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**Datasheet for the decision
of 30 January 2024**

Case Number: T 0063/22 - 3.3.05

Application Number: 15848665.4

Publication Number: 3205734

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Language of the proceedings: EN

Title of invention:
SUPERPLASTIC-FORMING ALUMINIUM ALLOY PLATE AND PRODUCTION
METHOD THEREFOR

Patent Proprietor:
UACJ Corporation

Opponent:
Speira GmbH

Headword:
SUPERPLASTIC-FORMING ALUMINIUM ALLOY PLATE / UACJ

Relevant legal provisions:
EPC Art. 83
EPC R. 139

Keyword:

Sufficiency of disclosure - (no)

Correction of error - immediately evident that nothing else could have been intended (no)

Decisions cited:

G 0001/03, T 1845/14, T 0380/05, T 0172/99

Catchword:



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Case Number: T 0063/22 - 3.3.05

D E C I S I O N
of Technical Board of Appeal 3.3.05
of 30 January 2024

Appellant:
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Decision under appeal: **Decision of the Opposition Division of the European Patent Office posted on 15 November 2021 revoking European patent No. 3205734 pursuant to Article 101(3)(b) EPC.**

Composition of the Board:

Chairman E. Bendl
Members: J. Roider
P. Guntz

Summary of Facts and Submissions

I. The appeal lies from the opposition division's decision to revoke the patent because the underlying invention was not sufficiently disclosed.

II. Claims 1 and 5 as granted read as follows:

"1. A superplastic-forming aluminum alloy plate comprising an aluminum alloy containing 2.0 to 6.0 mass% Mg, 0.5 to 1.8 mass% Mn, 0.40 mass% Cr or less and a balance of Al and unavoidable impurities, wherein the unavoidable impurities are restricted to have 0.20 mass% Fe or less, 0.20 mass% Si or less, 0.10 mass% Ti or less and at least one selected from 0.05 mass% Cu or less and 0.05 mass% Zn or less, the 0.2% proof stress is 340 MPa or more and the density of intermetallic compounds having an equivalent circle diameter of 5 to 15 μm at the RD-TD plane which extends along the center of the plate cross-section is 50 to 400 pieces/ mm^2 ."

*"5. A method for producing the superplastic-forming aluminum alloy plate according to any one of claims 1 to 4, comprising:
a casting step for casting a molten metal of the aluminum alloy in which $1000 \leq t/L \leq 4000$ is satisfied, where t is the thickness of an ingot (mm) and L is an amount of cooling water per unit time and unit ingot length (liter[sic]/minute \cdot mm),
a homogenization step for heat treating the obtained ingot at 400 to 560°C for 0.5 hours or longer,
a hot rolling step for hot rolling the homogenized ingot in which the reduction ratio at a temperature of 250 to 350°C in the last 1 pass is 30% or more, and a*

cold rolling step for cold rolling the hot-rolled plate with a final reduction ratio of 50% or more."

III. In the appeal proceedings, the proprietor (appellant) maintained the set of claims as granted, which had already been discussed in the decision under appeal, as its only claim request.

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

Article 100(b) EPC

The parameter t/L was an unusual parameter but the t and L constituting that ratio were common in the art. The parameter t was the ingot thickness in mm and L was the amount of cooling water in litres per minute per unit ingot length.

The skilled person would immediately recognise that using the ingot thickness for both t and L in the formula t/L did not make sense. The cooling requirement increased in direct proportion to the ingot width. The formula t/L thus only made sense if the ingot circumference was used for calculating the parameter L .

It was also clear to the skilled person that the feature "*unit length of ingot thickness*" in paragraph [0033] was erroneous and should have read "*unit length of ingot ~~thickness~~*", which was however unclear. As the skilled person could determine the amount of cooling water in light of the prior art, they would immediately arrive at the conclusion that nothing other than the "*unit length of the circumference of the ingot*" was meant. Also, the last sentence in paragraph [0033] supported this view.

Even if L was interpreted as being the ingot thickness, the patent did not lack sufficiency of disclosure. There was no evidence that the particle density in claim 1 could not be obtained when using the ingot thickness instead of the ingot circumference. There was therefore merely a lack of clarity at the boundaries of the claimed range.

- V. The opponent's (respondent's) key arguments can be summarised as follows:

Article 100(b) EPC

Claim 5 made reference to claim 1. The latter required the particle density to be within a specific range. This was achieved by keeping the parameter t/L within a specific range during production. The parameter t/L could however not be determined. Therefore, the patent was not sufficiently disclosed.

According to the wording of claim 5, the feature "*unit ingot length*" referred to a length of the ingot. It was unclear to which length it referred. It was however clear that it did not refer to the ingot circumference. Paragraph [0033] of the patent in suit could not clarify this ambiguity, either. It disclosed that L was the amount of cooling water per unit time and "*per unit length of ingot thickness (unit ingot length)*" which did not suggest that "*unit ingot length*" related to the ingot circumference.

There was also no basis in the application as originally filed for giving the term "*unit ingot length*" the meaning of ingot circumference.

It was not possible to make such a correction, as proposed by the appellant, because it was not immediately clear that nothing else could have been meant.

The patent in suit also contained no indication that L was a parameter originating in the prior art.

VI. Substantive requests:

- (a) The appellant requests that the decision under appeal be set aside and the opposition be rejected, thus the patent be upheld as granted.
- (b) The respondent requests that the appeal be dismissed.

Reasons for the Decision

1. Article 100(b) EPC

1.1 The subject-matter of claim 5 contains the following method step:

"a casting step for casting a molten metal of the aluminum alloy in which $1000 \leq t/L \leq 4000$ is satisfied, where t is the thickness of an ingot (mm) and L is an amount of cooling water per unit time and unit ingot length (liter[sic]/minute·mm)"

1.2 The significance of the feature "unit ingot length" is disputed (with it being referred to hereafter as "disputed feature").

- 1.3 Method claim 5 is dependent on product claim 1. Product claim 1 requires the superplastic-forming aluminium alloy plate to have intermetallic compounds with an equivalent circle diameter of 5 to 15 μm , in a density of 50 to 400 pieces/ mm^2 , a feature further referred to as the claimed particle density.

The claimed particle density is achieved by adjusting the process so as to fulfill the condition $1000 \leq t/L \leq 4000$ (paragraph [0033]). If the parameter t/L is outside of this range, the claimed particle density is not achieved, as also shown in the examples with production conditions P4 and P6 in tables 2 and 3 and paragraphs [0054] and [0055] of the patent in suit.

Use of the correct parameter t/L is therefore essential for achieving the claimed particle density, which in turn is responsible for the advantageous surface properties after forming and the superplastic-forming properties of the product as claimed (see paragraph [0008] of the patent in suit). If the claimed particle density is not achieved, the macroscopic effects the patent aims to achieve cannot be obtained. An unclear definition of this parameter amounts in the present case to a lack of sufficient disclosure (in accordance with T 380/05, point 7.2, with reference to G 1/03, point 2.5.2).

- 1.4 Claim 5 requires L to be an amount of cooling water per unit time and *unit ingot length*. The disputed feature is also used in paragraphs [0013] and [0033] of the patent in suit. Paragraph [0013] is essentially a repetition of claim 5 and is thus incapable of clarifying the meaning of the disputed feature.

The only sentence in paragraph [0033] which uses the

disputed feature reads:

"In the invention, the indicator of the cooling rate represented by t/L is $1000 \leq t/L \leq 4000$, preferably $3000 \leq t/L \leq 4000$, where t is the thickness of the ingot produced (mm) and L is the amount of cooling water per unit time and per unit length of ingot thickness (unit ingot length) (liter[sic]/minute·mm)."

- 1.5 The skilled person is thus taught that the feature *unit ingot length* is identical to the feature *unit length of ingot thickness*.

The skilled person would at most recognise an unfortunate choice of wording but they would not realise that there was a need for a different interpretation or correction.

- 1.6 It is not accepted that the feature *unit length of ingot thickness* actually referred to the ingot circumference, as alleged by the appellant. There is no basis in the patent in suit for completely changing the meaning of this term, e.g. by deleting the word *"thickness"* and purposively interpreting the remaining part as referring to the ingot circumference.

The requirements of Rule 139 EPC are also not fulfilled because it is not apparent that nothing else could have been intended, nor what could have been intended instead.

The only interpretation of the disputed feature which is reasonably supported by the description is that it corresponds to the *unit length of ingot thickness*.

1.7 The appellant alleges to have made an invention. They use the parameter t/L to describe the invention. This parameter is an unusual parameter, which is undisputed.

It is not apparent from the patent in suit that this unusual parameter is derived from parameters t and L found in the prior art, as alleged by the appellant. The patent in suit provides a definition for both t and L. There is nothing to prompt the skilled person to find an alternative definition in the prior art.

1.8 It is precisely in the case of claimed subject-matter relying on a newly formulated and, hence, unfamiliar parameter to define the solution of a technical problem by which a relevant effect is achieved, that the applicant or patentee, who has the duty of making a full and fair disclosure of his invention to the public (Article 83 EPC), is under a particular obligation to disclose all the information necessary to define the new parameter not only (i) in a formally correct and complete manner such that its values can be obtained by a person skilled in the art without undue burden, but also (ii) in a manner which reliably retains the validity of the parameter for the solution of the technical problem for the application or patent in suit as a whole in the sense that the values routinely obtained will not be such that the claimed subject-matter covers variants incapable of providing the relevant effect or, therefore, of solving the associated technical problem. See T 172/99, Reasons 4.5.6.

1.9 The parameter t/L is key to the success of the invention and the ambiguity concerning the disclosure is not merely a lack of clarity at the limits of the claimed range but affects the whole claimed range.

If the parameter t/L does not fulfill the condition $1000 \leq t/L \leq 4000$, the claimed particle density is not achieved, whereby the parameter L must, according to the appellant, be calculated by using the circumference of the ingot. The values in the examples in table 2, column 4, were, according to a statement by the appellant in the oral proceedings, calculated with the ingot circumference. The production conditions P4 and P6 in tables 2 and 3 of the patent in suit show that the claimed particle density is not achieved for $t/L=400$ and $5000 \text{ mm}^2 \cdot \text{min/l}$.

It was confirmed by the appellant in its submission of 13 December 2023, page 3, section II a), that "*the term 'thickness' means 'the smallest of three dimensions'*".

Thus, the length of the circumference of an ingot of rectangular cross-section is **at least** four times longer than the shortest edge, which is the ingot thickness. For typical ingots, this factor is **significantly** higher.

If, for a specific geometry of the casting equipment and a specific amount of cooling water per minute, the parameter L is calculated with the ingot thickness instead of the ingot circumference, the numerical result for L is higher by the quotient of the circumference and the thickness. In order to meet the condition $1000 \leq t/L \leq 4000$, the flaw in the calculation of L must be offset. This can be done by reducing the amount of cooling water per minute by this factor, to only a fraction of the amount required to provide the claimed particle density. The desired effect concerning particle density and, as a consequence, the impact on the surface properties will, however, not be achieved.

Identifying the correct cooling conditions in order to obtain the required properties amounts to a major research project.

- 1.10 The appellant's reference to the last sentence of paragraph [0033] cannot lead to any other conclusion.

It reads:

"In this regard, the larger the t/L value is, the lower the cooling rate is, while the smaller the t/L value is, the higher the cooling rate is."

This expresses nothing other than that, for a specific geometry of the casting equipment, increasing the amount of cooling water per minute leads to a decreasing parameter t/L and *vice versa*. This is a mathematical fact and does not support the interpretation of the disputed feature as proposed by the appellant.

2. Request under Article 112(1) (a) EPC

The appellant considered the decision T 1845/14 to be relevant to the present case. In the event that the board did not assign a sensible meaning to the term under dispute and therefore did not follow the teaching of T 1845/14, they requested a referral to the Enlarged Board of Appeal under Article 112(1) (a) EPC because of an alleged divergence in the case law.

The board interpreted the wording of the claim in such a way as to give it a sensible meaning (see point 1.6 ff. above). Therefore the pre-requisite for the referral is not given.

In addition, T 1845/14 concluded (point 9.8) that in the case of an unclear parameter defined in a claim whose values required in the claim are indicated in the specification to be essential to solving the problem underlying the patent at issue, the ability of the skilled person to solve that problem by reproducing what is claimed is not a suitable criterion for assessing sufficiency of disclosure when the problem or an effect derivable from it are not explicitly or implicitly part of the definition of the claimed subject-matter.

In claim 5, through its reference to claim 1, the case at issue contains a property, the claimed particle density, which is responsible for the desired effect and which is obtained if the unusual parameter t/L is kept within the range claimed in claim 5.

The present decision is in line with T 1845/14. The request for a referral under Article 112(1)(a) EPC is thus refused.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:



C. Vodz

E. Bendl

Decision electronically authenticated