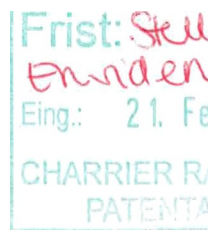


FEDERAL PATENT COURT



FEDERAL PATENT COURT, POSTFACH 90 02 S3, 81502 MÜNCHEN

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NUMBER
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YOUR SIGN
14.02.2024
DATE

Plaintiff/appellant: SLV GmbH
defendant/respondent: Everlight Electronics Co., Ltd.

The attention of the parties is drawn to the following, without the Senate having to final assessment of the factual and legal situation:

1. As additional prior art, the printed documents of which the Senate became aware from a parallel action against the patent in suit

NK1 US 7 771 093 B2 and NK2 US 7 462 870 B2

introduced in the present nullity proceedings.

2. The light-emitting device according to patent claim 1 is probably not new with regard to publication NK1 and is suggested to the skilled person by publications D1 and D3. The subject-matter of the contested dependent claims 2 to 11 is also unlikely to be patentable.

3. The specialist responsible here is likely to be a physicist or electrical engineer with a university degree who has experience in the field of lighting technology and the manufacture of LED units.

In detail:

4. The patent in suit relates to a light-emitting device with an LED chip, a carrier and an encapsulation.

Light-emitting diodes (LEDs) are used in numerous products due to their advantages in terms of service life, size, impact resistance, heat generation and power consumption and have the potential to become common lighting sources. To further improve the durability of the light emitting devices, most LEDs are also subjected to an encapsulation process. In a common manufacturing process for such light-emitting devices, the LEDs are first applied to a continuous carrier connection frame, which is then cut, for example by sawing. In particular, a plastic body is molded to a metal sheet material, then a chip bonding process, a wire bonding process and a wrapping process are performed, and finally the metal sheet material and the plastic body are simultaneously cut to form individual light-emitting devices separated from each other. However, during the cutting process, a large amount of plastic and metal dust is usually generated, which significantly contaminates the surfaces of the final products and therefore deteriorates the reliability of the products. In addition, this common manufacturing process does not allow functional testing of the components before the wrapping process, which is why measurements are only taken after separation. However, as the components are arranged irregularly and jumbled after separation, and machine measurements can only be taken after surface alignment and direction correction

this requires the use of additional equipment and is time-consuming, see paragraphs [0002] to [0004].

Against this background, the technical problem underlying the patent in suit is the task of providing a light-emitting device and an associated manufacturing process which do not exhibit these problems and with which the production speed and the production yield are improved, cf. para [0005]. This problem is solved by the light-emitting device of claim 1 and the manufacturing process of claim 12, which is not the subject of the present application.

Claim 1 reads as follows in the procedural language English and in the German translation according to the patent specification, in each case with the structure added in accordance with Annex CRL 9 of the applicant:

1. A light emitting device, comprising:
2. a carrier (110);
3. a light emitting diode, LED, chip
 - 3.1. carried within the carrier; and
4. an encapsulant covering the LED chip,
5. wherein the carrier comprises:
 - 5.1. at least one electrode portion (112),
 - 5.1.1. each of the at least one electrode portion comprising at least one electrode portion cross section (112A); and
 - 5.2. a housing (111)
 - 5.2.1. comprising a housing cross section (111A),
 - 5.2.2. the housing at least partially covering the at least one electrode portion;
6. wherein the housing cross section (111A) and the electrode portion cross section (112A) are not level with one another, and

7. wherein each of the at least one electrode portion further comprises
 - 7.1. a central area (112A1) and
 - 7.2. two edge areas (112A2), and
8. wherein the electrode portion cross section is located on at least one of the two edge areas,
9. wherein the central area and the two edge areas protrude from the housing cross section (111A), and
10. wherein the central area (112A1) protrudes from the two edge areas (112A2).

In German translation:

1. Light emitting device comprising the following:
2. a carrier (110);
3. a light-emitting diode chip, LED chip,
 - 3.1. which is carried in the carrier; and
4. an encapsulation that covers the LED chip,
5. where the carrier comprises the following:
 - 5.1. at least one electrode section (112),
 - 5.1.1. wherein the one or each of the plurality of electrode sections has at least one electrode section cross-section (112A); and
 - 5.2. a housing (111),
 - 5.2.1. which has a housing cross-section (111A),
 - 5.2.2. wherein the housing at least partially covers the at least one electrode section;
6. wherein the housing cross-section (111A) and the electrode section cross-section (112A) are not equal in height and

7. one or each of the multiple electrode sections is also
 - 7.1. a central area (112A1) and
 - 7.2. has two edge areas (112A2),
8. where the electrode section cross-section is located on at least one of the two edge regions,
9. the central region and the two edge regions protrude from the housing cross-section (111A) and
10. the central area (112A1) protrudes from the two edge areas (112A2).

In the patent in suit, the claimed device is explained, inter alia, with reference to Figures 1 and 7. In Fig. 1, the plastic housing is shown hatched and the metal lead frame is not hatched, whereas in Fig. 7, the part of the lead frame protruding from the housing on the left and right and serving for contacting is hatched and the representation is rotated by 90° compared to that in Fig. 1. It should also be pointed out that, according to the explanations in paragraphs [0018], [0044] and [0045], Figures 8 to 22 are not embodiments.

In fact, only Figures 5 and 7 are likely to show an embodiment according to claim 1, as can be seen from the following explanations. Thus, the claimed light-emitting device according to features 1 to 4 comprises a carrier (110), an LED chip carried in the carrier and an encapsulation covering the LED chip, it being obvious to the person skilled in the art that in feature 3 the term "LED" merely serves as an abbreviated spelling for "light emitting diode". The fact that the LED chip according to feature 3.1 is held in the carrier (110) is understood by the person skilled in the art according to par. [0020] and [0039s] to mean that the LED chip is arranged on the carrier (110) and the receiving area for the LED chip can also be formed as a recess in the carrier (110), but does not have to be (cf. para. [0020]: "the carrier 110 further comprises a reflection concave cup" and para. [0039]: "Then an LED chip is provided and die bonded and wire bonded into the reflection concave cup of the carrier").

In addition, the carrier (110) according to features 5, 5.1, 5.2, 5.2.1 and 5.2.2 has at least one electrode section (112) and a housing (111) with a housing cross-section (111A) which at least partially covers the at least one electrode section (112). As can be seen from the figures and the explanations of the manufacturing method of the carrier shown in Figures 2 to 4, the housing (111) is formed in particular from a plastic (cf. para. [0028]), which partially covers the metallic lead frame, the electrode portion (112) is formed by an electrode area.

With features 7, 7.1, 7.2, 9 and 10, it is additionally claimed that the one or each of the plurality of electrode portions (112) comprises a central region (112A1) and two edge regions (112A2), wherein the central region (112A1) and the two edge regions (112A2) project from the housing cross-section (111A) and the central region (112A1) projects from the two edge regions (112A2). This can be understood with reference to Figure 7 and the description. Thus, Figure 7, which shows the light-emitting device from above, in conjunction with the description in paragraph [0048], shows that wing regions (112A) of the electrode sections (112) protrude from the housing (111), cf. in particular the hatched region in Fig. 7, where the side surface of the housing (111) viewed from above is shown as an edge line (111A). These wing regions (112A) have a central region (112A1) and two edge regions (112A2), wherein the central region (112A1) protrudes from the two edge regions (112A2) when viewed from above and both the central region (112A1) and the two edge regions (112A2) protrude from the side surface of the housing shown as an edge line (111A).

(111) protrude. Therefore, the term "housing cross-section" of the patent in suit should refer in particular to the housing cross-section at the housing edge and thus designate the side surface of the housing, so that the feature that the central region (112A1) and the two edge regions (112A2) of the electrode portions (112A1) protrude from the housing cross-section (111A) is given a meaningful meaning.

However, claim 1 is not limited to this, and from the wording the housing cross-section could be placed anywhere in the housing.

Similarly, according to feature 5.1.1, the one or each of the plurality of electrode sections (112) also has at least one electrode section cross-section, with feature 8 explicitly stating that this electrode section cross-section is located on at least one of the two edge regions (112A2), and in Figure 7 the reference signs 112A2 and 112A1 point to the respective side edge of the electrode section. Consequently, the term "electrode section cross-section" of the patent in suit should refer to the cross-section of the electrode section at the edge of the electrode section in the edge region (112A2) and therefore be the side surface of the electrode section (112) in the edge region (112A2) of the electrode section (112).

In addition, according to feature 8, the housing cross-section (111A) and the electrode section cross-section are not to be at the same height, but this is likely to be a misleading translation of the decisive English wording "are not level with one another", as this is more likely to mean that these two side surfaces are not in the same plane.

The claimed light-emitting device is characterized in particular by the double protrusion of the wing region (112A) of the electrode section (112) by separating its central area (112A1) from the two edge regions (112A2) and, in addition, both the central region (112A1) and the two edge regions (112A2) project from the housing cross-section (111A), i.e. from the housing side surface, so that the housing side surface and the electrode section cross-section, i.e. the side surface of the electrode section, do not lie in one plane, cf. features 6 to 10 of claim 1. The side surface of the electrode section do not lie in one plane, cf. features 6 to 10 of claim 1. These features are only fulfilled by the devices shown in Figures 5 and 7, since in the devices shown in Figures 1 and 6 the edge regions (112A2)

do not protrude from the housing cross-section (111A), but are flush with it, see also paragraph [0036].

According to the explanations in paragraph [0036], the double protrusion of the wing area (112A) is intended to improve the adhesion of the solder during subsequent bonding processes, which thus increases the reliability of the device.

5. As has already been explained, the skilled person interprets the features 3, 5.1, 5.1.1, 5.2.1, 6 of the granted patent claim 1, some of which require explanation, on the basis of the figures and the description of the patent in suit in accordance with the above explanations and thereby obtains an executable teaching. The patent in suit should therefore disclose the subject matter of the patent so clearly and completely that the skilled person can carry out the claimed teaching.

6. Patentability

6.1 The light-emitting device according to patent claim 1 should be obvious to the person skilled in the art from publication D1 (CRL3), whereby reference is made below to the German translation CRL4.

Publication D1 discloses in its Figures 1, 2, 4 and 5 with associated description in paragraphs [0033] to [0046]

with the words of claim 1 a

1. Light emitting device (*light emitting device 1*), which comprises the following:
2. a carrier (*first connecting electrode 10, second connecting electrode 20* ;

3. a light-emitting diode chip, LED chip (*lighting element 4, LED 4*),
 - 3.1. carried in the carrier (20); and
- ~~4. eine Einkapselung, die den LED-Chip abdeckt,~~
5. where the carrier comprises the following:
 - 5.1. at least one electrode section (10, 20),
 - 5.1.1. wherein the one or each of the plurality of electrode sections has at least one electrode section cross-section; and
 - 5.2. a housing (*molded resin body 3*),
 - 5.2.1. which has a housing cross-section,
 - 5.2.2. wherein the housing at least partially covers the at least one electrode section (*see figures above*),'
6. whereby the housing cross-section and the electrode section cross-section are not equal in height (*see Figures 1, 4 and 5*) and
7. the one or each of the plurality of electrode sections (10, 20) further comprises
 - 7.1. a central area (*front edge 12, 22*) and
 - 7.2. has two edge areas (*side edge area 14, 24*),
8. wherein the electrode section cross-section is located on at least one of the two edge regions,
9. the central area and the two edge areas protrude from the housing cross-section (*see Figures 1, 4, 5*) and
10. the central area (12, 22) is separated from the two edge areas (14, 24) presides
(*See Figs. 1, 4 and 5 and paragraph [0039]: "As can be seen from Fig. 5 (b), the connecting electrode 10 is a thin plate having a shape of a quasi-trapezoid as seen from above with a trailing edge 11 facing the bridge portion 3b, a gate/kerf 12 projecting from the resin molded body 3, and side edges connecting the two edges. At a position of the side edge where it overlaps with the resin molded body 3, the recess portion 13*

which engages in the direction of the center of the panel (in the direction that connects the side edges with each other). On the first side edge area 14 seen from the recess section 13 further towards the front edge side as well as on the second side edge area 15 further towards the rear edge side, a step area 10a is provided on the side line area next to the above-mentioned recess section 13, as shown in more detail in Figs. 11, 12. This stepped area 10a is also provided on the entire side line of the rear edge 11."

and paragraph [0042j]: "The terminal electrode 20 has a thin plate shape with: a rear edge 21 facing the bridge portion 3b, a front edge 22 understood from the resin molded body 3, and side edges connecting the two edges. The central section in the longitudinal direction of the front edge 22 is formed as an extension section 28, which extends outwards in a quasi-trapezoidal shape. At the location of the side edge of the extension portion 28 where it overlaps with the resin molded body 3, the recess portion 23 is provided, which engages in the direction toward the center of the panel (in the direction connecting the side edges). On the first side edge portion 24 seen from the recess portion 23 further towards the front edge side and on the second side edge portion 25 further towards the rear edge side, a step portion 20a is provided on the side line portion next to the above-mentioned recess portion 23. This step region 20a is also provided on almost the entire side line of the rear edge 21. ")

As the figures of D1 show, the device described in D1 has in particular the double protrusion of the electrode sections from the housing.

The remaining feature 4, which is not explicitly disclosed in document D1, relating to an encapsulation covering the LED chip is obvious to the skilled person from document D1, since this is necessary and customary to protect the sensitive bonding wires (5, 6) (see NK1, Fig. 2a, translucent covering material 19 and column 7 and column 9, line 57). In addition, publication D1 already refers to a resin-encapsulated lighting device with an LED lighting element as part of the explanation of the prior art.

The light-emitting device of claim 1 is thus likely to be suggested to the skilled person by publication D1 in conjunction with his technical knowledge as evidenced by NK1 and is not patentable due to a lack of inventive step.

6.2 The light-emitting device according to patent claim 1 should be obvious to the person skilled in the art from publication D3 (CRL7), whereby reference is made below to the German translation CRL8.

Publication D3 discloses in its Figures 1, 3 and 5 with associated description in paragraphs [0040] to [0043]

with the words of claim 1 a

1. Light emitting device (*LED 100*) comprising the following:
2. a carrier (*first pin 201, second pin 202*),
3. ~~einen Leuchtdioden-Chip, LED-Chip,~~
 - 3.1. ~~der in dem Träger (20) getragen wird; und~~
4. ~~eine Einkapselung, die den LED-Chip abdeckt,~~
5. where the carrier comprises the following:
 - 5.1. at least one electrode section (*201, 202*),
 - 5.1.1. wherein the one or each of the plurality of electrode sections has at least one electrode section cross-section; and
 - 5.2. a housing (*plastic main body 10*),

- 5.2.1. which has a housing cross-section,
- 5.2.2. wherein the housing at least partially covers the at least one electrode section (*see Figure 3 and paragraph [0041]: "The first and second pins 201, 202 are embedded in one piece in the main plastic body 10. "*),
- 6. whereby the housing cross-section and the electrode section cross-section are not at the same height (*see Figure 3*) and
- 7. the one or each of the plurality of electrode sections (201, 202) further comprises
 - 7.1. a central area (*patch-type welding pin 27, middle section*) and
 - 7.2. has two edge areas (*patch-type welding pin 27, the two parts to the right and left of the center part*),
- 8. where the electrode section cross-section is located on at least one of the two edge regions,
- 9. the central area and the two edge areas protrude from the housing cross-section (*see Figure 3*) and
- 10. the central area (27, *middle part*) protrudes from the two edge areas (27, *the two parts to the right and left of the middle part*) (*see Figure 3*).

As Figure 3 of D1 shows, the device described in D1 features in particular the double protrusion of the electrode sections from the housing.

The remaining features not explicitly disclosed in leaflet D3 3, 3.1 and 4 concerning the LED chip carried in the carrier and the encapsulation covering the LED chip are obvious to the person skilled in the art from publication D3. Thus, the devices (100) shown in Fig. 1 are described in paragraphs [0040] and [0041] as LEDs each having a plastic main body (10), a first and second pin (201, 202) and a reflective shell, from which it follows that an LED chip is applied to the die mounting portion (26).

The fact that these LED chips are covered with an encapsulation is customary for protection and is known to the skilled person, for example, from publication NK1, cf. its Fig. 2a, reference sign 19 (translucent covering material) with column 7 and column 9, line 57.

The light-emitting device of claim 1 is thus likely to be suggested to the skilled person by publication D3 in conjunction with his technical knowledge as evidenced by NK1 and is not patentable due to a lack of inventive step.

6.3 The light-emitting device according to patent claim 1 is probably not new with regard to publication NK1, since the latter discloses in its Figures 1 and 2a reproduced below (with comments by the rapporteur) with the associated description in column 9, lines 14 to 67

Fig.1

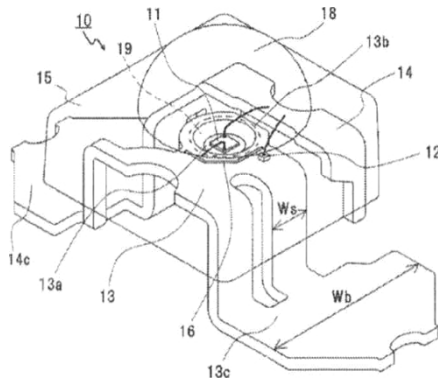
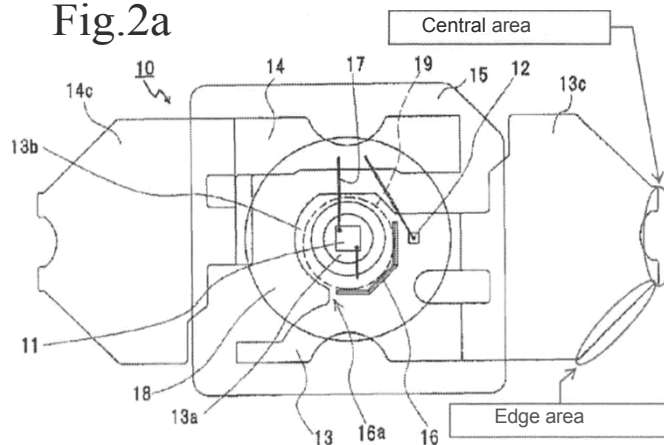


Fig.2a



with the words of claim 1 a

1. A light emitting device (light emitting device 10) comprising the following includes:
2. a carrier (first metal member 13, second metal member 14),
3. a light emitting diode chip, LED chip (light emitting element 11),
 - 3.1. which is carried in the carrier (13, 14); and
4. an encapsulation (translucent covering material 19) that protects the LED chip (11) is covered,

5. wherein the carrier (13, 14) comprises the following:
 - 5.1. at least one electrode section,
 - 5.1.1. wherein the one or each of the plurality of electrode sections has at least one electrode section cross-section; and
 - 5.2. a housing (*package 15*),
 - 5.2.1. which has a housing cross-section,
 - 5.2.2. wherein the housing (15) at least partially covers the at least one electrode section (*see Figures 1 and 2a above and col. 9, figs. 17 to 19: "[...] and parts of a first metal member 13 and a second metal member 14 are integrally sealed in a package 15 made of an epoxy resin."*),
6. whereby the housing cross-section and the electrode section cross-section are not equal in height (*see Figures 1 and 2a above*) and
7. one or each of the several electrode sections is furthermore
 - 7.1. a central area (*see note in Fig. 2a*) and
 - 7.2. has two edge areas (*see note in Fig. 2a*),
8. whereby the electrode section cross-section is located on at least one of the two edge areas,
9. the central area and the two edge areas protrude from the housing cross-section (*see Figures 1 and 2a above*) and
10. the central area protrudes from the two edge areas (*see Figures 1 and 2a above*).

As the above figures show, the device described in NK1 has all the features of the device according to claim 1 and in particular the double protrusion of the electrode sections from the housing.

The light-emitting device of patent claim 1 is therefore unlikely to be patentable due to lack of novelty with respect to publication NK1.

6.4 Compared with publications D1, D3 and NK1, publication NK2 is probably less relevant, since paragraph [0019] emphasizes that the central part of the connections (3) is designed as a groove (6) and does not protrude from the two edge areas as shown in Figs. 1 and 4. The illustration in Fig. 3 of D2, in which the central part of the connections (3) protrudes from the two edge areas, does not match the description and Figs. 1 and 4 in this respect. If, despite this contradiction, Fig. 3 of publication D2 is regarded as relevant, a light-emitting device should be known from it, as in publication D3, which, with the exception of features 3, 3.1 and 4, has all the features of the device according to claim 1, whereby these remaining features should be obvious to the skilled person on the basis of D2 in conjunction with his specialist knowledge as evidenced by NK1.

6.5 The features of the dependent claims 2 to 11 are either not practicable or can be taken from the printed matter in the process:

Claim 2: the condition of claim 2, according to which the electrode cross-section has an inclined surface, see Fig. 9 opposite of the patent in suit, is shown in electrodes according to Fig. 2a of NK1;

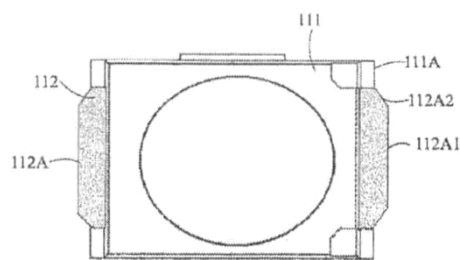


FIG. 9

Claim 3: the condition of the claim 3, that the electrode section cross-section and the central region are not coplanar is already specified by features 6 to 10 of claim 1;

Claim 4: the condition of claim 4, according to which the housing cross-section or the electrode section cross-section has a curved surface, is fulfilled in the curved edge regions of the electrodes in the above figures of D1 and D3;

Claim 5: the condition of claim 5, according to which the housing cross-section comprises a rounded corner, is fulfilled in the housings in the above figures of D1 and NK1;

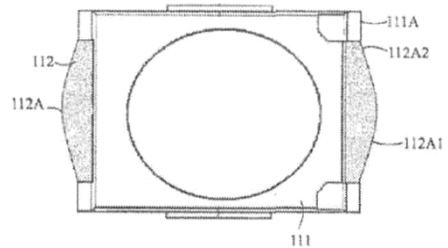
Claim 6: the condition that the housing cross-section and the electrode section cross-section have an uninterrupted convexly curved surface refers to the adjacent Fig. 10 of the

patent in suit and is in conflict with feature 9 of claim 1, according to which the central region and the

both edge areas

from the

housing cross section



therefore the teaching of claim 6 is not practicable;

partially coating the electrode with an antioxidant layer in accordance with claim 7 is a measure that is customary for the skilled person and is known to him, for example, from publication NK2, column 10, last paragraph;

Claim 7: the condition that the at least one electrode section comprises two electrode section cross-sections, each of which is located on the two edge regions, is given in the devices of printed documents D1, D3 and NK1, cf. the edge regions in the figures above;

Claim 8: the condition of claim 9 that the electrode portion cross-section has a curved surface is satisfied in the curved edge portions of the electrodes in the above figures of D1 and D3, wherein the curvature in the above figures of D1 is convex in accordance with claim 10;

Claim 9, 10: the condition of claim 11 that one of the two edge regions and the housing cross-section form an uninterrupted surface means, according to the

Claim 11:

The patent in suit is understood to mean that, as in Figure 10 above, the edge regions do not protrude from the housing cross-section, but this is in contradiction to feature 9 of claim 1, which is why the teaching of claim 11 cannot be implemented.

7. Before this background should the action
according to current the current situation.

8. The parties are instructed to submit

April 03, 2024

to comment conclusively on this reference by submitting relevant motions or supplementing their submissions and also on the amount in dispute (Section 83 (2) sentence 1 PatG).

Any replies to the opposing statement must be submitted to the Senate by no later than

May 29, 2024

to be submitted.

The parties are instructed to serve the pleadings from lawyer to lawyer.

The parties' attention is drawn to the following with regard to the deadline set:

The court may reject a party's attack and defense or an amendment to the action or a defense by the defendant with an amended version of the patent that is not filed until after the expiry of the time limit set under 83 (2) PatG.

The court may reject any arguments submitted within the time limit and decide without further investigation if consideration of the new submission would necessitate an adjournment of the already scheduled date and the party concerned does not sufficiently excuse the delay, Section 83 (4) PatG. The excuse must be substantiated.

By order of the court Office of the 2nd

Senate

Zindler judicial
employees

eEB

This letter was created electronically and is therefore not signed.