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Datasheet for the decision of 30 July 2007

Case Number: W 0019/07 - 3.2.03

Application Number: PCT/EP2006/063509

Publication Number: WO-A2-2006/136610

IPC: B22F 9/10, C04B 41/51, C03C 8/18

Language of the proceedings: EN

Title of invention:
Materials for coating ceramic bodies, processes for the preparation thereof, use thereof and ceramic articles including these materials

Applicant:
Colorabbia Italia S.P.A.

Opponent:
-

Headword:
-

Relevant legal provisions:
PCT Art. 17(3)(a)
PCT R. 13

Keyword:
"Unity - a priori (yes), unity a posteriori (yes)"

Decisions cited:
-

Catchword:
-

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Case Number: W 0019/07 - 3.2.03

International Application No. PCT/EP2006/063509

D E C I S I O N
of the Technical Board of Appeal 3.2.03
of 30 July 2007

Applicant: COLOROBBIA ITALIA S.P.A.

Representative: Notarbartolo & Gervasi
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Decision under appeal: **Protest according to Rule 40.2(c) of the Patent Cooperation Treaty made by the applicants against the invitation (payment of additional fees) of the European Patent Office (International Searching Authority) dated 27 December 2006.**

Composition of the Board:

Chairman: U. Krause
Members: G. Ashley
S. Hoffmann

Summary of Facts and Submissions

I. International patent application PCT/EP2006/063509 (international publication number WO-A2-2006/136610) was filed with the following twenty-two claims:

"1. Materials for coating of ceramic bodies comprising or consisting of metal powders.

2. Materials as claimed in claim 1, wherein said materials for coating of ceramic bodies are chosen in the group consisting of: frits, frit granules, ceramic paints, atomized, sintered, pelletized and granulated materials, enamels and crystal glazes for screen printing or silicone roller application, enamels and crystal glazes for dry application before, during and after pressing of the support, supplied dry and/or in a medium, in a wide range of grain sizes and suitable for all specific cases.

3. Materials as claimed in claims 1 and 2, wherein said metal powders are atomized powders composed of iron, nickel, cobalt or copper based alloys.

4. Materials as claimed in claim 3, wherein said atomized powders are produced by cooling the alloy in a flow of nitrogen or argon so that the particles forming the powder have spherical shape and an extremely low metal oxide content.

5. Materials as claimed in Claims 1 - 4 wherein the powder consists of a mixture of particles of different diameter.

6. Materials according to Claim 5 wherein the particles dimensions are comprised between 50 and 150 micron.

7. Materials according to Claim 6 wherein the fraction of particles having dimensions higher then 100 micron is comprised between 20 - 40 % wt on the total of the powder.

8. Materials as claimed in claims 1 to 7, wherein said metal powders have the following compositions in which the percentages are indicated in weight in relation to the total weight of the material:
Fe 50 - 90%; Cr 4 - 35%; Ni 4 - 11%;
Ni 75 - 96%, Cr 6 - 15%, Fe 1 - 4;
Co 50 - 68%; Cr 20 - 30%, Ni 2 - 25%;
Cu 75 - 92%; Ni 1 - 5%; Fe 1 - 3 %;
and optionally B, Si, C, W, Mo, Mn, Al, Ni, Nb, Sn, Zn.

9. Materials as claimed in claim 8, wherein said metal powders have the following compositions:
Fe 67% Cr 17%, Ni 12%, Mo 2,5% Mn 1,5%
Cr 26%, Ni 10%, Mo 5%, Si 1,5%, C 2
Cu 89% Al 10% Fe 1%
Co 36% Cr 26% W 12,5% Ni 22,5% Si 1,2% C 1,7%
Cu 89,1%, Al 7,3%, Zn 2,7%, Sn 0,3%, Ni 0,2%, Fe 0,4% (mint alloy)
Co 27, 1%, Cr 31,6%, Ni 23,90%, Cu 0,4%, Fe 2,2%, Mn 0,5%, W 14,3%

10. Materials as claimed in claims 1 to 9, composed of metal powders as defined in the previous claims in combination with other materials conventionally used in ceramics.

11. Materials as claimed in claim 10, wherein said other materials conventionally used in ceramics are chosen from the group composed of: frits, feldspars, kaolins, clays, zirconium silicates, alumina-silica minerals containing alkaline and/or alkaline earth elements, metal oxides.

12. Materials as claimed in claims 10 and 11 , wherein the metal powders are present in percentages ranging from 35 to 95% in weight calculated on the weight of the material.

13. Method for preparing materials as claimed in claims 10 to 12, wherein: the metal powders are added to other the materials conventionally used in ceramics as indicated above in a dry mixer or other machine suitable for the type of material to be mixed, to obtain homogenization.

14. Use of materials as claimed in claims 1 to 12 for the coating of the ceramic body of ceramic articles.

15. Use as claimed in claim 14, wherein said ceramic articles are double-fired, porous single-fired, single-fired, porcelain stoneware, third- and fourth-fired ceramic objects.

16. Ceramic articles with metallic effect composed of double-fired, porous single-fired, single-fired and porcelain stoneware ceramic objects comprising a coating obtained with the materials as claimed in claims 1 to 12.

17. Ceramic articles as claimed in claim 16, wherein said materials are composed of metal powders applied dry.

18. Ceramic articles as claimed in claims 16 and 17, wherein said objects are tiles.

19. Method for producing ceramic articles as claimed in claims 16 to 18, wherein:
- the metal powders are applied dry to the surface of the ceramic body creating the desired decoration by means of a suitable mechanical system;
- the ceramic body is subjected to the usual drying and firing operations, at the temperatures and for the times and cycles normally required.

20. Method for producing ceramic articles as claimed in claims 16 to 18, wherein:
- materials as claimed in claims 10 to 12 are applied to the ceramic body, if necessary with the aid of the usual media;
- the ceramic body is subjected to firing at the normal temperatures and for the times and cycles required.

21. Method for producing ceramic articles as claimed in claims 19 and 20 wherein the cooling of the fired article is performed in furnaces with a flow of nitrogen.

22. Method as claimed in claims 19 to 21 , wherein the cooled ceramic article is smoothed and polished."

II. On 27 December 2006 the European Patent Office (EPO) acting as International Searching Authority (ISA) pursuant to Article 16(1) PCT and Article 154(3) EPC informed the applicant that the application did not comply with the requirements of unity of invention (Rules 13.1, 13.2 and 13.3 PCT) and invited the applicant to pay eleven additional search fees (Article 17(3)(a) and Rule 40.1 PCT).

III. The ISA considered that the set of claims covered the following twelve inventions:

I: Claims 1, 3-22 (partly) are directed to an iron based alloy, that can be used for coating ceramic bodies, the use of the alloy for coating a ceramic body, ceramic bodies coated with the alloy and the method of producing the ceramic bodies.

II: Claims 1, 3-22 (partly) are directed to a nickel based alloy, that can be used for coating ceramic bodies, the use of the alloy for coating a ceramic body, ceramic bodies coated with the alloy and the method of producing the ceramic bodies.

III: Claims 1, 3-22 (partly) are directed to a cobalt based alloy, that can be used for coating ceramic bodies, the use of the alloy for coating a ceramic body, ceramic bodies coated with the alloy and the method of producing the ceramic bodies.

IV: Claims 1, 3-22 (partly) are directed to a copper based alloy, that can be used for coating ceramic bodies, the use of the alloy for coating a ceramic body,

ceramic bodies coated with the alloy and the method of producing the ceramic bodies.

V: Claims 2, 5 to 7, 14 to 16, 18, 20 to 22 (partly) are directed to frits or frits granules that can be used for coating ceramic bodies, the use of this material for coating a ceramic body, ceramic bodies coated with this material and the method of producing the ceramic bodies.

VI: Claims 2, 5 to 7, 14 to 16, 18, 20 to 22 (partly) are directed to ceramic paints that can be used for coating ceramic bodies, the use of this material for coating a ceramic body, ceramic bodies coated with this material and the method of producing the ceramic bodies.

VII: Claims 2, 4 to 7, 14 to 16, 18, 20 to 22 (partly) are directed to atomised materials that can be used for coating ceramic bodies, the use of this material for coating a ceramic body, ceramic bodies coated with this material and the method of producing the ceramic bodies.

VIII: Claims 2, 5 to 7, 14 to 16, 18, 20 to 22 (partly) are directed to sintered materials that can be used for coating ceramic bodies, the use of this material for coating a ceramic body, ceramic bodies coated with this material and the method of producing the ceramic bodies.

IX: Claims 2, 5 to 7, 14 to 16, 18, 20 to 22 (partly) are directed to pelletised materials that can be used for coating ceramic bodies, the use of this material for coating a ceramic body, ceramic bodies coated with this material and the method of producing the ceramic bodies.

X: Claims 2, 5 to 7, 14 to 16, 18, 20 to 22 (partly) are directed to granulated materials that can be used for coating ceramic bodies, the use of this material for coating a ceramic body, ceramic bodies coated with this material and the method of producing the ceramic bodies.

XI: Claims 2, 5 to 7, 14 to 16, 18, 20 to 22 (partly) are directed to enamels that can be used for coating ceramic bodies, the use of this material for coating a ceramic body, ceramic bodies coated with this material and the method of producing the ceramic bodies.

XII: Claims 2, 5 to 7, 14 to 16, 18, 20 to 22 (partly) are directed to crystal glazes that can be used for coating ceramic bodies, the use of this material for coating a ceramic body, ceramic bodies coated with this material and the method of producing the ceramic bodies.

IV. In reply (letter dated 26 January 2007) the applicant requested establishment of an International Search Report in respect of the subject matter identified in the first four inventions listed above, and under protest (Rule 40 PCT) paid three additional search fees. On 16 April 2007 an International search report, together with a written opinion under Rule 43*bis*.1, was drawn up for claims 1 and 3 to 22 in respect of the four inventions; at the same time the ISA invited the applicant to pay the protest fee (Rules 40.1(iii) and 40.2(c) PCT). The protest fee was paid on 14 May 2007 within the one month time limit set in Rule 40.1(iii).

V. The following prior art document is relevant for this decision:

D1: DE-C1-4 111 711

VI. The ISA identified the general concept of the first four inventions as being a metal based alloy powder, that can be used for coating ceramic bodies, the use of the alloy powder for coating a ceramic body, ceramic bodies coated with the alloy powder and the method of producing the ceramic bodies, with the common goal being to obtain ceramic bodies with a metallic effect on the surface. This, however, is known from D1 and the subject-matter of independent claim 1 is not novel.

Claim 3 is dependent upon claim 1 and defines the metal powders as atomised powders composed of iron, nickel, cobalt or copper based alloys. Although not explicitly stated, it seems that the ISA sees no common technical link between these metals and hence considers each of them to define a separate invention.

The ISA also argued that dependent claim 2, when read with the term "consisting of" in claim 1, defines the option of having a material without a metallic powder, contrary to the general concept of the invention, and hence this gives rise to a further series of inventions, listed as V to XII above.

VII. The applicant argued that the present application concerns materials for coating ceramic bodies which give the bodies a metallic effect. The invention lies in the addition of metal powders to conventional ceramic coating compositions. In light of D1 and the

wording of claim 1, the applicant accepted the subject-matter referring to the different metals (I to IV above) could be considered as separate inventions, but was of the view that claim 1 could nevertheless be amended to define novel and inventive features. The applicant suggested that the separate inventions indicated by the ISA as V to XII was based on a misunderstanding, since, according to the invention, metal powder is added to all the materials listed under V to XII.

Reasons for the Decision

1. The additional search fees were paid under protest in the sense of Rule 40.2(c) PCT. The protest complies with the requirements of Rule 40.2(c) and (e) PCT and is therefore admissible.

2. The application concerns the formation of a surface that has a metallic appearance on ceramics; this is achieved by using coating materials containing metal powders. The lack of unity objections put forward by the ISA appear to arise both *a priori*, that is before considering the claims in relation to any prior art, and secondly *a posteriori*, that is after taking prior art into consideration. However, for the following reasons, the Board considers that the application meets the requirement of Rule 13.1 PCT.

2.1 *A Priori* Objection

Independent claim 1 is directed to materials for coating ceramic bodies comprising or consisting of metal powders. The particular form that the materials

take is given in dependent claim 2. When, for example, ceramic paints or frits are chosen from the list in claim 2, the ISA argues that an inconsistency arises, as use of the term "consisting of" in claim 1 means that the material only contains metal powders and nothing else. Since it is not possible to have frits or a ceramic paint only containing metals, the ISA construed claim 1 as also defining purely ceramic materials; this was considered to be "the direct cause of the non-unity objection" (see sheet 4, second paragraph). However, the Board does not agree with this line of argument.

Claim 1 gives the reader a choice in that the material may either "comprise" or "consist of" metal powders. Although the group of materials in claim 2 is exclusive (as denoted by the expression "consisting of" in relation to the group), claim 2 does not define the material of claim 1 as "consisting of" one of the members of the group, it merely states that the material is chosen from the group, but by virtue of the dependency of claim 2, it is then subject to the requirements defined in claim 1.

The whole purpose of the invention, as set out in the description, is to provide the surface of ceramics with a metallic appearance by using coating materials that contain metal powders. It is therefore unrealistic to interpret the claim as being directed to non-metallic coating materials, as this is in contrary to the invention. It is apparent to a skilled reader, that when the material is in the form of frits or ceramic paint, it must in addition "comprise" metal powders in order to provide the desired metallic effect. The

interpretation by the ISA that claim 1 also relates to purely ceramic materials is against the basic teaching of the application.

2.2 *A Posteriori* Objection

Claim 1 defines materials for coating ceramic bodies comprising or consisting of metal powders. This has been correctly construed by the ISA as meaning merely materials comprising or consisting of metal powders which are suitable for coating ceramic bodies (see Item V, Novelty, "Interpretation of the claims). As acknowledged in the application (page 2, lines 27 to 28), such powders are widely known in the metallurgical sector and, for example, D1 discloses an alloy powder based on nickel and/or iron and/or cobalt, which is also used to coat ceramics (see D1, column 1, lines 50 to 68). The Board therefore shares the opinion of the ISA that claim 1 is anticipated by D1.

Chapter 10, paragraph 10.08 of the PCT International Search and Preliminary Examination Guidelines, as in force from 25 March 2004, states that if an independent claim does not avoid the prior art, as in this case, then the question whether there is still an inventive link between all the claims dependent on that claim needs to be carefully considered. If each of the dependent claims directly refers back to a fully anticipated independent claim, then there may be lack of unity *a posteriori*, however only in case there is no inventive link between the remaining dependent claims.

Dependent claim 2 contains a list of preferred materials, and dependent claim 3 contains a list of preferred metal powders. The ISA argued that, since the subject-matter of claim 1 is known, metal powders cannot be treated as the special technical feature linking the subject-matter of the claims; consequently each of the materials defined in claim 2 and each of the alloys of claim 3 are to be considered as separate inventions.

Although the general concept of coating using a material containing metal powders is known, the application is directed to providing an improved metal coating over those known in the art (see page 2 of the description, lines 5 to 10). The dependent claims refer to specific details of the metal powders used in the invention, such as compositions (claims 3, 4, 8, 9), particle dimensions (claims 5 to 7) and the amount of metal powders contained in the material (claim 12). The subject-matters of these claims all relate to the provision of metallic coatings on ceramics, and thus can be considered as being linked to form a single general inventive concept, even though the specific subject-matter of claim 1 is known in the art. It appears inappropriate to label preferred embodiments of the single inventive concept as lacking unity, when, as submitted by the applicant, it seems possible to amend claim 1 to incorporate one or more of the features of the dependent claims to yield a novel and inventive independent claim.

The present case does not involve a clear case of lack of unity, and the proper forum for dealing with this set of claims appears to be novelty and inventive step.

It is not appropriate in this decision to set out a detailed analysis of novelty and inventive step of all the claims, but it seems that the core of the invention might lie in the use of metal powders having a low oxygen content, as this improves the metallic appearance of the coating; whereas metal powders are usually atomised by water, powders with low oxygen contents can be obtained by atomising in nitrogen or argon gas.

Claims 14 and 15 concern the use of the claimed materials for coating ceramic articles, claims 16 to 18 relate to ceramic articles comprising the claimed coating and claims 19 to 22 concern methods of making the claimed ceramic articles; these claims are therefore also linked to the main concept of the invention, namely to provision of an improved metal coating.

As mentioned in the PCT Guidelines as in force from 25 March 2004 in chapter 10 at paragraph 10.04, "Although lack of unity should be raised in clear cases, it should neither be raised or persisted in on the basis of a narrow, literal or academic approach." The approach adopted by the ISA in identifying twelve inventions seems in particular to be the result of a literal and academic approach, and in the present case not appropriate.

Order

For these reasons it is decided that:

Reimbursement of the three additional search fees and of the protest fee is ordered.

The Registrar: The Chairman:

R. Schumacher U. Krause