(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 3 540 295 B1**

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention of the grant of the patent:
**20.09.2023 Bulletin 2023/38**

(21) Application number: **18161797.8**

(22) Date of filing: **14.03.2018**

(51) International Patent Classification (IPC):
***F21S 41/143*** *(2018.01)* ***F21S 41/20*** *(2018.01)*
***F21S 41/24*** *(2018.01)* ***F21S 41/32*** *(2018.01)*
***F21S 41/663*** *(2018.01)* ***F21S 43/40*** *(2018.01)*
***F21S 43/14*** *(2018.01)* ***F21S 43/237*** *(2018.01)*
***F21S 43/243*** *(2018.01)* ***F21S 41/27*** *(2018.01)*

(52) Cooperative Patent Classification (CPC):
**F21S 41/143; F21S 41/27; F21S 41/285**

(54) **VEHICLE HEADLAMP ASSEMBLY**

FAHRZEUG-SCHEINWERFER-ANORDNUNG

ENSEMBLE DE PHARE DE VÉHICULE

(84) Designated Contracting States:
**AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR**

(43) Date of publication of application:
**18.09.2019 Bulletin 2019/38**

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## Description

**[0001]** The invention relates to a vehicle light assembly, as known from DE 10 2010 018 119 A1 or DE 20 2013 101 509 U1.

**[0002]** As shown in Figures 1 and 2, a vehicle light assembly, disclosed in Taiwanese Patent No. I582335, includes a light emitter module 1 and a heat dissipation member 2. The light emitter module 1 includes a lens 11 and a light emitter 12. The lens 1 has a light entry surface 111, a light exit surface 112 spaced apart from the light entry surface 111 along an optical axis (L), and two opposite flank surfaces 113 connecting the light entry surface 111 to the light exit surface 112 along the optical axis (L).

**[0003]** The light emitter 12 emits light rays into the lens 11 through the light entry surface 111. Some light rays (A) (see arrow A in Fig. 2), which beam forwardly and exit from the light exit surface 112, are concentrated to a central area in front of the vehicle light assembly. Some light rays (B) (see arrow B in Fig. 2) are transmitted forwardly by multiple reflections between the flank surfaces 113 to exit from the light exit surface 112. The light rays (B), which are reflected from a left one of the flank surfaces 113 to the light exit surface 112, are emitted forward and rightward from the light exit surface 112 after exiting the light exit surface 112. The light rays (B), which are reflected from a right one of the flank surfaces 113 to the light exit surface 112, are emitted forward and leftward from the light exit surface 112 after exiting the light exit surface 112.

**[0004]** In practice, it is found that the light rays (A) and (B) project a non-continuous light pattern on an illuminated plane which forms three discrete bright regions. Because dark regions appear between adjacent bright regions, the non-continuous light pattern is unable to provide satisfactory visual effects. Furthermore, because the flank surfaces 113 are essentially utilized for light reflection, the light pattern provided by the vehicle light assembly is significantly affected by the flank surfaces 113. Hence, it is impossible to vary greatly the profile and curvature of the flank surfaces 113 for improving design varieties.

**[0005]** Therefore, an object is to provide a vehicle light assembly that can alleviate at least one of the drawbacks of the prior art.

**[0006]** According to the invention, a vehicle light assembly with the features of indenpendent claim 1 is provided.

**[0007]** Other features and advantages of the invention will become apparent in the following detailed description of the embodiments with reference to the accompanying drawings, of which:

Figure 1 is a perspective view of an existing vehicle light assembly;

Figure 2 is a top sectional view of the existing vehicle light assembly;

Figure 3 is a rear perspective view of a vehicle light assembly according to a first embodiment of the present invention;

Figure 4 is a side sectional view of the first embodiment functioning as a high beam light bulb;

Figure 5 is a top sectional view of the first embodiment;

Figure 6 is an enlarged fragmentary sectional view of the first embodiment;

Figure 7 is a side sectional view of the first embodiment functioning as a low beam light bulb;

Figure 8 is a front perspective view of a vehicle light assembly according to a second embodiment;

Figure 9 is a front perspective view of a vehicle light assembly according to a third embodiment of the present invention;

Figure 10 is a rear perspective view of the third embodiment; and

Figure 11 is a front perspective view of a vehicle light assembly according to a fourth embodiment of the present invention.

**[0008]** Before the invention is described in greater detail, it should be noted that where considered appropriate, reference numerals or terminal portions of reference numerals have been repeated among the figures to indicate corresponding or analogous elements, which may optionally have similar characteristics.

**[0009]** Referring to Figures 3 to 6, a vehicle light assembly according to a first embodiment of the present invention includes a light emitter module 3. The light emitter module 3 includes a lens 4, a light emitter 5 disposed at a rear side of the lens 4, and a circuit board 51.

**[0010]** The lens 4 includes a curved light exit surface 42 disposed at a front side of the lens 4, a light entry surface 41, left and right reflection surfaces 43, left and right bridge surfaces 44, and left and right flank surfaces 45.

**[0011]** The light entry surface 41 is spaced apart from the curved light exit surface 42 along an optical axis (L), and is disposed adjacent to the light emitter 5. The light entry surface 41 has a first light entry portion 411, a base portion 410, and a second light entry portion 412. The optical axis (L) passes through the first light entry portion 411. The first light entry portion 411 is convexed rearwardly in a direction away from the curved light exit surface 42. The base portion 410 is flat and disposed around the optical axis (L) rearwardly of the first light entry portion 411. The second light entry portion 412 is connected between an annular inner periphery of the base portion 410 and the first light entry portion 411. The first and second light entry portions 411, 412 cooperatively bound a light entry hole 413. The light entry hole 413 has an opening 414 that faces rearward and that is formed in the base portion 410. In other words, the light entry hole 413 is immediately disposed at the front of the light emitter 5, and the first light entry portion (411) is immediately disposed at the front of the light entry hole 413. The first

light entry portion 411 is convexed rearwardly into the light entry hole 413. The base portion 410 is close to the light emitter 5.

**[0012]** The curved light exit surface 42 has an exit surface top side 42a, an exit surface bottom side 42b, an exit surface left side 42c, and an exit surface right side 42d (see Figs. 3 and 8). The curved light exit surface 42 protrudes arcuately and forwardly from the exit surface top and bottom sides 42a, 42b to a region disposed midway between the exit surface top and bottom sides 42a, 42b so that the exiting light rays can be directed forward and downward. Further, the curved light exit surface 42 indents rearwardly and arcuately from the exit surface left and right sides 42c, 42d to a region disposed midway between the exit surface left and right sides 42c, 42d so that the exiting light rays slant slightly leftward and rightward to increase the range of illumination in a left-right direction. By virtue of the particular profile and curvature of the curved light exit surface 42, it is possible to effectively control an illuminated area.

**[0013]** The left and right reflection surfaces 43 are respectively connected to left and right sides of the light entry surface 41 to reflect light rays of the light emitter 5 incident on the light entry surface 41 toward the curved light exit surface 42. Particularly, the left and right reflection surfaces 43 are respectively connected to left and right sides of the base portion 410. Each of left and right reflection surfaces 43 is a parabolic surface. The left or right reflection surface 43 should not be large. The length of the left or right reflection surface 43 in a front-rear direction is shorter than that of the left or right flank surface 45.

**[0014]** The left and right bridge surfaces 44 respectively extend leftward and rightward from the left and right reflection surfaces 43 and connect rear ends of the left and right flank surfaces 45.

**[0015]** The left and right flank surfaces 45 are respectively disposed at the left side of the left reflection surface 43 and the right side of the right reflection surface 43 and extend forwardly from the respective left and right bridge surfaces 44 to connect the curved light exit surface 42. A minimum distance (d1) of each of the left and right flank surfaces 45 from the optical axis (L) is greater than a maximum distance (d2) of each of the left and right reflection surfaces 43 from the optical axis (L).

**[0016]** The light emitter 5, such as an LED, is mounted on the circuit board 51, and both of them are located rearward of the base portion 410 of the light entry surface 41. The light emitter 5 faces the first light entry portion 411 and the opening 414 of the light entry hole 413. In this embodiment, the light emitter 5 has a center located at the optical axis (L), and the light emitter module 3 functions as a high beam light bulb. Referring to Figure 7, when an edge of the light emitter 5 is located at the optical axis (L), the light emitter module 3 functions as a low beam light bulb. By orienting the light emitter 5 differently with respect to the optical axis (L), the light emitter module 3 is capable of providing different illumination functions.

**[0017]** Referring back to the Figures 4 to 6, when the light rays of the light emitter 5 enter the lens 4 through the first and second light entry portions 411, 412 of the light entry surface 41, the first light entry portion 411, which protrudes rearward, facilitates converging of the light rays after refraction. The left and right reflection surfaces 43 reflect the light rays to be closer to the optical axis (L) rather than toward the left and right flank surfaces 45. Afterwards, the light rays exit the curved light exit surface 42. The left reflection surface 43 reflects the light rays toward the curved light exit surface 42 at the left side of the optical axis (L). The right reflection surface 43 reflects the light rays to the curved light exit surface 42 at the right side of the optical axis (L). By virtue of the particular curvature and profile of the curved light exit surface 42, the curved light exit surface 42 can generate an illumination area sufficiently large to provide a light distribution pattern and brightness required by vehicle lighting regulations. Because the vehicle light assembly of the present invention can enable the exiting light rays to provide uniformly and continuously distributed lighting regions, occurrence of dark regions that interrupt or discontinue the light distribution pattern can be avoided. In addition, because the light rays of the light emitter 5 are reflected by the left and right reflection surfaces 43, the light rays almost do not travel to the left and right flank surfaces 45. Therefore, the left and right flank surfaces 45 are not main functional surfaces for reflecting the light rays and controlling the light distribution pattern. Accordingly, the left and right flank surfaces 45 may be provided with other design varieties, such as different extension directions, different curvatures, different slopes, different embossed patterns, etc., without affecting the desired light distribution pattern.

**[0018]** Referring back to Figure 5 and 6, the left and right reflection surfaces 43 are parabolic surfaces having respective focal points (F) disposed at a same location that has a distance from the entry surface 41 more longer than a distance of the light emitter 5 from the entry surface 41 and that is offset from the optical axis (L). The focal point (F) is at the rear side of the light emitter 5. Experiments showed that the aforesaid design can provide considerably high illumination efficiency and brightness. If the focal point (F) of the left and right reflection surfaces 43 falls to the location of the light emitter 5, or between the first light entry portion 411 of the light entry surface 41 and the light emitter 5 (i.e., at the front side of the light emitter 5), in order to achieve the desired optical effects, the light entry surface 41 will have to be located more forwardly and the curved light exit surface 42 will have to be adjusted and shifted forwardly. That is to say, the lens 4 will need an increased front-rear length (i.e., an increased distance between the base portion 410 and the curved light exit surface 42), which is not beneficial for miniaturization of the lens 4. According to the vehicle light assembly of the present disclosure, because the focal point (F) of the left and right reflection surfaces 43 is offset from the optical axis (L) and disposed at the

distance from the entry surface 41 more longer than the distance of the light emitter 5 from the entry surface 41, the front-rear length of the lens 4 can be shortened for minimizing the lens 4. Further, the optical axis (L) intersects the opening 414 at an intersection point (C). Optimally, the first light entry portion 411 of the light entry surface 41 has a focal point located at the intersection point (C). The curved light exit surface 42 has a focal point located at the intersection point (C) or located in vicinity of the intersection point (C).

**[0019]** Referring to Figure 8, a vehicle light assembly according to a second embodiment of the present invention includes a plurality of the light emitter modules 3 juxtaposed to each other. One of the left and right flank surfaces 45 of each of the juxtaposed light emitter modules 3 faces one of left and right the flank surfaces 45 of the other one of the juxtaposed light emitter modules 3. In this embodiment, the light emitter modules 3 are, but not limited to, juxtaposed to each other in a row. Every two adjacent light emitter modules 3 may be spaced apart from each other, or may adjoin each other. Further, at least one of the light emitter modules 3 functions as a high beam light bulb, and at least one of the light emitter modules 3 functions as a low beam light bulb. Therefore, the vehicle light assembly of the present invention can be controlled to provide the low beam function or high beam function. In other embodiments, all of the light emitter modules 3 may function as high or low beam light bulbs.

**[0020]** On the other hand, because the left and right flank surfaces 45 of each lens 4 are not essential components for controlling the light distribution pattern, the lenses 4 of the light emitter modules 3 can be juxtaposed to each other by adjoining the left and right flank surfaces 45 of every two adjacent ones of the lenses 4. By combining the light emitter modules 3 in different ways, it is possible to not only provide various unique and aesthetically pleasing appearances, but also allow the vehicle light assembly to match suitably with different installation spaces and to function differently as high or low beam light bulbs.

**[0021]** Referring to Figures 9 and 10, a vehicle light assembly according to a third embodiment of the present invention includes a plurality of the light emitter modules 3 juxtaposed to each other along a line and are integrally formed as one piece. The front-rear lengths of the light emitter modules 3 are different.

**[0022]** Referring to Figure 11, a vehicle light assembly according to a fourth embodiment of the present invention includes a plurality of the light emitter modules 3 are integrally interconnected and arranged to have an L-shaped configuration.

## Claims

**1.** A vehicle light assembly which comprises
at least one light emitter module (3) including a lens (4) and a light emitter (5) disposed at a rear side of said lens (4), said lens (4) including

a curved light exit surface (42) disposed at a front side of said lens (4),
a light entry surface (41) spaced apart from said light exit surface (42) along an optical axis (L), and disposed adjacent to said light emitter (5), said light entry surface (41) having a first light entry portion (411) through which the optical axis (L) passes,
left and right reflection surfaces (43) respectively connected to left and right sides of said light entry surface (41) to reflect light of said light emitter (5) passing through said light entry surface (41) to said curved light exit surface (42), each of said left and right reflection surfaces (43) being a parabolic surface and having a focal point (F) that is disposed at a distance from said entry surface (41) more longer than a distance of said light emitter (5) from said entry surface (41) and that is offset from the optical axis (L), and
left and right flank surfaces (45) respectively disposed at a left side of said left reflection surface (43) and a right side of said right reflection surface (43) and extending forwardly to connect said curved light exit surface (42) when viewed in the top sectional view of said lens,
**characterized by**:

each of said left and right flank surfaces (45) having a minimum distance (d1) from the optical axis (L), each of said left and right reflection surfaces (43) having a maximum distance (d2) from the optical axis (L), the minimum distance (d1) of each of said left and right flank surfaces (45) being greater than the maximum distance (d2) of each of said left and right reflection surfaces (43); and
said first light entry portion (411) being convexed rearwardly in a direction away from said curved light exit surface (42) when viewed in a top sectional view of said lens;
wherein said light entry surface (41) further has a base portion (410) and a second light entry portion (412), said base portion (410) disposed around the optical axis (L) rearwardly of said first light entry portion (411), said second light entry portion (412) being connected between an annular inner periphery of said base portion (410) and said first light entry portion (411), said first and second light entry portions (411, 412) cooperatively bounding a light entry hole (413); and
wherein said focal point (F) of each of said left and right reflection surfaces (43) is at a

rear side of said light emitter (5).

2. The vehicle light assembly as claimed in Claims 1, **characterized in that** said curved light exit surface (42) has an exit surface top side, an exit surface bottom side, an exit surface left side, and an exit surface right side, said curved light exit surface protruding arcuately and forwardly from said exit surface top and bottom sides to a region located midway between said exit surface top and bottom sides.

3. The vehicle light assembly as claimed in Claim 2, **characterized in that** said curved light exit surface (42) indents rearwardly and arcuately from said exit surface left and right sides to a region located midway between said exit surface left and right sides.

4. The vehicle light assembly as claimed in any one of Claims 1 to 3, **characterized in that** said light emitter (5) has a center located at the optical axis (L), said at least one light emitter module (3) functioning as a high beam light bulb.

5. The vehicle light assembly as claimed in any one of Claims 1 to 3, **characterized in that** said light emitter (5) has an edge located at the optical axis (L), said at least one light emitter module (3) functioning as a low beam light bulb.

6. The vehicle light assembly as claimed in Claim 1, **characterized in that** said at least one light emitter module includes a plurality of light emitter modules (3) juxtaposed to each other, one of said left and right flank surfaces (45) of each of said light emitter modules (3) facing one of left and right said flank surfaces (45) of the other one of said light emitter modules (3).

7. The vehicle light assembly as claimed in Claim 1, **characterized in that** said at least one light emitter module includes a plurality of light emitter modules (3) juxtaposed to each other, at least one of said light emitter modules (3) functioning as a high beam light bulb, at least one of said light emitter modules (3) functioning as a low beam light bulb.

8. The vehicle light assembly as claimed in Claim 1, **characterized in that** said at least one light emitter module (3) includes a plurality of light emitter modules (3) juxtaposed to each other, all of which function as high or low beam light bulbs.

9. The vehicle light assembly as claimed in claim 1, **characterized in that**:
said light entry surface (41) further has a light entry hole (413) immediately disposed at a front of said light emitter (5), said first light entry portion (411) immediately disposed at a front of said light entry hole (413), the optical axis (L) passing through said light entry hole (413) and said first light entry portion (411), said first light entry portion (411) being convexed rearwardly into said light entry hole (413),

10. The vehicle light assembly as claimed in Claim 9, **characterized in that** said light entry hole (413) has an opening (414) formed in said base portion (410), said left and right reflection surfaces (43) being connected to left and right sides of said base portion (410), said base portion (410) being close to said light emitter (5).

**Patentansprüche**

1. Fahrzeugbeleuchtungsanordnung, die folgendes aufweist

mindestens ein Lichtemittermodul (3) mit einer Linse (4) und einem Lichtemitter (5), der an einer Rückseite der Linse (4) ausgebildet ist, wobei die Linse (4) folgendes aufweist
eine gekrümmte Lichtaustrittsfläche (42), die derart ausgebildet ist, dass sie an einer Vorderseite der Linse (4) angeordnet ist,
eine Lichteintrittsfläche (41), die von der Lichtaustrittsfläche (42) entlang einer optischen Achse (L) beabstandet und derart ausgebildet ist, dass sie dem Lichtemitter (5) benachbart ist, wobei die Lichteintrittsfläche (41) einen ersten Lichteintrittsabschnitt (411) aufweist, durch den die optische Achse (L) verläuft,
linke und rechte Reflexionsflächen (43), die jeweils mit der linken und rechten Seite der Lichteintrittsfläche (41) verbunden sind, um Licht des Lichtemitters (5), das durch die Lichteintrittsfläche (41) hindurchgeht, zu der gekrümmten Lichtaustrittsfläche (42) zu reflektieren, wobei jede der linken und rechten Reflexionsflächen (43) eine Parabolfläche ist und einen Brennpunkt (F) aufweist, der in einem Abstand von der Eintrittsfläche (41) ausgebildet ist, der größer ist als ein Abstand des Lichtemitters (5) von der Eintrittsfläche (41) und der von der optischen Achse (L) versetzt ist, und
eine linke und eine rechte Flankenfläche (45), die jeweils an einer linken Seite der linken Reflexionsfläche (43) und einer rechten Seite der rechten Reflexionsfläche (43) ausgebildet sind und sich nach vorne erstrecken, um die gekrümmte Lichtaustrittsfläche (42) zu verbinden, wenn sie in der oberen Schnittansicht der Linse betrachtet wird,
**dadurch gekennzeichnet, dass**:

jede der linken und rechten Flankenflächen (45) einen minimalen Abstand (d1) von der

optischen Achse (L) aufweist, jede der linken und rechten Reflexionsflächen (43) einen maximalen Abstand (d2) von der optischen Achse (L) aufweist, wobei der minimale Abstand (d1) jeder der linken und rechten Flankenflächen (45) größer als der maximale Abstand (d2) jeder der linken und rechten Reflexionsflächen (43) ist; und
wobei der erste Lichteintrittsabschnitt (411) nach hinten in einer Richtung weg von der gekrümmten Lichtaustrittsfläche (42) konvex ist, wenn er in einer oberen Schnittansicht der Linse betrachtet wird;
wobei die Lichteintrittsfläche (41) ferner einen Basisabschnitt (410) und einen zweiten Lichteintrittsabschnitt (412) aufweist, wobei der Basisabschnitt (410) derart ausgebildet ist, dass er um die optische Achse (L) herum hinter dem ersten Lichteintrittsabschnitt (411) angeordnet ist, wobei der zweite Lichteintrittsabschnitt (412) zwischen einer ringförmigen inneren Peripherie des Basisabschnitts (410) und dem ersten Lichteintrittsabschnitt (411) verbunden ist, wobei der erste und der zweite Lichteintrittsabschnitt (411, 412) zusammenwirkend ein Lichteintrittsloch (413) begrenzen; und
wobei der Brennpunkt (F) jeder der linken und rechten Reflexionsflächen (43) an einer Rückseite des Lichtemitters (5) liegt.

**2.** Fahrzeugbeleuchtungsanordnung nach Anspruch 1, **dadurch gekennzeichnet, dass** die gekrümmte Lichtaustrittsfläche (42) eine Austrittsflächenoberseite, eine Austrittsflächenunterseite, eine linksseitige Austrittsfläche und eine rechtsseitige Austrittsfläche aufweist, wobei sich die gekrümmte Lichtaustrittsfläche von der Austrittsflächenoberseite und der Austrittsflächenunterseite bogenförmig und nach vorne zu einem Bereich erhebt, der in der Mitte zwischen der Austrittsflächenoberseite und der Austrittsflächenunterseite liegt.

**3.** Fahrzeugbeleuchtungsanordnung nach Anspruch 2, **dadurch gekennzeichnet, dass** die gekrümmte Lichtaustrittsfläche (42) von der linksseitigen und rechtsseitigen Austrittsfläche nach hinten und bogenförmig zu einem in der Mitte zwischen der linken und rechten Austrittsfläche liegenden Bereich verlaufend eintaucht.

**4.** Fahrzeugbeleuchtungsanordnung nach einem der Ansprüche 1 bis 3, **dadurch gekennzeichnet, dass** der Lichtemitter (5) ein auf der optischen Achse (L) liegendes Zentrum aufweist, wobei das mindestens eine Lichtemittermodul (3) als Fernlichtlampe fungiert.

**5.** Fahrzeugbeleuchtungsanordnung nach einem der Ansprüche 1 bis 3, **dadurch gekennzeichnet, dass** der Lichtemitter (5) eine an der optischen Achse (L) liegende Kante aufweist, wobei das mindestens eine Lichtemittermodul (3) als Abblendlichtlampe fungiert.

**6.** Fahrzeugbeleuchtungsanordnung nach Anspruch 1, **dadurch gekennzeichnet, dass** das mindestens eine Lichtemittermodul mehrere nebeneinander angeordnete Lichtemittermodule (3) aufweist, wobei eine der linken und rechten Flankenflächen (45) jedes der Lichtemitter-Module (3) einer der linken und rechten Flankenflächen (45) des anderen der Lichtemitter-Module (3) gegenüberliegt.

**7.** Fahrzeugbeleuchtungsanordnung nach Anspruch 1, **dadurch gekennzeichnet, dass** das mindestens eine Lichtemittermodul mehrere nebeneinander angeordnete Lichtemittermodule (3) aufweist, wobei mindestens eines der Lichtemittermodule (3) als Fernlichtlampe und mindestens eines der Lichtemittermodule (3) als Abblendlichtlampe fungiert.

**8.** Fahrzeugbeleuchtungsanordnung nach Anspruch 1, **dadurch gekennzeichnet, dass** das mindestens eine Lichtemittermodul (3) mehrere nebeneinander angeordnete Lichtemittermodule (3) aufweist, die alle als Fern- oder Abblendlichtlampen fungieren.

**9.** Fahrzeugbeleuchtungsanordnung nach Anspruch 1, **dadurch gekennzeichnet, dass**:

die Lichteintrittsfläche (41) ferner ein Lichteintrittsloch (413) unmittelbar an einer Vorderseite des Lichtemitters (5) aufweist,
der erste Lichteintrittsabschnitt (411) unmittelbar an einer Vorderseite des Lichteintrittslochs (413) ausgebildet ist,
die optische Achse (L) durch das Lichteintrittsloch (413) und den ersten Lichteintrittsabschnitt (411) verläuft, und
der erste Lichteintrittsabschnitt (411) nach hinten in das Lichteintrittsloch (413) hinein gewölbt ist.

**10.** Fahrzeugbeleuchtungsanordnung nach Anspruch 9,
**dadurch gekennzeichnet, dass** das Lichteintrittsloch (413) eine Öffnung (414) aufweist, die in dem Basisabschnitt (410) ausgebildet ist, wobei die linke und die rechte Reflexionsfläche (43) mit der linken und der rechten Seite des Basisabschnitts (410) verbunden sind, wobei der Basisabschnitt (410) nahe an dem Lichtemitter (5) liegt.

**Revendications**

**1.** Ensemble phare de véhicule comprenant :

au moins un module émetteur de lumière (3) incluant une lentille (4) et un émetteur de lumière (5) disposé du côté arrière de ladite lentille (4), ladite lentille (4) incluant

une surface de sortie de lumière incurvée (42) disposée du côté avant de ladite lentille (4),
une surface d'entrée de lumière (41) espacée de ladite surface de sortie de lumière (42) le long d'un axe optique (L) et disposée de manière adjacente audit émetteur de lumière (5), ladite surface d'entrée de lumière (41) ayant une première partie d'entrée de lumière (411) à travers laquelle passe l'axe optique (L),

des surfaces de réflexion gauche et droite (43) respectivement reliées aux côtés gauche et droit de ladite surface d'entrée de lumière (41) pour réfléchir la lumière dudit émetteur de lumière (5) passant à travers ladite surface d'entrée de lumière (41) vers ladite surface de sortie de lumière incurvée (42), chacune desdites surfaces de réflexion gauche et droite (43) étant une surface parabolique et ayant un point focal (F) qui est disposé à une distance de ladite surface d'entrée (41) plus longue que la distance dudit émetteur de lumière (5) de ladite surface d'entrée (41) et qui est décalée par rapport à l'axe optique (L), et
des surfaces de flanc gauche et droite (45) respectivement disposées sur un côté gauche de ladite surface de réflexion gauche (43) et un côté droit de ladite surface de réflexion droite (43) et s'étendant vers l'avant pour relier ladite surface de sortie de lumière incurvée (42) dans une vue en coupe supérieure de ladite lentille,
**caractérisé en ce que** :

chacune desdites surfaces de flanc gauche et droite (45) présente une distance minimale (d1) de l'axe optique (L), chacune desdites surfaces de réflexion gauche et droite (43) présente une distance maximale (d2) de l'axe optique (L), la distance minimale (d1) de chacune desdites surfaces de flanc gauche et droite (45) étant supérieure à la distance maximale (d2) de chacune desdites surfaces de réflexion gauche et droite (43) ; et
ladite première partie d'entrée de lumière (411) est convexe vers l'arrière dans une direction opposée à ladite surface de sortie de lumière incurvée (42) dans une vue en coupe supérieure de ladite lentille ;
dans lequel ladite surface d'entrée de lumière (41) présente en outre une partie de base (410) et une seconde partie d'entrée de lumière (412), ladite partie de base (410) étant disposée autour de l'axe optique (L) à l'arrière de ladite première partie d'entrée de lumière (411), ladite seconde partie d'entrée de lumière (412) étant reliée entre une périphérie intérieure annulaire de ladite partie de base (410) et ladite première partie d'entrée de lumière (411), lesdites première et seconde parties d'entrée de lumière (411, 412) délimitant de manière coopérative un trou d'entrée de lumière (413) ; et
dans lequel ledit point focal (F) de chacune desdites surfaces de réflexion gauche et droite (43) se trouve du côté arrière dudit émetteur de lumière (5).

**2.** Ensemble phare de véhicule selon la revendication 1, **caractérisé en ce que** ladite surface de sortie de lumière incurvée (42) présente un côté supérieur de surface de sortie, un côté inférieur de surface de sortie, un côté gauche de surface de sortie et un côté droit de surface de sortie, ladite surface de sortie de lumière incurvée faisant saillie en arc et vers l'avant depuis lesdits côtés supérieur et inférieur de surface de sortie jusqu'à une région située à mi-chemin entre lesdits côtés supérieur et inférieur de surface de sortie.

**3.** Ensemble phare de véhicule selon la revendication 2, **caractérisé en ce que** ladite surface de sortie de lumière incurvée (42) se creuse vers l'arrière et en arc depuis lesdits côtés gauche et droit de surface de sortie jusqu'à une région située à mi-chemin entre lesdits côtés gauche et droit de surface de sortie.

**4.** Ensemble phare de véhicule selon l'une quelconque des revendications 1 à 3, **caractérisé en ce que** ledit émetteur de lumière (5) a un centre situé sur l'axe optique (L), ledit au moins un module émetteur de lumière (3) fonctionnant comme une ampoule de feu de route.

**5.** Ensemble phare de véhicule selon l'une quelconque des revendications 1 à 3, **caractérisé en ce que** ledit émetteur de lumière (5) a un bord situé sur l'axe optique (L), ledit au moins un module émetteur de lumière (3) fonctionnant comme une ampoule de feu de croisement.

**6.** Ensemble phare de véhicule selon la revendication 1, **caractérisé en ce que** ledit au moins un module émetteur de lumière inclut une pluralité de modules émetteurs de lumière (3) juxtaposés les uns aux

autres, l'une desdites surfaces de flanc gauche et droite (45) de chacun desdits modules émetteurs de lumière (3) faisant face à l'une desdites surfaces de flanc gauche et droite (45) de l'autre desdits modules émetteurs de lumière (3).

**7.** Ensemble phare de véhicule selon la revendication 1, **caractérisé en ce que** ledit au moins un module émetteur de lumière inclut une pluralité de modules émetteurs de lumière (3) juxtaposés les uns aux autres, au moins l'un desdits modules émetteurs de lumière (3) fonctionnant comme une ampoule de feu de route, au moins l'un desdits modules émetteurs de lumière (3) fonctionnant comme une ampoule de feu de croisement.

**8.** Ensemble phare de véhicule selon la revendication 1, **caractérisé en ce que** ledit au moins un module émetteur de lumière (3) inclut une pluralité de modules émetteurs de lumière (3) juxtaposés les uns aux autres, qui fonctionnent tous comme des ampoules de feu de route ou de feu de croisement.

**9.** Ensemble phare de véhicule selon la revendication 1, **caractérisé en ce que** :
ladite surface d'entrée de lumière (41) présente en outre un trou d'entrée de lumière (413) disposé immédiatement à l'avant dudit émetteur de lumière (5), ladite première partie d'entrée de lumière (411) étant disposée immédiatement à l'avant dudit trou d'entrée de lumière (413), l'axe optique (L) passant par ledit trou d'entrée de lumière (413) et ladite première partie d'entrée de lumière (411), ladite première partie d'entrée de lumière (411) étant convexe vers l'arrière dans ledit trou d'entrée de lumière (413).

**10.** Ensemble phare de véhicule selon la revendication 9, **caractérisé en ce que** ledit trou d'entrée de lumière (413) présente une ouverture (414) formée dans ladite partie de base (410), lesdites surfaces de réflexion gauche et droite (43) étant reliées aux côtés gauche et droit de ladite partie de base (410), ladite partie de base (410) étant proche dudit émetteur de lumière (5).

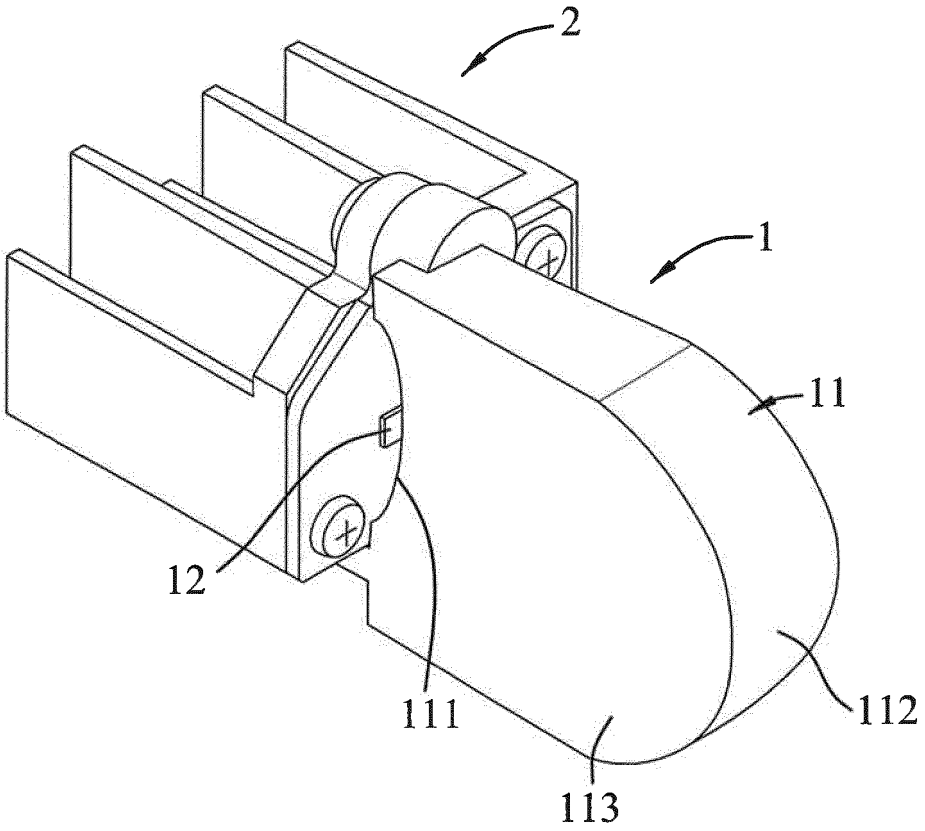


FIG.1
PRIOR ART

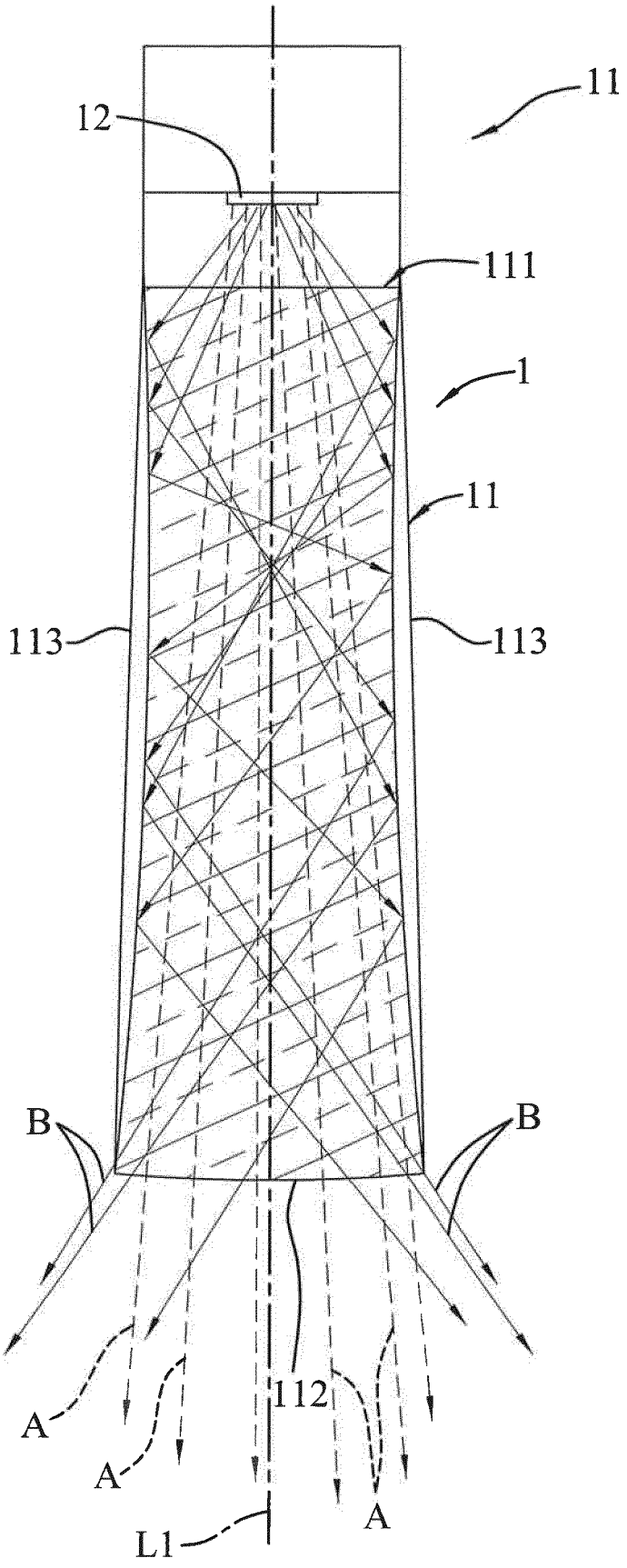


FIG.2
PRIOR ART

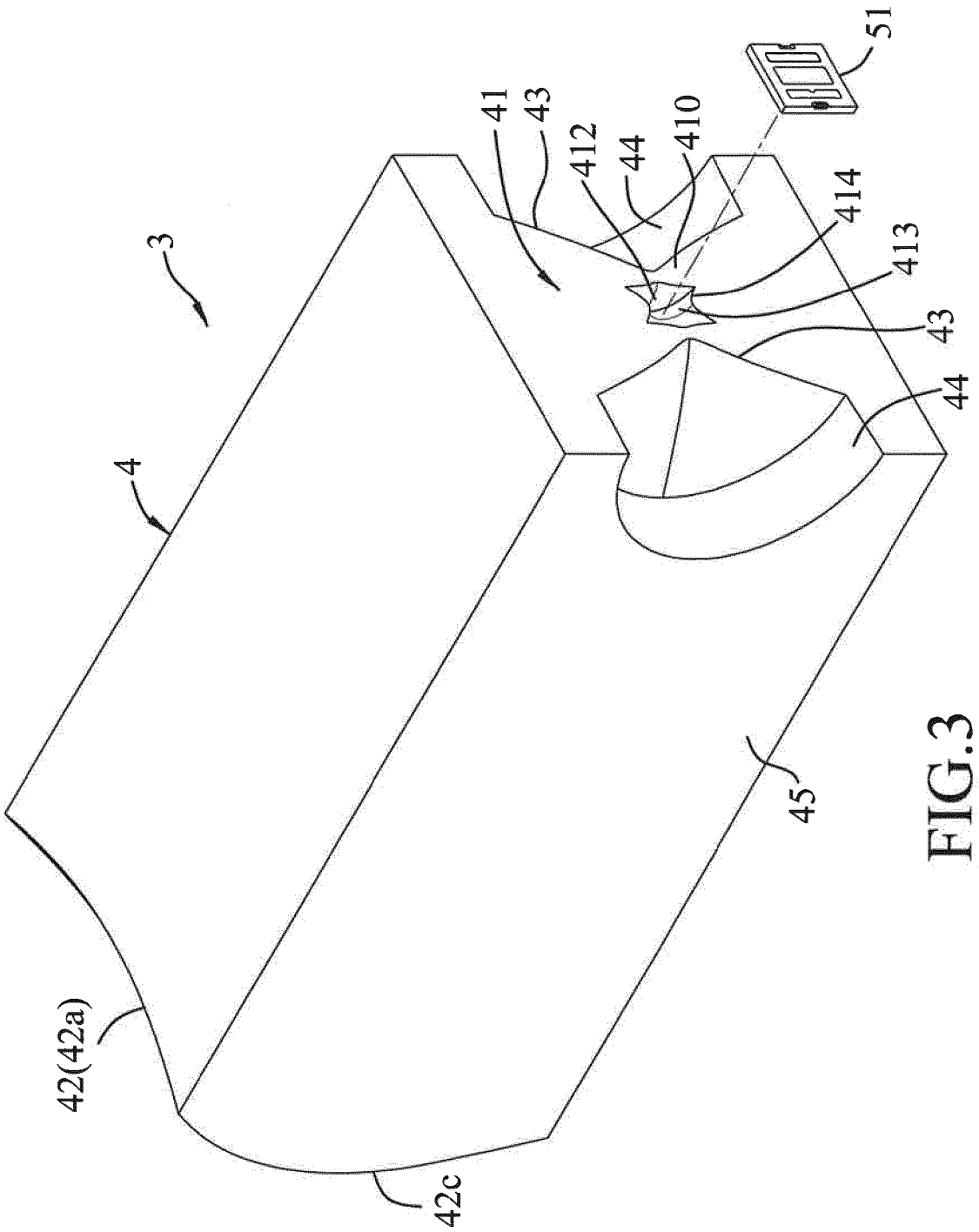


FIG.3

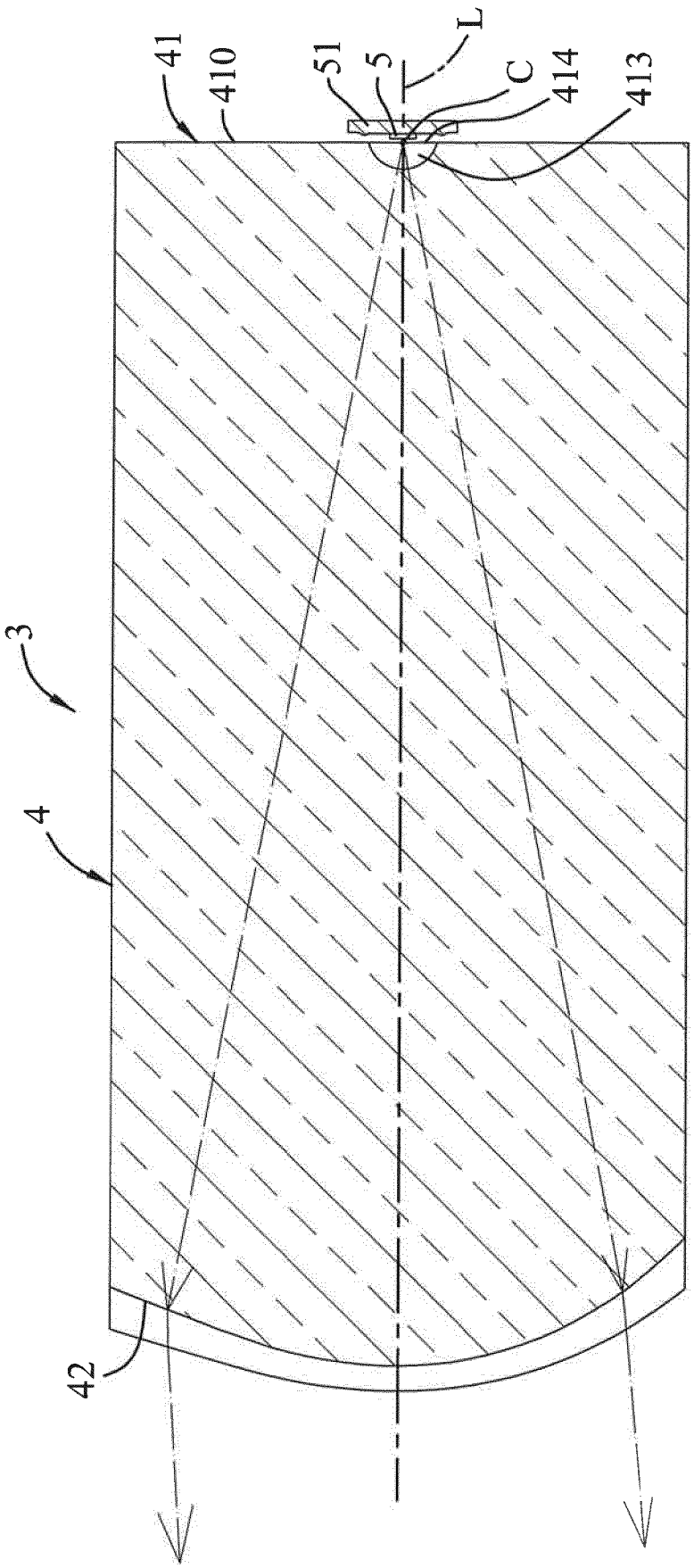


FIG.4

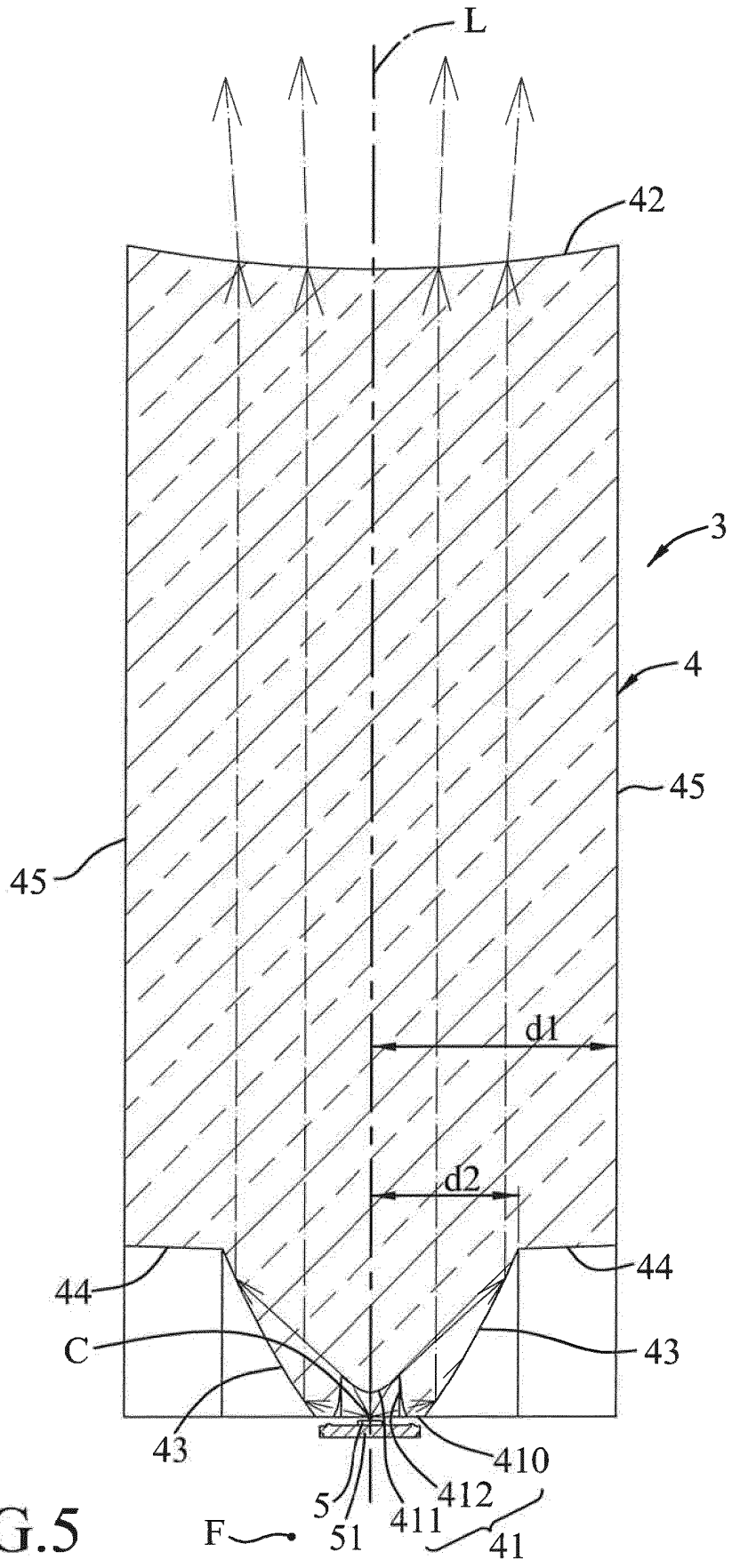


FIG.5

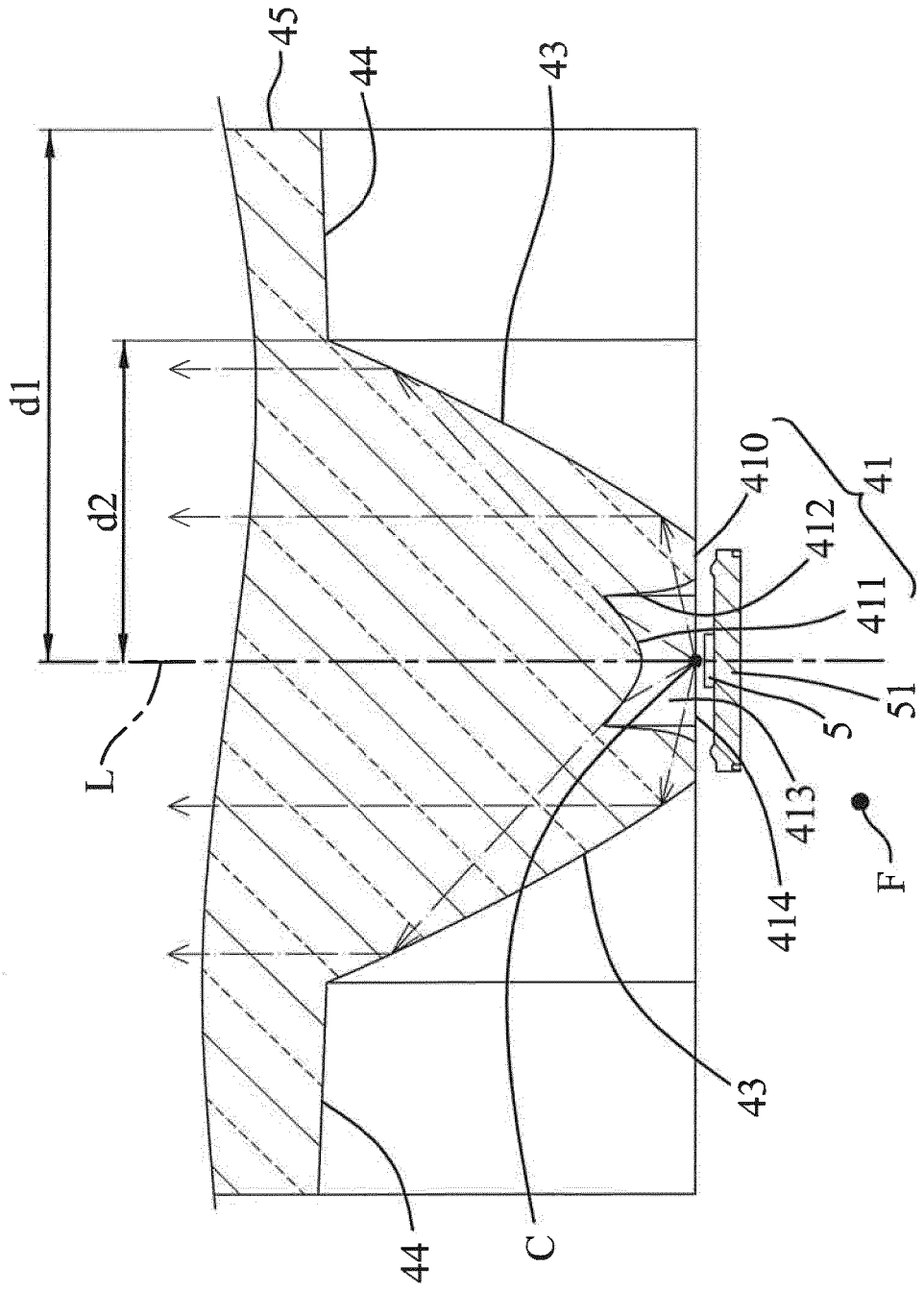


FIG.6

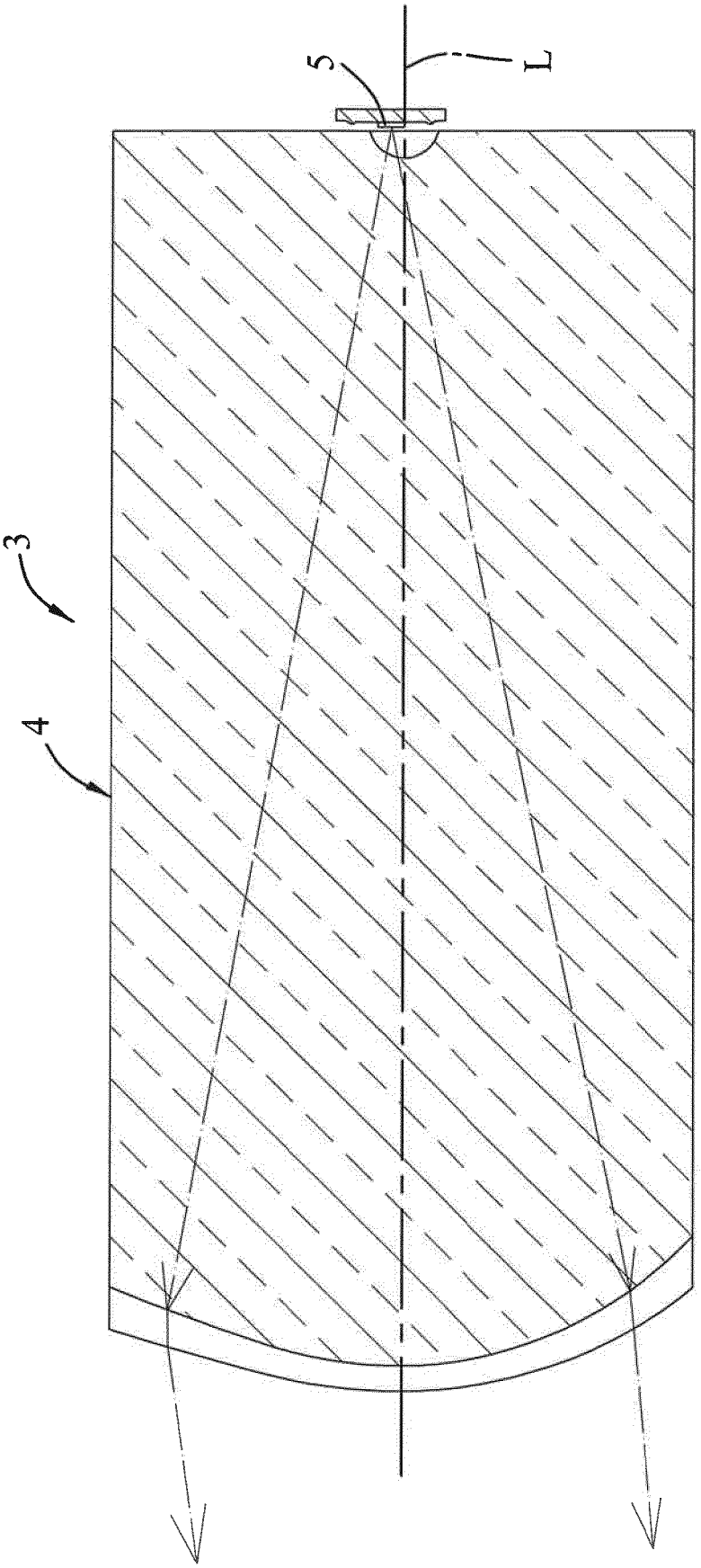


FIG.7

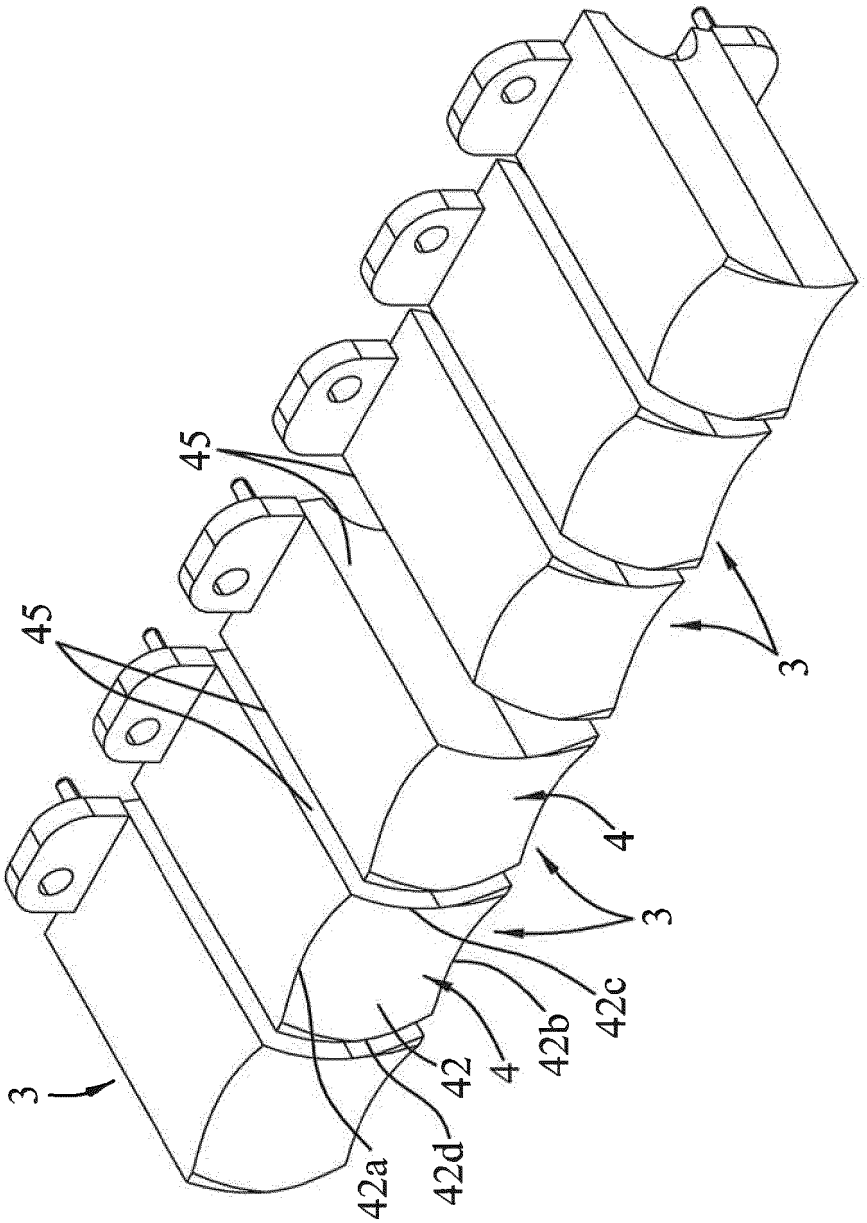


FIG.8

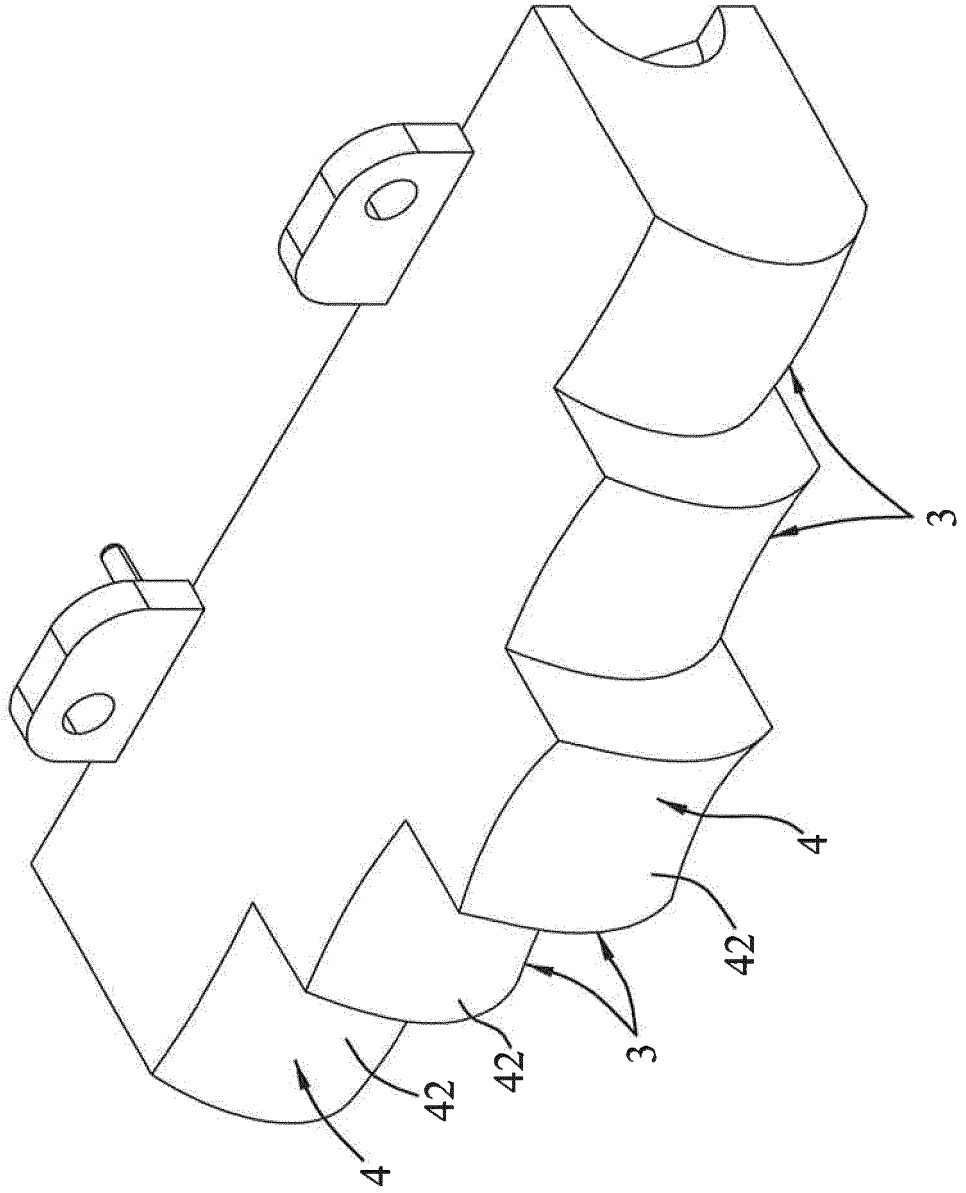


FIG.9

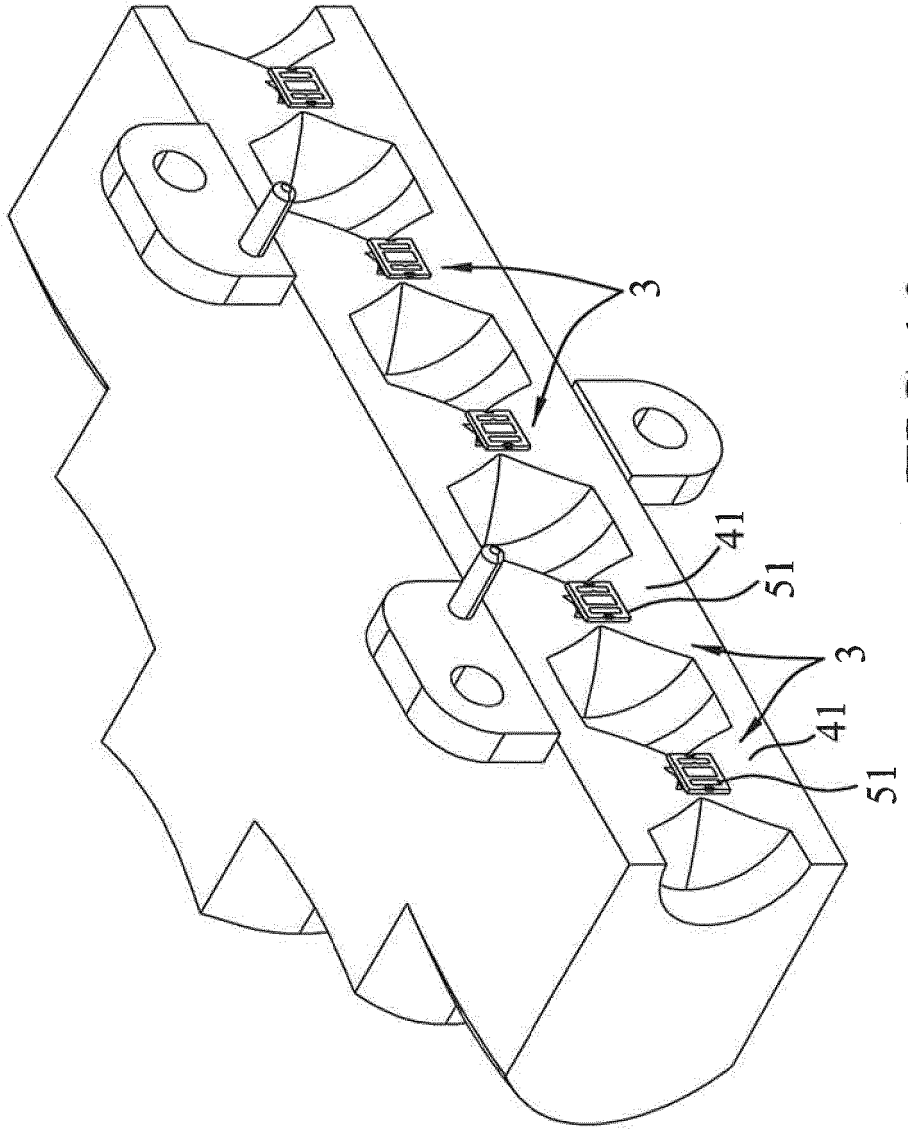


FIG.10

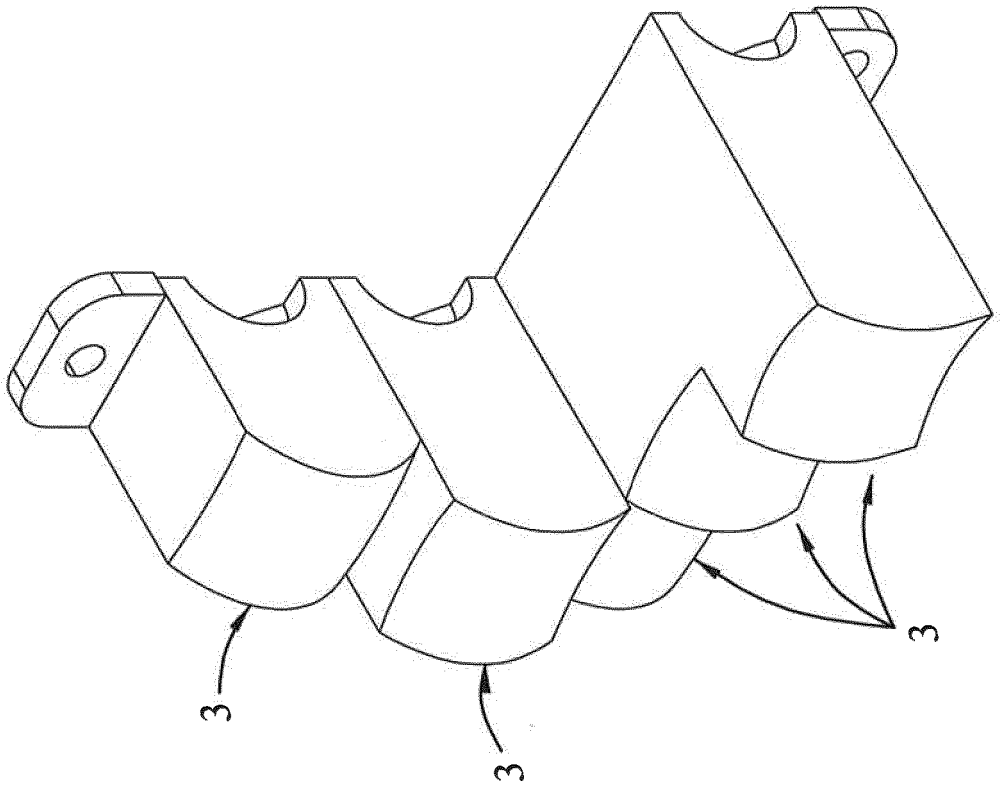


FIG.11

## REFERENCES CITED IN THE DESCRIPTION

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### Patent documents cited in the description


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- TW I582335 **[0002]**