Internal distribution code:

(A) [-] Publication in OJ
(B) [-] To Chairmen and Members
(C) [-] To Chairmen
(D) [X] No distribution

Datasheet for the decision of 4 November 2025

Case Number: T 0945/22 - 3.4.01

Application Number: 16713763.7

Publication Number: 3271013

IPC: A61N5/06, A61M21/00

Language of the proceedings: EN

Title of invention:
BIO HUE LAMP

Patent Proprietor:
Signify Holding B.V.

Opponent:
Molnia, David

Headword:
Bio Hue Lamp/ Philips Lighting

Relevant legal provisions:
EPC Art. 56

Keyword:
Inventive step - main request (no) - auxiliary request 2 (yes)

Europäisches Patentamt
European Patent Office
Office européen des brevets

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

Case Number: T 0945/22 - 3.4.01

D E C I S I O N
of Technical Board of Appeal 3.4.01
of 4 November 2025

Appellant: (Opponent)	Molnia, David Theatinerstrasse 16 80333 Munich (DE)
Representative:	Molnia, David Molnia Ho PartG mbB Theatinerstraße 16 80333 München (DE)
Respondent: (Patent Proprietor)	Signify Holding B.V. High Tech Campus 48 5656 AE Eindhoven (NL)
Representative:	Verweij, Petronella Daniëlle Signify Netherlands B.V. Intellectual Property High Tech Campus 7 5656 AE Eindhoven (NL)
Decision under appeal:	**Decision of the Opposition Division of the European Patent Office posted on 3 February 2022 rejecting the opposition filed against European patent No. 3271013 pursuant to Article 101(2) EPC.**

Composition of the Board:

Chairman	P. Scriven
Members:	A. Medeiros Gaspar
	L. Bühler

Summary of Facts and Submissions

I. The patent was opposed, invoking lack of novelty and lack of inventive step under Article 100(a) EPC.

II. Among the evidence submitted with the notice of opposition were:

D4 US2013/0249434 A1
D5 US2014/0228914 A1

III. The Opposition Division rejected the opposition. They held that the claimed subject-matter was novel and involved an inventive step over each of D4 and D5.

IV. The opponent appealed this decision, requesting that it be set aside and the patent revoked. They insisted that independent claims 1 and 13 of the patent lacked novelty, or at least inventive step, in view of D5, and that they furthermore lacked inventive step in view of the combination of D4 with D5 or the skilled person's common general knowledge.

V. In their response, the proprietor requested that the appeal be dismissed, i.e. that the patent be maintained as granted (main request); or that the patent be maintained on the basis of either auxiliary request 1 or auxiliary request 2 submitted during opposition proceedings, and resubmitted with the reply to the appeal.

VI. Both parties also conditionally requested oral proceedings.

VII. In the communication informing the parties of the Board's preliminary, non-binding opinion, the Board indicated that it considered that claim 1 of the patent, as well as claim 1 of each of the auxiliary requests lacked inventive step in view of D5 and the skilled person's common general knowledge.

VIII. In reply to this communication, both parties submitted further substantive arguments.

IX. At oral proceedings, the proprietor withdrew auxiliary request 1. Auxiliary request 2 became the proprietor's sole auxiliary request.

X. The proprietor's final requests are then that the appeal be dismissed or that the decision be set aside and the patent maintained in amended form on the basis of auxiliary request 2.

XI. The opponent's final requests are that the decision be set aside and that the patent be revoked.

XII. Claim 1 of the main request (the patent) reads:

A lighting apparatus (100) configured to provide white light (101) with a variable

correlated color temperature, wherein the lighting apparatus (100) comprises:

- a first light source (110) configured to provide first light source light (111), wherein the first light source light (111) comprises blue light having a first light source dominant wavelength selected from the range of 400-460 nm, wherein the first light source (110) is configured to irradiate a first luminescent material (210) with said first light source light (111), wherein the first luminescent material (210) is configured to convert part of the first light source light (111) into first luminescent material light (211), wherein the first luminescent material light (211) comprises one or more of green and yellow light, and wherein the first luminescent material light (211) has a first luminescent material dominant wavelength;

- a second light source (120) configured to provide second light source light (121), wherein the second light source light (121) comprises blue light having a second light source dominant wavelength selected from the range of 450-490 nm, wherein the second light source (120) is configured to irradiate a second luminescent material (220) with second light source light (121), and wherein the second luminescent material (220) is configured to convert part of the second light source light (121) into second luminescent material light (221), wherein the second luminescent material light (221)

comprises one or more of green and yellow light, and wherein the second luminescent material light (221) has a second luminescent material dominant wavelength;

- a third light source (130) configured to provide red light source light (131);

- a control unit (300), configured to independently control the first light source (110), the second light source (120) and the third light source (130), to provide said white light (101) having a variable correlated color temperature, wherein said white light (101) comprises one or more of (a) said first light source light (111), said first luminescent material light (211), and said red light source light (131) and, and (b) said second light source light (121), said second luminescent material light (221), and said red light source light (131); wherein the second light source dominant wavelength > first light source dominant wavelength, and wherein the first luminescent material dominant wavelength > second luminescent material dominant wavelength.

XIII. Claim 1 of auxiliary request 2 adds at the end of claim 1 of the main request:

[... dominant wavelength];
wherein the first light source light (111) has a dominant wavelength selected from the range of 430-450 nm, and wherein the second

light source light (121) has a dominant wavelength selected from the range of 450-475 nm, wherein the difference in dominant wavelengths is in the range of 15-30 nm, wherein the first luminescent material light (211) of the first luminescent material (110) has a dominant wavelength selected from the range of 550-590 nm, and wherein the second luminescent material light (221) of the second luminescent material (120) has a dominant wavelength selected from the range of 520-550 nm;
wherein the first luminescent material (110) and the second luminescent material (120) are selected from the group of cerium doped garnet luminescent materials.

Reasons for the Decision

The patent in suit

1. The patent is concerned with a lighting apparatuses comprising multi-colour LEDs. These apparatuses are capable of tuning the correlated colour temperature (CCT) of the light emitted, in particular so as to support the human circadian rhythm.

2. Put simply, a warm-cold setting of the light promotes or suppresses the secretion of melatonin, which, in turn, is associated with physiological states of sleepiness or alertness, respectively.

3. Equation 2, in paragraph [0007] of the patent, provides an estimate of the influence on melatonin secretion (the "melanopsin effectiveness factor" - MEF) is given in terms of the "spectral power distribution" of the emitted light, "melanopic sensitivity function" (m(λ)) of the eye, and the "photopic sensitivity" V(λ):

$$MEF = 1.22 \cdot \frac{\sum(SPD(\lambda) \cdot m(\lambda))}{\sum(SPD(\lambda) \cdot V(\lambda))}$$

4. Figure 1 of the patent depicts the spectral distributions of *m(λ)* (labelled m) and V(λ) (labelled p).

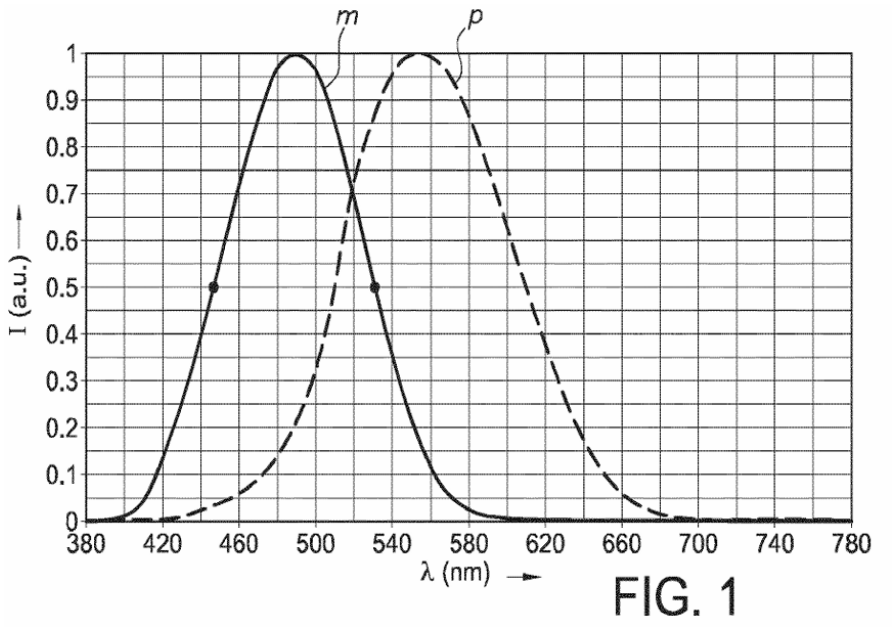

FIG. 1

5. Claim 1 of the patent defines a lighting apparatus comprising three light sources: two of them emitting blue light with dominant wavelengths, in the ranges 400-460nm and 450nm-490nm; and a third, emitting red light.

6. Each of the two blue light sources irradiates a luminescent material, which converts blue light to "luminescent light" in the green/yellow spectrum.

7. The dominant wavelength of first blue light source is shorter than that of the second, while the dominant wavelength of the emission of the first luminescent material is longer than that of the second.

8. No dominant wavelength or spectral range is defined for the red light source.

9. The claim further defines a control unit, for independently controlling the three light sources to obtain contributions from at least one of the blue light sources (and, implicitly, also light from the associated luminescent material) and from the red light source.

Main request, claim 1: novelty and inventive step in view of D5

10. D5 relates, as does the patent, to lighting apparatuses with multi-colour LEDs, adapted to provide a variable correlated colour temperature, and that are capable of tuning the emitted light so as to promote or suppress the production of melatonin (D5: title, [0001], [0012], [0052]]).

11. The opponent argues that claim 1 lacks novelty in view of D5 and refers to several different passages of this document. In their opinion, these different passages of D5 were combinable and, together, disclosed all features of claim 1.

12. The proprietor, on the other hand, argues that D5 disclosed a considerable number of different embodiments and that the passages cited by the opponent were widely distributed and could not be arbitrarily combined.

13. The Board considers that some of the passages D5 are of a general nature and, hence, not specific to particular embodiments, while others are of a more specific nature.

14. Indeed, the lighting apparatuses of D5 are generally described as including multiple LEDs, for providing adjustable melatonin suppression effects and variable correlated colour temperature, as indicated in the general outline provided in paragraphs [0012], [0051] and [0052].

15. This outline is supplemented, in paragraph [0053], by the general teaching that:

> *By providing multiple LED components having different melatonin suppressing effects (and preferably with similar chromaticities) in a single lighting device or apparatus, such components may be controlled to permit aggregated emissions to be adjusted to one or more desired effects. For instance, if enhanced melatonin suppression effects are desired (e.g., in order to promote wakefulness or alertness), then a greater proportion of the total power may be provided to one or more individual LED component(s) having greater melatonin suppression effects relative to one or more other LED*

components(s) of the same device having lesser melatonin suppression effects.

16. Paragraph [0054] provides some more information on the melanopic response curve, by reference to figures 1, 4A and 4B. This is followed, in paragraphs [0055] and [0056], by some explanations relating to the correlation of melatonin suppression values with *the correlated colour temperature* and colour rendering index for specific light sources. These explanations are general, and not specific to any embodiment.

17. While this general teaching significantly overlaps with the teaching of the patent in suit, these paragraphs do not disclose a lighting apparatus as defined in claim 1 of the patent.

18. The subsequent passages of D5 either refer to terminology, or describe certain aspects, or components, of "certain embodiments".

19. Paragraphs [0071] to [0092], for instance, mainly describe possible assemblies of LEDs and lumiphors, whereas other parts of D5 describe other aspects, such the mounting and contacting of LED chips onto substrates ([0127]-[0135]), or the grouping of LED elements into LED components ([0136]-[0144]), or the interconnection and control of LED components ([0145]-[0150]).

20. While it is clear that several of these different aspects could be combined, the combinations themselves are not disclosed. The proprietor is correct in noting that different passages referring to a number of possible "embodiments" cannot be arbitrarily combined

and argued to disclose, in combination, a single apparatus.

21. The comparison of claim 1 of the patent with D5 must, therefore, proceed on the basis of specific passages.

22. Paragraph [0090] is one of the passages to which the opponent refers. It discloses a lighting apparatus comprising independently controllable "blue shifted yellow" (BSY) emitters, optionally supplemented with one or more additional LEDs or lumiphors. It further discloses that the BSY emitters may include 2 blue LEDs of different dominant wavelengths (differing from one another by at least 5nm, 10nm, 15nm, 20nm, 25nm, 30nm, 35nm, or 40nm) and two yellow lumiphors, also of different dominant wavelengths (differing from one another by at least 5nm, 10nm, 15nm, 20nm, 25nm, 30nm, 35nm, or 40nm).

23. It does not, however, directly and unambiguously disclose the yellow lumiphor associated with the first blue LED, i.e. the blue LED with the shorter dominant wavelength, as being the lumiphor with the longer dominant wavelength, and vice versa, as defined in the claim.

24. The opponent's argument that such a possibility would be one of the four alternatives (longer-longer, shorter-shorter, longer-shorter, shorter-longer) that the skilled person would automatically consider, is rather one of inventive step than of novelty.

25. Paragraph [0090] also does not directly and unambiguously disclose the dominant wavelengths of each of two blue LEDs as falling within the ranges defined in the claim. Not even the disclosure that the dominant

wavelengths of the two blue LEDs might be at least 40 nm apart implies that one of the blue dominant wavelengths necessarily falls within the range 400 - 460 nm and the other within the 450 - 490 nm, as defined in the claim. For instance, the peak wavelengths of 405 nm and 445 nm fall both within the first wavelength range. The question of whether the two dominant wavelengths would be selected so as to each fall within each of the ranges defined in the claim is also rather one of inventive step.

26. Finally, paragraph [0090] also does not describe the additional LED as being a red light source, or the implicitly disclosed control unit as controlling the light sources so as to provide *white light having a variable correlated colour temperature;* as it merely discloses the inclusion of multiple independently controllable BSY emitters, optionally supplemented by one or more additional LEDs. Once again, whether or not the disclosure of paragraph [0090] would be combined with that of paragraph [0088] is rather a question of inventive step.

27. Claim 1 of the patent differs then from the lighting apparatus described in [0090] in that:
(a) the first blue light source has a dominant wavelength in the range of 400-460 nm and the second in the range of 450-490 nm;
(b) the second blue light source has a dominant wavelength longer than that of the first;
(c) the first luminescent material has a dominant wavelength longer than that of the second;
(d) the third source is a red light source; and
(e) the control unit is such that the apparatus provides white light having a variable correlated colour temperature.

28. The proprietor argues that (a), (b), and (c) contributed to the lighting apparatus' ability to stimulate or suppress the secretion of melatonin. The specific combination long-short short-long relationships defined in (b) and (c), for the dominant wavelengths of the light emitted by blue light sources and the light emitted by the lumiphors, enhanced effect achieved by using just one or the other of the blue light sources.

29. Concerning differences (a) and (b), it is true that, as argued by the proprietor and taught both in the patent and in D5, blue light with a shorter dominant wavelength (e.g. 420 nm) is more effective in suppressing melatonin secretion than blue light with a longer dominant wavelength (e.g. 480 nm).

30. However, the claim defines no minimum separation between the dominant wavelengths of the two blue light sources, that are furthermore defined as being selected from ranges that overlap in the the middle of the blue spectral range, concretely, the region from 450 nm to 460 nm. The two could, therefore, be almost equal.

31. It is not sufficient to define, in (b), one dominant wavelength as longer than the other for a effect the effectiveness in melatonin suppression to be recognised as being achieved over the entire scope of the claim. In particular, there is no such effect achieved for the apparatus, covered by the claim, comprising two blue light sources with dominant wavelengths close to one another, in the range from 450 nm to 460nm.

32. The same is true for the the dominant wavelengths of the two luminescent materials, as no minimum separation is defined for them either. Moreover, any possible

effect on melatonin suppression (MEF) attributable to light with a dominant wavelength in the yellow wavelength range would be negligible compared to the effect of light with a dominant wavelength in the blue wavelength range. Distinguishing features (b) and (c) are, therefore, not linked in the way argued by the proprietor.

33. Consequently, the combination of blue light sources with two yellow lumiphors, covered by the claim, is an arbitrary selection from among the possibilities at the disposal of the skilled person implementing the lighting apparatus described in [0090] of D5, and, hence, one for which no inventive step can be recognised.

34. As to the other distinguishing features, (d) and (e), the provision of a red light source, in addition to the blue light sources and respective yellow light emitting lumiphors, enables the production of white light of variable correlated colour temperature, as correctly noted by the proprietor.

35. However, this too does not entail an inventive step, given that [0090] of D5 already suggests supplementing the independently controllable BSY emitters by one or more additional LEDs, and that, as correctly noted by the opponent, the provision of an also independently controllable supplemental red LED is disclosed in [0088] of D5, as useful for the same purpose of adjusting the colour temperature.

36. It would, then have been obvious for the skilled person to implement the supplemental red emitter and control disclosed in [0088] in the lighting apparatus of

[0090], and thereby arrive at the subject-matter of claim 1.

37. Therefore, claim 1 of the patent lacks inventive step.

38. Consequently, the main request of the proprietor is not allowable.

Auxiliary request 2, claim 1: inventive step in view of D5

39. Claim 1 of the auxiliary request 2 modifies claim 1 of the main request in that:
(a') it limits the dominant wavelengths of the first and second blue light sources to the ranges 430-450 nm and 450-475 nm, respectively;
(b') it defines that the difference in dominant wavelengths is in the range of 15-30 nm;
(c') it limits the dominant wavelength of the first and second luminescent materials to the ranges of 550-590 nm and 520-550 nm, respectively; and
(d') it defines that the first and second luminescent materials are selected from the group of cerium-doped garnet materials.

40. The modifications introduced with (a') and (b'), in particular the definition of a separation of 15-30 nm between the dominant wavelengths of the two blue light sources, solve the issue identified above, under points 30. and 31., concerning the lack of recognisable effect on melatonin suppression.

41. Furthermore, in the range of 430-475 nm, the change in the effectiveness in suppressing melatonin secretion is the steepest. In that spectral range, a separation in dominant wavelengths between 15 and 30 nm maximizes the

impact that a change from one blue light source to the other has on melatonin secretion, while at the same time minimizing the impact that such a change has on the white light produced by the lighting apparatus.

42. Starting from paragraph [0090] of D5 and seeking to implement an apparatus optimizing the effects of a change from one blue light to the other on melatonin secretion while maintaining white light, the skilled person would not have arrived at the limitations introduced with (a') and (b'), because there was nothing to suggest it.

43. To the contrary, the lack of disclosure, in [0090] of an upper limit to the separation between the dominant wavelengths of the different BSY emitters, and the disclosure that the separation between the dominant wavelengths could be greater than 40 nm would rather have lead the skilled person to explore the extremes of the blue spectral range.

44. The same holds true for in any other passage of D5. There is nothing that discloses or suggests an upper limit to the separation between the dominant wavelengths of the two blue lights sources described.

45. Consequently, the inventive step objections in consideration of other starting points in D5 also necessarily fail.

46. In that context, the Board notes only that while the apparatus of figure 11E and paragraph [0140] of D5 combines, as does the apparatus of paragraph [0090], two blue LEDs with two yellow lumiphors, the other apparatuses mentioned as starting points are different and more distant from the subject-matter of claim 1.

Concretely, the apparatus of figure 11G and paragraph [0142] combines, similarly to the apparatus of paragraph [0087], two blue LEDs with a yellow and blue lumiphors, while in the apparatus of paragraph [0092] the two blue LEDs are arranged to stimulate a single yellow lumiphor.

47. Therefore, claim 1 entails an inventive step in view of D5.

Auxiliary request 2, claim 1 - inventive step in view of D4

48. In their statement of grounds of appeal, the opponent also indicated that the argumentation they had submitted, as to why claim 1 of the patent lacked inventive step in view of the combination of D4 with D5 also applied to auxiliary request 2.

49. Such a statement does not sufficiently substantiate an inventive step objection based on the combination of D4 with D5 to claim 1 of auxiliary request 2.

50. In any case, in their submission with regards to the main request, the opponent recognises that D4 does not disclose a lighting apparatus comprising two blue light sources having different dominant wavelengths, as defined in claim 1 of the patent.

51. Consequently, D4 also does not disclose two blue lights having dominant wavelengths as defined in claim 1 of auxiliary request 2, and indicated under point 39.(a') above.

52. The opponent, also recognises that the use of blue light sources of different dominant wavelengths impacts

melatonin secretion, but they then go on to argue that the skilled person, seeking to affect melatonin secretion, would find, in D5, the teaching that two blue light having different dominant wavelengths could be used.

53. While that might be true, the skilled person would still not arrive at a lighting apparatus according to claim 1 of auxiliary request 2, because, as indicated above with regards to the inventive step objection based on D5, this document neither discloses nor hints at the concrete combination of features defined in claim 1 of this request.

54. Therefore, claim 1 of auxiliary request 2 also entails an inventive step in view of the combination of D4 with D5.

Auxiliary request 2, other claims, other objections

55. Independent claim 11 defines a use of a lighting apparatus according to claim 1. It involves an inventive step for the same reasons as claim 1. The same applies to the remaining claims, that are dependent either on claim 1 or on claim 11.

56. No other objections were raised to this request either.

Conclusion

57. The patent can be maintained in amended form, on the basis of auxiliary request 2.

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 with the order to maintain the patent with the claims of auxiliary request 2, refiled with the reply to the appeal, and the description and drawings to be adapted thereto, if necessary.

The Registrar: The Chairman:

D. Meyfarth P. Scriven

Decision electronically authenticated