

Internal distribution code:

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

D E C I S I O N
of 2 October 2001

Case Number: T 0533/98 - 3.3.1

Application Number: 90109632.1

Publication Number: 0403809

IPC: C09K 11/07

Language of the proceedings: EN

Title of invention:

Chemiluminescent solution based on substituted perylene

Patentee:

OMNIGLOW CORPORATION

Opponent:

LUMINASA (EUROPE) LIMITED

Headword:

Perylenes/OMNIGLOW

Relevant legal provisions:

EPC Art. 56, 123(2)

Keyword:

"Power to examine novelty as ground of opposition (no)"
"Main request - added subject-matter (yes)"
"Auxiliary request - inventive step (yes) - non obvious
solution"

Decisions cited:

G 0010/91, G 0007/95, T 0184/82, T 0536/88

Catchword:

-



Case Number: T 0533/98 - 3.3.1

D E C I S I O N
of the Technical Board of Appeal 3.3.1
of 2 October 2001

Appellant: LUMINASA (EUROPE) LIMITED
(Opponent) Spectrum House
Warminster
Wiltshire BA12 9DX (GB)

Representative: Gallafent, Richard John
GALLAFENT & CO.
9 Staple Inn
London WC1V 7QH (GB)

Respondent: OMNIGLOW CORPORATION
(Proprietor of the patent) 20-C Pimentel Court
Novato
California 94949 (US)

Representative: Hartz, Nikolai F.
Patentanwalt
Tal 29
D-80331 München (DE)

Decision under appeal: Interlocutory decision of the Opposition Division
of the European Patent Office posted 24 March
1998 concerning maintenance of European patent
No. 0 403 809 in amended form.

Composition of the Board:

Chairman: A. J. Nuss
Members: P. P. Bracke
S. C. Perryman

Summary of Facts and Submissions

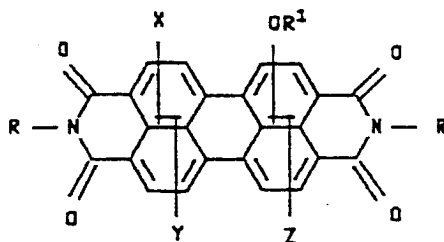
I. The appeal lies from the Opposition Division's interlocutory decision, dispatched on 24 March 1998, that, account being taken of the amendments made by the Patentee during the opposition proceedings, European patent No. 0 403 809 was found to meet the requirements of inventive step over the cited prior art, in particular, documents

(1) EP-A-0 201 704 and

(3) EP-A-0 227 980.

The independent Claim 1 underlying the contested decision read:

"1. A composition adapted to be reacted with hydrogen peroxide to provide chemiluminescent light, said composition comprising an oxalate compound and a solvent solution of a compound having the formula



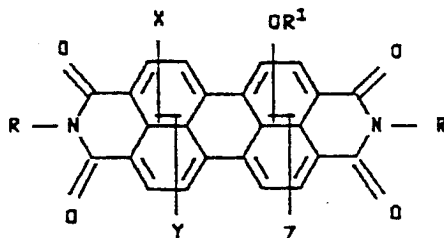
wherein each R is individually a phenyl group substituted in positions 2 and 6 by the same or different alkyl groups with at least 2 carbon atoms X, Y and Z are OR¹ and R¹ is a substituted or unsubstituted phenyl, the amount of said compound being such that it provides red light."

Claims 2 to 8 were dependent upon Claim 1.

II. In particular, the Opposition Division was of the opinion that document (1), represented the closest state of the art and that it could not be expected that the claimed compositions would be more stable than the compositions described in document (1).

III. At the oral proceedings, which took place on 2 October 2001, the Respondent (Proprietor of the patent) filed, as auxiliary request, a set of six claims, with the only independent claim reading:

"1. A composition adapted to be reacted with hydrogen peroxide to provide chemiluminescent light, said composition comprising an oxalate compound and a solvent solution of a compound having the formula



wherein each R is 2,6-diisopropylphenyl X, Y and Z are OR¹ and R¹ is phenyl, the amount of said compound being such that it provides signal red light."

IV. The Appellant (Opponent) alleged that claimed compositions were not novel since they were publicly available before the claimed priority date.

Moreover, the Appellant contested that the set of claims underlying the contested decision met the requirement of Article 123(2) EPC.

Finally, the Appellant argued that the claimed compositions lacked inventive step, since there was no proper basis for considering the aspect of stability and it was known from document (1), that any perylene dye could be used in order to provide chemiluminescent compositions, and therefore it was obvious to substitute the perylenes described in document (1) by other known perylenes.

- V. The Respondent expressly stated his disagreement to the introduction of the objection of lack of novelty as a new ground of opposition into the appeal proceedings relating to an alleged prior use of the claimed compositions based on documents submitted only at the stage of appeal.

The Respondent submitted that the compositions according to Claim 1 underlying the contested decision were supported by the application as filed and, consequently, that the requirement of Article 123(2) EPC was met.

Furthermore, the Respondent argued that the patent in suit communicates the problem of providing a signal red colour with a long duration to the skilled person and, therefore, clearly mentions the problem of stability. As it could not be deduced from any of the cited prior art documents that the claimed compositions would provide chemiluminescent signal red light with a sufficient long duration, the claimed compositions were not obviously derivable from the cited prior art documents.

- VI. The Appellant requested that the decision under appeal be set aside and that the European patent No. 0 403 809

be revoked.

The Respondent requested as main request that the appeal be dismissed or as auxiliary request that the decision under appeal be set aside and the patent be maintained on the basis of the auxiliary request filed at the oral proceedings on 2 October 2001.

Reasons for the decision

1. The appeal is admissible.
2. *Grounds of opposition*

Although the opposition was based on the sole ground that the claimed subject-matter did not involve an inventive step, the Appellant contested for the first time during the appeal proceedings the novelty of the claims on the basis of an alleged prior use submitted with the statement of grounds of appeal.

According to the principle laid down in G 10/91 (OJ EPO 1993, 420, point 18 of the reasons for the decision) fresh grounds for opposition may only be introduced at the appeal stage when the Patentee agrees that a fresh ground for opposition may be considered and in G 7/95 (OJ EPO 1996, 626, point 7.1) it is specifically said that an objection of lack of novelty is a different legal objection having a different legal basis from the objection of lack of inventive step and that, therefore, the objection of lack of novelty cannot be introduced into the appeal proceedings without the agreement of the Patentee.

As lack of novelty was not an opposition ground and as the Respondent expressly stated his disagreement to the introduction of the objection of lack of novelty into the appeal proceedings, the Board has no power to consider this fresh ground for opposition.

3. *Main request*

3.1 Article 123(2) EPC

The Board likes to observe that neither Claim 1 of the application as originally filed, nor Claim 1 as granted were limited to compounds providing red light. Thus the skilled reader would have no reason to assume that all the compounds of the formula of Claim 1 as originally filed or as granted necessarily produced red light, and so the skilled reader could not deduce from the said claims that any more narrow selection of these compounds, such as specified in Claim 1 of the present main request would also produce red light.

According to the Respondent, the subject-matter of Claim 1, directed to a composition comprising a perylene providing red light, is supported by the teaching of the description as originally filed on page 2, lines 18 to 24, that it had been found that known fluorescent dyes can be used to produce a red chemiluminescent light and by the description of the compounds of formula (I) on page 2, line 28 to page 3, line 8 of the application as filed.

However, in deciding whether an amended claim meets the requirement of Article 123(2) EPC, the decisive question is whether all the features of the said claim and the **claimed combination of such features** can be

directly and unambiguously deduced from the application as filed.

On page 2, lines 18 to 24, of the application as filed it was taught that it had been observed that known fluorescent dyes can be used to produce chemiluminescent light, **particularly**, a **red** chemiluminescent light. Furthermore, on page 2, line 28 to page 3, line 8 it was taught that in the chemiluminescent compositions, defined in their **broadest form**, the amount of the perylene is such as to provide **visible** light. As the only perylene compositions which were described to provide chemiluminescent **red** light were the ones cited in the examples of the application as filed, a skilled reader could not deduce from the application as filed which compositions containing a perylene other than the ones exemplified provide chemiluminescent **red** light, let alone that all compositions according to Claim 1 provide chemiluminescent **red** light.

The Respondent argued that it was clear from the application as filed that compositions according to present Claim 1 were preferred compositions and that compositions comprising the most preferred perylene, 1,6,7,12-tetraphenoxy-N,N'-bis(2,6-diisopropylphenyl)-3,4,9,10-perylene dicarboximide, provide chemiluminescent **red** light. Therefore, a skilled person would interpret such teaching that all preferred compositions would provide red light.

The Board can, however, not follow such argumentation, because nowhere from the application as filed it may be derived that the information given in the examples that

compositions described therein provide chemiluminescent red light may be generalised to any composition as defined in present Claim 1 and nowhere from the application as filed it may be deduced which perylenes other than the ones exemplified provide chemiluminescent red light.

Consequently, the Board comes to the conclusion that compositions comprising perylenes as defined in Claim 1 in such amounts that they provide chemiluminescent red light were not directly and unambiguously derivable from the application as filed, contrary to the requirement of Article 123(2) EPC.

4. *Auxiliary request*

4.1 Article 123(2) EPC

Since Claim 8 as originally filed provides a basis for the substitution pattern of present Claim 1 and it appears from Example 1 as filed that such substitution pattern leads to the desired red signal light, the Board comes to the conclusion that the requirement of Article 123(2) EPC is met. This was not contested by the Appellant.

4.2 Inventive step

4.2.1 Both Parties and the Opposition Division were of the opinion that document (1) represented the closest state of the art.

In accordance with the "problem-solution approach" applied by the Boards of Appeal to assess inventive step on an objective basis, it is necessary to

establish the closest state of the art being the starting point, to determine in the light thereof the technical problem which the invention addresses and solves, and to examine the obviousness of the claimed solution to this problem in view of the state of the art.

The "closest state of the art" must be a prior art document disclosing subject-matter aiming at the same objective as the claimed invention and, if several prior art documents disclose subject-matter aiming at the same objective, the "closest state of the art" is represented by that document describing subject-matter having the most relevant technical features in common.

As Claim 1 is concerned with compositions providing chemiluminescent red light whereas document (1) is related to chemiluminescent compositions exhibiting white light in the dark, enabling one to discern colours accurately or exhibiting coloured light at an intensity greater than those commercially available, document (1) does not disclose subject-matter aiming at the same objective as the claimed invention and therefore, document (1) cannot be considered to represent the closest state of the art and, thus, a suitable starting point in assessing inventive step.

Since the only available prior art mentioning the problem of providing chemiluminescent red light is the reference on page 2, lines 21 to 29, of the patent in suit to US-A-4 379 320, this document, further referred to as document (A), is considered to represent the only suitable starting point in assessing inventive step.

Document (A), which was mentioned in the application as

filed (page 2, lines 1 to 17), was not referred to before the Opposition Division or during written appeal proceedings but only discussed at the oral proceedings before the Board. Thus the question arises whether or not this prior art can be considered in these proceedings.

In the present case, the Board is of the opinion that for the examination of an inventive step it is necessary to objectively examine the complete prior art on file for equally objectively finding out the problem which was to be solved by the claimed subject-matter. The Board follows with this view the decision T 536/88 (OJ EPO, 1992, 638) stating that while documents cited and discussed in the patent in suit are in principle not automatically subject-matter of an opposition appeal proceedings, this does not extend to a prior art document in a European patent which is discussed as essential prior art in relation to which the technical problem to be solved is formulated. Such a prior art document forms part of the documents to be considered in an opposition appeal proceedings. Document (A) is such a document, and so can be considered.

- 4.2.2 Document (A) mentions in column 1, lines 15 to 30, that typically a chemiluminescent mixture comprises an oxalate diester which reacts with hydrogen peroxide and a fluorescer compound, that the best light efficiency with chemiluminescent mixtures has been obtained using fluorescers which emit in the yellow region of the visible spectrum and that a second fluorescer can be incorporated to obtain a red emission, but that the efficiency of such mixtures is unduly low due to the instability of the reaction mixture. In order to emit red light, document (A) proposes in column 1, lines 31

to 41, the incorporation of a red fluorescer in the walls of the container so that the red fluorescer in the wall can be activated by the light emitted from the chemiluminescent mixture without being subjected to decomposition due to instability in the chemiluminescent mixture.

According to page 2, lines 26 to 29, of the patent in suit articles known from document (A) have the drawback that it produces a red-orange colour and not a true pure red colour designated as "signal red" with an emission at a wavelength of approximately 625 nanometres.

- 4.2.3 As, in the present case, the problem to be solved consists in providing articles which do not have the drawbacks of the articles known from document (A), the technical problem underlying the invention consisted thus in the provision of articles which are suitable to provide chemiluminescent signal red light over a sufficient long period.

The patent in suit claims to solve this problem by providing for the production of useful articles compositions according to Claim 1 (see point III above).

- 4.2.4 The first point to be considered in assessing inventive step is then whether it has been convincingly shown that by the process according to Claim 1 the problem underlying the patent in suit has effectively been solved.

It has never been contested that with the test report provided with letter dated 16 January 1998 a credible

case has been put forward that the problem underlying the invention, as defined in point 4.2.3 above, is effectively solved by the claimed process.

- 4.2.5 Therefore, it remains to be decided whether a skilled person would have expected that the claimed compositions would be suitable for providing chemiluminescent signal red light over a sufficient long period.

The Appellant argued that a skilled person would have done so, since it was known from page 3, lines 24 to 26, of document (1) that any perylene dye which is soluble in the solvent solution used to produce the compositions described therein may be used and that it was obvious to choose a known fluorescent compound, such as 1,6,7,12-tetraphenoxy-N,N'-bis(2,6-diisopropylphenyl)-3,4,9,10-perylene dicarboximide.

However, document (1) relates to compositions which, when activated in the presence of hydrogen peroxide and a solvent, either exhibit chemiluminescent white light in the dark, which light enables one to discern colours accurately, or exhibit coloured light at a high intensity (see page 2, lines 4 to 17).

As nowhere in document (1) the problem of providing chemiluminescent **signal red** light as defined in the patent in suit is mentioned, this document cannot give any hint how the known problem of insufficient stability of red fluorescers in chemiluminescent compositions comprising an oxalate, a solvent and hydrogen peroxide, as described in column 1, lines 27 to 30, of document (A), could be overcome.

Document (3) describes aryloxy-substituted perylene-3,4,9,10-tetracarboxylic acid diimides, which are suitable for the conventional apparatuses for concentrating light over a particular area in plastic sheets or films and which have high fluorescence and good solubility in the medium used, coupled with good light fastness and a broad absorption range (see page 2, lines 14 to 68) and Example 2 specifically teaches that 1,6,7,12-tetraphenoxy-N,N'-bis(2,6-diisopropylphenyl)-3,4,9,10-perylene dicarboximide has a λ_{max} emission of 613 nanometres in CHCl_3 .

As document (3) is only concerned with compounds suitable for concentrating light, this document is completely silent about the properties of such compounds when used for producing chemiluminescence, in particular, the stability of such compounds in the presence of an oxalate, a solvent and hydrogen peroxide. Whereas for concentrating light the used compositions and their ingredients must be stable to light, in particular, daylight, for being suitable in chemiluminescence the compositions and their ingredients must rather be stable in the chemiluminescent medium.

Therefore, a skilled person could not deduce from document (3) that the compounds according to Claim 1 would be sufficiently stable to provide a chemiluminescent signal red light over a sufficiently long period.

As both documents (1) and (3) are silent about compositions suitable for providing chemiluminescent signal red light, as defined in the patent in suit, the claimed compositions were not obviously derivable from

those documents.

- 4.2.6 The Appellant also contested that the stability of the claimed compositions could form the basis for inventive step, since the application as filed and the patent in suit were silent about this problem and, consequently, the problem of stability was constructed by hindsight.

However, according to the jurisprudence of the Boards of Appeal of the EPO, a reformulation of the problem can be allowed provided the skilled person can recognise the same as implied or related to the problem initially suggested (see decision T 184/82 OJ EPO 1984, 261, point 4 of the reasons).

In the application as filed on page 1, lines 18 to 30, and in the patent in suit on page 2, lines 10 to 16, it is said that there existed no simple means to produce red chemiluminescent light which is satisfactory for the users, because the compounds used were shown to be unstable in the reaction and the duration of the chemiluminescence obtained in this manner was too short to be of commercial interest. As it is also said on page 2, lines 18 to 24, of the application as filed and on page 2, lines 30 to 33, of the patent in suit that it has been unexpectedly observed that known fluorescent dyes can be advantageously used to produce a red chemiluminescent light, it is implicitly taught in the application as filed and in the patent in suit that the claimed compositions have a satisfactory stability in order to be used for providing chemiluminescent signal red light over an acceptable period of time.

This is in line with the statement in the introductory

paragraph of document (A), i.e. the closest state of the art, that mixtures containing one of the known red fluorescers have an efficiency which is unduly low, due probably to the fact that the red fluorescer is unstable in the reaction mixture (see column 1, lines 26 to 30).

Consequently, the problem of stability was not constructed by hindsight.

- 4.2.7 Therefore, the Board comes to the conclusion that the compositions according to Claim 1 were not obviously derivable from the cited prior art.

Claims 2 to 6, which represent preferred embodiments of Claim 1, derive their patentability from the same inventive concept.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The matter is remitted to the first instance with the order to maintain the patent on the basis of claims 1 to 6 filed as auxiliary request at the oral proceedings on 2 October 2001 and a description to be adapted.

The Registrar:

The Chairman:

N. Maslin

A. Nuss