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**Datasheet for the decision
of 11 February 2021**

Case Number: T 2716/16 - 3.2.03

Application Number: 10179700.9

Publication Number: 2305852

IPC: C23C4/08, C23C4/12, C23C28/00,
F01D5/28, F01D25/00

Language of the proceedings: EN

Title of invention:
Method for the Production of a single layer bond coat.

Patent Proprietor:
General Electric Company

Opponent:
Siemens Aktiengesellschaft

Headword:

Relevant legal provisions:
EPC R. 99
EPC Art. 56

Keyword:

Admissibility of appeal - notice of appeal - indication of the
impugned decision - notice of appeal - name and address of
appellant - notice of appeal - request defining subject of
appeal

Inventive step - improvement not credible

Decisions cited:

T 0001/88, T 0620/13

Catchword:



Beschwerdekammern
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Case Number: T 2716/16 - 3.2.03

D E C I S I O N
of Technical Board of Appeal 3.2.03
of 11 February 2021

Appellant: Siemens Aktiengesellschaft
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Decision under appeal: **Decision of the Opposition Division of the
European Patent Office posted on 16 December
2016 rejecting the opposition filed against
European patent No. 2305852 pursuant to Article
101(2) EPC.**

Composition of the Board:

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

Summary of Facts and Submissions

I. European patent No. 2 305 852 ("the patent") relates to a method for forming a protective coating system on a metal substrate by a thermal spray process.

II. An opposition was filed against the patent based on the grounds of Article 100(b) and (c) EPC and Article 100(a) EPC together with both Articles 54 and 56 EPC. The opposition division decided to reject the opposition.

This decision was appealed by the opponent ("the appellant").

III. The appellant requested that the decision under appeal be set aside and that the patent be revoked in its entirety.

The patent proprietor ("the respondent") requested that the appeal be rejected as inadmissible under Rule 101(1) EPC or dismissed.

IV. Claim 1 of the patent including a feature numbering as proposed by the appellant in its grounds of appeal reads as follows:

"A method for forming a protective coating system on a metal substrate, said method comprising:

- 1.1 applying a single layer bond coat to a superalloy metal substrate in a thermal spray process
- 1.2 from a single homogeneous powder composition

- 1.3 having a particle size distribution range wherein: 90% by volume of the particles are within a range of 10 μm to 100 μm ;
- 1.4 the percentage of particles within any 10 μm band within the range does not exceed 20% by volume; and
- 1.5 the percentage of particles within any two adjacent 10 μm bands within the range does not deviate by more than 8% by volume."

Claims 2 to 11 as granted relate to preferred embodiments of the process according to claim 1.

V. State of the art

The following document of the opposition proceedings was of relevance for the present decision:

D1: US 5,817,372 A

VI. With the summons to oral proceedings, the Board sent a communication pursuant to Articles 15(1) and 17(2) of the Rules of Procedure of the Boards of Appeal (RPBA 2020) indicating to the parties its preliminary, non-binding opinion that the subject-matter claimed did not involve an inventive step (see point 8 of the communication).

VII. With the consent of both parties, oral proceedings were held on 11 February 2021 by videoconference.

VIII. The appellant's arguments, as far as they are relevant for this decision, can be summarised as follows.

The notice of appeal contained obvious errors but nevertheless fulfilled the requirements of Rule 99 EPC.

The contested patent did not describe an unexpected effect linked to the use of a particle composition as defined in claim 1.

The objective technical problem could thus be formulated as the provision of an alternative particle composition. Arbitrarily varying the particle composition in a spraying process as disclosed in D1 would have been customary practice for the skilled person.

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

The notice of appeal did not meet the requirements of Rule 99 EPC since it i) did not refer to the correct tenor of the contested decision, ii) was not addressed to the European Patent Office, iii) did not clearly identify the appellant and iv) did not cite the correct date of the decision. Therefore, the appeal was inadmissible.

D1 did not disclose a process for the deposition of a bond coat for a thermal barrier system making use of a homogeneous particle powder composition having the flat and smooth particle size distribution as defined by the parametric definition according to claim 1.

Starting from D1, it would not have been obvious to form a single bond coat by using a powder composition having the very specific and unusual particle size distribution as defined in claim 1 to obtain an improved bond coat.

Reasons for the Decision

1. Admissibility of the appeal

1.1 The letter forming the notice of appeal was written on behalf of Siemens Aktiengesellschaft with its address clearly indicated in the letter head. Therefore, there is no doubt who filed the notice of appeal and who the appellant is. Thus, the requirements of Rule 99(1)(a) EPC are met.

1.2 The opposition division decided to reject the opposition against European patent 2 305 852. However, the appellant requested in the notice of appeal that the decision on the revocation of the patent be set aside. Therefore, the wording used by the appellant in the notice of appeal when referring to the impugned decision is not correct.

Interpreting the notice of appeal in an objective way, it is immediately apparent that the appellant filed an appeal against the decision of the opposition division concerning the opposition against European patent 2 305 852 and therefore inherently against the rejection of the opposition as required according to Rule 99(1)(b) EPC. The fact that the appellant referred to the opposition division's decision in its notice of appeal erroneously as a decision on the revocation of the patent is thus immaterial to the admissibility of its appeal (see T 1/88 in which the appellant (opponent) had also erroneously referred to the opposition division's decision to reject the opposition as a decision to reject the application).

Arguing in favour of the inadmissibility of the appeal, the respondent referred, *inter alia*, to decision T 620/13. However, the procedural situation underlying T 620/13 can be distinguished from the case at hand since in T 620/13 it had not been possible to identify any request to appeal at all. The conclusions in T 620/13 are therefore not applicable to the current case.

- 1.3 In its notice of appeal, the appellant referred to the decision of 16 December 2016 on patent No. 2 305 852 as the impugned decision and requested that this decision be set aside. Although the opposition division's decision to reject the opposition was taken at the end of the oral proceedings on 22 November 2016, the grounds for this decision are dated 16 December 2016.

The date indicated in the notice of appeal is thus consistent with the opposition proceedings against the identified patent. The reference to the date when the reasoned decision was posted does not generate any doubts as to which decision is appealed by the notice of appeal.

- 1.4 Under Rule 99(1)(c) EPC, the notice of appeal must contain a request defining the subject of the appeal. According to established case law (Case Law of the Boards of Appeal, 9th edition 2019, Chapter V.A. 2.5.2 c), this requirement is satisfied if the notice of appeal identifies the impugned decision and contains a request to set aside this decision.

- 1.5 In its statement of grounds of appeal, the appellant specified its previous request and requested that the opposition division's decision to reject the opposition be set aside and that the patent be revoked in its

entirety. This also corresponds to the appellant's requests in the opposition proceedings.

Therefore, the appeal also satisfies Rule 99(2) EPC, which stipulates that the extent to which the impugned decision is to be amended must only be indicated in the statement of grounds of appeal.

1.6 Although the letterhead on the notice of appeal refers to "Paul & Albrecht" and not to the European Patent Office, the notice of appeal was actually submitted to the European Patent Office, which is without any doubt the intended addressee of the letter.

1.7 In summary, the appeal fulfils the requirements of Rule 99 EPC and is thus admissible.

2. Article 100(a) in combination with Article 56 EPC

2.1 D1 discloses a process for the deposition of a bond coat for a thermal barrier system on a superalloy. Thus, it deals with the same purpose as the contested patent. Therefore, the Board agrees with the statement in point 2.5 of the contested decision and the submissions of the parties that D1 is an appropriate starting point for the assessment of inventive step.

2.2 It is correctly argued in the contested decision that D1 discloses a preferred embodiment according to which the bond coat is formed by applying a first layer of fine particles and a second layer of the particle mixture since this provides a further improved barrier to oxidation (see column 5, lines 1 to 6).

However, the teaching of D1 is not limited to this embodiment. D1 clearly describes in addition that a bond coat can be formed by a single layer which can be obtained by applying a mixture of finer and coarser particles (see column 3, lines 17 to 21, column 4, lines 51 to 63, or dependent claim 5).

According to the embodiment described from column 5, line 50, to column 6, line 16, of D1, the bond coat is formed by the high velocity oxy-fuel (HVOF) process using a mixture of a fine powder having a particle size distribution of 22 to 44 μm and a coarse powder having a particle size distribution of 44 to 89 μm . The ratio of fine to coarse particles in the mixture is 5:8.

D1 therefore describes a method of forming a single layered bond coat by using a single powder composition.

2.3 D1 further describes in column 3, lines 29 to 39, that the finer particles fill the interstices between particles of the coarser powder and thereby increase the density and micro-surface roughness.

Hence, when applying a single bond coat according to the teaching of D1, the mixture of the fine and coarse particles has to be relatively homogeneous to achieve this effect described in D1 and to obtain the inherently required uniformity of the single bond coat. It follows that the particle mixture disclosed in D1 has to be homogenous within the meaning of claim 1 of the patent.

2.4 The subject-matter of claim 1 therefore differs from the coating method of D1 in that the particles of the powder composition for forming the bond coat have a smoother and flatter particle size distribution, i.e. the percentage of particles within any 10 µm band within the range does not exceed 20% by volume, and the percentage of particles within any two adjacent 10 µm bands within the range does not deviate by more than 8% by volume (features 1.4 and 1.5 of claim 1).

2.5 The patent does not demonstrate or at least generally describe an effect which can be obtained by using a particle composition as defined by claim 1 for forming the bond coat. In particular, the examples of the patent only provide a comparison between a process leading to a single layered bond coat and a process forming a bi-layered bond coat (see Table 1).

However, D1 already teaches that a single layered bond coat can be obtained when applying a mixture of fine and coarse particles. Hence the results in Tables 1 and

2 of the patent are not relevant in view of the teaching of D1.

The patent describes (in paragraph [0022] with reference to Figure 5) the ideal particle size distribution of the spray powder and states that in reality a powder with a particle size distribution having a "bi-modal" aspect such as illustrated by Graph D in Figure 5 is used to form the bond coat. However, it does not further demonstrate that a single layered bond coat obtained by a bi-modal powder composition having a particle size distribution in accordance with Graph D of Figure 5 of the patent, which fulfils the requirements of claim 1, has improved properties compared to a bond coat obtained by a bi-modal powder having a different particle size distribution such as the one described in D1.

When comparing the results of the furnace cycle test reported in Table 2 of the patent and in column 6, lines 174 to 39, of D1 (see the table), it can be observed that the bond coat obtained by the examples of the patent last longer before failure.

However, it has not been demonstrated that this difference between the patent and D1 is caused by the claimed particle size distribution. The processes to form the bond coat according to D1 and the examples of the patent do not only differ by the particle size distribution of the bi-modal powder composition used for the coating process but also in the method of coating. In D1, an air plasma spray (APS) or vacuum plasma spray (VPS) process is used whereas the examples of the patent make use of a HVOF process.

The coating method itself and the parameter settings used in it have a great impact on the properties of the bond coat. This is confirmed by the explanations in paragraph [0030] of the patent and is also clearly visible from the examples of the patent.

With regard to the parameter settings, in both examples 1 and 2, a powder composition having a particle size distribution according to Graph D of Figure 5 of the patent is used to provide a single layered coating by the HVOF process (see paragraphs [0039] and [0040]). Hence, in both examples the same process and the same type of particles are used. Nevertheless, the results of the furnace cycle test reported in Table 2 (1038°C, 0.75 hr: sample A: 1800 hrs, sample B: 2300 hrs; 1038°C, 20.0 hr: sample A: 2750 hrs, sample B: 5700 hrs) differ to a great extent between sample A obtained by example 1 and sample B obtained by example 2. This is because different process parameters were used.

Hence, a meaningful comparison of the results reported in Table 2 of the patent and the table in column 6 of D1 is not possible. The test results in the patent therefore do not demonstrate that an improved bond coat can be achieved by using a bi-modal powder composition having a particle distribution as defined in claim 1 compared to a bond coated obtained with a bi-modal particle composition according to D1.

- 2.6 The objective technical problem can thus be regarded as providing a method of forming an alternative bond coat.

- 2.7 Mixing particle powders to adjust the particle size distribution of the final spray powder would have been part of the experimental routine of the skilled person. Starting from a coating method according to D1 which

already makes use of a bi-modal powder composition, it would have been within the customary practice of the skilled person to use an alternative bi-modal powder composition having an arbitrarily selected alternative particle size distribution (e.g. having flatter and smoother and thus overlapping particle size distributions of the individual powders) to provide a method for obtaining an alternative protective coating system.

Repeating the teaching of D1 by arbitrarily using such a spray powder having a flatter and smoother particle size distribution as defined by the parametric definition of claim 1 would have been an obvious option for providing a process for forming an alternative bond coat.

The Board therefore agrees with the argument of the appellant that the subject-matter of claim 1 is obvious when starting from the teaching in D1. Hence, the ground of opposition pursuant to Article 100(a) EPC in combination with Article 56 EPC prejudices the maintenance of the patent.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The patent is revoked.

The Registrar:

The Chairman:



C. Spira

C. Herberhold

Decision electronically authenticated