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Datasheet for the decision of 3 November 2010

Case Number: T 1442/09 - 3.2.07

Application Number: 04252349.8

Publication Number: 1471163

IPC: C23C 4/12

Language of the proceedings: EN

Title of invention:
Method for preparing and ultrasonically testing a thermal-spray coated article

Applicant:
GENERAL ELECTRIC COMPANY

Headword:
-

Relevant legal provisions:
EPC Art. 111(1)
EPC R. 103(1)a), 111(2)

Keyword:
"Decision on the state of of file: reasoned (no)"
"Substantial procedural violation (yes)"
"Reimbursement of the appeal fee (yes)"

Decisions cited:
T 1309/05, T 1356/05, T 1709/06

Catchword:
A decision as referred to in Rule 111(2) EPC should in principle be complete and self-contained and be comprehensible (see points 1.4.1 to 1.6)

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Case Number: T 1442/09 - 3.2.07

D E C I S I O N
of the Technical Board of Appeal 3.2.07
of 3 November 2010

Appellant: GENERAL ELECTRIC COMPANY
1 River Road
Schenectady, NY 12345 (US)

Representative: Goode, Ian Roy
London Patent Operation
General Electric International, Inc.
15 John Adam Street
London WC2N 6LU (GB)

Decision under appeal: **Decision of the Examining Division of the European Patent Office posted 5 February 2009 refusing European patent application No. 04252349.8 pursuant to Article 97(1) EPC.**

Composition of the Board:

Chairman: H. Meinders
Members: H. Hahn
E. Dufrasne

Summary of Facts and Submissions

I. The applicant lodged an appeal against the decision of the Examining Division to refuse the European patent application No. 04 252 349.8 with a decision according to the state of the file.

II. With its grounds of appeal dated 12 June 2009 the appellant requested to set aside the decision and to grant a patent on the basis of the claims 1-6 of the single request as filed together with the grounds of appeal. As an auxiliary request oral proceedings were requested.

III. In the present decision the following documents are cited:

D1 = JP-A-04 238 265 (with English abstract)
D2 = US-B2-6 534 975
D3 = DD-A-246 832
D4 = JP-A-2000 074 888 (with English abstract)

IV. In the course of the examination proceedings the appellant, in response to the first substantive communication of the Examining Division dated 14 December 2005, filed with its letter dated 22 June 2006 an amended set of claims 1-8 and submitted arguments concerning novelty and inventive step.

In response to the second substantive communication of the Examining Division dated 16 July 2007 the appellant filed with its letter dated 17 January 2008 an amended set of claims 1-7 together with arguments concerning novelty and inventive step. In that letter the

appellant also requested oral proceedings as an auxiliary request.

A summons dated 19 June 2008 to oral proceedings on 26 November 2008 was issued by the Examining Division. In the third substantive communication that was annexed to that summons the Examining Division set out its opinion regarding the amended set of claims 1-7 filed with letter of 17 January 2008.

With letter dated 14 November 2008 the appellant withdrew its request for oral proceedings and requested an appealable written decision in accordance with the current state of the file.

The wording of the main claims of those requests is reproduced in the reasons for this decision, for a clearer understanding of the reasoning of the Examining Division in this respect.

V. The decision grounds of the Examining Division are as follows:

"In the communication(s) dated 14.12.2005, 16.07.2007, 19.06.2008 the applicant was informed that the application does not meet the requirements of the European Patent Convention. The applicant was also informed of the reasons therein.

The applicant filed no comments or amendments in reply to the latest communication but requested a decision according to the state of the file by a letter received in due time on 17.11.2008.

The European patent application is therefore refused on the basis of Article 97(2) EPC)."

VI. With a communication dated 22 July 2010 the Board gave its preliminary and non-binding opinion and expressed the view that the decision of the Examining Division was deficient in that it was not reasoned as required by Rule 111(2) EPC and that it intended to remit the case to the department of first instance for further prosecution and to reimburse the appeal fee. The appellant was asked whether or not it maintains its request for oral proceedings.

VII. With letter dated 21 August 2009 [*sic*] (should read: 21 August 2010) the appellant withdrew its "previous request for oral proceedings in the event that the Appeal Board intends to confirm their provisional opinion and remit the case back to first instance".

Reasons for the Decision

1. *Lack of reasoning in the decision - substantial procedural violation*

1.1 The first substantive communication of the Examining Division dated 14 December 2005 and referred to in the impugned decision was based on claims 1-10 as originally filed.

1.1.1 The single independent claim 1 as originally filed reads:

"1. A method for preparing an article having a thermal-spray coating (46) thereon, comprising the steps of providing a substrate article (44) having a surface (42);
forming a coated article (40), the step of forming including the step of thermally spraying a coating material (41) onto the surface (42) of the substrate article (44), wherein a surface of contact between the coating material (41) and the substrate article (44) is a bondline (48); and
nondestructively testing the coated article (40), wherein the step of nondestructively testing includes the steps of
directing a transmitted ultrasonic signal (68) into the coated article (40), receiving a received ultrasonic signal (72) from the coated article (40), and
evaluating a near-bondline region (50) of the coated article (40) located adjacent to the bondline (48) using the received ultrasonic signal (72)."

1.1.2 In point 2 of this communication the Examining Division raised a novelty objection with respect to the subject-matter of claim 1 in view of D1 by stating "**D1 discloses an adhesion measuring method for thermal spray deposit by measuring the intensity of the reflected wave generated when a specific ultrasonic wave is fed to the interface between the the** [*sic*] **thermal spray deposit and the substrate. The frequency of the ultrasonic wave is set to 5-20 MHz.**" (emphasis added by the Board).

In points 3 and 4 of this communication only a short description of the disclosures of D2 and D3 was given: "D2 discloses a nondestructive method for determining

the thickness of a metallic protective layer on a metallic base material (e.g. turbine blade) by detection of a different type of intervening layer wich [*sic*] is situated between the metallic protective layer and the metallic base material, by e.g. ultrasound thermography (see abstract)." and
"D3 discloses a nondestructive method for measuring the thickness of a metallic layer on a substrate by directing an ultrasonic signal on the substrate, receiving and evaluating the received ultrasonic signal from the coated substrate (see claims 1,2; fig.1).".

In point 5 of this communication it further considered that "**Dependent claims 2-10 do not appear to contain any additional features which, in combination with the features of claim1 to which they refer, meet the requirements of the EPC with respect to novelty and/or inventive step, the reasons being as follows: the features are known from D1, D2 and/or D3.**" (emphasis added by the Board).

1.1.3 It is thus apparent from a comparison of the wording of claim 1 as originally filed (see point 1.1.1 above) with the statement made in point 2 of the first communication (see point 1.1.2 above) that this communication neither contains an explanation as to why the adhesion measuring method according to D1 fulfils **all** the requirements as set out by the features of said claim 1, nor does it indicate why the subject-matter of dependent claims 2-10 as originally filed would either be anticipated by D1 - the English abstract of D1 is silent with respect to a method step of "evaluating a near-bondline region of the coated article located adjacent the bondline" as well as to any "delamination"

of the coating - or would be rendered obvious by the cited prior art.

Points 2 and 5 of the first communication contain only allegations without giving any reasoning for the lack of novelty or lack of inventive step, e.g. as to why the person skilled in the art would combine the **adhesion measuring** method of D1 with the **thickness measuring** methods of either D2 or D3, i.e. which objective technical problem should be solved by the person skilled in the art. The allegation additionally made in point 5 further does not give any references in the cited documents D1 to D3 for the features of the dependent claims allegedly known therefrom.

1.2 As a response to the first communication the appellant filed with its letter dated 22 June 2006 an amended set of claims 1-8. It stated that new claim 1 includes the features of claims 8 and 9 as originally filed and submitted arguments concerning novelty and inventive step:

D2 and D3 relating to measuring thickness were not believed to be concerned with the problem presented and solved by the claims of the present application which are directed to a method of preparing an article having a thermal spray coating thereon including, in part, non-destructively testing the coating article by the steps recited in new claim 1. Since the operating parameters may cause the coated article to have flaws in a near-bondline region which may cause the coating to perform in an unsatisfactory manner it is important to determine when such flaws are present and when the coated article is free of such flaws.

D1 is not concerned with the above problem but with determining adhesion. However, "delamination" is not the same as adhesion. Figure 4 of the application illustrates a structure having a bondline delamination wherein the thermal spray coating is physically separated from the surface, leaving a gap therebetween. Thus a delamination not only has zero adhesive strength, but also requires a physical separation. Nor does D1 give any disclosure or suggestion for a method for concluding the presence of a mechanical bond and appears to deal with a different ultrasonic parameter than that of the subject claims.

1.2.1 Claim 1 of this set of claims reads as follows (amendments as compared to claim 1 as originally filed are in bold; emphasis added by the Board):

"1. A method for preparing an article having a thermal-spray coating (46) thereon, comprising the steps of providing a substrate article (44) having a surface (42);
forming a coated article (40), the step of forming including the step of thermally spraying a coating material (41) onto the surface (42) of the substrate article (44), wherein a surface of contact between the coating material (41) and the substrate article (44) is a bondline (48); and
nondestructively testing the coated article (40), wherein the step of non-destructively testing includes the steps of
directing a transmitted ultrasonic signal (68) into the coated article (40), receiving a received ultrasonic signal (72) from the coated article (40), and

evaluating a near-bondline region (50) of the coated article (40) located adjacent to the bondline (48) using the received ultrasonic signal (72), **wherein the step of evaluating includes the steps of concluding the presence of a delamination if there is a strong return in the received ultrasonic signal from the near-bondline region, and concluding the presence of a mechanical bond if there is a weak return in the received ultrasonic signal from the near-bondline region**."

1.2.2 The second substantive communication of the Examining Division, of 16 July 2007, was based on these amended claims 1-8. Initially it stated "**Your arguments have been carefully considered by the examining division, however following objections remain**". Thereafter D1 and the new D4 were referred to.

In point 4 of this communication the Examining Division maintained its objection of lack of novelty, in stating: "**D1 discloses a non-destructive method for judging "the quality of adhesion" and the "level degree of adhesion" of a thermal-sprayed coating on a substrate by measuring the intensity of a reflected wave generated when a specific ultrasonic wave is fed to the interface between the thermal sprayed coating and the substrate. Apart from the fact** [*sic*] **the frequency of the ultrasonic wave is the same as in the application (5-20 MHz), it is clear that a possible delamination will be detected and registred** [*sic*] **by the method of D1**".

It further stated that "D4 discloses a non-destructive method to detect defects, such as exfoliation and cracks, of **a spray deposit** on a surface of a substrate

by directing an ultrasonic signal in the coated substrate, by receiving the ultrasonic signal, evaluating the received ultrasonic signal and so detecting the presence of a possible delamination adjacent to the bondline of the spray deposit and the substrate (see fig. 1-5, page 1-3)" (emphasis added by the Board).

In point 5 it is concluded that "At least some of the objections raised above are such that there appears to be no possibility of overcoming them by amendment. Refusal of the application under Article 97(1) EPC is therefore to be expected.".

1.2.3 This second communication clearly does **not** contain anything dealing with the arguments submitted by the appellant, particularly not as to why they cannot be accepted. Furthermore, also this second communication does **not** contain any comprehensible reasoning as to why the methods disclosed in documents D1 and D4 would fulfil the requirement of evaluating a near-bondline region as now more exclusively defined in the amended claim 1 (see point 1.2.1 above).

In this context the Board remarks that the English abstract of D4 is silent with respect to a method step of "evaluating a near-bondline region of the coated article located adjacent the bondline … concluding the presence of a delamination if there is a strong return in the received ultrasonic signal from the near-bondline-region, and concluding the presence of a mechanical bond if there is a weak return in the received ultrasonic signal from the near-bondline

region". Furthermore, this abstract only mentions "a spray deposit" and not a **thermal-spray** deposit.

1.3 As a response to this second communication the appellant filed with its letter dated 17 January 2008 an amended set of claims 1-7 based on a combination of claims 1, 8, 9 and 10 as originally filed in combination with an adapted description. The amendments were again supported by arguments concerning novelty and inventive step. In particular it was argued that "Claim 1 has been clarified to specify the evaluation steps in the method and also to specify more clearly the aspect of the received ultrasonic signal that is used to determine the nature of the bond in the near-bondline region. In D1 and D4 methods of evaluating adhesion of a coating to a substrate are disclosed which comprise transmitting an ultrasonic wave and receiving the reflected ultrasonic wave generated from the interface between the coating and the substrate. In D1 the intensity of the reflected wave is used and D4 a frequency analysis is performed. Neither D1 nor D4 disclose evaluating the nature of the bond using the return peak of the reflected wave. Nor do D1 or D4 disclose that the evaluation discriminates between a delamination, a mechanical bond and a metallurgical bond on the basis of the nature of the peak reflected wave".

1.3.1 Claim 1 of this amended set reads as follows (amendments as compared to claim 1 filed with letter of 22 June 2006 are in bold with deletions in brackets; emphasis added by the Board):

"1. A method for preparing an article having a thermal-spray coating (46) thereon, comprising the steps of providing a substrate article (44) having a surface (42);
forming a coated article (40), the step of forming including the step of thermally spraying a coating material (41) onto the surface (42) of the substrate article (44), wherein a surface of contact between the coating material (41) and the substrate article (44) is a bondline (48); and
nondestructively testing the coated article (40), wherein the step of non-destructively testing includes the steps of
directing a transmitted ultrasonic signal (68) into the coated article (40), receiving a received ultrasonic signal (72) from the coated article (40), and
evaluating a near-bondline region (50) of the coated article (40) located adjacent to the bondline (48) using the received ultrasonic signal (72), **[wherein] characterisied** [*sic*] **in that** the step of evaluating includes the steps of: concluding the presence of a delamination **(80)** if there is a strong return **peak (86)** in the received ultrasonic signal from the near-bondline region **(50)**; **[and]** concluding the presence of a mechanical bond **(88)** if there is a weak return **peak (90)** in the received ultrasonic signal from the near-bondline region **(50); and concluding the presence of a metallurgical bond if there is substantially no return in the received ultrasonic signal (72) peak from the near-bondline region (50)**."

1.3.2 The third substantive communication of the Examining Division dated 19 June 2008 was annexed to the summons to oral proceedings before the Examining Division

scheduled for 26 November 2008. It was based on this amended set of claims 1-7.

Therein it was initially stated "**The applicant's explanations submitted with his letter of 17.01.2008 have been carefully considered. However it is the preliminary opinion of the examining division that the new claims submitted on 17.01.2008 do not comply with the requirements of the EPC and the application should be refused (Art.97 (1) EPC). According to your request Oral Proceedings are summoned. The reasons for the preliminary opinion are given below**." (emphasis added by the Board).

Under point 3 of this communication it was then stated "**As already mentioned in communication dated 16 July 2007, it is clear that D1 and D4 not only disclose the same non-destructive method of judging the interface between a substrate and a sprayed coating layer on the substrate, but also disclose the evaluation of the nature of this interface by detecting possible delaminations. It is implicit that the nature of the bond is being evaluated and that a possible delamination will be detected and registred** [*sic*] **by the method of D1.**" (emphasis added by the Board).

Subsequently, in point 4 the Examining Division remarked "**In any event the claims as a whole lack an inventive step with respect to D1 and D4**" and "the subject of the oral proceedings will be whether the claimed subject-matter involves novelty in the sense of Article 54(1) and (2) EPC." (emphasis added by the Board).

Finally in point 6 it was considered "**Furthermore the application does not meet the requirements of Article 84 EPC in that the matter for which protection is sought is not clearly defined. It is clear from the description that a nondestructively testing of a sprayed coating on a substrate is claimed and not a method for preparing an article having a thermal-spray coating thereon**".

1.3.3 From the above it is already clear that also this third communication contains only allegations. It neither deals with the appellant's arguments in support of the amendments made to claim 1, nor does it contain any comprehensible reasoning as to why D1 and/or D4 would be novelty destroying for the subject-matter of amended claim 1. It further does not explain why its arguments still hold in the light of that amended claim 1, let alone does it give the required reasoning concerning inventive step.

1.3.4 With respect to the alleged lack of clarity the Board further notes that the basic features of claim 1 as originally filed - which defines **a method for preparing an article having a thermal-spray coating thereon** comprising principally the steps of providing a substrate article having a surface and forming a coated article by thermally spraying a coating material on that surface, and then non-destructively testing the coated article (see point 1.1.1 above) - have only subsequently been amended in the later versions of claim 1 to more precisely define the non-destructive testing step of the coated article (compare points 1.2.1 and 1.3.1 above).

Its original character as "a method for preparing an article having a thermal spray coating thereon", however, has not changed in this final version. The Examining Division's allegation that "it is clear from the description that a nondestructively testing of a sprayed coating on a substrate is claimed and not a method for preparing an article having a thermal-spray coating thereon" and that for this reason the application contravenes Article 84 EPC therefore cannot hold since it is incorrect not only with respect to this claim 1 but also with respect to the whole specification of the present application which makes it clear that it is a method for preparing an article having a thermal spray coating thereon which is claimed (see. e.g. page 3 filed 17 January 2008, second and third paragraphs; page 4 as originally filed, second paragraph; figure 1, etc.). Furthermore, the Examining Division has not quoted any passage in the application which would provide support to its allegation.

1.4 The impugned decision according to the state of the file merely refers to "the communication(s) dated 14.12.2005, 16.07.2007, 19.06.2008" and states that "the applicant was informed that the application does not meet the requirements of the European Patent Convention. **The applicant was also informed of the reasons therein**" and that the applicant filed no comments or amendments in reply to the latest communication (emphasis added by the Board).

1.4.1 From the above analysis of the content of these three substantive communications it is evident that the impugned decision falls short of revealing the reasons which led the first instance to conclude lack of

novelty and/or lack of inventive step, or lack of clarity for that matter.

1.4.2 Furthermore, contrary to what is stated in the second and third communication ("the applicant's explanations … have been carefully considered") it is apparent that the Examining Division ignored all the appellant's arguments since these communications and therefore the decision are silent in this respect. Consequently, the impugned decision is also not reasoned in that respect.

1.4.3 It is evident that the Examining Division, when issuing the impugned decision, did not follow the Guidelines for Examination in the European Patent Office, according to which the reasoning must contain in logical sequence those arguments which justify the order. Furthermore, the reasoning should be complete and independently comprehensible and the reasoning should contain important facts and arguments which speak against the decision (see the Guidelines, chapter E-X, 5). The latter means that the decision should address the arguments of the losing party (not in the least to also comply with the right to be heard).

1.4.4 Moreover, even though claim 1 of the three sets of claims has been amended twice by incorporating further features so that the subject-matter of claim 1 of the three different requests has been substantially restricted, the impugned decision refers to all three substantive communications.

This means that it is left up to the Board to construct the applicable reasons by having to "mosaic" the

various arguments from the file, or that it leaves the Board in doubt as to which arguments apply to which claim version. This does **not** meet the requirement of a "reasoned" decision in accordance with Rule 111(2) EPC (see e.g. decisions T 1309/05, points 3 to 3.7 of the reasons; T 1356/05, point 15 of the reasons; and T 1709/06, points 1.2 to 1.2.5 of the reasons; none published in OJ EPO).

To be able to benefit from a "decision on the state of the file as it stands" an Examining Division should make sure that its communications are well-structured, deal sufficiently with the counterarguments put forward and provide reasoned support for what it alleges.

1.5 The lack of reasoning in a decision is a substantial procedural violation since it results in the appellant being deprived of any reasoning which it can properly address in appeal and the Board being unable to properly examine the reasons why the Examining Division came to the conclusions of lack of novelty and/or lack of inventive step, or lack of clarity.

2. *Remittal to the department of first instance (Article 111(1) EPC)*

In view of the aforesaid substantial procedural violation the Board considers that it is appropriate to set aside the decision under appeal for this reason alone and to remit the case to the department of first instance for further prosecution in accordance with Article 111(1) EPC.

As the request for oral proceedings was only auxiliary in this respect, the present decision could be taken in written proceedings.

3. *Reimbursement of the appeal fee (Rule 103(1)a) EPC)*

For the above reasons it is also equitable to reimburse the appeal fee pursuant to Rule 103(1)a) EPC.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the department of first instance for further prosecution.

3. The appeal fee is to be reimbursed.

The Registrar: The Chairman:

G. Nachtigall H. Meinders