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**Datasheet for the decision  
of 11 June 2012**

**Case Number:** T 1394/10 - 3.2.03

**Application Number:** 00980578.9

**Publication Number:** 1234140

**IPC:** F21K 7/00

**Language of the proceedings:** EN

**Title of invention:**

Systems and methods for generating and modulating illumination conditions

**Patent Proprietor:**

Philips Solid-State Lighting Solutions, Inc.

**Opponents:**

TridonicAtco GmbH & Co. KG  
OSRAM Gesellschaft mit beschränkter Haftung  
ERCO GmbH  
Koninklijke Philips Electronics N.V.

**Headword:**

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**Relevant legal provisions:**

EPC Art. 123(2)

**Keyword:**

"Amendments - added subject-matter (no)"  
"Unallowable intermediate generalisation (no) - failure to disclose that claimed combination achieves desired effect (no)"

**Decisions cited:**

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**Catchword:**

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Case Number: T 1394/10 - 3.2.03

**D E C I S I O N**  
of the Technical Board of Appeal 3.2.03  
of 11 June 2012

**Appellant:** Philips Solid-State Lighting Solutions, Inc.  
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(Opponent 4)

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**Decision under appeal:**

**Decision of the Opposition Division of the  
European Patent Office posted 27 April 2010  
revoking European patent No. 1234140 pursuant  
to Article 101(3)(b) EPC.**

**Composition of the Board:**

**Chairman:** U. Krause  
**Members:** G. Ashley  
I. Beckedorf

## Summary of Facts and Submissions

I. European patent EP-B1-1 234 140 concerns the generation of white-light. The granted patent was opposed on the grounds of Articles 100(a) (novelty and inventive step), 100(b) and 100(c) EPC. The opposition division concluded that the claims of the main and auxiliary requests contained subject-matter extending beyond the content of the application as filed (Article 100(c) and Article 123(2) EPC), and hence decided to revoke the patent. The decision was posted on 27 April 2010.

II. The patent proprietor (Philips Solid State Lighting Solutions Inc., hereafter "the appellant") filed notice of appeal on 25 June 2010, paying the appeal fee on the same day. A statement containing the grounds of appeal was filed on 6 September 2010.

III. The granted patent had been opposed by four opponents, all of whom have since withdrawn their oppositions:

Opponent I (TridonicAtco GmbH & Co. KG) withdrew its opposition on 8 May 2009.

Opponent II (Osram GmbH) withdrew its opposition on 13 October 2008.

Opponent III (ERCO Leuchten GmbH) withdrew its opposition on 27 October 2010.

Opponent IV (Koninklijke Philips Electronics N.V.) withdrew its opposition on 13 September 2007.

IV. Requests

The appellant requests that the decision under appeal be set aside, and that the claims filed with the

grounds of appeal are found to meet the requirements of Article 123(2) and (3) EPC, Article 84 EPC and Rule 80 EPC.

The appellant also requests that the case be remitted to the opposition division for consideration of the grounds of opposition under Article 100(a) EPC.

Should the Board be considering an adverse decision, oral proceedings are requested.

V. Claims

Claim 1 of the set of claims before the Board is based upon independent Claim 66 of the original application (WO-A-01/3684), which has been amended as follows (added text is in italics and deleted text is shown by strikethrough), and corresponds to that decided upon by the opposition division.

"1. A lighting fixture (300, 5000) for generating white-light said fixture comprising:

a plurality of component illumination sources (320, 5007), said plurality including component illumination sources *arranged to produce* ~~ing~~ electromagnetic radiation of at least two different spectrums (1201, 1301),

a mounting (5005) holding said plurality, said mounting *being arranged* ~~designed~~ to allow said spectrums of said plurality to mix and form a resulting spectrum (2201, 2203) *that is continuous between 400 and 700 nanometers;*

*characterised in that said plurality of component illumination sources consists of only LEDs, the LEDs including a first white LED, including a phosphor, to produce a first spectrum (1201) of the at least two different spectrums, and a second white LED, including a phosphor, to produce a second spectrum (1301) of the at least two different spectrums; and*

*the lighting fixture further comprises a processor (316) responsive to data and configured to independently control the first white LED and the second white LED based on the data such that an intensity of the first white LED and the second white LED may be varied thereby to vary a color temperature of the resulting spectrum within a preselected range of color temperatures;*

wherein the visible portion of said resulting spectrum has intensity greater than background noise at its lowest spectral valley."

Method claim 28 reads as follows:

"28. A method for generating light, comprising acts of:

mounting a plurality of component illumination sources (320, 5007) producing electromagnetic radiation of at least two different spectrums (1201, 1301) in such a way as to mix the spectrums, characterised in that said plurality of illumination (302, 5007) sources consist of only LEDs, wherein a first LED including phosphor emits first radiation and a second LED including phosphor emits second radiation, the first radiation having a first spectrum of the at least two different

spectrums and the second radiation having a second spectrum of the at least two different spectrums, the second spectrum being different from the first spectrum;

choosing said at least two different spectrums (1201, 1301) in such a way that the mix of spectrums forms a resulting spectrum (2201, 2203) having, in its visible portion, an intensity at a lowest spectral valley that is greater than background noise; and

adjusting the relative intensities of the first white LED and second white LED."

Dependent claims 2 to 27 and 29 to 30 concern preferred embodiments of the lighting fixture of claim 1 and the method of claim 28 respectively.

VI. Arguments of the Opposition Division and the Submissions of the Appellant

*Article 123(2) EPC*

- (a) Claim 1 of the main request before the opposition division had been amended from

"... at least one of said plurality of component illumination sources comprising an LED including a phosphor..."

to

"... said plurality of component illumination sources consists of only LEDs, the LEDs including

a first white LED including a phosphor... and a second white LED, including a phosphor...".

- (b) The opposition division considered that the combination of two white LEDs on their own would not provide a complete solution to the technical problem addressed by the application, namely the production of high quality white light where both colour temperature and colour rendering index (CRI) are critical factors. Although there is an example of two different white LEDs, it is said that this combination will appear abnormally warm (blue) on its own. The opposition division thus concluded that claim 1 had been amended by the introduction of a technical feature taken in isolation from a specific embodiment, and that the subject-matter of the amended claim does not provide a complete solution to the technical problem posed in the application.
- (c) The appellant's submissions can be summarised as follows:
- the use of two LEDs to provide high quality, controllable white light is disclosed in the application;
  - the definition of any particular colour temperature or CRI value is not relevant to the claimed subject-matter;
  - the question as to whether an embodiment is enabled or not is irrelevant in determining compliance with Article 123(2) EPC.



## Reasons for the Decision

1. The appeal is admissible.

### *Article 123(2) EPC*

2. Amendment:

Claim 1 as granted was amended during the opposition proceedings, as set out above in point V, to define the illumination sources as including first and second white LEDs.

3. Conclusion of the Opposition Division:

The opposition division was of the view that a lighting fixture comprising two different white LEDs on their own would not solve the problem addressed in the application, namely the production of high quality white light, where both colour temperature and colour rendering index (CRI) are critical factors. The opposition division argued that, although the combination of two LEDs is disclosed on page 35, line 4 to page 37, line 17 of the application as originally filed (WO-A-01/36864) as being selected from Nichia LEDs (bin A, bin B and bin C), it is also said that such a combination does not cover the entire range of colour temperatures and will appear abnormally warm. It is therefore necessary to have one of the following additional features:

- (1) a high pass filter positioned over the LEDs (page 35, line 29 to page 37, line 8);

- (2) use a different LED with a colour temperature of 2300K (page 37, lines 13 to 14); the opposition division queried the availability of such an LED at the filing date of the patent, hence concluded that this was not an enabling embodiment;
- (3) pass the output of the Nichia bin C LED through an additional filter (page 37, lines 14 to 15);
- (4) use a third amber LED (page 37, line 17 to page 38, line 16 and page 40, lines 7 to 13).

Since the application does not contain a workable embodiment of the invention using two LEDs on their own, the opposition division concluded that claim 1 had been amended by introducing a feature taken in isolation from a specific embodiment (intermediate generalisation) and that the claimed subject-matter does not provide a complete solution to the technical problem unambiguously derivable from the application.

4. Desired Effect:

Claim 1 defines a lighting fixture for generating white light, wherein the resulting spectrum is continuous between 400 and 700 nm, and wherein the visible portion has an intensity greater than background noise at its lowest spectral valley.

It is clear from the general teaching of the application (page 5, lines 29 to 31; page 29, lines 3 to 10) that the visible portion of the spectrum relates to wavelengths in the range 400 to 700 nm, and that it is desirable to have a substantially continuous spectrum in this region (page 29, lines 29 to 32). Further, it is also said that it is desirable that the

lowest valley in this range should have an intensity greater than the background noise (page 31, lines 17 to 20).

Consequently, a spectrum having these features is the effect that the lighting feature of claim 1 is trying to achieve. The question to be answered is therefore, whether or not it is derivable from the application that such a spectrum can be produced by means of only two white LEDs each including a phosphor and each having a different spectrum, as defined in claim 1. As argued by the appellant, whether or not a particular colour temperature or CIR value is achieved, is not important for the requirement of Article 123(2) EPC regarding the subject-matter defined in claim 1.

5. Disclosure in the Application:

The use of Nichia LEDs is described in the application starting at page 35 line 4, and in particular lines 19 to 28, where it is said that a combination of bin A or bin C LEDs enable the source to fill the spectrum around the centre of the photopic (visual) response at 555 nm (page 35, lines 23 to 24). The spectra produced by the two white LEDs, Nichia bin A and bin C, are shown in Figures 18 and 19 respectively. These are depicted as being continuous in the claimed range, in the sense that there are no missing portions (which exist in the prior art spectrum shown in Figure 27). Two LEDs thus provide a continuous spectrum in the visible range. This, together with the requirement that the lowest valley should have an intensity greater than the background noise, contributes to the emission of high quality white light (see the application at

page 29, lines 29 to 32 and page 31, lines 17 to 20). The disclosure goes on to say that the effect of the two LEDs can be improved by taking further measures, which are summarised in point 3 above; but nevertheless two LEDs are capable of producing the required spectrum.

The claim is, however, not limited to the combination of Nichia bin A and bin C LEDs, but includes any combination of two or more phosphor-based white LEDs. On page 28, lines 9 to 12 there is the general teaching that high-quality white light is accomplished by choosing LEDs that provide white light that is targeted to the human eye's interpretation of light as well as the mathematical CRI index. More specifically, the application discloses on page 37, lines 11 to 13 that the desired range can be achieved by an LED close to 2300K and one close to 4500K. Independent claim 66 of the original application defines a plurality of component illumination sources producing electromagnetic radiation of at least two different spectrums; dependent claims 78 and 79 refer to the illumination sources as comprising an LED including a phosphor and an LED that produces white light.

It is thus apparent that the application as a whole discloses, for the purpose of Article 123(2) EPC, that the desired effect can be achieved by two LEDs, and that the Nichia LEDs are just an example of how the invention could be achieved.

Claim 28 concerns a method, in which first and second LEDs are defined. The fact that these LEDs are only referred to at the end of the claim as being white LEDs might be a clarity issue under Article 84 EPC, but

nevertheless, the above arguments regarding claim 1 and Article 123(2) EPC also apply to claim 28.

6. Summary

The opposition division revoked the patent because the amendment concerned features, in particular the use of two white LEDs, that were taken in isolation from an embodiment, and which failed to provide high quality white light in terms of colour temperature and CRI. The application does, however, disclose the use of two LEDs to create a continuous spectrum and provide an intensity greater than the background noise, both of which contribute to white light of improved quality, albeit not the best. There is therefore no objection to the amendments under Article 123(2) EPC.

7. Remittal

The contested decision has not dealt with *inter alia* novelty, inventive step, Article 84 EPC and Rule 80 EPC, hence the Board is not in a position to deal with these issues. Some of the arguments set out by the opposition division in its decision may also be of relevance to these issues and hence it is necessary to remit the case to the opposition division for further prosecution.

Although all of the opponents have withdrawn their oppositions, attention of the opposition division is drawn to Rule 84(2) EPC, which provides for continuation of opposition proceedings under such circumstances should the opposition division consider that any of the outstanding issues are prejudicial to the maintenance of the patent.

Since the requests of the appellant have been met, oral proceedings are not necessary.

**Order**

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

1. The decision under appeal is set aside.
2. The case is remitted to the opposition division for further prosecution.

The Registrar:

The Chairman:

D. Hampe

U. Krause