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(54) **LIGHT FIXTURE**

LEUCHTE

LUMINAIRE

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EP 3 144 582 B1

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Description

Field of the Invention

[0001] The present invention relates to a light fixture comprising a light source formed by one or more light emitters that give off heat in the direction opposite the direction of light emission, such as light emitting diodes, for example, of the type of light fixtures which require an electric power supply and/or control circuit, as well as a heat sink arranged for dissipating the heat produced by said light source.

Background of the Invention

[0002] The suitable operation of light fixtures of the type described above requires the light sources to work at an optimum temperature, preventing excessive heating of the electrical part of said light fixtures which lead to rapid wear, breakdown and/or malfunction.

[0003] To maintain the ideal working temperature, heat sinks provided with fins that are manufactured with materials having a high thermal conductivity, such as aluminum or copper, are often used. Said sinks allow absorbing the heat generated by light emitters to subsequently dissipate it into the air by means of heat exchange.

[0004] Today, electric circuits forming the power and/or control electronics of these light fixtures are usually located outside the casing of the light fixture. In most cases, a greater heat concentration must take place in the same sink or in the direction of heat dissipation. This is particularly significant when there are light sources formed by light emitters that give off heat in the direction opposite the direction of light emission. This aspect is a major problem, since the electric circuits are located in areas having thermal conditions that are more unfavorable for their correct operation.

[0005] In contrast, on certain occasions, the light sources themselves, particularly light sources having a higher sensitivity such as LED-type light sources, suffer from the heat generated by the electric circuits, causing them to lose efficiency and to have a reduced service life when working in environments with a temperature higher than their optimum working temperature.

[0006] Document EP2481973A2 refers to a lamp apparatus that comprises a casing defining a surrounding wall, a light source formed by one or more light emitters that give off heat in the direction opposite the direction of light emission, a heat sink arranged for dissipating the heat produced by the light source into the air, and an electric circuit configured for supplying power to and/or controlling the light source. The electric circuit is housed within the casing, separated from the heat sink, and arranged on a plane located below the heat sink and the light source, in the direction of the path of the light emitted by the light source.

[0007] The present invention relates to a light fixture

the configuration of which allows separating the electric circuit from areas where more heat is generated, and at the same time having better protection against the heat generated by the light source and by the electric circuit itself, and the configuration of which allows reducing its height, and thereby also reducing the minimum height for the assembly thereof, with the respective material savings and the possibility of placing it in places with a more limited headroom.

Description of the Invention

[0008] The light fixture of the present invention is defined by the features of claim 1. Preferred embodiments of the same are defined by the features of the dependent claims.

[0009] The light fixture of the present invention is of the type comprising:

- a casing defining a surrounding wall;
- a light source formed by one or more light emitters that give off heat in the direction opposite the direction of light emission, such as light emitting diodes (LED), for example;
- an electric circuit configured for supplying power to and/or controlling the light source; and
- a heat sink arranged for dissipating the heat produced by the light source, located on the casing.

[0010] The electric circuit is arranged on a plane different from the plane of the heat sink, in the direction of the path of the light emitted by the light source, i.e., on a plane located on the side opposite the side to which the flow of heat emitted by the heat sink itself is directed, a better thermal protection of the electric circuit thus being obtained.

[0011] The electric circuit is housed within the casing, separated from the heat sink. The electric circuit can thus be separated from the heat sink and the space of the light fixture is optimized to enable housing said electric circuit within the casing. The resulting light fixture is more compact, being able to be installed in places with more limited space.

[0012] To further favor the compact design of the light fixture of the present invention, the light source is housed within the heat sink in a housing provided therein.

[0013] The surrounding wall is preferably provided in the inner part thereof with one or more fixing elements configured for fixing the electric circuit to said surrounding wall. Such fixing elements can consist of threaded holes for the passage of screws, attachment clips, staplers, supports, etc.

[0014] The surrounding wall preferably comprises a central opening which is arranged facing the light source and configured for enabling the passage of the light emitted by said light source. Said central opening in turn faces the housing of the heat sink.

[0015] The surrounding wall comprises a support base

on which the heat sink is externally fixed.

[0016] The light fixture of the present invention preferably also comprises a protective element housed inside the casing, defining an outer wall, a space being established between the surrounding wall and the outer wall, and the electric circuit being arranged in said space. This protective element further favors the thermal insulation of the electric circuit, preventing the actual heat produced by the circuit from being able to negatively affect the light source.

[0017] The protective element can act only as a physical barrier against the passage of heat, but it can also be manufactured with heat-insulating materials that further favor said thermal insulation. According to a preferred embodiment, the light reflector of the light fixture is used as protective element.

Brief Description of the Drawings

[0018] A set of drawings that help to better understand the invention and are expressly related to an embodiment of said invention presented as a non-limiting example thereof will be very briefly described below.

Figure 1 depicts an exploded perspective view of the light fixture of the present invention.

Figure 2 depicts a sectioned elevational view of the light fixture of the present invention.

Figure 3 depicts a partially sectioned front view of the light fixture of the present invention.

Detailed Description of the Invention

[0019] Figure 1 shows an exploded perspective view of the light fixture of the present invention. In this case, a downlight-type light fixture for flush-mounted installation is used as an example. As can be seen, the light fixture (1) comprises:

- a casing (2) defining a surrounding wall (21);
- a light source (3) formed by one or more light emitters that give off heat (Q) in the direction opposite the direction of light emission, in this case, light emitting diodes;
- an electric circuit (4) configured for supplying power to and/or controlling the light source (3); and
- a heat sink (5) arranged on the casing (2) for dissipating the heat (Q) produced by the light source (3).

[0020] Figure 2 shows a sectioned elevational view of the light fixture (1) of the present invention. As can be seen, the electric circuit (4) is arranged on a plane (P) different from the plane of the heat sink (5), in the direction of the path (R) of the light emitted by the light source (3), in other words, opposite the flow of heat (Q) emitted by said light source (3). It can therefore be stated that the

electric circuit (4) is arranged on a plane (P) located below the heat sink (5), and according to this example, also below the light source (3).

[0021] According to the present example, the electric circuit (4) is housed within the casing (2), separated from the heat sink (5). The light source (3) is in turn housed within the heat sink (5) in a housing (51) provide therein.

[0022] The surrounding wall (21) is provided in the inner part (21a) thereof with fixing elements (22) configured for fixing the electric circuit (4) to said surrounding wall (21).

[0023] The surrounding wall (21) comprises a central opening (23) which is arranged facing the light source (3) and configured for enabling the passage of the light emitted by said light source (3). Said central opening (23) in turn faces the housing (51) of the heat sink (5).

[0024] The surrounding wall (21) comprises an outer frame (24) for being adapted to the mounting surface (false ceiling, gypsum-cardboard or wood enclosures, furniture, etc.) once the light fixture (1) has been mounted.

[0025] The surrounding wall (21) comprises a support base (25) on which the heat sink (5) is externally fixed.

[0026] The light fixture (1) comprises a protective element (6) housed inside the casing (2), defining an outer wall (61), a space (S) being established between the inner part (21a) of the surrounding wall (21) and the outer wall (61) of the protective element (6). The electric circuit (4) is arranged in said space (S). The outer wall (61) has a frustoconical shape establishing a space (S) having a triangular cross section with the surrounding wall (21).

[0027] The protective element (6) is prolonged from an inner end (62) of the outer wall (61), and is configured for housing the light source (3).

[0028] Figure 3 shows a partially sectioned bottom view of the light fixture (1) of the present invention. Said figure clearly shows the arrangement of the electric circuit (4) within the casing (2) and how it is attached to said casing by means of the fixing elements (22).

Claims

1. A light fixture, comprising:

- a casing (2) defining a surrounding wall (21);
- a light source (3) formed by one or more light emitters that give off heat (Q) in the direction opposite the direction of light emission;
- a heat sink (5) arranged for dissipating the heat (Q) produced by the light source (3) into the air, externally fixed on a support base (25) of the surrounding wall (21); and
- an electric circuit (4) configured for supplying power to and/or controlling the light source (3), housed within the casing (2), separated from the heat sink (5);

wherein the electric circuit (4) is arranged on a plane (P) located below the heat sink (5) and the light source (3), in the direction of the path (R) of the light emitted by the light source (3), wherein the light source (3) is housed in a cup shaped housing (51) arranged within the heat sink (5), wherein the cup shaped housing (51) comprises a bottom wall and a cylindrical side wall, **characterized in that** a plurality of V-shaped fins extend radially outwardly from the cylindrical side wall.

2. The light fixture according to claim 1, **characterized in that** the surrounding wall (21) is provided in the inner part (21a) thereof with one or more fixing elements (22) configured for fixing the electric circuit (4) to said surrounding wall (21).
3. The light fixture according to any of claims 1 to 2, **characterized in that** the surrounding wall (21) comprises a central opening (23) which is arranged facing the light source (3) and configured for enabling the passage of the light emitted by said light source (3).
4. The light fixture according to claim 3, **characterized in that** the central opening (23) of the surrounding wall (21) faces the housing (51) of the heat sink (5).
5. The light fixture according to any of claims 1 to 4, **characterized in that** it comprises a protective element (6) housed inside the casing (2), defining an outer wall (61), a space (S) being established between the inner part (21a) of the surrounding wall (21) and the outer wall (61) of the protective element (6); and **in that** the electric circuit (4) is arranged in said space (S).
6. The light fixture according to claim 5, **characterized in that** the protective element (6) consists of a light reflector.

Patentansprüche

1. Leuchte, umfassend:
 - einen Mantel (2), welcher eine umgebende Wand (21) definiert;
 - eine Lichtquelle (3), welche aus einem oder mehreren Lichtemittern gebildet ist, welche Wärme (Q) in die der Lichtemissionsrichtung entgegengesetzte Richtung abgeben;
 - eine Wärmesenke (5), welche zum Ableiten der von der Lichtquelle (3) erzeugten Wärme (Q) in die Luft angeordnet ist und außen auf einer Stützbasis (25) der umgebenden Wand (21) befestigt ist; und
 - eine elektrische Schaltung (4), welche dazu

ausgebildet ist, der Lichtquelle (3) Strom zuzuführen und/oder dieselbe zu steuern, wobei sie innerhalb des Mantels (2) von der Wärmesenke (5) getrennt aufgenommen ist;

wobei die elektrische Schaltung (4) auf einer Ebene (P) angeordnet ist, welche sich unter der Wärmesenke (5) und der Lichtquelle (3) befindet, in der Richtung des Weges (R) des von der Lichtquelle (3) emittierten Lichtes, wobei die Lichtquelle (3) in einem topfförmigen Gehäuse (51) aufgenommen ist, welches innerhalb der Wärmesenke (5) angeordnet ist, wobei das topfförmige Gehäuse (51) eine untere Wand und eine zylindrische Seitenwand umfasst, **dadurch gekennzeichnet, dass** sich eine Vielzahl von V-förmigen Flügeln nach außen von der zylindrischen Seitenwand radial erstrecken.

2. Leuchte nach Anspruch 1, **dadurch gekennzeichnet, dass** die umgebende Wand (21) im inneren Teil (21a) derselben mit einem oder mehreren Befestigungselementen (22) versehen ist, welche dazu ausgebildet sind, die elektrische Schaltung (4) an der genannten umgebenden Wand (21) zu befestigen.
3. Leuchte nach einem der Ansprüche 1 bis 2, **dadurch gekennzeichnet, dass** die umgebende Wand (21) eine mittige Öffnung (23) umfasst, welche der Lichtquelle (3) zugewandt angeordnet ist und dazu ausgebildet ist, den Durchgang des von der genannten Lichtquelle (3) emittierten Lichtes zu ermöglichen.
4. Leuchte nach Anspruch 3, **dadurch gekennzeichnet, dass** die mittige Öffnung (23) der umgebenden Wand (21) dem Gehäuse (51) der Wärmesenke (5) zugewandt ist.
5. Leuchte nach einem der Ansprüche 1 bis 4, **dadurch gekennzeichnet, dass** sie ein Schutzelement (6) umfasst, welches innerhalb des Mantels (2) aufgenommen ist, unter Definierung einer Außenwand (61), wobei ein Raum (S) zwischen dem Innenteil (21a) der umgebenden Wand (21) und der Außenwand (61) des Schutzelementes (6) geschaffen wird; und dass die elektrische Schaltung (4) im genannten Raum (S) angeordnet ist.
6. Leuchte nach Anspruch 5, **dadurch gekennzeichnet, dass** das Schutzelement (6) aus einem Lichtreflektor besteht.

Revendications

1. Luminaire, comprenant :
 - un boîtier (2) définissant une paroi périphéri-

que (21) ;

- une source de lumière (3) formée par un ou plusieurs émetteurs de lumière qui dégagent de la chaleur (Q) dans la direction opposée à la direction d'émission de lumière ;
- un dissipateur thermique (5) disposé pour dissiper la chaleur (Q) produite par la source de lumière (3) dans l'air, fixé extérieurement sur une base de support (25) de la paroi périphérique (21) ; et
- un circuit électrique (4) configuré pour alimenter de la puissance à et/ou commander la source de lumière (3), logé dans le boîtier (2), séparé du dissipateur thermique (5) ;

dans lequel le circuit électrique (4) est disposé sur un plan (P) situé sous le dissipateur thermique (5) et la source de lumière (3), dans la direction du trajet (R) de la lumière émise par la source de lumière (3), dans lequel la source de lumière (3) est logée dans un logement en forme de coupelle (51) disposé dans le dissipateur thermique (5), dans lequel le logement en forme de coupelle (51) comprend une paroi inférieure et une paroi latérale cylindrique, **caractérisé en ce que** plusieurs ailettes en V s'étendent radialement vers l'extérieur à partir de la paroi latérale cylindrique.

2. Luminaire selon la revendication 1, **caractérisé en ce que** la paroi périphérique (21) est pourvue dans sa partie intérieure (21a) d'un ou plusieurs éléments de fixation (22) configurés pour fixer le circuit électrique (4) à ladite paroi périphérique (21).
3. Luminaire selon l'une quelconque des revendications 1 à 2, **caractérisé en ce que** la paroi périphérique (21) comprend une ouverture centrale (23) qui est disposée face à la source de lumière (3) et configurée pour permettre le passage de la lumière émise par ladite source de lumière (3).
4. Luminaire selon la revendication 3, **caractérisé en ce que** l'ouverture centrale (23) de la paroi périphérique (21) est tournée vers le logement (51) du dissipateur thermique (5).
5. Luminaire selon l'une quelconque des revendications 1 à 4, **caractérisé en ce qu'il** comprend un élément de protection (6) logé à l'intérieur du boîtier (2), définissant une paroi extérieure (61), un espace (S) étant établie entre la partie intérieure (21a) de la paroi périphérique (21) et la paroi extérieure (61) de l'élément de protection (6) ; et **en ce que** le circuit électrique (4) est disposé dans ledit espace (S).
6. Luminaire selon la revendication 5, **caractérisé en ce que** l'élément de protection (6) est constitué par un réflecteur de lumière

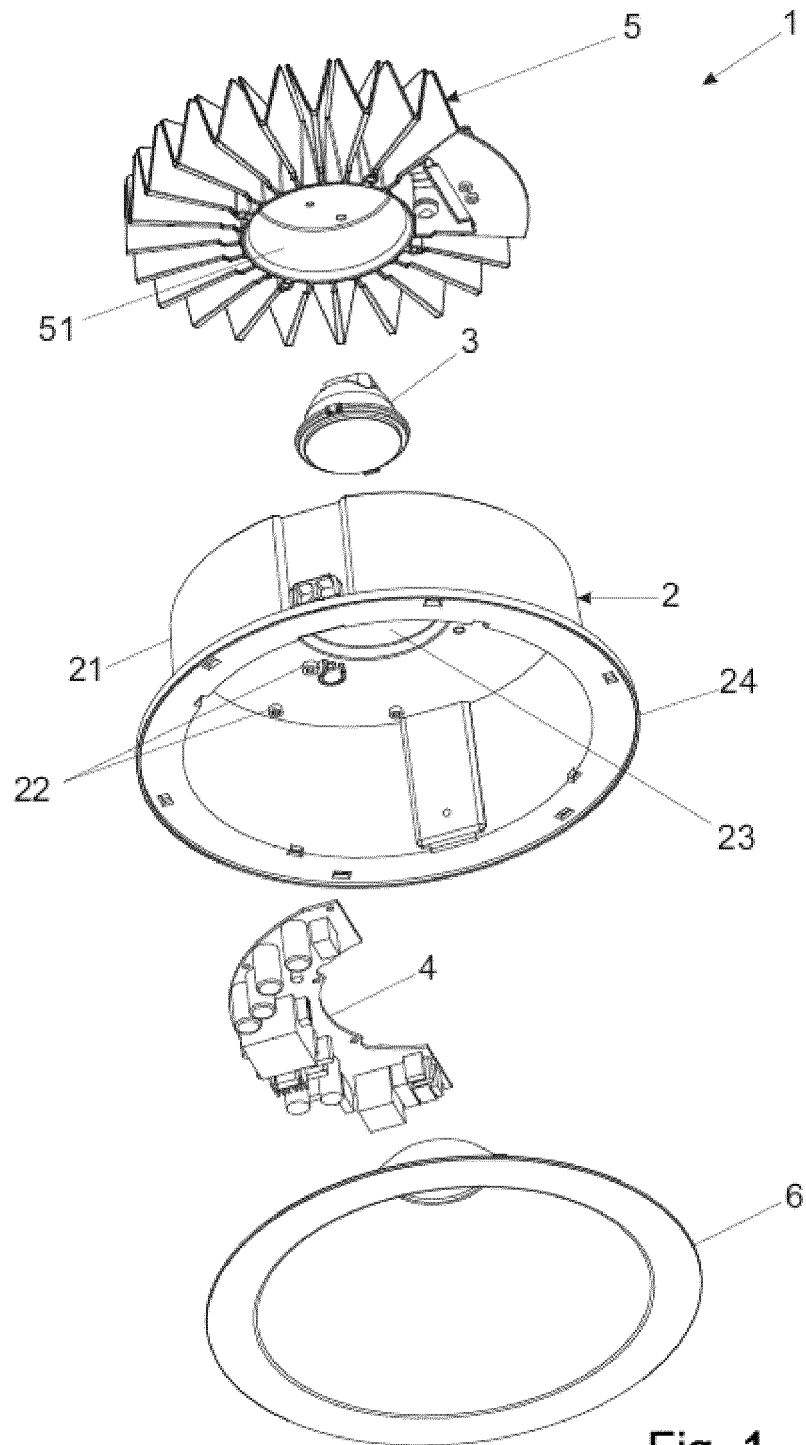


Fig. 1

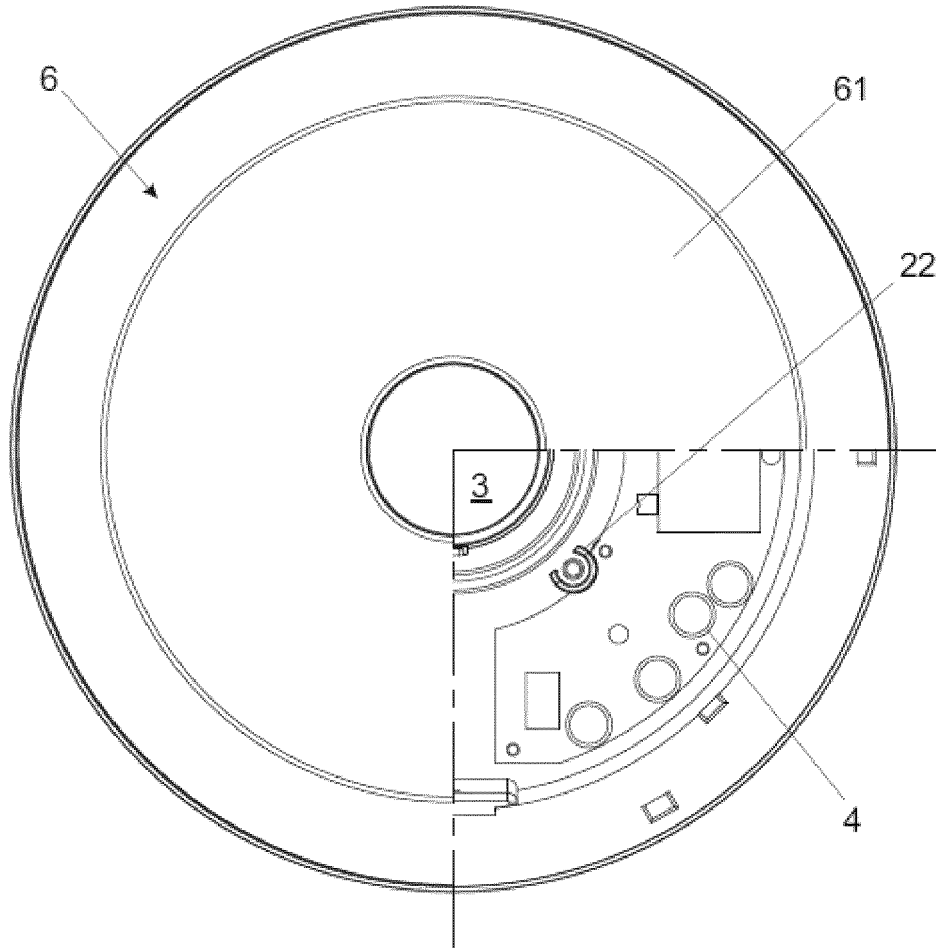


Fig. 3

REFERENCES CITED IN THE DESCRIPTION

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