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(54) **Lighting device for illuminating streets, roads or paths**

Beleuchtungseinrichtung zur Beleuchtung von Strassen oder Wegen.

Dispositif d'éclairage pour éclairer des routes, rues ou chemins

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Description

1. Field of the invention

[0001] The present invention relates to a lighting device for illuminating streets, roads or paths comprising at least one light source, one reflector for reflecting light emitted by the at least one light source and a housing comprising at least one translucent enclosure part.

2. Technical background

[0002] In the prior art, in principle, two kinds of street lightings are known, namely street lightings having a horizontal translucent enclosure part (*i.e.* a flat translucent enclosure part at the bottom side of the street lighting through which light is directed) and street lightings having a curved translucent enclosure part (i.e. an arc-shaped or semi-circular shaped translucent enclosure part at the bottom side of the street lighting through which light is directed).

[0003] Street lightings having a horizontal translucent enclosure part have the advantage that, due to the geometry and the resulting light guiding, no light is directed in an upward direction (i.e. the *"Upper Light Output Ration*" of such street lightings is almost zero). Notably, such upwardly directed light is wasted and may at the worst disturb local residents. On the other hand, the surface area which can be illuminated by such a street lighting is comparatively small, and thus, the distance/spacing between two neighboring street lightings having a horizontal translucent enclosure part has to be correspondingly small.

[0004] Street lightings having a curved translucent enclosure part can illuminate a comparatively large surface area, and thus, the distance/spacing between two neighboring street lightings having a curved translucent enclosure part can be correspondingly wide. However, such street lightings have the disadvantage that a certain amount of the light is directed in an upward direction, and is thus wasted and may at the worst disturb local residents.

[0005] WO 2012/059 790 A1 discloses a projector for street lighting, which comprises a case that houses a plurality of LEDs and a cap. The cap comprises a plurality of reflective surfaces for reflecting at least a part of the emission of the LEDs for illuminating areas that are close to the projector. The LEDs are mounted on boards of high thermal conductivity in the proximity of opposed longitudinal edges of the case. Furthermore, a front opening of the cap is covered with a substantially flat plate of an optically transparent material.

[0006] WO 2013/131858 A1 discloses a lighting device for road lighting, which comprises a channel-shaped housing having two ends with a main axis of the housing extending between the two ends. The lighting device further comprises a pair of mounting fixtures for mounting a pair of LEDs within the housing. The LEDs radiate light radiation in opposite directions along the main axis of the housing. Moreover, the lighting device comprises a pair of reflectors each facing one of the mounting fixtures to receive the light radiation from the LEDs along the main axis and to reflect it to the outside of the housing.

[0007] In view of this known street lightings, it is an object of the present invention to provide a new lighting device for illuminating streets, roads or paths. Particularly, it is an object of the present invention to provide a street lighting with which no, or hardly any, light is directed in an upward direction, and wherein the street lighting is nevertheless able to illuminate a comparatively large surface such that the spacing between two neighboring street lightings may be correspondingly wide. In other words, one of the objects of the present invention is to provide a street lighting combining the advantages of the above-described known street lightings.

[0008] These and other objects which become apparent upon reading the following description are solved by the subject-matter of the independent claim(s). The dependent claims refer to preferred embodiments of the present invention.

3. Summary of the invention

[0009] According to the invention, a lighting device for illuminating streets, roads or paths is provided comprising: at least one light source; at least one reflector for reflecting the light emitted by the at least one light source; a housing comprising at least one curved translucent enclosure part, wherein the light source is arranged at a peripheral position between the reflector and the translucent enclosure part; and wherein the at least one light source is oriented towards the reflector such that the light is reflected by the reflector in a direction to the translucent enclosure. The reflector surface of the reflector does not comprise any jump discontinuities. The light sources of the lighting device are arranged at/onto side wall sections of the lighting device. The light sources are in thermal contact with the side wall sections of the lighting device.

[0010] In the prior art, the light source is usually positioned between a reflector and a translucent enclosure part (*e.g.* a horizontal flat enclosure or a curved enclosure part) at a central/middle position with respect to the reflector. In contrast, the light source according to the present invention is arranged at a peripheral position between the reflector and the translucent enclosure part (e.g. at a sidewall of the housing).

[0011] Moreover, the at least one light source is oriented towards the reflector resulting in that almost all of the light emitted by the at least one light source is directed to the reflector and subsequently directed through the translucent enclosure part only in a direction to the surface to be illuminated. In other words, a structure is provided with which a surface is illuminated by means of indirect light, wherein almost all light can be directed to the surface to be illuminated by means of the reflector such that no or almost any light is directed in a direction

upward. Finally, by means of the reflector geometry the light distribution can be adjusted in such a way that a comparatively wide surface area can be illuminated.

[0012] As a result, the present invention provides a lighting device having a light distribution as known from the street lightings with curved enclosure parts (i.e. also the spacing between two neighboring street lightings can be correspondingly wide), wherein no, or hardly any, light is directed in a direction upward). Moreover, a homogeneous light distribution can be provided.

[0013] Preferably, the lighting device comprises two light sources arranged at peripheral positions, each between a corresponding reflector and a corresponding translucent enclosure part. In this respect, it is further preferred that the light sources, the reflectors and the translucent enclosures are arranged opposite to each other. By providing a lighting device with two light sources a larger surface area can be illuminated. Moreover, it is preferred that the light sources, the reflectors and the translucent enclosures are arranged mirror symmetrical at peripheral positions.

[0014] Preferably, the lighting device comprises at least three, more preferably at least four light sources arranged equidistantly at respective peripheral positions, wherein each light source is arranged between a reflector and a translucent enclosure. In other words, the at least four light sources are arranged in a cruciform such that a relatively large area can be illuminated. Such a light distribution may be desired for illuminating paths, for example, in a park.

[0015] It is further preferred that with increasing distance from one light source in a direction towards an opposite sidewall of the housing or, if more than one light source is provided, in a direction to another light source, the distance between a corresponding reflector and translucent enclosure part decreases. Generally, it is preferred that the distance between the reflector and the translucent enclosure part decreases with increasing distance from the light source(s). By such an arrangement, a homogeneous distribution of the light emitted by the lighting device can be provided.

[0016] Preferably, the reflectors are provided as one integral part. For example, the reflectors can be provided by a plastic material onto which a reflecting surface (*e.g.* a metallic layer) has been applied. It is further preferred that also the translucent enclosure parts are provided as one integral part. Thereby, the assembly of the lighting device can be simplified.

[0017] Preferably, the translucent enclosure parts comprise optical means, like lenses, covers, etc. By such optical means, the specific light distribution and direction of the light emitted by the lighting device can be further adapted to the respective mounting location (*e.g.* mounting height, orientation of the lighting device, mounting angle of the lighting device etc.).

[0018] In the preferred embodiment, the light sources of the lighting device are arranged at a circumferential sidewall of the lighting device. In other words, the light sources are in thermal contact with the sidewall(s) of the lighting device, which are preferably provided by a heat conducting metallic material such that the heat of the light source can be lead away from the light sources.

[0019] Preferably, the translucent enclosure part does not extend beyond the sidewall sections of the lighting device in a direction towards the surface to be illuminated. Thereby, it can be further ensured that no light may be emitted in an upward direction.

[0020] In the preferred embodiment, the light sources are provided by a directional light source emitting light essentially only in one direction, *i.e.* towards the reflection surface of the reflector. Thereby, it can be ensured that the light emitted by the light source is completely directed towards the reflector and that no light is unintentionally directed in another direction.

[0021] Preferably, the light source comprises a high brightness light emitting diode, a light emitting diode array/cluster and/or a chip on board light in diode arrangement.

4. Description of the preferred embodiments

[0022] In the following, the invention is described exemplarily with reference to the enclosed figures, in which

Figure 1 is a schematic side view of a first embodiment of the invention; and

Figure 2 is a schematic side view of a second embodiment of the invention.

[0023] Figure 1 shows a schematic side view of a first embodiment of a lighting device 10 for illuminating streets, roads or paths.

[0024] The lighting device 10 comprises a housing 20 having a translucent enclosure part 25 at a bottom side which is oriented to a surface to be illuminated. In the housing 20, a light source 30 is arranged at a peripheral position (here at an outer side wall of the housing 20). In the preferred shown embodiment, the light source 30 is arranged onto a metallic side wall section 40 of the housing 20, wherein the light source 30 and the metallic side wall section 40 are in thermal contact with each other such that the heat from the light source 30 is lead away by the metallic side wall section 40. The light source 30 of the shown preferred embodiment is a directional light source (e.g. a light emitting diode array/cluster or a chip on board light emitting diode arrangement).

[0025] The lighting device 10 further comprises a reflector 50 preferably provided by a plastic material onto which a metallic surface was applied.

[0026] As can be taken from figure 1, with increasing distance from the light source 30 in a direction opposite to the light source, the distance between the reflector 50 and the translucent enclosure part 25 decreases. Thereby, the light emitted by the light source 30 is directed to the reflector 50 such that almost the entire light of the

light source 30 is directed to the reflector 50 which in turn reflects the light in a direction to the translucent enclosure part 25. As a result, a surface area to be illuminated is not directly illuminated by the light source 30, but only via the reflector 50 (i.e. only in an indirect manner). Thereby, no upwardly directed light is emitted by the lighting device 10.

[0027] In the shown preferred embodiment, the translucent enclosure part 25 further comprises optical lenses (not shown) such that the specific light distribution of the lighting device 10 is further adapted. As can further be taken from figure 1, the translucent enclosure part 25 does not extend beyond the side wall section 40 of the lighting device 10 in a direction toward a surface to be illuminated. Thereby, it can be further ensured that no light is emitted in an upward direction.

[0028] Figure 2 shows a second embodiment of a lighting device 100 for illuminating streets, roads or paths.

[0029] As can be taken from figure 2, the lighting device 100 comprises a housing 200 in which two light sources 300, 300' (*e.g.* two light emitting diode arrays) are arranged opposite to each other, wherein each light source 300, 300' is arranged on a side wall section 400, 400' (*e.g.* a circumferential side wall of the housing 200). Moreover, each light source 300, 300' is arranged between a corresponding translucent enclosure part 250, 250' and a respective reflector 500, 500'. In the shown preferred embodiment, the reflectors 500, 500' and the translucent enclosure parts 250, 250' are each provided as an integral part. As can be further taken from figure 2, the lighting device 100 is basically mirror symmetrical with respect to an axis 600. According to the shown preferred embodiment of figure 2, the other contours of the translucent enclosure parts 250, 250' and the reflectors 500, 500', when seen in a side view, is basically propeller-like.

[0030] Moreover, with increasing distance from each light source 300, 300' in a direction to the axis 600, the distance between the reflectors 500, 500' and the translucent enclosure parts 250, 250' decreases. Thereby, the light emitted by each light source 300, 300' is directed to the respective reflectors 500, 500' such that almost the entire light of each light source 300, 300' is directed to the respective reflector 500, 500' which in turn reflects the light in a direction to the respective translucent enclosure parts 250, 250'. As a result, a surface area to be illuminated is not directly illuminated by the light sources 300, 300', but only via the reflectors 500, 500' (*i.e.* only in an indirect manner). Thereby, no upwardly directed light is emitted by the lighting device 100.

[0031] Summing up, the above-described lighting devices 10, 100 provide a light distribution having no, or hardly any, light directed in an upward direction, wherein nevertheless a comparatively large surface can be illuminated such that the spacing between two neighboring lighting devices may be correspondingly wide. As a result, the advantages of a lighting device having a horizontal flat enclosure and a lighting device having a curved enclosure can be merged, but without the above-mentioned disadvantages.

[0032] It should be clear to a skilled person that the embodiments shown in the figures above are only preferred embodiments, but that, however, also different numbers of light sources, reflectors and translucent enclosure parts can be used, as long as the light sources are arranged at a peripheral position between the respective reflector and translucent enclosure part, and wherein the light source is oriented towards the reflector such that the light is reflected by the reflector in a direction to the translucent enclosure parts. Moreover, the invention is also not limited to the mentioned materials. The features of the embodiments are interchangeable as long as they are covered by the appended claims.

Claims

1. Lighting device (10; 100) for illuminating streets, roads or paths, comprising:

   - at least one light source (30; 300, 300');
   - at least one reflector (50; 500, 500') for reflecting light emitted by the at least one light source (30; 300, 300');
   - a housing (20; 200) comprising at least one curved translucent enclosure part (25; 250, 250'), wherein the light source (30; 300, 300') is arranged at a peripheral position between the reflector (50; 500, 500') and the translucent enclosure part (25; 250, 250');

   and wherein the at least one light source (30; 300, 300') is oriented towards the reflector (50; 500, 500') such that the light is reflected by the reflector (50; 500, 500') in a direction to the translucent enclosure part (25; 250, 250'), wherein
   the reflector surface of the reflector (50; 500, 500') does not comprise any jump discontinuities, wherein the light sources (30; 300, 300') are arranged at side wall sections (40; 400, 400') of the lighting device (10; 100), and wherein the light sources (30; 300, 300') are in thermal contact with the side wall sections (40; 400, 400').

2. Lighting device (10; 100) according to claim 1, wherein the lighting device (10; 100) comprises two light sources (30; 300, 300') arranged at peripheral positions in the housing (20; 200) each between a reflector (50; 500, 500') and a translucent enclosure part (25; 250, 250').

3. Lighting device (10; 100) according to claim 2, wherein the light sources (30; 300, 300'), the reflectors (50; 500, 500') and the translucent enclosure parts (25; 250, 250') are arranged opposite to each other.

4. Lighting device (10; 100) according to claim 2 or 3, wherein the light sources (30; 300, 300'), the reflectors (50; 500, 500') and the translucent enclosure parts (25; 250, 250') are arranged mirror symmetrical with respect to a symmetry axis (600).

5. Lighting device (10; 100) according to claim 1, wherein the lighting device (10; 100) comprises at least four light sources (30; 300, 300') arranged equidistantly at peripheral positions in the housing (20; 200), wherein each light source (30; 300, 300') is arranged between a reflector (50; 500, 500') and a translucent enclosure part (25; 250, 250').

6. Lighting device (10; 100) according to any of the claims 2 to 4, wherein with increasing distance from one light source (30; 300, 300') in a direction towards the other light source (30; 300, 300'), the distance between a corresponding reflector (50; 500, 500') and translucent enclosure part (25; 250, 250') decreases.

7. Lighting device (10; 100) according to any of the preceding claims, wherein the reflectors (50; 500, 500') are provided as one integral part.

8. Lighting device (10; 100) according to any of the preceding claims, wherein the translucent enclosure parts (25; 250, 250') are provided as one integral part.

9. Lighting device (10; 100) according to any of the preceding claims, wherein the translucent enclosure parts (25; 250, 250') comprise optical means, like lenses, covers, etc.

10. Lighting device (10; 100) according to any of the preceding claims, wherein the translucent enclosure parts (25; 250, 250') do not extend beyond the side wall sections (40; 400, 400') of the lighting device (10; 100) in a direction towards the surface to be illuminated.

11. Lighting device (10; 100) according to any of the preceding claims, wherein the light source (30; 300, 300') is a directional light source (30; 300, 300') emitting light essentially only in the direction to the reflection surface of the reflector (50; 500, 500').

12. Lighting device (10; 100) according to any of the preceding claims, wherein the light source (30; 300, 300') comprises a high brightness light emitting diode, a light emitting diode array/cluster and/or a chip on board light emitting diode arrangement.

Patentansprüche

1. Beleuchtungsvorrichtung (10, 100) zum Beleuchten von Straßen, Landstraßen oder Wegen, Folgendes umfassend:

   - mindestens eine Lichtquelle (30, 300, 300'), mindestens einen Reflektor (50, 500, 500') zum Reflektieren von Licht, das von der mindestens einen Lichtquelle (30, 300, 300') ausgestrahlt wird,
   - ein Gehäuse (20, 200), das mindestens einen gewölbten lichtdurchlässigen Einfassungsteil (25, 250, 250') umfasst, wobei die Lichtquelle (30, 300, 300') an einer Außenrandposition zwischen dem Reflektor (50, 500, 500') und dem lichtdurchlässigen Einfassungsteil (25, 250, 250') angeordnet ist,

   und wobei die mindestens eine Lichtquelle (30, 300, 300') derart hin zum Reflektor (50, 500, 500') ausgerichtet ist, dass das Licht von dem Reflektor (50, 500, 500') in eine Richtung zum lichtdurchlässigen Einfassungsteil (25, 250, 250') reflektiert wird, wobei die Reflektoroberfläche des Reflektors (50, 500, 500') keine Sprungstellen umfasst, wobei die Lichtquellen (30, 300, 300') an Seitenwandabschnitten (40, 400, 400') der Beleuchtungsvorrichtung (10, 100) angeordnet sind und wobei die Lichtquellen (30, 300, 300') in thermischem Kontakt mit den Seitenwandabschnitten (40, 400, 400') stehen.

2. Beleuchtungsvorrichtung (10, 100) nach Anspruch 1, wobei die Beleuchtungsvorrichtung (10, 100) zwei Lichtquellen (30, 300, 300') umfasst, die jeweils zwischen einem Reflektor (50, 500, 500') und einem lichtdurchlässigen Einfassungsteil (25, 250, 250') an Außenrandpositionen in dem Gehäuse (20, 200) angeordnet sind.

3. Beleuchtungsvorrichtung (10, 100) nach Anspruch 2, wobei die Lichtquellen (30, 300, 300'), die Reflektoren (50, 500, 500') und die lichtdurchlässigen Einfassungsteile (25, 250, 250') einander gegenüber angeordnet sind.

4. Beleuchtungsvorrichtung (10, 100) nach Anspruch 2 oder 3, wobei die Lichtquellen (30, 300, 300'), die Reflektoren (50, 500, 500') und die lichtdurchlässigen Einfassungsteile (25, 250, 250') im Verhältnis zu einer Symmetrieachse (600) spiegelsymmetrisch angeordnet sind.

5. Beleuchtungsvorrichtung (10, 100) nach Anspruch 1, wobei die Beleuchtungsvorrichtung (10, 100) mindestens vier Lichtquellen (30, 300, 300') umfasst, die im gleichen Abstand an Außenrandpositionen in dem Gehäuse (20, 200) angeordnet sind, wobei jede

Lichtquelle (30, 300, 300') zwischen einem Reflektor (50, 500, 500') und einem lichtdurchlässigen Einfassungsteil (25, 250, 250') angeordnet ist.

6. Beleuchtungsvorrichtung (10, 100) nach einem der Ansprüche 2 bis 4, wobei mit zunehmender Entfernung von einer Lichtquelle (30, 300, 300') in einer Richtung hin zur anderen Lichtquelle (30, 300, 300') der Abstand zwischen einem entsprechenden Reflektor (50, 500, 500') und einem entsprechenden lichtdurchlässigen Einfassungsteil (25, 250, 250') abnimmt.

7. Beleuchtungsvorrichtung (10, 100) nach einem der vorhergehenden Ansprüche, wobei die Reflektoren (50, 500, 500') als ein integraler Teil bereitgestellt sind.

8. Beleuchtungsvorrichtung (10, 100) nach einem der vorhergehenden Ansprüche, wobei die lichtdurchlässigen Einfassungsteile (25, 250, 250') als ein integraler Teil bereitgestellt sind.

9. Beleuchtungsvorrichtung (10, 100) nach einem der vorhergehenden Ansprüche, wobei die lichtdurchlässigen Einfassungsteile (25, 250, 250') optische Mittel wie Linsen, Abdeckungen usw. umfassen.

10. Beleuchtungsvorrichtung (10, 100) nach einem der vorhergehenden Ansprüche, wobei sich die lichtdurchlässigen Einfassungsteile (25, 250, 250') in eine Richtung hin zu der zu beleuchtenden Fläche nicht über die Seitenwandabschnitte (40, 400, 400') der Beleuchtungsvorrichtung (10, 100) hinaus erstrecken.

11. Beleuchtungsvorrichtung (10, 100) nach einem der vorhergehenden Ansprüche, wobei die Lichtquelle (30, 300, 300') eine gerichtete Lichtquelle (30, 300, 300') ist, die Licht im Wesentlichen nur in Richtung der Reflexionsfläche des Reflektors (50, 500, 500') ausstrahlt.

12. Beleuchtungsvorrichtung (10, 100) nach einem der vorhergehenden Ansprüche, wobei die Lichtquelle (30, 300, 300') eine Leuchtdiode mit großer Helligkeit, ein Leuchtdiodenfeld / eine Leuchtdiodengruppe und/oder eine Chip-On-Board-Leuchtdiodenanordnung umfasst.

Revendications

1. Dispositif d'éclairage (10 ; 100) permettant d'éclairer des rue, des routes ou des chemins, et comprenant :

- au moins une source de lumière (30 ; 300, 300') ;
- au moins un réflecteur (50 ; 500, 500') destiné à réfléchir de la lumière émise par l'au moins une source de lumière (30 ; 300, 300') ;
- un boîtier (20 ; 200) comprenant au moins une partie d'enceinte translucide incurvée (25 ; 250, 250'), dans lequel la source de lumière (30 ; 300, 300') est agencée dans un emplacement périphérique entre le réflecteur (50 ; 500, 500') et la partie d'enceinte translucide (25 ; 250, 250') ;

et dans lequel l'au moins une source de lumière (30 ; 300, 300') est orientée vers le réflecteur (50 ; 500, 500') de telle sorte que la lumière est réfléchie par le réflecteur (50 ; 500, 500') en direction de la partie d'enceinte translucide (25 ; 250, 250'), dans lequel la partie réfléchissante du réflecteur (50 ; 500, 500') ne comprend aucune discontinuité de type saut, dans lequel les sources de lumière (30 ; 300, 300') sont agencées dans des sections de parois latérales (40 ; 400, 400') du dispositif d'éclairage (10 ; 100), et dans lequel les sources de lumière (30 ; 300, 300') sont en contact thermique avec les sections de parois latérales (40 ; 400, 400').

2. Dispositif d'éclairage (10 ; 100) selon la revendication 1, dans lequel le dispositif d'éclairage (10 ; 100) comprend deux sources de lumière (30 ; 300, 300') agencées dans des emplacements périphériques dans le boîtier (20 ; 200) chacune entre un réflecteur (50 ; 500, 500') et une partie d'enceinte translucide (25 ; 250, 250').

3. Dispositif d'éclairage (10 ; 100) selon la revendication 2, dans lequel les sources de lumière (30 ; 300, 300'), les réflecteurs (50 ; 500, 500') et les parties d'enceintes translucides (25 ; 250, 250') sont agencés face à face.

4. Dispositif d'éclairage (10 ; 100) selon la revendication 2 ou 3, dans lequel les sources de lumière (30 ; 300, 300'), les réflecteurs (50 ; 500, 500') et les parties d'enceintes translucides (25 ; 250, 250') sont agencés selon une symétrie bilatérale par rapport à un axe de symétrie (600).

5. Dispositif d'éclairage (10 ; 100) selon la revendication 1, dans lequel le dispositif d'éclairage (10 ; 100) comprend au moins quatre sources de lumière (30 ; 300, 300') agencées de façon équidistante dans des emplacements périphériques dans le boîtier (20 ; 200), dans lequel chaque source de lumière (30 ; 300, 300') est agencée entre un réflecteur (50 ; 500, 500') et une partie d'enceinte translucide (25 ; 250, 250').

6. Dispositif d'éclairage (10 ; 100) selon l'une quelconque des revendications 2 à 4, dans lequel au fur et à mesure que la distance d'une source de lumière

(30 ; 300, 300') en direction de l'autre source de lumière (30 ; 300, 300') augmente, la distance entre un réflecteur (50 ; 500, 500') et une partie d'enceinte translucide (25 ; 250, 250') correspondants diminue.

7. Dispositif d'éclairage (10 ; 100) selon l'une quelconque des revendications précédentes, dans lequel les réflecteurs (50 ; 500, 500') se présentent d'un seul tenant.

8. Dispositif d'éclairage (10 ; 100) selon l'une quelconque des revendications précédentes, dans lequel les parties d'enceintes translucides (25 ; 250, 250') se présentent d'un seul tenant.

9. Dispositif d'éclairage (10 ; 100) selon l'une quelconque des revendications précédentes, dans lequel les parties d'enceintes translucides (25 ; 250, 250') comprennent des moyens optiques tels que lentilles, caches, etc.

10. Dispositif d'éclairage (10 ; 100) selon l'une quelconque des revendications précédentes, dans lequel les parties d'enceintes translucides (25 ; 250, 250') ne s'étendent pas au-delà des sections de parois latérales (40 ; 400, 400') du dispositif d'éclairage (10 ; 100) en allant vers la surface à éclairer.

11. Dispositif d'éclairage (10 ; 100) selon l'une quelconque des revendications précédentes, dans lequel la source de lumière (30 ; 300, 300') est une source de lumière directionnelle (30 ; 300, 300') émettant de la lumière essentiellement uniquement en direction de la surface de réflexion du réflecteur (50 ; 500, 500').

12. Dispositif d'éclairage (10 ; 100) selon l'une quelconque des revendications précédentes, dans lequel la source de lumière (30 ; 300, 300') comprend une diode électroluminescente à haute luminosité, un réseau ou une grappe de diodes électroluminescentes et/ou un agencement de diodes électroluminescentes Chip-On-Board.

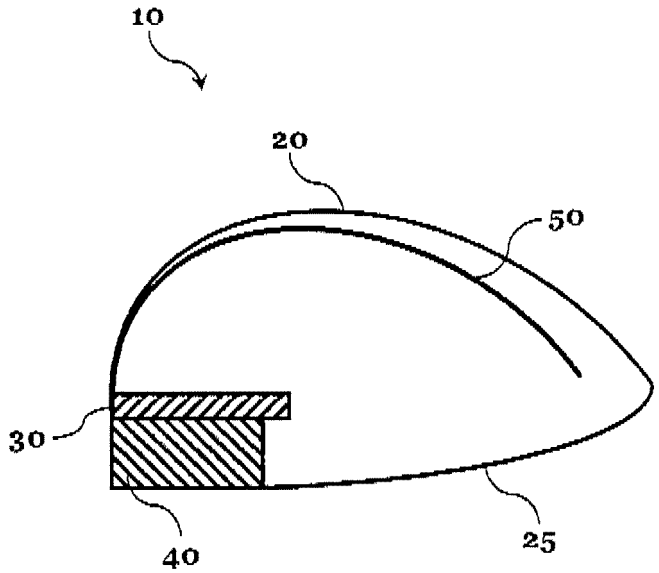

Figure 1

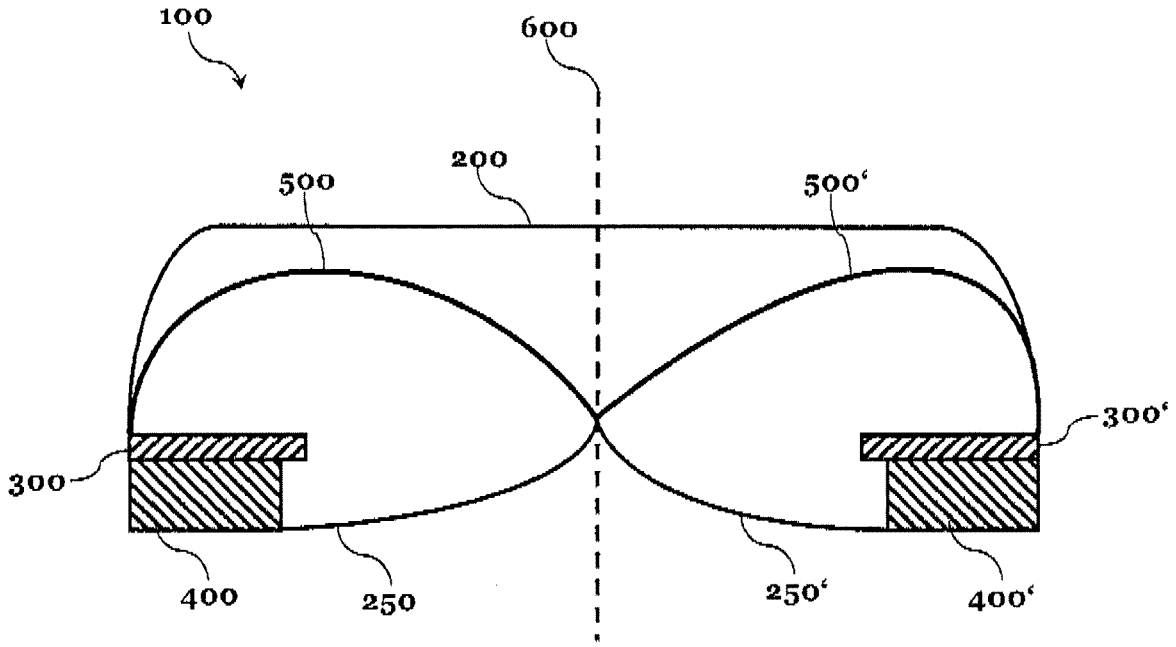

Figure 2

REFERENCES CITED IN THE DESCRIPTION

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