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**Datasheet for the decision  
of 17 October 2019**

**Case Number:** T 1871/14 - 3.5.02

**Application Number:** 07755651.2

**Publication Number:** 2052589

**IPC:** H05B41/16, H05B33/08,  
F21Y101/02

**Language of the proceedings:** EN

**Title of invention:**

Lighting device and lighting method

**Applicant:**

Cree, Inc.

**Relevant legal provisions:**

EPC Art. 83, 84

EPC R. 137(5)

RPBA Art. 12(4)

**Keyword:**

Sufficiency of disclosure - main request first and auxiliary  
request (no)

Claims - clarity - main request first and auxiliary request  
(no)

Amendments of application - second auxiliary request -  
allowable (no)



**Beschwerdekammern**  
**Boards of Appeal**  
**Chambres de recours**

Boards of Appeal of the  
European Patent Office  
Richard-Reitzner-Allee 8  
85540 Haar  
GERMANY  
Tel. +49 (0)89 2399-0  
Fax +49 (0)89 2399-4465

Case Number: T 1871/14 - 3.5.02

**D E C I S I O N**  
**of Technical Board of Appeal 3.5.02**  
**of 17 October 2019**

**Appellant:** Cree, Inc.  
(Applicant) 4600 Silicon Drive  
Durham, NC 27703 (US)

**Representative:** Dummett Copp LLP  
25 The Square  
Martlesham Heath  
Ipswich IP5 3SL (GB)

**Decision under appeal:** **Decision of the Examining Division of the  
European Patent Office posted on 10 April 2014  
refusing European patent application No.  
07755651.2 pursuant to Article 97(2) EPC.**

**Composition of the Board:**

**Chairman** R. Lord  
**Members:** H. Bronold  
R. Cramer

## **Summary of Facts and Submissions**

- I. The appeal lies from the decision of the examining division to refuse European patent application No. 07 755 651.2. The examining division concluded that independent claims 1 and 12 according to the sole request pending before it lacked novelty over the disclosure of document D1 (DE 20 2005 001540 U1). Moreover, the examining division found in an obiter dictum that dependent claims 2 and 13 did not comply with the requirements of Article 84 EPC.
- II. With the statement setting out the grounds of appeal the appellant filed a main request and first and second auxiliary requests.
- III. In a communication under Article 15(1) RPBA the board informed the appellant of its preliminary opinion that the independent claims according to the main request and the first auxiliary request were not clear in the sense of Article 84 EPC and not sufficiently disclosed in the sense of Article 83 EPC. Further, the board informed the appellant that it was minded to hold the second auxiliary request inadmissible under Rule 137(5) EPC.
- IV. Together with a reply dated 16 September 2019 the appellant filed a revised main request and a revised first auxiliary request. The independent claims according to these requests are identical to those filed together with the statement setting out the grounds of appeal. The two independent claims according to each of these requests comprise at least the features of claims 1 and 2 or claims 12 and 13,

respectively, according to the sole request underlying the contested decision, which the examining division had found not to comply with the requirements of Article 84 EPC.

- V. Thus the appellant's current requests are that the decision under appeal be set aside and that a patent be granted based on the claims of their main request or first auxiliary request filed with letter dated 16 September 2019 or that a patent be granted based on the claims of their second auxiliary request filed together with the statement setting out the grounds of appeal.
- VI. With letter dated 20 September 2019 the appellant informed the board that they would not attend the oral proceedings scheduled for 17 October 2019.
- VII. Oral proceedings before the board took place on 17 October 2019 in the absence of the appellant.
- VIII. Independent claim 1 according to the main request reads as follows:

"A lighting device comprising:  
a first group of solid state light emitters, said first group of solid state light emitters including at least one solid state light emitter;  
a first group of luminescent material;  
a second group of solid state light emitters, said second group of solid state light emitters including at least one solid state light emitter; and  
a second group of luminescent material,  
wherein:  
each of said first group of solid state light emitters and each of said second group of solid state light

emitters, when illuminated, emit light having a peak wavelength in the range of from 430 nm to 480 nm; said first group of luminescent material and said second group of luminescent material, when excited, emit light having a dominant wavelength in the range of from about 555 nm to about 585 nm; when said first group of solid state light emitters is illuminated and said first group of luminescent material is excited, a first mixture of (1) light emitted from said first group of solid state light emitters and (2) light emitted from said first group of luminescent material would, in the absence of any additional light, have a first correlated color temperature on a 1931 CIE Chromaticity Diagram; when said second group of solid state light emitters is illuminated and said second group of luminescent material is excited, a second mixture of (1) light emitted from said second group of solid state light emitters and (2) light emitted from said second group of luminescent material would, in the absence of any additional light, have a second correlated color temperature on a 1931 CIE Chromaticity Diagram; said first correlated color temperature differs from said second correlated color temperature by at least 500 K; and when said first group of solid state light emitters is illuminated, said first group of luminescent material is excited, said second group of solid state light emitters is illuminated and said second group of luminescent material is excited: a mixture of (1) light exiting said lighting device which was emitted by said first group of solid state light emitters, (2) light exiting said lighting device which was emitted by said first group of luminescent material, (3) light exiting said lighting device which was emitted by said second group of solid state light

emitters and (4) light exiting said lighting device which was emitted by said second group of luminescent material would, in an absence of any additional light, have x, y color coordinates which define a point which is within an area on a 1931 CIE Chromaticity Diagram enclosed by first, second, third, fourth and fifth line segments, said first line segment connecting a first point to a second point, said second line segment connecting said second point to a third point, said third line segment connecting said third point to a fourth point, said fourth line segment connecting said fourth point to a fifth point, and said fifth line segment connecting said fifth point to said first point, said first point having x, y coordinates of 0.32, 0.40, said second point having x, y coordinates of 0.36, 0.48, said third point having x, y coordinates of 0.43, 0.45, said fourth point having x, y coordinates of 0.42, 0.42, and said fifth point having x, y coordinates of 0.36, 0.38."

Independent claim 11 according to the main request defines a corresponding method of lighting.

IX. Independent claim 1 according to the first auxiliary request differs from claim 1 according to the main request in the following additional features:

"said lighting device further comprising a third group of solid state light emitters, said third group of solid state light emitters including at least one solid state light emitter, each of said third group of solid state light emitters, when illuminated, emitting light having a dominant wavelength in the range of from 600 nm to 630 nm."

Independent claim 10 according to the first auxiliary request defines a corresponding method of lighting.

X. Independent claim 1 according to the second auxiliary request comprises inter alia the following features:

"- a first power line, a number of solid state light emitters in said first group of solid state light emitters and a number of solid state light emitters in said second group of solid state light emitters being directly or switchably electrically connected to said first power line and

- a second power line, a number of solid state light emitters in said first group of solid state light emitters and a number of solid state light emitters in said second group of solid state light emitters being directly or switchably electrically connected to said second power line,

wherein, a first ratio is equal to (1) the number of solid state light emitters in said second group of solid state light emitters connected to said first power line, divided by (2) the number of solid state light emitters in said first group connected to said first power line, and a second ratio is equal to (3) the number of solid state light emitters in said second group of solid state light emitters connected to said second power line, divided by (4) the number of solid state light emitters in said first group of solid state light emitters connected to said second power line; and wherein said first ratio differs from said second ratio, and said first ratio is not equal to zero."

Independent claim 12 according to the second auxiliary request defines a corresponding method of lighting.

XI. The appellant's arguments, as far as they are relevant for the present decision, can be summarised as follows:

*Clarity*

The examining division had not raised an objection under Article 84 EPC against claim 1. Thus, the examining division must have been of the opinion that the independent claims according to the main request and the first auxiliary request were clear. Further, a more precise definition in the claims such as specifying the exact light emitters used would be overly limiting and would reduce the scope of protection. Moreover, the person skilled in the art was aware that the colour point produced on a CIE chromaticity diagram by a mixture of hues was easily predictable using simple geometry. A mixed colour light point resulting from two light emitters on a CIE diagram was located on a line segment that linked the colour point of the first light emitter with that of the second light emitter. The location of the point of the mixed light depended on the relative brightness of the first and second light emitters. For more than two light emitters, the range of possible colour points was defined by the perimeter obtained from drawing lines connecting the respective colour points of the light emitters. Thus, the required selection of light emitters and their relative brightness was clearly within the skill of a person skilled in the art. Therefore, a recitation of a combination of solid state light emitters and luminescent materials which are capable of emitting a mixture of light that has a colour point that falls within the area on a CIE chromaticity diagram recited in claim 1 was not a result to be achieved but defined the technical features of the present invention.



Thus, claim 1 according to the main request and according to the first auxiliary request complied with the requirements of Article 84 EPC.

*Sufficiency of disclosure*

As discussed with respect to clarity, claim 1 clearly specified the required technical features of the lighting device to put the claimed invention into effect. Moreover, Rule 42(1)(e) EPC merely required one way of carrying out the invention. Thus, no specific examples were required. Claim 1 therefore satisfied the requirement of Rule 42(1)(e) EPC. Consequently, the requirement of Article 83 EPC was met.

*Second auxiliary request*

The appellant did not present any arguments in support of the admissibility of the second auxiliary request.

**Reasons for the Decision**

1. Admissibility of the appeal

The appeal was filed in due time and form and sufficiently substantiated. Thus, the appeal is admissible.

2. Main request and first auxiliary request

*Clarity (Article 84 EPC)*

2.1 The independent claims 1 and 11 according to the main request as well as independent claims 1 and 10 according to the first auxiliary request define the claimed subject-matter merely by a result to be achieved.

2.2 The appellant's argument, that the examining division had never raised an objection under Article 84 EPC against claim 1 does not take into account point 2.6.5 on page 14 of the contested decision, where former claim 2, the features of which are contained in the independent claims of the present main request and auxiliary request, was found not to comply with the requirements of Article 84 EPC, because it lacked essential features. Besides that, the appellant's argument has no bearing on the decision because the board can, according to Article 111(1), 2nd sentence EPC, exercise any power within the competence of the department which was responsible for the decision appealed. Thus, in appeal proceedings concerning a decision of an examining division, the board may even raise new objections which did not form part of the contested decision at all.

2.3 The board is also not convinced by the appellant's substantive arguments with respect to Article 84 EPC.

The definition of an area in a 1931 CIE chromaticity diagram provides no more information than the result that shall be achieved with the claimed lighting device, i.e. the emitted colour. It can also be read as to provide the lighting device with the required

features such that the light emitted by it lies within the defined area of the 1931 CIE chromaticity diagram.

The board has no doubts that it was within the skill of an ordinary light colour mixing artisan to identify colour points in a CIE chromaticity diagram that relate to light emitted by individual light emitters, to draw line segments representing the mixture of emitted light from two light emitters and that in the case of more than two light emitters, the range of mixed colour light was defined by the perimeter obtained from drawing lines connecting the respective colour points of the light emitters.

However, the appellant's arguments do not reflect the claimed subject-matter, which does not relate to the representation of a given colour point on a CIE diagram. In contrast, the claimed subject-matter relates to creating a lighting device that has the technical properties to achieve a desired light colour which is represented by a colour point in a predefined area on a CIE chromaticity diagram. That is the opposite of indicating a colour point on a CIE diagram for a known wavelength of a given light emitter.

Moreover, in claim 1 according to the main request and according to the first auxiliary request, there is no correlation defined between the colour points on the CIE diagram and the peak wavelength and dominant wavelength which are used to define the first and second groups of light emitters and the first and second groups of luminescent materials, respectively. Thus, although it may be assumed that the colour points of the light emitters and luminescent materials lie within an area such as the one defined in the independent claims, the claims contain no definition

whether the colour points relating to the claimed light emitters and luminescent material are located in the CIE diagram as defined in the independent claims. This is because the claims define merely two types of light sources, the light emitters and the luminescent material, but five distinct colour points in the CIE diagram that define the claimed area. Already for this reason, the independent claims are not clear.

Further, even under the assumption that such a correlation was defined in claim 1, it would not be possible for the person skilled in the art to determine the light emitters and luminescent materials according to the subject-matter of claim 1 because neither the peak wavelength nor the dominant wavelength correspond to a single specific colour point on the CIE diagram, because they both represent a wavelength spectrum.

Moreover, contrary to the argument of the appellant that it was clearly within ordinary skill to select light emitters such that the resulting colour point lies within a predefined area, the person skilled in the art is limited by the claim wording to a predefined area and to the peak wavelengths and dominant wavelengths defining the light emitters and luminescent materials, which do not directly correlate to corresponding colour points in the CIE diagram.

2.4 Thus, the board has arrived at the conclusion, that the independent claims according to the main request and the first auxiliary request merely define the technical effect to be achieved without defining the technical features of the lighting device that are required to arrive at the desired technical effect, contrary to the requirements of Article 84 EPC.

*Insufficient disclosure (Article 83 EPC)*

2.5 The application also does not disclose the invention according to the independent claims of the main request and the first auxiliary request in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art in the sense of Article 83 EPC.

As discussed above under 2.3, neither the peak wavelength nor the dominant wavelength can be interpreted to unambiguously define a corresponding colour point in a CIE diagram. The reason for this lies in the emitted wavelength spectra of the light emitters and the luminescent materials, which cannot be deduced from the peak wavelength or the dominant wavelength alone, respectively.

Moreover, the whole application does not seem to provide a different definition of the lighting device than the one given in the independent claims of the main request and of the first auxiliary request. The passage on page 34 cited by the appellant to support the claim wording is more or less a copy of the claim wording without any further technical details.

The only passage describing an embodiment of the invention on pages 47 to 58 of the 175 page A2-publication is completely silent about the contested claim feature of an area of the 1931 CIE chromaticity diagram. It also contains no indication as to whether the embodiment provides the claimed difference in correlated colour temperatures. The remaining 164 pages are nothing more than copies of claim wording and repetitions.

Further, the application as a whole does not provide any information as to which colour points correlate to the claimed light emitters and luminescent materials based on the peak wavelength and dominant wavelength as defined in the independent claims, which could be regarded as a way to carry out the invention in the sense of Rule 42(1)(e) EPC.

Therefore, the disclosure of the claimed invention is not complete in the sense of Article 83 EPC.

- 2.6 Thus, the board has arrived at the conclusion that the independent claims according to the main request and the first auxiliary request do not fulfil the requirement of Article 83 EPC.

3. Second auxiliary request (Rule 137(5) EPC)

The independent claims according to the second auxiliary request contain features directed to a first power line and a second power line as well as a first ratio and a second ratio of light emitters of the first group and of the second group on the respective first and second power lines.

With this request, filed with the statement of grounds of appeal, this technical concept has been claimed for the first time during the European phase of the application. Thus, this concept is not covered by the supplementary European search. Moreover, this concept does not combine with the invention as originally claimed in claims 1 to 15 as filed upon entry into the European phase to form a single general inventive concept, which like the claims of the present main and

first auxiliary requests were characterised by properties of the light emitted by the device, such as correlated colour temperatures, CRI and coordinates on the CIE Chromaticity Diagram.

Therefore, the subject-matter of the second auxiliary request constitutes an inadmissible amendment in the sense of Rule 137(5) EPC. Should the appellant have wished to pursue subject-matter of this nature, they should have filed corresponding claims upon entry into the European phase of the application.

In that context, with respect to Article 12(4) RPBA, because the second auxiliary request relates to a different invention not covered by the supplementary European search, it clearly could and should have been filed before the department of first instance.

Since the appellant did not put forward any arguments in support of the admissibility of their second auxiliary request, the board sees no reason to deviate from its preliminary opinion given in the communication under Article 15(1) RPBA.

Consequently, the board exercised its power under Article 12(4) RPBA to hold inadmissible the second auxiliary request.

4. Since none of the appellant's requests is allowable, the appeal has to be dismissed.

**Order**

**For these reasons it is decided that:**

The appeal is dismissed.

The Registrar:

The Chairman:



U. Bultmann

R. Lord

Decision electronically authenticated