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**Datasheet for the decision
of 11 August 2017**

Case Number: T 2150/15 - 3.3.05
Application Number: 12005662.7
Publication Number: 2562144
IPC: C03C3/097, C03C8/08, C04B41/52,
C04B41/89
Language of the proceedings: EN

Title of invention:

Procedure for obtaining a metallic effect on ceramic bases by
ink injection

Applicant:

Sociedad Anónima Minera Catalano-Aragonesa

Headword:

Metal effect ink/SOCIEDAD ANONIMA MINERA CATALANO-ARAGONESA

Relevant legal provisions:

EPC Art. 54, 56, 83, 84, 123(2)

Keyword:

Novelty - (yes)
Inventive step - (yes)
Sufficiency of disclosure - (yes)
Amendments - allowable (yes)

Decisions cited:

T 0231/99, T 0508/08, T 1005/08

Catchword:



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Case Number: T 2150/15 - 3.3.05

D E C I S I O N
of Technical Board of Appeal 3.3.05
of 11 August 2017

Appellant: Sociedad Anónima Minera Catalano-Aragonesa
(Applicant) P° Independencia, 21 - 3°
50001 Zaragoza (ES)

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Decision under appeal: Decision of the Examining Division of the
European Patent Office posted on 15 June 2015
refusing European patent application No.
12005662.7 pursuant to Article 97(2) EPC.

Composition of the Board:

Chairman G. Glod
Members: H. Engl

R. Winkelhofer

Summary of Facts and Submissions

- I. European patent application EP 12005662.7 was refused by a decision of the examining division on the ground that the claims of all pending requests contravened Article 123(2) EPC.
- II. The appeal lodged against this decision was filed timely and the appeal fee was paid. The statement of grounds of appeal was supplemented by amended claims in accordance with a main request and auxiliary requests 1 to 3.
- III. The board issued three communications (dated 16 March 2016, 22 December 2016 and 10 May 2017, respectively) with provisional opinions on procedural and substantive matters.
- IV. Under cover of a submission dated 3 August 2017, the applicant (appellant) filed an amended set of claims 1 to 7 as its sole request, and a description, pages 1 to 9. Further requests, including those for a remittal and for a reimbursement of the appeal fee, had previously been withdrawn on the condition that a patent would be granted; only a request for a correction of the minutes of the oral proceedings before the examining division was upheld.
- V. The only independent claim of this sole request reads:

"1. Procedure for obtaining a metallic effect on ceramic bases by ink jet printing, of the type used in the manufacture of tiles and other ceramic items, characterized in that it uses, separately, a glaze (2) with part of the oxides needed to obtain the metallic effect, including Si and Al, and a metallic ink (4)

with the other part of the oxides required, the metallic ink (4) consisting essentially of iron compounds being oxides or salts and combined with a glaze (2) consisting of P - Si - Al - Li oxides and optionally oxides of Na, K, Mg, Ca, or the metallic ink (4) consisting essentially of Fe-P oxide pigments and combined with a glaze (2) consisting of Si - Al - Li oxides and optionally oxides of Na, K, Mg, Ca, or the metallic ink (4) consisting essentially of Fe - P - Li oxide pigments and combined with a glaze (2) consisting of Si - Al oxides and optionally oxides of Li, Na, K, Mg, Ca, the procedure comprising carrying out a first phase of application (3) of the glaze (2) on a ceramic base (1), wherein the glaze (2) is white and has a matt or gloss finish, continuing with a second phase of ink jet printing (5) of the metallic ink (4) on the coat previously deposited on the ceramic base (1) and causing a reaction between the glaze (2) and the overlaid metallic ink (4) that produces the metallic effect, finishing off with a third phase of firing (6)."

VI. The documents cited in examination procedure included the following:

D1: EP-A-1 921 055

D2: ES-2 246 166 A

D3: WO-A-01 09061

D6: Ferro Spain SA, Nota Técnica, "Tintas Ink-Jet para Decoracion 3D", Bol. Soc. Esp. Ceram. Vidr. volume 50, 2, March/April 2011, pages XXVII to XXX

VII. The arguments of the appellant, insofar as they are of relevance for the decision taken, may be summarized as follows:

- The new claims met the requirements of Article 123(2) EPC. In particular, there was no unallowable intermediate generalisation, as the three different embodiments A, B and C of metallic ink (4) and glaze (2), respectively, were clearly disclosed in the context of the general description of the invention;
- The expression "ink jet printing" was disclosed in the original application in Spanish language ("inyección de tinta");
- D1 disclosed a process wherein a transparent and colorless glass frit was applied on a surface subsequently to a previously recorded ink image (by ink jet printing); D1 was also silent about a chemical reaction between the ink and the glass frit producing a metallic effect; in fact, D1 did not disclose a process for obtaining a metallic effect;
- The metal finishing compositions of D2 were too thick and thus not suitable for ink jet printing;
- D3 did not teach breaking down of a ceramic glaze formulation into two separate formulations which together produce the desired metallic effect;
- Starting from D2 as the closest prior art, the problem of the invention consisted in providing a process for providing a ceramic base, such as a ceramic tile, with a metallic effect in a more efficient and environment-friendly manner;
- The problem was solved by the process as defined in claim 1, by breaking down the ceramic glaze formulation into two separate compositions, the ink part of which was of a viscosity low enough to be suitable for ink jet printing, and which reacted with the ceramic glaze part to produce a metallic effect;
- This teaching was not obvious in view of the prior art.

VIII. Requests

The appellant requests that the contested decision be set aside and a patent be granted on the basis of the following application documents:

Description, pages 1 to 9, filed with letter dated 3 August 2017;

Claims 1 to 7, filed with letter dated 3 August 2017;
Figure 1 as originally filed.

Reasons for the Decision

1. Article 123(2) EPC

The present application documents meet the requirements of Article 123(2) EPC.

Claim 1 finds a basis in original claim 1 and the description, page 8, lines 5 and 6 (for the term "wherein the glaze (2) is white and has a matt or gloss finish"), page 8, lines 9 and 10 (for the term "causing a reaction between the glaze (2) and the overlaid metallic ink (4) that produces the metallic effect"), and pages 5, 6 and 7, and especially the table linking pages 7 and 8 (for the three combinations of glaze (2) and metallic ink (4)).

The expression "ink jet printing" is a correct translation of the term "inyección de tinta" of the original application document in Spanish language (page 2, lines 12, 13, 16 and 17). Evidence for the correctness of the proposed translation into English is found in Annex I of the appellant's submission dated 9 July 2014. "Ink jet printing" is also supported by

original claim 10, disclosing an application of 6 to 200 picoliters of ink per drop.

Further objections under Article 123(2) EPC which formed the basis for the decision of the examining division, in particular the objection of an unallowable intermediate generalisation in claim 1 of the (then) main request, are resolved by the wording of new claim 1.

The board agrees with the examining division that the claim feature "*causing a reaction between the glaze (2) and the overlaid metallic ink (4) that produces the metallic effect*", originally disclosed on page 8, lines 9 and 10, is linked to the specific combinations of glaze and ink, as defined in the preceding paragraphs. Therefore, the new wording of claim 1, which recites these specific combinations of glaze and metallic ink, does not extend beyond the disclosure of the application documents as originally filed.

Dependent claims 2 to 7 find their respective basis in original claims 3, 4, 7 and 9 to 11.

2. Article 84 EPC

During examination of the case the question arose of whether the percentage values appearing in the present application refer to weight-% or to mole-%. In view of the explanations given by the appellant in its letter dated 14 November 2014, the board is satisfied that the skilled person would interpret the numerical values as being expressed in weight-%, as the same compositions, when expressed in mole-%, would give rise to extremely high melting, unvitriifiable formulations.

In addition, the wording "metallic effect" is clear to the skilled person and can be understood as resembling to metals. In any case the "metallic effect" is the inevitable result of the process steps of claim 1.

3. Article 83 EPC

The examining division expressed, in an *obiter dictum* to the decision under appeal, its opinion that some of the claimed glaze compositions were not vitrifiable, or only so at very high temperatures. As an example, a glaze composition of 40 wt-% SiO₂, 15 wt-% P₂O₅, 10 wt-% ZrO₂, 30 wt-% Al₂O₃ and 5 wt-% BaO, then formally falling under the scope of the claim, was given. The application could therefore not be carried out over the whole of the claimed range and contravened Article 83 EPC. However, the examining division did not give a full reasoning for its negative opinion.

Since the scope of claim 1 has been considerably restricted, there is no more reason to doubt that the skilled person would be able to choose the different components such that vitrifiable compositions were obtained.

An occasional failure does not detract from the overall workability of the claimed invention. In order to satisfy the requirements of Article 83 EPC, the skilled person must only be able to obtain substantially all embodiments falling within the ambit of the claim (emphasis added) (see Case Law of the Boards of Appeal EPO, 8th Edition 2016, page 335, chapter 4.4, and the decisions cited therein).

Therefore, the requirements of Article 83 EPC are

met.

4. Article 54 EPC

Process claim 1 is directed to a procedure for obtaining a metallic effect on a ceramic base material by ink jet printing.

Document D1 does not disclose a method for obtaining a metallic effect, because no reaction between the substrate glaze and the coloured ink that may produce such an effect takes place. Moreover, D1 does not disclose a metallic ink consisting essentially of iron compounds or Fe-P oxide pigments or Fe-P-Li oxide pigments.

In accordance with the process described in D2, a metal ink is applied by serigraphy, rotogravure, printing, etc. onto the glaze of a ceramic item which is then fired (see in particular page 5, lines 6, till page 6, line 44). Ink jet printing of the ink is not disclosed.

D3 does not disclose breaking down of a ceramic glaze formulation into two separate formulations according to claim 1 of the patent which together produce a metallic effect. Further D3 is silent about ink jet printing.

D6 discloses inks based on high purity cordierite, mullite or diopside, for the decoration of tiles by ink-jet printing (see page XXVII: "3. Introducción"). The inks are also capable of creating a lustre effect (see page XXIX, left hand column: "Efectos lustrados"). However, the glaze/ink system of D6 differs from the application under appeal in that it is not a two component glaze/metal ink system. Furthermore, the metallic ink does not consist essentially of iron

compounds or Fe-P oxide pigments or Fe-P-Li oxide pigments.

In conclusion, the claims meet the requirements of Article 54 EPC.

5. Inventive step (Article 56 EPC)

5.1 The claimed process relates to improvements in applying metallic finishes on tiles and other ceramic elements.

5.2 In the board's view, D6 represents the closest prior art, since it also relates to applying an ink by ink-jet heads in order to obtain metallic effects on ceramic tiles.

5.3 According to the description, the technique of ink jet printing offers considerable advantages in the decoration of ceramic tiles. However, due to restrictions in the thickness of the ink layer so applied, ink jet printing could hitherto not be used for applying metallic finishes (see description, page 2, third paragraph; page 3, first full paragraph; page 4, second paragraph).

The claimed process aims at solving this technical problem, making the application of metallic finishes more efficient and environment-friendly.

5.4 The claimed solution consists in providing a procedure for obtaining a metallic effect on a ceramic base material by ink jet printing in accordance with claim 1, in which the oxide components of Fe, Si, Al, P and Li of the glaze formulations for metallic finishes are partly incorporated into the glaze, and partly into the metallic ink. This sub-division may be

effected according to the three options claimed.

- 5.5 Decoration of ceramic tiles by ink jet printing, *per se* known from D6, reduces process times and production costs as it allows the decor to be selectively applied only to that areas where required (in contrast to the conventional covering of the whole of the ceramic substrate), thereby avoiding a waste of material (see page 4, third paragraph).

The claimed solution solves the underlying technical problem, because the process of the invention permits the use of ink jet printing devices for applying a metallic ink in that a part of the oxides needed for the metallic effect is applied with the glaze. Breaking down the ceramic glaze formulation into two separate compositions, as defined in claim 1, lowers the thickness (viscosity) of the metallic ink so as to make possible the use of ink jet printing technology for metallic finishes.

- 5.6 It remains to be decided whether the claimed process is obvious in view of the prior art.

In the view of the board, the subject-matter of process claim 1 involves an inventive step, because none of the prior art documents discloses or suggests to apply - by ink jet printing - a part of the oxides needed to obtain a metallic effect as a part of the glaze, and the other part of the oxides required, together with the metallic ink.

Document D6, which represents the closest prior art, does not disclose or suggest a two component glaze/metal ink system for ink-jet printing, as claimed in claim 1.

D3 does not give a hint towards breaking down the ceramic glaze formulation into two separate components.

D2 mentions only conventional application techniques, such as serigraphy, rotogravure, printing, etc., but does not disclose ink jet printing.

D1 is completely silent about a metallic effect.

5.7 In conclusion, the claimed subject-matter is considered to involve an inventive step (Article 56 EPC).

6. Minutes of Oral Proceedings before the examining division

As regards the appellant's request dated 15 October 2015 for a correction of the minutes of the oral proceedings before the examining division, the board is not competent to decide on such a request. The request must be considered and decided on by the examining division who sat at the oral hearing.

T 231/99 (Reasons 1.5), T 508/08 (Reasons 2) and T 1005/08 (Reasons 1.2) have stated that the boards neither have the competence to decide on the accuracy of the first instance minutes nor can they compel the division to make corrections.

The board also draws attention to the communication of the examining division dated 13 November 2015, which refers to the appellant's request, and under cover of which an amended version of the minutes of the oral proceedings should have been sent. However, apparently by mistake, the same text (i.e. the version of 15 June 2015) was sent again (apart from a different document

title on page 1 of the said minutes). It rests with the examining division, to send the corrected version of the minutes again, if still relevant.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The case is remitted to the examining division with the order to grant a patent on the following application documents:
Description, pages 1 to 9, filed with submission dated 3 August 2017;
Claims 1 to 7, filed with submission dated 3 August 2017;
Drawing, Figure 1, as originally filed.

The Registrar:

The Chairman:



C. Vodz

G. Glod

Decision electronically authenticated