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**Datasheet for the decision
of 7 December 2023**

Case Number: T 1509/21 - 3.3.05

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Language of the proceedings: EN

Title of invention:

ALUMINUM ALLOY FOIL FOR ELECTRODE CURRENT COLLECTOR, AND
METHOD FOR PRODUCING SAME

Patent Proprietor:

UACJ Corporation
UACJ Foil Corporation

Opponent:

Speira GmbH

Headword:

ALUMINUM ALLOY FOIL FOR ELECTRODE CURRENT COLLECTOR/UACJ

Relevant legal provisions:

EPC Art. 54, 56, 83

RPBA 2020 Art. 12(6)

Keyword:

Novelty - (yes)

Inventive step - (yes)

Sufficiency of disclosure - (yes)

Late-filed evidence - admitted in first-instance proceedings
(yes)

Decisions cited:

T 1076/21, T 1596/16, T 0051/10, T 0095/97, T 0666/89,

T 0012/81

Catchword:



Beschwerdekammern

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Case Number: T 1509/21 - 3.3.05

D E C I S I O N
of Technical Board of Appeal 3.3.05
of 7 December 2023

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Decision under appeal: **Interlocutory decision of the Opposition
Division of the European Patent Office posted on
12 May 2021 concerning maintenance of the
European Patent No. 3061839 in amended form.**

Composition of the Board:

Chairman	G. Glod
Members:	J. Roider
	P. Guntz

Summary of Facts and Submissions

I. The appeal by the opponent (appellant) lies from the interlocutory decision to maintain European Patent EP 3 061 839 B1 on the basis of auxiliary request 1, filed during the oral proceedings before the opposition division, the present main request.

II. The following documents, cited in the decision under appeal, are referred to as follows:

D1/D1a WO 2013/018165 A1 and the corresponding European patent application EP 2 738 850 A1

D2/D2a JP 2003-239052 A and the English machine translation

D3/D3a JPH06-101003 and the English machine translation

D1a is the European patent application of D1, published under Article 153(4) EPC, after the priority date of the patent in suit. The parties assume that its content corresponds to the original Japanese application. It was not disputed that the contents of D1a and D1 were identical.

III. Claims 1 and 5 of the main request read as follows:

"1. An aluminum alloy foil for a current collector of an electrode, obtained by a method comprising a step of continuous casting a cast plate of a molten aluminum alloy having the composition set forth below, and a step of cold rolling and foil rolling the cast plate, wherein no heating is performed between the steps of the continuous casting, cold rolling and foil rolling, the aluminum alloy foil containing 1.0 to 2.0 mass % of Fe, 0.01 to 0.2 mass % of Si, 0.0001 to 0.2 mass % of

Cu, and 0.005 to 0.3 mass % of Ti, the remainder being Al and inevitable impurities, wherein an amount of Fe contained as a solid solution is 300 ppm or more, and particles of intermetallic compounds having an equivalent circle diameter of 0.1 to 1.0 μm exist at 1.0×10^5 particles / mm^2 or more."

"5. A method of manufacturing an aluminum alloy foil for a current collector of an electrode of claim 1 or 2, comprising a step of manufacturing, by a continuous casting method, a cast plate having a composition of 1.0 to 2.0 mass % of Fe, 0.01 to 0.2 mass % of Si, 0.0001 to 0.2 mass % of Cu, and 0.005 to 0.3 mass % of Ti, the remainder being Al and inevitable impurities, and a step of performing on said cast plate cold rolling and foil rolling, wherein no heating process is performed between the steps from the continuous casting step to the cold rolling and foil rolling step to yield an aluminum alloy foil."

IV. The appellant's key arguments can be summarised as follows:

Article 54(1) and (2) EPC

The starting material and the manufacturing process for the foils according to D1/D1a, examples 9 and 13 were the same as the material and process steps claimed in product claim 1. In line with [T 666/89](#), point 6, the disputed feature was inevitably achieved in D1/D1a. It was an effect implicit in the remaining features in the claim. Nothing other could be obtained by the claimed manufacturing process (Case Law of the Boards of Appeal of the EPO, 10th edition, 2022, I.C.4.3; [T 95/97](#) point 3.3; [T 51/10](#), point 2.4). The disputed feature was thus implicitly disclosed in D1/D1a, examples 9 and 13.

The patent in suit could only show that Fe and Si had an influence on the number and size of the intermetallic compounds. Interrelations of these and the further claimed alloying elements, Cu and Ti, were not disclosed.

Fe in solid solution was only necessary for forming intermetallic precipitates during thermal stress, such as occurs during the drying of the active material, so as to reduce the adverse impact on the yield strength. The alloying elements in the examples varied within their entire respective claimed ranges. Example 13 of D1/D1a fell well inside all these claimed ranges. Examples 8 and 10 of the patent in suit were the most suitable examples to be compared with D1/D1a, examples 9 and 13.

The subject-matter of claim 5 differed from the process disclosed in D1/D1a only by the reference to the product claim 1. However, all the claimed manufacturing steps were disclosed in D1/D1a.

Article 83 EPC

Either the subject-matter of claim 1 of the patent in suit lacked novelty over D1/D1a or it was insufficiently disclosed, because if there was a difference it was not apparent which feature led to the different aluminum foil. Had the appellant itself carried out and filed D1/D1a, example 13 as a test, it would either have been considered as novelty-destroying or as showing that the subject-matter of claim 1 was insufficiently disclosed.

The skilled person was confronted with the undue burden of finding out exactly which parameters would lead to the claimed particle number density, particularly when considering the whole scope of the claimed subject-

matter.

Admission of D2/D2a and D3/D3a

The opposition division had erred in exercising its discretion not to admit D2/D2a and D3/D3a. It had not appropriately considered the high relevance of these documents and had erroneously not admitted them into the proceedings.

- V. The key arguments of the respondents (patent proprietors) can be summarised as follows:

Article 54(1) and (2) EPC

It was the combination of the specific amounts of all the alloying elements which led to the claimed particle number density. The opponent had not provided evidence that the manufacturing process in D1/D1a yielded the same particle number density.

Article 83 EPC

The patent disclosed a number of examples. It was not appropriate to assess sufficiency of disclosure in view of D1/D1a.

Admission of D2/D2a, D3/D3a

D2/D2a and D3/D3a were not pertinent, so the opposition division rightly had not admitted them into the proceedings.

- VI. Substantive requests:

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

The respondents (patent proprietors) requested that the appeal be dismissed, i.e. that the patent be maintained as held allowable by the opposition division, or in the alternative, that the patent be maintained on the basis of one of auxiliary requests 1 to 5 as submitted with the reply to the appeal.

Reasons for the Decision

Main Request

1. Claim 1, novelty, Article 54(1) and (2) EPC

The subject-matter of claim 1 requires *inter alia* that the product contain at least 1.0×10^5 particles / mm^2 of particles of intermetallic compounds having an equivalent circle diameter within the range of 0.1 to 1.0 μm .

It is referred to hereinafter as the claimed PND (particle number density in particles / mm^2).

- 1.1 D1/D1a, including examples 9 and 13, disclose an aluminum foil having a certain minimum number of particles with a maximum diameter length within the range of 0.1 to 1.0 μm .
It is referred to hereinafter as the PND in D1/D1a (particle number density in particles / mm^2).

Therefore the PND in D1/D1a cannot be directly compared with the claimed PND because the relevant particle size parameters are different. The PND in D1/D1a cannot be converted to the claimed PND either.

These facts are undisputed.

1.2 The claimed PND is a further limitation. It is not an inevitable result of all the other features of the subject-matter of claim 1, as alleged by the opponent.

1.3 The patent discloses in paragraphs [0032]-[0034] that the other alloying elements (Cu, Si, Ti) influence the particle size or the number of the intermetallic compounds, at least when contained in an amount beyond the claimed range. A certain influence on the PND, already observable within the claimed range, cannot be ruled out. Effects attributable to the combination of these alloying elements cannot be ruled out either.

Neither the claim nor the description implies that, by varying the elements constituting the alloy within the claimed ranges, any resulting alloy will inevitably show the disputed feature.

1.4 [T 666/89](#), point 6, referred to by the opponent, elaborates on the significance of the term "available" in Articles 54(2) and (3) EPC. It establishes that it *"clearly goes beyond literal or diagrammatical description, and implies the communication, express or implicit, of technical information by other means as well."*

In this context, [T 666/89](#) refers to [T 12/81](#) as an example for a product-by-process claim. [T 12/81](#) (see Headnote) relates to a case where a prior-art document describes a process for producing a chemical substance described by its structural formula. This process inevitably leads to that substance's particular stereospecific configuration, which however was not explicitly stated in that prior-art document. According

to [T 12/81](#), *"novelty by selection cannot be claimed in such cases, since none of the possible combinations of all the listed starting compounds and process variants introduce a new element - indispensable for substance selection - that would result in a true and not just "identical" modification of the starting substances."*

The present case is different.

- 1.5 The steps of the manufacturing process included in claim 1 are disclosed in D1/D1a. However, it is known to the skilled person that even small changes in the content of alloying elements in aluminum alloys may have a noticeable impact on the product. Alloying elements may also show effects in combination with other alloying elements. However, the figures provided by the appellant in the letter dated 23 November 2023 only show the variation of a single alloying element for each figure.

It can moreover not be excluded that the amount of iron in solid solution may be important in achieving the claimed PND.

In the absence of further evidence, it cannot be assumed that the claimed PND was only an inevitable result of the other features of claim 1.

- 1.6 The comparison of D1/D1a, example 13 with example 8 of the patent in suit corroborates the view that the claimed PND is a limiting feature. Example 8 of the patent in suit has an Fe content of 1.55%, hence significantly above the lower limit of the claimed range of Fe. But it shows a PND of 1.0×10^5 , which is exactly at the lower limit of the claimed range.

In the submission of 13 November 2023, the appellant provided figures based on the data disclosed in the patent in suit. The uppermost figure on page 9 suggests a strong increase in the claimed PND with an increasing content of Fe. All the other alloying elements show less or no influence, at least when considered alone.

When following the logic of said figure, it is likely that the claimed PND is not achieved in D1/D1a, example 13, because the iron content is lower than in example 8 of the patent in suit (1.50% vs. 1.55%).

The appellant argued that example 8 was an outlier. While this conclusion is based on the figures provided by the appellant, there is no evidence in the form of experiments in support of its allegation. Therefore it cannot be concluded that there was an error of measurement. The result could also have been caused by the specific composition of the alloy. It cannot be ruled out from the outset that the patent in suit provided consistent and correct data.

1.7 Since the intermetallic compounds are essentially Al-Fe or Al-Fe-Si compounds, it is expedient to compare examples 9 and 13 of D1/D1a with examples of the patent in suit having the most similar iron content, i.e. examples 2, 6 and 8.

The appellant also considers a comparison with example 10 pertinent.

1.8 Compared with example 9 of D1/D1a (Fe: 0.96 %), example 6 of the patent in suit (Fe: 1.04%) contains significantly less Si, Cu and Ti and significantly less iron in solid solution. However, iron in solid solution is not available for forming intermetallic compounds. Example 9 of D1/D1a contains iron slightly below the

lower limit of the claimed range. The unavailability of iron for intermetallic compounds cannot support the assumption that the claimed PND was implicitly disclosed.

- 1.9 Compared with example 13 of D1/D1a (Fe: 1.50%), example 2 of the patent in suit (Fe: 1.46%) contains somewhat less Ti and significantly less Si and Cu. Again, example 13 of D1/D1a contains much more iron in solid solution, unavailable for forming intermetallic compounds. Although less iron is available for forming intermetallic compounds than in example 2 of the patent in suit, the iron still available exceeds the amount of iron of examples 4, 6 and 10 in the patent in suit. There should thus in principle be enough iron available to achieve the disputed feature. Whether the claimed PND was indeed achieved is however speculative since the impact of the slightly lower titanium content, the higher amounts of iron in solid solution and the significantly different amounts of Si and Cu are not clear.

It cannot therefore be concluded that in D1/D1a nothing other, within the meaning of [T 95/97](#) (Reasons 3.3) and [T 51/10](#) (Reasons 2.4), than the claimed PND was obtained.

- 1.10 With respect to example 8 of the patent in suit (Fe: 1.55%), reference is made to paragraph 1.6 above. It is immediately obvious that the lower iron content in D1/D1a, example 13 (Fe: 1.50%) argues against the implicit disclosure of the claimed PND.
- 1.11 The appellant also referred to the patent in suit, example 10 (Fe: 1.24%), which according to the appellant had a composition similar to D1/D1a,

example 13 (Fe: 1.50%) when reducing the iron content by the amount of iron in solid solution.

According to the appellant, the figures provided in the letter dated 23 November 2023, relating to Cu and Ti, showed that these did not have any influence on the PND.

However, Example 10 of the patent in suit has a considerably higher Ti content (0.11% v. 0.018%), less Si (0.12% v. 0.18%), more Cu (0.19% v. 0.12%) and a considerably lower amount of iron in solid solution (459 ppm v. 2855 ppm) than D1/D1a, example 13.

Evidence showing that these differences have no impact on the PND is not available.

It cannot therefore be concluded that in D1/D1a nothing other, within the meaning of [T 95/97](#) (Reasons 3.3) and [T 51/10](#) (Reasons 2.4), than the claimed PND was obtained.

1.12 Consequently, the subject-matter of claim 1 is novel over D1/D1a (Article 54(1) and (2) EPC).

2. Claim 5, novelty, Article 54(1) and (2) EPC

Claim 1 is directed to an aluminum alloy foil for a current collector of an electrode.

Claim 5 is directed to a method for manufacturing an aluminum alloy foil for a current collector of an electrode of claim 1 or 2.

Claim 5 contains all the features of claim 1. A method for manufacturing which does not yield the claimed product of claim 1 is not covered by the definition of

claim 5.

The subject-matter of claim 5 is therefore also novel over D1/D1a (Article 54(1) and (2) EPC).

3. Claim 1, inventive step, Article 56 EPC

3.1 Admission of D2/D2a and D3/D3a

Documents D2/D2a and D3/D3a were late-filed. Their admission was subject to the opposition division's discretion. No error of the opposition division in exercising its discretion not to admit D2/D2a and D3/D3a can be recognised.

The opposition division considered their *prima facie* relevance in view of the heat treatment steps, the number of intermetallic particles and example 17 of the patent in suit.

It concluded that D2/D2a and D3/D3a should not be admitted into the proceedings because they were not considered relevant.

The opponent argued that the opposition division's assessment of the relevance on a *prima facie* basis was substantially flawed.

The board cannot recognise that the opposition division has applied the wrong standard or applied it in an arbitrary manner in establishing that documents D2/D2a and D3/D3a are not *prima facie* relevant.

The patent in suit is directed to an aluminum foil for a current collector of an electrode. Neither D2/D2a or D3/D3a is directed to such an application. Thus when

starting from D2/D2a, as proposed by the appellant, it is not apparent how the skilled person could unavoidably arrive at an aluminum foil suitable for a current collector of an electrode.

Circumstances of the appeal case which justified their admittance are not present either.

Documents D2/D2a and D3/D3a are thus not admitted into the proceedings (Article 12(6) RPBA 2020).

3.2 The attack under Article 56 EPC was based on D2/D2a and D3/D3a. Since these documents are not part of the proceedings, there is no inventive-step attack on file. The board sees no reason to question inventive step.

4. Sufficiency of disclosure, Article 83 EPC

4.1 While novelty is assessed on the basis of the claims in view of prior art, the basis for assessing sufficiency of disclosure is the whole patent. The considerations in the assessment of novelty are therefore of limited relevance to the assessment of sufficiency of disclosure.

In the assessment of novelty, the evidence on file led to the conclusion that examples 9 and 13 of D1/D1a did not directly and unambiguously disclose the disputed feature. However, this does not render the patent in suit insufficiently disclosed.

4.2 The patent contains a number of examples according to claim 1 and comparative examples. It also explains the impact of the alloying elements (paragraphs [0031]-[0034]). There is no reason to disregard or doubt this guidance from the outset ([T 1596/16](#), Reasons 2.2;

[T 1076/21](#), Reasons 1.1.7).

The appellant did not provide evidence that the invention, particularly the examples in the patent in suit, could not be carried out.

- 4.3 D1/D1a cannot support the alleged fact because it relies on a different size parameter for establishing the PND and thus cannot be directly compared with the patent in suit (see considerations under novelty). This would not have been different had the opponent itself carried out and filed the experiment in D1/D1a, example 13. The crucial aspect is not the author of the experiment but the non-comparability of the different definitions for the PND.

Also the allegation that the invention cannot be carried out over the whole claimed range is unproven.

- 4.4 In the opposition proceedings, the opponent alleging insufficiency of disclosure has the burden of proof. The appellant did not discharge its burden of proof, as it did not provide evidence which would allow sufficiency of disclosure to be questioned.
- 4.5 Consequently, there is no reason to doubt that the skilled person can repeat the examples of the patent. Based thereupon and on the teaching of the patent, the skilled person is able to provide further aluminum alloy foils falling within the scope of claim 1. The requirements of Article 83 EPC are met.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:



C. Vodz

G. Glod

Decision electronically authenticated