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(54) **MULTI-ANGLE SHIFTING STRUCTURE AND LINEAR LAMP**

(57) The present disclosure is applicable to the field of illumination technologies, and provides a multi-angle shifting structure and a linear lamp, wherein the multi-angle shifting structure includes a driving module, and at least two light-emitting units arranged side by side or in parallel, wherein each of the light-emitting units includes at least one light-emitting module (10, 20), each of the light-emitting units has a different light-emitting angle, and the driving module separately controls on and off and/or drive current of each of the light-emitting units;

the linear lamp includes the multi-angle shifting structure as described above. The present disclosure can realize shifting between multiple light-emitting angles with one lamp, thereby overcoming the defect of a single angle of linear lamps, increasing diversity of application scenes and application manners of the linear lamps, realizing the function of multi-angle shifting of the linear lamps and saving the space, and shifting between multiple light-emitting angles can be controlled simply by switch-over, which is simple and highly functional.

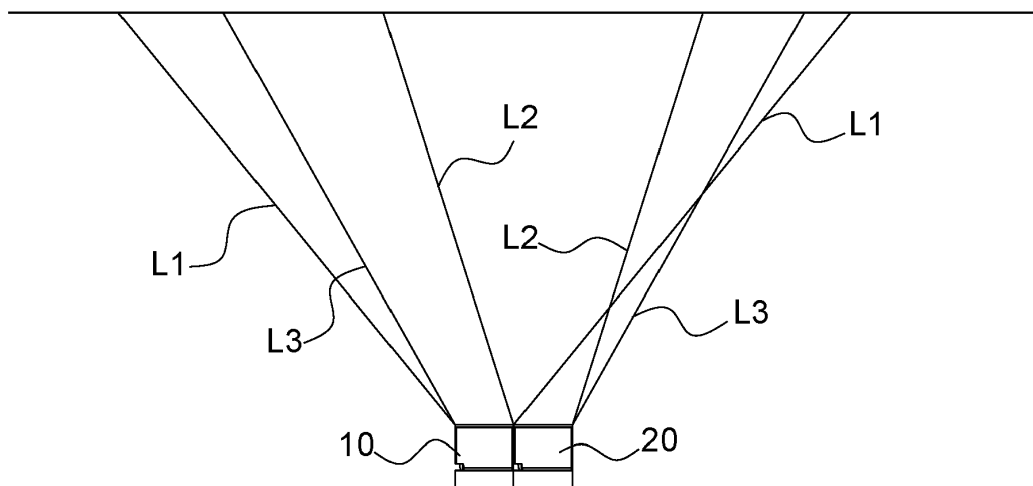


Fig. 1

Description

Technical Field

[0001] The present disclosure relates to the field of illumination technologies, in particular to a multi-angle shifting structure and a linear lamp.

Background Art

[0002] With the development of electronic technologies and the ever-increasing improvement of LED technologies, LED lamps such as LED linear lamps are increasingly applied in various situations. The linear lamp refers to a series of lamps with a linear or elongated shape, also called as line lamps, wall washer lamp, etc. The linear lamp is usually applied to decoration of building contours, beautification of indoor and outdoor places, brightening of outdoor landscapes, making of billboards, etc. due to the characteristics such as low power consumption, long service life, high brightness and bendability.

[0003] Currently, most common linear lamps have only a single light-emitting angle, and the light-emitting angle is unchangeable, therefore, only one light-emitting effect can be obtained during normal operation of the linear lamp, which cannot satisfy an application environment where a plurality of light-emitting effects are required at the same time. In addition, a light-emitting mask is usually used in the common linear lamp to reduce glare, but the anti-glare effect of the light-emitting mask is poor, and there still may be certain glare during use.

Summary

[0004] An object of the present disclosure is to provide a multi-angle shifting structure and a linear lamp, which can at least partially solve the technical problems of single light-emitting angle and poor anti-glare effect of current linear lamps.

[0005] An embodiment of the present disclosure provides a multi-angle shifting structure, including a driving module, and at least two light-emitting units arranged side by side or in parallel, wherein each of the light-emitting units includes at least one light-emitting module, each of the light-emitting units has a different light-emitting angle, and the driving module configured to separately control on and off and/or drive current of each of the light-emitting units.

[0006] In an embodiment of the present disclosure, the light-emitting modules of each of the light-emitting units are arranged in an alternating manner.

[0007] In an embodiment of the present disclosure, each light-emitting module of each of the light-emitting units includes a light source, and the light sources of each of the light-emitting units have a different light-emitting angle.

[0008] In an embodiment of the present disclosure,

each light-emitting module of each of the light-emitting units further includes a lens arranged on a light-emitting path of the light source, and the lenses of each of the light-emitting units have a different light-emitting angle.

[0009] In an embodiment of the present disclosure, the multi-angle shifting structure includes a first light-emitting unit and a second light-emitting unit, wherein the first light-emitting unit includes at least one first light-emitting module, the second light-emitting unit includes at least one second light-emitting module, the first light-emitting module and the second light-emitting module have different light-emitting angles, and the driving module is configured to separately control on and off of the first light-emitting module and the second light-emitting module respectively.

[0010] In an embodiment of the present disclosure, the multi-angle shifting structure further includes a grid lamp cup, the grid lamp cup is provided with a plurality of grooves at intervals along a length direction of the grid lamp cup, a first through hole is provided at a bottom portion of each of the grooves, and each light-emitting module is provided corresponding to the respective first through hole.

[0011] In an embodiment of the present disclosure, the multi-angle shifting structure further includes a light source plate, wherein the at least one light-emitting module is arranged on the light source plate side by side or in parallel along a length direction of the light source plate; and the grooves are in one-to-one correspondence with the at least one the light-emitting modules, and side walls of each groove are provided with an anti-glare layer.

[0012] In an embodiment of the present disclosure, the grid lamp cup includes a plurality of sub-grids, each of the sub-grids is provided therein with one of the grooves, and the plurality of sub-grids are spliced into a strip shape.

[0013] In an embodiment of the present disclosure, the grid lamp cup is of an integrally formed structure.

[0014] In an embodiment of the present disclosure, the grid lamp cup is provided with a plurality of reinforcement sheets disposed at intervals along two sides of the length direction of.

[0015] In an embodiment of the present disclosure, the lamp further includes a connector provided at a bottom portion of the grid lamp cup.

[0016] In an embodiment of the present disclosure, the grid lamp cup is provided with at least one set of connection posts on a side close to the at least one the light-emitting module.

[0017] In an embodiment of the present disclosure, side walls of each groove are disposed in a tilted manner.

[0018] In an embodiment of the present disclosure, a light shielding angle of the grid lamp cup is 0 to 25 °.

[0019] Another object of the present disclosure is to provide a linear lamp, which includes the multi-angle shifting structure as described above.

[0020] The following beneficial effects are brought by implementing the multi-angle shifting structure and the

linear lamp in the present disclosure:

By providing at least two light-emitting units side by side or in parallel, wherein each light-emitting unit includes at least one light-emitting module, each light-emitting unit has a different light-emitting angle, and the driving module separately controls on and off and/or drive current of each light-emitting unit, the multi-angle shifting structure can realize the shifting between light-emitting angles in the process of the driving module controlling on and off and/or drive current of each light-emitting unit. For example, when the driving module controls only one of the light-emitting units to be turned on, one of the light-emitting angles may be realized, and further by switching various light-emitting units to emit light, adjustment of corresponding light-emitting angles corresponding to each light-emitting unit can be realized; for another example, when the driving module controls two of the light-emitting units to be turned on, the two light-emitting units may realize another light-emitting angle in combination, and the rest can be done in a similar manner, thereby multiple light-emitting angles may be realized; for another example, when the driving module controls all of the light-emitting units to be turned on, the light-emitting angles combined by different light-emitting units can be changed by adjusting a ratio of drive currents of the light-emitting units; besides, a plurality of light-emitting modules are provided on the light source plate side by side or in parallel along the length direction of the light source plate, the grid lamp cup is covered on the light-emitting modules, a plurality of grooves are provided on the grid lamp cup, the first through hole is provided at the bottom portion of each groove, each light-emitting module is provided corresponding to the respective first through hole, and the anti-glare layer is provided on the side walls of each groove, when the light-emitting modules emit light, all of light with a large angle is shielded by the grid lamp cup, and a better anti-glare effect is further realized.

[0021] The linear lamp using the multi-angle shifting structure realizes the shifting between the light-emitting angles, increase the diversity of application methods and scenes of the linear lamp, and can realize the multi-angle shifting with one lamp, which saves the space, and is simple and effective, and meanwhile, has a better anti-glare effect.

Brief Description of Drawings

[0022] In order to more clearly illustrate technical solutions in embodiments of the present disclosure, accompanying drawings which are required to be used in the embodiments will be introduced briefly below, and apparently, the accompanying drawings in the description below merely show some embodiments of the present disclosure, and those ordinarily skilled in the art still could obtain other accompanying drawings in light of these accompanying drawings, without using creative effort.

Fig. 1 is a schematic view of light paths of a multi-

angle shifting structure according to an embodiment of the present disclosure;

Fig. 2 is a top structural view of a multi-angle shifting structure according to an embodiment of the present disclosure;

Fig. 3 is a side structural view of a grid lamp cup, along a first direction, of the multi-angle shifting structure according to an embodiment of the present disclosure;

Fig. 4 is a perspective structural view of the grid lamp cup of the multi-angle shifting structure provided in an embodiment of the present disclosure;

Fig. 5 is a perspective structural view of a multi-angle shifting structure according to an embodiment of the present disclosure;

Fig. 6 is a top structural view of the grid lamp cup of the multi-angle shifting structure according to an embodiment of the present disclosure;

Fig. 7 is a cross-section view of FIG. 6 along A-A; and

Fig. 8 is a side structural view of the grid lamp cup along a second direction, of the multi-angle shifting structure according to an embodiment of the present disclosure.

[0023] Details of numerals involved in the above accompanying drawings are as follows: 10-first light-emitting module; 20-second light-emitting module; 30-grid lamp cup; 31-groove; 311-first through hole; 32-connection post; 33-reinforcement sheet; 40-connector.

Detailed Description of Embodiments

[0024] In order to make the objects, technical solutions and advantages of the present disclosure more clear and distinct, the present disclosure is further described in detail below in combination with accompanying drawings and embodiments. It should be understood that the specific embodiments described herein are merely used to explain the present disclosure, rather than being used to limit the present disclosure. Apparently, some but not all embodiments of the present disclosure are described. Generally, components in the embodiments of the present disclosure, as described and shown in the accompanying drawings herein, may be arranged and designed in various different configurations.

[0025] It should be noted that when an element is "fixed" or "provided" on another element, it may be directly or indirectly located on another element. When an element is "connected with" another element, it may be directly or indirectly connected to another element. Orientations or positions indicated by terms such as "upper",

"lower", "left", "right", "front", "back", "vertical", "horizontal", "top", "bottom", "inner", and "outer", based on the orientations or positions as shown in the accompanying drawings, are merely for facilitating the description, but should not be construed as limitations on the present technical solution. Terms "first" and "second" are merely for descriptive purpose, but should not be construed as indicating or implying importance in the relativity or suggesting the number of a technical feature. "Multiple (a plurality of)" means two or more, unless otherwise defined explicitly.

[0026] In the description of the present disclosure, it further should be noted that unless otherwise specified and defined explicitly, terms such as "provide" and "connect" should be construed in a broad sense, for example, a "connection" may be fixed connection, detachable connection, or integral connection; it may be mechanical connection, and also may be electrical connection; and it may be direct connection, indirect connection through an intermediary, or inner communication between two elements. For those ordinarily skilled in the art, specific meanings of the above-mentioned terms in the present disclosure can be understood according to specific circumstances. In order to illustrate the technical solutions in the present disclosure, detailed description is made below in conjunction with specific accompanying drawings and embodiments.

[0027] The present disclosure first provides a multi-angle shifting structure, which is mainly applied to lamps, especially linear lamps. Optionally, the multi-angle shifting structure includes a driving module and at least two light-emitting units arranged side by side or in parallel with each other, wherein each light-emitting unit includes at least one light-emitting module, each light-emitting unit has a different light-emitting angle, and the driving module is configured to separately (individually, independently) control on and off and/or drive current of each light-emitting unit. In the present embodiment, the light-emitting modules are arranged side by side or in parallel with each other, that is, the light-emitting modules are linearly arranged in a horizontal direction. Each light-emitting unit is electrically connected with the driving module, respectively, so that the driving module separately can control on and off and/or drive current of each light-emitting unit, respectively. Optionally, when each light-emitting unit includes at least two light-emitting modules, the at least two light-emitting modules of each light-emitting unit also may be electrically connected with the driving module respectively, and the driving module separately controls on and off and/or drive current of each light-emitting module, respectively. Reference can be made to conventional means in the prior art for methods and principles for the above driving module controlling each light-emitting unit and each light-emitting module, which are not described in detail herein.

[0028] In a specific application, the driving module mainly includes a driving circuit board and electronic components provided on the driving circuit board, a spe-

cific structure of the driving module may adopt a common structure at present, and the principle of the driving module driving the light-emitting units to emit light is also the same as that of a conventional driving module, which will not be described in detail herein.

[0029] By providing at least two light-emitting units side by side or in parallel, wherein each light-emitting unit includes at least one light-emitting module, each light-emitting unit has a different light-emitting angle, and the driving module separately controls on and off and/or drive current of each light-emitting unit, shifting of light-emitting angles can be realized in the process of the driving module controlling on and off and/or drive current of each light-emitting unit. For example, when the driving module controls only one of the light-emitting units to be turned on, one light-emitting angle may be realized; for another example, when the driving module controls two of the light-emitting units to be turned on, the two light-emitting units may realize another light-emitting angle in combination, and the rest can be done in a similar way, thus multiple light-emitting angles may be realized. It can be understood that the driving module at this time is mainly configured to control on and off of each light-emitting unit, that is, the driving module functions as a switch. For another example, in a case where each light-emitting unit is turned on, the driving module may separately control the drive current of each light-emitting unit respectively, that is, the driving module may adjust a ratio of currents flowing through the light-emitting units, and further the light-emitting angle combined by different light-emitting units may be directly changed, in this way, more variable and flexible angles can be achieved. For another example, the driving module may separately control on and off and drive current of each light-emitting unit simultaneously.

[0030] In the present disclosure, the multi-angle shifting structure includes a first light-emitting unit and a second light-emitting unit, wherein the first light-emitting unit includes at least one first light-emitting module, the second light-emitting unit includes at least one second light-emitting module, the at least one first light-emitting module and the at least one second light-emitting module have different light-emitting angles, and the driving module is configured to separately control on and off of the at least one first light-emitting module and the at least one second light-emitting module respectively. In the present embodiment, by providing the first light-emitting unit and the second light-emitting unit, an adjustment between three light-emitting angles may be realized. Specifically, a first light-emitting angle is rendered when the driving module controls only the first light-emitting unit to emit light; a second light-emitting angle is rendered when the driving module only controls the second light-emitting unit to emit light; a third light-emitting angle is rendered when the driving module controls the first light-emitting unit and the second light-emitting unit to emit light simultaneously, and the three light-emitting angles are different from each other.

[0031] It should be noted that the light-emitting angle described in the present disclosure is also referred to as view angle or light beam angle, and it is defined as an included angle formed by boundaries of light beams emitted from a light source or a lamp which are within a certain intensity range. In the art, the above intensity range generally refers to an included angle range formed by 50% luminous intensity.

[0032] Referring to FIG. 1, the present embodiment is described below in detail by taking an example in which the first light-emitting unit includes one first light-emitting module 10, and the second light-emitting unit includes one second light-emitting module 20. Optionally, the light-emitting angle of the first light-emitting module 10 is 80° , and the light-emitting angle of the second light-emitting module 20 is 36° , and this is taken as an example for description. In the multi-angle shifting structure in the present embodiment, in order to realize three light-emitting angles, three circuits are provided, which are circuit A, circuit B and circuit C respectively. When switching to the circuit A, the second light-emitting module 20 having the light-emitting angle of 36° emits light, the first light-emitting module 10 does not emit light, then the light-emitting angle at this time is an included angle between two light beams L2 as shown in FIG. 1; when switching to the circuit B, the first light-emitting module 10 having the light-emitting angle of 80° emits light, the second light-emitting module 20 does not emit light, then the light-emitting angle at this time is an included angle between two light beams L1 as shown in FIG. 1; when switching to the circuit C, the first light-emitting module 10 and the second light-emitting module 20 both emit light, and a value of light-emitting angle at this time may be a certain angle between the value of the included angle between the two light beams L1 and the value of the included angle between the two light beams L2, which are mixed in a certain ratio, that is, the light-emitting angle at this time is an included angle between two light beams L3 as shown in FIG. 1, and the light-emitting angle is smaller than 80° and greater than 36° . Thus, the function of shifting between multiple illumination angles with one lamp can be realized. It can be understood that the above circuit A, circuit B and circuit C are merely division of circuits in terms of logical functions, which do not represent or imply that the above circuit control function must be realized by three separate circuits in practical implementation, and a person skilled in the art could design the circuit according to actual needs, which will not be described in detail herein.

[0033] Optionally, take a manner of mixing 36° with 80° to obtain 60° as an example: the second light-emitting module 20 having the light-emitting angle of 36° and the first light-emitting module 10 having the light-emitting angle of 80° are simultaneously turned on, and a luminous flux ratio between the second light-emitting module 20 having the light-emitting angle of 36° and the first light-emitting module 10 having the light-emitting angle of 80° is about 1:2.86. Assuming that the luminous flux

of the second light-emitting module 20 having the light-emitting angle of 36° is 700 lm at this time, correspondingly, the luminous flux of the first light-emitting module 10 having the light-emitting angle of 80° is approximately 2000 lm, and at this time, an angle formed by superposition of luminous fluxes of the two will become approximately 60° . With this principle, more different angles may appear by changing between combinations of multiple luminous flux ratios. This principle is also applicable to a case where a plurality of first light-emitting modules 10 and a plurality of second light-emitting modules 20 are provided. Moreover, theoretically, the more the light-emitting units having different angles are provided, the more the angle combinations may be eventually realized. It can be understood that during adjustment, when different luminous flux ratios are selected for the second light-emitting module 20 having the light-emitting angle of 36° and the first light-emitting module 10 having the light-emitting angle of 80° , the light-emitting angles eventually obtained are also different, that is to say, when the angle is adjusted under the condition that the first light-emitting module 10 and the second light-emitting module 20 are turned on, other angles besides 60° may appear therebetween, and may be voluntarily selected according to actual requirements of illumination.

[0034] In an embodiment of the present disclosure, the light-emitting modules of each light-emitting unit are arranged in an alternating manner. Referring to FIG. 2, a first light-emitting unit and a second light-emitting unit are also provided in the present embodiment, and for example, the first light-emitting unit includes five first light-emitting modules 10, and the second light-emitting unit includes five second light-emitting modules 20. Optionally, the five first light-emitting modules 10 and the five second light-emitting modules 20 are arranged side by side in an alternating manner, at this time, a plurality of light-emitting angles can be realized, and the light distribution is uniform. It can be understood that, in other embodiments of the present disclosure, the light-emitting modules of each light-emitting unit also may be arranged in one row in other arrangement manners, which is not limited to the above. In an embodiment of the present disclosure, each light-emitting module of each light-emitting unit includes a light source, and the light sources of each light-emitting unit has a different light-emitting angle, that is, the light sources of the light-emitting modules within the same light-emitting unit have the same light-emitting angle, while the light sources of different light-emitting units have different light-emitting angles. In the present embodiment, different light-emitting angles are realized using different light sources, which is simple and convenient. In a specific application, the light source may be an LED light source, and a plurality of light sources are provided on a light source plate.

[0035] In another embodiment of the present disclosure, each light-emitting module of each light-emitting unit further includes a lens arranged on a light-emitting path of corresponding light source, for example, covered

(capped) on the light source. The lenses of each light-emitting unit has a different light-emitting angle, that is, the lenses of the light-emitting modules within the same light-emitting unit have the same light-emitting angle, while the lenses of different light-emitting units have different light-emitting angles. In the present embodiment, different light-emitting angles are realized by providing different lenses, which is simple and convenient. In a specific application, the light sources of different light-emitting units may have the same or different light-emitting angles.

[0036] Referring to FIG. 2 to FIG. 8 in combination, in an embodiment of the present disclosure, the multi-angle shifting structure further includes a grid lamp cup 30, wherein the grid lamp cup 30 is substantially elongated, the grid lamp cup 30 is provided with a plurality of grooves 31 at intervals along a length direction thereof, a first through hole 311 is provided at a bottom portion of each groove 31, and the above light-emitting modules are provided corresponding to the first through holes 311, for example, the lens of each light-emitting module is provided corresponding to the respective first through hole 311. Optionally, the lens is partially accommodated in corresponding first through hole 311, or a light-emitting surface of the lens is accommodated in the first through hole 311. In the present embodiment, the first through hole 311 is substantially circular, and penetrates through the bottom portion of the groove 31. In addition, the grid lamp cup 30 is of an integrally formed structure, so as to simplify the structure and save the cost.

[0037] Undoubtedly, in other embodiments, the grid lamp cup 30 may also include a plurality of sub-grids which are separately formed, wherein each sub-grid is provided therein with one groove 31, and the plurality of sub-grids are spliced to form inline grid lamp cup 30, specifically, the sub-grids may be spliced together by bonding, clamping and other connection modes.

[0038] Optionally, an anti-glare layer for absorbing light is provided on side walls of each groove 31 of the grid lamp cup 30. In the present embodiment, by providing the light-emitting module with the grid lamp cup 30, and providing the anti-glare layer on the side walls of the grooves 31 of the grid lamp cup 30, when the light-emitting module emits light, the grid lamp cup 30 may shield light with a large angle, further achieving the anti-glare effect.

[0039] It is to be understood that in other embodiments, a reflective layer may be provided on the side walls of each groove 31 of the grid lamp cup 30, at this time the light emitted by the light-emitting module is partially reflected inside the grid lamp cup 30, and the grid lamp cup 30 functions to reflect light.

[0040] Referring to FIG. 3, FIG. 5 and FIG. 8, in an embodiment of the present disclosure, at least one set of connection posts 32 are provided on one side of the grid lamp cup 30 close to the light-emitting module, wherein the connection posts 32 are configured to be connected with a connector 40 provided at the bottom

portion of the grid lamp cup 30. Optionally, second through holes are provided on the connector 40, wherein each second through hole is matched with the respective connection post 32 and is used for insertion of the connection post 32. In a specific application, each set of connection posts 32 include two connection posts 32 arranged parallel to each other along a width direction of the grid lamp cup 30, and the number of sets of connection posts 32 can be selected according to actual requirements. Optionally, each connection post 32 and corresponding grid lamp cup 30 are integrally formed so as to simplify the structure and save the cost.

[0041] Referring to FIG. 4, FIG. 5 and FIG. 7, in an embodiment of the present disclosure, the side walls of each groove 31 are disposed in a tilted manner, and the side walls of the groove 31 are disposed to be tilted outward from one end of the groove 31 close to the first through hole 311 to one end far away from the first through hole 311. In the present embodiment, the groove 31 is substantially square, and four side walls of the groove 31 are all disposed in a tilted manner so as to facilitate demolding. In a specific application, the side walls of the groove 31 are inclined with respect to a vertical surface by an angle ranging from 10° to 15° , which angle may also be called as draft angle. Optionally, the side walls of the groove 31 are inclined with respect to the vertical surface by an angle of 14° , and at this time, referring to FIG. 7, an included angle α between two opposite side walls of the groove 31 is 28° . It can be understood that the angle at which the side walls of the groove 31 are inclined with respect to the vertical surface also may be other possible draft angles.

[0042] In one embodiment of the present disclosure, a light shielding angle of the grid lamp cup 30 is 0 to 25° , which specifically may be 5° , 10° , 15° , 20° , 25° and so on. In the present embodiment, when the grid lamp cup 30 has a fixed height, it is not the case that the bigger light shielding angle of the grid lamp cup 30 the better, because when the grid lamp cup 30 has a fixed height, the bigger the light shielding angle of the grid lamp cup 30 is, the more the light is shielded by the grid lamp cup 30 is, the smaller the light-emitting angle of the light shielding cup 30 is, and the lower the use rate of light at this time is. Therefore, the light shielding angle of the grid lamp cup 30 is selected from the range of 0 to 25° . In a specific application, as shown in FIG. 8, when height H of the grid lamp cup 30 is 18 mm, the light shielding angle of the grid lamp cup 30 is selected to be 25° , and a maximum light-emitting angle corresponding to the grid lamp cup 30 is about 65° at this time, i.e., the light-emitting angle is cut off at about 65° . It can be understood that the higher the height of the grid lamp cup 30 is, the smaller the light-emitting angle of the grid lamp cup 30 is. Therefore, the height of the grid lamp cup 30 and the light shielding angle of the grid lamp cup 30 may be selected according to the actual requirements on the light-emitting angle of the grid lamp cup 30.

[0043] Referring to FIG. 4 and FIG. 5, in one embodi-

ment of the present disclosure, the grid lamp cup 30 is provided with a plurality of reinforcement sheets 33 at intervals along two sides in the length direction thereof, and the reinforcement sheets 33 are configured to reinforce the structural strength of the grid lamp cup 30, and meanwhile also may play a certain role in heat dissipation. Optionally, the reinforcement sheets 33 of the grid lamp cup 30 along two sides in the length direction thereof are disposed at equal intervals, and the reinforcement sheets 33 at the two sides are symmetrically disposed. In a specific application, the reinforcement sheets 33 are substantially triangular. Optionally, the reinforcement sheets 33 and corresponding grid lamp cup 30 are integrally molded so as to simplify the structure and save the cost.

[0044] Based on the same conception, referring to FIG. 1 to FIG. 8, an embodiment of the present disclosure further provides a linear lamp, which includes the multi-angle shifting structure as described in any one of the above embodiments. In the present embodiment, the linear lamp further includes a connector 40 provided at the bottom portion of the grid lamp cup 30, a lamp body and other structures. The linear lamp of the present embodiment, including the above multi-angle shifting structure, can realize the shifting between the light-emitting angles, increase the diversity of application methods and scenes of the linear lamp, and can realize the multi-angle shifting with one lamp, which saves the space, and is simple and effective, and meanwhile, shifting of more angles can be realized through combinations of multiple lamps. The above-mentioned is merely optional embodiments of the present disclosure, rather than being intended to limit the present disclosure, and any amendments, equivalent replacements, improvements and so on made within the spirit and principle of the present disclosure should be covered within the scope of protection of the present disclosure.

Claims

1. A multi-angle shifting structure, **characterized by** comprising a driving module, and at least two light-emitting units arranged side by side or in parallel, wherein each of the light-emitting units comprises at least one light-emitting module (10, 20), each of the light-emitting units has a different light-emitting angle, and the driving module is configured to separately control on and off and/or drive current of each of the light-emitting units.
2. The multi-angle shifting structure according to claim 1, wherein the light-emitting modules (10, 20) of each of the light-emitting units are arranged in an alternating manner.
3. The multi-angle shifting structure according to claim 1 or 2, wherein each light-emitting module (10, 20) of each of the light-emitting units comprises a light source, and the light sources of each of the light-emitting units have a different light-emitting angle.
4. The multi-angle shifting structure according to claim 3, wherein each light-emitting module (10, 20) of each of the light-emitting units further comprises a lens arranged on a light-emitting path of the respective light source, and the lenses of each of the light-emitting units have a different light-emitting angle.
5. The multi-angle shifting structure according to any one of claims 1 to 4, wherein the multi-angle shifting structure comprises a first light-emitting unit and a second light-emitting unit, wherein the first light-emitting unit comprises at least one first light-emitting module (10), the second light-emitting unit comprises at least one second light-emitting module (20), the at least one first light-emitting module (10) and the at least one second light-emitting module (20) have different light-emitting angles, and the driving module is configured to separately control on and off of each first light-emitting module (10) and each second light-emitting module (20) respectively.
6. The multi-angle shifting structure according to any one of claims 1 to 4, wherein the multi-angle shifting structure further comprises a grid lamp cup (30), the grid lamp cup (30) is provided with a plurality of grooves (31) disposed at intervals along a length direction of the grid lamp cup (30), a first through hole (311) is provided at a bottom portion of each of the grooves (31), and each light-emitting module is provided corresponding to the respective first through hole (311).
7. The multi-angle shifting structure according to claim 6, further comprising a light source plate, wherein the at least one light-emitting module is arranged on the light source plate side by side or in parallel along a length direction of the light source plate, and the grooves (31) are in one-to-one correspondence with the at least one light-emitting module, and side walls of each groove (31) are provided with an anti-glare layer.
8. The multi-angle shifting structure according to claim 6 or 7, wherein the grid lamp cup (30) comprises a plurality of sub-grids, each of the sub-grids is provided therein with one of the grooves (31), and the plurality of sub-grids are spliced into a strip shape.
9. The multi-angle shifting structure according to any one of claims 6 to 8, wherein the grid lamp cup (30) is of an integrally formed structure.
10. The multi-angle shifting structure according to any one of claims 6 to 9, wherein the grid lamp cup (30)

is provided with a plurality of reinforcement sheets (33) disposed at intervals along two sides of the length direction of the grid lamp cup (30).

11. The multi-angle shifting structure according to any one of claims 6 to 10, wherein the lamp further comprises a connector (40) provided at a bottom portion of the grid lamp cup (30). 5
12. The multi-angle shifting structure according to any one of claims 6 to 11, wherein the grid lamp cup (30) is provided with at least one set of connection posts (32) on a side close to the at least one light-emitting module. 10
13. The multi-angle shifting structure according to any one of claims 6 to 12, wherein a light shielding angle of the grid lamp cup (30) is 0 to 25 °. 15
14. The multi-angle shifting structure according to any one of claims 7 to 13, wherein side walls of each groove (31) are disposed in a tilted manner. 20
15. A linear lamp, **characterized by** comprising the multi-angle shifting structure according to any one of claims 1 to 14. 25

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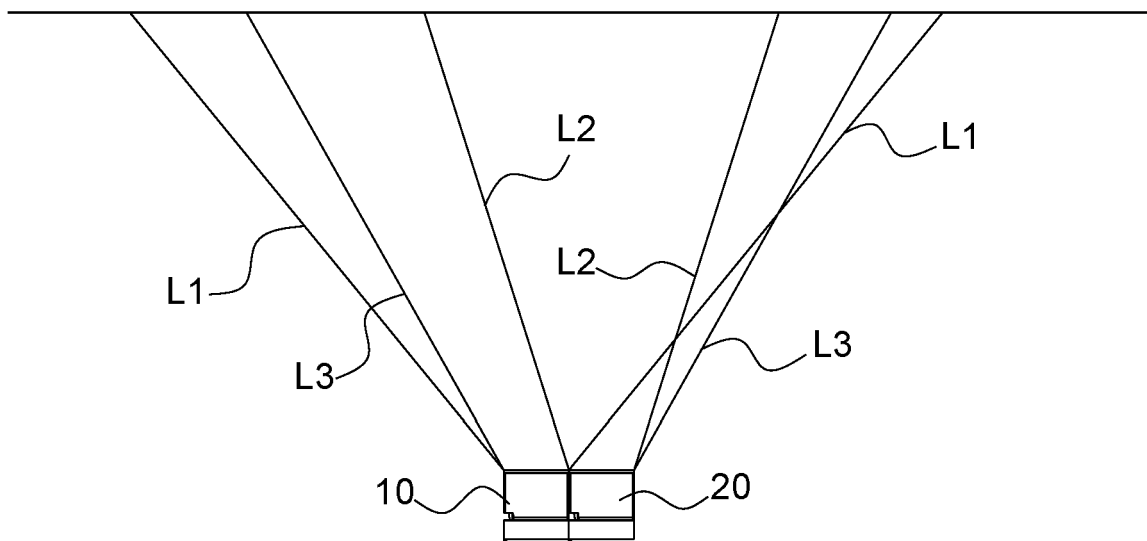


Fig. 1

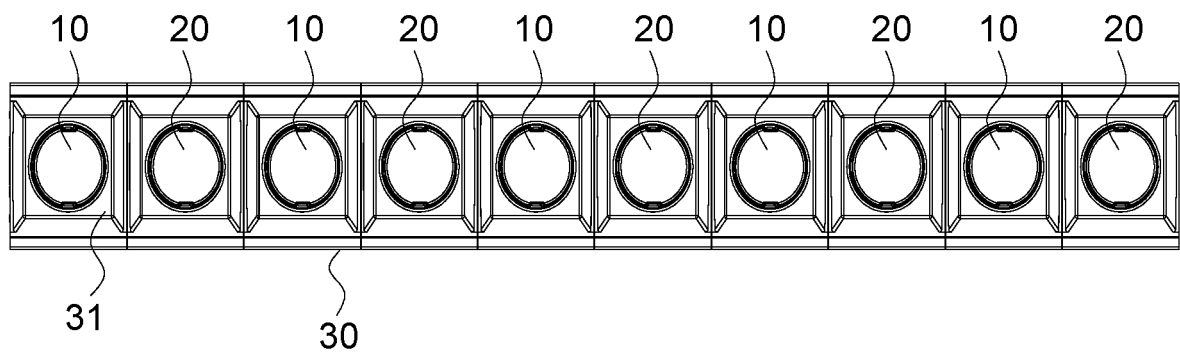


Fig. 2

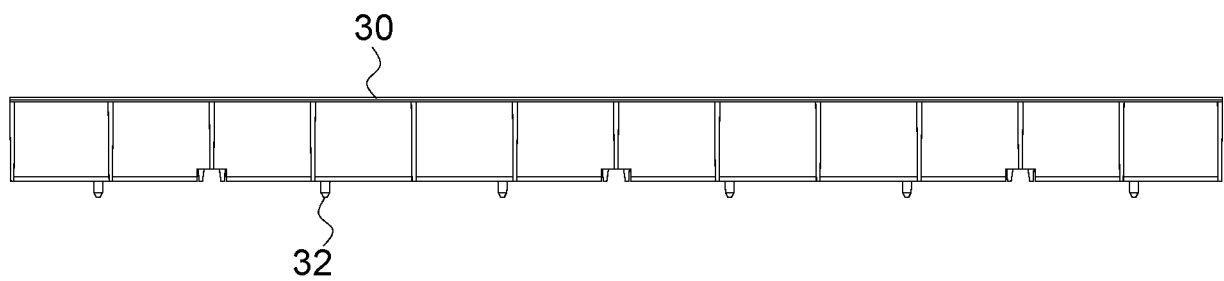


Fig. 3

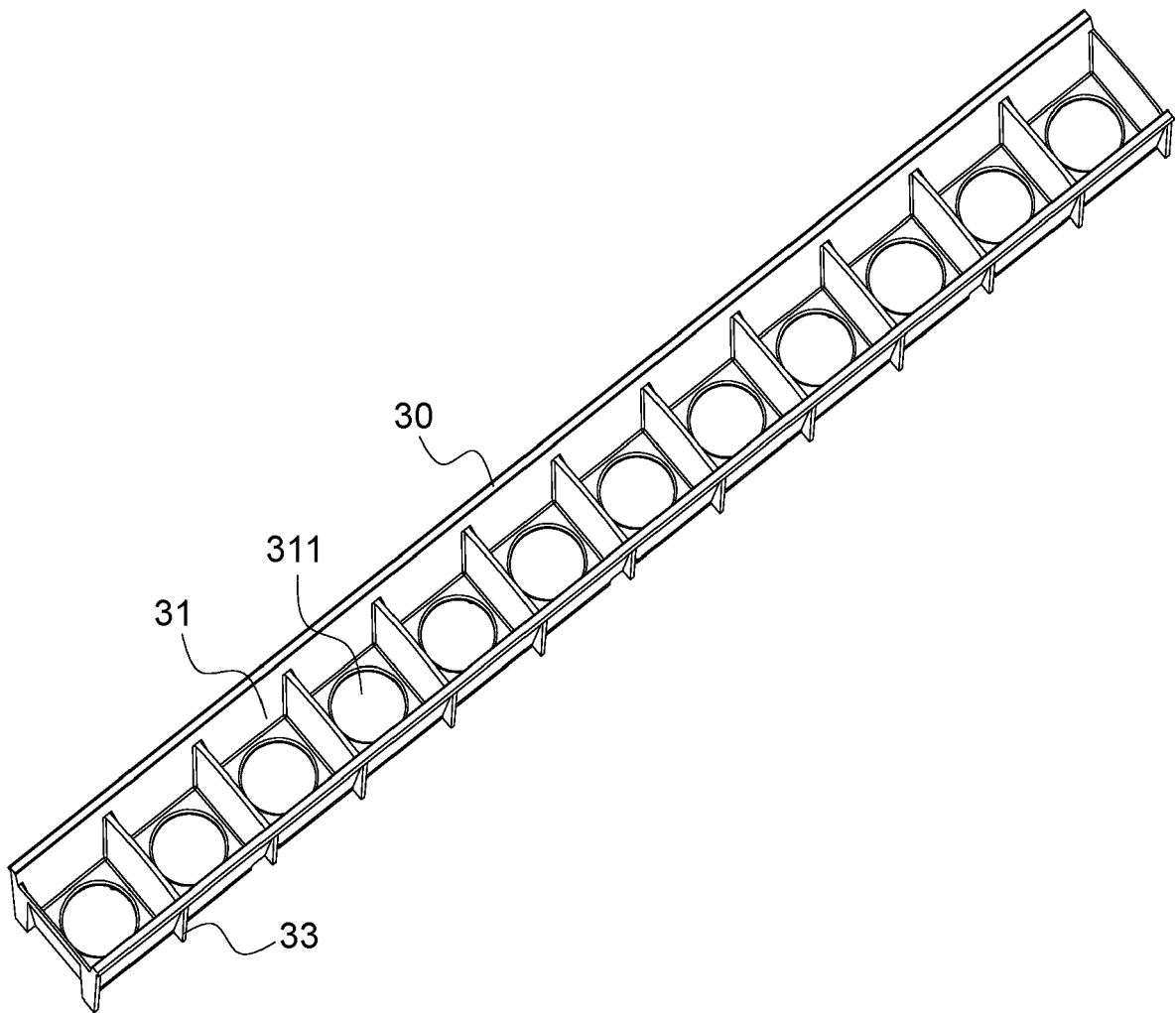


Fig. 4

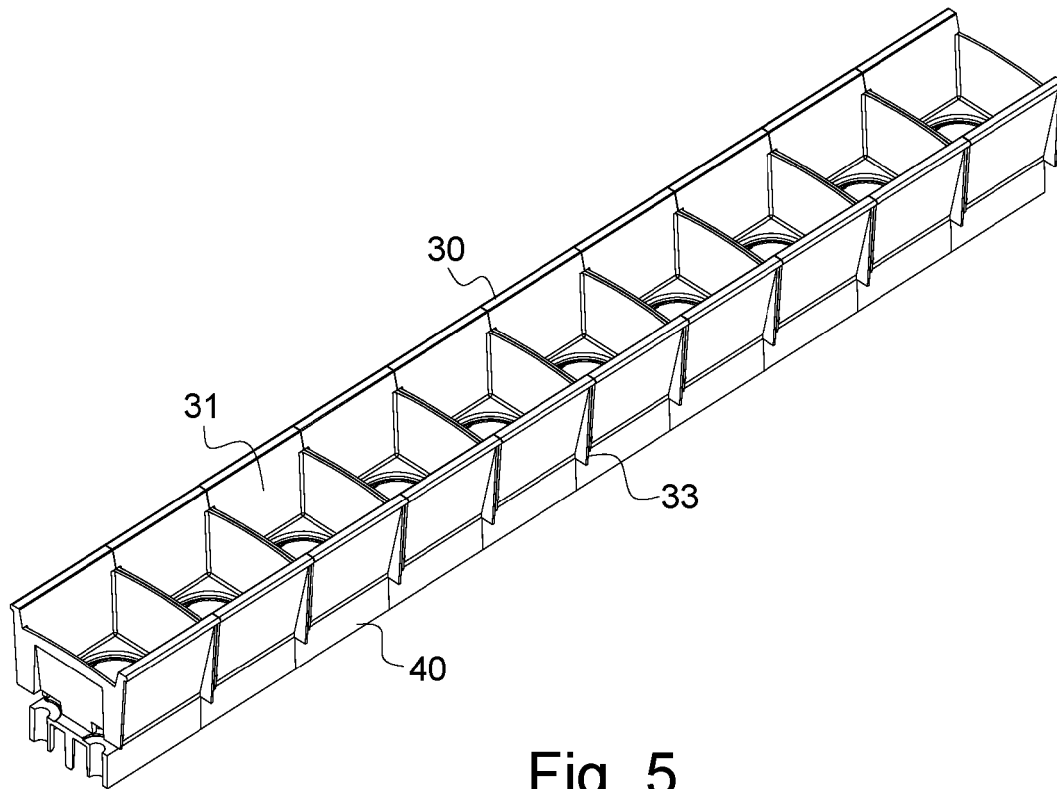


Fig. 5

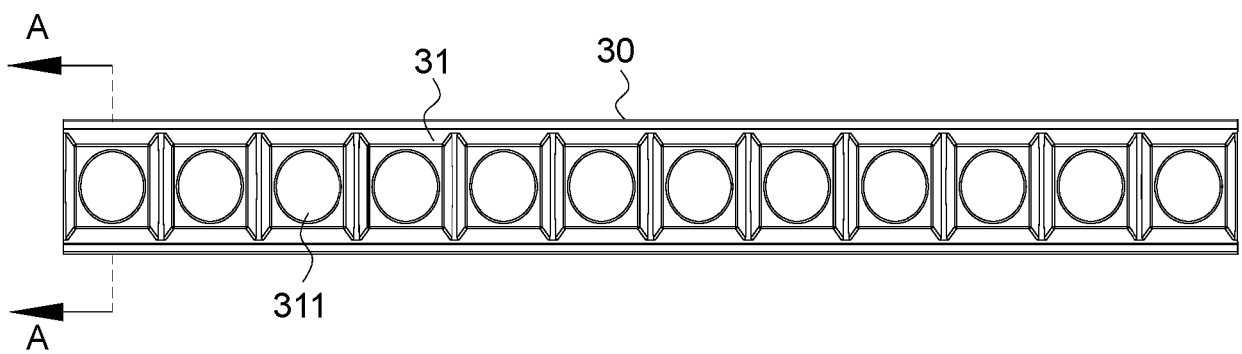


Fig. 6

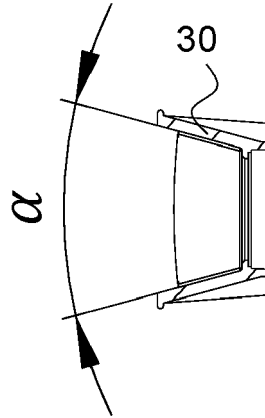


Fig. 7

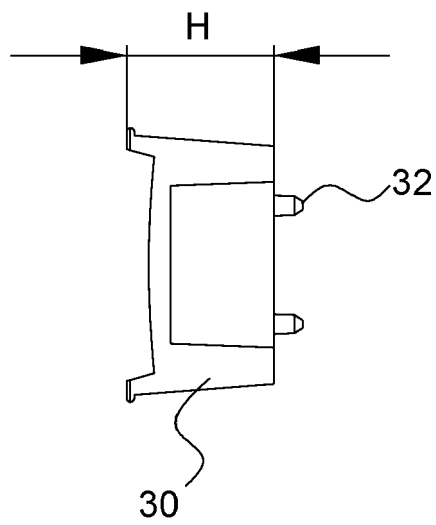


Fig. 8



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