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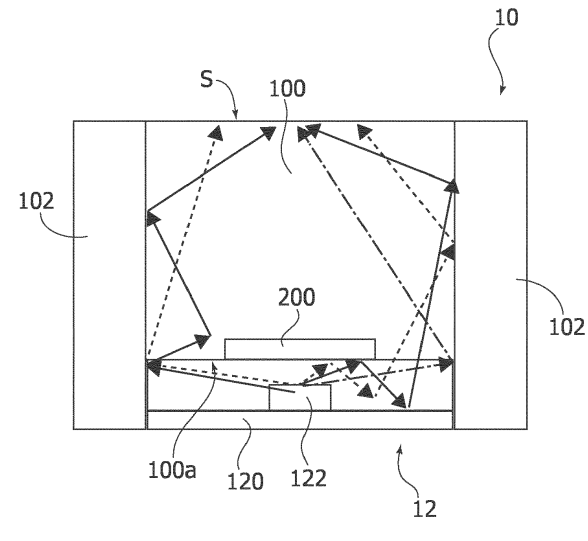
(54) A COVER MEMBER FOR LIGHTING DEVICES, CORRESPONDING DEVICE AND METHOD

(57) A cover member (10) for elongated lighting modules (12), e.g. LEDs (122), includes:
- an elongated light-propagation body (100) having a light-radiation receiving surface (100a) and a light-radiation emitting surface (S) opposite to the light-radiation receiving surface (100a), the cover member (10) being positionable with the light-radiation receiving surface (100a) facing an elongated light-radiation emission module (12), wherein the light-propagation body (100) provides light-propagation paths for light radiation from the light-radiation receiving surface (100a) to the light-radiation emitting surface (S), wherein:
- the light-propagation body (100) comprises light-diffusive material (with consequent mixing of the light that propagates along the aforesaid light-propagation paths), and
- a light-obstructive barrier (200) provided at the light-radiation receiving surface (100a) leaving at least one lateral portion of the light-radiation receiving surface (100a) uncovered, so that the aforesaid light-propagation paths include tortuous light-propagation paths through said at least one side portion circumventing the light-obstructive barrier (200) .

FIG. 2



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Description

Technical field

[0001] The description refers to lighting devices.
[0002] One or more embodiments can be applied to lighting devices using electrically-powered light radiation sources, for example, solid-state light radiation sources such as LED sources.

Technological background

[0003] LED lighting modules, e.g. flexible-type modules, with bright spots that are not visible (i.e. being difficult to perceive their individuality), are becoming increasingly widespread.
[0004] These modules allow a uniform and diffused lighting effect to be achieved over the entire length of the module.
[0005] These modules are available in different configurations, for example, with the ability to emit white light radiation for lighting purposes and/or with the possibility of emitting colored radiation, for example, as a decorative function.
[0006] It is possible to use more than one color in the same LED strip, for example, by using RGB and RGB-W type LED modules.
[0007] An RGB LED source comprises three chips in the same package (one for each color: red, green and blue), and usually has (at least slightly) greater dimensions than those of a standard LED that emits white light radiation.
[0008] Obtaining a good level of uniformity in the outgoing light radiation can be facilitated thanks to the use of diffusive material arranged above the LEDs and, possibly, also by playing on the distance (or "pitch") between the various light sources.
[0009] The greater encumbrance of an RGB LED source is an obstacle to obtaining a reduced distance between two adjacent sources (for example, a distance of 2-3 mm).
[0010] In these conditions, obtaining a good level of uniformity is facilitated by the use of a greater quantity of diffusive material arranged above the LED sources. This, however, translates into an additional increase in the size of the LED module.
[0011] Regarding the use of such a diffusive material in LED modules, for example, of a flexible type, it is possible to apply at least two different solutions.
[0012] The first involves the use of a completely diffusive-type cover member, applied above the module.
[0013] The second, instead, envisages the use of just a layer of diffusive material arranged above a light-permeable cover member (for example, of transparent material). In such a solution, the diffusive layer can be applied, for example, with potting techniques.
[0014] For the diffusive material, it is possible to use material such as silicone or polycarbonate, charged with light-diffusive particles (for example, alumina). In this way, it is possible to use the same base material as the base or matrix (silicone, polycarbonate, etc.) usable for producing light-permeable covering materials.
[0015] The result in terms of uniformity of light emission may essentially depend on two factors:

- the characteristics of the diffusive material used (for example, type/concentration of the diffusive particles used as a filler, and outer dimensions of the particles),
- the distance between the light radiation sources (the so-called "pitch").

[0016] It has been observed that these current solutions are not suitable in the case of modules that require reduced dimensions.
[0017] Furthermore, these solutions do not facilitate the placement of LED sources (very) close to one another.
[0018] Another limitation of these current solutions may derive from the direct lighting of the diffusive material by the light radiation sources of the module.
[0019] In some solutions, the LED sources may not be exactly centered with respect to the LED module, and this eccentric placement is likely to result in non-homogeneity of the light emission, in the sense that one edge of the module will be brighter than the other (darker) side.

Object and summary

[0020] One or more embodiments aim to overcome the drawbacks outlined above.
[0021] According to one or more embodiments, this object can be achieved thanks to a cover member for lighting devices having the characteristics referred to in the following claims.
[0022] One or more embodiments may also concern a corresponding device.
[0023] One or more embodiments may concern a corresponding method.

[0024] The claims form an integral part of the technical disclosure provided here in relation to the embodiments.

[0025] One or more embodiments make it possible to achieve one or more of the following advantages:

- reduction of the overall dimensions of the lighting device (for example, a flexible LED module) while maintaining a good level of uniformity of the light radiation emitted starting from the light-radiation emitting surface;
- good level of color uniformity when using light radiation generators (for example, LEDs) of a multicolored type; this applies even if they are not aligned with respect to the longitudinal axis of the lighting module (with the consequent possibility of achieving greater uniformity in the transverse direction);
- less criticality linked to the distance between the light radiation sources, with the consequent possibility of reducing the number of these sources per unit length, with a corresponding reduction in the cost of the module;
- possibility of using diffusive materials with contained diffusive characteristics: this makes it possible to increase the efficiency in the emission of light radiation, and at the same time reduce costs;
- slackening of the requirements in terms of distance or pitch between the sources, and the possibility of using several different types of light radiation sources in the same device layout make it possible to produce more sophisticated and innovative chromatic solutions.

Brief description of the figures

[0026] One or more embodiments will be now described, purely by way of non-limiting example, with reference to the attached figures, wherein:

- Figure 1 is a cross-sectional view of a cover member according to embodiments,
- Figure 2 is an example of the possible coupling methods of a cover member (as illustrated in Figure 1) with a corresponding light radiation-generating module,
- Figure 3 is an example of possible ways of using embodiments, and
- Figure 4 exemplifies the possible application of embodiments to a device structure of the simplified type in Figure 3.

[0027] It will be appreciated that, for clarity and simplicity of representation, the various views may not be all on the same scale.

Detailed description of examples of embodiments

[0028] The following description illustrates various specific details in order to provide a thorough understanding of various examples of embodiments according to the description. The embodiments can be obtained without one or more of the specific details, or with other methods, components, materials, etc. In other cases, known structures, materials or operations are not illustrated or described in detail so that the various aspects of the embodiments and not rendered unclear.

[0029] The reference to "an embodiment" in the context of the present description indicates that a particular configuration, structure or characteristic described in relation to the embodiment is included in at least one embodiment. Thus, sentences such as "in an embodiment", which may be present at various points in the present description, do not necessarily refer to exactly the same embodiment. Moreover, particular configurations, structures or characteristics can be combined in any suitable way in one or more embodiments.

[0030] The references used here are provided simply for convenience and therefore do not define the field of protection or scope of the embodiments.

[0031] One or more embodiments may refer to a cover member 10, which can be used in conjunction with a light radiation-generating element (module) 12.

[0032] One or more embodiments may concern an element or module (of the type sometimes called "flex") comprising a ribbon-like substrate 120, for example, flexible, substantially similar to a printed circuit board (PCB) on which light radiation sources 122 are distributed (for example, in the direction of the length of the substrate 120) capable of presenting the characteristics discussed below.

[0033] Elements or modules of this nature are known per se in the art, and are now widely used commercially: this makes it unnecessary to provide a more detailed description here.

[0034] In this regard, the views of Figures 1, 2 and 4 can be considered as cross-sections of an elongated body of indefinite length - per se - possibly susceptible to being cut to length according to the application and use requirements. Figure 3 can, instead, be considered as a plan view of a portion of a lighting device corresponding to the cross-section of Figure 4.

[0035] One or more embodiments aim at increasing the uniformity of the light radiation emitted from the light emitting surface (LES) of the lighting device comprising the module 12 and the cover member 10.

[0036] This light-radiation emitting surface may correspond to the surface indicated by S in Figures 1, 2 and 4.

[0037] In one or more embodiments, the cover member 10 may be in the form of an elongated element, with a channel-like transverse profile, capable of being coupled to the module 12 according to the methods exemplified in Figure 2.

[0038] For example, a cover member 10 - as exemplified in Figures 1 and 2 - may comprise a channel-shaped central part (body part or portion), indicated by 100, and two side portions 102.

[0039] In one or more embodiments, as exemplified in Figures 1 and 2, the light-radiation emitting surface S may basically correspond to the surface or face - represented here with a planar conformation, even if this conformation is not to be considered imperative - (at the top in Figures 1 and 2) of the channel-shaped portion of the cover member 10.

[0040] In one or more embodiments, the aforesaid body part 100 of the cover member 10 may comprise a light-permeable material that exhibits characteristics of light-diffusivity.

[0041] One or more embodiments may concern, for example, a material such as silicone or polycarbonate, etc. in which particles (for example, alumina) are dispersed, with characteristics of light radiation diffusivity.

[0042] The surface or face 100a of the central part or body 100 of the element 10, opposite the surface S, can be directed towards the light radiation-generating module 12 when the module 12 and the cover member 10 are coupled together, as exemplified in Figure 2

[0043] For example, this may occur thanks to the presence of side parts or arms 102 of the cover member 10, shaped so as to "enclose" the light radiation-generating module 12.

[0044] In this way, the module 12 is located at the mouth part of the channel-shaped portion of the cover member 10, with the light radiation sources 122 facing the body part 100.

[0045] The light radiation emitted by the sources 122 is therefore able to propagate (according to the methods described below) through the diffusive material of the body part 100, and then be emitted outwards from the lighting device (module 12 plus cover member 10) starting from the light-radiation emitting surface S.

[0046] In one or more embodiments, the side walls or branches 102 of the cover member 10 may comprise (at least at the level of surface cover, and according to solutions known per se, also regarding the implementation technologies, e.g. co-extrusion) a material that is - overall - not permeable to light radiation, for example, impermeable or slightly light-permeable. This can be white material, obtainable, for example, using a silicone or polycarbonate (etc.) matrix charged (to a high degree) with light-radiation diffusive/reflective particles.

[0047] In this way, the light radiation emitted by the sources 122 is able to reflect on the side walls or branches 102, with these walls or branches able to carry out a "recycling" action of the light radiation. This action promotes the propagation of this light radiation towards the emission surface S, with an improvement in the emission efficiency of the light radiation of the device.

[0048] One or more embodiments, as exemplified in the plan view of Figure 3, may provide "multicolored" sources of light radiation sources 122, each capable of comprising several light radiation generators (e.g. LEDs) that emit light radiation of a different color.

[0049] For example, (this indication is purely exemplary and not limitative of the embodiments) there could be groups of generators emitting red radiation (122a), green radiation (122b) and blue radiation (122c), arranged close to each other (for example, on the same chip), coupled with a generator 122d of white light radiation (for example, with a controllable/variable correlated color temperature - CCT - value).

[0050] In one or more embodiments, electrical/electronic components 124 can be interposed between the various sources 122 (capable of comprising simple components or, possibly, even more complex circuits - for example, integrated) of which it is generally desirable be able to mask the presence with respect to observing the lighting device from the outside (for example, starting from the surface S). This takes into account the fact that these components may have dark colored casing (packages) e.g. black.

[0051] One or more embodiments aim to take into account the fact that, for example, in the case of multicolored light radiation sources (it will be appreciated that one or more embodiments are not limited to this possible application), it is desirable to ensure that the colors coming from different generators (122a, 122b, 122c, 122d) can be mixed together so as to give rise to a homogeneous coloring effect in the light radiation leaving the surface S.

[0052] Moreover, it is desirable to be able to carry out an action to homogenize the emission of light radiation, even regarding the geometric location of the sources 122 within the module 12.

[0053] As mentioned, some solutions may envisage (for various reasons) that the various light radiation generators (for example, 122a, 122b, 122c, 122d) are located in an eccentric position with respect to a longitudinal median plane (vertical with reference to the observation point of Figure 4) common to the module 12 and the cover member 10 coupled thereto, thus being positioned, so to speak, "on one side" with respect to the module 12 and to the device as a whole.

[0054] This side placement may run the risk of resulting in a non-uniform distribution (also in this case in the sense of a lateral displacement) of the distribution of light radiation leaving the surface S.

[0055] One or more embodiments may envisage the presence - at the surface 100a of the body part 100 of the cover member 10 (i.e. the surface intended to be directed towards the module 12) - of a barrier 200 of non-permeable material (i.e. impermeable or slightly permeable) to light radiation.

[0056] In one or more embodiments, this obstructive barrier of the light propagation is intended to be placed in front of the light radiation sources 122. This in order to contrast (and - at least in principle - avoid) direct propagation of the light radiation coming from the sources 122 towards the emission surface S of the light radiation.

[0057] In one or more embodiments, the barrier 200 can be made in the form of a strip-shaped insert (see the dashed-line representation in Figure 3) or in the form of individual blocks separated from each other and placed in front of the various sources 122.

[0058] In this way, the light radiation emitted by the sources 122 is practically forced (see, for example, the representations with arrows and broken lines in Figures 2 and 4) to arrive in the diffusive material of the body part 100 of the cover member 10 (only) after having been reflected against the side walls or branches 102 and/or against the surface of the substrate 12 (which, as well as the side walls 102, may comprise, at least at the surface coverage level, a material that reflects light radiation, for example, white material).

[0059] In this way, the light-diffusive material of the body part 100 can act as a "mixing chamber" in which the light radiation is subjected to mixing before being emitted from the emission surface S, thus giving rise to a diffused and homogeneous distribution of light emission. This is from both a geometric point of view, with possible compensation of possible eccentric positions of the sources 122 (see for example, Figure 4), and from a chromatic point of view, for example if, as exemplified in Figures 3 and 4, there are multicolored light radiation sources with differently colored light radiation generators placed in different geometric positions.

[0060] At the same time, the presence of the barrier 200 can also be beneficial with regard to the masking effect with respect to the outside of the electric/electronic components 124 (if present).

[0061] The function of the non-light-permeable barrier 200 (i.e. impermeable or weakly permeable to light) is to contain (virtually avoid) direct propagation of the light radiation coming from the sources 122 towards the surface S.

[0062] By itself, this choice could be seen as likely to lead to a reduction in the emission efficiency of the light radiation of the lighting system as a whole.

[0063] The light radiation reflective characteristics of the barrier 200 (and/or of the side walls 102 and/or of the substrate 120) make it possible to compensate, at least in part, for the aforesaid loss of efficiency, also offering the possibility to reduce the dimensions of the device (module 12 and cover member 10) as a whole.

[0064] It has been observed that, in the presence of multicolored light sources (for example, the RGB-W sources exemplified in Figure 3), as well as compensating for possible effects related to the different spatial location of the various light radiation generators (and to the possible eccentric location of the sources 122), one or more embodiments may make the spacing conditions between the sources 122 less stringent with the same uniformity of the emitted light radiation.

[0065] In particular, it is possible to increase the distance between the sources 122. This allows reduction of the number of sources 122 per unit length of the device 10 (with a consequent reduction in the costs of the device) and - at the same time - facilitates the fact of placing several different types of sources within the same layout, with the possibility of giving rise to more sophisticated and innovative solutions, also regarding the use of color.

[0066] Figure 4 exemplifies, in addition to the various characteristics already discussed above, the possibility of producing the cover member 100 with the lateral sides 102 connected to each other at the ends which enclose the substrate 120 of the module 12 through a transverse branch 104. This transverse branch closes the cover member 10 around the module 12 in an opposite position with respect to the surface S.

[0067] For example, solutions as exemplified in Figure 4 can be implemented by providing the side branches 102 and the connecting branch 104 as parts of the same channel-like casing in which the module 12 is arranged at the bottom wall. The barrier 200 and the body part 100 of light-diffusive material can be subsequently applied on the module (capable of being produced as a potting mass dispensed inside the channel-shaped element comprising the side branches 102 and the connecting branch 104 with the module 12 mounted therein).

[0068] Furthermore, one or more embodiments as exemplified in Figure 4 may envisage that the space comprised between the substrate 120 of the module 12 and the surface 100a of the part 100, where the barrier 200 is located, receives a filling 106 (e.g. a potting mass) of material comprising the filling of light-permeable or translucent material capable of further increasing the diffusion effect.

[0069] One or more embodiments, as exemplified in Figure 4, may offer the advantage given by the fact that the cover member 10 as a whole is capable of carrying out a protection action of the module 12 against the penetration of external agents, for example, with an IPx degree of protection.

[0070] As has been seen, one or more embodiments may envisage the presence of tortuous light propagation paths that circumvent a light-obstructive barrier, for example, that indicated by 200 in the figures. In this way, it is possible to cause the light of the source 122 to reach the emission surface S (only) after having been deflected and reflected, even a large number of times.

[0071] In this way, it is possible to avoid the occurrence of isolated light "spots" on the surface S, which is uniformly illuminated (both in terms of flow intensity and color level).

[0072] In one or more embodiments, tortuous paths of the type discussed here can be obtained when the obstruction element (barrier) 200 is positioned (at least partially) opposite or "above" the source(s) 122.

[0073] By reasoning in a geometric way, such a situation can occur (see, for example, the cross-sections of Figures 2 and 4) when the projection of the light emission surface (LES) of the source 122 onto a plane (e.g. a plane coinciding with or parallel to the light-radiation receiving surface 100a), which contains the obstruction element (barrier) 200, is at least partially contained within the obstruction element 200.

[0074] It will be appreciated that such a criterion can be satisfied even when the obstruction element 200 has a different shape from the parallelepiped shape exemplified here and/or does not extend in a plane parallel to the light emission surface (LES) of the source 122, being, e.g. arranged, so to speak, askew with respect to the source.

[0075] It will also be appreciated that one or more characteristics exemplified with reference to any one of Figures 1 to 4 are not constrained to use in the context of a combination such as that exemplified in the corresponding figure. These characteristics are, therefore, also capable of being applied, individually or in combination with each other, to embodiments as exemplified in any other of the figures attached here.

[0076] In one or more embodiments, a cover member (e.g. 10) for lighting devices may comprise:

- an elongated light-propagation body (e.g. 100) having a light-radiation receiving surface (e.g. 100a) and a light-radiation emitting surface (e.g. S) opposite to the light-radiation receiving surface, the cover member being positionable with the light-radiation receiving surface facing an elongated light-radiation emission module (e.g. 12), wherein the light-propagation body provides light-propagation paths for light radiation from the light-radiation receiving surface to the light-radiation emitting surface, wherein:
    - the light-propagation body comprises light-diffusive material (with consequent mixing of the light that propagates along the aforesaid light-propagation paths), and
    - a light-obstructive barrier (e.g. 200) can be provided at the light-radiation receiving surface, which leaves at least one side portion of the light-radiation receiving surface uncovered, so that said light-propagation paths comprise tortuous paths (i.e. with so to speak "labyrinth" deviations and reflections,) of light propagation through said at least one side portion, which circumvent the light-obstructive barrier.

[0077] In one or more embodiments, the light-obstructive barrier can be located centrally with respect to the light-radiation receiving surface, leaving two opposite side portions of the light-radiation receiving surface uncovered for said light-propagation paths.

[0078] In one or more embodiments, the light-obstructive barrier may comprise:

- a barrier strip that extends along the light-propagation body, or
- a sequence of barrier segments distributed along the light-propagation body.

[0079] One or more embodiments may comprise side confinement surfaces (e.g. 102) of the light-propagation body, the side confinement surfaces comprising material with light-reflective characteristics, wherein said light-propagation paths comprise reflections at said side confinement surfaces.

[0080] In one or more embodiments, the light-obstructive barrier may comprise material with light-reflective characteristics, so that said light-propagation paths may include reflections at said light-obstructive barrier.

[0081] One or more embodiments may comprise side walls configured to receive a light radiation emission module between them.

[0082] A lighting device according to one or more embodiments may comprise:

- an elongated light-radiation emission module,
- a cover member according to one or more embodiments, coupled to the light-radiation emission module, with the light-radiation receiving surface positioned facing the light-radiation emission module.

[0083] In one or more embodiments:

- the light-radiation emission module may have a light emission surface (e.g. LES), and
- the projection of said light emission surface onto a plane including the light-obstructive barrier may be at least partially included within the light-obstructive barrier.

[0084] One or more embodiments may comprise the filling (e.g. 106) of light-permeable or translucent material between the emission module of light radiation and the cover member.

[0085] In one or more embodiments, the light radiation emission module may comprise:

- a laminar support member (e.g. 120), and
- a distribution of light radiation sources (e.g. 122) along the support member facing the light-radiation receiving surface of the cover member.

[0086] In one or more embodiments, the light radiation emission module may comprise:

- electrically-powered light-radiation sources, optionally LED sources, and/or
- multicolored light radiation sources (e.g. 122a, 122b, 122c, 122d), and/or
- a distribution of light radiation sources arranged offset (see, for example, Figure 4) with respect to a longitudinal median plane common to the light radiation emission module and the cover member coupled therewith, and/or
- a laminar support member having a distribution of light radiation sources therealong, the laminar support member including material with light-reflective characteristics facing the cover member.

[0087] In one or more embodiments, a method may comprise:

- providing an elongated light radiation emission module, and
- coupling a cover member to the light radiation emission module according to one or more embodiments, coupled to the light-radiation emission module with the light-radiation receiving surface positioned facing the light-radiation emission module.

[0088] Without prejudice to the underlying principles of the invention, the details of construction and the embodiments may vary, even significantly, with respect to those illustrated here, purely by way of non-limiting example, without departing from the scope of the invention.

[0089] The extent of protection is determined by the attached claims.

LIST OF REFERENCE SIGNS

Cover member	10
Light-propagation body	100
Light-radiation receiving surface	100a
Side confinement surfaces	102
Transverse branch	104
Filling of light-permeable material	106
Light radiation emission module	12
Laminar support member	120
Light radiation sources	122
Multicolored light radiation sources	122a, 122b, 122c, 122d
Electrical/electronic components	124
Light-obstructive barrier	200
Light radiation emission surface	S

Claims

1. A cover member (10) for lighting devices, the cover member (10) comprising:

- an elongated light-propagation body (100) having a light-radiation receiving surface (100a) and a light-radiation emitting surface (S) opposed to the light-radiation receiving surface (100a), the cover member (10) positionable with the light-radiation receiving surface (100a) facing an elongated light-radiation emission module (12), wherein the light-propagation body (100) provides light-propagation paths for light radiation from the light-radiation receiving surface (100a) to the light-radiation emitting surface (S), wherein:
- the light-propagation body (100) comprises light-diffusive material, and
- a light-obstructive barrier (200) is provided at the light-radiation receiving surface (100a) leaving uncovered at least one lateral portion of the light-radiation receiving surface (100a), wherein said light-propagation paths include tortuous light-propagation paths through said at least one lateral portion circumventing the light-obstructive barrier (200).

2. The cover member (10) of claim 1, wherein the light-obstructive barrier (200) is located centrally of the light-receiving surface (100a) leaving uncovered two opposed lateral portions of the light-receiving surface (100a) for said light-propagation paths.

3. The cover member (10) of claim 1 or claim 2, wherein the light-obstructive barrier (200) comprises:

- a barrier strip extending along the light-propagation body (100), or
- a sequence of barrier segments distributed along the light-propagation body (100).

4. The cover member (10) of any of the previous claims, including lateral confinement surfaces (102) of the light-propagation body (100), the lateral confinement surfaces (102) comprising material with light-reflection capability, wherein said light-propagation paths comprise reflections at said lateral confinement surfaces (102).

5. The cover member (10) of any of the previous claims, wherein the light-obstructive barrier (200) comprises material with light-reflection capability, wherein said light-propagation paths include reflections at said light-obstructive barrier (200).

6. The cover member (10) of any of the previous claims, comprising lateral side walls (102) configured to receive a light-radiation emission module (12) therebetween.

7. A lighting device (10, 12), comprising:

- an elongated light-radiation emission module (12),
- a cover member (10) according to any of claims 1 to 6, coupled to the light-radiation emission module (12) with the light-radiation receiving surface (100a) positioned facing the light-radiation emission module (12) .

8. The lighting device (10, 12) of claim 7, wherein:

- the light-radiation emission module (12) has a light emission area, and
- the projection of said light emission area (LES) onto a plane including the light-obstructive barrier (200) is at least partially included within the light-obstructive barrier (200).

9. The lighting device (10, 12) of claim 7 or claim 8, comprising a filling (106) of light-permeable or translucent material between the light-radiation emission module (12) and the cover member (10).

10. The lighting device (10, 12) of any of claims 7 to 9, wherein the light-radiation emission module (12) comprises:

- a laminar support member (120),
- a distribution of light-radiation sources (122) along the support member (120) facing the light-radiation receiving surface (100a) of the cover member (10) .

11. The lighting device (10, 12) of any of claims 7 to 10, wherein the light-radiation emission module (12) comprises:

- electrically-powered light-radiation sources (122), preferably LED light-radiation sources, and/or
- multi-colour light-radiation sources (122a, 122b, 122c, 122d), and/or
- a distribution of light-radiation sources (122) arranged offset with respect to a longitudinal median plane common to the light-radiation emission module (12) and the cover member (10) coupled therewith, and/or
- a laminar support member (120) having a distribution of light-radiation sources (122) therealong, the laminar support member (120) including material with light-reflective capability facing the cover member (10).

12. A method, comprising:

- providing an elongated light-radiation emission module (12), and
- coupling to the light-radiation emission module (12) a cover member (10) according to any of claims 1 to 6, coupled to the light-radiation emission module (12) with the light radiation receiving surface (100a) facing the light radiation emission module (12).

FIG. 1

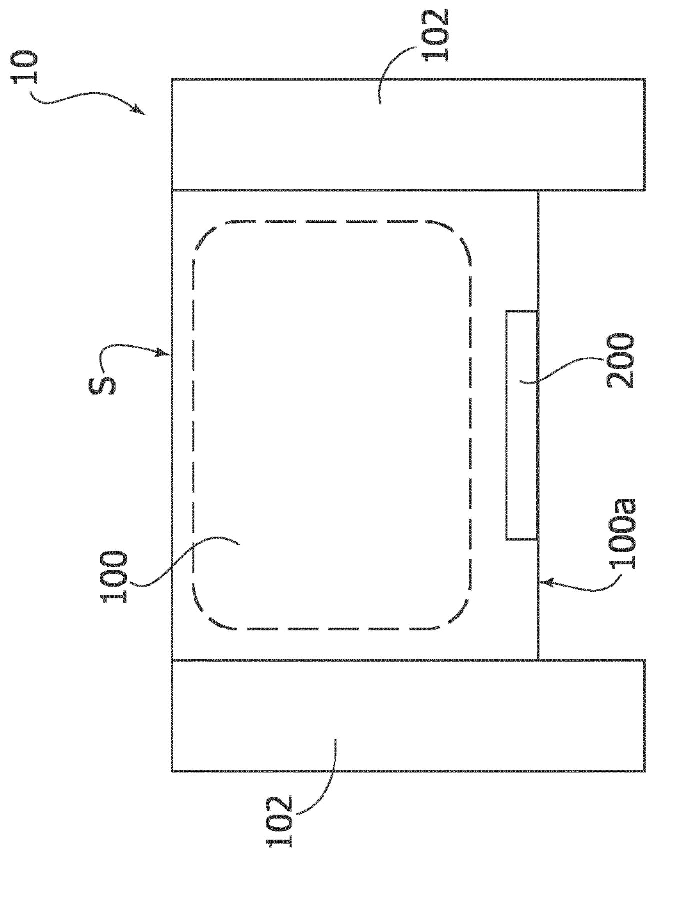
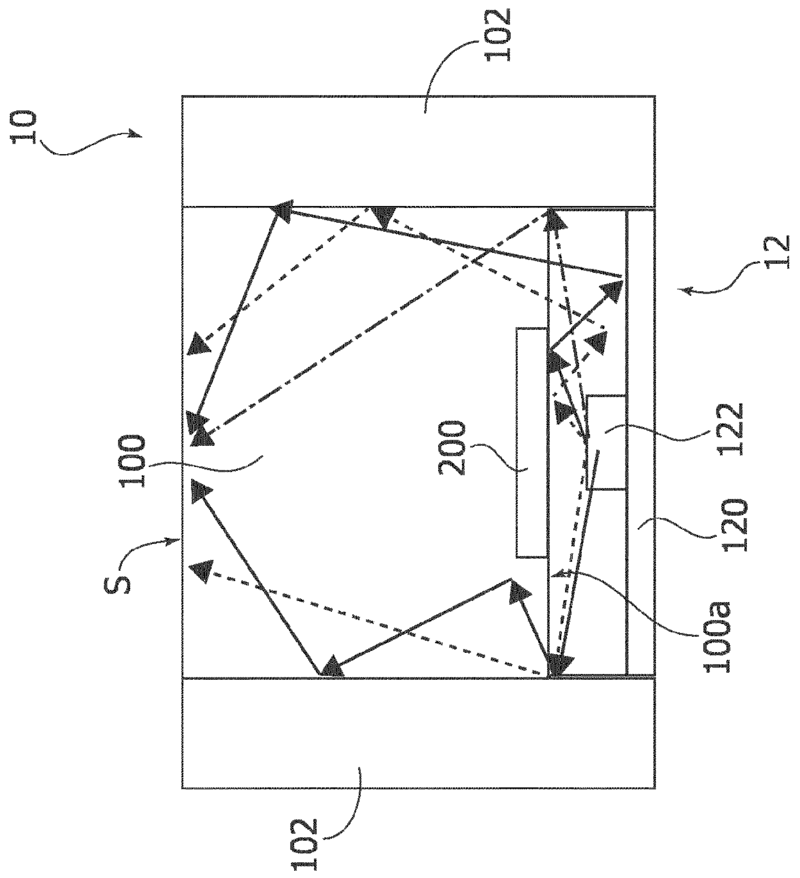


FIG. 2



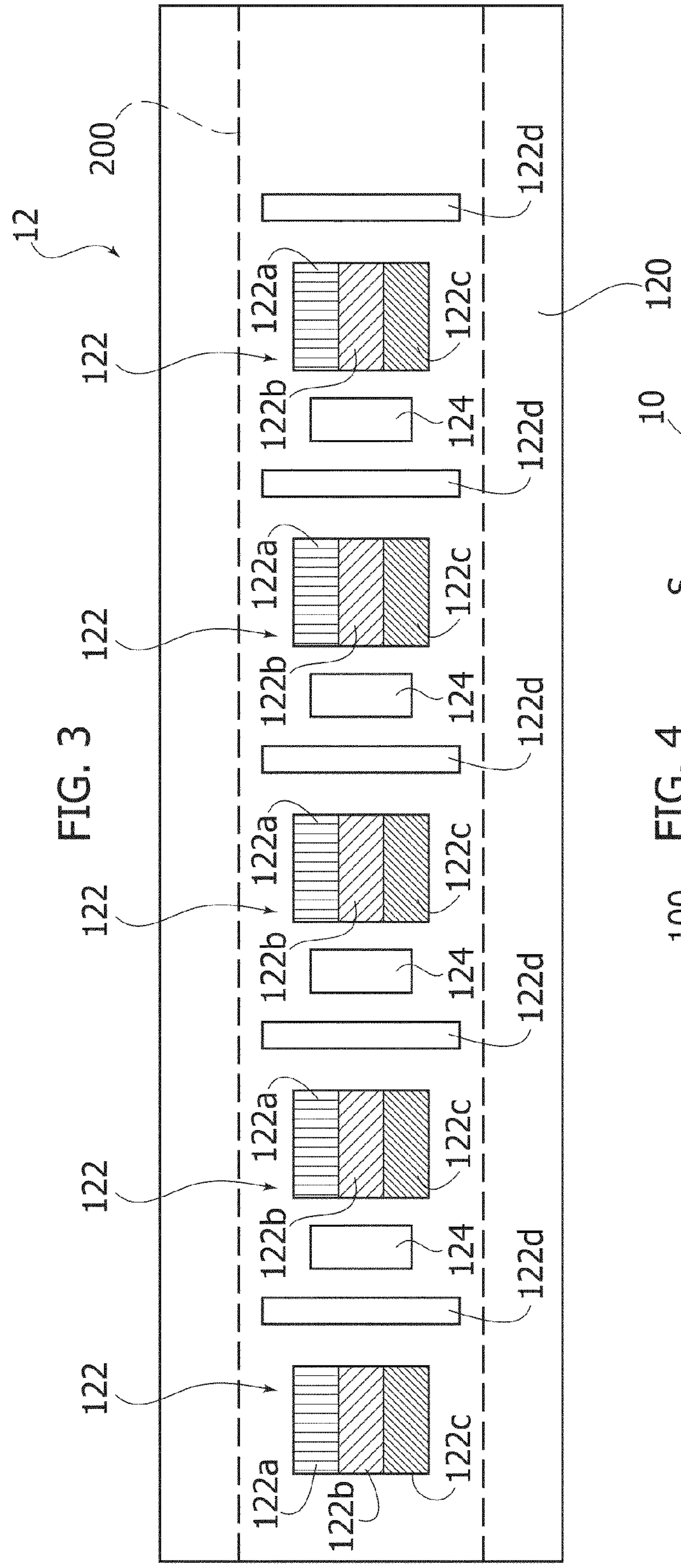

12
200
122
122a
122b
122c
122d
124
120

FIG. 3

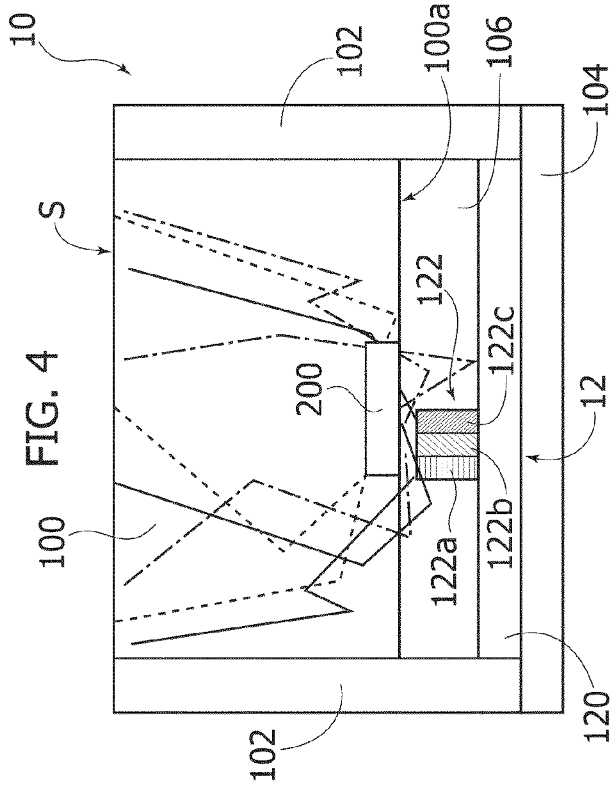

10
102
100a
106
104
S
122
122c
200
12
100
122a
122b
120

FIG. 4

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EUROPEAN SEARCH REPORT

Application Number
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The present search report has been drawn up for all claims

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Place of search	Date of completion of the search	Examiner
The Hague	25 March 2019	Allen, Katie

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