

29 September 2008

PATENTS ACT 1977

APPLICANT General Electric Company

ISSUE Whether patent application
GB0320318.9 complies with sections
1(1)(a), 1(1)(b), 14(5)(c) & 14(5)(d)

HEARING OFFICER John Rowlatt

DECISION

Introduction

- 1 Patent application GB0320318.9, “Phosphor blends for high-CRI fluorescent lamps”, was filed, without priority, on 29 August 2003; the compliance period has been extended three times and ended on 29 August 2008.
- 2 In the first examination report, the examiner formulated principal objections to plurality, lack of novelty, lack of inventive step and internal conflict of claim. There have been several rounds of correspondence in which the applicant has narrowed the scope of the main claim, but the applicant has been unable to overcome the examiner’s objections.
- 3 In his final report of 09 May 2008, in which he confirmed that he had referred the application for hearing, the examiner maintained objections to lack of novelty, lack of inventive step, for which he followed the steps outlined in *Pozzoli*¹, plurality and an objection under Sect.14(5)(c) due to the speculative nature of the main claim.
- 4 The matter was due to come before me at a hearing on 04 August 2008 but, on 22 July 2008, a fax was received from the applicant’s representative that they had been instructed “*not to proceed further with this application and will not, as a consequence, be attending the hearing*”. This decision is based on the papers following clarification of the applicant’s intent but, apparently, there will be no further processing.
- 5 It is unfortunate that, having decided not to proceed further with the application,

¹ *Pozzoli SpA v BDMO SA* [2007] EWCA Civ 588

there is no argument of any kind to the examiner's last report but, bearing in mind the previous correspondence on file I do not think that hinders me in coming to a decision.

The Application

- 6 The application relates to a phosphor blend having particular absorbing and emitting wavelengths. The claims have been amended during prosecution; the latest independent claims, filed with a letter dated 14 April 2008, read:

"1. A phosphor blend comprising $(Tb, Y, Lu)_3Al_5O_{12}:Ce^{3+}$ and at least one phosphor selected from the group consisting of:-

- (d) $(Gd, La, Lu, Sc)_2O_3:Eu^{3+}$,
 $(La, Lu, Sc)_2O_3:Eu^{3+}$,
 $(Y, Gd, La, In, Lu, Sc)BO_3:Eu^{3+}$,
 $(Y, Gd)Al_3B_4O_{12}:Eu^{3+}$,
 $(Ba, Sr, Ca)(Y, Gd, La, Lu)_2O_4:Eu^{3+}$,
 $(Y, Gd, La)(Al, Ga)O_3:Eu^{3+}$,
 $(Gd, Y)_4(Al, Ga)_2O_9:Eu^{3+}$, and
 $(Ca, Sr)(Gd, Y)_3(Ge, Si)Al_3O_9:Eu^{3+}$,

wherein said phosphor blend is capable of absorbing EM radiation having wavelengths in the range from 200 nm to 400 nm and emitting light having wavelengths in a visible spectrum."

and

"7. A light source comprising:

- (a) a source of gas discharge; and
(b) a phosphor blend as claimed in any preceding claim."

The law

- 7 As indicated above, the examiner maintained objections to lack of novelty, lack of inventive step, plurality and lack of clarity. The relevant sections read:

1(1) A patent may be granted only for an invention in respect of which the following conditions are satisfied, that is to say -

- (a) the invention is new;**
(b) it involves an inventive step;
(c) it is capable of industrial application;
(d) the grant of a patent for it is not excluded by subsections (2) and (3) or section 4A below;

and references in this Act to a patentable invention shall be construed accordingly.

- 14(5) The claim or claims shall -
- (a) define the matter for which the application seeks protection;
 - (b) be clear and concise;
 - (c) be supported by the description;**
 - (d) relate to one invention or to a group of inventions which are so linked as to form a single inventive concept.**

14(6) Without prejudice to the generality of subsection 14(5)(d) above, rules may provide for treating two or more inventions as being so linked as to form a single inventive concept for the purposes of this act.

Novelty

The arguments

- 8 In their letter accompanying the latest claims, the applicants assert, without argument, that there is no disclosure in EP1403355 of the phosphor blend of amended claim 1.
- 9 The examiner believes otherwise. Claim 1 of the application comprises (that is, it is not solely), a blend of $(\text{Tb}, \text{Y}, \text{Lu})_3\text{Al}_5\text{O}_{12}:\text{Ce}^{3+}$ [hereafter (“A”)] with at least one other phosphor, which may be $(\text{Gd}, \text{La}, \text{Lu}, \text{Sc})_2\text{O}_3:\text{Eu}^{3+}$ [hereafter (“B”)]. He points to claim 1 of EP1403355 which comprises a phosphor blend of $(\text{Y}, \text{Gd}, \text{Tb}, \text{Sm}, \text{Pr}, \text{Lu})_x(\text{Al}, \text{Ga}, \text{In})_y\text{O}_{12}:\text{Ce}^{3+}$, in which the range for x includes 3 and the range for y includes 5, with $(\text{Gd}, \text{Y}, \text{Lu}, \text{La})_2\text{O}_3:\text{Eu}^{3+}$ and a further phosphor. Necessarily, these phosphors absorb at particular ranges of wavelengths.
- 10 I would also point out that one of the additional phosphors of claim 2 of the application, $(\text{Sr}, \text{Ca})\text{MgAl}_{10}\text{O}_{17}:\text{Eu}^{2+}$ [hereafter (“C”)], is one of the further phosphors of claim 1 of EP1403355.
- 11 I agree with the examiner. Claim 1 of the application is directed to a phosphor blend *per se*, claim 1 of EP1403355 to a phosphor blend only suitable for a particular device. Claim 7 is unrestricted in use and simply directed to a light source. Although their embodiments are applied to different devices, both application and citation use the resulting phosphor blends as a visible light source, absorbing at one range of frequencies and emitting at another range; the person skilled in the art is one skilled in the blending of such phosphors, based on documented absorption and emission characteristics, to achieve particular results expected of those characteristics [see paragraph 20 below], not in the devices in which those phosphors will be used. Further, as they use the same materials, for the same underlying reasons, to the same end (white light), the resulting blends necessarily include the desired characteristics of claim 1-3. It is also inevitable that the desired characteristics of claims 4-6 will be found in the blends of the cited document.
- 12 Claim 1 of the application does not encompass an exclusive blend solely of (“A”) and (“B”), but includes other materials, which may be other, and several,

phosphors. The main claim of EP1403355 discloses a blend of (“A”) and (“B”) with another phosphor. Further, application claim 2 includes that another phosphor to the blend of claim 1 may be (“C”), which may also be the other phosphor of the citation.

- 13 Consequently, for the formulae disclosed, I find that claims 1-7 are not novel.
- 14 However, that conclusion is on the basis only of (“A”) and (“B”), with additionally (“C”) for claim 2. There are other combinations which have not been searched or examined and may well be novel.

Inventive Step

Interpretation

- 15 As noted above, the lack of novelty of claim 1 is in respect only of a limited range of phosphors. There remains the question of whether more generally there is an inventive step in claim 1.
- 16 The assessment of inventive step is based on the well-known *Windsurfing*² approach, as reformulated by Jacob LJ in *Pozzoli*. The four steps of the test are now:
- 1) (a) Identify the notional skilled person in the art, and
(b) Identify the relevant common general knowledge of that person;
 - 2) Identify the inventive concept of the claim in question or, if that cannot readily be done, construe it;
 - 3) Identify what, if any, differences exist between the matter cited as forming part of the “state of the art” and the inventive concept of the claim or the claim as construed;
 - 4) Viewed without any knowledge of the invention as claimed, do these differences constitute steps which would have been obvious to the person skilled in the art or do they require any degree of invention?

The arguments

- 17 The applicant’s view from previous rounds, prior to the examiner having located EP1403355, was that there was no art showing the features of claim 1 and that the selection of combinations was the result of gaining superior results within the field of combination phosphors, not a question of random experimentation.
- 18 In their last argument, following the examiner’s use of EP1403355, they introduced that the colour rendering index, CRI, was important; they considered that the blends of claim 1 have improved properties, in particular the CRI, illustrating an inventive step. However, consideration of CRI is not present at all

² *Windsurfing International Inc v Tabur Marine (Great Britain) Ltd* [1985] RPC 59

in the claims and, as the examiner has pointed out, it is not presented as a characterising feature of the invention.

19 In his final report, the examiner followed the steps of *Pozzoli* in detail:

Step 1

20 For part (a), the examiner considered that the notional skilled person in the art is a chemist qualified in, and expert in, the art of the chemistry of phosphor compositions and in matters relating to the subject of chromaticity. I would not place it so narrowly. The invention does not concern the creation or identification of new phosphors with particular characteristics, but the blending of known phosphors of known characteristics in ways predictable from known, documented blendings and testable to a predefined desired outcome (emission of visible, preferably white, light). With relevant data sheets of those known phosphors and of their characteristics, blending to achieve a desired testable result could easily be achieved by a competent laboratory technician.

21 However, such a conclusion is dependent on the data available in the art, which leads us to part (b) of the test. That is, as long as the relevant data was readily available, a request along the lines of “find me blends of phosphors which absorb in this range of wavelengths and emit at this other range of wavelengths” would not require the services of a chemist expert in phosphors, nor a detailed knowledge of chromaticity, particularly if blending to such ends is already known.

22 The examiner alleges a wealth of information in this art and has cited a small selection of patent references to demonstrate the background directly relevant to the main claim, for example the use of YAG garnets and Eu doped phosphors and their characteristics and properties in relation to colour, colour comparability, colour measurement and classification, and that CRI and CIE chromaticity are generally known. In particular, and bearing in mind that his search was only partial, he considered that his example documents demonstrated that (i) it is known to blend two phosphors in which the light output of the first is wavelength-modified by the second, (ii) it is known to use phosphor (“A”) in combination with another phosphor to provide a wavelength-modified light output, (iii) at least some of the phosphors in claim 1 are known to be used as modifying phosphors in blends of the type considered, (iv) blends absorbing and emitting at the required wavelengths are known, and (v) CRI values close to 100 are desirable.

23 I agree. Consequently, I am content that blending of phosphors of known particular characteristics resulting in predictable, predefined properties is not only known but a highly active and well-documented art, as are absorption, emission and other technical details of phosphor groups themselves. The particular invention does not utilise any new group of phosphors and data relevant to those listed in claim 1 would be available to the person skilled in the art, who I consider to fall within the broader description found in paragraph 20 above.

Step 2

24 In construing the claim, the examiner limited his consideration to the blend of (“A”) with (“B”), on his interpretation of plurality; with that limitation he believed the

inventive concept to be a blend of those phosphors characterised by absorption in the range 200-400 nm and emission of light in the visible spectrum.

- 25 More broadly, for a wider interpretation of inventive step, I consider that the inventive concept is a blend of a phosphor (“A”) with another phosphor selected from a set of eight general formulae, characterised by the resulting blend having absorption in the range 200-400 nm and emission of light in the visible spectrum.

Step 3

- 26 The examiner argues that the invention of claim 1 is the blending of (“A”) with other phosphors to achieve a particular characteristic. It is already known to blend (“A”) with other phosphors to achieve a particular end; even disregarding the anticipation of the blend of (“A”) and (“B”), he suggests that the difference between the invention and the state of the art is the choice of other known phosphor(s).
- 27 There are two characteristics of the blend, one the absorbing range of wavelength, the other the emitting range. I am satisfied from the prior art that the emitting range is fully known and that, to function, the absorbing range is known. Consequently, I agree with the examiner’s assessment.

Step 4

- 28 The examiner considered that, notwithstanding anticipation, in this technology blends such as those claimed were routinely tried and tested for useful, new, or improved characteristics or desired criteria.
- 29 In my view it is entirely known to blend phosphors of known characteristics to achieve particular results. The invention is to blend one phosphor (“A”) having known, desired properties, and already known in phosphor blends of this type, with another phosphor of another particular group having known, desired properties and analyse whether the mixture meets the desired, testable outcome parameters. I agree with the examiner that this is an exercise of standard and routine testing rather than of inventive ingenuity. In terms of the phraseology of *Pozzoli*, viewed without any knowledge of the invention as claimed, the prior art clearly demonstrates that such blends of known phosphors lead to potentially desirable results and it would have been obvious to the person skilled in the art to try such blends, without any degree of invention.

S.14(5)(c)

- 30 The examiner has objected that the number of possible combinations within the general formulae of claim 1 is so high that the result is speculative and a complete search is beyond the realms of possibility.
- 31 It is conventional to use general formulae of this type in this technology (as well as others); for example, cited EP1403355 not only has considerably more combinations in its pairings of phosphors than does claim 1, but adds a third set of phosphors. A person skilled in the art, on reading the description, would have

no difficulty in understanding which classes of compound were represented, how to select initial phosphors, how to blend for modified predicted outcome or how to test the result. Indeed, were that not so, the inventive step objection likely would have failed. There is support in the description and I would not regard this as a “reach-through” claim. Consequently, I do not find that claim 1 falls foul of section 14(5)(c).

Plurality

- 32 The objection to plurality within claim 1 arises from the number of unsearched combinations of phosphors which might be mutually exclusive and/or covered by lack of novelty or inventive step. Were those serious objections to be overcome, it may be that the resulting form of claim would have removed the objection to plurality. However, the point becomes academic unless such an amendment arises and I make no formal assessment here of any potential plurality.

Conclusion

- 33 I have found that the invention as claimed is not novel as one of its permutations and blend properties is known. I have also found that, notwithstanding the anticipation of one permutation, the invention lacks inventive step. However, as indicated in paragraph 14 above, it may be that there is something among the number of possible permutations which is novel and that it might be possible to formulate a form of claim on the basis of CRI which contains an inventive step. The agents have stated that the applicants have instructed them not to proceed further with the application; however, they have not formally withdrawn the application. Consequently, I allow a period of two months in which to file saving amendments. If no such amendments are received, the application will be refused under S18(3).

Appeal

- 34 Under the Practice Direction to Part 52 of the Civil Procedure Rules, any appeal must be lodged within 28 days.

John Rowlatt

Deputy Director acting for the Comptroller