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**Datasheet for the decision  
of 22 January 2015**

**Case Number:** T 0167/11 - 3.2.07

**Application Number:** 04256632.3

**Publication Number:** 1528117

**IPC:** C23C10/30

**Language of the proceedings:** EN

**Title of invention:**

Diffusion coating process

**Patent Proprietor:**

GENERAL ELECTRIC COMPANY

**Opponent:**

Siemens Aktiengesellschaft

**Headword:**

**Relevant legal provisions:**

EPC Art. 100(b), 100(c), 123(2), 54, 56

RPBA Art. 12(4)

EPC R. 76(2)(c), 77(1)

**Keyword:**

New grounds for opposition, new lines of attack based on documents not used or substantiated in the opposition proceedings, new documents (not admitted)  
Inventive step - (yes, could-would approach)  
Documents filed with the opposition, but not substantiated: not considered instead of "not admitted", see point 3

**Decisions cited:**

G 0009/91, G 0010/91, G 0001/95, T 1704/06, T 1067/08,  
T 0936/10, T 1125/10, T 1500/10, T 0911/11, T 1400/11

**Catchword:**



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Case Number: T 0167/11 - 3.2.07

**D E C I S I O N**  
**of Technical Board of Appeal 3.2.07**  
**of 22 January 2015**

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**Decision under appeal:** **Interlocutory decision of the Opposition  
Division of the European Patent Office posted on  
26 November 2010 concerning maintenance of the  
European Patent No. 1528117 in amended form.**

**Composition of the Board:**

**Chairman** H. Meinders  
**Members:** H. Hahn  
I. Beckedorf

## Summary of Facts and Submissions

I. The opponent (appellant) lodged an appeal against the decision of the Opposition Division to maintain the European patent 1 528 117 in amended form on the basis of the claims 1-8 of the then main request (filed as auxiliary request) dated 8 October 2010.

II. In the present decision the following documents of the opposition proceedings are cited:

D1 = GB-A-1 431 355

D4 = US-A-3 804 665

D5 = US-A-5 366 765

D7 = GB-A-1 186 924

D10 = DE-A-2 147 755

D11 = US-A-2 855 332

D14 = US-A-3 900 613

While the following documents were submitted by the appellant in the appeal procedure:

D17 = GB-A-1 508 472

D18 = GB-A-1 508 473

III. The opposition had been filed against the patent in its entirety under Article 100(a) EPC, for lack of novelty and inventive step. The notice of opposition listed sixteen documents but substantiated arguments were actually supplied **only** on D7 and D11 (both with respect to lack of novelty of claim 1 of the patent as granted; D7 also with respect to dependent claim 5 of the patent as granted), on D5 and D4 (with respect to lack of inventive step of claim 1 of the patent as granted) and D1 (only with respect to inventive step of dependent claim 4 of the patent as granted).

An objection under Article 123(2) EPC was raised by the opponent with letter dated 18 August 2009 with respect to claim 1 of a new (main) request submitted by the patent proprietor (respondent) dated 22 July 2009.

According to the preliminary opinion of the Opposition Division presented in its communication of 8 February 2010 the subject-matter of claim 1 of the single request appeared to lack inventive step over a combination of the teachings of the closest prior art D7 and D11. Furthermore, it stated that inventive step will be discussed based on document D7 in combination with D11; if necessary, D4 and D5 might additionally be used and that "The other cited documents by the opponent are not admissible under Art. 99(1) and Rule 76(2)(c) EPC" (see the communication, page 3, point 1; and page 4, the second point "2" of its "conclusions").

At this point of time the opponent withdrew its request for oral proceedings with a letter dated 13 October 2010, but faxed as late as 18 October. The new auxiliary request filed by the patent proprietor with letter of 8 October 2010 had been forwarded to him by the Opposition Division with letter dated 14 October 2010. Both parties were informed with letter of 3 November 2010 that the date fixed for oral proceedings was maintained.

The Opposition Division considered at the oral proceedings held on 9 November 2010 in the absence of the opponent that the amended claims 1-8 of the then - single - new main request dated 8 October 2010 met the requirements of Rule 80 EPC and of Articles 123(2) and (3) EPC. It further considered that the subject-matter of claim 1 of this request was novel, particularly with

respect to D7 and D11 but also with respect to D4 and D5. Furthermore, it considered that the subject-matter of claim 1 of the single request involved inventive step with respect to a combination of the teachings of D7 with D11, or of D5 with D4. Consequently, the patent was maintained in that amended form.

IV. With a communication annexed to the summons to oral proceedings the Board presented its preliminary opinion with respect to claims 1-8 of the single request underlying the impugned decision, which was maintained on appeal.

The Board remarked amongst others that the novelty objections based on D5 and D14 and the lack of inventive step objections based on D1 and D10, D17 or D18 and D10, or D7 alone appeared to represent new objections compared to those of the preceding opposition proceedings which not only **could** but **should** have been raised by the opponent in these proceedings. Therefore these objections might not be admitted into the proceedings (Article 12(4) RPBA).

The Board further considered that D17 and D18, which could have been filed in the opposition proceedings, should be disregarded for being late filed and for not being *prima facie* relevant.

Furthermore, since the notice of opposition only referred to grounds of opposition under Article 100(a) EPC the new objections raised under Articles 100(b) and 100(c) EPC represent fresh grounds of opposition which can only be introduced with the explicit consent of the patent proprietor.

The subject-matter of claim 1 appeared already to be novel over the process of D5, the latter using an aqueous slurry.

Taking account of the distinguishing feature with respect to D5 - the malleable, formable consistency of the coating mixture - it seemed to be obvious that the skilled person would adapt the viscosity of the slurry of D5 in order to apply the adhesive coating mixture to localized regions of a workpiece in a uniform thickness and in an easy manner.

- V. With letter of 19 November 2014 the appellant withdrew its auxiliary request for oral proceedings and stated that it would not attend the scheduled oral proceedings.

This letter did **not** contain any further arguments concerning the objections raised with the appeal and the remarks made by the Board in its communication.

- VI. With letter dated 22 December 2014 the respondent argued amongst others that the new objections under Articles 100(b) and 100(c) EPC as well as the newly cited documents D17 and D18 should not be admitted into the proceedings and that the issue of inventive step should be the only substantive matter remaining to be considered at the oral proceedings.

- VII. Oral proceedings before the Board were held on 22 January 2015. As announced, the appellant did not attend so that the oral proceedings were continued in its absence in accordance with Rule 115(2) EPC and Article 15(3) RPBA. The issue of Article 56 EPC was discussed with respect to claim 1 of the sole request of the respondent, on which basis the patent was

maintained by the Opposition Division. The discussion dealt with the teaching of document D5 and the general technical knowledge and practice of the person skilled in the art.

- a) The appellant requested in the written proceedings that the decision under appeal be set aside and that the patent be revoked.
- b) The respondent requested that the appeal be dismissed.

At the end of the oral proceedings the Board announced its decision.

VIII. Claim 1 of the patent as maintained by the impugned decision reads as follows (amendments as compared to claim 1 of the patent as granted are in bold with deletions in brackets; emphasis added by the Board):

"1. A process of forming a diffusion aluminide coating on a component, the process comprising the steps of:  
mixing a particulate donor material **[containing a coating element] comprising an aluminum alloy**, an activator dissolved in a solvent, and a particulate filler to form an adhesive mixture having a formable, malleable consistency and wherein the adhesive mixture does not contain an extraneous binder, and the donor material and the filler within the adhesive mixture are cohered solely by the dissolved activator;  
applying the adhesive mixture to a surface of the component; and heating the component to a temperature sufficient to vaporize and react the activator with the **[coating element] aluminum** of the donor material to form a reactive vapor of the **[coating element] aluminum**, the reactive vapor reacting at the surface of



the component to form a diffusion coating containing the **[coating element] aluminum.**"

- IX. The appellant argued, insofar as relevant for the present decision, in the written proceedings essentially as follows:

The subject-matter of claim 1 of the patent as maintained contravenes Article 123(2) EPC since it is based on claim 1 as originally filed and additionally comprises the combination of the features of the dependent claims 3 and 6 as originally filed, each of them only referring to claim 1 (and not to each other). Thus the claims 3 and 6 cannot serve as a basis but also the description does not allow for a direct and unambiguous disclosure of the claimed subject-matter.

On the basis of the features of claim 1 as maintained - which requires that an adhesive mixture is formed which has a formable, malleable consistency - the skilled person is not enabled to carry out the claimed process over the whole breadth of claim 1 since the specification does not disclose how such an adhesive mixture can be obtained, which solvents and activators should be used and in which amounts, and on which substrate surfaces this adhesive mixture should be applied. In this context it is generally known that adhesive properties are dependent upon the properties of the specific substrate. Furthermore, the formable, malleable consistency is temperature dependent but the patent in suit is silent in this respect and does not specify at which temperature(s) this consistency should be achieved.

D5 discloses a process for providing a diffusion aluminide coating on super-alloy substrate surfaces

using a slurry mixture comprising aluminum powder, a halide activator and an inert powder material as filler material in an aqueous suspension medium (see column 1, lines 6 and 7; column 2, lines 22 to 32). Since excess suspension can be drained after it has been applied (see column 2, lines 29 to 32) it has to be concluded that the mixture adheres to the surface to be coated. It can contain an organic thickener so that the viscosity is on the order of that observed in honey (see column 4, lines 3 to 16) so that it has a formable, malleable consistency. An organic thickener as used in D5 does not constitute an extraneous binder which coheres the donor material and the filler. A thickener is characterized in that it swells on contact with solvent and/or water and thereby increases the viscosity of a mixture. This holds particularly true with respect to the methyl cellulose disclosed in D5 (see column 3, lines 38 to 47) which is also used as thickener in yogurt. Thus the thickener does not intervene in the cohesion of the donor material and filler but only interacts with the solvent and/or the water. Finally in D5 the mixture is likewise heated to react the aluminum with the activator to form the aluminide (see column 4, lines 41 to 65). Consequently, claim 1 lacks novelty over D5

The subject-matter of claim 1 in any case lacks inventive step over a combination of D1 and D10, or D17 (or D18) and D10, or over D7 alone or D7 in combination with D11.

- X. The respondent argued, insofar as relevant for the present decision, essentially as follows:

No consent is given to the introduction of the new grounds of opposition under Articles 100(b) and 100(c)

EPC. Likewise the new documents D17 and D18 and the new lines of attack of lack of inventive step based on these documents as well as those based on D1 and D10 or D7 alone should not be admitted into the proceedings in view of Article 12(4) RPBA as set out in the Board's communication.

The subject-matter of the claims is novel over the cited prior art, in particular over D5, for the reasons also set out the Board's communication.

Claim 1 involves an inventive step over any one of the documents discussed in the Board's communication wherein D5 was chosen as the closest prior art. All other documents are less relevant than D5.

However, D5 is not necessarily the closest prior art since the purpose of its process is different from that of the patent in suit. According to D5 it was difficult to coat internal passages of turbine parts and therefore a slurry was used and injected into these passages (see D5, figure 1). The viscosity of the slurry had to be increased to a range of from about 100 to 1000 centipoise by incorporating an organic thickener, i.e. to a viscosity observed in molasses or honey, so that it stayed in these passageways (see column 4, lines 6 to 10). There is no hint in D5 to coat parts of turbine blades made of superalloys without using masking, let alone with an adhesive mixture that has a formable and malleable consistency. The latter would, in any case, be hardly usable in internal passages. Peanut butter for example has a much higher viscosity (above 100000 centipoise) than that of the slurry mixture disclosed in D5, which therefore cannot be considered to have such a malleable/formable

consistency. Malleable things can be formed into shape and then keep this shape.

Further, claim 1 excludes any extraneous binder while D5 teaches the use of an organic thickener, which is to be seen as a binder.

The patent in suit is silent on the hectorite clay of example 3 representing a thickener. This hectorite clay is also not added to adjust the viscosity of the adhesive mixture. However, the addition of about 1% by weight of hectorite clay, which is put in a large amount of water to produce a 4% clay mix (see patent, paragraph [0027]), increases the green strength of the coating.

A paste is not the same as a formable and malleable mixture. The same holds true with respect to a thixotropic mixture which cannot be considered to be formable/malleable.

### **Reasons for the Decision**

1. Although the appellant did not attend the oral proceedings, the principle of the right to be heard pursuant to Article 113(1) EPC is observed since it only affords the opportunity to be heard and, by absenting itself from the oral proceedings, a party gives up that opportunity (see the explanatory note to Article 15(3) RPBA cited in T 1704/06, not published in OJ EPO, see also the Case Law of the Boards of Appeal, 7<sup>th</sup> edition 2013, section IV.E.4.2.3.c)).

In the communication accompanying the summons to oral proceedings the Board, taking account of the submissions of the appellant, raised objections under

Article 12(4) RPBA with respect to the admission of new grounds of opposition under Articles 100(b) and 100(c) EPC and of new objections against the subject-matter of claim 1 as maintained (see point IV above).

The appellant did **not** reply in substance to any of this nor to any of the other remarks made by the Board in its communication (see point V above). Since there has been no attempt by the appellant to refute or overcome the objections raised in the above communication, the Board sees no reason to depart from its preliminary opinion expressed therein with respect to these objections.

Taking account of the preceding observations, the Board concludes in this context the following.

2. *Admission of the new grounds of opposition under Articles 100(b) and 100(c) EPC and of new objections into the proceedings (Article 12(4) RPBA)*
  - 2.1 In the present opposition appeal case the course of events is as follows:
    - 2.1.1 An opposition had been filed against the patent in its entirety under Article 100(a) EPC, for lack of novelty and inventive step. Although the notice of opposition mentioned the documents D1 to D16, however, substantiated support for these grounds was based **only** on D7 and D11 (both with respect to lack of novelty of claim 1 of the patent as granted; the latter also with respect to dependent claim 5 of the patent as granted), on D5 and D4 (with respect to lack of inventive step of claim 1 of the patent as granted) and D1 (only with respect to inventive step of dependent claim 4 of the

patent as granted). The notice of opposition also dealt with the other dependent claims 2-6.

2.1.2 During the opposition proceedings an objection under Article 123(2) EPC was raised by the opponent with letter dated 18 August 2009 with respect to amended claim 1 of a new (main) request submitted by the patent proprietor dated 22 July 2009.

2.1.3 The Opposition Division presented its preliminary opinion in its communication of 8 February 2010. It considered that claim 1 of this new request appeared to lack inventive step over a combination of the closest prior art D7 with the teachings of D11. It also considered that all the other documents "*are not admissible under Article 99(1) and Rule 76(2)(c) EPC since no case to answer was based upon those documents*" and since they appeared to have no *prima facie* relevance regarding novelty or inventive step.

The opponent withdrew its request for oral proceedings with its letter dated 13 October 2010, but faxed on 18 October 2010.

2.1.4 This letter of the opponent appears to have crossed the communication of the Opposition Division of 14 October 2010 informing the opponent of the amended claims filed by the patent proprietor with its letter of 8 October 2010. However, amended claim 1 of this request was formed by merely combining claims 1 and 3 of the patent as granted. In its letter faxed 18 October 2010 the opponent has acknowledged such an auxiliary request, based on claim 3 (dependent on claim 1) of the patent as granted, and has reacted to it in substance. With letter of 3 November 2010 the Opposition Division informed both parties that the date fixed for oral

proceedings was maintained. It reiterated its opinion that all documents filed with the opposition were not admitted, except D7, D11 and D4 and D5. The discussion in the oral proceedings would be limited to Article 123(2) EPC for the amended claims, and Article 56 EPC for documents D7, D11, D4 and D5.

2.1.5 At the oral proceedings held on 9 November 2010 in the absence of the opponent the Opposition Division considered that the amended claims 1-8 of the - single - new main request dated 8 October 2010 meet the requirements of Rule 80 EPC and of Articles 123(2) and (3) EPC. The Opposition Division further considered that the subject-matter of claim 1 of the main request is novel, particularly with respect to D7 and D11 but also with respect to D4 and D5. Furthermore, it considered that the subject-matter of this claim 1 involves inventive step with respect to a combination of the teachings of D7 with D11, or of D5 with D4. Consequently, the patent was maintained in that amended form.

The Opposition Division thus remained entirely within the framework it had indicated with its communications of 8 February 2010 and 3 November 2010.

2.1.6 The appellant then filed its appeal against the decision and presented the following grounds:

- i) the subject-matter of claims 1-8 of the patent as maintained contravenes **Articles 100(c)** and 123(2) EPC;
- ii) the patent in suit contravenes **Article 100(b) and Article 83 EPC**;
- iii) the subject-matter of claim 1 **lacks novelty** with respect to **D5 and D14**; and

iv) the subject-matter of claim 1 **lacks inventive step** over a combination of the teachings of **D1 and D10**, of a combination of either **D17 or D18 (both filed with the appeal and statement of grounds of appeal) and D10**, over **D7 taken alone** or over D7 in combination with D11.

The bold typed objections represent new objections compared to those of the preceding opposition proceedings. The notice of opposition only referred to Article 100(a) EPC in respect of novelty (D7 and D11) and inventive step (D5 and D4). No substantiated objections had been raised on the basis of D10 and D14.

2.2 Taking account of the aforementioned course of events the Board considers that the appellant has **not** made use of the opportunities available to it in the opposition proceedings, to file such new objections:

- in reaction to the patent proprietor's reply to the opposition dated 22 July 2009,
- in reply to the preliminary opinion of the Opposition Division dated 8 February 2010, which substantially limited their examination to only some of the documents, only inventive step and the compliance with Article 123(2) EPC.
- in reply to the maintenance of the date for the oral proceedings by communication of 3 November 2010.

With its letter dated 10 August 2009 the appellant only addressed issues with Article 123(2) EPC with the amended claims filed with letter of 22 July 2009.

The reaction to the Opposition Division's preliminary opinion, instead of introducing these submissions, went in the exact opposite direction: withdrawal of the request for oral proceedings and announcement of non-attendance.



Finally, on the communication of 3 November 2010, the appellant did not react at all, nor did it decide to announce its participation at the oral proceedings.

Thus the appellant consciously did **not** make use of its procedural opportunities.

- 2.2.1 The purpose of the *inter-partes* appeal procedure is mainly to give the losing party a possibility to challenge the decision of the Opposition Division on its merits and to obtain a judicial ruling on whether the decision of the Opposition Division is correct (G 9/91 and G 10/91, published in OJ EPO 1993, 408 and 420, respectively). The appeal proceedings are not about bringing an entirely fresh case, rather the decision of the Board of Appeal will in principle be taken on the basis of the subject of the dispute in the first-instance proceedings. The appeal proceedings are thus largely determined by the factual and legal scope of the preceding opposition proceedings and the parties have only limited scope to amend the subject of the dispute in appeal proceedings.

In the present case, the Board notes that in the opposition procedure the opponent had based its objections against the granted patent entirely on the disclosures of documents D7 and D11 for the novelty of claim 1 (and 5) as granted, D5 and D4 for lack of inventive step of the same claim and D1 for lack of inventive step of claim 4 as granted. The decision under appeal consequently only refers to these documents in its reasons.

The reasoning in the decision does not create a new situation, to which only in appeal can be reacted by filing new objections/documents/grounds. What the

decision would deal with was clearly expressed by the Opposition Division, in its communications of 8 February 2010 and 3 November 2010.

Also the subject of the proceedings has not changed in the oral proceedings before the Opposition Division, the amended claims (1 and 3) leading to the maintenance of the patent having been transmitted to the appellant with communication of 14 October 2010 and having been acknowledged by the appellant (see point 2.1.4 above).

2.2.2 All in all, sufficient opportunities to file the further submissions existed in the opposition proceedings. In this respect, the appellant **should** have filed such there and then and not have waited with them till the appeal proceedings.

In this respect, the Board does not exercise its discretion pursuant to Article 12(4) RPBA in favour of the appellant. The new objections as indicated in point 2.1.6 are therefore not taken into consideration.

The present procedural behaviour of the appellant is comparable with the behaviour of a patent proprietor who has not submitted necessary (auxiliary) requests at the opposition stage which in effect prevented the Opposition Division from giving a reasoned decision on their critical issues. This would compel the Board either to give a first ruling on those issues or to remit the case to the Opposition Division. This is exactly the situation for which there is the discretionary power under Article 12(4) RPBA (compare in this context for example the decisions T 1067/08, points 3 and 5.3 of the reasons; T 936/10, point 9 of the reasons; T 1125/10, points 1.2 and 1.3 of the reasons; T 1500/10; T 911/11; T 1400/11, points 2 to

2.2 and 3.2 of the reasons; all not published in OJ EPO).

- 2.2.3 The fact that the documents D10 and D14 have been formally cited in the notice of opposition cannot alter this conclusion.

The opposition, nor the further submissions of the appellant in the opposition proceedings contain any analysis of these documents, nor do they explain why they would be relevant against the opposed patent. This counts *a fortiori* for the novelty objection based on D14.

Accordingly, the attempt made by the opponent to introduce into the appeal procedure documents D10 and D14 and new arguments based upon them is tantamount to confronting the Board with an entirely fresh case, in particular in the present situation of the claims subject of the decision under appeal being a combination of granted claims 1 and 3.

- 2.2.4 The "new" novelty objection based on D5 is in any case sufficiently dealt with by the Board in its assessment of the disclosure of D5 with respect to the subject-matter of claim 1 of the patent as maintained, see point 3.5 below. The "new" objection of inadmissible amendment by the combining of claims 1 and 3 of the patent as granted into claim 1 of the patent as maintained is in any case dealt with in point 2.3, since the impugned decision also dealt with it, in points 3 and 4.

2.3 Allowability of amendment of claim 1 (Article 123(2) EPC)

2.3.1 When claim 1 of the patent as maintained is a complete combination of claims 1 and 3 of the patent as granted, it is questionable whether this "amended claim" can lead to an objection under Article 123(2) EPC, since such an objection is equivalent to raising an Article 100(c) EPC objection against granted claims.

2.3.2 In any case, the impugned decision dealt with the issue. In this respect, the Board considers that this combination of features is directly and unambiguously derivable from the application as originally filed, contrary to the appellant's submissions, as follows.

2.3.3 The first full paragraph on page 4 of the application as originally filed represents the counterpart to the subject-matter of claim 1 as originally filed wherein it is already stated that "the invention is **generally** a cementation process that is particularly well suited for forming **diffusion aluminide coatings**".

Thus already this paragraph teaches the skilled person that the process of claim 1 is generally suitable for forming diffusion aluminide coatings which further implies to him that one component of the adhesive mixture has to comprise aluminum.

2.3.4 The following second full paragraph on page 4 then states that "According to a preferred aspect of the invention, **the adhesive mixture does not require or contain extraneous binding agents** or other materials that are otherwise extrinsic to the coating process. Instead, the invention makes use of an activator that is capable of serving as a binder when dissolved, and

is consumed (reacted) during the diffusion coating process so as not to interfere with the diffusion process. The adhesive mixture of dissolved activator and particulate materials is a paste-like material that, if dried, forms a solid pack exhibiting sufficient strength to permit handling of the component prior to the diffusion process". In this paragraph it is further stated "As such, the **dissolved activator is capable of being the sole binding constituent within the adhesive mixture, and the adhesive mixture does not contain extraneous binding agents** of the type that have previously led to inconsistencies in diffusion coating processes".

The skilled person is thus taught by this paragraph that the adhesive mixture of the claimed process, which is generally suitable for forming diffusion aluminide coatings, preferably contains no extraneous binder but that **the activator** to be used, which is dissolved in a solvent, **is the sole binding agent** within this mixture.

2.3.5 The following paragraph bridging the pages 4 and 5 once again teaches that the present invention which overcomes shortcomings of the prior art is "in view of these advantages ... useful in circumstances where it is desirable to **aluminize** a surface of a component". Thereafter embodiments of the invention are described and figure 1 depicts a **diffusion aluminide coating** and the corresponding description in the first full paragraph on page 6 mentions that the paste could be similarly used to produce a platinum **aluminide diffusion coating**.

2.3.6 The second paragraph on page 6 then discloses that the activator is preferably an ammonium halide, more preferably ammonium chloride, which is soluble in water

and somewhat hygroscopic. It further states that "Other potentially suitable activators include ammonium bromide, ammonium iodide, ammonium fluoride and ammonium bifluoride which are also soluble in water. The solubility of the activator in water avoids the need for a solvent that is potentially hazardous or detrimental to the coating process. The other constituents of the paste mixture include a particular donor material for the diffusion coating and an inert filler material that prevents sintering of the donor material particles. Suitable compositions for the donor material will depend on the particular type of diffusion coating desired, with notable examples being **CrAl**, **CoAl**, **FeAl**, and **TiAl** alloys". This paragraph thus teaches the skilled person that the ammonium halides are the preferred activators for the paste which are all soluble in water (which implies that water can be used as a the solvent) and that the suitable particulate donor materials are aluminum containing alloys (which is not surprising in view of the intention to provide a diffusion aluminide coating. The paragraph bridging pages 6 and 7 then states: "With this in mind, suitable paste mixtures can comprise, by weight percent, about 1 to 10% of the activator powder, about 5 to about 30% of a donor material powder, about 30 to about 70% of an inert filler powder, and about 17 to about 37% water" (see page 7, first paragraph) and therefore supports the aforementioned conclusion that the paste (i.e. the adhesive mixture) can consist of said ammonium halide activator dissolved in a solvent (water), a particulate donor material including an aluminum alloy and an inert filler material.

Consequently, this paste does likewise not contain any extraneous binder material.

2.3.7 The following second paragraph on page 7 then discloses that the paste mixture is preferably heated to evaporate the solvent (water) before forming a **diffusion aluminide coating**.

2.3.8 The third paragraph on page 7 re-iterates that "**A significant feature of the invention is the use of an activator as the binding agent for the paste mixture. As a result, extraneous binding agents are not necessary or desirable**, particularly since such binding agents may interfere with the coating process or may be difficult to remove from the component surface at the end of the process. In contrast, the activator-binder of this invention promotes the coating process reaction, and is entirely consumed during the coating process so as not to subsequently pose a problem".

Thus the skilled person is again taught that the inventive paste mixture should **not** contain any extraneous binding agent and that the activator acts as the binder.

2.3.9 Thereafter three working examples of paste mixtures are disclosed which contain only water, ammonium chloride, aluminum alloy powder and aluminum oxide and which are used to form a diffusion aluminide coating. These examples support the general disclosure of a process including the steps wherein an adhesive mixture (paste) made of a particulate donor material comprising an aluminum alloy, an activator dissolved in a solvent (preferably one of the disclosed ammonium halides) optionally including a clay (which serves as a thickener), and a particulate filler not containing an extraneous binder is applied onto a component and heated to vaporize the solvent (water) and then to react the activator with the aluminum of the donor

material for forming a diffusion aluminide coating on the component.

2.3.10 Consequently, the appellant's arguments cannot hold.

2.4 Insofar as this objection is to be seen as a new ground of opposition under Article 100(c) EPC, the respondent has not given its consent to its introduction as required according to the established jurisprudence (see Case Law of the Boards of Appeal, 7<sup>th</sup> edition 2013, section IV.D.5.3; see G 10/91, OJ EPO 1993, 420; G 1/95, OJ EPO 1996, 615).

3. *Remarks on the procedure before the Opposition Division*

The Opposition Division concluded in its communication of 8 February 2010 annexed to the summons to oral proceedings that all the further documents "*are not admissible under Article 99(1) and Rule 76(2)(c) EPC since no case to answer was based upon those documents*" (see point 2.1.3 above). The same occurred in its communication of 3 November 2010 confirming the date of the oral proceedings.

It appears that the Opposition Division adheres to the concept that an opposition may have a "partial admissibility" in the sense that documents filed with the opposition, but which are not "in support of these grounds" (i.e. the grounds mentioned in the opposition) as mentioned in Rule 76(2)c) EPC, are also not complying with Article 99(1) EPC and can therefore be found "inadmissible". This appears to be an analogous application of Rule 77(1) EPC, which applies, however, to the opposition as a whole.



The Board cannot agree with this approach. What an Opposition Division can do, however, is to indicate that it sees no need at that point in time to consider the evidence for which no substantiation has been submitted. This has the same result, but is not formulated as a procedural decision taken by the Opposition Division in the early stages of the proceedings.

"Admission into opposition proceedings" only appears to apply when Rule 116(2) EPC is to be considered, i.e. facts and evidence filed after the final date for making written submissions.

As a consequence, the evidence filed with the opposition is not "outside" of the proceedings, but is "in" the proceedings. Of these, the Board only deems D1 sufficiently relevant, so as to be discussed for inventive step.

4. *Inventive step (Article 56 EPC)*

4.1 For the following reasons the Board considers that document D5 represents the closest prior art and/or the most promising springboard towards the invention (see Case Law of the Boards of Appeal, 7<sup>th</sup> edition 2013, section I.D.3.4.2).

4.2 D1 does **not** represent the closest prior art since its process uses a paste made from a mixture of the deposit metal or an alloy thereof, an inert refractory material, an activating material comprising a halide (preferably ammonium iodide or ammonium chloride), and **a binder** (preferably a polyvinyl alcohol) which is volatile without leaving a carbon deposit at the annealing temperature (see claim 1).

- 4.3 D7 does **not** represent the closest prior art either since it discloses only a process using a mixture for forming surface diffusion alloys of chromium and aluminum in which the workpieces are immersed in said mixture in a gas-tight casing in an at least partially hydrogenated atmosphere. The halogenated constituent - i.e. the activator - is a liquid or a solid one, namely halogen, halogenide, hypohalogenite, or mixtures thereof (see figures 1 and 2; page 1, line 88 to page 2, line 85; page 2, line 118 to page 3, line 15). All examples 1-9 were, however, made with a dry mixture including ammonium chloride. D7 thus discloses the well-known "**pack cementation**" process.
- 4.4 D11 only discloses a **chromizing** process and is thus even more remote than D7. It is thus evident that a combination of the teachings of D7 and D11 cannot result in the subject-matter of claim 1.
- 4.5 D5 discloses a process for producing a diffusion aluminide coating on the surfaces of cooling passages of superalloy articles, i.e. gas turbine engine parts (see column 1, lines 6 to 13; column 2, lines 22 to 25) which uses a source of aluminum, a halide activator, and an inert ceramic powder material. These components are incorporated in an aqueous base dispersant to form a slurry which includes **an organic thickener** (such as A15C produced by Dow Chemical Company) and therefore has a certain viscosity in the range of from about 100 to 1000 centipoise. This viscosity range is in the order of that observed in molasses or honey. The halide activator can be any of e.g. aluminum fluoride, sodium fluoride, sodium chloride, sodium bromide, sodium iodide, ammonium fluoride, ammonium chloride, potassium fluoride, potassium bromide, and potassium iodide (see

column 2, lines 25 to 32 and line 47 to column 3, line 59; column 4, lines 3 to 21). The parts filled with said slurry are then heated to a temperature between 1350°F to 2250°F (732,2-1232,2°C) for a period sufficient to allow the aluminum to diffuse into the surfaces of the internal passages (see column 4, lines 40 to 49).

- 4.5.1 The Board considers that the subject-matter of claim 1 of the single request due to the used wording "comprising" does **not** exclude any thickener (as is included in the slurry proposed by D5).

This conclusion is due to the fact that the composition of the third example of the patent in suit besides the "aluminum alloy" (which actually is a chromium alloy containing 56 wt.% Cr), the alumina filler, the ammonium chloride and water, in addition contains hectorite clay (as a 4% by weight mixture in water and a small amount of ammonium hydroxide) to form a paste. It is clear to the person skilled in the art that hectorite clay represents an inorganic thickener. The respondent's arguments to the contrary cannot hold since this functionality is an inherent property of this specific clay material.

It is therefore concluded that the constituents of the aluminiding compositions according to D5 including an organic thickener would fall under the definitions of claim 1 of the patent as maintained.

In this context the Board remarks that the parties have not submitted any evidence which would show that either the specific organic thickener A15C of D5 or any other thickener has to be considered a binder. Furthermore, D5 uses the wording "as the organic binder" only once

but in general it teaches the use of "an **organic thickener**" of which key requirements are the desired degree of **viscosity increase**, that it degrades/ decomposes at moderate temperatures, that it leaves no residue to contaminate the surfaces after degradation and breakdown, that it does not produce excessive by-products during decomposition, that it leaves a network of interconnected voids to facilitate easy removal of the powder pack material, and that it contains no chemical species which are harmful to superalloys. Therefore the use of an organic **thickener** such as the methyl cellulose according to the example and in accordance with the teachings of D5 is much more credible than its use as an organic **binder**. In the latter respect mention is made of Kelzan<sup>®</sup>, for which it is stated that "the overall suitability of this slurry is presently unknown" (see column 3, line 38 to column 4, line 21; Table I, claims 1 and 3).

4.5.2 The aqueous **slurry** according to D5 having a viscosity in the range of about 100 to 1500 centipoise does, however, **not** represent a mixture with a "malleable, formable consistency" as required by claim 1 in the sense of the patent in suit.

4.5.3 Consequently, the subject-matter of claim 1 is distinguished from the process according to D5, of which the resulting coating mixture does not contain any extraneous binder but a thickener, **only** in that the coating mixture has a malleable, formable consistency. The effect of this consistency is that the coating mixture can be easily applied in uniform thickness on **localized** regions of a workpiece that need to be diffusion aluminide coated (see patent in suit, paragraphs [0009], [0010] and [0013]). Due to its consistency, the use of masking is avoided.

4.5.4 Thus the objective technical problem starting from the teaching of D5 can be defined as the provision of a diffusion aluminide process which would allow applying the adhesive coating mixture on localized regions of a workpiece in a uniform thickness and in an easy manner, without the use of masking, by using the equipment of D5.

It appears to be obvious that the person skilled in the art **could** adapt the viscosity of the honey-like or molasses-like adhesive mixture of D5 (which when applied to a surface of a workpiece will drip off or flow away from a localized region thereof), in order that the adhesive mixture remains in the desired localized region to be coated, without any masking, and **could** select another thickener providing a then paste-like consistency.

4.5.5 However, as argued by the respondent, even if the solution to this technical problem may appear to reside in the application of common general knowledge and practice of the person skilled in the art he **would not** have done so. The skilled person would have maintained his opinion that the adhesive mixture of D5 should remain suitable to be injected (or sprayed) into the internal passages of turbine parts, the field of application of D5. This would not have been possible with a formable and malleable adhesive mixture. This is to be applied by a spatula or other mechanical means or by manual manipulation (see Case Law of the Boards of Appeal, 7<sup>th</sup> edition 2013, section I.D.5).

Since the appellant has **not** submitted any counter-arguments with respect to document D5 and inventive step, let alone concerning this particular aspect (see

point V above), the Board considers that claim 1 of the patent as maintained involves inventive step over the teaching of D5 and the common general knowledge and practice of the person skilled in the art.

4.6 Taking account of the above the Board notes that the appellant failed to demonstrate that the Opposition Division's decision was wrong in the above respects. Since the combination of the teachings of D5 with D4 as dealt with in the impugned decision was not argued at the appeal stage, the Board sees no need to consider it either.

## Order

### **For these reasons it is decided that:**

The appeal is dismissed.

The Registrar:

The Chairman:



G. Nachtigall

H. Meinders

Decision electronically authenticated



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Case Number: T 0167/11 - 3.2.07

**D E C I S I O N**  
**of Technical Board of Appeal 3.2.07**  
**of 23 November 2015 correcting an error in the decision**  
**of 22 January 2015**

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**Decision under appeal:** Interlocutory decision of the Opposition  
Division of the European Patent Office posted on  
26 November 2010 concerning maintenance of the  
European Patent No. 1528117 in amended form.

**Composition of the Board:**

**Chairman** H. Meinders  
**Members:** H. Hahn  
I. Beckedorf

In the last paragraph of point 2.2.2 of decision T 0167/11 the reference to the decisions "T 936/10, point 9 of the reasons" and "T 911/11" are erroneous. The first reference should correctly read "T 936/09, point 9 of the reasons" and the second one should correctly read "R 11/11".

The Registrar:

The Chairman

G. Nachtigall

H. Meinders