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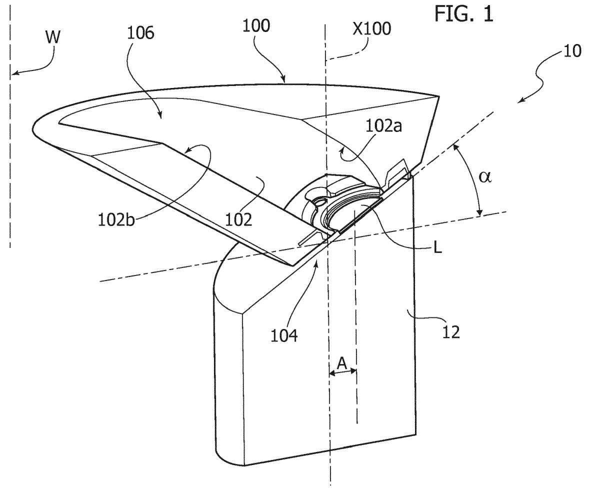
(54) A REFLECTOR FOR LIGHTING DEVICES, CORRESPONDING DEVICE AND METHOD

(57) A reflector (100), for providing a wall-washing lighting pattern from an electrically-powered light radiation source (L), includes a body traversed by a light propagation cavity (102) which defines a light propagation path between a light injection window (104) lying in a first plane (X104) and a light emission window (106) lying in a second plane (X106).

The light propagation cavity (102) is of a flattened shape, with first (102a) and second (102b) light reflective surfaces lying on opposite sides with respect to said light injection window (104).

The first plane (X104), wherein the light injection window (104) is located, may be either oblique or parallel with respect to the second plane (X106), wherein the light emission window (104) is located, with the light radiation path through the reflector (100) being oblique with respect to a main axis of reflector (X100).

FIG. 1



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Description

Technical Field

[0001] The present description relates to reflectors for lighting devices.

[0002] One or more embodiments may refer to reflectors which may be employed in generating a "wall-washing" lighting pattern, by using electrically-powered light radiation sources, e.g. solid-state light radiation sources, e.g. LED sources.

Technological Background

[0003] Wall-washing lighting may be improved by specific conditions of light radiation distribution and uniformity of the (laterally) projected illumination, so that the illuminated wall is "washed" by light.

[0004] This result may be achieved by using e.g. optics designed in order to achieve the required performances, especially as regards the radiation pattern, so that different radiation patterns may require customized optical devices, e.g. reflectors.

[0005] Documents such as US 2009/027892 A1, US 8 708 522 B2, EP 2 647 902 A2 or DE 10 2006 030646 B4 are representative of the prior art.

Object and Summary

[0006] Despite the research exemplified by the above documents, the need is still felt of improved solutions, e.g. as regards the possibility of modelling/optimizing the shape of the reflector, so as to obtain a satisfactory distribution of radiation and illuminance on the wall while avoiding an excessively cumbersome structure.

[0007] According to one or more embodiments, said object may be achieved thanks to a reflector having the features specifically set forth in the claims that follow.

[0008] One or more embodiments may also concern a corresponding device, as well as a corresponding method.

[0009] One or more embodiments enable the achievement of one or more of the following advantages:

- the bundle of light emerging from the light radiation emission window may be tilted at approximately 30° in the C90-C270 plane and along the optical axis in the C0-C180 plane,
- the same bundle of light radiation may have, projected in a plane parallel to the floor, an FWHM value (Full-Width Half-Maximum) of about 100°,
- by using a plurality of reflectors according to one or more embodiments, placed at a distance of about 1 m from a wall and at a distance of about 1 m from each other in a direction parallel to the wall, a widely uniform illuminance distribution may be obtained on the wall, without observable peaks,
- it is possible to achieve UGR (Unified Glare Rating) values lower than 10 in all directions (both laterally and away from the wall), resulting in a better comfort for the user.

Brief Description of the Figures

[0010] One or more embodiments will now be described, by way of non-limiting example only, with reference to the annexed Figures, wherein:

- Figure 1 shows a lighting device including a reflector according to one or more embodiments, in section across a central plane,
- Figure 2 is a perspective exploded view of a reflector according to one or more embodiments,
- Figures 3 to 5 separately show parts of a reflector as exemplified in Figure 2,
- Figure 6 is a perspective view of a reflector according to one or more embodiments, observed from a point of view approximately opposed to the emission direction of the light radiation,
- Figure 7 is a view of a reflector according to one or more embodiments, in a front view,
- Figure 8 is a cross section view approximately corresponding to line VIII-VIII of Figure 6, and
- Figures 9 to 13 show, according to a viewpoint approximately corresponding to Figure 8, various operation features of a reflector according to one or more embodiments.

[0011] It will be appreciated that, for clarity of illustration, the various Figures may not be all drawn to the same scale.

Detailed Description

[0012] In the following description, various specific details are given to provide a thorough understanding of various exemplary embodiments according to the present specification. The embodiments may be practiced without one or several specific details, or with other methods, components, materials, etc. In other instances, well-known structures, materials, and operations are not shown or described in detail to avoid obscuring various aspects of the embodiments.

[0013] Reference throughout this specification to "one embodiment" or "an embodiment" means that a particular feature, structure, or characteristic described in connection with the embodiment is included in at least one embodiment. Thus, the possible appearances of the phrases such as "in one embodiment" or "in an embodiment" in various places throughout this specification are not necessarily all referring to the same embodiment. Furthermore, particular features, structures or characteristics may be combined in any suitable manner in one or more embodiments.

[0014] The headings provided herein are for convenience only, and therefore do not interpret the extent of protection or scope of the embodiments.

[0015] In Figure 1, reference 10 generally denotes a lighting device, in a section across an approximately median plane.

[0016] Device 10 is adapted to be employed in wall-washing applications, with the purpose of obtaining a distributed and uniform lighting of a wall W (schematically shown in dashed lines).

[0017] In possible use configurations, device 10 may be mounted on a ceiling, e.g. as a spotlight embedded into a false ceiling, in conditions that may be considered as approximately rotated by 180° upside down with reference to the orientation used for simplicity of illustration in Figure 1.

[0018] In one or more embodiments, device 10 may comprise a body 12 (e.g. of a metal or heat-conductive plastic material, optionally finned in order to act as a heat sink) whereon there may be mounted an electrically-powered light radiation source L.

[0019] In one or more embodiments, the source may be a solid-state light radiation source, e.g. a LED source.

[0020] In one or more embodiments, source L may have a planar shape, e.g. an at least approximately disk-like shape, having a Light Emitting Source (LES) adapted to include for instance an e.g. circular array or cluster (see Figure 1) of single LEDs lying in a common plane, the latter defining said emitting surface.

[0021] It will be appreciated, however, that the embodiments (which do not necessarily include source L itself) may envisage the use of other light radiation sources L, especially as regards the shape and configuration thereof (e.g. planar sources of square, rectangular, mixtilinear shapes of various nature, etc.).

[0022] In one or more embodiments, light radiation source L may be a LED source of the kind known as Chip on Board (CoB).

[0023] In one or more embodiments, device 10 may include a reflector 100 adapted to achieve a wall-washing lighting pattern from the light radiation generated by source L.

[0024] In one or more embodiments, reflector 100 may comprise a body e.g. of a moulded plastic material.

[0025] In one or more embodiments, reflector 100 may have a tubular shape.

[0026] In one or more embodiments, the body of the reflector may be traversed by a cavity 102 for propagating the light radiation, adapted to define a propagation path of the light radiation produced by source L between a (e.g. planar) light radiation injection aperture or window, denoted as 104, and a (e.g. planar) light radiation emission aperture or window, denoted as 106.

[0027] As may be appreciated e.g. in the cross-section views of Figures 8 to 13, the light radiation injection window 104 and the light radiation emission window 106 may lie in respective planes X104 and X106, the plane X106 of the light radiation emission window 106 being perpendicular to an axis X100.

[0028] Axis X100 may be, at least approximately, identified as a main axis of reflector 100.

[0029] In one or more embodiments, as exemplified in Figure 1, axis X100 may correspond to the central axis of body 12, e.g. when the latter has a generally cylindrical structure.

[0030] If body 12 exhibits a cylindrical structure, axis X100 may correspond to a main axis of the device, and the light radiation source L (which, thanks to the planar structure thereof, may actually lie in plane X104 of injection window 104) may be seen as generally shifted, i.e. located in an eccentric (off-axis) position relative to said axis X100, e.g. by an amount denoted as A in Figure 1.

[0031] If body 12 has a structure and geometry other than cylindrical, axis X100 may not be the main geometrical axis of the device, while keeping however the role of an (optical) axis of reflector 100, as it identifies the general orientation direction of reflector 100 relative to wall W (see e.g. Figure 1).

[0032] In one or more embodiments, irrespective of the features of body 12 and of the mounting position of source L, the lying planes X104 and X106 of the light radiation injection window 104 and of the light radiation emission window 106 may define a dihedron having a dihedral angle of width α.

[0033] In one or more embodiments, width α may amount approximately to 25°.

[0034] In one or more embodiments, the lying plane X104 of the light radiation injection window 104 and the lying plane X106 of the light radiation emission window 106 may therefore form a dihedron having a dihedral angle with width α, being tilted (i.e. slanting or sloping) with respect to each other.

[0035] In one or more embodiments, the lying plane X104 of light radiation injection window 104 and the lying plane X106 of light radiation emission window 106 may also be parallel, i.e. they may not form any dihedron (or they may form a dihedron having a dihedral angle α substantially amounting to zero).

[0036] In one or more embodiments, whether planes X104 and X106 are inclined or sloping with respect to each other or planes X104 and X106 are parallel or substantially parallel to each other, the propagation path the light radiation defined by cavity 102 may still be tilted relative to the direction identified by axis X100.

[0037] In one or more embodiments, whether planes X104 and X106 are inclined or sloping to each other or planes X104 and X106 are parallel or substantially parallel to each other, cavity 102 may have a generally flattened shape, thus including two reflecting surfaces 102a, 102b lying on opposed sides or bands relative to the light radiation injection window 104, so that they may lie on opposed sides or bands relative to light radiation source L.

[0038] As a consequence, the teachings contained in the present specification referring, by way of example, to embodiments wherein planes X104 and X106 are tilted or slanted with respect to each other, are to be deemed as applicable also to embodiments wherein planes X104 and X106 are parallel or substantially parallel to each other.

[0039] In one or more embodiments, the surfaces of light radiation propagation cavity 102 may be implemented or treated so as to have a light radiation reflectivity e.g. higher than 85%.

[0040] In one or more embodiments, a reflector 100 may enable the generation of a light radiation output pattern from window 106 which is asymmetrical (non circular), e.g. with a distribution having an axis at approximately 30° in a plane C and at approximately 0° along orthogonal plane C.

[0041] Such a lighting distribution may be used for wall-washing applications, e.g. by employing a plurality of devices 10 according to one or more embodiments, arranged in a certain number (e.g. five devices 10) ad a distance of approximately 1 m from the wall (W in Figure 1) with a mutual distance of 1 m in the direction parallel to the wall.

[0042] More generally, denoting with X the spacing (mutual distance) between devices 10 of said plurality, with Y the distance from wall W and with H the height of the wall, a selection of X = Y amounting to 1/3 of H has been found to achieve particularly satisfying wall-washing results.

[0043] In one or more embodiments, the body of reflector 100 may include two complementary portions 100a, 100b divided by an intermediate plane extending parallel to axis X100.

[0044] For example, in one or more embodiments (for reference see Figures 3 to 5) the light radiation injection window 104 may be located in the first portion 100a, while the light radiation emission window 106 may be located in the second portion 100b.

[0045] In one or more embodiments, in the intermediate plane between portions 100a and 100b there may be arranged a screen 100c (see Figure 4).

[0046] In one or more embodiments, screen 100c may be permeable to light radiation, e.g. transparent, and adapted to avoid an accidental hand contact with source L, e.g. during the operation thereof.

[0047] In one or more embodiments, screen 100c may include a diffusive screen with a (limited) scattering action, e.g. in order to improve the uniformity of the illuminance distribution projected onto wall W from device 10.

[0048] In one or more embodiments, the body of reflector 100 may comprise a material at least partially impermeable to light radiation.

[0049] In one or more embodiments, light radiation injection window 104 may therefore be masked, i.e. invisible, through the light radiation emission window 106 when reflector 100 is observed from the front in the direction of axis X100, i.e. in a direction orthogonal to the extension plane of the light radiation emission window 106 (see e.g. Figure 7).

[0050] In this way it is possible to reduce the scattering of light radiation towards the floor (as well as undesired blinding phenomena on people in the neighbourhood).

[0051] Figures 9 to 13 show various options for the implementation of surfaces 102a, 102b of the light radiation propagation cavity 102.

[0052] Said Figures refer - by way of example - to embodiments wherein planes X104 and X106 are tilted or inclined with respect to each other.

[0053] As previously stated, it has been observed that substantially similar lighting results may be obtained by optionally acting on the tilting of reflective surfaces 102a and 102b, also in embodiments wherein plane X106 is parallel to plane X104.

[0054] As a consequence, the following examples referring to embodiments wherein planes X104 and X106 are tilted or slanted with respect to each other must be deemed as applicable, mutatis mutandis, also to embodiments wherein planes X104 and X106 are parallel or substantially parallel to each other.

[0055] In one or more embodiments, the first reflective surface 102a may be implemented so as to extend towards the light radiation injection window 104, so as to form a sort of roof pitch projecting over the light radiation injection window 104.

[0056] In one or more embodiments, the first reflective surface 102a may thus receive the light radiation injected into window 104 in a direction orthogonal to respective plane X104, so as to reflect it.

[0057] In one or more embodiments, the second surface 102b (located on the opposite side or band from light radiation injection window 104) may extend away from window 104.

[0058] In one or more embodiments, the second surface 102b may thus be impinged on by the light radiation emitted from source L, which:

- has already been reflected on surface 102a, or
- has been injected into injection window 14 orthogonally to axis X100, i.e. in the direction of plane X106 of the light radiation emission window.

[0059] In one or more embodiments (see e.g. Figure 10) both reflective surfaces 102a, 102b of cavity 102 may define a gap therebetween, such as to enable a direct reflectionless propagation of the light radiation from injection window 104 to emission window 106.

[0060] Figures 9 to 13 exemplify in more detail possible implementations of the above general criteria, by referring by way of example to embodiments wherein plane X106 is tilted or oblique relative to plane X104.

[0061] For example, Figure 9 refers to the possible propagation path of the light radiation rays entering cavity 102 orthogonally to plane X104 of light radiation injection window 104.

[0062] Such a component of the light radiation injected into reflector 100 is subjected to a mirror-like reflection onto first surface 102a, and is then reflected onto surface 102b, so as to exit window 106 in a generally off-axis condition.

[0063] Figure 9 exemplifies the case of a light radiation cone (which may be e.g. a green-coloured radiation cone) emitted from the centre of source L, while the side bands or cones (which may correspond e.g. to red and blue emissions) are emitted from the edges of the light radiation emission surface of source L; in this exemplary case, one of said side cones (e.g. the red cone) only marginally touches reflective surface 102a, while the other (e.g. the blue cone) is subjected to a twofold reflection, substantially similar to the reflection of the central cone (which has been assumed as green).

[0064] In any case, it will be appreciated that the three components exemplified herein may exit window 106 generally forming one bundle.

[0065] The condition exemplified in Figure 9 may also be considered as corresponding to components (rays) of the light radiation which are injected into reflector 100 at an angle β to axis X100 substantially corresponding to angle α of the dihedron formed by planes X104 and X106.

[0066] On the other hand, Figure 10 exemplifies conditions approximately corresponding to a direct (reflectionless) propagation of the light rays from injection window 104 to emission window 106. This propagation path may be covered e.g. by light rays emitted by source L at an angle of approximately 30° to the normal to the light radiation emission window of source L, i.e. with an angle β amounting approximately to 55° relative to axis X100.

[0067] Figure 11 refers to light radiation components emitted by source L at an angle of approximately 65° to the normal to the light radiation emission surface (LES), i.e. at an angle β relative to axis X100 amounting approximately to 90°.

[0068] In this case, the rays corresponding to such components of the light radiation impinge on the second surface 102b while interacting only marginally with the first surface 102a (e.g. on the sides of cavity 102, where surfaces 102a and 102b unite).

[0069] Figure 12 refers to components of the light radiation which are injected into reflector 100 while forming an angle of approximately -25° relative to the normal to the light radiation emission surface of source L, i.e. in a direction which forms, relative to axis X100, an angle β practically amounting to zero.

[0070] In this case, the components of the light radiation are subjected to a twofold reflection, initially on first surface 102a and from this on second surface 102b. Also in this case, the action of reflector 100 is such that most rays exit window 106 in an off-axis condition.

[0071] Figure 13 exemplifies the possibility, e.g. for components (rays) emitted from source L at an angle of about -65° to the normal to the light radiation emission surface (i.e. at an angle β relative to axis X100 of approximately -40°), of being subjected to a threefold reflection:

- initially on surface 102a,
- then on surface 102b, and
- then once again on first reflective surface 102a.

[0072] In one or more embodiments, in a plane orthogonal to the plane in the Figures 9 to 13, the light radiation pattern emitted by reflector 100 has been found to exhibit a side widening (FWHM amounting approximately to 100°) while showing a good degree of uniformity, albeit being emitted in a tilted direction relative to wall W, as previously exemplified.

[0073] One or more embodiments may therefore concern a reflector (e.g. 100) to produce a wall-washing lighting pattern from an electrically-powered light radiation source (e.g. L).

[0074] In one or more embodiments, a reflector may include a body traversed by a light propagation cavity (e.g. 102) defining a light propagation path between a light injection window (e.g. 104) lying in a first plane (e.g. X104) and a light emission window (e.g. 106) lying in a second plane (e.g. X106).

[0075] In one or more embodiments, the light propagation cavity may have a flattened shape, with a first (e.g. 102a) and a second (e.g. 102b) light reflective surfaces lying in opposite planes relative to said light injection window.

[0076] In one or more embodiments (as visible e.g. in Figures such as Figure 2 or Figure 5), having a flattened light propagation cavity 102, the light emission window 106 may have two straight (rectilinear) edges connected by curved (concave/convex) edges, linked with the corresponding surface portions of light radiation propagation cavity 102 bordering on said edges.

[0077] In one or more embodiments, said first plane may be tilted relative to said second plane.

[0078] In one or more embodiments, said first plane may be tilted at approximately 25° (see e.g. the angle denoted as α in the Figures) relative to said second plane.

[0079] As may be appreciated e.g. in Figure 8, the fact that, in one or more embodiments, the (first) plane X104 (lying plane of source L) is tilted relative to the (second) plane X106 (lying plane of the light emission window 106) may also be described by stating that both such planes (X104 and X106) form an obtuse angle therebetween (e.g. of a width 180° - α).

[0080] In one or more embodiments, said first plane may be parallel to said second plane.

[0081] In one or more embodiments, at least one of said first and second planes (e.g. said second plane X106) may be orthogonal to an axis of the reflector (e.g. X100), and said light propagation path may be tilted relative to said axis of the reflector.

[0082] In one or more embodiments, the body of the reflector may include a light-impermeable material, so that said light injection window is not visible through said light emission window (e.g. viewed from the front, e.g. in the direction of said reflector axis).

[0083] In one or more embodiments:

- the reflector body may include a first (e.g. 100a) and a second portion (e.g. 100b), which are mutually complementary, having an intermediate plane which may be e.g. parallel to said reflector axis,

- said light injection window and said light emission window may be arranged respectively in said first portion and in said second portion of the reflector body.

[0084] One or more embodiments may include an intermediate screen (e.g. 100c) between said first and said second portion.

[0085] In one or more embodiments, said intermediate screen may be chosen between a light-permeable screen and a light diffusive screen.

[0086] In one or more embodiments, said first reflective surface may extend towards said light injection window, so that e.g. said first reflective surface is adapted to be impinged on by the light radiation injected into said light injection window in a direction orthogonal to said first plane.

[0087] In one or more embodiments, said second reflective surface may extend away from said light injection window, so that said second reflective surface may be impinged on e.g.:

- i) by a light radiation injected into said light injection window orthogonally to said reflector axis, and/or
- ii) by a light radiation reflected from said first reflective surface.

[0088] In one or more embodiments, said first and second reflective portions may define a gap therebetween, enabling a direct reflectionless propagation of the light radiation from said light injection window to said light emission window.

[0089] In one or more embodiments, a lighting device may comprise:

- a reflector (e.g. 100) as exemplified herein,
- an electrically-powered light radiation source, coupled to the light injection window of the reflector, wherein said light radiation source optionally comprises a planar light emission surface, extending at said light injection window.

[0090] In one or more embodiments, light radiation source L may be located outside the reflector.

[0091] In one or more embodiments, a method of implementing a wall-washing lighting pattern of a wall (e.g. W) may include:

- arranging a plurality of lighting devices as exemplified herein, aligned with each other in the direction of said wall, with the light radiation emission windows of the respective reflectors facing towards the wall, and
- activating the light radiation sources coupled to the light injection windows of the respective reflectors of said plurality of lighting devices.

[0092] One or more embodiments may comprise:

- arranging said plurality of lighting devices aligned with each other at a distance X of separation in the direction of said wall, with the light radiation emission windows of the respective reflectors facing towards the wall at a distance Y from the wall itself, and
- choosing X as approximately equal to Y, with values of X and Y approximately amounting to one third of H, wherein H is the height of said wall.

[0093] Without prejudice to the basic principles, the implementation details and the embodiments may vary, even appreciably, relative to what has been described herein by way of non-limiting example only, without departing from the extent of protection.

[0094] The extent of protection is defined by the annexed claims.

Claims

1. A reflector (100) for providing a wall-washing lighting pattern from an electrically-powered light radiation source (L), the reflector including a body traversed by a light propagation cavity (102) which defines a light propagation path between a light injection window (104) lying in a first plane (X104) and a light emission window (106) lying in a second plane (X106),
wherein the light propagation cavity (102) is of a flattened shape, with first (102a) and second (102b) light reflective surfaces lying on opposite sides with respect to said light injection window (104).

2. The reflector (100) of claim 1, wherein said first plane (X104) is oblique with respect to said second plane (X106).

3. The reflector (100) of claim 2, wherein said first plane (X104) is tilted approximately 25° with respect to said second plane (X106).

4. The reflector (100) of claim 1, wherein said first plane (X104) is parallel to said second plane (X106).

5. The reflector (100) of any of the preceding claims, wherein at least one (X106) of said first (X104) and said second plane (X106) is orthogonal to a reflector axis (X100), wherein said light propagation path is oblique with respect to said reflector axis (X100).

6. The reflector (100) of any of the preceding claims, wherein the reflector body includes light-impermeable material, whereby said light injection window (104) is not visible through said light emission window (106).

7. The reflector (100) of any of the preceding claims, wherein:

- the reflector body includes first (100a) and second (100b) complementary portions having an intermediate plane therebetween,
- said light injection window (104) and said light emission window (106) are provided in said first portion (100a) and in said second portion (100b) of the reflector body (100), respectively.

8. The reflector (100) of claim 7, including an intermediate screen (100c) between said first (100a) and second (100b) portions, said intermediate screen (100c) preferably selected out of a light-permeable screen and a light diffusive screen.

9. The reflector (100) of any of the preceding claims, wherein:

- said first reflective surface (102a) extends towards said light injection window (104), and
- said second reflective surface (102b) extends away from said light injection window (104).

10. The reflector (100) of any of the preceding claims, wherein said first (102a) and second (102b) reflective surfaces define therebetween a direct, reflectionless propagation path of light radiation from said light injection window (104) to said light emission window (106).

11. The reflector (100) of any of the preceding claims, wherein said light emission window (106) includes two parallel linear edges connected by curved edges with corresponding portions of the light propagation cavity (102) bordering on said edges.

12. A lighting device (10), including:

- a reflector (100) according to any one of claims 1 to 11,
- an electrically-powered light radiation source (L) coupled to the light injection window (104) of the reflector, wherein said light radiation source (L) preferably includes a planar light emission surface extending at said light injection window (104).

13. The lighting device (10) of claim 12, wherein the light radiation source (L) includes a LED cluster, preferably of circular shape.

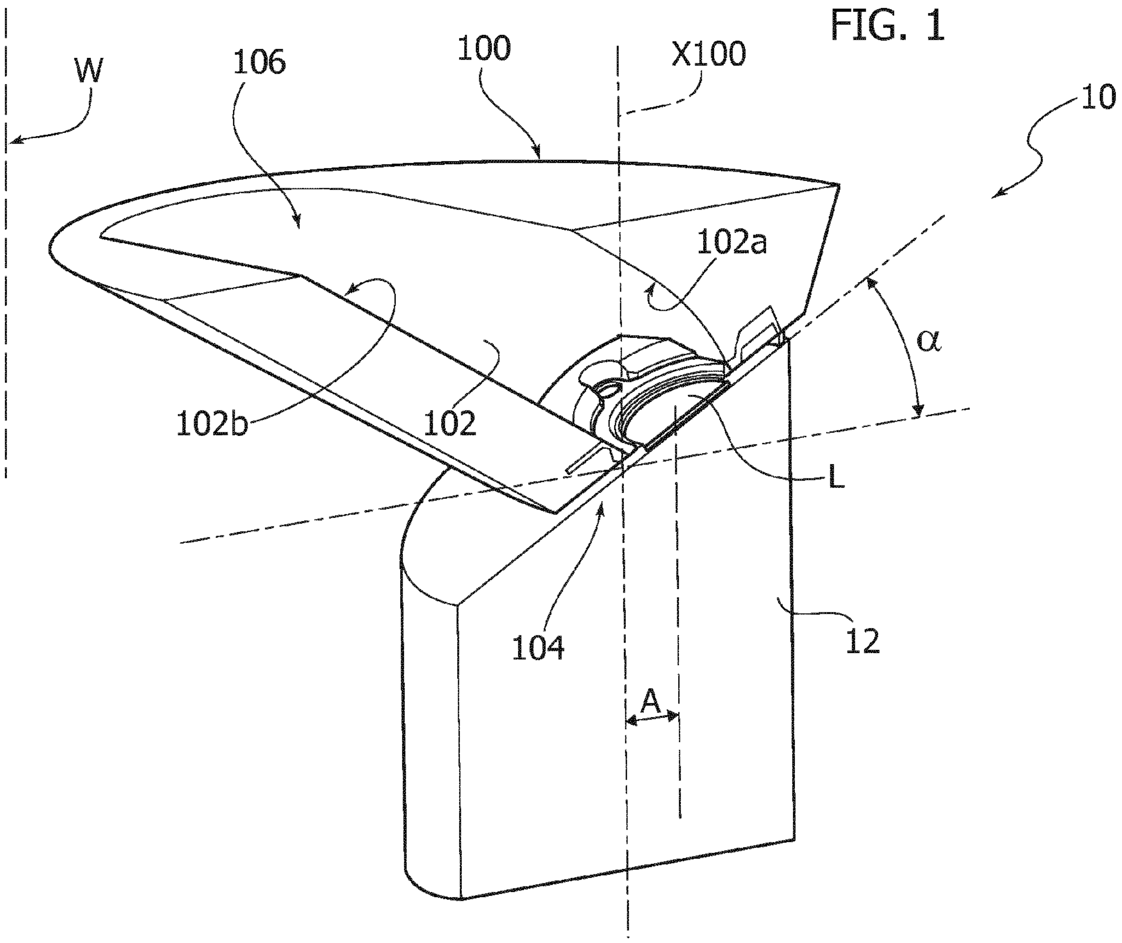
14. A method of providing a wall-washing lighting configuration of a wall (W), the method including:

- arranging a plurality of lighting devices (10) according to claim 12 or claim 13 aligned with each other in the direction of said wall (W) with the light emission windows (106) of the respective reflectors (100) facing the wall (W), and
- activating the light radiation sources (L) coupled to the light injection windows (104) of the respective reflectors (100) of said plurality of lighting devices (10).

15. The method of claim 14, including:

- arranging said plurality of lighting devices (10) aligned with a mutual distance X in the direction of said wall (W) with the light emission windows (106) of the respective reflectors (100) facing the wall (W) at a distance Y from the wall (W), and
- selecting X about equal to Y with values for X and Y about one third of H, where H is the height of said wall (W).

FIG. 1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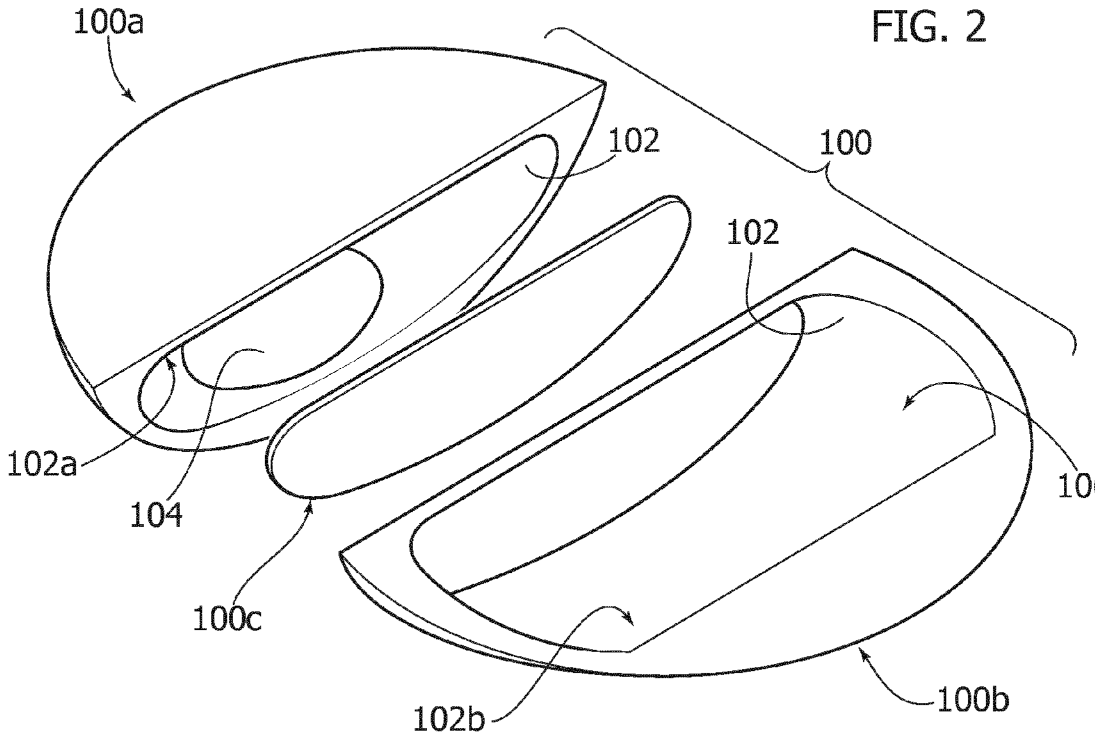
100
X100
10
102a
α
102b
102
L
104
12
A

FIG. 2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106
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FIG. 3

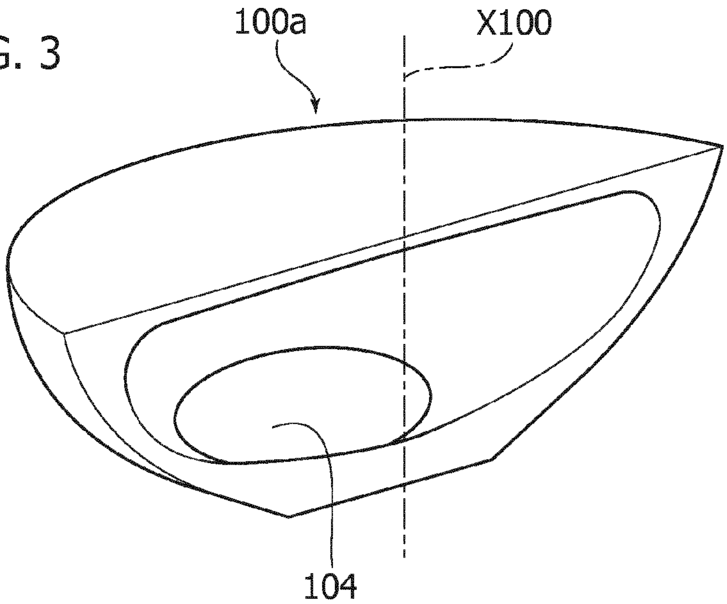


FIG. 4

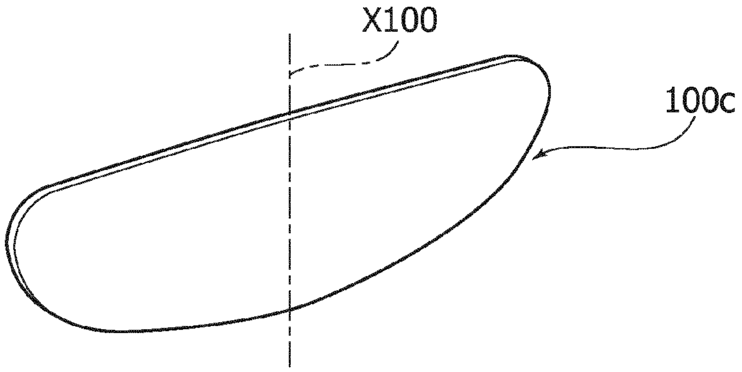
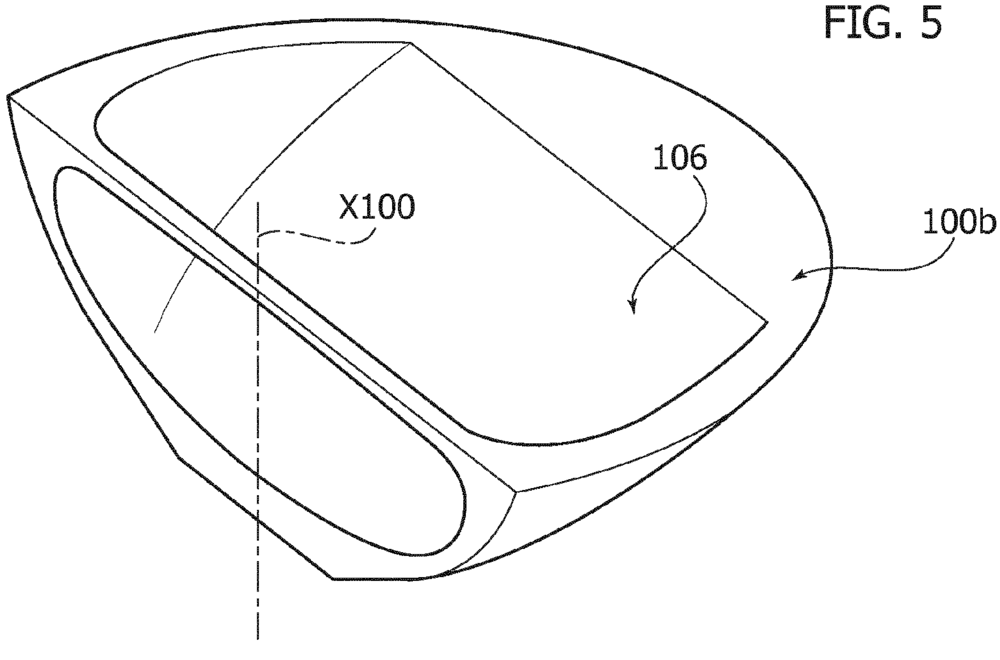


FIG. 5



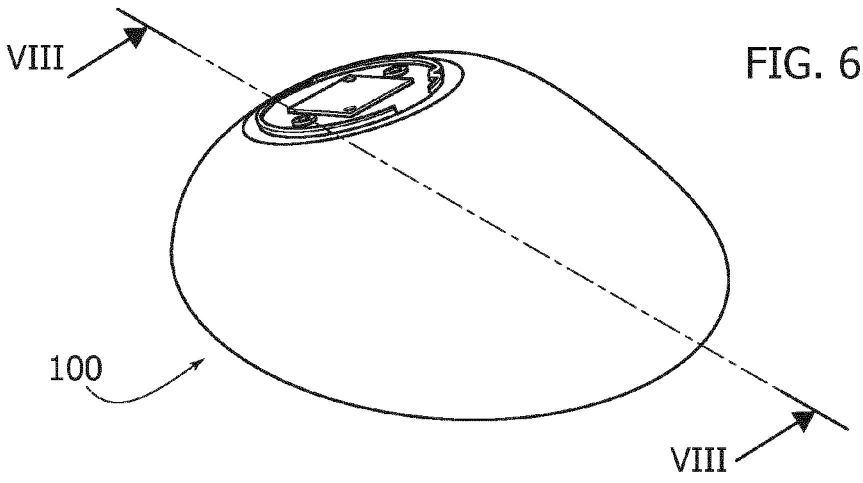


FIG. 6

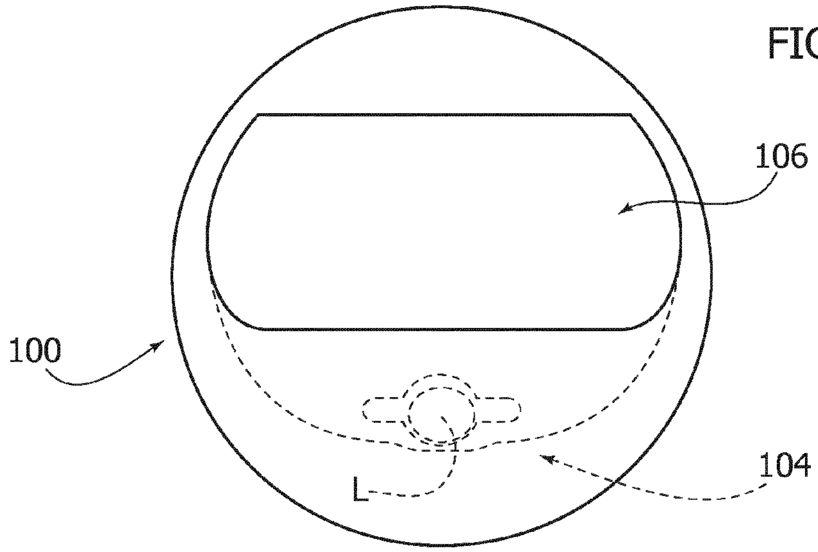


FIG. 7

FIG. 8

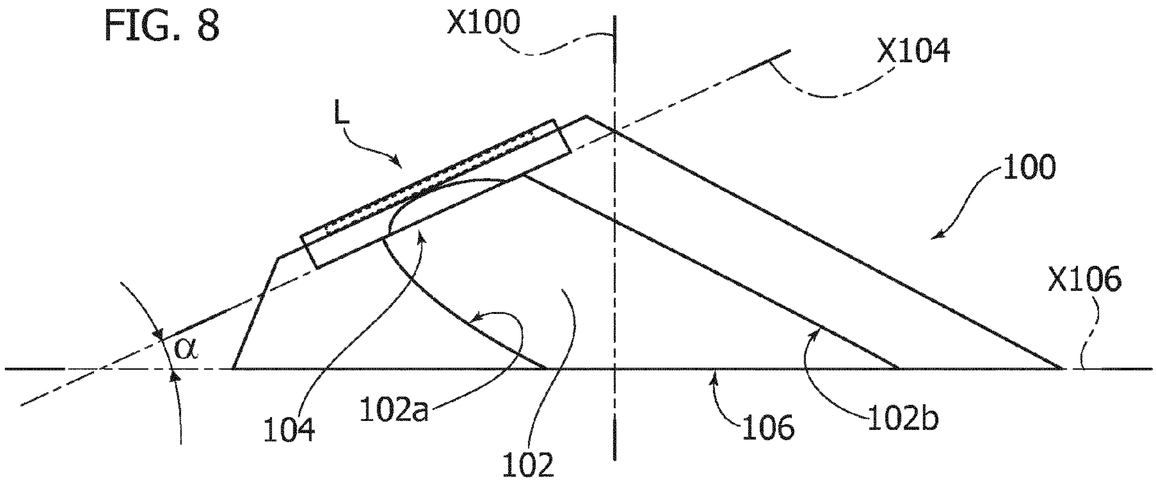
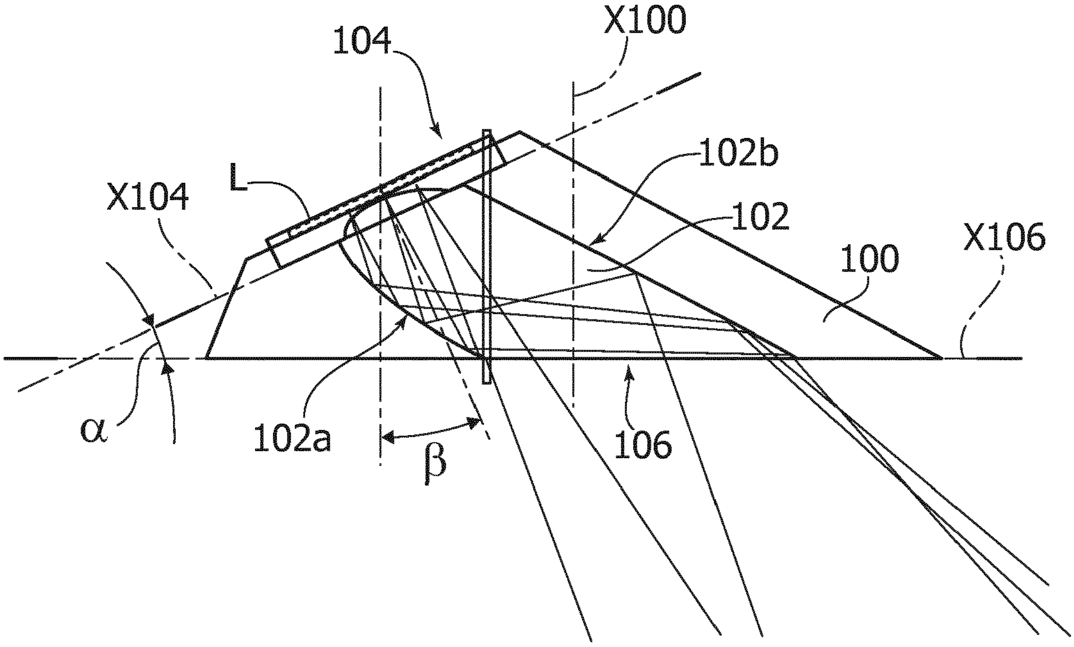


FIG. 9


104
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102b
L
X104
102
100
X106
α
102a
β
106
W

FIG. 10

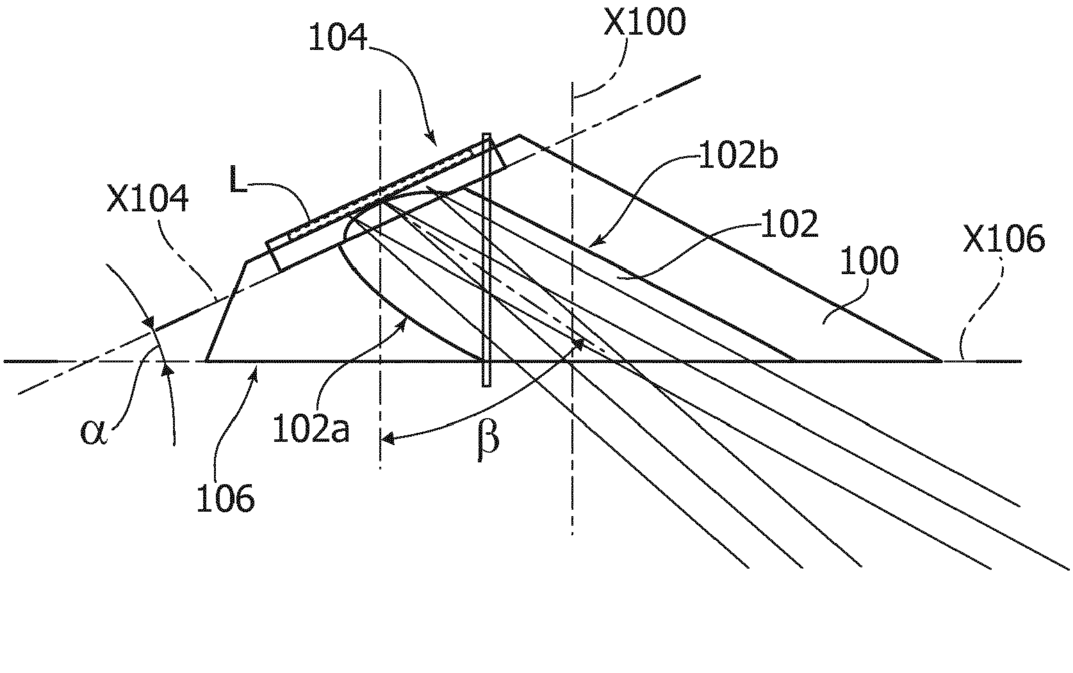

104
X100
102b
L
X104
102
100
X106
α
102a
β
106
W

FIG. 11

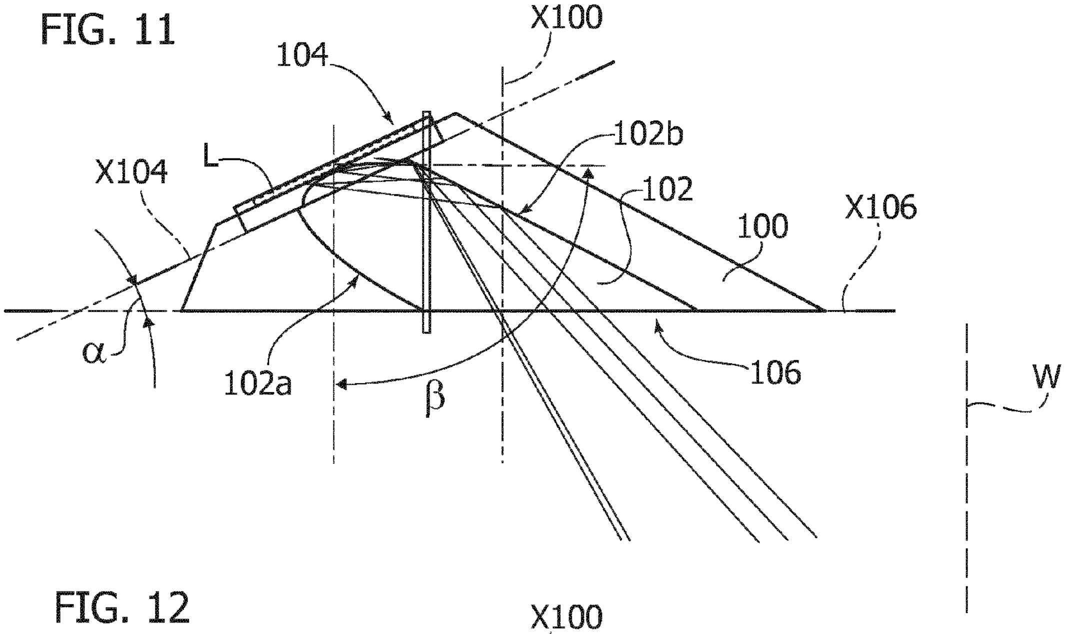


FIG. 12

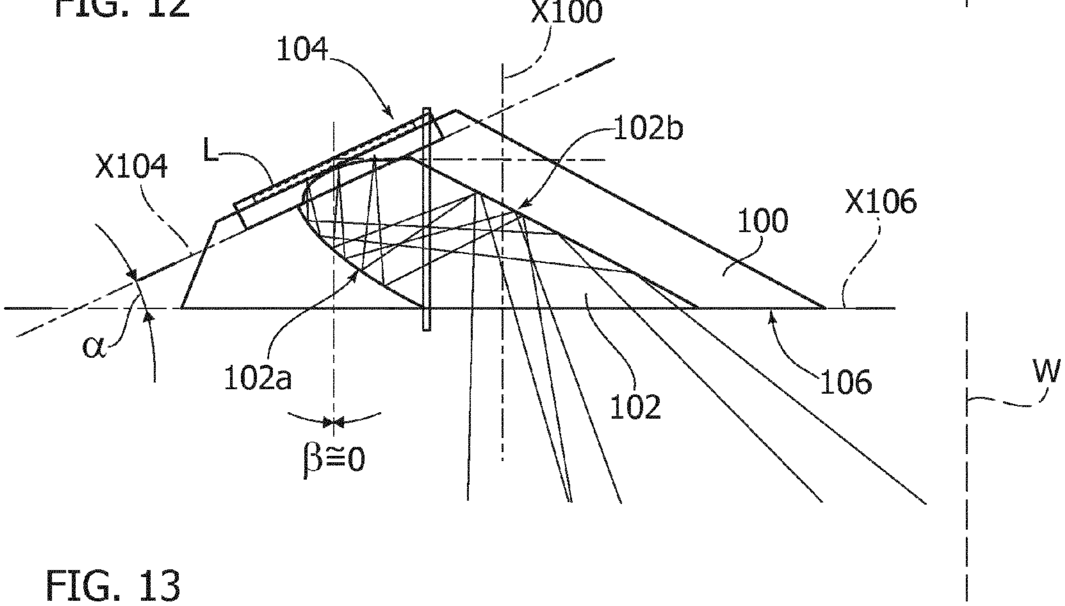
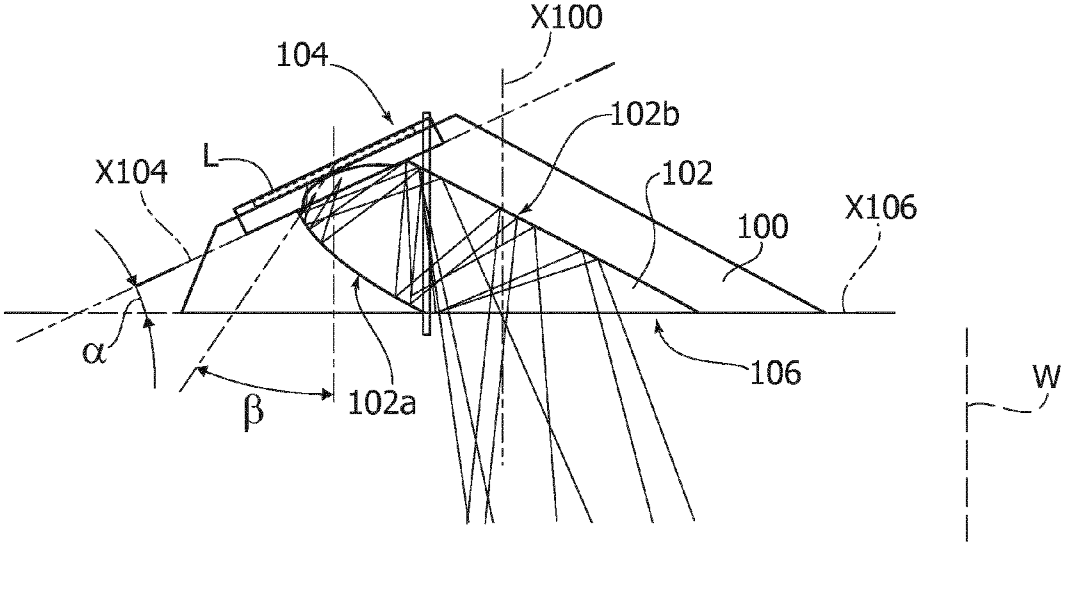


FIG. 13



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Place of search	Date of completion of the search	Examiner
The Hague	22 June 2017	Kebemou, Augustin

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