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(54) **OPTICAL ASSEMBLY, LIGHTING AND/OR SIGNAL APPARATUS AND VEHICLE**

OPTISCHE ANORDNUNG, BELEUCHTUNGS- UND/ODER SIGNALVORRICHTUNG UND FAHRZEUG

ENSEMBLE OPTIQUE, APPAREIL D'ÉCLAIRAGE ET/OU DE SIGNALISATION ET VÉHICULE

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(73) Proprietor: **Valeo Vision**

93012 Bobigny Cedex (FR)

(72) Inventors:

- **LIU, Qiang**
Wuhan, Hubei 430056 (CN)
- **WAN, Ting**
Wuhan, Hubei 430056 (CN)

• **XIANG, Yunyun**

Wuhan, Hubei 430056 (CN)

• **ZHU, Yujuan**

Wuhan, Hubei 430056 (CN)

(74) Representative: **Valeo Visibility**

Service Propriété Industrielle

c/o Valeo Vision

34, rue Saint André

93012 Bobigny (FR)

(56) References cited:

WO-A1-2017/047598 CN-A- 106 247 250
CN-A- 106 287 488 CN-U- 201 487 676
JP-A- 2012 216 348 JP-A- 2013 258 078
JP-A- 2014 235 988 JP-A- 2018 037 205
US-A1- 2014 334 145 US-A1- 2016 215 951
US-A1- 2017 267 161 US-A1- 2018 058 654

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Description

TECHNICAL FIELD

[0001] The present invention relates to an optical assembly, a lighting and/or signal apparatus and a vehicle.

BACKGROUND ART

[0002] Many types of lighting and/or signal indicating apparatuses for vehicles are known in the prior art; these have a light source, a heat dissipating component and a reflector, which are generally fixed together in a complex manner.

SUMMARY OF THE INVENTION

[0003] Thus, an object of the present invention is to provide an optical assembly, and a lighting and/or signal indicating apparatus having the optical assembly, which can at least realize simplified assembly.

[0004] According to the present invention, an optical assembly comprises a heat dissipating module, a light emitting module and a reflecting module as defined in the appended claim 1.

[0005] By accommodating the pivot in the slot, simplified assembly can be realized at least to a certain extent.

[0006] According to an embodiment of the present invention, one or more connecting plates are provided, each connecting plate having an opening therein; the width of the opening corresponds to the size of the pivot, in order to realize positioning of the pivot in at least one direction. In particular, where there are multiple connecting plates, and when the openings in the connecting plates are arranged linearly, the robustness of connection can be correspondingly increased.

[0007] According to an embodiment of the present invention, a joint part of an adjusting module for adjusting the optical assembly is disposed on the heat dissipating module. For example, the adjusting module may take the form of an electric motor or a manually-adjusted threaded transmission mechanism, wherein an end of a rotor shaft of the electric motor or an end of a threaded rod of the threaded transmission mechanism may be engaged in the joint part, thereby converting associated rotation to tilting of the optical assembly about a horizontal rotation axis or a vertical rotation axis, in order to adjust the light distribution of light emitted by the optical assembly, such that it meets regulatory requirements.

[0008] According to an embodiment of the present invention, a rib is disposed on the heat dissipating module, and the height of the rib is at least equal to the height of a section of the light emitting module, which protrudes beyond an upper edge of the reflecting surface of the reflecting module. Preferably, the light source and other electronic elements are arranged between the ribs; this can prevent damage to the light source and other electronic elements during assembly. When the rib extends

continuously, it can also prevent unwanted lateral light leakage.

[0009] According to an embodiment of the present invention, the light emitting module is a printed circuit board assembly, which has a printed circuit board with the light source arranged thereon.

[0010] According to an embodiment of the present invention, a heat transfer material is disposed between the heat dissipating module and the light emitting module. The heat transfer material may be a flexible heat transfer sheet or heat dissipating silicone rubber; this can ensure good heat transfer between the heat dissipating module and the light emitting module.

[0011] According to an embodiment of the present invention, the reflecting module is provided with a locating structure which acts together with a mating locating structure of the light emitting module. For example, the locating structure takes the form of a locating boss, and the mating locating structure takes the form of a locating hole; they form a shape-fitted connection in an assembled state, thereby achieving the precise positioning of the light source relative to the reflecting surface of the reflecting module. The locating structure and the mating locating structure may also take other suitable forms.

[0012] According to an embodiment of the present invention, the heat dissipating module is integrally formed, e.g. formed by casting of a metal material, in particular aluminium. This can realize cost-effective manufacture.

[0013] According to an embodiment of the present invention, the optical assembly has at least one light source, in order to realize one or more light functions. Preferably, the light source is a light emitting diode, e.g. a white light emitting diode, a red light emitting diode or a yellow light emitting diode, in order to correspondingly realize a function such as a headlamp, tail lamp, brake lamp or direction indicator lamp.

[0014] The present invention also relates to a vehicle, having the optical assembly or lighting and/or signal apparatus described above.

[0015] The present invention also relates to an assembly process according to claim 15.

BRIEF DESCRIPTION OF THE DRAWINGS

[0016] The present invention is expounded further below by means of the accompanying drawings. Here:

Fig. 1 shows schematically a sectional view of a lighting and/or signal apparatus for a vehicle;

Fig. 2 shows schematically a three-dimensional view of an optical assembly of a lighting and/or signal apparatus for a vehicle according to the present invention;

Fig. 3 shows an exploded view of the optical assembly of Fig. 2;

Fig. 4 shows a side view of the optical assembly of Fig. 2;

Fig. 5 shows a partial enlarged view of region A of

Fig. 4; and

Figs. 6a - 6c show schematically an assembly process of the optical assembly of Fig. 2.

PARTICULAR EMBODIMENTS

[0017] Embodiments of the present invention are described demonstratively below. As those skilled in the art should realize, the embodiments described may be amended in various different ways without departing from the concept of the present invention. Thus, the accompanying drawings and the Description are in essence demonstrative and nonlimiting. In the following text, identical drawing reference labels generally indicate functionally identical or similar elements.

[0018] Fig. 1 shows schematically a sectional view of a lighting and/or signal apparatus for a vehicle.

[0019] The lighting and/or signal apparatus concerned here is for example a headlamp 100 of a vehicle. The headlamp 100 mainly comprises a housing 11 and a cover 12 covering a front opening of the housing 11. The housing 11 and the cover 12 together form an internal space 13, in which internal space an optical assembly 10 is accommodated. The optical assembly 10 is for example used to generate at least one of a low beam distribution or high beam distribution, or used to generate another light distribution. For this purpose, an adjusting module 50 for adjusting the optical assembly 10 is also disposed in the internal space 13, in order to adjust an optical axis of the optical assembly 10, and thereby generate a light distribution meeting regulatory requirements. The adjusting module may employ various existing known structures, which are not expounded in detail here.

[0020] An optical assembly 10 according to the present invention is explained below by means of Figs. 2 - 5; this is likewise installed in an internal space formed by a housing 11 and a cover 12, and comprises a heat dissipating module 20, a light emitting module 30 and a reflecting module 40.

[0021] Here, the light emitting module 30 and the reflecting module 40 are both connected to and positionally fixed to the heat dissipating module 20. The heat dissipating module 20 is further provided with joint parts of an adjusting module 50 for adjusting the optical assembly 10, wherein three joint parts 23a, 23b and 23c are shown demonstratively; one of these may take the form of a ball socket of a ball joint, the other two are engaged with corresponding adjustment means of the adjusting module, such that the entire optical assembly 10 can tilt under the adjusting action of the adjustment means with the ball joint as a pivot point, in order to adjust the optical axis.

[0022] The light emitting module 30 may take the form of a printed circuit board assembly having a printed circuit board 32, a light source and other electrical elements, e.g. a connector 33 connected to an onboard power supply, a capacitor or a resistor, etc., which are mounted on the printed circuit board.

[0023] At least a part of light emitted by the light source can reach a reflecting surface of the reflecting module 40, and exit in the direction of a housing opening after reflection by the reflecting surface, as shown by the arrow H in Fig. 1. The light source may take the form of a light emitting diode LED. A first light source 31a and a second light source 31b arranged above the reflecting module 40 are shown demonstratively here. Of course, the quantity and type of the light source may be selected as required, and the light source could also be arranged at another suitable position of the reflecting module 40, e.g. a left side and/or a right side.

[0024] The printed circuit board 32 is layed on the heat dissipating module 20 by means of a side, which is opposite to the side on which the light source is arranged. In order to achieve good heat dissipation, a heat transfer material such as a flexible heat transfer sheet or heat dissipating silicone rubber may be provided between the printed circuit board 32 and the heat dissipating module 20, in order to ensure good thermal conductivity between the light emitting module 30 and the heat dissipating module 20.

[0025] In order to ensure precise positioning of the light source relative to the reflecting module 40, the printed circuit board 32 and the reflecting module 40 may have locating structures which act together. For example, the reflecting module 40 may have locating bosses 43a and 43b, and the printed circuit board 32 may have mating locating holes 33; the locating bosses are inserted into the mating locating holes to form a shape-fitted connection. The mating locating holes can also be disposed on the heat dissipating module 20 to simplify assembly.

[0026] Alternatively, the light source of the light emitting module 30 may be arranged directly on the heat dissipating module 20. In this case, mating locating structures which act together with locating structures of the reflecting module 40 are disposed directly in the heat dissipating module 20, and for example take the form of mortise-and-tenon structures.

[0027] The reflecting module 40 takes the form of a reflector; the reflecting surface thereof is a curved surface and faces the light source. The reflecting surface may be a parabolic reflector, or formed by combining multiple surface sheets. In the former case, the basic surface of the reflecting surface is a paraboloid of revolution; a central axis of revolution thereof forms an optical axis of the reflecting module, the optical axis corresponding to a longitudinal direction of the vehicle, and a positional relationship between the reflecting surface of the reflecting module 40 and the light source is set such that a focus of the reflecting surface coincides with the light source. In the latter case, a corresponding surface sheet combination is allocated to an associated light source, in order to generate the desired light distribution. As shown in Fig. 3, a first surface sheet combination 41a is allocated to the first light source 31a, and a second surface sheet combination 42a is allocated to the second light source 31b, finally generating for example a low beam distribu-

tion or high beam distribution.

[0028] The reflecting module 40 may be formed by plastic injection moulding, and the reflecting surface thereof is formed by a metal plated layer, e.g. a plated aluminium layer.

[0029] The heat dissipating module 20 is for example integrally formed by casting of a metal, in particular aluminium, and has the function of dissipating heat generated by the light source. In order to further improve the heat dissipating function of the heat dissipating module 20, multiple protruding fins may be provided on a side of the heat dissipating module, which faces away from the reflecting module.

[0030] The heat dissipating module 20 may have a first section 20a and a second section 20b. The light emitting module 30 is arranged on a side of the first section 20a, which faces the reflecting surface. Through-holes 24a, 24b and 24c are also disposed in the first section 20a, and act together with openings 44a, 44b and 44c disposed in the reflecting module 40. The through-holes 24a, 24b and 24c and the openings 44a, 44b and 44c are aligned with each other in a corresponding manner. Here, the openings 44a, 44b and 44c may take the form of threaded holes, and screws 60 may be screwed into aligned holes, thereby achieving a fixed connection between the heat dissipating module and the reflecting module. The quantity and positions of the through-holes and openings may be set as required. The openings 44a, 44b and 44c are disposed at an edge of the reflecting module 40 which abuts against the heat dissipating module 20.

[0031] In particular, when the light emitting module 30 takes the form of a circuit board assembly, the light emitting module 30 is arranged between the first section 20a of the heat dissipating module 20 and the reflecting module 40.

[0032] The first section of the heat dissipating module 20 may be provided with a rib 21; the height of the rib is at least equal to the height of a section of the light emitting module 30, which protrudes beyond an upper edge of the reflecting surface of the reflecting module 40. Preferably, a pair of ribs 21 is provided, and the abovementioned section of the light emitting module 30 is arranged between the ribs, thereby protecting associated electronic elements, and preventing lateral light leakage.

[0033] At least one pair of plates 25 protrude from a side of the second section 20b of the heat dissipating module 20, which faces the reflecting module, and a cylindrical pivot 26 is constructed between the plates. An outer profile of the second section 20b approximately corresponds to the extension of an outer profile of the reflecting module. More specifically, in the direction of the optical axis, an end of the second section which adjoins the first section is offset with respect to an end of the second section which is provided with the plates 25. This can reduce the length of the plates and achieve a compact structure.

[0034] A connecting plate 45 is formed on a side of the

reflecting module 40, which is opposite the reflecting surface, the connecting plate having a slot 46 which is open at one end. Only one connecting plate is shown here, but multiple connecting plates which correspondingly have slots could of course also be provided. The width of the slot is equal to the diameter of the cylindrical pivot 26. The pivot 26 of the heat dissipating module 20 is inserted into the slot 46, as can be seen from Figs. 4 and 5.

[0035] Figs. 6a - 6c show schematically an assembly process of the optical assembly; first of all, the pivot 26 of the heat dissipating module 20 having the light emitting module 30 is inserted into the slot 46 of the connecting plate 45 of the reflecting module 40. Preferably, the pivot 26 is pushed into the bottom of the slot 46; the heat dissipating module is then rotated relative to the reflecting module in a direction H, such that the light source of the light emitting module arranged on the heat dissipating module faces the reflecting surface of the reflecting module; the pivot is then immediately guided in the slot towards the open end of the slot, and the positions of the heat dissipating module 20 and the reflecting module 40 are adjusted at the same time, such that the locating bosses of the reflecting module 40 are inserted into the associated mating locating holes, and the through-holes and openings for the screws 60 are aligned with each other; and finally the screws are screwed in.

[0036] By providing, on a side of the heat dissipating module 20 which faces the reflecting surface, ribs of a height at least corresponding to the height of the section of the light emitting module, which protrudes beyond the upper edge of the reflecting surface of the reflecting module 40, damage to associated electrical elements during assembly is advantageously prevented. In addition, the continuously extending ribs can also prevent unwanted lateral leakage of light.

[0037] When the abovementioned modules are in the correct positions relative to each other, besides using a threaded connection, another suitable connection method could also be used, e.g. snap-fit connection, riveting, welding, etc.

[0038] The present invention is not limited to the structure described above; various other variants could also be used. Although the present invention has already been described by means of a limited number of embodiments, those skilled in the art could, drawing benefit from this disclosure, design other embodiments which do not depart from the scope of protection of the present invention disclosed herein. Thus, the scope of protection of the present invention should be defined by the attached claims alone.

Claims

1. Optical assembly (10) for a lighting and/or signal apparatus of a vehicle, comprising a heat dissipating module (20), a light emitting module (30) and a reflecting module (40), the light emitting module (30)

- having a light source (31) and being arranged on the heat dissipating module (20), with at least a part of light emitted by the light source (31) reaching a reflecting surface of the reflecting module (40), wherein a connecting plate (45) is disposed on a side of the reflecting module (40) which is opposite to the reflecting surface, **characterized in that** the connecting plate has a slot (46) which is open at one end, the heat dissipating module (20) correspondingly has a cylindrical pivot (26), the pivot (26) being configured to, during the assembly process of the optical assembly, be inserted into the slot (46) and to allow the rotation of the heat dissipating module (20), around an axis perpendicular to the optical axis of the optical assembly, relative to the reflecting module (40) such that the light source (31) of the light emitting module (30) faces the reflecting surface of the reflecting module (40), the pivot (26) being configured to be subsequently guided in the slot towards its open end, at the same time as the positions of the heat dissipating module (20) and of the reflecting module (40) are being adjusted, and once adjusted, the reflecting module (40) is configured to be positionally fixed and connected to the heat dissipating module (20).
2. Optical assembly (10) according to Claim 1, **characterized by** being provided with multiple connecting plates (45) having slots (46).
 3. Optical assembly (10) according to Claim 2, **characterized in that** the width of the slot (46) corresponds to the diameter of the pivot (26).
 4. Optical assembly (10) according to Claim 2, **characterized in that** a joint part of an adjusting module (50) for adjusting the optical assembly (10) is disposed on the heat dissipating module (20).
 5. Optical assembly (10) according to Claim 2, **characterized in that** a rib (21) is disposed on the heat dissipating module (20), and the height of the rib (21) is at least equal to the height of a section of the light emitting module (30), which protrudes beyond an upper edge of the reflecting surface of the reflecting module (40).
 6. Optical assembly (10) according to any one of Claims 1 - 5, **characterized in that** the light emitting module (30) is a printed circuit board assembly, which has a printed circuit board (32) with the light source arranged thereon.
 7. Optical assembly (10) according to Claim 6, **characterized in that** a heat transfer material is disposed between the heat dissipating module (20) and the light emitting module (30).
 8. Optical assembly (10) according to Claim 6, **characterized in that** the reflecting module (40) is provided with a locating structure which acts together with a mating locating structure of the light emitting module (30).
 9. Optical assembly (10) according to any one of Claims 1 - 5, **characterized in that** the heat dissipating module (20) is integrally formed.
 10. Optical assembly (10) according to Claim 9, **characterized in that** the heat dissipating module (20) is made of aluminium.
 11. Optical assembly (10) according to any one of Claims 1 - 5, **characterized in that** the optical assembly (10) has at least one light source, in order to realize one or more light functions.
 12. Optical assembly (10) according to Claim 11, **characterized in that** the light source is a light emitting diode.
 13. Lighting and/or signal apparatus, having an optical assembly (10) according to any one of the preceding claims.
 14. Vehicle, having the optical assembly (10) according to any one of Claims 1 - 12 or the lighting and/or signal apparatus according to Claim 13.
 15. Assembly process of an optical assembly (10) for lighting and/or signal apparatus of a vehicle, the optical assembly (10) comprising
 - a heat dissipating module (20),
 - a light emitting module (30) and a reflecting module (40), the light emitting module (30) having a light source (31) and being arranged on the heat dissipating module (20), with at least a part of light emitted by the light source (31) reaching a reflecting surface of the reflecting module (40), a connecting plate (45) being disposed on a side of the reflecting module (40) which is opposite to the reflecting surface, the connecting plate having a slot (46) which is open at one end, the heat dissipating module (20) correspondingly having a cylindrical pivot (26), the assembly process comprising the following steps:
 - inserting the pivot (26) into the slot (46);
 - rotating the heat dissipation module (20) relative to the reflecting module (40) around an axis perpendicular to the optical axis of the optical assembly, such that the light source (31) of the light emitting module (30) faces the reflecting surface of the reflecting

module;

- adjusting the positions of the heat dissipating module (20) and the reflecting module (40) at the same time as the pivot (46) is guided in the slot towards its open end;
- connecting the reflecting module (40) to the heat dissipating module (20) once the reflecting module (40) and the dissipating module (20) are adjusted, so that the reflecting module (40) is positionally fixed to the heat dissipation module (20).

Patentansprüche

1. Optische Anordnung (10) für eine Beleuchtungs- und/oder Signalvorrichtung eines Fahrzeugs, umfassend ein Wärme ableitendes Modul (20), ein Licht emittierendes Modul (30) und ein reflektierendes Modul (40), wobei das Licht emittierende Modul (30) eine Lichtquelle (31) aufweist und auf dem Wärme ableitenden Modul (20) angeordnet ist, wobei zumindest ein Teil des von der Lichtquelle (31) emittierten Lichts eine reflektierende Oberfläche des reflektierenden Moduls (40) erreicht, wobei eine Verbindungsplatte (45) auf einer Seite des reflektierenden Moduls (40) angeordnet ist, die der reflektierenden Oberfläche gegenüberliegt, **dadurch gekennzeichnet, dass** die Verbindungsplatte einen Schlitz (46) aufweist, der an einem Ende offen ist, das Wärme ableitende Modul (20) entsprechend einen zylindrischen Drehzapfen (26) aufweist, der Drehzapfen (26) so ausgelegt ist, dass er während des Montageprozesses der optischen Anordnung in den Schlitz (46) eingeführt wird und Drehung des Wärme ableitenden Moduls (20) um eine Achse senkrecht zur optischen Achse der optischen Anordnung relativ zum reflektierenden Modul (40) ermöglicht, sodass die Lichtquelle (31) des Licht emittierenden Moduls (30) der reflektierenden Oberfläche des reflektierenden Moduls (40) zugewandt ist, der Drehzapfen (26) so ausgelegt ist, dass er anschließend gleichzeitig mit der Anpassung der Positionen des Wärme ableitenden Moduls (20) und des reflektierenden Moduls (40) im Schlitz zu seinem offenem Ende geführt wird, und das reflektierende Modul (40) so ausgelegt ist, dass es nach der Anpassung lagefixiert und mit dem Wärme ableitenden Modul (20) verbunden ist.
2. Optische Anordnung (10) nach Anspruch 1, **dadurch gekennzeichnet, dass** sie mit mehreren Verbindungsplatten (45) mit Schlitz (46) versehen ist.
3. Optische Anordnung (10) nach Anspruch 2, **dadurch gekennzeichnet, dass** die Breite des Schlitzes (46) dem Durchmesser des Drehzapfens (26) entspricht.
4. Optische Anordnung (10) nach Anspruch 2, **dadurch gekennzeichnet, dass** ein Verbindungsteil eines Anpassungsmoduls (50) zum Anpassen der optischen Anordnung (10) auf dem Wärme ableitenden Modul (20) angeordnet ist.
5. Optische Anordnung (10) nach Anspruch 2, **dadurch gekennzeichnet, dass** eine Rippe (21) auf dem Wärme ableitenden Modul (20) angeordnet ist und die Höhe der Rippe (21) zumindest gleich der Höhe eines Abschnitts des Licht emittierenden Moduls (30) ist, das über eine Oberkante der reflektierenden Oberfläche des reflektierenden Moduls (40) hinaus vorsteht.
6. Optische Anordnung (10) nach einem der Ansprüche 1 bis 5, **dadurch gekennzeichnet, dass** das Licht emittierende Modul (30) eine gedruckte Leiterplattenanordnung ist, die eine gedruckte Leiterplatte (32) mit der darauf angeordneten Lichtquelle aufweist.
7. Optische Anordnung (10) nach Anspruch 6, **dadurch gekennzeichnet, dass** ein Wärmeübertragungsmaterial zwischen dem Wärme ableitenden Modul (20) und dem Licht emittierenden Modul (30) angeordnet ist.
8. Optische Anordnung (10) nach Anspruch 6, **dadurch gekennzeichnet, dass** das reflektierende Modul (40) mit einer Positionierungsstruktur versehen ist, die mit einer passenden Positionierungsstruktur des Licht emittierenden Moduls (30) zusammenwirkt.
9. Optische Anordnung (10) nach einem der Ansprüche 1 bis 5, **dadurch gekennzeichnet, dass** das Wärme ableitende Modul (20) einstückig ausgebildet ist.
10. Optische Anordnung (10) nach Anspruch 9, **dadurch gekennzeichnet, dass** das Wärme ableitende Modul (20) aus Aluminium hergestellt ist.
11. Optische Anordnung (10) nach einem der Ansprüche 1 bis 5, **dadurch gekennzeichnet, dass** die optische Anordnung (10) mindestens eine Lichtquelle aufweist, um eine oder mehrere Lichtfunktionen zu realisieren.
12. Optische Anordnung (10) nach Anspruch 11, **dadurch gekennzeichnet, dass** die Lichtquelle eine Leuchtdiode ist.
13. Beleuchtungs- und/oder Signalvorrichtung mit einer optischen Anordnung (10) nach einem der vorhergehenden Ansprüche.

14. Fahrzeug mit der optischen Anordnung (10) nach einem der Ansprüche 1 bis 12 oder der Beleuchtungs- und/oder Signalvorrichtung nach Anspruch 13.

15. Montageprozess für eine optische Anordnung (10) für eine Beleuchtungs- und/oder Signalvorrichtung eines Fahrzeugs, wobei die optische Anordnung (10) umfasst:

- ein Wärme ableitendes Modul (20),
- ein Licht emittierendes Modul (30) und ein reflektierendes Modul (40), wobei das Licht emittierende Modul (30) eine Lichtquelle (31) aufweist und auf dem Wärme ableitenden Modul (20) angeordnet ist, wobei zumindest ein Teil des von der Lichtquelle (31) emittierten Lichts eine reflektierende Oberfläche des reflektierenden Moduls (40) erreicht, wobei eine Verbindungsplatte (45) auf einer Seite des reflektierenden Moduls (40) angeordnet ist, die der reflektierenden Oberfläche gegenüberliegt, die Verbindungsplatte einen Schlitz (46) aufweist, der an einem Ende offen ist, das Wärme ableitende Modul (20) entsprechend einen zylindrischen Drehzapfen (26) aufweist, und der Montageprozess die folgenden Schritte umfasst:

- Einführen des Drehzapfens (26) in den Schlitz (46);
- Drehen des Wärme ableitenden Moduls (20) relative zum reflektierenden Modul (40) um eine Achse senkrecht zur optischen Achse der optischen Anordnung, sodass die Lichtquelle (31) des Licht emittierenden Moduls (30) der reflektierenden Oberfläche des reflektierenden Moduls zugewandt ist;
- Anpassen der Positionen des Wärme ableitenden Moduls (20) und des reflektierenden Moduls (40), während gleichzeitig der Drehzapfen (46) im Schlitz zu seinem Ende geführt wird;
- Verbinden des reflektierenden Moduls (40) mit dem Wärme ableitenden Modul (20), sobald das reflektierende Modul (40) und das Wärme ableitende Modul (20) angepasst sind, sodass das reflektierende Modul (40) am Wärme ableitenden Modul (20) lagefixiert ist.

Revendications

1. Ensemble optique (10) pour un appareil d'éclairage et/ou de signalisation d'un véhicule, comprenant un module de dissipation thermique (20), un module d'émission de lumière (30) et un module de réflexion (40), le module d'émission de lumière (30) compor-

tant une source de lumière (31) et étant disposé sur le module de dissipation thermique (20), avec au moins une partie de la lumière émise par la source de lumière (31) qui atteint une surface réfléchissante du module de réflexion (40), dans lequel une plaque de raccordement (45) est disposée sur un côté du module de réflexion (40) qui est à l'opposé de la surface réfléchissante, **caractérisé en ce que** la plaque de raccordement comporte une fente (46) qui est ouverte à une extrémité, le module de dissipation thermique (20) comporte parallèlement un pivot cylindrique (26), le pivot (26) étant configuré pour, pendant le procédé d'assemblage de l'ensemble optique, être inséré dans la fente (46) et pour permettre la rotation du module de dissipation thermique (20), autour d'un axe perpendiculaire à l'axe optique de l'ensemble optique, par rapport au module de réflexion (40) de telle sorte que la source de lumière (31) du module d'émission de lumière (30) fait face à la surface réfléchissante du module de réflexion (40), le pivot (26) étant configuré pour être ensuite guidé dans la fente vers son extrémité ouverte, en même temps que les positions du module de dissipation thermique (20) et du module de réflexion (40) sont ajustées, et une fois ajustées, le module de réflexion (40) est configuré pour être fixé en position et raccordé au module de dissipation thermique (20).

2. Ensemble optique (10) selon la revendication 1, **caractérisé en ce qu'il** est pourvu de multiples plaques de raccordement (45) comportant des fentes (46).

3. Ensemble optique (10) selon la revendication 2, **caractérisé en ce que** la largeur de la fente (46) correspond au diamètre du pivot (26).

4. Ensemble optique (10) selon la revendication 2, **caractérisé en ce qu'une** partie d'articulation d'un module d'ajustement (50) destiné à ajuster l'ensemble optique (10) est disposée sur le module de dissipation thermique (20).

5. Ensemble optique (10) selon la revendication 2, **caractérisé en ce qu'une** nervure (21) est disposée sur le module de dissipation thermique (20), et la hauteur de la nervure (21) est au moins égale à la hauteur d'une section du module d'émission de lumière (30), qui dépasse d'un bord supérieur de la surface réfléchissante du module de réflexion (40).

6. Ensemble optique (10) selon l'une quelconque des revendications 1 à 5, **caractérisé en ce que** le module d'émission de lumière (30) est un ensemble carte de circuit imprimé, qui comporte une carte de circuit imprimé (32) avec la source de lumière disposée pardessus.

7. Ensemble optique (10) selon la revendication 6, **ca-**

ractérisé en ce qu'un matériau de transfert de chaleur est disposé entre le module de dissipation thermique (20) et le module d'émission de lumière (30).

8. Ensemble optique (10) selon la revendication 6, **caractérisé en ce que** le module de réflexion (40) est pourvu d'une structure de positionnement qui agit conjointement avec une structure de positionnement complémentaire du module d'émission de lumière (30). 5
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9. Ensemble optique (10) selon l'une quelconque des revendications 1 à 5, **caractérisé en ce que** le module de dissipation thermique (20) est formé d'une seule pièce. 15
10. Ensemble optique (10) selon la revendication 9, **caractérisé en ce que** le module de dissipation thermique (20) est constitué d'aluminium. 20
11. Ensemble optique (10) selon l'une quelconque des revendications 1 à 5, **caractérisé en ce que** l'ensemble optique (10) comporte au moins une source de lumière, afin d'assurer une ou plusieurs fonctions d'éclairage. 25
12. Ensemble optique (10) selon la revendication 11, **caractérisé en ce que** la source de lumière est une diode électroluminescente. 30
13. Appareil d'éclairage et/ou de signalisation, comportant un ensemble optique (10) selon l'une quelconque des revendications précédentes.
14. Véhicule, comportant l'ensemble optique (10) selon l'une quelconque des revendications 1 à 12 ou l'appareil d'éclairage et/ou de signalisation selon la revendication 13. 35
15. Procédé d'assemblage d'un ensemble optique (10) pour un appareil d'éclairage et/ou de signalisation d'un véhicule, l'ensemble optique (10) comprenant 40
 - un module de dissipation thermique (20),
 - un module d'émission de lumière (30) et un module de réflexion (40), le module d'émission de lumière (30) comportant une source de lumière (31) et étant disposé sur le module de dissipation thermique (20), avec au moins une partie de la lumière émise par la source de lumière (31) qui atteint une surface réfléchissante du module de réflexion (40), une plaque de raccordement (45) étant disposée sur un côté du module de réflexion (40) qui est à l'opposé de la surface réfléchissante, la plaque de raccordement comportant une fente (46) qui est ouverte à une extrémité, le module de dissipation thermique (20) comportant parallèlement un pivot 45
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cylindrique (26), le procédé d'assemblage comprenant les étapes suivantes :

- insertion du pivot (26) dans la fente (46) ;
- rotation du module de dissipation thermique (20) par rapport au module de réflexion (40) autour d'un axe perpendiculaire à l'axe optique de l'ensemble optique, de telle sorte que la source de lumière (31) du module d'émission de lumière (30) fasse face à la surface réfléchissante du module de réflexion ;
- ajustement des positions du module de dissipation thermique (20) et du module de réflexion (40) en même temps que le pivot (46) est guidé dans la fente vers son extrémité ouverte ;
- raccordement du module de réflexion (40) au module de dissipation thermique (20) une fois que le module de réflexion (40) et le module de dissipation (20) ont été ajustés, de telle sorte que le module de réflexion (40) soit fixé en position au module de dissipation thermique (20) .

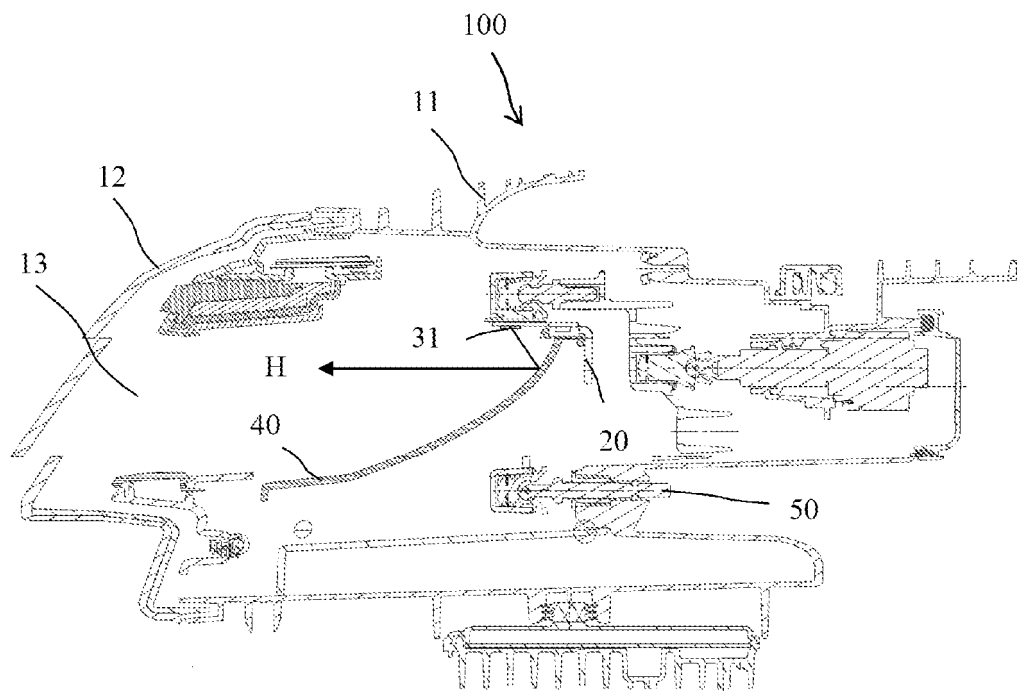


Fig. 1

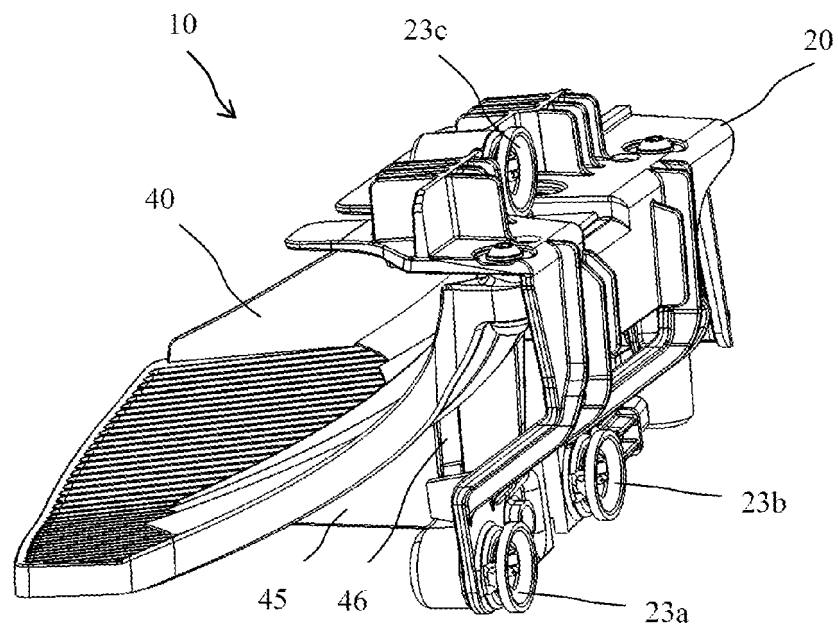


Fig. 2

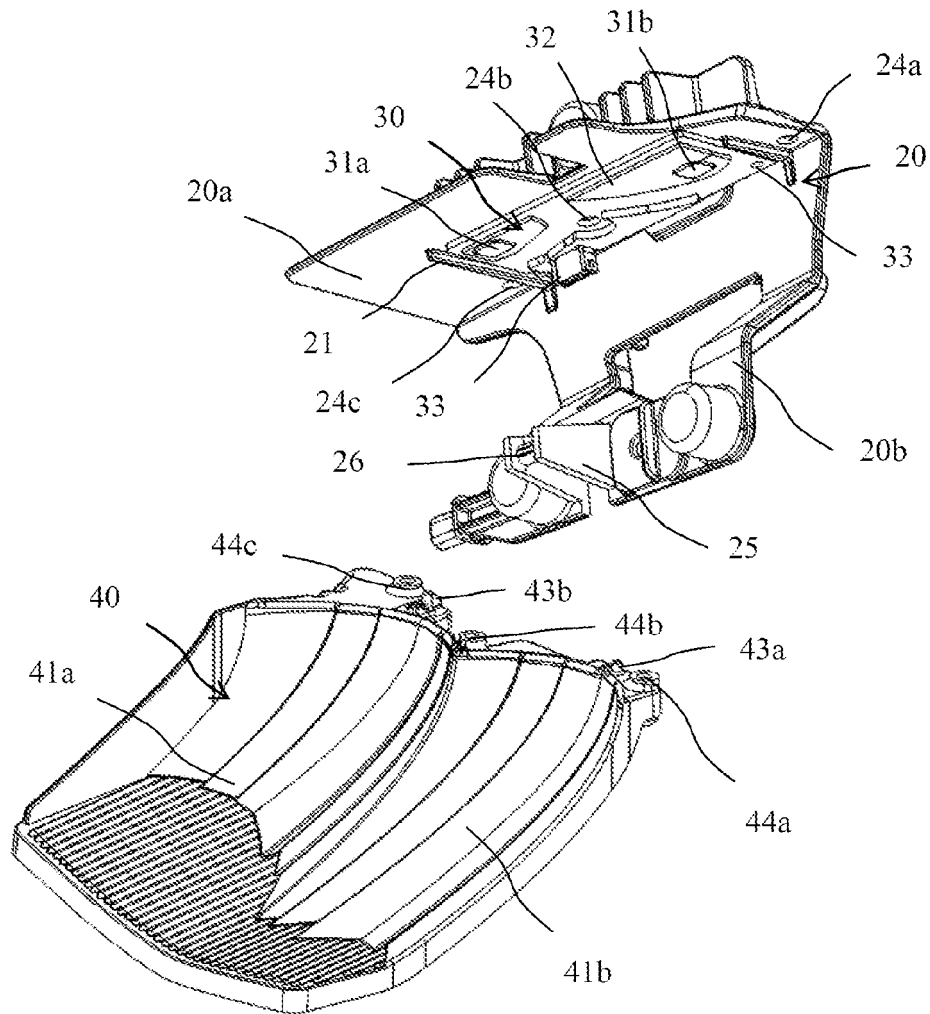


Fig. 3

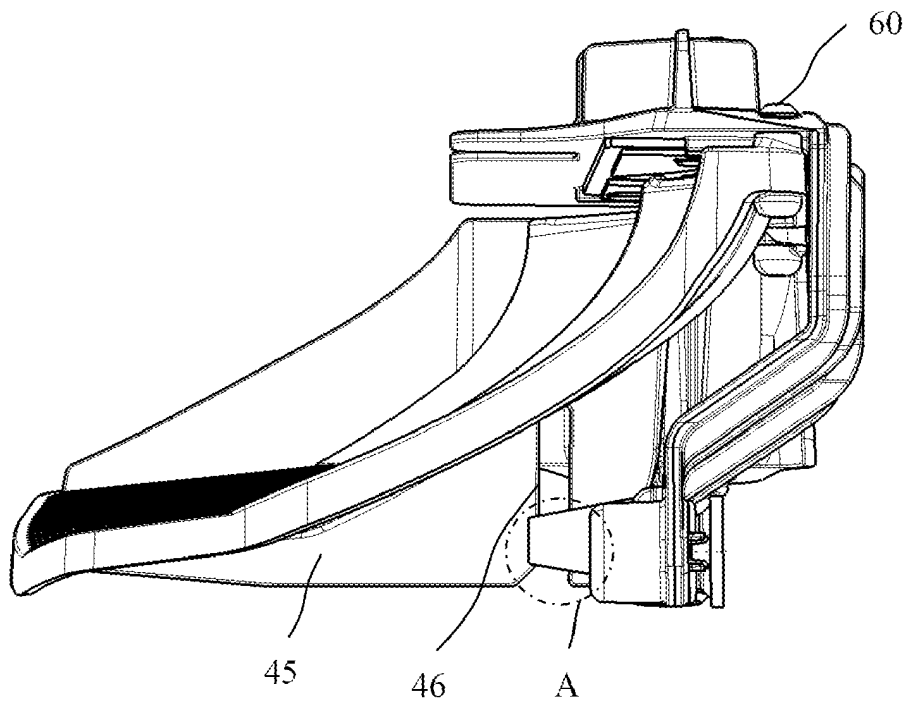


Fig. 4

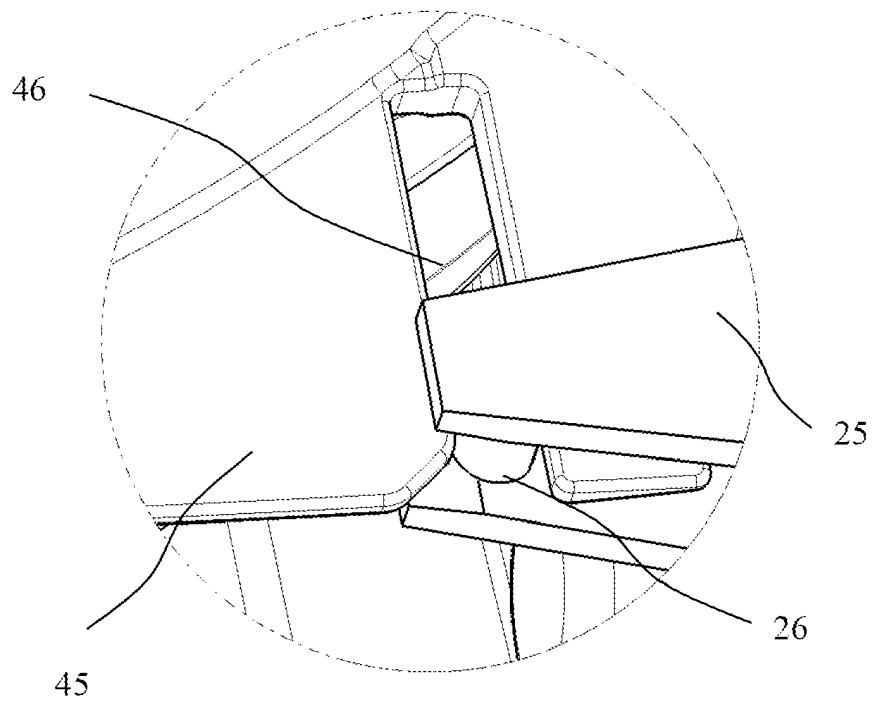


Fig. 5

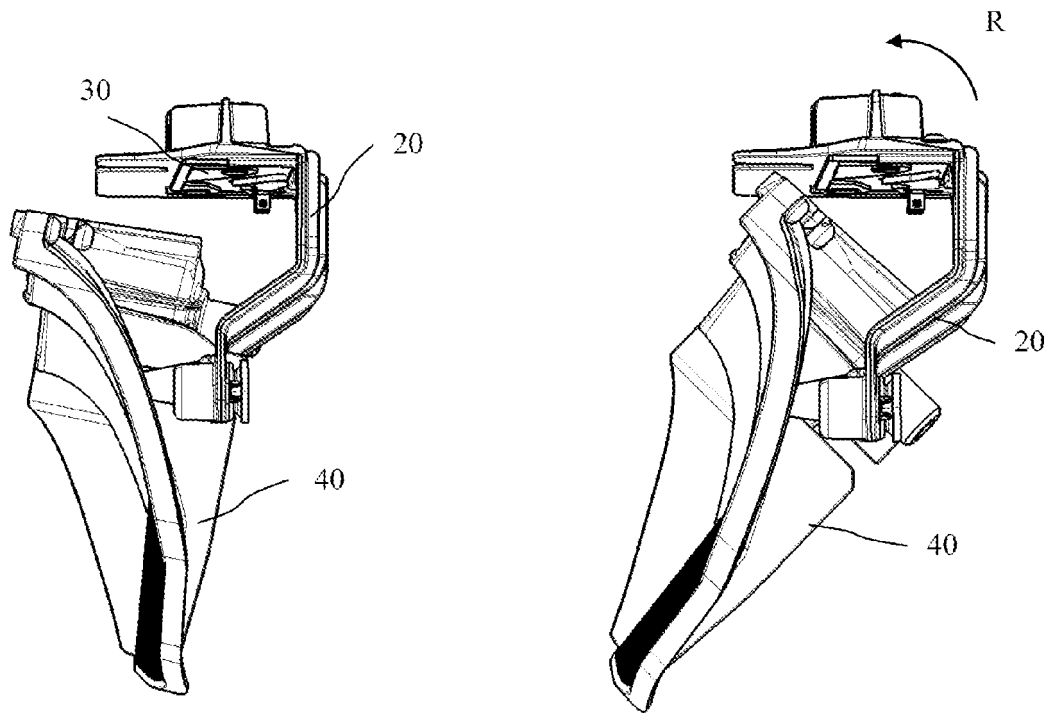


Fig. 6(a)

Fig. 6(b)

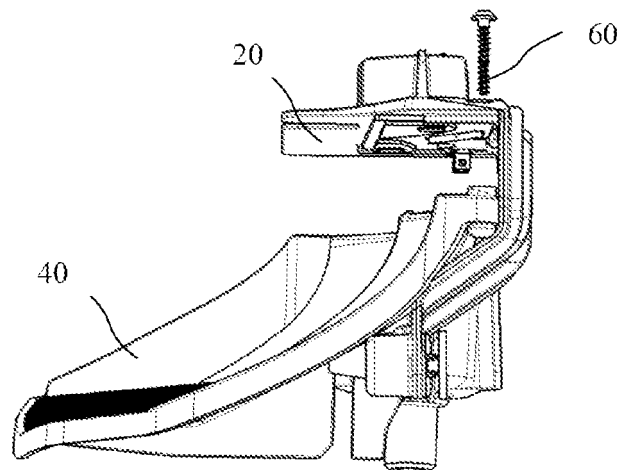


Fig. 6(c)