEAN SEARCH REPORT

Application Number  
EP 15 19 1290

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CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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ANNEX TO THE EUROPEAN SEARCH REPORT  
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5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.  
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