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Nederland**

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Uitvinder(s):
**Morgan Vyvey te Liège (BE)
Paul Smets te Liège (BE)**

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Gemachtigde:
dr. ir. G.J.C. Verdijck c.s. te Den Haag

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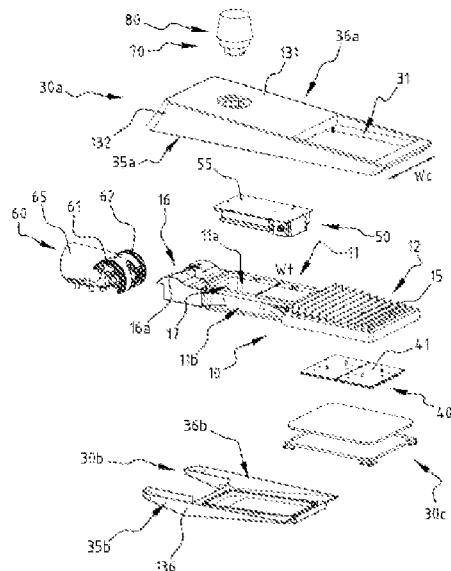
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LUMINAIRE HEAD ASSEMBLY

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Luminaire head assembly comprising: a frame structure with a heat sink, an optical block with at least one light source, said optical block being attached to said frame structure opposite the heat sink, a gear tray comprising one or more electrical components such as a driver configured for driving said at least one light source and/or surge protection circuitry and/or a fuse, a cover structure configured and arranged for covering at least a portion of the frame structure, said frame structure comprising a frame part with a frame opening extending between an upper and a lower side of the frame structure and configured to receive the gear tray.



LUMINAIRE HEAD ASSEMBLY

FIELD OF INVENTION

5 The field of the invention relates to a luminaire head assembly comprising a frame structure, an optical block and a cover structure, and in particular a modular luminaire head assembly for outdoor luminaires.

BACKGROUND

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Luminaires, in particular outdoor luminaires, are often designed for a particular purpose and/or for a specific customer, and many different luminaires have to be kept in stock for different applications.

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In the commonly used outdoor luminaires, a luminaire head is usually manufactured, e.g. molded, as a single piece. Alternatively, if the luminaire head is manufactured by assembling different parts, the parts are often inconvenient to unmount from each other for the purpose of maintenance or replacement and/or the parts do not allow a high flexibility in terms of number, type, position and dimensions of internal components to be arranged in the luminaire head. Indeed, often luminaire heads are designed with a particular design which is fixed, or which can only be changed to a limited extent.

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Therefore, conventional luminaire heads lack modularity, or have limited modularity. Hence, it is necessary to manufacture luminaire heads for different applications, thereby increasing the manufacturing costs. In addition, a large number of components are needed to address the needs of different customers, with a lot of different components requiring different molds.

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The current problem occurring in the industry of outdoor luminaires is that when it is desirable to change the look of a luminaire head, often a metal housing part needs to be changed which is costly. Also, when a different type of fixation is needed, often the housing needs to be changed. Further, typically the housing needs to function as a heat sink, requiring the housing to be made of a metal material.

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In view of the above, the housing of a typical luminaire needs to fulfill at the same time a number of technical requirements (robustness, e.g., good vibration and thermal characteristics) as well as esthetical requirements. This typically result in a relatively heavy metal housing in which the various components of the luminaire are accommodated.

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SUMMARY

The object of embodiments of the invention is to provide a modular luminaire head assembly which can fulfill the required robustness and/or vibration and/or thermal characteristics in an improved manner.

According to a first aspect, there is provided a luminaire head assembly comprising a frame structure, an optical block, a gear tray and a cover structure. The frame structure has a heat sink. The optical block has at least one light source and is attached to the frame structure opposite the heat sink. The gear tray comprises one or more electrical components such as a driver configured for driving the at least one light source and/or surge protection circuitry and/or a fuse. The cover structure is configured and arranged for covering at least a portion of the frame structure. The frame structure comprises a frame part with a frame opening extending between an upper and a lower side of the frame structure and configured to receive the gear tray.

By providing on the one hand a frame structure and on the other hand a cover structure a modular assembly is obtained, allowing to optimize the frame structure for being sufficiently rigid and robust against vibrations whilst at the same time limiting the amount of material of the frame structure. Indeed, the frame structure can be given an improved shape so as to provide the required technical functionalities in an improved way, whilst the cover structure can be easily adapted according to the wishes of the customer and can be made in any material, without having to modify the frame structure of the luminaire head. Compared to prior art embodiments where often the housing fulfills the function of frame and cover at the same time, the assembly of embodiments of the invention can have a frame structure with a weight and/or volume which is smaller than the weight and/or volume of typical prior art housings whilst ensuring the same or even improved robustness and/or vibration characteristics (moment of inertia) and/or thermal characteristics and whilst allowing to use different materials and shapes for the cover structure so that the external view of the luminaire can be customized.

Further, by providing a frame structure, a cover structure and a gear tray which can be easily mounted in the frame structure a modular assembly allowing for easy maintenance is obtained. Indeed, when access to the gear tray is desirable, the cover structure or a portion thereof may be removed to access the gear tray, and because of the frame opening, the access can be either from above or from below the frame opening.

Preferably, the gear tray comprises a plate-like element on which the one or more electrical components are arranged. In this way the components can be easily replaced and/or new components may be added.

- 5 Preferably, the cover structure comprises an upper cover and a lower cover configured for covering the frame opening from above and from below, respectively. In this way, to get access to the gear tray, an operator may either remove the lower cover or the upper cover, e.g. depending in what is most convenient.
- 10 Preferably, an upper seal is arranged between the upper cover and the frame structure around the frame opening, and a lower seal is arranged between the lower cover and the frame structure around the frame opening. This results in a sealed compartment delimited by the upper cover, the lower cover, and a portion of the frame structure delimiting the frame opening.
- 15 Preferably, the upper cover adjoins the lower cover along at least two opposite sides of the luminaire head.

- Preferably, the upper cover has a width which is larger than a width of the frame structure covered by the upper cover and which is arranged and dimensioned such that a portion of the heat sink is not covered by the upper cover and such that air is allowed to flow freely adjacent the heat sink.
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- Preferably, the frame structure has a fixation end configured to be fixed to a base, and the frame opening is located between the fixation end and the optical block. Preferable, the fixation end is an integral part of the frame structure.
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- Preferably, the frame structure comprises a first and second wing extending from the fixation end at a first and second longitudinal side of the frame opening. In this way, the frame structure can be given good robustness. Indeed, such structure can provide an improved moment of inertia and require less material than plate-like frame structures of the prior art.
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- Preferably, the first and second wing have a minimum height H_{min} and a minimum thickness t , wherein $5 < H_{min}/t < 60$, preferably $6 < H_{min}/t < 40$, more preferably $7 < H_{min}/t < 35$. The inventors have discovered that such relatively thin and high profiles can provide the required robustness and can provide in particular improved vibration characteristics with less material as compared to prior art structures where a plate-like element is used for the frame structure. The minimum height may be e.g. between 15mm and 60mm and the thickness t may be between 1.5mm and 4mm.
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In an exemplary embodiment, the first and second wing have an average height H_{av} and an average thickness t_{av} , seen along a side adjacent the frame opening, wherein $5 < H_{av}/t_{av} < 60$, preferably $6 < H_{av}/t_{av} < 40$, more preferably $7 < H_{av}/t_{av} < 35$. The average height may be e.g. between 30mm and 60mm and the average thickness t_{av} may be between 1.5mm and 4mm.

It is noted that in some embodiments the height may be constant across the entire length of the wing, whilst in other embodiments the height may vary, e.g., increase in the direction of the fixation end. Also, in some embodiments the thickness may be constant across the entire length of the wing, whilst in other embodiments the thickness may vary.

In an exemplary embodiment, the frame part delimiting the frame opening may comprise a peripheral wall delimiting the frame opening. Optionally, an inner side of the peripheral wall may be provided with fixation means facilitating the mounting of the gear tray in the frame opening. Such peripheral wall may have a maximum height which is larger than 20 mm, preferably larger than 30mm, more preferably larger than 40 mm. In this way, the frame part is sufficiently rigid and provides enough room for the gear tray. Also, the relatively large height results in an improved moment of inertia.

Optionally, the frame structure may be a single piece with the heat sink being an integral part of the frame structure.

Preferably, the frame structure has a weight per unit width which, when looking from a fixation end configured to fix the frame to a base to a free end including the heat sink, first decreases at the level of the frame opening and then increases again at the level of the heat sink. In this way the weight is spatially distributed in an improved manner compared to prior art embodiments.

In another preferred embodiment, the frame structure comprises a second frame part wherein the heat sink is integrated in or coupled to the second frame part. In preferred embodiment, the second frame part is removably attached to the frame part with the frame opening.

Preferably, the cover structure is dimensioned such that air is allowed to flow freely adjacent the heat sink. For example, the cover structure may comprise an upper cover with a hole dimensioned such that a portion of the heat sink is accessible through said hole and such that air is allowed to flow freely adjacent the heat sink. In another exemplary embodiment, the cover structure may comprise an upper cover which does not cover the heat sink.

Preferably, the frame structure comprises metal, more preferably an aluminum material. The frame structure may be made entirely out of metal or may be partially in metal, e.g. an over-molded metal structure. The frame structure may also comprise carbon or a plastic thermos-conductor. In another example, the heatsink could be made in metal and the rest of the frame structure in a non-metal material.

Preferably, the cover structure comprises a non-metal material, more preferably a plastic material, e.g. a recycled plastic material. However, the cover may also be made of other materials such as wood or a composite material. Also, the cover structure could be a light metal cover structure, i.e. a thin metal structure could be used for example.

According to a further aspect the luminaire head assembly comprises a frame structure, an optical block and a cover structure. The frame structure has a heat sink. The optical block is provided with at least one light source and is attached to said frame structure opposite the heat sink. The cover structure is configured and arranged for covering at least a portion of the frame structure. The cover structure comprises an upper cover with a hole dimensioned such that a portion of the heat sink is accessible through said hole and such that air is allowed to flow freely adjacent the heat sink.

By providing on the one hand a frame structure and on the other hand a cover structure a modular assembly is obtained. Indeed, the cover structure can be easily adapted according to the wishes of the customer and can be made in any material, without having to modify the frame structure of the luminaire head. Moreover, by using an upper cover with a hole, the frame structure can be adequately covered whilst still allowing a good operation of the heat sink.

According to another aspect the luminaire head assembly comprises a frame structure, an optical block and a cover structure. The frame structure has a heat sink. The optical block is provided with at least one light source and is attached to said frame structure opposite the heat sink. The cover structure is configured and arranged for covering at least a portion of the frame structure. The cover structure comprises an upper cover with a width which is larger than a width of the frame structure covered by the upper cover and which is arranged and dimensioned such that a portion of the heat sink is not covered by the upper cover and such that air is allowed to flow freely adjacent the heat sink.

Also in such an embodiment, by providing on the one hand a frame structure and on the other hand a cover structure a modular assembly is obtained. Moreover, by using an upper cover with adequate

dimensions, the frame structure can be adequately covered whilst still allowing a good operation of the heat sink.

5 Preferably, the cover structure comprises a lower cover configured for covering a lower portion of the frame structure, wherein the upper cover adjoins the lower cover along at least two opposite sides of the luminaire head. In this way, the upper and lower cover can adequately surround the frame structure and determine largely the look of the luminaire. Thus, the same frame structure can be combined with different cover structures if it is desirable to offer luminaire heads with a different look.

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In an exemplary embodiment, the frame structure is a single piece and the heat sink is an integral part of the frame structure.

15 In another exemplary embodiment, the frame structure comprises a first frame part and a second frame part removably attached to the first frame part, and the heat sink is integrated in the second frame part. The upper cover may cover at least a portion of the first frame part, and preferably substantially the entire first frame part.

20 Preferably, the luminaire head assembly further comprises a driver configured for driving said at least one light source, said driver being attached to said frame structure, and more preferably to the first frame part thereof. For example, there may be provided a gear tray with a driver and the gear tray may be fixed to the frame structure. However, in other embodiments, the driver may be provided outside of the luminaire head.

25 According to a further aspect, there is provided a luminaire head assembly comprising a frame structure integrating a first fixation part, an optical block, a second fixation part, and a cover structure. The frame structure further comprising a frame part having a heat sink. The optical block comprises at least one light source and is attached to the frame structure opposite the heat sink. The second fixation part is configured to be attached to a base, such as a pole, and to cooperate with said first fixation part. The cover structure may be configured and arranged for covering at least a portion of the first fixation part and the frame part.

30 According to another aspect, there is provided a luminaire head assembly comprising a gear tray, a frame structure with a first fixation part, a second fixation part, and a cover structure. The gear tray comprises one or more electrical components such as a driver configured for driving said at least one light source and/or surge protection circuitry and/or a fuse. The frame structure comprises a first

fixation part and a frame part configured to receive the gear tray. Preferably, the first fixation part and the frame part are integrated in one piece. The optical block comprises at least one light source and is attached to the frame structure. The second fixation part is configured to be attached to a base, such as a pole, and to cooperate with said first fixation part. The cover structure is configured and arranged for covering at least a portion of the first fixation part and the frame part.

Preferably, the first and second fixation part are configured such that the frame structure can be mounted in different positions with respect to the base. For example, the first fixation part could include a structure with a plurality of steps, wherein each step defines a different position of the frame structure relative to the second fixation part.

Preferably, the second fixation part comprises a tubular portion configured to receive a portion of a pole. In this way, the second fixation part can be easily attached to a pole, whereupon the frame structure may be fixed through the first fixation part thereof which can cooperate with the second fixation part.

Preferably, the first and second fixation part comprise a first and second pivot part, respectively, such that the frame structure can be mounted in different angular positions with respect to the base. In this way the optical block can be oriented in a suitable direction.

Preferably, the assembly further comprises a driver configured for driving the at least one light source, said driver being attached to the frame structure between the optical block and the first fixation part. Optionally, the driver may be part of a gear tray which is attached to the frame structure, e.g. in a frame opening of the frame structure as described above.

Preferably, the cover structure comprises a lower cover configured for covering a lower portion of the first fixation part and/or an upper cover, and more preferably the upper cover adjoins the lower cover along at least two opposite sides of the luminaire head.

According to another aspect there is provided a luminaire head assembly comprising a frame structure, an optical block, a gear tray and a cover structure. The frame structure comprises a first frame part and a second frame part, said second frame part having a heat sink. The optical block has at least one light source and is attached to said frame structure opposite the heat sink. The gear tray comprises one or more electrical components, such as a driver configured for driving said at least one light source and/or surge protection circuitry and/or a fuse. The cover structure is configured and

arranged for covering at least a portion of the frame structure. The gear tray is attached to the first frame part and the second frame part is pivotable with respect to the first frame part.

5 By having a second frame part which carries the optical block, and which is pivotable with respect to the first frame part, the at least one light source can be oriented in a suitable manner. This may be combined with simple fixation means for fixing the first frame part to a base or with adjustable fixation means, e.g., as described above, so that two degrees of adjustment are possible.

10 Preferably, the cover structure comprises an upper cover configured for covering an upper portion of the first frame part and/or a lower cover configured for covering a lower portion of the first frame part. Optionally, the upper cover adjoins the lower cover along at least two opposite sides of the luminaire head.

15 The following preferred features may be used in combination with all aspects disclosed above.

Preferably, the cover structure is dimensioned such that air is allowed to flow freely adjacent the heat sink.

20 Preferably, the frame structure comprises metal, more preferably an aluminum material.

Preferably, the cover structure comprises a non-metal material, preferably a plastic material.

25 In an exemplary embodiment, the cover structure is provided with a hole in which a receptacle configured for a receiving a pluggable external module is arranged. Such receptacle may be arranged in an upper cover or in a lower cover.

30 The pluggable external module may contain different control blocks and/or sensors, e.g. a light sensor for sensing the light level of ambient light to automatically control the one or more light sources of the optical block. For uniformity throughout the lighting industry, electrical receptacles for receiving such external modules are mostly made according to specific standards such as standards approved by American National Standards Institute, Inc. (ANSI). Such receptacles are electrically connected to various components of the assembly, and in particular to components of the gear tray. The receptacle has a connection interface located on an external side of the cover structure, so that an external module can be plugged into the receptacle to provide control for the lighting equipment. Preferably, the receptacle and the external control module fulfil the requirements of the ANSI C136.10-2017 standard or of the ANSI C136.41-2013 standard or of the Zhaga Interface
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Specification Standard (Book 18, Edition 1.0, July 2018, see https://www.zhagastandard.org/data/downloadables/1/0/8/1/book_18.pdf).

5 According to an exemplary embodiment, the receptacle may be implemented as described in PCT publication WO2017133793A1 in the name of the applicant, which is included herein by reference. Optionally, the receptacle may be configured and/or mounted as described in PCT publications WO2020212515 and/or WO2021001544A1 in the name of the applicant, which are included herein by reference.

10 In an exemplary embodiment, the cover structure is provided with a hole in which a sensor or human interface device is arranged. The one sensor may be e.g. selected from: an optical sensor such as a photodetector or an image sensor, a sound sensor, a radar such as a Doppler effect radar, a LIDAR, a humidity sensor, a pollution sensor, a temperature sensor, a motion sensor, an antenna, an RF sensor, a vibration sensor, a metering device (e.g. a metering device for measuring the power
15 consumption of a component of an edge device, more in particular a metering device for measuring the power consumption of a driver of a luminaire), a malfunctioning sensor (e.g. a sensor for detecting the malfunctioning of a component of an edge device such as a current leakage detector for measuring current leaks in a driver of a luminaire), a measurement device for measuring a maintenance related parameter of a component of the edge device, an alarm device (e.g. a push button
20 which a user can push in the event of an alarming situation).

Preferred embodiments relate to a luminaire head assembly for use in an outdoor luminaire. By outdoor luminaire, it is meant luminaires which are installed on roads, tunnels, industrial plants, stadiums, airports, harbors, rail stations, campuses, parks, cycle paths, pedestrian paths or in
25 pedestrian zones, for example, and which can be used notably for the lighting of an outdoor area such as roads and residential areas in the public domain, private parking areas and access roads to private building infrastructures, etc..

In a particular embodiment, the optical block may comprise one or more optical elements, typically
30 one or more lens elements and optionally one or more other optical element such as reflectors, backlights, prisms, collimators, diffusors, and the like. For example, there may be associated a backlight element with one or more lens elements or with each lens element. The one or more other optical elements may be formed integrally with the one or more lens elements, and e.g. integrally with a lens plate. In other embodiments, the one or more other optical elements may be mounted on
35 the lens elements.

In the context of the invention, a lens element may include any transmissive optical element that focuses or disperses light by means of refraction. It may also include any one of the following: a reflective portion, a backlight portion, a prismatic portion, a collimator portion, a diffusor portion. For example, a lens element may have a lens portion with a concave or convex surface facing a light source, or more generally a lens portion with a flat or curved surface facing the light source, and optionally a collimator portion integrally formed with said lens portion, said collimator portion being configured for collimating light transmitted through said lens portion. Also, a lens element may be provided with a reflective portion or surface, referred to as a backlight element in the context of the invention, or with a diffusive portion.

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A lens element may comprise a lens portion having an outer surface and an inner surface facing the associated light source. The outer surface may be a convex surface and the inner surface may be a concave or planar surface. Also, a lens element may comprise multiple lens portions adjoined in a discontinuous manner, wherein each lens portion may have a convex outer surface and a concave inner surface. Lens elements are not limited to rotation-symmetric lenses such as hemispherical lenses, or to ellipsoidal lenses having a major symmetry plane and a minor symmetry plane, although such rotation-symmetric lenses could be used. Alternatively, lenses with no symmetry plane or symmetry axis could be envisaged.

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In a particular embodiment, one or more further optical elements may be further provided such as one or more light shielding structures complying with different glare classifications, e.g. the G classification defined according to the CIE115:2010 standard and the G* classification defined according to the EN13201-2 standard. The light shielding structures may be configured for reducing a solid angle of light beams of the light emitting elements by cutting off or reflecting light rays having a large incident angle, thereby reducing the light intensities at large angles and improving the G/G* classification of the luminaire system. The one or more light shielding structures may be mounted on any one of the optical elements, the optical plate or the substrate. Alternatively, the one or more light shielding structures may be integrally formed with any one of the optical elements or the optical plate. Examples of such shielding structures and similar optical elements are disclosed in patent specifications N2021671, WO2020249684A1, WO2021186058A1, N2025166, and WO2020058282A1, in the name of the applicant, which are included herein by reference.

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Examples of suitable optical elements, and especially modular optical systems, are disclosed in PCT patent specifications WO2020074229A1, WO2020136197A1, WO2022023441A1 and in NL patent specification N2030243, all in the name of the applicant, which are included herein by reference. Also, side emitting LEDs in combination with suitable optics may be used, as disclosed for example

in NL patent specification N2032294 in the name of the applicant, which is included herein by reference.

Furthermore, an optical element or optical plate may be movable and/or the control of the light elements may be selective. Examples of movable optics are disclosed in patent applications
5 WO2019134875A1, WO2020136202A1, WO2020136200A1, WO2020136205A1, WO2020136203A1, WO2020136204A1, WO2020136197A1, and WO2020136196A1 in the name of the applicant, which are included herein by reference. Examples of selective control of light elements are disclosed in patent applications
10 WO2019020366A1, WO2020165284A1, WO2020173836A1, and WO2021130275A1 in the name of the applicant, which are included herein by reference.

Other preferred embodiments are defined in the following clauses:

1. Luminaire head assembly comprising:
15 a frame structure (10) with a heat sink (15),
an optical block (40) with at least one light source, said optical block being attached to said frame structure opposite the heat sink,
a cover structure (30a, 30b, 30c) configured and arranged for covering at least a portion of the frame structure, said cover structure comprising an upper cover (30a) with a hole (31) dimensioned such
20 that a portion of the heat sink is accessible through said hole and such that air is allowed to flow freely adjacent the heat sink.
2. Luminaire head assembly comprising:
a frame structure (10) with a heat sink,
an optical block (40) with at least one light source, said optical block being attached to said frame
25 structure opposite the heat sink,
a cover structure (30a, 30b, 30c) configured and arranged for covering at least a portion of the frame structure, said cover structure comprising an upper cover (30a) with a width (W_c) which is larger than a width (W_f) of the frame structure covered by the upper cover and which is arranged and dimensioned such that a portion of the heat sink is not covered by the upper cover and such that air
30 is allowed to flow freely adjacent the heat sink.
3. The luminaire head assembly of any one of the previous clauses, wherein the cover structure comprises a lower cover (30b) configured for covering a lower portion of the frame structure, and wherein the upper cover adjoins the lower cover along at least two opposite sides (35a, 35b; 36a, 36b) of the luminaire head.
- 35 4. The luminaire head assembly of any one of the previous clauses, wherein the heat sink is an integral part of the frame structure.

5. The luminaire head assembly of any one of the previous clauses, wherein the frame structure comprises a first frame part and a second frame part removably attached to the first frame part, wherein the heat sink is integrated in the second frame part, and wherein the upper cover covers at least a portion of the first frame part.
- 5 6. The luminaire head assembly of any one of the previous clauses, further comprising a driver (51) configured for driving said at least one light source, said driver being attached to said frame structure.
7. The luminaire head assembly of clause 5 and 6, wherein the driver is attached to the first frame part.
- 10 8. Luminaire head assembly comprising:
a frame structure (10) comprising a first fixation part (16) and a frame part (12) having a heat sink, wherein the first fixation part and the frame part are preferable integrated in one piece,
an optical block (40) with at least one light source, said optical block being attached to said frame structure opposite the heat sink,
15 a second fixation part (60) configured to be attached to a base, such as a pole, and to cooperate with said first fixation part;
a cover structure (30a, 30b, 30c) configured and arranged for covering at least a portion of the first fixation part and the frame part.
9. Luminaire head assembly comprising:
20 a frame structure (10) comprising a first fixation part (16) and a frame part (11), wherein the first fixation part and the frame part are preferable integrated in one piece,
a gear tray (50) comprising one or more electrical components such as a driver configured for driving said at least one light source and/or surge protection circuitry and/or a fuse, said gear tray being attached to the frame part,
25 an optical block (40) with at least one light source, said optical block being attached to said frame structure,
a second fixation part (60) configured to be attached to a base, such as a pole, and to cooperate with said first fixation part;
a cover structure (30a, 30b, 30c) configured and arranged for covering at least a portion of the first
30 fixation part and the frame part.
10. The luminaire head assembly of clause 8 or 9, wherein the first and second fixation part are configured such that the frame structure can be mounted in different positions with respect to the base.
11. The luminaire head assembly of any one of the clauses 8-10, wherein the first and second
35 fixation part comprise a first and second pivot part, respectively, such that the frame structure (10) can be mounted in different angular positions with respect to the base.

12. The luminaire head assembly of clauses 8-11, further comprising a driver configured for driving said at least one light source, said driver being attached to said frame structure between the optical block and the first fixation part.
13. The luminaire head assembly of any one of the clauses 8-12, wherein the second fixation part comprises a tubular part configured to receive a portion of a pole.
14. The luminaire head assembly of any one of the clauses 8-13, wherein the cover structure comprises a lower cover configured for covering a lower portion of the first fixation part.
15. The luminaire head assembly of the previous clause, wherein the cover structure comprises an upper cover, and wherein the upper cover adjoins the lower cover along at least two opposite sides of the luminaire head.
16. Luminaire head assembly comprising:
a frame structure (10) comprising a first frame part (11) and a second frame part (12), said second frame part having a heat sink (15),
an optical block with at least one light source, said optical block being attached to said frame structure opposite the heat sink,
a gear tray (50) comprising one or more electrical components, such as a driver configured for driving said at least one light source and/or surge protection circuitry and/or a fuse,
a cover structure configured and arranged for covering at least a portion of the frame structure, wherein the gear tray is attached to the first frame part and wherein the second frame part is pivotable with respect to the first frame part.
17. The luminaire head assembly of the previous clause, wherein the cover structure comprises an upper cover configured for covering an upper portion of the first frame part and/or a lower cover configured for covering a lower portion of the first frame part.
18. The luminaire head assembly of the previous clause, wherein the upper cover adjoins the lower cover along at least two opposite sides of the luminaire head.
19. The luminaire head assembly of any one of the clauses, wherein the cover structure is dimensioned such that air is allowed to flow freely adjacent the heat sink.
20. The luminaire head assembly of any one of the previous clauses, wherein the cover structure is provided with a hole in which a receptacle (70) configured for receiving a pluggable control module (80) is arranged.
21. The luminaire head assembly of any one of the previous clauses, wherein the frame structure comprises metal, preferably an aluminum material.
22. The luminaire head assembly of any one of the previous clauses, wherein the cover structure comprises a non-metal material, preferably a plastic material.

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BRIEF DESCRIPTION OF THE FIGURES

Aspects of the present invention will now be described in more detail, with reference to the appended drawings showing exemplary embodiments. Like numbers refer to like features throughout the drawings.

- 5 FIG. 1 is an exploded perspective view of a luminaire head assembly according to an exemplary embodiment;
 FIG. 2 is a perspective view of the luminaire head assembly of FIG. 1 in the assembled state, seen from above;
 FIG. 3 is a perspective view of the luminaire head assembly of FIG. 1 in the assembled state, seen
 10 from below;
 FIG. 4 is a cross-sectional view of a portion of the luminaire head assembly of FIG. 1;
 FIG. 5 is an exploded bottom view of a luminaire head assembly according to an exemplary embodiment;
 FIG. 6A is an exploded bottom view of a luminaire head assembly according to an exemplary
 15 embodiment;
 FIG. 6B is a side view of the exemplary embodiment of FIG. 2A.
 FIG. 7 is a cross-sectional view of a portion of a luminaire head assembly according to a variant;
 FIG. 8 is a perspective view of a lower cover with integrated sensing means;
 FIG. 9 is a bottom view of another exemplary embodiment of a luminaire head assembly;
 20 FIG. 10 is a perspective view of an exemplary embodiment of the frame structure; and
 FIG. 11 shows various images of an exemplary embodiment.

DESCRIPTION OF EMBODIMENTS

- 25 FIGS. 1-4 illustrate schematically a luminaire head assembly comprising a frame structure 10, an optical block 40, a gear tray 50, a fixation part 60 and a cover structure 30a, 30b, 30c. A similar luminaire head is shown in FIG. 11.

The frame structure 10 is provided with a heat sink 15 which is here an integral part of the frame
 30 structure. The frame structure comprises a first frame part 11 and a second frame part 12 which integrates the heat sink 15. The first frame part 11 has a frame opening 11a extending between an upper and a lower side of the frame structure 10 and configured to receive the gear tray 50.

The optical block 40 comprises a support 41 on which one or more light sources 42, typically LEDs,
 35 are arranged, see FIG. 4. Optionally, one or more optical elements 43 may be arranged over the one

or more light sources 42. The optical block 40 is attached to the frame structure 10 opposite the heat sink 15.

5 The cover structure 30a, 30b, 30c is configured and arranged for covering at least a portion of the frame structure 10. The cover structure may comprise an upper cover 30a and a lower cover 30b. The upper cover 30a is configured for covering an upper portion of the frame structure 10, and preferably substantially the entire first frame part 11. The upper cover may be provided with a hole 31 dimensioned such that a portion of the heat sink 15 is accessible through said hole 31 and such that air is allowed to flow freely adjacent the heat sink 15. The lower cover 30b is configured for
10 covering a lower portion of the frame structure 10. The upper cover 30a may adjoin the lower cover 30b along at least two opposite sides 35a, 35b; 36a, 36b of the luminaire head. In this way the cover structure can at least partially enclose the frame structure and provide the luminaire with any desired look. Indeed, the cover structure 30a, 30b may have a substantially rectangular shape, seen from below or above as in FIG. 1, but could also have a rounded shape as illustrated in FIG. 9. More
15 generally, the cover structure 30a, 30b may be given any suitable or desired shape. A fixation means 85, such as a clip, may be provided to attach the upper cover to the lower cover, see FIG. 11.

The gear tray 50 may comprise one or more electrical components such as a driver 51 configured for driving the at least one light source 42 and/or surge protection circuitry and/or a fuse. Preferably, the
20 gear tray 50 comprises a plate 55 on which the one or more electrical components are mounted. The gear tray 50 is intended to be fixed in the hole 11a in the first frame part 11. Preferably the hole 11a is delimited by a circumferential wall 11b. The circumferential wall 11b may be provided at an inner side thereof with fixation elements 11c such as inwardly protruding lugs to which the gear tray 50 may be fixed. Optionally, the first frame part 11 may be provided with a cable gland 17 for a power
25 cable (not shown) to be connected to the gear tray 50. Such cable gland 17 may be provided in the circumferential wall 11b. Optionally the driver 51 may be provided with one or more pluggable modules to enhance the functionalities of the driver, as described in WO2017220690A1 or WO2020064864 in the name of the applicant which are included herein by reference.

30 The upper cover 30a may be provided with a receptacle 70 in which a pluggable control module 80 can be fitted.

The upper cover 30a may have a width W_c which is larger than a width W_f of the frame part of the frame structure 10 covered by the upper cover 30a, here frame part 11. The upper cover 30a and the
35 lower cover 30b may be configured for covering the frame opening 11a from above and from below, respectively. As shown in FIG. 4 an upper seal 32a may be arranged between the upper cover 30a

and the frame structure 10 around the frame opening 11a, and a lower seal 32b may be arranged between the lower cover 30b and the frame structure 10 around the frame opening 11a. The upper cover 30a may adjoin the lower cover 30b along at least two opposite sides 35a, 35b; 36a, 36b of the luminaire head. More in particular, the upper cover 30a may have a top wall 131 and an upper peripheral wall 132, and the lower cover 30b may have a bottom wall 135 and a lower peripheral wall 136, and a lower edge portion of the upper peripheral wall 132 may be adjacent an upper edge portion of the lower peripheral wall 136.

The cover structure may further comprise a second lower cover 30c comprising a cover frame 37 and transparent or translucent protector 38. This second lower cover 30c covers the optical block 40. A seal 38b may be arranged between the frame structure 10 and the protector 38, see FIG. 4.

The frame structure 10 comprises a first fixation part 16 configured to cooperate with a second fixation part 60. The second fixation part 60 is configured to be attached to a base, such as a pole, and to cooperate with said first fixation part 16. The cover structure 30a, 30b, 30c may then be configured and arranged for covering at least a portion of the first fixation part 16. In the illustrated embodiment the upper cover 30a extends over the first fixation part 16 and a portion of the second fixation part 60. Preferably, the first and second fixation part 16, 60 may be configured such that the frame structure 10 can be mounted in different positions with respect to the base. More preferably, as illustrated, the first and second fixation part 16, 60 may comprise a first and second pivot part, respectively, such that the frame structure 10 can be mounted in different angular positions with respect to the base.

The frame is shown in more detail in FIG. 10. The frame structure 100 comprises a first and second wing 18a, 18b extending from the fixation end 16 at a first and second longitudinal side of the frame opening. The first and second wing 18a, 18b may have a minimum height H_{min} and a minimum thickness t , wherein $5 < H_{min}/t < 60$, preferably $6 < H_{min}/t < 40$, more preferably $7 < H_{min}/t < 35$. The minimum height may be e.g. between 15mm and 60mm and the thickness t may be between 1.5mm and 4mm.

In an exemplary embodiment, the first and second wing have an average height H_{av} and an average thickness t_{av} , seen along a side adjacent the frame opening, wherein $5 < H_{av}/t_{av} < 60$, preferably $6 < H_{av}/t_{av} < 40$, more preferably $7 < H_{av}/t_{av} < 35$. The average height may be e.g. between 30mm and 60mm and the average thickness t_{av} may be between 1.5mm and 4mm.

In an exemplary embodiment, the frame part delimiting the frame opening 11a may comprise a peripheral wall 11b delimiting the frame opening. Optionally, an inner side of the peripheral wall may be provided with fixation means 11c facilitating the mounting of the gear tray in the frame opening 11a. Such peripheral wall 11a may have a maximum height which is larger than 20 mm, preferably larger than 30mm, more preferably larger than 40 mm. In this way, the frame part is sufficiently rigid and provides enough room for the gear tray. Also, the relatively large height results in an improved moment of inertia.

In the illustrated embodiment, the first and second fixation parts are similar to the second and first joint member 200, 100, respectively, disclosed in PCT publication WO2020144191A1 in the name of the applicant, which is included herein by reference. The second fixation part 60 comprises a tubular part 65 for receiving a pole portion and an outer cylindrical surface section 61 provided with a first plurality of interengaging surfaces 62. The first fixation part 16 comprises an inner cylindrical surface provided with a second plurality of interengaging surfaces 16a configured to interengage the first plurality of interengaging surfaces 62. The first and second fixation parts 16, 60 may have any of the other features of the second and first joint member 200, 100, respectively, disclosed in PCT publication WO2020144191A1.

In other embodiments (not illustrated), the second fixation part 60 could comprise a simple U-shaped part in which a pole part can be received, and the frame structure would then comprise a means configured for cooperating with the U-shaped second fixation part. Such fixation system is disclosed in PCT publication WO2019015976A1 in the name of the applicant, which is included herein by reference, see in particular fastener means 140 and 41 which would form the second fixation part and a portion of the plate 110 with two holes or the fastener block 40, e.g. a fastener block with a stepped surface, which would form the first fixation part, respectively.

In another embodiment (not illustrated), the first and second fixation parts are similar to the second and first element 200, 100, respectively, disclosed in PCT publication WO2022069368A1 in the name of the applicant, which is included herein by reference.

In yet another embodiment (not illustrated), the frame structure may comprise a tubular portion in which a portion of the pole may be arranged. A frame structure with a tubular portion is disclosed in PCT publication WO2019197489A1 in the name of the applicant, which is included herein by reference, see in particular

Preferably, the frame structure 10 is made of metal, more preferably an aluminum material. Preferably, the cover structure is made of a non-metal material, more preferably a plastic material.

5 FIG. 5 illustrates another exemplary embodiment of a luminaire head assembly for which the same or similar elements have been indicated with the same reference numerals. In this embodiment the second frame part 12 integrates the heat sink and this second frame part 12 can be removably attached to the first frame part 11. The first frame part 11 is provided at a first end with a fixation part 16 and at a second end opposite said first end with a peripheral frame 19 in which the second frame part 12 can be arranged. The optical block 40 is mounted on the second frame part 12 opposite the heat sink
10 (not visible in FIG. 5), such that the support 41 carrying the light sources 42 is in contact with the second frame part 12.

FIG. 6A and 6B illustrate another embodiment of a luminaire head assembly for which the same or similar elements have been indicated with the same reference numerals. In this embodiment the
15 second frame part 12 integrates the heat sink 15 and this second frame part 12 is pivotably attached to the first frame part 11, such that the second frame part 12 can be put in different angular positions with respect to the first frame part 11. The second frame part 12 may be one integral part or may be composed of a peripheral frame 19 in which the heat sink 15 is arranged as in FIG. 5. The gear tray 50 is attached to the first frame part 11.

20 FIG. 7 illustrates another exemplary embodiment of a luminaire head assembly for which the same or similar elements have been indicated with the same reference numerals. The cover structure comprises an upper cover 30a configured for covering an upper portion of the first frame part 11 and a lower cover 30b configured for covering a lower portion of the first frame part 11. The upper cover
25 30a is arranged and dimensioned such that a portion of the heat sink 15 is not covered by the upper cover 30a and such that air is allowed to flow freely adjacent the heat sink. Preferably, the upper cover 30a adjoins the lower cover 30b along at least two opposite sides of the luminaire head (not shown, but this may be similar as in the embodiment of FIGS. 1-4).

30 FIG. 8 illustrates a variant of the lower cover 30b. As illustrated a sensor device 90, such as a camera, may be integrated in the lower cover 30b. More generally any type of sensor or human interface device may be integrated in the upper cover 30a or in the lower cover 30b. In yet other embodiments a sensor may be arranged on the frame structure 10, wherein optionally the cover structure extends over the sensor.

35

Whilst the principles of the invention have been set out above in connection with specific embodiments, it is to be understood that this description is merely made by way of example and not as a limitation of the scope of protection which is determined by the appended claims.

CONCLUSIES

1. Een lichtarmatuurkopsamenstel omvattende:
5 een framestructuur (10) met een koellichaam (15),
een optisch blok (40) met ten minste één lichtbron, waarbij het optisch blok aan de
framestructuur tegenover het koellichaam is bevestigd,
een montagestructuur (50) omvattende één of meer elektrische componenten zoals een
driver geconfigureerd voor het aandrijven van de ten minste één lichtbron, en/of een
overspanningsbeveiliging en/of een zekering,
10 een afdekstructuur (30a, 30b, 30c) geconfigureerd en aangebracht voor het afdekken
van ten minste een gedeelte van de framestructuur,
waarbij de framestructuur een framegedeelte (11) omvat met een frameopening (11a)
die zich tussen een boven- en een onderzijde van de framestructuur uitstrekt en die is
geconfigureerd om de montagestructuur te ontvangen.
15
2. Het lichtarmatuurkopsamenstel volgens conclusie 1, waarbij de afdekstructuur is
geconfigureerd om de boven- en/of onderzijde van de frameopening af te dekken.
3. Het lichtarmatuurkopsamenstel volgens conclusie 1 of 2, waarbij de afdekstructuur een
20 bovendeksel (30a) en een onderdeksel (30b) omvat, die zijn geconfigureerd om de
frameopening respectievelijk van boven en van onder af te dekken.
4. Het lichtarmatuurkopsamenstel volgens de vorige conclusie, waarbij een bovenafdichting
(32a) tussen het bovendeksel en de framestructuur, rond de frameopening is aangebracht,
25 en waarbij een onderafdichting (32b) tussen het onderdeksel en de framestructuur, rond de
frameopening is aangebracht.
5. Het lichtarmatuurkopsamenstel volgens conclusie 3 of 4, waarbij het bovendeksel aan het
30 onderdeksel grenst langs ten minste twee tegenover elkaar liggende zijden van de
lichtarmatuurkop.
6. Het lichtarmatuurkopsamenstel volgens één der voorgaande conclusies, waarbij de
framestructuur een bevestigingsuiteinde heeft dat is geconfigureerd om aan een basis te
worden bevestigd, en waarbij de frameopening zich tussen het bevestigingsuiteinde en het
35 optische blok bevindt.

7. Het lichtarmatuurkopsamenstel volgens de voorgaande conclusie, waarbij de frame structuur een eerste en een tweede vleugel (18a, 18b) omvat die zich vanaf het bevestigingsuiteinde aan een eerste en tweede langszijde van de frameopening uitstrekt.
- 5
8. Het lichtarmatuurkopsamenstel volgens de voorgaande conclusie, waarbij de eerste en tweede vleugel een minimumhoogte H_{min} en een minimumdikte t hebben, waarbij $5 < H_{min}/t < 60$, bij voorkeur $6 < H_{min}/t < 40$, meer bij voorkeur $7 < H_{min}/t < 35$.
- 10
9. Het lichtarmatuurkopsamenstel volgens één der voorgaande conclusies, waarbij het framegedeelte een perifere wand (11b) die de frameopening begrenst, omvat, waarbij de perifere wand een maximumhoogte H_{max} heeft, waarbij H_{max} groter dan 20mm is, bij voorkeur groter dan 30mm, meer bij voorkeur groter dan 40mm.
- 15
10. Het lichtarmatuurkopsamenstel volgens één der voorgaande conclusies, waarbij de framestructuur een tweede framegedeelte (12) omvat, dat optioneel verwijderbaar aan het framegedeelte met de frameopening is bevestigd, waarbij het koellichaam in het tweede framegedeelte is geïntegreerd.
- 20
11. Het lichtarmatuurkopsamenstel volgens de voorgaande conclusie, waarbij het tweede framegedeelte zwenkbaar is ten opzichte van het framegedeelte met de frameopening.
12. Het lichtarmatuurkopsamenstel volgens één der voorgaande conclusies, waarbij de framestructuur metaal omvat, bij voorkeur een aluminium materiaal.
- 25
13. Het lichtarmatuurkopsamenstel volgens één der voorgaande conclusies, waarbij de afdekstructuur een niet-metaal materiaal omvat, bij voorkeur een kunststof materiaal.
14. Het lichtarmatuurkopsamenstel volgens één der voorgaande conclusies, waarbij de montagestructuur een plaatvormig element omvat waarop de één of meer elektrische componenten zijn aangebracht.
- 30
15. Het lichtarmatuurkopsamenstel volgens één der voorgaande conclusies, waarbij de afdekstructuur zo is gedimensioneerd dat lucht vrij langs het koellichaam kan stromen.
- 35

16. Het lichtarmatuurkopsamenstel volgens één der voorgaande conclusies, waarbij de afdekstructuur (30a, 30b, 30c) een bovendeksel (30a) omvat met een gat (31) zo gedimensioneerd dat een gedeelte van het koellichaam toegankelijk is door het gat en dat lucht vrij langs het koellichaam kan stromen.
- 5
17. Het lichtarmatuurkopsamenstel volgens één der voorgaande conclusies, waarbij de afdekstructuur zo is aangebracht en gedimensioneerd dat een gedeelte van het koellichaam niet door het bovendeksel is bedekt en dat lucht vrij langs het koellichaam kan stromen.
- 10
18. Het lichtarmatuurkopsamenstel volgens één der voorgaande conclusies, waarbij de afdekstructuur een bovendeksel (30a) met een breedte (W_c) die groter is dan een breedte (W_f) van de framestructuur bedekt door het bovendeksel, omvat.
- 15
19. Het lichtarmatuurkopsamenstel volgens één der voorgaande conclusies, waarbij de framestructuur (10) een eerste bevestigingsgedeelte (16) omvat, waarbij het eerste bevestigingsgedeelte bij voorkeur een integraal gedeelte van de framestructuur is, waarbij het samenstel een tweede bevestigingsgedeelte (60) omvat, dat is geconfigureerd om aan een basis, zoals een paal, te worden bevestigd en om met het eerste bevestigingsgedeelte samen te werken.
- 20
20. Het lichtarmatuurkopsamenstel volgens de voorgaande conclusie, waarbij de afdekstructuur (30a, 30b, 30c) geconfigureerd en aangebracht is om ten minste een deel van het eerste bevestigingsgedeelte te bedekken.
- 25
21. Het lichtarmatuurkopsamenstel volgens conclusie 19 of 20, waarbij het eerste en tweede bevestigingsgedeelte zo zijn geconfigureerd dat de framestructuur in verschillende posities ten opzichte van de basis kan worden gemonteerd.
- 30
22. Het lichtarmatuurkopsamenstel volgens één van conclusies 19-21, waarbij het eerste en tweede bevestigingsgedeelte respectievelijk een eerste en een tweede scharniergedeelte omvatten zodat de framestructuur (10) in verschillende hoekposities ten opzichte van de basis kan worden gemonteerd.

23. Het lichtarmatuurkopsamenstel volgens één van conclusies 19-22, waarbij de montagestructuur aan de framestructuur tussen het optische blok en het eerste bevestigingsgedeelte is bevestigd.
- 5 24. Het lichtarmatuurkopsamenstel volgens één van conclusies 19-23, waarbij het tweede bevestigingsgedeelte een buisvormig gedeelte omvat dat is geconfigureerd om een gedeelte van een paal te ontvangen.
- 10 25. Het lichtarmatuurkopsamenstel volgens één der voorgaande conclusies, waarbij de afdekstructuur een onderdeksel omvat, dat is geconfigureerd om een ondergedeelte van het eerste bevestigingsgedeelte te bedekken.
- 15 26. Het lichtarmatuurkopsamenstel volgens één der voorgaande conclusies, waarbij het koellichaam een integraal gedeelte van de framestructuur is.
- 20 27. Het lichtarmatuurkopsamenstel volgens één der voorgaande conclusies, waarbij de afdekstructuur van een gat is voorzien, waarin een contactdoos (70) geconfigureerd om een insteekbare controlemodule (80) te ontvangen, is aangebracht.
- 20 28. Het lichtarmatuurkopsamenstel volgens één der voorgaande conclusies, waarbij de afdekstructuur van een gat is voorzien waarin een sensor of een gebruiker interface is aangebracht.

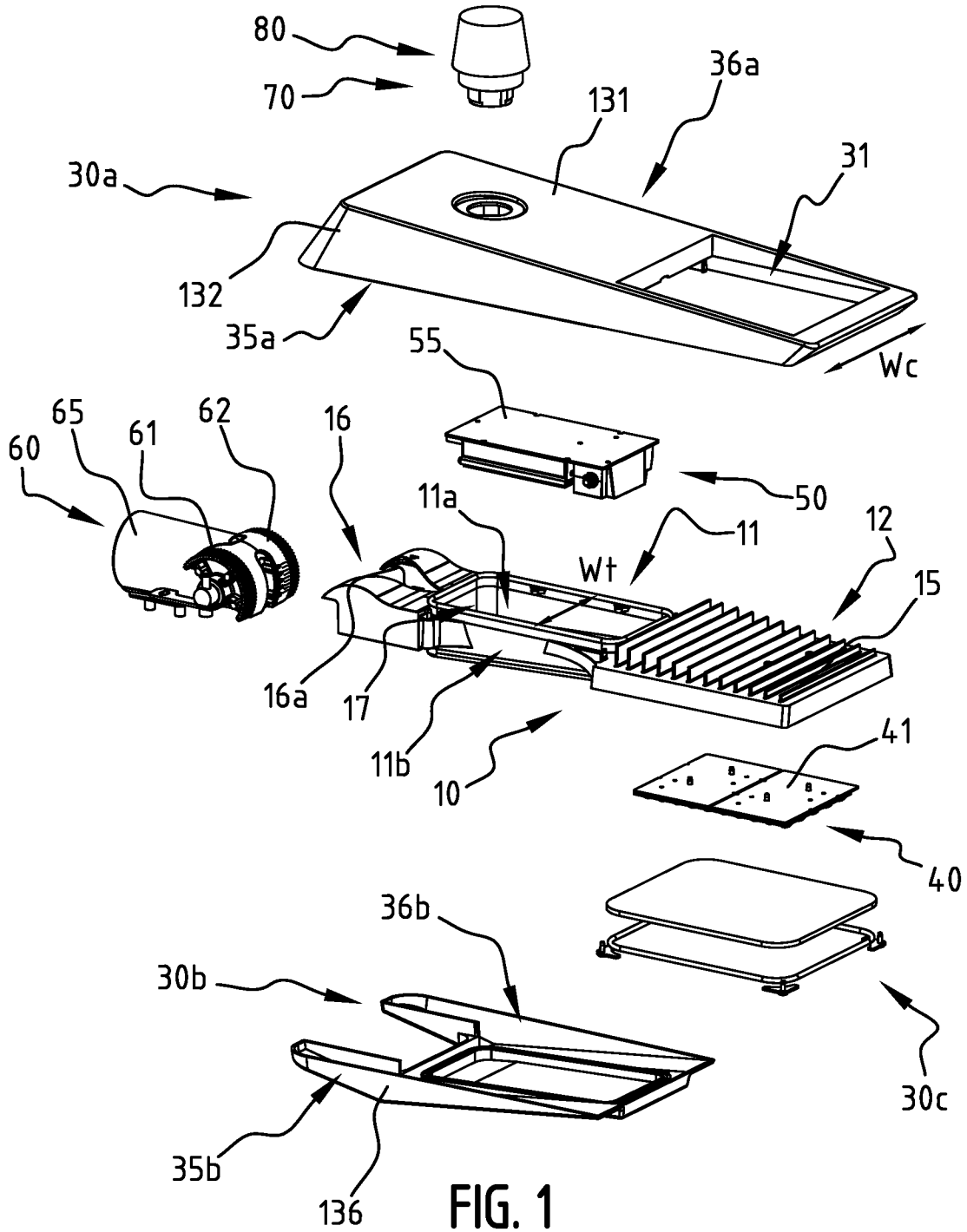


FIG. 1

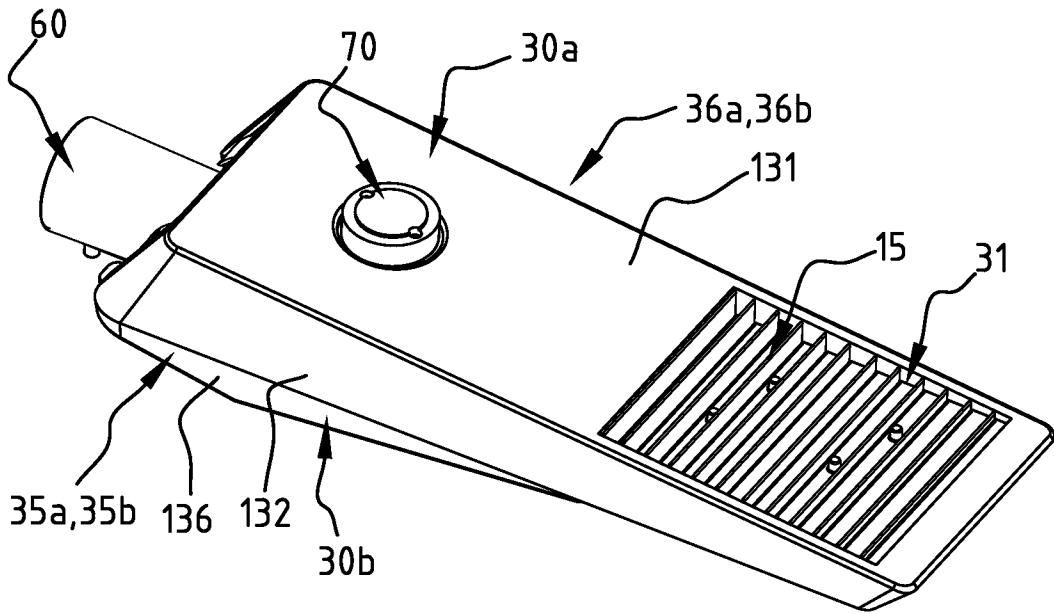


FIG. 2

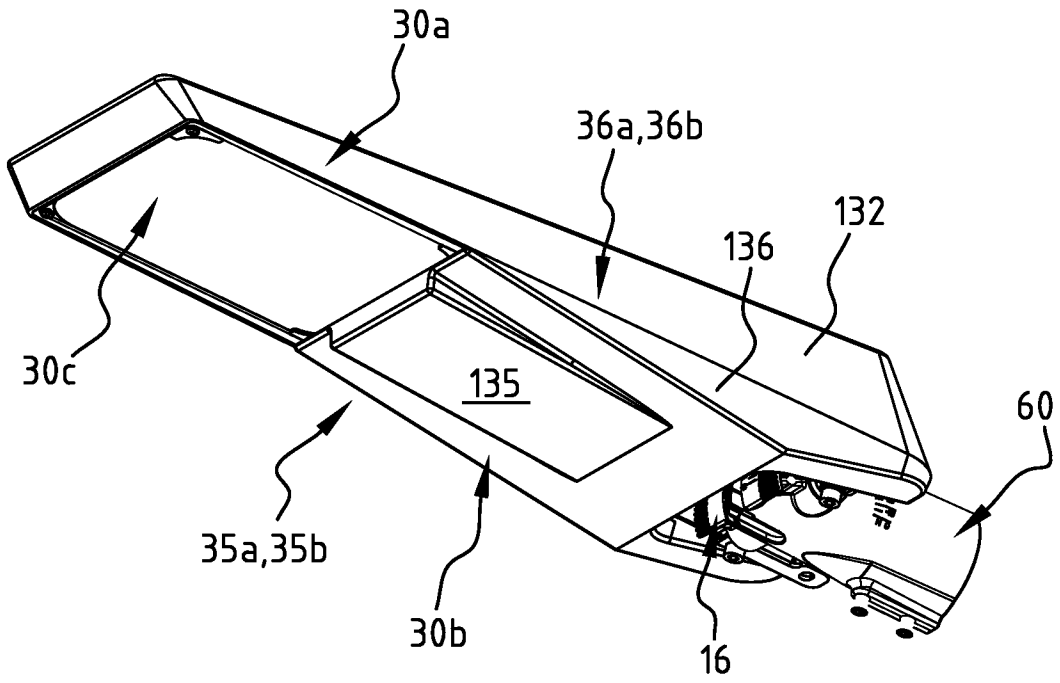


FIG. 3

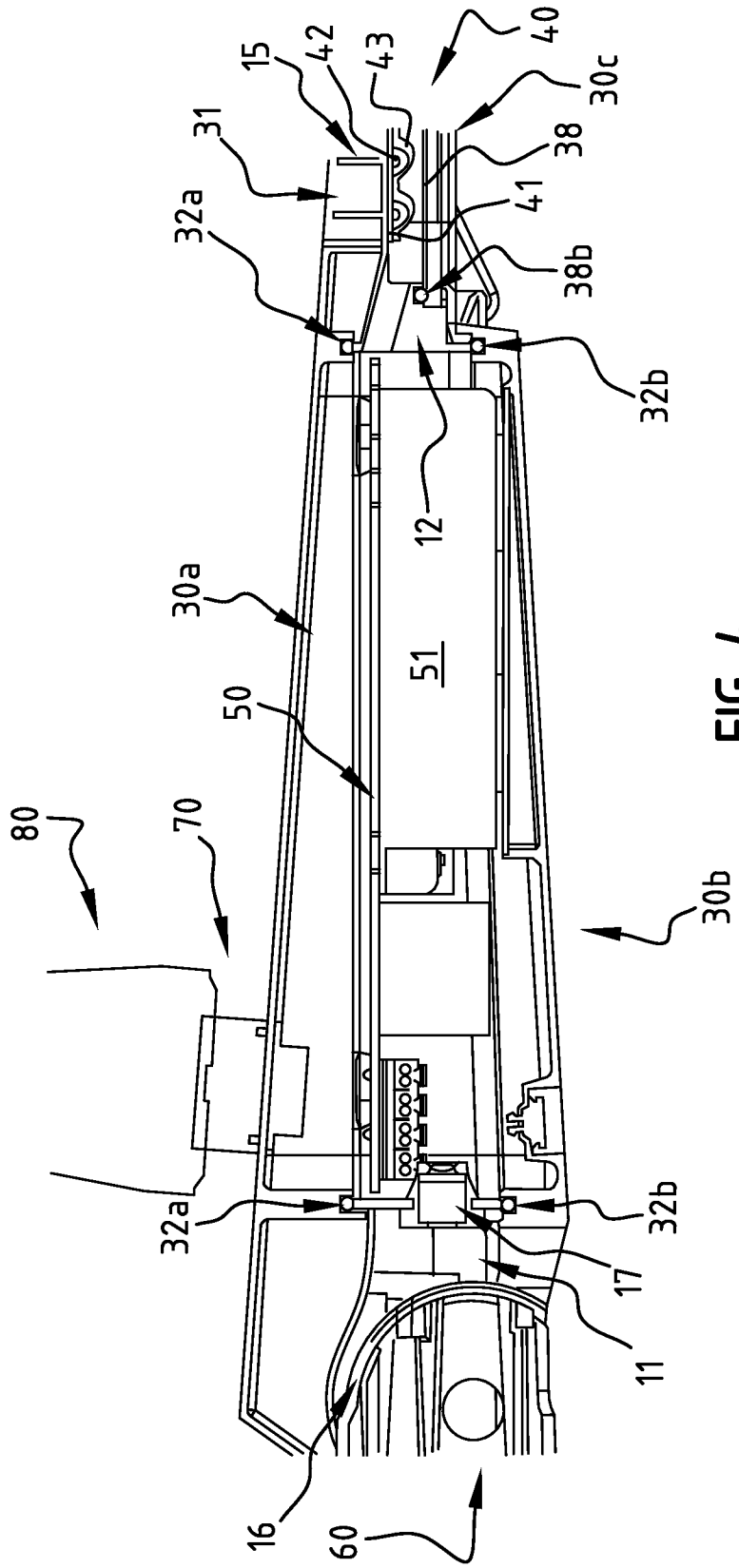
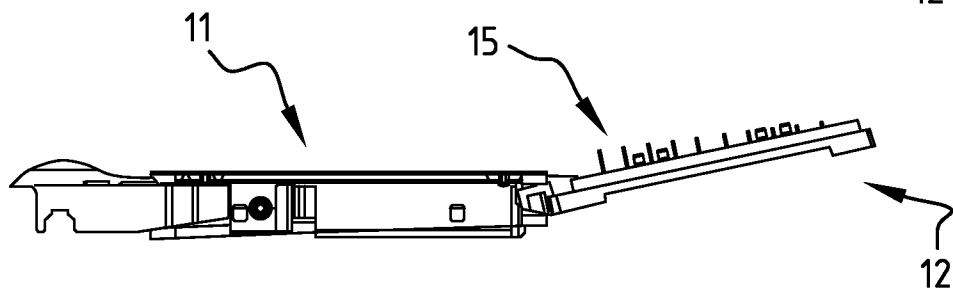
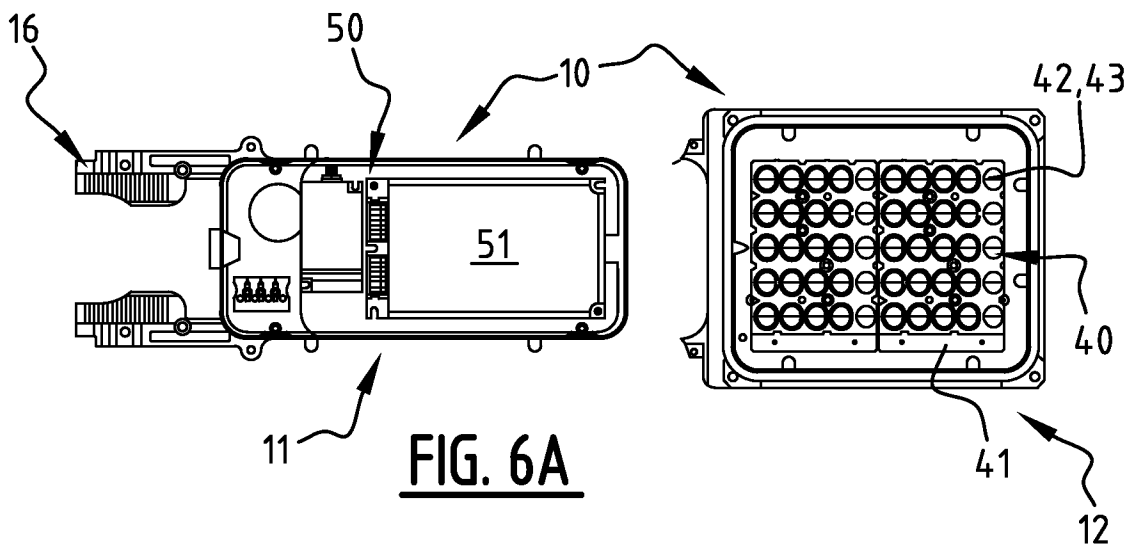
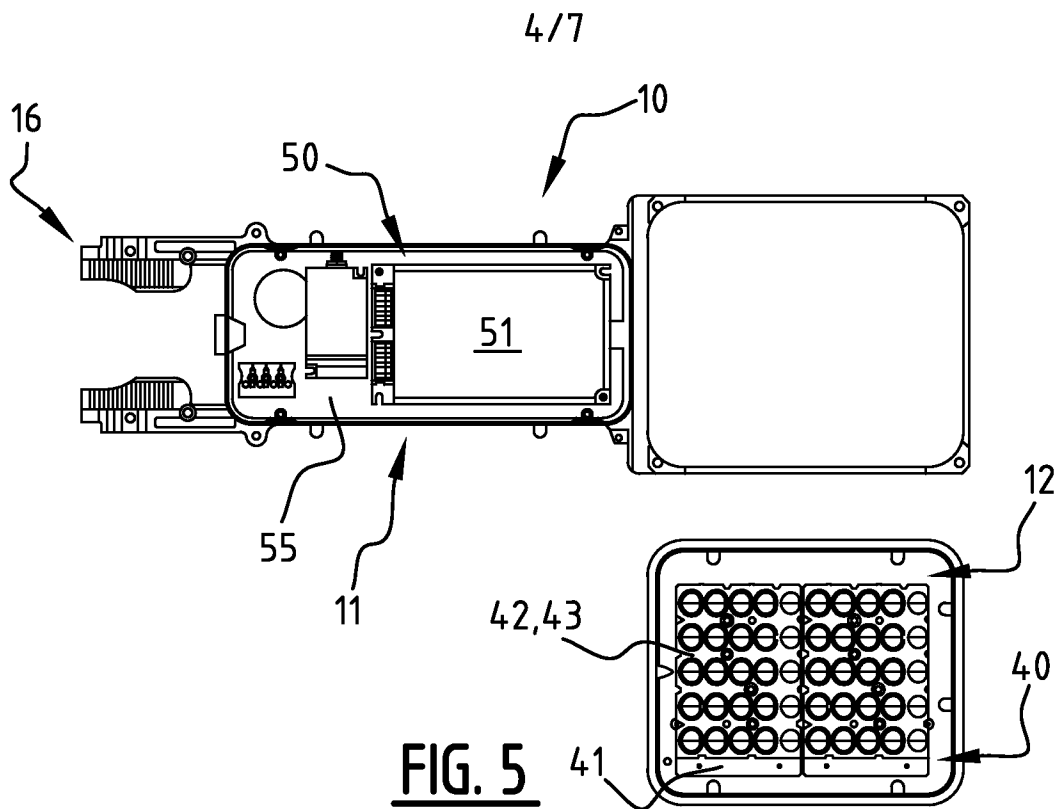


FIG. 4



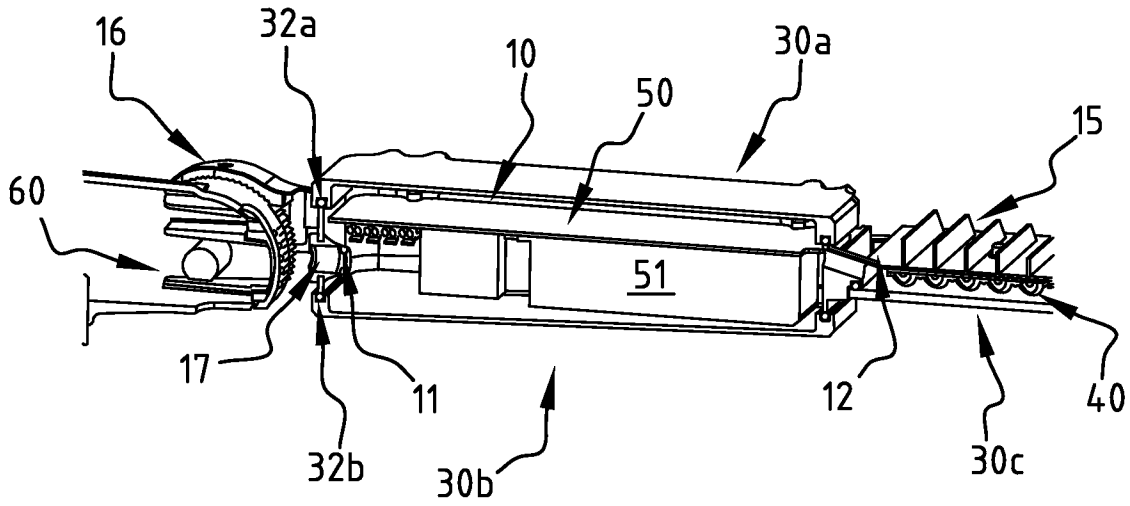


FIG. 7

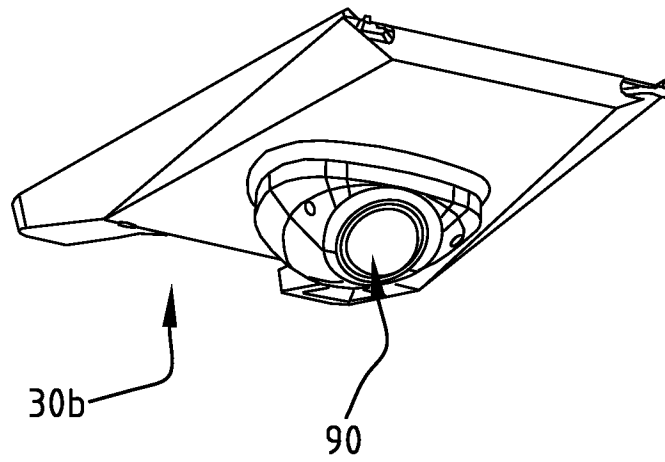


FIG. 8

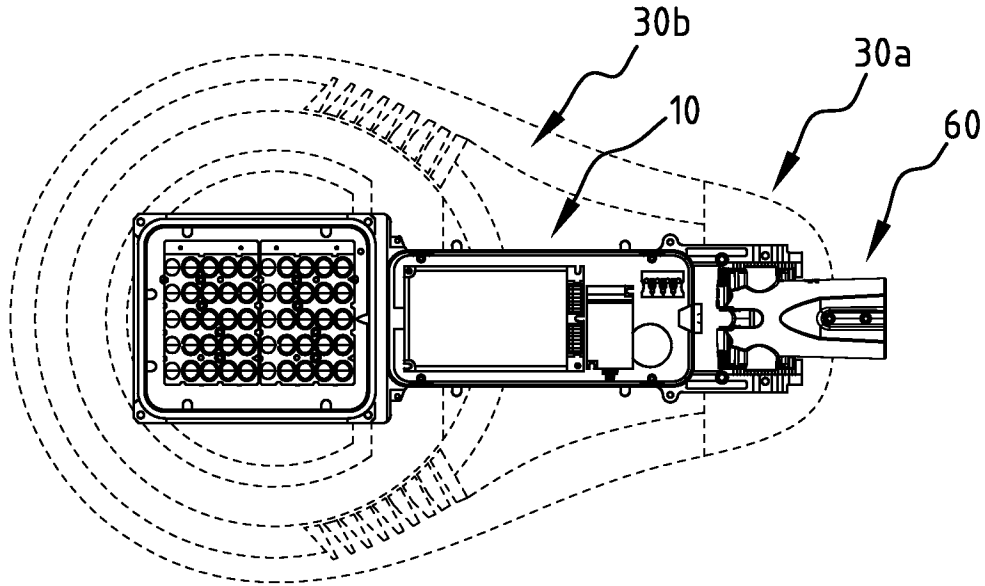


FIG. 9

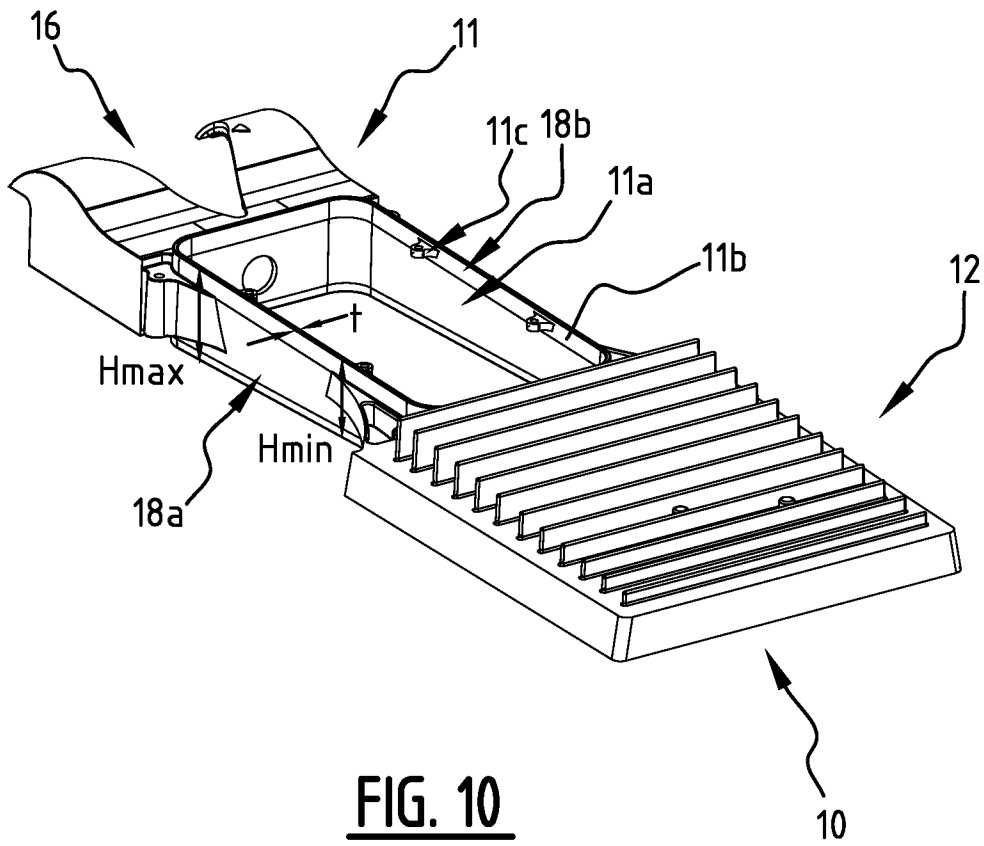


FIG. 10

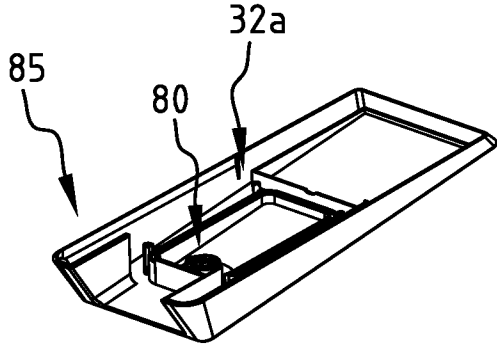


FIG. 11A

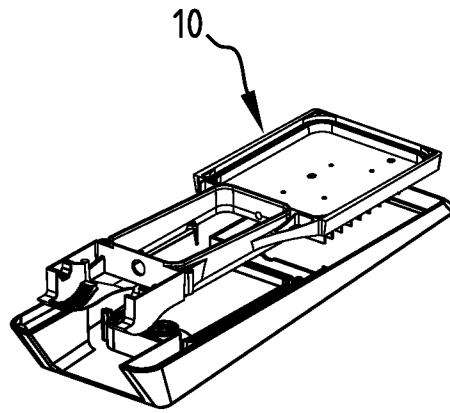


FIG. 11B

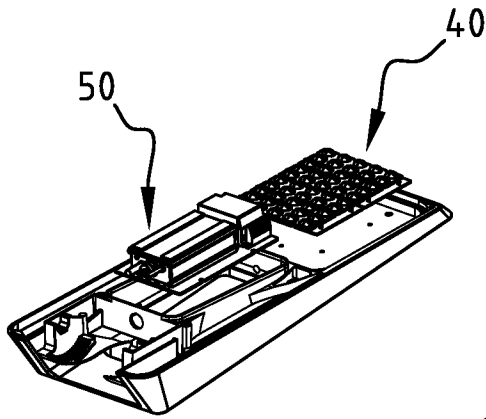


FIG. 11C

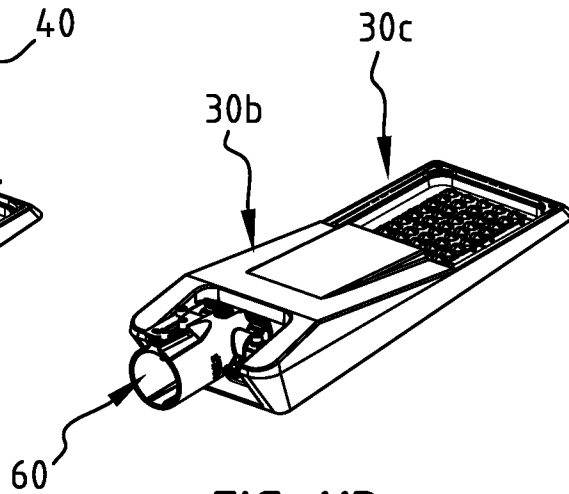


FIG. 11D

SAMENWERKINGSVERDRAG (PCT)

RAPPORT BETREFFENDE NIEUWHEIDSONDERZOEK VAN INTERNATIONAAL TYPE

| | |
|---|--|
| IDENTIFICATIE VAN DE NATIONALE AANVRAGE | KENMERK VAN DE AANVRAGER OF VAN DE GEMACHTIGDE |
| Nederlands aanvraag nr. 2033710 | Indieningsdatum 12-12-2022 |
| | Ingeroepen voorrangdatum |
| Aanvrager (Naam) SCHREDER S.A. | |
| Datum van het verzoek voor een onderzoek van internationaal type 25-03-2023 | Door de Instantie voor Internationaal Onderzoek aan het verzoek voor een onderzoek van internationaal type toegekend nr. SN83485 |
| I. CLASSIFICATIE VAN HET ONDERWERP (bij toepassing van verschillende classificaties, alle classificatiesymbolen opgeven) | |
| Volgens de internationale classificatie (IPC) Zie onderzoeksrapport | |
| II. ONDERZOCHE GEBIEDEN VAN DE TECHNIEK | |
| Onderzochte minimumdocumentatie | |
| Classificatiesysteem | Classificatiesymbolen |
| IPC | Zie onderzoeksrapport |
| Onderzochte andere documentatie dan de minimum documentatie, voor zover dergelijke documenten in de onderzochte gebieden zijn opgenomen | |
| | |
| III. | GEEN ONDERZOEK MOGELIJK VOOR BEPAALDE CONCLUSIES (opmerkingen op aanvullingsblad) |
| IV. | GEBREK AAN EENHEID VAN UITVINDING (opmerkingen op aanvullingsblad) |

**ONDERZOEKSRAPPORT BETREFFENDE HET
RESULTAAT VAN HET ONDERZOEK NAAR DE STAND
VAN DE TECHNIEK VAN HET INTERNATIONALE TYPE**

Nummer van het verzoek om een onderzoek naar
de stand van de techniek
NL 2033710

A. CLASSIFICATIE VAN HET ONDERWERP

INV. F21V23/00 F21V15/01 F21V17/00 F21V21/30 F21S8/08
ADD. F21V31/00 F21Y105/16 F21W131/103 F21Y115/10

Volgens de Internationale Classificatie van octrooien (IPC) of zowel volgens de nationale classificatie als volgens de IPC.

B. ONDERZOCHETE GEBIEDEN VAN DE TECHNIEK

Onderzochte minimum documentatie (classificatie gevolgd door classificatiesymbolen)

F21V F21Y F21S F21W

Onderzochte andere documentatie dan de minimum documentatie, voor dergelijke documenten, voor zover dergelijke documenten in de onderzochte gebieden zijn opgenomen

Tijdens het onderzoek geraadpleegde elektronische gegevensbestanden (naam van de gegevensbestanden en, waar uitvoerbaar, gebruikte trefwoorden)

EPO-Internal, WPI Data

C. VAN BELANG GEACHTE DOCUMENTEN

| Categorie ° | Geciteerde documenten, eventueel met aanduiding van speciaal van belang zijnde passages | Van belang voor conclusie nr. |
|-------------|---|--|
| X | WO 2010/088790 A1 (SHE JIE [CN]) 12 augustus 2010 (2010-08-12) * figuren 3,4 * * alineas [0035], [0041], [0042] * ----- | 1-18, 21-28 |
| X | US 2019/309935 A1 (NIMMA SRIDHAR REDDY [US] ET AL) 10 oktober 2019 (2019-10-10) * figuren 2a,2b * ----- | 1-6,10, 12-15, 18-21, 23-28 |
| X | EP 2 487 406 A1 (LG INNOTEK CO LTD [KR]) 15 augustus 2012 (2012-08-15) * figuren 1,2,9 * ----- | 1-28 |

Verdere documenten worden vermeld in het vervolg van vak C.

Leden van dezelfde octroofamilie zijn vermeld in een bijlage

° Speciale categorieën van aangehaalde documenten

"A" niet tot de categorie X of Y behorende literatuur die de stand van de techniek beschrijft

"D" in de octrooiaanvraag vermeld

"E" eerdere octrooi(aanvraag), gepubliceerd op of na de indieningsdatum, waarin dezelfde uitvinding wordt beschreven

"L" om andere redenen vermelde literatuur

"O" niet-schriftelijke stand van de techniek

"P" tussen de voorrangsdatum en de indieningsdatum gepubliceerde literatuur

"T" na de indieningsdatum of de voorrangsdatum gepubliceerde literatuur die niet bezwarend is voor de octrooiaanvraag, maar wordt vermeld ter verheldering van de theorie of het principe dat ten grondslag ligt aan de uitvinding

"X" de conclusie wordt als niet nieuw of niet inventief beschouwd ten opzichte van deze literatuur

"Y" de conclusie wordt als niet inventief beschouwd ten opzichte van de combinatie van deze literatuur met andere geciteerde literatuur van dezelfde categorie, waarbij de combinatie voor de vakman voor de hand liggend wordt geacht

"&" lid van dezelfde octroofamilie of overeenkomstige octrooipublicatie

Datum waarop het onderzoek naar de stand van de techniek van internationaal type werd voltooid

28 juni 2023

Verzenddatum van het rapport van het onderzoek naar de stand van de techniek van internationaal type

Naam en adres van de instantie

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040,
Fax: (+31-70) 340-3016

De bevoegde ambtenaar

Dinkla, Remko

**ONDERZOEKSRAPPORT BETREFFENDE HET
RESULTAAT VAN HET ONDERZOEK NAAR DE STAND
VAN DE TECHNIEK VAN HET INTERNATIONALE TYPE**

Informatie over leden van dezelfde octrooifamilie

Nummer van het verzoek om een onderzoek naar
de stand van de techniek

NL 2033710

| In het rapport genoemd octrooigeschrift | Datum van publicatie | Overeenkomend(e) geschrift(en) | Datum van publicatie |
|--|-------------------------|-----------------------------------|-------------------------|
| WO 2010088790 | A1 | 12-08-2010 | CN 101482241 A |
| | | | WO 2010088790 A1 |
| ----- | | | |
| US 2019309935 | A1 | 10-10-2019 | CN 106796005 A |
| | | | EP 3186552 A1 |
| | | | ES 2822448 T3 |
| | | | US 2016061428 A1 |
| | | | US 2019309935 A1 |
| | | | WO 2016033320 A1 |
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| EP 2487406 | A1 | 15-08-2012 | CN 102635792 A |
| | | | CN 105351812 A |
| | | | CN 105444076 A |
| | | | EP 2487406 A1 |
| | | | US 2012206901 A1 |
| | | | US 2014321100 A1 |
| ----- | | | |

WRITTEN OPINION

| | | | |
|--|---|---|------------------------------|
| File No. SN83485 | Filing date (<i>day/month/year</i>) 12.12.2022 | Priority date (<i>day/month/year</i>) | Application No. NL2033710 |
| International Patent Classification (IPC) INV. F21V23/00 F21V15/01 F21V17/00 F21V21/30 F21S8/08 ADD. F21V31/00 F21Y105/16 F21W131/103 F21Y115/10 | | | |
| Applicant SCHREDER S.A. | | | |

This opinion contains indications relating to the following items:

- Box No. I Basis of the opinion
- Box No. II Priority
- Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- Box No. IV Lack of unity of invention
- Box No. V Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- Box No. VI Certain documents cited
- Box No. VII Certain defects in the application
- Box No. VIII Certain observations on the application

| | |
|--|---------------------------|
| | Examiner Dinkla, Remko |
|--|---------------------------|

WRITTEN OPINION**Box No. I Basis of this opinion**

1. This opinion has been established on the basis of the latest set of claims filed before the start of the search.
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the application, this opinion has been established on the basis of a sequence listing:
 - a. forming part of the application as filed.
 - b. furnished subsequent to the filing date for the purposes of search,
 - accompanied by a statement to the effect that the sequence listing does not go beyond the disclosure in the application as filed.
3. With regard to any nucleotide and/or amino acid sequence disclosed in the application, this opinion has been established to the extent that a meaningful opinion could be formed without a WIPO Standard ST.26 compliant sequence listing.
4. Additional comments:

Box No. V Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

| | | |
|--------------------------|-------------|-------------------|
| Novelty | Yes: Claims | 8, 9, 16 |
| | No: Claims | 1-7, 10-15, 17-28 |
| Inventive step | Yes: Claims | |
| | No: Claims | 1-28 |
| Industrial applicability | Yes: Claims | 1-28 |
| | No: Claims | |

2. Citations and explanations

see separate sheet

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1 Reference is made to the following documents:

D1 WO 2010/088790 A1 (SHE JIE [CN]) 12 augustus 2010 (2010-08-12)

D2 US 2019/309935 A1 (NIMMA SRIDHAR REDDY [US] ET AL) 10 oktober 2019 (2019-10-10)

D3 EP 2 487 406 A1 (LG INNOTEK CO LTD [KR]) 15 augustus 2012 (2012-08-15)

2 The present application does not meet the criteria of patentability, because the subject-matter of claim1 is not new.

D1 discloses (see fig. 3, 4):

*Een lichtarmatuurkopsamenstel omvattende:
een framestructuur (3) met een koellichaam (22),
een optisch blok (23) met ten minste één lichtbron, waarbij het optisch blok aan de framestructuur tegenover het koellichaam is bevestigd,
een montagestructuur (6) omvattende één of meer elektrische componenten zoals een driver geconfigureerd voor het aandrijven van de ten minste één lichtbron, en/of een overspanningsbeveiliging en/of een zekering,
een afdekstructuur (4,8) geconfigureerd en aangebracht voor het afdekken van ten minste een gedeelte van de framestructuur,
waarbij de framestructuur een framegedeelte (3) omvat met een frameopening (**opening between 2 and 3**) die zich tussen een boven- en een onderzijde van de framestructuur uitstrekt en die is geconfigureerd om de montagestructuur te ontvangen.*

3 The present application does not meet the criteria of patentability, because the subject-matter of claim1 is not new.

D2 discloses (see fig. 2a):

*Een lichtarmatuurkopsamenstel omvattende:
een framestructuur (140) met een koellichaam,
een optisch blok (126) met ten minste één lichtbron, waarbij het optisch blok aan de framestructuur tegenover het koellichaam is bevestigd,
een montagestructuur (**wiring of the photocontroller 115**) omvattende één of meer elektrische componenten,*

een afdekstructuur (110, 150) geconfigureerd en aangebracht voor het afdekken van ten minste een gedeelte van de framestructuur, waarbij de framestructuur een framegedeelte (131) omvat met een frameopening die zich tussen een boven- en een onderzijde van de framestructuur uitstrekt en die is geconfigureerd om de montagestructuur te ontvangen.

- 4 The present application does not meet the criteria of patentability, because the subject-matter of claim1 is not new.

D3 discloses (see fig. 1, 2, 9):

Een lichtarmatuurkopsamenstel omvattende:

een framestructuur (5500, 3000, 8000) met een koellichaam (8000), een optisch blok (1000) met ten minste één lichtbron, waarbij het optisch blok aan de framestructuur tegenover het koellichaam is bevestigd, een montagestructuur (6000) omvattende één of meer elektrische componenten zoals een driver geconfigureerd voor het aandrijven van de ten minste één lichtbron, en/of een overspanningsbeveiliging en/of een zekering, een afdekstructuur (5100, 5200) geconfigureerd en aangebracht voor het afdekken van ten minste een gedeelte van de framestructuur, waarbij de framestructuur een framegedeelte omvat met een frameopening (62) die zich tussen een boven- en een onderzijde van de framestructuur uitstrekt en die is geconfigureerd om de montagestructuur te ontvangen.

- 5 Dependent claims 2-28 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of novelty and/or inventive step, see documents D1-D3 and the figures cited in the search report..
- 6 Claims 2-5: D2 shows an upper and lower cover (110, 150) and gaskets (135, 145).
- 7 Claims 6, 7: D1 shows a frame with a connecting piece for (3) attaching to a pole.
- 8 Claims 8, 9: The claimed dimensions are mere design choices the skilled person would make, depending for example on the structural and functional requirements.
- 9 Claims 10-15: D1 shows a second frame part (1, 2). D1 discloses metals and plastics ([0041], [0042]). D1 shows a power supply box (5). A box comprises at least six plate shaped elements. D1 shows a pivotable frame part (22).

- 10 Claim 16: Providing openings for allowing an air flow for cooling is common practice and does not provide an inventive step.
- 11 Claims 17-25: D1 shows that the cover 4, 8 does not enclose the entire frame structure 1,2,3. D1 shows that the cover 4, 8 encloses part of the frame 3. D1 shows a connection piece 3 covered by the covers 4, 8. Elements for connecting luminaire heads to light poles commonly comprise a hinge.
- 12 Claim 26: D2 shows that the cooling part supporting the lighting elements 125 is an integral part of the frame structure 140.
- 13 Claims 27, 28: D2 shows a socket of a photocontroller 115 and an opening for a sensor 115.