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Datasheet for the decision of 15 May 2025

Case Number: T 1868/23 - 3.3.05

Application Number: 19795239.3

Publication Number: 3679167

IPC: C22C19/03, C23C18/50, H01L21/288, H01L23/00

Language of the proceedings: EN

Title of invention:
ELECTROLESS NICKEL PLATING SOLUTION

Patent Proprietor:
Atotech Deutschland GmbH & Co. KG

Opponent:
MacDermid, Incorporated

Headword:
Nickel Plating/Atotech

Relevant legal provisions:
EPC Art. 56, 123(2)
RPBA 2020 Art. 12(6), 13(2)

Keyword:
Inventive step - (no)
Amendments - allowable (no)
Late-filed request - no longer maintained in first-instance proceedings (yes)
Amendment after summons - exceptional circumstances (no)

Decisions cited:
T 0197/86, T 0939/92, T 1102/00, T 0798/18, T 1421/20

Catchword:

Europäisches Patentamt
European Patent Office
Office européen des brevets

Beschwerdekammern

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Case Number: T 1868/23 - 3.3.05

D E C I S I O N
of Technical Board of Appeal 3.3.05
of 15 May 2025

Appellant: (Opponent)	MacDermid, Incorporated 245 Freight Street Waterbury CT 06702 (US)
Representative:	Page White Farrer Bedford House 21a John Street London WC1N 2BF (GB)
Respondent: (Patent Proprietor)	Atotech Deutschland GmbH & Co. KG Erasmusstraße 20 10553 Berlin (DE)
Representative:	MKS IP Association Intellectual Property Erasmusstraße 20 10553 Berlin (DE)
Decision under appeal:	**Interlocutory decision of the Opposition Division of the European Patent Office posted on 28 September 2023 concerning maintenance of the European Patent No. 3679167 in amended form.**

Composition of the Board:

Chairman	E. Bendl
Members:	G. Glod
	O. Loizou

Summary of Facts and Submissions

I. The appeal of the opponent (appellant) concerns the opposition division's decision finding that European patent No. 3 679 167 B1 in amended form, i.e. on the basis of the main request, met the requirements of the EPC.

II. The following documents are of relevance here.

D2: JP-H10306378A
D2E: Certified English translation of D2
D4: JP-2001/164375A
D4E: Certified English translation of D4
D6: Declaration by Ernest Long

III. Claim 1 of the main request reads as follows.

"*1. An electroless nickel plating solution, comprising*
- a source of nickel ions,
- a source of molybdenum ions,
- a source of tungsten ions,
- a source of hypophosphite ions,
- at least one complexing agent,
wherein the solution does not comprise any reducing agent comprising boron,
characterised in that the solution further comprises
- at least one organic sulphur containing compound in a concentration of 0.38 - 38.00 µmol/L, and
- at least one amino acid in a concentration of 0.67 - 40.13 mmol/L."

Compared with claim 1 of the main request, claim 1 of auxiliary request 1 includes the following underlined amendments.

"*1. An electroless nickel plating solution, comprising*
- a source of nickel ions, wherein a concentration of nickel ions is 0.067 - 0.133 mol/L,
- a source of molybdenum ions, wherein a concentration of molybdenum ions is 1.05 - 4.18 mmol/L,
- a source of tungsten ions, wherein a concentration of tungsten ions is 12.1 - 109.2 mmol/L,
- a source of hypophosphite ions, wherein a concentration of hypophosphite ions is 0.09 - 0.27 mol/L
- at least one complexing agent, wherein a concentration of the complexing agent is 0.095 - 0.178 mol/L,
wherein the solution does not comprise any reducing agent comprising boron,
characterised in that the solution further comprises
- at least one organic sulphur containing compound in a concentration of 0.38 - 38.00 µmol/L, and
- at least one amino acid in a concentration of 5.36-26.75 ~~0.67 - 40.13~~mmol/L
wherein the pH in the solution is in the range of 7-11."

Auxiliary requests 2 to 7 include the same amendments as claim 1 of auxiliary request 1, as well as further restrictions.

Compared with claim 1 of the main request, claim 1 of auxiliary request 8 includes the following underlined amendment at the end.

"1. [...] - at least one amino acid in a concentration of 0.67 - 40.13 mmol/L, wherein the pH of the solution is in the range of 7- 11."

In addition to this amendment, claim 1 of auxiliary request 9 also includes the following feature at the end.

"*and wherein the amino acid is a non-sulphur containing amino acid.*"

In addition to the features of claim 1 of auxiliary request 8, claim 1 of auxiliary request 10 also includes the following feature at the end.

"*and wherein the amino acid is selected from the group consisting of glycine, alanine, valine, leucine and isoleucine.*"

Claim 1 of auxiliary request 11 is identical to claim 1 of auxiliary request 1 except that the amino acid concentration has not been amended, i.e. the amino acid concentration is the same as in the main request.

Compared with claim 1 of auxiliary request 1, claim 1 of auxiliary request 1a includes the following underlined amendment.

"*1. [...] at least one complexing agent, wherein a concentration of the at least one complexing agent is 0.095 - 0.178 mol/L, [...].*"

IV. The appellant's arguments are reflected in the Reasons for the Decision given below.

V. The respondent's arguments, where relevant to the decision, can be summarised as follows.

The main request met the requirements of Article 56 EPC. Starting from D1, the problem to be solved was to

provide an electroless nickel plating solution allowing the deposition of quaternary nickel with reduced tensile stress.

The problem was solved by the combination of an organic sulphur-containing compound and an amino acid in the specified concentrations. This combination showed a synergistic effect over the separate use of these components, which could not have been expected. The synergistic effect was clearly demonstrated in Examples 4 and 5. It was not understandable why the experiment of D6 at a pH of 4.4 did not work, contrary to what was stated in D2E.

A person skilled in the art would not use a very small Ni concentration together with other alloying metal ions for plating a nickel layer without a reason to do so.

D2E dealt with a different technical problem from that of the patent. There was no motivation for a skilled person to start from D2E and combine this document with D4E. There was no incentive starting from D2E to select another complexing agent.

The wording "a concentration of the complexing agent" in claim 1 of auxiliary request 1 clearly referred to the total amount of all complexing agents. This also applied to auxiliary requests 2 to 7 and 11.

Requests 8 to 10 had not been abandoned in the opposition proceedings and should be considered part of the appeal proceedings.

Auxiliary request 1a was not filed until the oral proceedings before the board because the respondent had

not anticipated the board's position on "a concentration of the complexing agent". It contained a straightforward amendment and was not detrimental to procedural economy. It should be taken into account.

VI. The appellant (opponent) requests that the decision under appeal be set aside and that the patent be revoked.

The respondent (patent proprietor) requests that the appeal be dismissed (main request), or, alternatively, that the patent be maintained in amended form on the basis of one of auxiliary requests 1 to 11 as submitted with the reply to the appeal, or on the basis of auxiliary request 1a as filed during the oral proceedings.

Reasons for the Decision

Main request

1. Article 56 EPC

Claim 1

1.1 The invention relates to an electroless nickel plating solution.

1.2 D2E was chosen as a possible starting point for the discussion of inventive step. Although D2E does not relate to reduced tensile stress, it does relate to an electroless nickel plating solution leading to a smooth plating film. Claim 1 of the main request is not a use claim but a composition claim.

The parties agreed that D2E does not disclose that the electroless plating solution contains at least one amino acid in a concentration of 0.67 - 40.13 mmol/L and that the combination of a source of molybdenum ions *and* a source of tungsten ions is not mentioned in Table 1 thereof.

1.3 The problem to be solved by the patent in suit is to provide an electroless nickel plating solution allowing the deposition of quaternary nickel with reduced tensile stress (paragraph [0009] of the patent).

1.4 It is proposed that the problem be solved by an electroless nickel plating solution according to claim 1, characterised in that it contains at least one amino acid in a concentration of 0.67 - 40.13 mmol/L, and a source of molybdenum ions combined with a source of tungsten ions.

1.5 It needs to be evaluated whether there is sufficient evidence to conclude that the problem is solved over the whole scope claimed.

The respondent argues that the patent shows, in particular in Examples 4 and 5, that the problem was solved. However, it is noted that these examples were conducted at a pH of 9 and 9.5, respectively, and at concentrations as shown in Example 1 of the patent (paragraph [0119]). Claim 1 does not contain any limitations in that respect.

No direct comparison with D2E is available. The examples of D2E were conducted at a pH of 4.4. It is established jurisprudence that in a case where comparative tests are chosen to demonstrate an inventive step and an improved effect over the whole

scope claimed, the nature of the comparison with the closest state of the art must be such that the effect is convincingly shown to have its origin in the distinguishing feature of the invention (T 197/86, Reasons 6.1.3). Since such a comparison is missing here, it cannot be concluded that the alleged effect is effectively achieved and is due to the distinguishing features.

In addition, it is evident from D6 that the concentrations have an impact on performance (Example B vs. Example D; Example B vs. Example I; Example A vs. Example E). Even if the respondent's argument that certain concentrations are unrealistic were to be accepted, D6 nevertheless confirmed that the concentrations are a relevant factor.

Additionally , D6 shows that the desired effect is not obtained at a pH of 4.6 (Example E) and with the combination of cystine (organic sulphur-containing compound at 4.2 µmol/L) and cysteine (amino acid at 8.3 mmol/L) (Example F). Furthermore, the composition according to Comparative Example 2 outperforms that of Example C, thereby indicating that the choice of an organic sulphur-containing compound and amino acid is critical. Overall, the evidence provided by D6 is such that it is not credible that the alleged problem is solved over the whole scope claimed.

Thus, the problem is to be defined in less ambitious terms and can be seen as the provision of an alternative electroless nickel plating solution.

1.6 The solution to this not so ambitious problem is obvious for the following reasons.

D2E teaches in paragraph [0017] that a water-soluble molybdate can be added in combination with tungstate ("and/or").

D4E also relates to electroless plating and would be considered by the skilled person searching for an alternative plating solution to the one of D2E. D4E discloses the combination of different types of complexing agents (paragraph [0017]), including amino acids in a concentration of 2-50 g/liter (paragraph [0042]). The use of such complexing agents is one possibility among many and is in line with the teaching of D2E, which indicates the possibility of combining two or more types (paragraph [0015]). Consequently, the combination of a complexing agent with an amino acid and an organic sulphur-containing compound (paragraphs [0018] and [0019] of D2E) at the claimed concentrations is one of many possibilities the skilled person will find when looking for an alternative electroless nickel plating solution.

It should be noted that if the problem to be solved is the provision of an alternative, the presence of an incentive towards the solution is not mandatory (T 1102/00, Reasons 14). Furthermore, a mere arbitrary choice from the possible solutions cannot be regarded as involving an inventive step (T 939/92, Reasons 2.5.3).

1.7 The subject-matter of claim 1 is therefore obvious in view of a combination of D2E with D4E. The requirements of Article 56 EPC are not met.

The main request is not allowable.

Auxiliary request 1

This request includes specifications relating to the concentration of the ingredients.

2. Article 123(2) EPC

Claim 1 of auxiliary request 1 is based on claims 1, 3, 4, 5 and 6 of the application as filed, in combination with page 8, lines 2 and 3, page 8, line 25, page 10, lines 29 and 30, and page 12, line 13, of said application as originally filed.

However, the appellant's objection relating to "a concentration of the complexing agent" is convincing. There is no doubt that the concentration range of 0.095 - 0.178 mol/L disclosed in the application as filed relates to the total amount of complexing agent (page 8, lines 22 to 26). The wording "a concentration of the complexing agent", as present in claim 1 of auxiliary request 1, is ambiguous. It can be understood as relating to one complexing agent from the "at least one complexing agent", rather than to the total amount of all complexing agents. A basis for the concentration range of only one complexing agent is not present in the application as filed.
The disclosure on page 6, lines 1 to 4, of the application as filed does not alter this conclusion since it only relates to the ranges given in the description and is not included in the claim.

Thus, the requirements of Article 123(2) EPC are not met.

This request is therefore not allowable either.

Auxiliary requests 2 to 7

3. Article 123(2) EPC

The wording "a concentration of the complexing agent is 0.095 - 0.178 mol/L" is present in claim 1 of auxiliary requests 2 to 7. The objection raised with respect to auxiliary request 1 thus also applies to these requests. The fact that in some of these requests the complexing agent(s) are further defined does not alter this conclusion. The expression is understood as possibly referring to only one complexing agent, while the original disclosure related to the total amount of all complexing agents.

During the oral proceedings before the board the respondent acknowledged that the same deficiency as for Claim 1 of auxiliary request 1 applies to auxiliary request 2 to 7 and 11 (see minutes).

Consequently, auxiliary requests 2 to 7 are not allowable either.

Auxiliary requests 8 to 10

4. These requests correspond to auxiliary requests 1 to 3 as submitted with the reply to the notice of opposition, except that claim 13 (or claim 12 in auxiliary request 10) has been amended in line with claim 13 of the main request. The requests filed before the opposition division as auxiliary requests 1 to 3 were subsequently replaced by others (see the letter of the patent proprietor of 5 July 2023; A(1)).

According to Article 12(6) RPBA, the board shall not admit requests that are no longer maintained in the

proceedings leading to the decision under appeal, unless the circumstances of the appeal case justify their admittance.

It is established case law that the replacement of requests is equivalent to the withdrawal of requests (T 798/18, Reasons 2.2, and T 1421/20, Reasons 5.4.3), which means that in the present case auxiliary requests 8 to 10 were considered no longer maintained before the opposition division. This does not imply that their subject-matter was completely abandoned; it simply means that the respondent had at that point in time decided to no longer pursue these requests.

The board cannot see any particular reason why the appeal case would justify their admittance. As outlined by the appellant, the requests do not deal with all of the objections raised under Article 123(2) EPC and do not contain any limitations regarding the concentrations of the metals present in the composition. In that respect, claim 1 of these requests is broader than claim 1 of the main request.

Consequently, auxiliary requests 8 to 10 are not admitted into the appeal proceedings.

Auxiliary request 11

5. This request does not meet the requirements of Article 123(2) EPC for the same reasons as those set out with respect to auxiliary requests 1 to 7.

Auxiliary request 11 is therefore not allowable either.

Auxiliary request 1a

6. Article 13(2) RPBA 2020

This request was filed during the oral proceedings before the board.

Under Article 13(2) RPBA 2020, any amendment to a party's appeal case made after notification of a communication under Article 15, paragraph 1, shall, in principle, not be taken into account unless there are exceptional circumstances which have been justified with cogent reasons by the party concerned.

In the case at hand there are no exceptional circumstances, for the following reasons.

The request was submitted after the board's communication pursuant to Article 15(1) RPBA 2020, which indicated that auxiliary requests 1 to 7 and 11 did not meet the requirements of Article 123(2) EPC.

The objection under Article 123(2) EPC concerning "a concentration of the complexing agent" was first raised in the appellant's grounds of appeal (see page 59). The respondent did not file a request to address this objection with its reply to the appeal. However, pursuant to Article 12(3) RPBA, the reply to the appeal has to contain a party's complete appeal case.

In its communication pursuant to Article 15(1) RPBA, the board set out why it considered the objection persuasive. There were no new facts which would have triggered the filing of a new request at such a late stage of the proceedings. The communication *per se* cannot be regarded as creating exceptional

circumstances (Case Law of the Boards of Appeal of the EPO, 10th edition, 2022, V.A.4.5.6(c)).

Generally, patent proprietors have to anticipate that the board might evaluate a case differently from what they might have expected. Therefore, the respondent should have reacted to all of the appellant's objections immediately, even if it considered them to be completely without substance.

Furthermore, the communication pursuant to Article 15(1) RPBA 2020 is not an invitation to make new submissions (Case Law of the Boards of Appeal of the EPO, 10th edition, 2022, V.A.4.5.6(a)).

Therefore, auxiliary request 1a is not taken into account and is thus not part of the proceedings.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The patent is revoked.

The Registrar: The Chairman:

U. Bultmann E. Bendl

Decision electronically authenticated