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**D E C I S I O N**  
**of 6 July 2005**

**Case Number:** T 0818/03 - 3.4.3

**Application Number:** 95940366.8

**Publication Number:** 0797909

**IPC:** H05K 3/38

**Language of the proceedings:** EN

**Title of invention:**  
Copper Coating

**Patentee:**  
Alpha Fry limited

**Opponent:**  
MacDermid Incorporated

**Headword:**  
Copper Coating/ALPHA FRY LIMITED

**Relevant legal provisions:**  
EPC Art. 84

**Keyword:**  
"Clarity of claim amended in opposition proceedings (no)"

**Decisions cited:**  
T 0153/85, T 1126/97

**Catchword:**  
A claim must be considered to lack clarity if it sets out insufficiently clearly both the necessary parameters of the method and the relevant characteristic features of the result.



Case Number: T 0818/03 - 3.4.3

**D E C I S I O N**  
**of the Technical Board of Appeal 3.4.3**  
**of 6 July 2005**

**Appellant:** MacDermid Incorporated  
(Opponent) 245 Freight Street  
Waterbury, CT 06720 (US)

**Representative:** Jenkins, Peter David  
Page White & Farrer  
54 Doughty Street  
London WC1N 2LS (GB)

**Respondent:** Alpha Fry Limited  
(Proprietor of the patent) Tandem House  
Marlowe Way  
Beddington Farm Road  
Croydon CRO 4XS (GB)

**Representative:** Rausch, Michael, Dipl.-Ing.  
Stenger, Watzke & Ring  
Patentanwälte  
Kaiser-Friedrich-Ring 70  
D-40547 Düsseldorf (DE)

**Decision under appeal:** **Interlocutory decision of the Opposition  
Division of the European Patent Office posted  
6 June 2003 concerning maintenance of European  
patent No. 0797909 in amended form.**

**Composition of the Board:**

**Chairman:** R. G. O'Connell  
**Members:** E. Wolff  
J. P. B. Seitz

## Summary of Facts and Submissions

I. This is an appeal by the opponent as sole appellant against the maintenance of European Patent 797 909 in amended form.

II. The claims as maintained constitute the respondent proprietor's main request. They comprise three independent claims of which claim 1, directed to a process, claim 15 to a composition and claim 22 to a product read as follows:

"1. A process of forming a micro-roughened conversion coated copper or copper alloy surface, which process comprises forming the micro-roughened conversion coating by contacting the copper or copper alloy surface with an aqueous adhesion promotion composition consisting of from 0.1 to 20% by weight hydrogen peroxide, from 1% to 50% by weight of an inorganic acid, from 0.5% to 20% by weight of an organic corrosion inhibitor, from 0.001% to 5% by weight of a cationic surfactant, optionally a stabilising agent for the hydrogen peroxide and the balance water."

"15. An aqueous adhesion promotion composition for use in the process according to claim 1, said composition consisting of from 0.1 to 20% by weight hydrogen peroxide, from 1% to 50% by weight of an inorganic acid, from 0.5% to 2.5% by weight of an organic corrosion inhibitor, from 0.001% to 5% by weight of a cationic surfactant, optionally a stabilising agent for the hydrogen peroxide and the balance water."

"22. Copper having a micro-roughened conversion coated surface in which the surface coating comprises a complex of copper with a corrosion inhibitor and which is obtainable by the process as claimed in any one of claims 1 to 14."

III. The appellant opponent put forward a range of arguments against these claims, of which those pertinent to the Board's decision can be summarised as follows:

In claim 1, the phrase "by contacting" of its granted form had been replaced by the words "forming the micro-roughened conversion coating by contacting".

The change of wording introduced the specific processing step of forming the micro-roughened conversion coating by contacting. It was not stated, however, how the claimed contacting step would lead to the formation of the coating. The claim was therefore unclear.

There were no process parameters recited in the claim although the formation of the micro-roughened conversion coating does not occur for all treatment times and temperatures. This was apparent both from the description and the respondent proprietor's reply to the statement of grounds of appeal.

It was not even clear what a "a micro-roughened conversion coating" was and how the skilled person would know whether or not he had formed such a coating, since the specification was silent on how to determine whether the required coating was present.

A claim limited to forming a specific coating which allegedly had not been formed before in the state of the art, lacked clarity unless it was unambiguously clear to the skilled person how to determine whether the coating had been formed.

- IV. In reply, the respondent proprietor submitted that it was widely understood that the prefix, "micro-" refers to smallness (i.e. on a microscopic scale), and "roughened" means something that is uneven or not smooth. These terms were used in the patent consistently with these plain meanings. Furthermore, as used in the claims of the patent, the term "micro-roughened" described the topography of the surface of the "conversion coating." An example of this "micro-roughened conversion coating" was illustrated in Figure 3 of the patent, where it was shown to have a distinctive micro-porous or "cracked-mud" appearance when imaged under the magnification of a scanning electron microscope (SEM); this reproduction of the appearance of a micro-roughened conversion coating surface enabled one skilled in the art readily to identify it by similar means.

Moreover, the provision in the description of guidelines and specific exemplary procedures for forming such a conversion coating offered ready means for comparison and further evaluation of the coating.

The independent claim 1 specified clearly all of the essential features needed to define the invention. Article 84, which not only requires that a claim be clear but also that it be concise, did not require the patentee to exclude by recitation every possible

combination of ingredients and process parameters that might otherwise satisfy many of the claim limitations and yet not produce a micro-roughened conversion coating. The opposition division was therefore correct in its finding that the claim fulfilled the requirements of Article 84 EPC.

- V. The appellant opponent requests that the decision of the opposition division be set aside and that the patent be revoked.
- VI. In the written appeal procedure, the respondent proprietor requested only that the appeal be dismissed. At the oral proceedings before the Board, he added seven auxiliary requests.

### **Reasons for the Decision**

1. The appeal is admissible.

#### *The main request*

2. Clarity (Article 84 EPC)
- 2.1 The claims forming the respondent proprietor's main request now before the Board, and in particular independent claims 1, 15 and 22, correspond word for word to the claims of the first auxiliary request submitted by the proprietor during the opposition proceedings and maintained by the opposition division.
- 2.2 It was argued by the appellant opponent - in the Board's view correctly so - that in "forming the micro-

roughened conversion coating by contacting", process parameters such as the processing time and processing temperature, and the chemical composition of the solution which by contacting forms the micro-roughened surface, are highly relevant parameters.

- 2.2.1 Processing time and processing temperature are indeed relevant parameters. Examples of processing times and temperatures are, in fact, provided in the patent on page 5, paragraph [0041]. On the same page in paragraph [0042] it is observed that a deposit other than the micro-crystalline deposit which forms the micro-roughened surface is deposited if the contacting time is too long. The processing temperatures indicated vary from a maximum of 75°C to between 10 and 35°C, and the processing time between 10 minutes at the most and as little as 1 minute or less. There is, however, no apparent linking in the description of processing times and processing temperatures.

In the Board's view, the absence of these parameters from the claim would not necessarily be a sufficient reason for considering the claim unclear, if the person skilled in the art could without undue burden establish which processing times and which processing temperatures lead to the formation of a micro-roughened conversion coating.

- 2.2.2 The appellant opponent argued that the claim was unclear also by virtue of the unduly wide percentage ranges of the ingredients of the adhesion promotion composition. According to the appellant opponent, the compositions ranged from strong acid to weak solution, as illustrated by means of some extreme examples of the

range covered by the terms of the claim: one composition was little else than strong sulphuric acid (0.1% H<sub>2</sub>O<sub>2</sub>, 50% H<sub>2</sub>SO<sub>4</sub>, 0.5% corrosion inhibitor (benzotriazole), 0.001% surfactant and 49.399% H<sub>2</sub>O); another one was close to being pure water (0.1% H<sub>2</sub>O<sub>2</sub>, 0.1% acid, 0.05% corrosion inhibitor, 0.001% surfactant and 99.399% H<sub>2</sub>O); and a third composition combined a large hydrogen peroxide content with a large acid content and a large percentage of corrosion inhibitor (20% H<sub>2</sub>O<sub>2</sub>, 50% acid, 20% corrosion inhibitor, 5% surfactant and 5% water). The appellant opponent further contrasted this range with the concentrations as listed in table 1 of the description (3.5% H<sub>2</sub>O<sub>2</sub>, 8.5%/15% sulphuric acid or 9.5% nitric acid or 7.4%/14.8% phosphoric acid, 0.68% benzotriazole (as corrosion inhibitor), and 0.01% or 0.02% of surfactant, and deionized water to 100%).

The appellant opponent alleged and the respondent proprietor agreed (response to the statement of the grounds of appeal, page 17, point 87, second paragraph) that formation of a micro-roughened conversion is not inevitable "when contacting a copper or copper alloy surface with a composition having ingredients within the cited ranges". The respondent proprietor admitted that processes using compositions within the claimed range might be directed to different objectives such as pickling or etching, and hence did not necessarily lead to a micro-roughened conversion coated surface. However, the admission that there were combinations of conditions and/or parameters that did not result in micro-roughened conversion coatings did not detract from the fact that the process was defined as carefully as was reasonably practicable.

In the Board's view, the breadth of the chosen parameters of the claim would not necessarily be a sufficient reason for considering the claim unclear, as long as the person skilled in the art could without undue burden establish which compositions of the ingredients lead to the formation of a micro-roughened conversion coating.

2.3 The appellant opponent alleged not merely that claim 1 was unclear concerning the process parameters for achieving a micro-roughened conversion coating, but also that both the term "micro-roughened" and the term "conversion coating" were indefinite and therefore unclear. The degree of roughening required was not defined in the claims or implicit to a skilled person.

2.4 The Board finds this argument persuasive since even the "cracked mud" appearance which is relied on by the respondent proprietor as being a defining feature of a micro-roughened surface, is, according to the description (patent, page 6, paragraph [0052], lines 18 - 19), a feature that is shown by such surfaces often [emphasis added] but - by clear implication - not always. Thus, the skilled person, having employed an aqueous adhesion promotion composition within the range required by claim 1 would still not be able, even after analysis of the product, to determine definitively whether or not the surface produced was, in fact, a "micro-roughened conversion-coated surface".

The respondent proprietor also argued that the appellant opponent's objection to the term "micro-roughened conversion coated surface" was undermined by

the use of that very term in one of the appellant opponent's own later US patent applications. The Board is not persuaded by this argument, which incidentally is based on a single occurrence of the term in the US patent, since it provides no evidence either way whether this term would have had a clear meaning at the filing date of the opposed patent.

Yet, in the Board's view, the lack of a clear definition of what a micro-roughened conversion surface is, would not in itself necessarily be a sufficient reason for considering the claim unclear, provided the person skilled in the art is given clear instructions concerning those processing steps which, when carried out, will inevitably lead to its formation.

2.5 In summary, a method claim which does not state sufficiently clearly the steps by which a particular result is achieved, might still be considered clear provided the result to be achieved was clearly defined, and a claim which defines a method of achieving some less than clearly defined result might also still be considered clear provided the steps that need to be taken to achieve that result are sufficiently clearly defined.

However, a claim must be considered to lack clarity if, as here, it sets out insufficiently clearly both the necessary parameters of the method and the relevant characteristic features of the result. The Board therefore concludes that claim 1 of the main request is not clear within the meaning of Article 84 EPC.

*The auxiliary requests*

3. The auxiliary requests 1 to 7 were filed at the oral proceedings.
- 3.1 Admissibility of the auxiliary requests
  - 3.1.1 According to the established jurisprudence of the Boards of Appeal, eg T 0153/85, OJ EPO 1998, 1, auxiliary requests not filed in due time will normally be considered inadmissible unless the claims are "clearly allowable". In particular, the new claims should be clearly allowable in the sense that they do not introduce new objections under the EPC and overcome all outstanding objections (cf T 1126/97, at 3.1.2). This approach is reflected also in Article 10 of the Rules of Procedure of the Boards of Appeal as they apply to proceedings such as the present in which the notice of appeal was received after 1 May 2003.
  - 3.1.2 Each of the auxiliary requests 1 to 7 includes an independent claim 1 directed to a process of forming a micro-roughened conversion coated copper or copper alloy surface in which the micro-roughened conversion coating is formed by contacting the copper or copper alloy surface with an aqueous adhesion promotion composition consisting, among other ingredients listed in claim 1 of the main request, of from 0.1% to 20% by weight hydrogen peroxide and from 0.1% to 50% by weight of an inorganic acid. The differences with respect to claim 1 of the main request lie in the quantities or selection of the other ingredients set out in claim 1 of the main request and, in the case of auxiliary requests five to seven, in the addition of steps

relating to adhering a polymer material to the micro-roughened conversion coating. These claims thus include the same combination of features that gave rise to the objection of lack of clarity in respect of claim 1 of the main request, and hence do not fulfil the established requirements that they be clearly allowable.

3.1.3 For the reasons set out in the preceding paragraph, new auxiliary requests 1 to 7 are not admitted into the proceedings.

## **Order**

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

1. The decision under appeal is set aside
2. The patent is revoked

Registrar:

Chair:

M. H. A. Patin

R. G. O'Connell



Case Number: T 0818/03 - 3.4.3

**D E C I S I O N**  
of 1 September 2005  
correcting errors in the decision  
of the Technical Board of Appeal 3.4.3  
of 6 July 2005

**Appellant:** MacDermid Incorporated  
(Opponent) 245 Freight Street  
Waterbury, CT 06720 (US)

**Representative:** Jenkins, Peter David  
Page White & Farrer  
54 Doughty Street  
London WC1N 2LS (GB)

**Respondent:** Alpha Fry Limited  
(Proprietor of the patent) Tandem House  
Marlowe Way  
Beddington Farm Road  
Croydon CRO 4XS (GB)

**Representative:** Rausch, Michael, Dipl.-Ing.  
Stenger, Watzke & Ring  
Patentanwälte  
Kaiser-Friedrich-Ring 70  
D-40547 Düsseldorf (DE)

**Decision under appeal:** Interlocutory decision of the Opposition  
Division of the European Patent Office posted  
6 June 2003 concerning maintenance of European  
patent No. 0797909 in amended form.

**Composition of the Board:**

**Chairman:** R. G. O'Connell  
**Members:** E. Wolff  
J. P. B. Seitz

Pursuant to Rule 89 EPC, errors of transcription in the decision dated 6 July 2005 in appeal case T 818/03 are hereby corrected as follows:

Page 6

line 6: "1%" replaces "0.1%" before the word "acid", and "0.5%" replaces "0.05%" before the term "corrosion inhibitor";

line 7: "98.399%" replaces "99.399%" before the expression "H<sub>2</sub>O".

Registrar

Chair

A. Counillon

R. G. O'Connell