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(54) **LAMP UNIT, HEADLAMP, AND VEHICLE**

(57) A lamp unit (1) for a vehicle headlamp, the lamp unit comprising: a light-emitting module (10), wherein the light-emitting module (10) is arranged in a vertical direction of a vehicle, the light-emitting module (10) comprises a light emergent surface (100), and light rays that are straight up relative to the vehicle are emitted from the light emergent surface (100) by the light-emitting module (10); and a light ray adjusting device (20), wherein the light ray adjusting device (20) is configured to adjust the light rays emitted from the light emergent surface (100), so as to form a desired shape of light illuminating a road in front of the vehicle. The light ray adjusting device (20) comprises a first reflecting device (201) and a second reflecting device (202), wherein the first reflecting device (201) is configured to adjust emergent light rays of the light emergent surface (100) of the light-emitting module (10) among a plurality of working positions, so as to adjust the position of the light shape in the vertical direction; and the second reflecting device (202) is configured to adjust the emergent light rays of the light emergent surface (100) of the light-emitting module (10) among a plurality of working positions, so as to adjust the position of the light shape in a transverse direction.

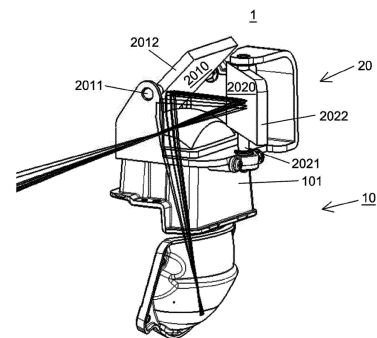


FIG. 5

Description

Technical Field

[0001] The present disclosure generally relates to a lamp unit for a headlamp of a vehicle, a headlamp including the lamp unit and a vehicle including the headlamp.

Background Art

[0002] This section provides background information about the present disclosure, while the information does not necessarily constitute the prior art.

[0003] With the rapid development of modernization and high density of road traffic, the road traffic environment is becoming increasingly complex, and therefore, the design of a headlamp of a vehicle is increasingly challenging. In the related art, in order to make light illuminate an appropriate position in front of the vehicle, an additional dimming structure independent of a light-emitting module of a headlamp needs to be designed in a headlamp of the vehicle. Generally, such additional dimming structure needs to be provided with a motor that can drive the light-emitting module and make the light-emitting module move or rotate, and the structure thereof is usually complex. Therefore, the light-emitting module originally having a small volume becomes bulky due to such additional dimming structure, which is not conducive to the development of lightweight and simplification of the headlamp.

Summary

[0004] This section provides a general summary of the present disclosure, rather than a comprehensive disclosure of a full scope or all the features of the present disclosure.

[0005] Exemplary embodiments of the present disclosure provide a lamp unit for a headlamp of a vehicle, wherein the lamp unit may include: a light-emitting module, wherein the light-emitting module is arranged in an up-down direction of the vehicle, the light-emitting module includes a light emergent surface, and the light-emitting module emits light that is vertically upward (straight up) relative to the vehicle from the light emergent surface; and a light adjusting device (light ray adjusting device), wherein the light adjusting device is configured to adjust the light emitted from the light emergent surface, so as to form a desired light shape illuminating the front of the vehicle, wherein the light adjusting device includes a first reflecting device and a second reflecting device, wherein the first reflecting device is configured to adjust emergent light from the light emergent surface of the light-emitting module among a plurality of working positions, so as to implement adjustment of a position of the light shape in the up-down direction, and the second reflecting device is configured to adjust the emergent light from the light emergent surface of the light-emitting module among a

plurality of working positions, so as to implement adjustment of the position of the light shape in a left-right direction.

[0006] In some embodiments, the first reflecting device includes a first reflecting surface, and the second reflecting device includes a second reflecting surface arranged lateral to the first reflecting surface, wherein the first reflecting surface is arranged to face the light emergent surface of the light-emitting module, and is configured to reflect the light emitted from the light emergent surface, and guide it towards the second reflecting surface, and the second reflecting surface is configured to reflect the light reflected by the first reflecting surface, and guide it towards the front of the vehicle.

[0007] In some embodiments, the first reflecting device may include a first pivot and a first plane mirror provided with the first reflecting surface, wherein the first pivot may have a first pivot axis perpendicular to the up-down direction of the vehicle, and the first plane mirror is configured to pivot about the first pivot axis.

[0008] In some embodiments, the first pivot axis of the first pivot may pass through a geometric center of an area illuminated by the light emitted from the light emergent surface on the first reflecting surface.

[0009] In some embodiments, the second reflecting device may include a second pivot and a second plane mirror provided with the second reflecting surface, wherein the second pivot may have a second pivot axis parallel to the up-down direction of the vehicle, and the second plane mirror is configured to pivot about the second pivot axis.

[0010] In some embodiments, the light-emitting module may be a reflective light-emitting module or a transmissive light-emitting module.

[0011] In some embodiments, the light adjusting device is configured to be detachably mounted to the light-emitting module.

[0012] In some embodiments, the light-emitting module may be a vehicle lamp module including a lens, the light-emitting module further may include a lens holder, and the first reflecting device and the second reflecting device are configured to be detachably mounted to the lens holder.

[0013] In some embodiments, the light adjusting device may be integrated with the light-emitting module.

[0014] In some embodiments, the light-emitting module may be a vehicle lamp module including a lens, the light-emitting module further may include a lens holder, and the first reflecting device and the second reflecting device are integrated with the lens holder.

[0015] Exemplary embodiments of the present disclosure further provide a headlamp for a vehicle, wherein the headlamp may include the lamp unit provided according to the preceding embodiments.

[0016] Exemplary embodiments of the present disclosure further provide a vehicle, wherein the vehicle may include the headlamp provided according to the preceding embodiments.

[0017] According to the above configuration, the lamp unit, the headlamp and the vehicle according to the present disclosure at least can bring about the following beneficial technical effects:

1) The lamp unit is vertically arranged relative to a front-rear direction of the vehicle, which can save space of the vehicle in a transverse direction, and facilitates space utilization of the headlamp of the vehicle.

2) Since the lamp unit is vertically arranged relative to the front-rear direction of the vehicle, and the space of the vehicle in a vertical direction is usually abundant, heat dissipation of the lamp unit can be facilitated, further improving optical efficiency.

3) Since the lamp unit is vertically arranged relative to the front-rear direction of the vehicle, the second reflecting surface of the light-emitting module is seen when observing the lamp unit provided in the present disclosure from a head of the vehicle. In this case, appearance requirement of the lamp unit may be satisfied by designing a shape of the second reflecting surface, so that a diversified appearance of the lamp unit can be realized without expensive decorative rims and decorative rings, further reducing production costs.

4) The first reflecting device and the second reflecting device of the light adjusting device provided in the present disclosure both can be adjusted among a plurality of working positions, so as to respectively adjust the position of the shape of light illuminating the front of the vehicle in the up-down direction and in the left-right direction, and thus the light shape can be simultaneously adjusted up, down, left and right, thereby forming a shape of light illuminating a position desired to be illuminated in front of the vehicle.

5) The light adjusting device and the light-emitting module may jointly form an integrated light-emitting component with a dimming function, and therefore it is unnecessary to design an additional dimming structure for the light-emitting component, so that the headlamp of the vehicle may be designed to be smaller in volume, lighter in weight, and simpler in structure.

6) The light adjusting device according to the present disclosure may be used as an independent external dimming system to replace the conventional dimming structure with a complex structure, so that the structure of the vehicle lamp may be simplified. Besides, the light adjusting device according to the present disclosure may be applied to various types of light-emitting modules, so as to give new life to the headlamp in the related art.

7) The light adjusting device according to the present disclosure may be applied to dimming for a number of functions such as low beam, high beam, and corner lamp.

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Brief Description of Drawings

[0018] Through the following description with reference to the drawings, the features and advantages of the embodiments of the present disclosure will become easier to understand. The drawings are not drawn to scale, and some features may be zoomed in or out to show details of specific parts. In the drawings:

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FIG. 1 is a schematic side view of a light-emitting module for a headlamp of a vehicle according to the related art.

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FIG. 2 is a schematic front view of a light-emitting module for a headlamp of a vehicle according to the related art.

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FIG. 3 is a schematic side view of a lamp unit for a headlamp of a vehicle according to exemplary embodiments of the present disclosure.

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FIG. 4 is a schematic front view of a lamp unit for a headlamp of a vehicle according to exemplary embodiments of the present disclosure.

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FIG. 5 is a schematic diagram of travel directions of light from a lamp unit for a headlamp of a vehicle according to exemplary embodiments of the present disclosure.

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FIG. 6 is a schematic perspective view of a light adjusting device integrated with a lens holder according to exemplary embodiments of the present disclosure.

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FIG. 7 is a schematic perspective view of a light adjusting device that can be detachably mounted to a light-emitting module according to exemplary embodiments of the present disclosure.

Detailed Description of Embodiments

[0019] Vehicles are means of transportation with complex structure including thousands of parts and components. How to rationally utilize an interior space of vehicles to arrange various parts and components has always been a problem of close interest to those skilled in the art.

[0020] The inventors of the present disclosure have found that, in the construction of a vehicle, particularly in the construction of a headlamp of a vehicle, in order to save space, it is usually necessary to arrange various parts and components of the vehicle quite compactly, and therefore a space in a transverse direction of the

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vehicle (including a front-rear direction and a left-right direction of the vehicle) is usually utilized very well. On the other hand, a space utilization rate in a vertical direction (an up-down direction) of the vehicle is relatively low compared with that in the transverse direction of the vehicle. In order to describe this more clearly, a light-emitting module for a headlamp of a vehicle according to the related art will be described below with reference to FIG. 1 and FIG. 2 firstly.

[0021] FIG. 1 and FIG. 2 show a schematic side view and a schematic front view, respectively, of the light-emitting module for a headlamp of a vehicle according to the related art. It should be indicated that, in the context of the present disclosure, a front view refers to a view obtained by observing from a head of a vehicle (i.e., from the front of the vehicle towards the rear of the vehicle), while a side view refers to a view obtained by observing in a left-right direction perpendicular to a front-rear direction of the vehicle.

[0022] In exemplary embodiments, a light-emitting module 10' according to the related art shown in FIG. 1 and FIG. 2 is a poly-ellipsoid system module (PES module) for a headlamp of a vehicle, which includes a radiator 101', a reflecting mirror 102', a lens holder 103' and a lens 104'. It may be appreciated that, although not shown, the light-emitting module 10' may include a light-emitting unit for emitting illumination light. During operation of the headlamp of the vehicle, the illumination light emitted from the light-emitting unit is guided towards the lens 104' via reflection by the reflecting mirror 102', and is finally emitted to the front of the vehicle via refraction by the lens 104' for illumination.

[0023] As shown in FIG. 1 and FIG. 2, the light-emitting module 10' according to the related art is arranged in a front-rear direction of the vehicle, and the lens 104' of the light-emitting module 10' is seen when observing from the head of the vehicle. However, as shown, in this case, a size of the light-emitting module 10' in the front-rear direction of the vehicle will be significantly larger than that of the vehicle in the up-down direction. Therefore, the light-emitting module 10' occupies more space in the front-rear direction of the vehicle than in the up-down direction of the vehicle, which is undesirable for space utilization of the headlamp of the vehicle. In addition, it may be appreciated that, when the light-emitting module for the headlamp of the vehicle is arranged in the front-rear direction of the vehicle, the lens or the reflecting mirror of the light-emitting module will be seen when observing from the head of the vehicle, and therefore, in order to avoid appearance defects of the lens or the reflecting mirror caused by optical design, many decorative rims and decorative rings are usually needed for matching and decoration, which is costly.

[0024] In this regard, the applicant of the present disclosure has found that there is still room for improvement in terms of space utilization for the headlamp of the vehicle in the related art, and it is desired to minimize the space utilization in the front-rear direction of the vehicle

and instead use the space in the up-down direction of the vehicle in the construction of the headlamp of the vehicle.

[0025] The present disclosure will be described in detail below by means of exemplary embodiments with reference to the drawings. It is to be noted that the following detailed description of the present disclosure is merely for illustrative purpose, but is in no way limitation to the present disclosure. Besides, the same reference signs are used to denote the same components in the drawings.

[0026] It also should be noted that, for the sake of clarity, not all of the features of actual specific embodiments are described and shown in the description and drawings. Moreover, in order to avoid obscuring the technical solutions focused in the present disclosure with unnecessary details, only device structures closely related to the technical solutions of the present disclosure are described and shown in the drawings and the description, while other details that are irrelevant to the technical contents of the present disclosure and known to those skilled in the art are omitted.

[0027] Next, a lamp unit for a headlamp of a vehicle provided according to exemplary embodiments of the present disclosure is described in detail with reference to the drawings.

[0028] Firstly, a lamp unit 1 for a headlamp of a vehicle according to exemplary embodiments of the present disclosure is described in detail with reference to FIG. 3 to FIG. 5.

[0029] FIG. 3 and FIG. 4 show a schematic side view and a schematic front view, respectively, of the lamp unit 1 for a headlamp of a vehicle according to exemplary embodiments of the present disclosure. FIG. 5 shows a schematic view of travel directions of light from the lamp unit 1 for a headlamp of a vehicle according to exemplary embodiments of the present disclosure.

[0030] In some embodiments, with reference to FIG. 3 to FIG. 5, the lamp unit 1 according to exemplary embodiments of the present disclosure may include a light-emitting module 10 arranged in an up-down direction of a vehicle. This light-emitting module 10 may include a light emergent surface 100, and the light-emitting module 10 emits, from the light emergent surface 100, light that is substantially vertically upward relative to the vehicle, as shown in FIG. 5.

[0031] The lamp unit 1 according to exemplary embodiments of the present disclosure is vertically arranged relative to a front-rear direction of the vehicle, which can save space of the vehicle in a transverse direction (including the front-rear direction and a left-right direction of the vehicle), and facilitates space utilization of the headlamp of the vehicle. In addition, since the space of the vehicle in a vertical direction is abundant, heat dissipation of the lamp unit 1 can be facilitated, further improving optical efficiency.

[0032] In order to guide the light that is emitted substantially vertically upward relative to the vehicle by the

light-emitting module 10 towards the front of the vehicle so as to form a desired shape of light illuminating the front of the vehicle, the lamp unit 1 according to the present disclosure further may include a light adjusting device 20, as shown in FIG. 3 to FIG. 5. The light adjusting device 20 is configured to adjust the light emitted from the light emergent surface 100 of the light-emitting module 10, so as to form the desired shape of light illuminating the front of the vehicle.

[0033] Referring to FIG. 3 to FIG. 5, in some embodiments, the light adjusting device 20 may include a first reflecting device 201 and a second reflecting device 202, wherein the first reflecting device 201 is configured to adjust emergent light from the light emergent surface 100 of the light-emitting module 10 among a plurality of working positions, so as to implement adjustment of a position of the shape of light illuminating the front of the vehicle in the up-down direction, and the second reflecting device 202 is configured to adjust the emergent light from the light emergent surface 100 of the light-emitting module 10 among a plurality of working positions, so as to implement adjustment of the position of the shape of light illuminating the front of the vehicle in the left-right direction. It should be understood that, the adjustment of the position of the light shape in the up-down direction and/or the left-right direction mentioned in the present disclosure refers to up, down, left and right on a filament shield.

[0034] In some embodiments, the first reflecting device 201 may include a first reflecting surface 2010, and the second reflecting device 202 may include a second reflecting surface 2020 arranged lateral to the first reflecting surface 2010, wherein the first reflecting surface 2010 may be arranged to face the light emergent surface 100 of the light-emitting module 10 and configured to reflect the light emitted from the light emergent surface 100, and guide it towards the second reflecting surface 2020, and the second reflecting surface 2020 is configured to reflect the light reflected by the first reflecting surface 2010, and guide it towards the front of the vehicle.

[0035] According to the lamp unit 1 provided in the present disclosure, by providing the first reflecting device 201 and the second reflecting device 202, the light that is emitted substantially vertically upward relative to the vehicle by the light-emitting module 10 arranged in the up-down direction of the vehicle may be guided towards the front of the vehicle, so as to illuminate the front of the vehicle. In addition, the first reflecting device 201 and the second reflecting device 202 both can be adjusted among a plurality of working positions, so as to respectively adjust the position of the shape of light illuminating the front of the vehicle in the up-down direction and in the left-right direction, and thus the light shape can be simultaneously adjusted up, down, left and right by the light adjusting device 20, so as to form a desired shape of light illuminating the front of the vehicle.

[0036] In addition, the second reflecting surface 2020 of the light-emitting module 10 is seen when observing the lamp unit 1 provided in the present disclosure from

the head of the vehicle. Therefore, a diversified appearance may be designed for the second reflecting surface 2020 without affecting the illumination light shape of a vehicle lamp. Compared with the lens or the reflecting surface that cannot be changed in the conventional module, the present disclosure avoids use of expensive decorative rims and decorative rings that have to be used to overcome an appearance defect caused by exposure of the lens or the reflecting mirror, thereby reducing the production cost.

[0037] In some embodiments, the first reflecting device 201 may include a first pivot 2011 and a first plane mirror 2012 provided with the first reflecting surface 2010, wherein the first pivot 2011 may have a first pivot axis perpendicular to the up-down direction of the vehicle, and the first plane mirror 2012 is configured to pivot about the first pivot axis. By making the first plane mirror 2012 pivot about the first pivot axis of the first pivot 2011, the first plane mirror 2012 may be adjusted among a plurality of working positions, thereby implementing movement of the shape of light illuminating the front of the vehicle in the up-down direction.

[0038] Preferably, the pivot axis of the first pivot 2011 may pass through a geometric center of an area illuminated by the light emitted from the light emergent surface 100 on the first reflecting surface 2010. In this way, reflection efficiency of the first reflecting surface 2010 on the light emitted from the light emergent surface 100 can be increased, so that the shape of light illuminating the front of the vehicle is brighter.

[0039] In some embodiments, the second reflecting device 202 may include a second pivot 2021 and a second plane mirror 2022 provided with the second reflecting surface 2020, wherein the second pivot 2021 may have a second pivot axis parallel to the up-down direction of the vehicle, and the second plane mirror 2022 is configured to pivot about the second pivot axis. By making the second plane mirror 2022 pivot about the second pivot axis of the second pivot 2021, the second plane mirror 2022 may be adjusted among a plurality of working positions, thereby implementing movement of the shape of light illuminating the front of the vehicle in the left-right direction.

[0040] It may be appreciated that although FIG. 3 to FIG. 5 show a PES module according to exemplary embodiments as the light-emitting module 10, types of the light-emitting module 10 of the present disclosure are not limited thereto. In other words, the light-emitting module 10 of the present disclosure may be selected from any suitable types as long as the light-emitting module 10 can be arranged in the up-down direction of the vehicle and can emit light that is substantially vertically upward relative to the vehicle.

[0041] For example, in some embodiments, the light-emitting module 10 of the present disclosure may be a reflective light-emitting module or a transmissive light-emitting module. It should be indicated that, the reflective light-emitting module refers to a light-emitting module

that implements road illumination by reflection of a reflecting mirror, and the transmissive light-emitting module refers to a light-emitting module that implements road illumination by adding a lens in front of a primary optical element such as a reflecting mirror or a collimator. It may be appreciated that, by adding the lens, the lamp unit can collect light better when turned on, cutoff lines of light shape of a low-beam headlamp are also clearer, and light emitted is also more uniform.

[0042] In some other embodiments, the light-emitting module 10 of the present disclosure also may be an LED direct-illumination type light-emitting module.

[0043] In some other embodiments, the light adjusting device 20 may be integrated with the light-emitting module 10. In this way, the light adjusting device 20 and the light-emitting module 10 may jointly form an integrated light-emitting component with a dimming function, and therefore, it is unnecessary to design an additional dimming structure for the light-emitting component, so that the headlamp of the vehicle may be designed to be smaller in volume, lighter in weight, and simpler in structure.

[0044] Preferably, in some embodiments, the light-emitting module 10 may be a vehicle lamp module including a lens, the light-emitting module 10 further may include a lens holder 101, and the first reflecting device 201 and the second reflecting device 202 may be integrated with the lens holder 101, as shown in FIG. 6.

[0045] It may be contemplated that in some other embodiments, the light adjusting device 20 may be configured to be detachably mounted to the light-emitting module 10. In this way, the light adjusting device 20 may be mounted on a light-emitting module in the related art, so as to perform dimming for the light-emitting module in the related art. Therefore, the dimming structure having a complex structure and a heavy weight in the related art may be omitted, so that the headlamp of the vehicle in the related art may be simplified, which is conducive to the development of lightweight and simplification of the headlamp of the vehicle. In addition, when the light adjusting device 20 according to the present disclosure is used to replace the dimming structure in the related art, the light-emitting module 10 in the related art does not need to be moved or rotated for dimming, so that it may be always fixed, which enhances the stability of the system.

[0046] Preferably, in some embodiments, the light-emitting module 10 may be a vehicle lamp module including a lens, the light-emitting module 10 further may include the lens holder 101, and the first reflecting device 201 and the second reflecting device 202 may be configured to be detachably mounted to the lens holder 101, as shown in FIG. 7.

[0047] In some embodiments, at least one of the following may be specifically set according to the shape and size of the light emergent surface 100 of the light-emitting module 10: a working position of the first plane mirror 2012; a size of the first plane mirror 2012; a working position of the second plane mirror 2022; a size of the

second plane mirror 2022; a position of the first pivot 2011; and a position of the second pivot 2021, so that the first reflecting surface 2010 and/or the second reflecting surface 2020 may reflect as many light as possible among the light emitted from the light emergent surface 100. In this way, the light adjusting device 20 may be more adapted to the light-emitting module 10, further improving the accuracy of adjusting the shape of light illuminating the front of the vehicle. In addition, the light adjusting device 20 according to the present disclosure also may be adapted to different light-emitting modules. In this case, the light adjusting device 20 according to the present disclosure may be used as an independent external dimming system to replace the conventional dimming structure with a complex structure, so that the structure of the vehicle lamp may be simplified. Moreover, the light adjusting device 20 according to the present disclosure may be applied to various types of light-emitting modules, so as to give new life to the headlamp in the related art.

[0048] According to exemplary embodiments of the present disclosure, a headlamp including the above lamp unit and a vehicle including the headlamp are further provided. It may be appreciated that the headlamp and the vehicle provided in the present disclosure at least can achieve various advantages described about the lamp unit 1 in the above.

[0049] In the context of the present disclosure, orientation terms such as "front", "rear", "left", "right", "up", and "down" are used merely for the purpose of facilitating the description, but should not be deemed as limiting. Although the present disclosure has been described with reference to exemplary embodiments, it should be understood that the present disclosure is not limited to the specific embodiments described and shown in detail herein. Those skilled in the art could make various changes to the exemplary embodiments without departing from the scope defined by the claims of the present disclosure.

[0050] Features mentioned and/or shown in the description of exemplary embodiments of the present disclosure in the above may be incorporated into one or more other embodiments in the same or similar manner, and combined with the features in other embodiments or replace corresponding features in other embodiments. These technical solutions obtained through combination or replacement should also be considered as being included in the scope of protection of the present disclosure.

Industrial Applicability

[0051] The present disclosure provides a lamp unit for a headlamp of a vehicle, wherein the lamp unit may include: a light-emitting module, wherein the light-emitting module is arranged in an up-down direction of a vehicle, the light-emitting module includes a light emergent surface, and the light-emitting module emits light that is vertically upward relative to the vehicle from the light emer-

gent surface; and a light adjusting device, wherein the light adjusting device is configured to adjust the light emitted from the light emergent surface, so as to form a desired shape of light illuminating the front of the vehicle, wherein the light adjusting device includes a first reflecting device and a second reflecting device, wherein the first reflecting device is configured to adjust emergent light emitted from the light emergent surface of the light-emitting module among a plurality of working positions, so as to implement adjustment of a position of the light shape in the up-down direction, and the second reflecting device is configured to adjust the emergent light from the light emergent surface of the light-emitting module among a plurality of working positions, so as to implement adjustment of the position of the light shape in a left-right direction. Vertical arrangement of the lamp unit according to the present disclosure, relative to the front-rear direction of the vehicle, can save the space of the vehicle in the transverse direction, and facilitate the space utilization of the headlamp of the vehicle. In addition, since the space of the vehicle in the vertical direction is abundant, heat dissipation of the lamp unit can be facilitated, further improving the optical efficiency. Besides, by providing the first reflecting device and the second reflecting device, the light that is emitted substantially vertically upward relative to the vehicle by the light-emitting module arranged in the up-down direction of the vehicle may be guided towards the front of the vehicle, so as to illuminate the front of the vehicle. The first reflecting device and the second reflecting device both can be adjusted among a plurality of working positions, so as to respectively adjust the position of the shape of light illuminating the front of the vehicle in the up-down direction and in the left-right direction, and thus the light shape can be adjusted up, down, left and right by the light adjusting device, so as to form a desired shape of light illuminating the front of the vehicle.

[0052] Besides, it may be understood that the lamp unit, the headlamp and the vehicle provided in the present disclosure are reproducible, and may be applied in various industrial applications.

Claims

1. A lamp unit (1) for a headlamp of a vehicle, **characterized in that** the lamp unit (1) comprises:

a light-emitting module (10), wherein the light-emitting module (10) is arranged in an up-down direction of the vehicle, the light-emitting module (10) comprises a light emergent surface (100), and the light-emitting module (10) emits light that is vertically upward relative to the vehicle from the light emergent surface (100); and
a light adjusting device (20), wherein the light adjusting device (20) is configured for adjusting the light emitted from the light emergent surface

(100), so as to form a desired light shape illuminating the front of the vehicle,

wherein the light adjusting device (20) comprises a first reflecting device (201) and a second reflecting device (202), and wherein the first reflecting device (201) is configured for adjusting emergent light from the light emergent surface (100) of the light-emitting module (10) among a plurality of working positions, so as to implement adjustment of a position of the light shape in the up-down direction, and the second reflecting device (202) is configured for adjusting the emergent light from the light emergent surface (100) of the light-emitting module (10) among a plurality of working positions, so as to implement adjustment of the position of the light shape in a left-right direction.

2. The lamp unit (1) for a headlamp of a vehicle according to claim 1, wherein
the first reflecting device (201) comprises a first reflecting surface (2010), and the second reflecting device (202) comprises a second reflecting surface (2020) arranged lateral to the first reflecting surface (2010), wherein the first reflecting surface (2010) is arranged to face the light emergent surface (100) of the light-emitting module (10), and is configured for reflecting the light emitted from the light emergent surface (100), and guiding it towards the second reflecting surface (2020), and the second reflecting surface (2020) is configured for reflecting the light reflected by the first reflecting surface (2010), and guiding it towards the front of the vehicle.
3. The lamp unit (1) for a headlamp of a vehicle according to claim 2, wherein
the first reflecting device (201) comprises a first pivot (2011) and a first plane mirror (2012) provided with the first reflecting surface (2010), wherein the first pivot (2011) has a first pivot axis perpendicular to the up-down direction of the vehicle, and the first plane mirror (2012) is configured for pivoting about the first pivot axis.

4. The lamp unit (1) for a headlamp of a vehicle according to claim 3, wherein
the first pivot axis of the first pivot (2011) passes through a geometric center of an area illuminated by the light emitted from the light emergent surface (100) on the first reflecting surface (2010).
5. The lamp unit (1) for a headlamp of a vehicle according to any one of claims 2 to 4, wherein
the second reflecting device (202) comprises a second pivot (2021) and a second plane mirror (2022) provided with the second reflecting surface (2020), wherein the second pivot (2021) has a second pivot axis parallel to the up-down direction of the vehicle,

and the second plane mirror (2022) is configured for pivoting about the second pivot axis.

6. The lamp unit (1) for a headlamp of a vehicle according to any one of any one of claims 1 to 5, wherein the light-emitting module (10) is a reflective light-emitting module or a transmissive light-emitting module. 5

7. The lamp unit (1) for a headlamp of a vehicle according to any one of claims 1 to 6, wherein the light adjusting device (20) is configured for being detachably mounted to the light-emitting module (10). 10

8. The lamp unit (1) for a headlamp of a vehicle according to claim 7, wherein the light-emitting module (10) is a vehicle lamp module comprising a lens, the light-emitting module (10) further comprises a lens holder (101), and the first reflecting device (201) and the second reflecting device (202) are configured for being detachably mounted to the lens holder (101). 15 20

9. The lamp unit (1) for a headlamp of a vehicle according to any one of claims 1 to 6, wherein the light adjusting device (20) is integrated with the light-emitting module (10). 25

10. The lamp unit (1) for a headlamp of a vehicle according to claim 9, wherein the light-emitting module (10) is a vehicle lamp module comprising a lens, the light-emitting module (10) further comprises a lens holder (101), and the first reflecting device (201) and the second reflecting device (202) are integrated with the lens holder (101). 30 35

11. A headlamp for a vehicle, **characterized in that** the headlamp comprises the lamp unit (1) according to any one of claims 1 to 10. 40

12. A vehicle, **characterized in that** the vehicle comprises the headlamp according to claim 11. 45

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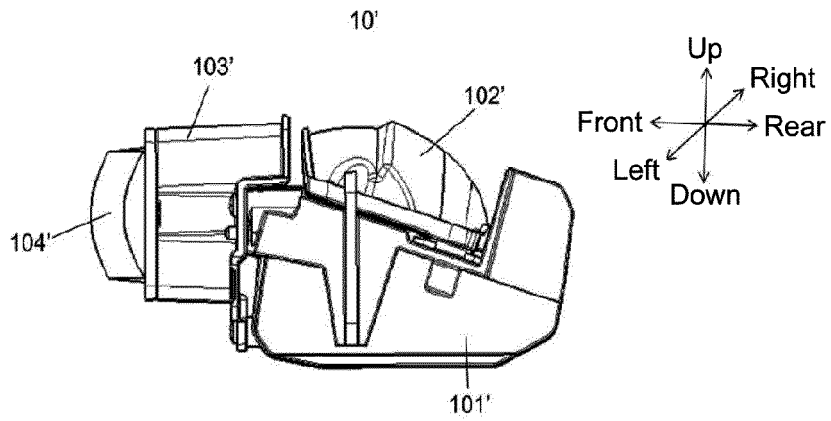


FIG. 1

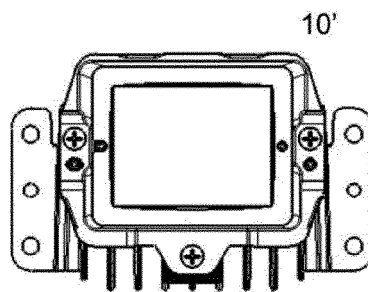


FIG. 2

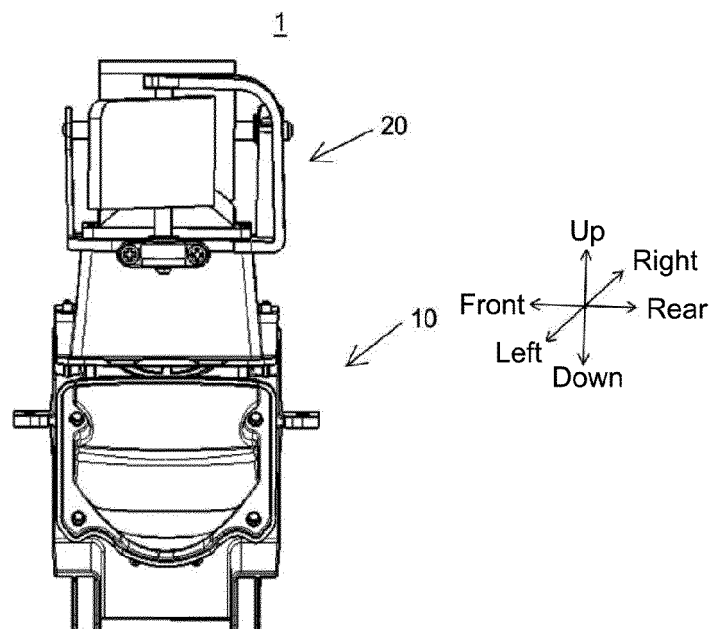


FIG. 3

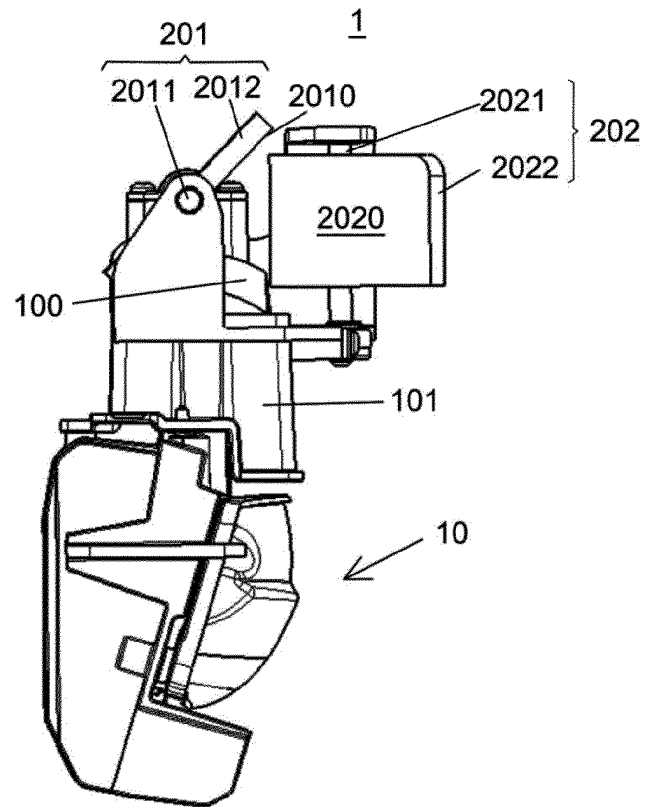


FIG. 4

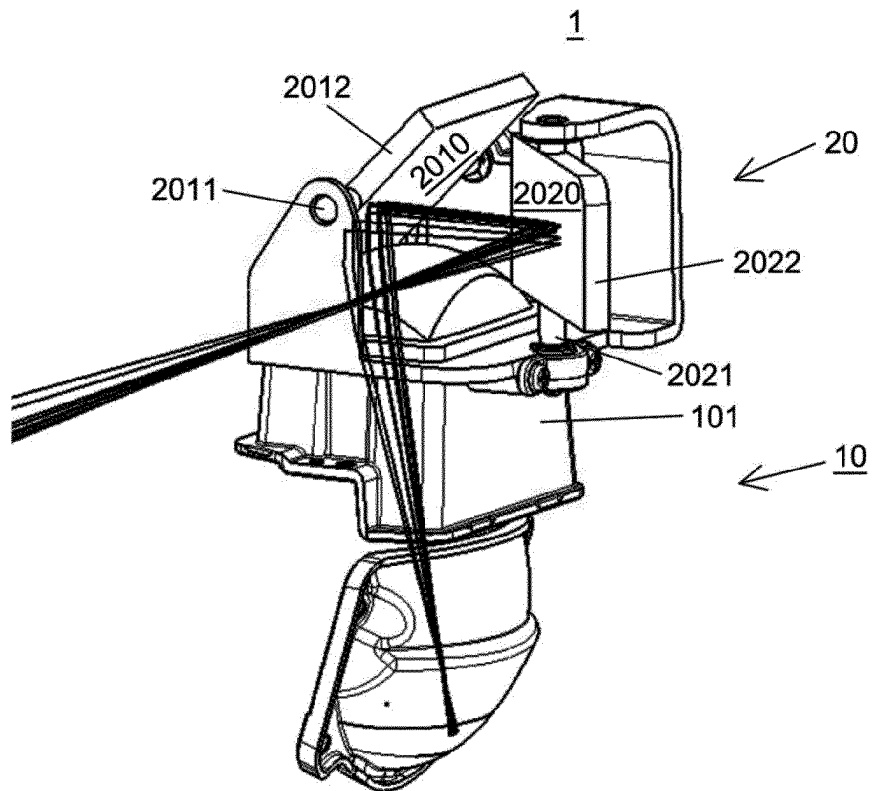


FIG. 5

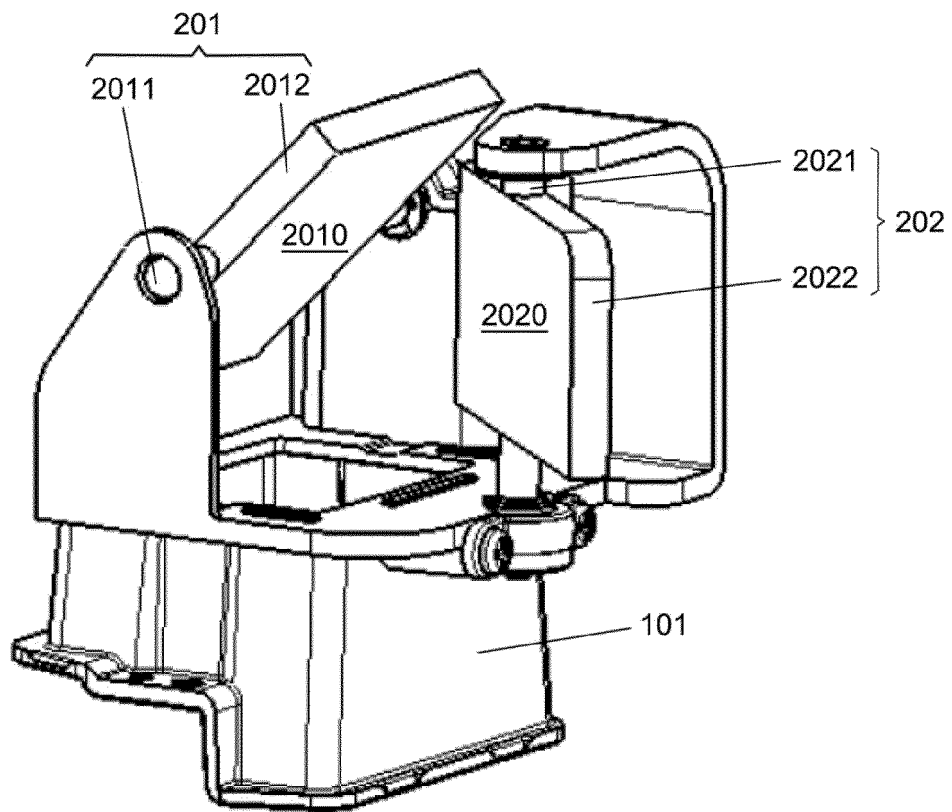


FIG. 6

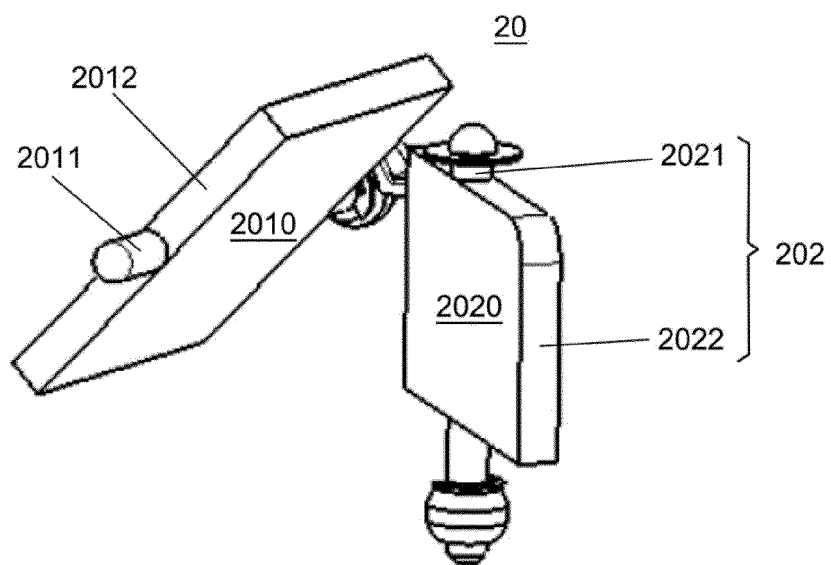


FIG. 7

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2021/143212

A. CLASSIFICATION OF SUBJECT MATTER

F21S 41/36(2018.01)i; F21V 7/00(2006.01)i; F21V 14/04(2006.01)i

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

F21S41/-, F21V7/-, F21V14/-

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

CNABS, CNPAT, TWABS, CNTXT, TWTXT, CNKI, DWPI, SIPOABS, USTXT, EPTXT, WOTX: 陈向前, 陈兆禹, 沈进, 李应, 张韬, 华域视觉, 车灯, 灯, 车辆, 上下, 方向, 反光, 聚光, 准直, 出光, 光路, 平面镜, 反射镜, 反射, 调节, 出射, 投射, 空间, 转轴, vehicle lamp, lamp, optical, reflect+, light, condensat+, up, down, collimat+, mirror, adjust, position, subject, project, shape, space, plane, layout

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	CN 212565607 U (HASCO VISION TECHNOLOGY (SHANGHAI) CO., LTD.) 19 February 2021 (2021-02-19) description, paragraphs [0065]-[0085], and figures 1-30	1, 6-12
Y	CN 212565607 U (HASCO VISION TECHNOLOGY (SHANGHAI) CO., LTD.) 19 February 2021 (2021-02-19) description, paragraphs [0065]-[0085], and figures 1-30	2-5
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☒ Further documents are listed in the continuation of Box C.
 ☒ See patent family annex.

* Special categories of cited documents:	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A" document defining the general state of the art which is not considered to be of particular relevance	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
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"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&" document member of the same patent family
"O" document referring to an oral disclosure, use, exhibition or other means	
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search 05 July 2022	Date of mailing of the international search report 28 July 2022
Name and mailing address of the ISA/CN China National Intellectual Property Administration (ISA/ CN) No. 6, Xitucheng Road, Jimenqiao, Haidian District, Beijing 100088, China Facsimile No. (86-10)62019451	Authorized officer Telephone No.

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INTERNATIONAL SEARCH REPORT

International application No.

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