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Datasheet for the decision of 15 March 2024

Case Number: T 1817/22 - 3.2.03

Application Number: 13846727.9

Publication Number: 2909352

IPC: C23C2/06, C23C2/12, C23C2/28

Language of the proceedings: EN

Title of invention:
METHOD OF PRODUCING METAL COATED STEEL STRIP

Patent Proprietor:
Bluescope Steel Limited

Opponent:
ArcelorMittal

Headword:

Relevant legal provisions:
EPC Art. 100(b)

Keyword:
Grounds for opposition - insufficiency of disclosure (yes)

Decisions cited:
G 0003/14

Catchword:

Europäisches Patentamt
European Patent Office
Office européen des brevets

Beschwerdekammern

Boards of Appeal

Chambres de recours

Boards of Appeal of the
European Patent Office
Richard-Reitzner-Allee 8
85540 Haar
GERMANY
Tel. +49 (0)89 2399-0
Fax +49 (0)89 2399-4465

Case Number: T 1817/22 - 3.2.03

D E C I S I O N
of Technical Board of Appeal 3.2.03
of 15 March 2024

Appellant: (Patent Proprietor)	Bluescope Steel Limited Level 11 120 Collins Street Melbourne, VIC 3000 (AU)
Representative:	D Young & Co LLP 3 Noble Street London EC2V 7BQ (GB)
Respondent: (Opponent)	ArcelorMittal 24-26, Boulevard d'Avranches 1160 Luxembourg (LU)
Representative:	Lavoix 2, place d'Estienne d'Orves 75441 Paris Cedex 09 (FR)
Decision under appeal:	**Decision of the Opposition Division of the European Patent Office posted on 16 May 2022 revoking European patent No. 2909352 pursuant to Article 101(3)(b) EPC.**

Composition of the Board:

Chairman	C. Herberhold
Members:	B. Miller
	N. Obrovski

Summary of Facts and Submissions

I. European patent No. 2 909 352 ("the patent") relates to the production of steel strip which has coatings of corrosion-resistant Al-Zn-Si-Mg metal alloys.

II. An opposition against the patent was filed on the grounds of Article 100(c) EPC and Article 100(a) EPC in conjunction with Articles 54 and 56 EPC.

III. The opposition division concluded that the patent in amended form

(a) on the basis of the main request fulfilled the requirements of Articles 83, 84 and 123(2) EPC but did not comply with the requirements of Article 54(3) EPC,

(b) on the basis of auxiliary requests 1, 3, 5, 6, 8, 9, 11 and 12 did not fulfil the requirements of Article 123(2) EPC,

(c) on the basis of auxiliary requests 4, 7 and 10 did not fulfil the requirements of Article 54(3) EPC.

Furthermore, the opposition division did not admit auxiliary request 2 since it did not *prima facie* comply with the requirements of Articles 84 and 123(2) EPC.

For these reasons the opposition division decided to revoke the patent.

IV. This decision of the opposition division was appealed by the patent proprietor ("the appellant").

V. With the summons to oral proceedings, the Board sent a communication pursuant to Article 15(1) RPBA, in which it indicated to the parties its preliminary, non-binding opinion of the case: that the appeal was likely to be dismissed.

VI. At the end of the oral proceedings before the board on 15 March 2024, the following requests were maintained by the parties:

The appellant requested that the decision under appeal be set aside and that the case be remitted to the opposition division for consideration of inventive step on the basis of

- a new main request as filed by e-mail dated 15 March 2024 (in the following referred to as "main request 0"),
- the original main request or one of auxiliary requests 1 to 13 as submitted with the statement setting out the grounds of appeal,
- one of auxiliary requests 14 to 16 as submitted by letter dated 22 September 2023, or
- one of auxiliary requests 17 to 22 as submitted by letter dated 21 December 2023.

The respondent (opponent) requested that the appeal be dismissed.

VII. Wording of the claims

(a) Claim 1 of main request 0 reads as follows:

"Use of cooling water in a method of forming a coating of a metal alloy on a steel strip to form a metal alloy coated steel strip, to maintain a native oxide layer intact on the metal alloy coating, the method including

a hot dip coating step of dipping steel strip into a bath of molten Al-Zn-Si-Mg alloy and forming the metal alloy coating of the Al-Zn-Si-Mg alloy on exposed surfaces of the steel strip, with exposed surfaces of the metal alloy coating oxidising and forming the native oxide layer after the metal alloy coated strip emerges from the metal coating bath, and a step of cooling the metal alloy coated strip with the native oxide layer with the cooling water, and the method including controlling the pH of the cooling water to be in a range of pH 5-9 and the temperature of the cooling water to be in a range of 30-50°C in the strip cooling step to maintain the native oxide layer intact on the metal alloy coating during the downstream steps, the Al-Zn-Si-Mg alloy coating including the following ranges in % by weight of the elements Al, Zn, Si, and Mg:
Zn: 30 to 60%;
Si: 0.3 to 3%;
Mg: 0.3 to 10%; and
Balance Al and unavoidable impurities."

(b) The original main request and auxiliary requests 1 to 22

The original main request and auxiliary requests 1 to 22 define the claimed use by the same features as main request 0, i.e.

i) "to maintain a native oxide layer intact on the metal alloy coating" and

ii) "to maintain the native oxide layer intact on the metal alloy coating during the downstream steps".

The present decision is based on the reproducibility of features i) and ii).

The amendments in all of the further requests on file compared to claim 1 of main request 0 do not address feature i) or ii).

Hence, the specific and detailed wording of the original main request and auxiliary requests 1 to 22 is of no relevance to this decision.

VIII. The appellant's arguments, insofar as they are relevant to this decision, can be summarised as follows:

(a) Admittance of main request 0

Main request 0 was filed in reaction to an objection under Article 123(2) EPC which had been raised for the first time by the board in its communication under Article 15(1) RPBA. Hence, there were exceptional circumstances justifying the submission of the request.

(b) Sufficiency of disclosure

The features of claim 1 had to be interpreted with a mind willing to understand and in a technically sensible manner in the context of the patent as a whole.

The feature "to maintain the native oxide layer intact" in claim 1 had to be interpreted as "to maintain the native oxide layer to an extent that it still covered the coating surface" or as "to maintain the native oxide layer such that it is functionally intact".

The patent showed in Figures 2(a) to 2(c) that the native oxide layer was still present to a certain extent after the use of cooling water under the conditions defined in claim 1. In relation to Figure 2(d), the patent further described how the native oxide layer could be distinguished from an oxide layer formed after the removal of the native oxide layer.

The expression "during the downstream steps" also had to be read in a technically sensible manner and was not to be interpreted literally.
Considering the disclosure of the patent as a whole, the feature only required that the native oxide layer remained intact - within the meaning set out above - during the cooling step. Since the native oxide layer was maintained intact during the cooling step, it was still present during the further downstream steps as long as needed and required, i.e. until further steps were taken that were intended to change or even remove the native oxide layer.

The difference between the invention as defined in claim 1 and that described for example in paragraphs [0016], [0058] and [0059] of the patent was an inconsistency and hence a question of clarity, which was not a ground of opposition.

The skilled person would not conclude from the features of claim 1 that the native oxide layer had to be maintained intact during all possible further downstream steps, in particular during steps which were known to remove the native oxide layer.

IX. The respondent's arguments can be summarised as follows:

(a) Admittance of main request 0

Main request 0 was filed very late, shortly before the beginning of the oral proceedings before the board, and hence well after the communication under Article 15(1) RPBA had been issued. There were no exceptional circumstances justifying the admittance of a further request at this very late stage of the proceedings.

(b) Sufficiency of disclosure

Claim 1 required that the native oxide layer remained intact during the cooling step. A layer was considered intact when it had not been changed or impaired in any way.

The examples of the patent demonstrated that with the disclosed method, the native layer was not maintained intact during the use of cooling water, since the examples described that the native oxide layer was partially removed or not completely removed.

Moreover, the cooling water was only present during the cooling step. Hence, it was impossible that the cooling water was used to maintain the native oxide layer intact during any further downstream steps as required *expressis verbis* by claim 1, in particular when performing further process steps such as a skin pass or passivation step as proposed by the patent.

Reasons for the Decision

1. Preliminary remark

Claim 1 of each request submitted by the appellant is a use claim, characterised in that cooling water is used "to maintain the native oxide layer intact on the metal alloy coating during the downstream steps".

The following reasoning on sufficiency focuses on this characterising feature and applies to claim 1 of each request. Since the finding of the Board is ultimately that the claimed invention is insufficiently disclosed, it follows that any further issues, including the admittance of late-filed requests such as main request 0, do not need to be discussed.

2. Main request 0 - sufficiency of disclosure

2.1 The invention as defined by claim 1 is directed to the use of cooling water in a method of forming a coating of a metal alloy on a steel strip. The use of claim 1 is characterised in that cooling water is used "to maintain the native oxide layer intact on the metal alloy coating during the downstream steps". The particular effect of the use, i.e. maintaining the native oxide layer intact during the downstream steps, is - in the context of a use claim - a mandatory technical feature of the claim, which the person skilled in the art must be able to obtain by following the disclosure of the patent.

2.2 The examples of the patent disclose in paragraphs [0063] and [0064] that controlling the

cooling water as required by claim 1 leads to the maintenance of a "partial native oxide layer", i.e. "there was partial removal of the native oxide layer", the layer being, however, "not totally removed".

The examples of the patent therefore cast doubt on whether it is possible to maintain the native oxide layer **intact** by using cooling water while interpreting the word "intact" in claim 1 in the normal way ("not damaged or impaired in any way").

The appellant argued by reference to the XPS spectra demonstrated in the figures of the patent that in this technical context the term "intact" in claim 1 had to be interpreted as referring to a layer which was functionally intact but could have been reduced in thickness.

However, even if one were to accept, for the sake of argument, that the term "intact" in claim 1 only requires the native oxide layer to remain functionally intact, i.e. to be "not totally removed", the use as defined in claim 1 still cannot be achieved by the skilled person for the following reasons:

2.3 Claim 1 requires that the cooling water is used to maintain the native oxide layer intact "**during** the downstream steps" (emphasis added by the Board).

The patent does not describe how the cooling water of the quenching step can contribute to maintaining the native oxide layer intact during any further undefined downstream steps, given the fact that the cooling water is no longer present during these further downstream steps.

It follows that for this reason alone, the skilled person is unable to reproduce the invention as defined in claim 1. The ground of opposition pursuant to Article 100 b) EPC therefore prejudices the maintenance of the patent.

2.4 The use as defined by claim 1 cannot be reproduced when focusing on the specific downstream steps proposed in the patent, either.

The patent describes that the further downstream steps encompass a skin pass or passivation of the coated surface, see paragraphs [0016], [0019], [0035], [0053], [0054], [0058] and [0059]. Hence, the patent confirms the understanding of a person skilled in the art that, in the context of a method of forming a coating of a metal alloy on a steel strip, further downstream steps include, for example, a passivation step.

It is undisputed that a conventional passivation step for an aluminium alloy can encompass a step of deoxidation, i.e. a step of removing any oxide layer on the surface before the final passivation step.

The patent does not disclose how the cooling water used during the cooling step can be used to maintain the native oxide layer intact during further process steps such as a conventional passivation step.

The same applies to further steps such as a skin pass, which usually impairs the native oxide layer mechanically.

2.5 The appellant argued that the feature "to maintain the native oxide layer intact during the *downstream* steps" had been formulated in an unfortunate manner and should

not be interpreted literally. Claim 1 should be interpreted in line with the disclosure of the patent as a whole, in particular paragraphs [0016], [0058] and [0059]. It was explained therein that the native oxide layer contributed to achieving good results during the passivation since it protected the coating from corrosion **before** the passivation.

Therefore, the feature of claim 1 should be interpreted as "to maintain the native oxide layer intact during the *cooling* step".

This argument is not convincing.

2.5.1 What must be sufficiently disclosed is the invention as defined in claim 1. Since the information provided *inter alia* in paragraphs [0016], [0058] and [0059] of the patent does not correspond to this invention, this information has little impact on how claim 1 is to be interpreted and understood.

The patent discloses in said paragraphs that the invention is based on the finding that the native oxide layer protects the alloy coating from corrosion **before** a downstream passivation step (emphasis added by the board). The teaching of the patent therefore only explains how the cooling water is to be used during the cooling step to maintain the native oxide layer intact during the cooling step.

The invention as defined by claim 1, on the other hand, requires the native oxide layer to be maintained intact - as an effect of the cooling water - also **during** the downstream steps.

2.5.2 The wording of claim 1 leaves no room for the interpretations as proposed by the appellant that the cooling water is used to maintain the native oxide layer intact only during the cooling step, since claim 1 defines *expressis verbis* that cooling water is used to maintain the native oxide layer intact "**during the downstream steps**". The interpretations proposed by the appellant would imply either that parts of the characterising feature ("during the downstream steps") should be ignored or that its meaning should be changed, contrary to the explicit wording thereof. This really over-stretches what can be considered a claim interpretation by "the mind willing to understand" in the context of the description, and would not be compatible with the well-established principle of the primacy of the claims in claim interpretation.

2.6 The appellant argued that the difference between the invention as defined in claim 1 and that described for example in paragraphs [0016], [0058] and [0059] of the patent was an inconsistency and hence a question of clarity, which was not a ground of opposition.

This argument is not convincing either, since the explicit wording of claim 1 ("during the downstream steps") leaves no room for doubt as to the intended use of claim 1.

Moreover, irrespective of the question of whether or not the invention defined by the wording of claim 1 and that defined by the specification of the patent is consistent, the claimed invention must be determined through interpretation, and has to be reproducible in line with the principles explained in G 3/14, point 55 of the reasons:

"A granted claim may turn out not to comply with Article 84 EPC but such non-compliance must be lived with. However, any lack of clarity of the claims may still be highly relevant in opposition proceedings in that it can influence the decisions on issues under Article 100 EPC: see T 127/85 (OJ EPO 1989, 271), Headnote and point 2.1 of the Reasons. For example the lack of clarity of a claim may have a profound effect on the outcome of the grounds for opposition according to (i) Article 100(b) / sufficiency".

2.7 The appellant further argued that the expression "during the downstream steps" had to be interpreted in a technically sensible manner. The skilled person would not necessarily conclude that passivation steps or any other steps which are known to remove the native oxide layer would be addressed by the expression "downstream steps". It would be clear for the skilled person that the native oxide layer was only to be maintained intact as long as it was intended or needed, for example until a passivation treatment comprising a conventional deoxidation step is performed.

This argument is not persuasive either.

The aim of the patent is to achieve a coated article with a passivation layer, see paragraphs [0016], [0019], [0035], [0054], [0058] and [0059].
The patent therefore makes it clear that after the coating step passivation is intended as a further downstream step.

This interpretation is also confirmed by the main request filed by the appellant with the grounds of appeal, which explicitly defines that the downstream steps include passivation.

Therefore, it cannot be concluded that the skilled person reading claim 1 and the patent would not consider the downstream steps to include passivation.

Furthermore, the patent does not disclose any details or requirements concerning the passivation method or passivation solution to be used after the coating step to achieve the intended satisfactory passivation results, see paragraph [0066] of the patent.

In line with the general unspecific disclosure of the patent, the skilled person would thus interpret the expression "further downstream steps" in claim 1 to encompass conventional passivation methods such as a chromate conversion step including deoxidation.

2.8 Hence, although it is indeed the patent as a whole and not claim 1 as such that must convey a reproducible teaching for the person skilled in the art (Case Law of the Boards of Appeal, 10th edition, 2022, Chapter II.C. 3.1), the teaching of the patent as a whole does not provide the required information as to how the use as defined by claim 1 is to be performed. In other words, the use as defined by claim 1 of main request 0 cannot be reproduced by the skilled person. The ground for opposition pursuant to Article 100(b) EPC therefore prejudices the maintenance of the patent on the basis of main request 0.

3. It is undisputed that the same reasoning applies to the original main request and auxiliary requests 1 to 22. As a consequence, none of the requests submitted by the appellant is allowable.

The appeal is therefore not successful.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

C. Spira C. Herberhold

Decision electronically authenticated