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Built-in light

The invention concerns a square built-in light comprising a frame
10 which can be mounted to a ceiling, a retaining hoop which can be fixed to
the top side of the frame, a reflector which can be connected to the frame
and a fitting carrier which can be connected to the frame.

By way of example German utility model No G 88 04 149 discloses a
square built-in light of that kind, which generally nowadays is also referred
15 to as a 'down light'. In the course of assembly, the frame is fitted into a
corresponding receiving opening in the ceiling and latched to the ceiling
with fixing means which engage behind the rear side of the opening in the
ceiling. In that situation the frame which is usually in the form of a sturdy
die cast frame pulls irregularities in the ceiling straight so that the frame is
20 caused to bear against the ceiling without a gap. Mounted on the frame at
the top side thereof is the retaining hoop which preferably comprises a
stamped sheet metal part which is suitably bent in a U-shape. A reflector
and a fitting carrier can be releasably fixed to that retaining hoop. The
fitting carrier receives the fittings for the lamp means which in the
25 installation position project laterally through the reflector into the interior of
the internal space of the reflector. For cost reasons the reflector is
nowadays preferably made from a very thin aluminium; in contrast, for
stability reasons, the retaining hoop usually comprises steel sheet.

In general terms the problem arises in built-in lamps of that kind
30 that the entire built-in lamp, that is to say the reflector, has to be installed
during electrical system installation in the phase of erecting the carcass
shell of the building. As still further stages in construction usually have to
be performed after the electrical system installation phase, the reflector

from time to time gets dirty to a considerable extent or is scratched during the further building phases. Prior to final purchase the reflector either has to be separately cleaned or even replaced.

5 It is admittedly known for the reflector to be fixed releasably to the retaining hoop, but then assembly of the unit carrier is also quite complicated and expensive.

Accordingly the object of the present invention is to develop a built-in light of the general kind set forth, in such a way that it can be fitted more easily.

10 In accordance with the invention, in a built-in light of the kind set forth in the opening part of this specification, that object is attained in that the retaining hoop is provided with lateral guide surfaces for guiding the fitting carrier and support surfaces engaging thereunder for draw-like receiving the fitting carrier and that there are provided latching means for
15 connecting the fitting carrier to the retaining hoop.

The draw-like receiving configuration on the frame for receiving the fitting carrier provides that the fitting carrier can be particularly easily fixed to the frame. The fitting carrier only has to be pushed into the retaining hoop, in a direction of pushing movement which is substantially parallel to
20 the surface of the horizontally extending part of the retaining hoop, until the latching means come into latching engagement. For that purpose provided on the retaining hoop for receiving the fitting carrier are support surfaces which engage therebeneath and lateral guide surfaces. Latching means are further provided between the fitting carrier and the retaining
25 hoop.

Preferably the latching means include latching tongues which are provided on the fitting carrier and which in the installation position engage into undercut configurations correspondingly provided on the retaining hoop. By way of example, the undercut configurations can be in the form of
30 simple openings on the fitting carrier.

The draw-like receiving means on the fitting carrier is particularly simple to produce if the fitting carrier has suitably bent-over tongues which at the same time perform the lateral guide function and the contact support

function; that can be achieved for example by the tongues being bent over in an angular configuration. On those angle portions, a vertical portion functions as a lateral guide element and a horizontal portion adjoining the vertical portion serves as a support surface for the fitting carrier. Those
5 angle configurations can be provided by being simply stamped out and bent over on the retaining hoop. Preferably those tongues are provided at both sides at the longitudinal edges of the horizontal portion of the retaining hoop in order to ensure a stable hold between the retaining hoop and the device carrier.

10 The invention is described hereinafter by means of a preferred embodiment with reference to the accompanying drawings in which:

Figure 1 shows a perspective view of the square built-in light,

Figure 2 shows a perspective view of the built-in light to illustrate assembly in a suspended ceiling,

15 Figure 3 shows a perspective view to illustrate assembly of the built-in light, and

Figure 4 shows a view on an enlarged scale of the detail IV in Figure 1.

Referring to the Figures the square built-in light substantially
20 comprises a square frame 1, a retaining hoop 2 which is screwed at the top side to the frame 1, a fitting carrier 3 which can be connected to a horizontal portion of the retaining hoop 2 and a reflector 4 which can be releasably fixed to the underside of the horizontal portion of the retaining hoop.

25 Separately from the built-in light, it is connected by means of a cable 5 to power supply unit boxes 6 which can be provided in the ceiling. The power supply unit box 6 serves to receive electronic or electrical power supply units for operation of the built-in light.

The frame 1 is in the form of a die cast frame and has a horizontally
30 extending contact flange 1a for bearing against an opening in a ceiling, for example in a plasterboard panel. Adjoining the contact flange 1a in inwardly displaced relationship is a step 1b which extends vertically in the installation position and which bears against the inside edge in the opening

in the ceiling. Screwed on the top side of the frame 1 is the U-shaped retaining hoop 2 which extends in a bridge-like configuration over the central opening in the frame. The retaining hoop 2 has two lateral vertical legs 2a and a horizontal leg 2b connecting the vertical legs 2a. That
5 horizontal leg 2b represents the fixing plane for the fitting carrier 3 and the reflector 4.

The reflector 4 is releasably clipped to the underside of the retaining hoop 2. The fitting carrier 3 is shown in Figure 1 in its assembly position of being pushed on to the retaining hoop 2.

10 Figure 2 shows the built-in light upon installation. The power supply unit box 6 is mounted on the top side of a plasterboard panel 1 or simply laid thereon. The plasterboard panel 1 has a square opening 7a, into which the frame 1 can be exactly inserted. In the phase involving production of the carcass shell of the building the fitting carrier 3 is merely pushed on to
15 the retaining hoop 2 of the built-in light in a draw-like manner, that is to say by implementing a substantially horizontal pushing movement, until there is latching engagement of the latching means on the retaining hoop. In that pre-assembly position, the frame 1 is fitted into the opening and screwed therein; insertion of the reflector 4 and the lamp means is only
20 effected in the last building phases in which damage to the reflector can no longer occur.

The connection technology as between the fitting carrier 3 and the retaining hoop 2 can be particularly clearly seen from Figures 3 and 4. The retaining hoop 2 has four of the tongues 2c shown on an enlarged scale in
25 Figure 4. The tongues 2c are produced by stamping at the longitudinal edges in the region at the ends of the horizontal leg 2b. Each tongue 2c has a lateral guide surface 2d projecting downwardly out of the plane of the horizontal leg 2b and an adjoining support surface 2e which extends in downwardly displaced relationship parallel to the horizontal leg 2b. The
30 lateral guide surfaces 2d and support surfaces 2e are produced by simply bending over the tongues 2c. The total of four support surfaces 2e of the tongues 2c serve to receive the slide bars 3a formed on the fitting carrier at the outside thereof; the four support surfaces 2e accordingly define a

support plane. At the same time the outer edges of those slide bars 3a bear laterally against the guide surfaces 2d. In the installation operation therefore the fitting carrier 3 only has to be connected to the retaining hoop 2 by performing a horizontal thrust force.

- 5 The latching tongues 3b provided on the fitting carrier 3 at the top side thereof serve for fixing in the assembled position. In the installation position they latch into four square openings 2f in the horizontal leg 2b of the retaining hoop 2. In order for the fitting carrier 3 to be particularly well fixed to the retaining hoop 2 in the installation position, two upwardly
- 10 projecting supports 3c are also formed on the fitting carrier between the retaining tongues 3b, and in the installation position clamp the retaining hoop 2 between them and the top side of the fitting carrier 3. The fitting carrier 3 is preferably injection moulded in the form of a plastic component and preferably comprises thermoplastic materials, in particular PC, ABS,
- 15 PA, PBT, POM and blends thereof. Fittings (not shown in greater detail) are arranged in the fitting carrier 3 for receiving the lamp means, which in the installation position project through an opening in the reflector 4 into the interior of the reflector 4.

List of references

- 1 frame
- 1a support flange
- 1b step
- 2 retaining hoop
- 2a vertical leg
- 2b horizontal leg
- 2c tongue
- 2d guide surface
- 2e support surface
- 2f opening
- 3 fitting carrier
- 3a slide bar
- 3b retaining tongue
- 3c support
- 4 reflector
- 5 cable
- 6 power supply unit box
- 7 plasterboard panel
- 7a opening

Built-in light

1. A built-in light comprising a frame (1) which can be mounted to a ceiling, a retaining hoop (2) which can be fixed to the top side of the frame, a reflector (4) which can be connected to the frame (1) and a fitting carrier (3) which can also be connected to the frame (1), characterised in that the retaining hoop (2) is provided with lateral guide surfaces (2d) for guiding the fitting carrier (3) and support surfaces (2e) engaging thereunder for draw-like receiving the fitting carrier (3) and that there are provided latching means for connecting the fitting carrier (3) to the retaining hoop (2).

2. A built-in light according to claim 1 characterised in that the guide surfaces (2d) and the support surfaces (2e) are provided on tongues (2c) provided on the retaining hoop (2).

3. A built-in light according to claim 2 characterised in that the fitting carrier (3) has laterally extending slide bars (3a) which in the installation position engage into the tongues (2c).

4. A built-in light according to one of the preceding claims characterised in that the fitting carrier (3) has latching tongues (3b) which in the installation position engage behind corresponding undercut configurations on the retaining hoop (2).

5. A built-in light according to one of the preceding claims characterised in that the fitting carrier (3) has supports (3c) which in the installation position embrace the retaining hoop (2).