Surface-Mounted or Wall-Mounted Luminaire

The invention relates to a surface-mounted or wall-mounted luminaire of the type described in the preamble of claim 1.

The object of the invention is to create a surface-mounted luminaire for the device for media supply known from DE 20 2007 004 239 U1, by which optimal workplace and space illumination is made possible and which is both easy to install and highly service-friendly.

To solve the lighting problem, the surface-mounted luminaire provided in claim 1 is proposed, which is suitable for attachment to both the aforementioned media distributor or to a vertical wall.

The known surface-mounted luminaire is substantially composed of an elongated housing having an approximately triangular cross-section, the back wall of the housing being fastened to the media distributor. Inside the housing, a fluorescent lamp is disposed, the light of which is emitted directly to the workplace or indirectly in the direction of the room ceiling by way of reflectors that extend parallel to the lamp and screens disposed at an angle relative to each other.

The luminaire according to the invention, as characterized in claim 1, significantly improves the quality of the directly and indirectly emitted light. This is achieved, for one, by a particular reflector geometry, which ensures the emission of extremely homogeneous light both upward and downward, and secondly by the configuration of the screens which cover the luminaire toward the top and the bottom and by which the light is scattered diffusely upward and the light is oriented downward such that the portion of horizontally exiting light is

as low as possible.

Claims 2 and 3 propose reflector configurations which both favor the light direction described and are economical to produce and install.

The proposed designs described in detail in claims 4 to 17 provide for easy production and improve the service friendliness, while offering safe handling.

In the luminaire characterized in claim 4, the design of which corresponds to the surface-mounted luminaire known from DE 20 2007 004 239 U1, the screens used for light direction are removably inserted.

Advantageously, according to claim 5 at least one screen, preferably the one located at the top, can be pivoted away for service purposes.

Measures for configuring the top screen that can be pivoted away are the subject matter of dependent claims 6 to 10.

Dependent claims 11 and 12 refer to proposed solutions for securely fastening the bottom screen.

Claims 13 to 15 finally propose solutions for fastening the lateral parts to the luminaire housing and for fastening the luminaire to a supply duct or a wall.

The luminaire according to the invention is configured so that a plurality of luminaires of this type can be disposed in series next to one another, as is desirable for the aforementioned media distributor.

Such a luminaire element must not only be easy to orient in the series, but also be easy to install and remove.

Claims 16 and 17 propose solutions for improving these properties.

These characteristics are described in detail based on a preferred exemplary embodiment, which is shown in the drawings.

The drawings show:

FIG. 1 is a perspective illustration of a luminaire according to the invention, in which the top screen is open,

FIG. 2 is a cross-section of the luminaire installed on a supply duct, having a schematically indicated beam path,

FIG. 3 is a perspective and enlarged illustration of one of the two lateral parts of the luminaire shown in FIG. 1,

FIG. 3a is an enlarged detail III of the lateral part shown in FIG. 3,

FIG. 4 is a cross-section of the luminaire according to FIG. 1 close to the lateral part 10 with closed screens,

FIG. 4a is a cross-section according to FIG. 4 with partially open screens,

FIG. 5 is a cross-section of the luminaire screwed onto a supply duct,

FIG. 5a is an enlarged perspective detailed illustration of a keyhole-shaped opening provided in the rear wall, comprising a threaded pin used for fastening and a nut,

FIG. 6 are perspective partial views of two luminaire elements having top screens that are folded open, the elements being disposed in series and connected to one another,

FIG. 6a is a perspective larger illustration of a locking pin used to mechanically connect the luminaire elements, and

FIG. 7 is a cross-section of the luminaire according to FIG. 4 with the top screen being entirely folded open.

The overall design of the luminaire 1 according to the invention is apparent from the perspective illustration according to FIG. 1.

The luminaire housing is substantially composed of a rear wall 30, to which lateral parts 10 and 20 are screwed perpendicularly by countersunk head screws 16, the lateral parts being connected to one another at the front by means of a profiled rail 40. This rail is also connected to the lateral parts 10 and

20 by means of countersunk head screws 16.

As is apparent in particular from FIG. 3a, the countersunk holes 11 for receiving the countersunk head screws 16 are provided with lobular recesses 12, which remove the paint adhering to the countersunk head screw when the same is screwed in and thereby ensure good electrical connection between the lateral parts 10, the countersunk head screws 16 and the rear wall 30 connected thereto or the front profiled rail 40.

Inside the housing, a fluorescent lamp 2 is provided as the luminous element 2, which is inserted in bases 3 attached to the lateral parts 10 and 20.

Reflectors are disposed between the rear wall 30 and fluorescent lamp 2, with the drawing showing the reflector surfaces 61a and 62c.

The luminaire is covered toward the top and the bottom by transparent screens, of which only the upwardly folded-open screen 50 is shown in FIG. 1.

For the electrical connection of the luminaire, connecting cables 91 are provided inside the luminaire housing between the rear wall 30 and the reflector 61a, wherein the plugs 92 and sockets 93 located at the ends of the cables are shown, which can be guided through feedthrough openings 18 or 18' provided in the lateral walls 10 or 20. Moreover, locking pins 15 and detent openings 17 associated with one another are provided in the lateral parts 10 and 20 and are used to orient and lock the luminaire elements disposed in series, as will be explained in more detail hereinafter.

Keyhole-shaped openings 31 are provided in series next to one another for fastening the luminaire 1 to a rear wall, which is not shown in FIG. 1.

The most important measures for the configuration of the luminaire according to the invention relate to the light distribution and light direction, the latter being illustrated by the cross-section according to FIG. 2, which schematically indicates the light beams generated by the lamp 2 for generating the indirect light A, for generating the direct light B and the lateral light C.

The light direction symbolized here is made possible by the special configuration of the rear reflector comprising the reflector surfaces 61a and 61b and the front reflector comprising the reflector surfaces 62a, 62b and the screens 50 and 70.

The reflector surfaces 61a and 62a delimit a bottom chamber 63 opening downward in a funnel shape, and the reflector surfaces 61b, 62b, and 62c delimit a top chamber 64 opening upward in a funnel shape.

The bottom chamber 63 is covered by a bottom screen 70 having a flute-shaped structure. The reflector surfaces 61a and 62a, together with the fluted bottom screen 70, cause the light generated by the lamp 2 for illuminating the workplace to be deflected notably perpendicularly downward in the direction B, while laterally emitted light in direction C is substantially suppressed, which results in extraordinarily good freedom of glare.

The top chamber 64 is covered by a frosted screen 50. The light emitted upward by the lamp 20 is reflected by means of the reflector surfaces 61b, 62b and 62c and diffusely scattered more strongly by means of the frosted screen

50 than by the bottom screen 70, whereby indirect light that is emitted in direction A and reflected by the room ceiling is generated.

For design reasons, the reflector surfaces 61a and 61b and the reflector surfaces 62a, 62b and 62c are integrally produced, respectively.

The design measures also proposed by the invention and described in more detail based on the remaining figures are no less important for production, installation and maintenance.

The configurations and arrangements of the top screen 50 and bottom screen 70 are important for installation and maintenance; they are disposed between the rear wall 30 and the forward rail 40, which are advantageously produced as extruded sections.

With a lip 51a which is located at the rear edge 51 and bent downwardly, the top screen 50 is pivotably suspended in a flute 35 provided at the upper edge of the rear wall. The top screen 50 can thus be pivoted away toward the top, as is shown in FIG. 4a. A front lip 51b, which likewise runs at the rear edge of the top screen 50 parallel to the lip 51a and is seated against the front wall part 35a of the rear wall 30 that delimits the flute 35, prevents the top screen 50 from being detached when it is folded up. Given this special shape, the top screen 50 can also be easily installed and removed without tools.

The rear wall 30 advantageously transitions upward into an extension 35c forming a stop for the screen 50, the operating principle of the extension being apparent in particular from FIG. 7.

This configuration makes it possible for the screen 50 to be locked in the folded-up state, so that the service technician has both hands free when replacing the lamp, performing the repair work or cleaning.

At the front end, the closed top screen 50 engages with a groove 42 of the profiled rail 40 via a downwardly directed, elastically spring-loaded lip 52 for locking purposes. The top screen 50 and the profiled rail 40 are dimensioned such that, when the screen 50 is closed, the surface thereof is flush with the surface of the rail 40, so that only a narrow gap is formed between the mutually adjoining edges of the screen 50 and rail 40. This substantially prevents accidental opening of the screen, because a tool, for example a screwdriver to be introduced in the gap, is required for opening.

For service purposes, for example to replace a lamp 2, it suffices to open the top screen 50, and the bottom screen 70 can remain fixedly installed. However, so as to enable economical production, the rear wall 30, rail 40 and the lateral parts 10 and 20 are configured so that easy installation and removal are possible.

The screen 70, for example, comprises edges 71 that are tapered on both sides relative to the screen thickness, which are removably inserted on one side in a groove 32 of the profiled rear wall 30 and on the other side in a groove 41 of the profiled rail 40. The distance between the mutually facing edges 32a of the rear

wall 30, and 41a of the rail 40, is smaller than the width of the inserted screen 70, while the distance of the bases 41b of the groove 41, and 32b of the groove 32, is larger than the width of the bottom screen 70, whereby easy insertion and retention of the screen 70 are assured. So as to fix the screen 70 in the position thereof, a fixing pin 13 engages in the intermediate space between the groove base 32b and the edge 71 of the screen 70, the pin being provided on the lateral part 10, as is shown in particular in FIG. 3. The edges 71 and 72 of the bottom screen 70 and the screen are dimensioned such that a smooth transition is obtained when the screen 70 is inserted.

In particular when using the luminaire as a luminaire element in a lighting strip, the easy and flush installation thereof is required. For this purpose, a series of keyhole-shaped openings 31 are provided in the rear wall 30 of the luminaire 1, which have already been mentioned in connection with FIG. 1. The special configuration of the openings is shown in the perspective illustration according to FIG. 5a. During installation, the luminaire 1 is placed on threaded pins 81 located on the supply duct 80, which penetrate the keyhole-shaped openings 31. The nuts, preferably self-locking nuts 33 with serrated bearing surfaces, screwed onto the threaded pins 81 must be tightened to fix the luminaire 1. The elongated hole 31a provided on the opening 31 makes it possible to orient the luminaire 1 vertically.

To further fix the position of and mount the luminaire, an upwardly bent lug 82 which engages in a receiving flute 36 of the rear wall 30 is provided at the lower end of the supply duct 80. This ensures secure fastening of the luminaire. As soon as the luminaire 1 is suspended on the threaded pins 81 and the self-locking nuts 33 with serrated bearing surfaces are screwed on, the luminaire is fixed in place. The lug 82 prevents the luminaire from being pushed upward. Even if the self-locking nut 33 with serrated bearing surfaces is not tightened,

secure fastening is assured.

When the luminaire elements 1, 1' are used in a strip lighting fixture, as is shown in FIG. 6, it is important that they are oriented such that they are aligned with one another.

So as to ensure or facilitate this, a spring-loaded locking pin 15' is provided in each lateral wall 10', the pin engaging in a detent opening 17 associated therewith, which is apparent, for example, from FIGS. 1 and 3. During removal, this locking pin 15' must be loosened.

To remove a luminaire element 1 or 1' from the lighting strip, not only the fastening and locking elements 81 and 15 must be loosened, but the electrical connections of the cables 91, 91' must also be disconnected. For this reason, the cables 91, 91' are equipped at the mutually associated ends with plugs 92' or sockets 93, which can easily be connected to one another and disconnected from one another.

The spaces between the rear walls 30, 30' and the reflector surfaces 61a and 61a' are dimensioned such that, after the connecting cables 91 and 91' are disconnected, they can be stored together with the sockets 93 and plugs 91' without difficulty behind the reflectors 61a and 61a'.

List of reference numerals

1 Luminaire
1' Luminaire
2 Fluorescent lamp
3 Base
10 Lateral part, left
10' Lateral part, left
11 Countersunk hole
12 Lobular recess
13 Fixing pin
15 Locking pin
16 Countersunk head screw
17 Detent opening
18 Feedthrough opening
18' Feedthrough opening
20 Lateral part, right
30 Rear wall
30' Rear wall
31 Keyhole-shaped opening
31a Elongated hole
32 Groove for bottom screen
32a Edge
32b Base
33 Self-locking nut with serrated bearing surfaces
35 Flute for top screen
35a Front wall part
35b Rear wall part
35c Stop
36 Receiving flute

40 Rail
41 Groove for bottom screen
41a Edge
41b Base
42 Groove
50 Top screen
51 Rear edge of top screen
51a Rear lip
51b Front lip
52 Front lip of top screen
61a Partial reflector surface
61a' Partial reflector surface
62a Partial reflector surface
62b Partial reflector surface
62c Partial reflector surface
63 Bottom chamber
64 Top chamber
70 Rear screen
71 Rear edge of bottom screen
72 Front edge of bottom screen
80 Supply duct
81 Threaded pin
82 Lug
91 Cable
92 Plug
93 Socket

A Indirect light

B Direct light

C Side light

Claims

1. A surface-mounted or wall-mounted luminaire, substantially comprising an elongated housing having a rear wall used for fastening, the housing having an approximately triangular cross-section, further comprising a luminous element disposed inside the housing, preferably a fluorescent lamp, and screens which surround the luminous element, extend parallel thereto and are located at an angle relative to one another for emitting direct and indirect light,
   characterized in that the reflectors for generating the downwardly oriented direct light (B) comprise flat reflector surfaces (61a, 62a) that are disposed at an angle relative to one another, and the reflectors for generating the upwardly oriented indirect light (A) comprise a reflector surface (61b) that is approximately parabolically curved in the direction of the luminous element (2) and, located opposite of this surface, at least one flat reflector surface (62b), wherein the reflector surfaces (61a, 62a; 61b, 62b) for generating the direct light (B) and the indirect light (A) delimit respective chambers (63, 64) opening downward or upward in a funnel shape, the screen (70) comprises fluting for the direct light (B) by which the portion of the downwardly emitted light is increased in relation to the laterally emitted light (C), and the screen (50) for the indirect light (A) diffusely scatters the same.

2. The luminaire according to claim 1,
   characterized by
   a first reflector which is located close to the rear wall (30) and comprises the flat reflector surface (61a) of the bottom chamber (63) and the parabolically curved reflector surface (61b) of the top chamber (64), and

by a second reflector which comprises the flat reflector surfaces (62a, 62b) of the bottom and top chambers (63, 64).

3. The luminaire according to claim 1 or 2,
characterized in that
the reflector surface of the top chamber (64) that is located opposite of the parabolically curved reflector surface (61b) comprises two partial surfaces (62b, 62c) disposed at an angle relative to one another, wherein the outer partial surface (62c) is inclined more strongly relative to the vertical than the inner partial surface (62b).

4. The luminaire in particular according to claim 1, 2 or 3,
characterized in that
the housing of the luminaire (1) comprises a rear wall (30) designed as a profiled part, a rail (40) that is designed as a profiled part and is parallel to the rear wall (30), and two lateral parts (10, 20) which are disposed perpendicular to the rear wall (30) and the rail (40) and correspond to the cross-sectional shape of the housing, wherein the screens (50, 70) are removably inserted between the rear wall (30) and the rail (40).

5. The luminaire according to claim 4,
characterized in that
at least one screen (50), preferably the one located at the top, can be pivoted away for service purposes.

6. The luminaire according to claim 5,
characterized in that
a flute (35) extending in the longitudinal direction is provided at the upper edge of the rear wall (30), with the top screen (50) being pivotably suspended in this flute with a rear lip (51a).

7. The luminaire according to claim 6,
characterized in that
a front lip (51b) is provided which runs on the top screen (50) parallel to the rear lip (51a) and envelopes the front wall part (35a) delimiting the flute (35) in a locking manner when the screen (50) is closed.

8. The luminaire according to claim 6 or 7,
characterized in that
the rear wall part (35b) delimiting the flute (35) is extended toward the top and constitutes a stop for the open screen (50).

9. A luminaire according to any one of claims 5 to 8,
characterized in that
a downwardly projecting, spring-loaded lip (52) is provided at the front edge of the top screen (50), the lip engaging in a corresponding groove (42) of the rail (40) in a latching manner.

10. The luminaire according to claim 9,
characterized in that
the upper face of the top screen (50) is flush with the upper face of the rail (40) in the latched state.

11. A luminaire according to any one of the claims 4 to 10,
characterized in that
grooves (32, 41) extending in the longitudinal direction are provided on the lower edge of the rear wall (30) and on the lower edge of the rail (40), with the bottom screen (70) being inserted in the grooves with edges (71, 72) which correspond to the cross-section of the grooves (32, 41) and are preferably tapered relative to the thickness of the screen (70).

12. The luminaire according to claim 11,
characterized in that
the distance of the edges (32a, 41a) of the grooves (32, 41) from one another is smaller than the width of the bottom screen (70) and the distance of the bases (32b, 41b) of the grooves (32, 41) from one another is greater than the width of the bottom screen (70), and when the screen (70) is inserted in the grooves (32, 41), fixing pins (13) provided on the lateral parts (10, 20) are inserted in the resulting free space between the groove base (32b) and the edge (71) of the screen (70) for fixing the position of the screen (70).

13. A luminaire according to any one of claims 4 to 12,
characterized in that
the lateral parts (10, 20) are connected to the rear wall (30) and the rail (40) by way of countersunk head screws (16), wherein the countersunk holes (11) in the lateral parts (10, 20) comprise lobular recesses (12) that are brought into engagement with the heads of the countersunk head screws (16).

14. A luminaire according to any one of the claims 4 to 13,

characterized in that
the rear wall (30) comprises a series of keyhole-shaped cut-outs (31) disposed at a distance from one another, which receive threaded pins (81) which are provided on a supply duct (80) or a wall and onto which nuts, preferably self-locking nuts (33) with serrated bearing surfaces, can be screwed for fastening the luminaire.

15. The luminaire according to claim 14,
characterized in that
a receiving flute (36) is provided at the back on the lower edge of the rear wall (30), with a lug (82) used for positional fixation engaging in this flute when installing the luminaire (10) on a supply duct (80) or a wall.

16. A luminaire according to any one of claims 4 to 15,
characterized in that
an axially displaceable and latchable, spring-loaded locking pin (15) is provided on one of the lateral parts (10, 20), with a corresponding detent opening (17) that is provided in another lateral parts (10, 20) being associated with this locking pin.

17. A luminaire according to any one of claims 4 to 16,
characterized in that
a cable (91, 91') for the electrical connection of the luminaire (1) is disposed between the rear wall (30) and the reflector (61, 61') and provided with a plug (92, 92') or a socket (93) close to the lateral part (10, 10'), and the lateral part (10, 10') comprises a feedthrough opening (18') that is associated with the plug (92') or the socket (93).