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Datasheet for the decision of 15 July 2014

Case Number: T 0021/13 - 3.2.08

Application Number: 03009539.2

Publication Number: 1433865

IPC: C22C19/05

Language of the proceedings: EN

Title of invention:
High-strength Ni-base superalloy and gas turbine blades

Patent Proprietor:
Hitachi, Ltd.

Opponent:
Siemens Aktiengesellschaft

Headword:

Relevant legal provisions:
EPC Art. 123(2), 84

Keyword:
Amendments - added subject-matter (no)
Claims - support in the description (yes)

Decisions cited:

Catchword:

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Case Number: T 0021/13 - 3.2.08

D E C I S I O N
of Technical Board of Appeal 3.2.08
of 15 July 2014

Appellant: (Opponent)	Siemens Aktiengesellschaft Wittelsbacherplatz 2 80333 München (DE)
Representative:	Siegler, Frank Siemens AG Postfach 22 16 34 80506 München (DE)
Respondent: (Patent Proprietor)	Hitachi, Ltd. 6 Kanda Surugadai 4-chome Chiyoda-ku, Tokyo 100-8010 (JP)
Representative:	Strehl Schübel-Hopf & Partner Maximilianstrasse 54 80538 München (DE)
Decision under appeal:	**Interlocutory decision of the Opposition Division of the European Patent Office posted on 26 October 2012 concerning maintenance of the European Patent No. 1433865 in amended form.**

Composition of the Board:

Chairman	T. Kriner
Members:	M. Alvazzi Delfrate
	D. T. Keeling

Summary of Facts and Submissions

I. By its decision posted on 26 October 2012 the opposition division found that European patent No. 1433865, in amended form according to the main request filed at the oral proceedings, and the invention to which it related met the requirements of the EPC.

II. The appellant (opponent) lodged an appeal against that decision in the prescribed form and within the prescribed time limit.

III. The appellant requests that the decision under appeal be set aside and that the patent be revoked.

The respondent (patent proprietor) requests that the appeal be dismissed and that the patent be maintained in the amended form agreed by the opposition division or, in the alternative, that the patent be maintained on the basis of the auxiliary request filed with letter of 3 June 2013. As a further auxiliary request it requests to amend Figures 2 to 5. Oral proceedings are requested as a precautionary measure.

IV. Claim 1 of the main request reads as follows:

"1. A gas turbine blade made of an ordinary casting of a high-strength Ni-base superalloy consisting of (in wt-%):
Cr : 13.0 to 15.0
Co : 6.0 to 8.0
Al : 3.6 to 4.4
Nb : 1.0 to 1.5
C : 0.1 to 0.16
B : 0.01 to 0.02

Hf : 0 to 2.0
Re : 0 to 0.5
Zr : 0 to 0.05
O : 0 to 0.005
N : 0 to 0.005
Si : 0 to 0.01
Mn : 0 to 0.2
P : 0 to 0.01
S : 0 to 0.01
W : 3.8 to 4.4
Ti : 3.2 to 3.6
Ta : 2.5 to 3.2
Mo : 1.6 to 2.3
wherein
the balance is Ni and unavoidable impurities;
$4.0 \leq TiEq \leq 6.0$, $TiEq = Ti + 0.5153\ Nb + 0.2647\ Ta$;
$5.0 \leq MoEq \leq 8.0$, $MoEq = Mo + 0.5217\ W + 0.5303\ Ta + 1.0326\ Nb$;
the γ' phase is precipitated in the matrix of the alloy."

The auxiliary requests do not play a role for the present decision.

V. The following document was cited in the appeal proceedings:

A1: EP -A- 0 045 563.

VI. The arguments of the appellant can be summarised as follows:

Claim 1 was amended during the opposition proceedings and consisted essentially of a combination of originally filed claims 1, 10, 15 and 16. However, the Ti content of 3.2 to 3.6% was not taken from these

claims but from the description. In this way preferred and most preferred values of the contents of the various alloying elements were combined at random. Hence, a Ti content of 3.2 to 3.6% was not disclosed in combination with a Cr content of 13 to 15% but only with one of 12 to 16%. Additionally, as made clear by the importance of the Mo and Ti equivalents, the Ti content could not be arbitrary chosen without defining the Nb, Ta, W and Mo contents which were given in claims 13, 14 and 16. Therefore, the values for the Ti content according to claim 1 introduced subject-matter which extended beyond the content of the application as originally filed.

The same applied in respect of the Hf content. Paragraph [0027] of the A-publication taught that for ordinary castings Hf should be avoided whereby an upper limit of 0.1% could be tolerated. Higher contents of Hf, between 0.7 and 2.0%, were foreseen only for unidirectionally solidified castings and it was not disclosed at all which castings were to be considered for Hf contents between 0.1 and 0.7%. Moreover, the disadvantages of Hf for ordinary castings were also part of the common general knowledge of the person skilled in the art , as evidenced by A1 on page 1. However, present claim 1 was directed to ordinary castings and recited a Hf content up to 2.0%. Also for this reason it was amended contrary to Article 123(2) EPC. The same objection applied in respect of dependent claim 5.

The fact that the patent was amended contrary to Article 123(2) EPC was also confirmed by a novelty test, since a Hf content of between 0.1 and 0.7% or respectively greater that 0.7% for ordinary castings was novel and a Cr content of 13 to 15% was also novel

over the originally filed application of the patent in suit.

Furthermore in the figures the compositions not in accordance with the invention had neither been removed nor indicated as not belonging to the invention.

VII. The arguments of the respondent can be summarised as follows:

The Ti range of 3.2 to 3.6 % was disclosed in the description as a "preferable range". Neither in the text of the description nor in general practice of patent specification interpretation, there was any basis for the person skilled in the art interpreting the concerned passage such that the preferred range of Ti was to be tied to preferred ranges for other constituents. These other preferred ranges were recommended in view of the enhancement or attenuation of technical effects different from those of the Ti content. The role of Ti with respect to the groups of Ti equivalents and Mo equivalents was given by the two inequalities at the end of claim 1. Therefore, the restriction of the Ti content stipulated by claim 1 did not result in subject-matter extending beyond the content of the application as originally filed.

The Hf content of 0 to 2.0 wt-% was disclosed in original claim 1 and in the description. There was no contradiction in the Hf content being in the claimed range and the gas turbine blade being made by ordinary casting. In fact, this configuration was expressly supported by the dependence of original claim 10 on original claim 1. Also the passage in paragraph [0027] on the role of Hf within the alloy did not give any rise to a contradiction. In view of Hf being a rare and

expensive element, the recommendation to keep the Hf content small did not come as a surprise to the person skilled in the art and was not understood as a contradiction to a generally claimed range of 0 to 2.0 wt-% of Hf. As to document A1, it included some fairly general observations on the role of Hf in a particular single crystal casting alloy different from the one of the invention.

Concerning the drawings it was true that not all alloys A1 to A28 were covered by the invention according to the amended patent. However, amended Tables 1-1 and 1-2 precisely told the person skilled in the art, which alloys were covered by the invention and which were not. Therefore, a further revision of the figures did not appear necessary.

Reasons for the Decision

1. The appeal is admissible.

2. Main request - Article 123(2) EPC and Article 100(c) EPC

2.1 A gas turbine blade with the Cr, Co, Al, Nb, C, B, W, Ta and Mo contents according to claim 1 is disclosed in originally filed claims 15 and 16, which in particular stipulate a Cr content of 13.0 to 15.0%. Further, since claims 15 and 16 depend on claim 1, the contents of of Hf, Re, Zr, O, N, Si, Mn, P, S, TiEq and MoEq of present claim 1 are also disclosed in the originally filed application.

2.2 The feature that the blade is made of an ordinary casting is disclosed in claim 10 as originally filed.

The appellant argues, referring to paragraph [0027] of the A-publication, that for ordinary castings Hf should be avoided and in any event held below 0.1%. However, the appellant's view that the application does not disclose ordinary castings with Hf contents above 0.1% is in contradiction with examples A21 to A25 (see table 1-2 and paragraphs [0036] to [0037]). Moreover and most importantly, paragraph [0027], while indicating that Hf addition for ordinary casting is not advantageous, cannot diminish the fact that the combination of originally filed claims 1 and 10 discloses an ordinary casting with Hf content up to 2.0%, as required by present claim 1.

Similarly, an ordinary casting with a Hf content according to present dependent claim 5 is disclosed by the combination of originally filed claims 10 and 12.

A1 does not change these findings, since its teaching in respect of Hf (page 1, last paragraph) is not part of the disclosure of the patent in suit but merely relates to the invention considered in A1.

2.3 The combination of originally filed claims 1, 15 and 16 foresees the presence of Ti in the composition of the turbine blade but does not stipulate the content of this alloying element. However, a Ti content in accordance with claim 1 (3.2 to 3.6%) is disclosed in paragraph [0022] of the application as originally filed. There is no disclosure in the application as originally filed of this preferred range being tied to other features not comprised in originally filed claims 1 and 16. Hence, it is clear for the person skilled in the art that a Ti content of 3.2 to 3.6% can be chosen for the composition of claim 16.

The appellant submits that this Ti content is disclosed only in combination with Cr contents of 12 to 16% and that the Ti cannot be chosen arbitrarily without indicating the contents of Nb, Ta, W and Mo, as defined in claims 13, 14 and 16. However, notwithstanding the fact that claim 14 discloses the ranges of the Ti and Cr contents of present claim 1 in combination, it is pointed out that the Cr content of present claim 1 falls within the range 12 to 16% and that the contents of Nb, Ta, W and Mo are either identical or fall within the ranges defined in originally filed claims 13, 14 and 16. In other words none of the features allegedly disclosed in combination with a Ti content of 3.2 to 3.6% has been omitted by claim 1.

2.4 Accordingly, claim 1 and claim 5 satisfy the requirements of Article 123(2) EPC.

3. Main request - Article 84 EPC

The appellant criticises that in Figures 1 to 5 the alloys not belonging to the invention have not been deleted or indicated as not inventive.

It is true that these Figures still carry the wordings "invention alloys" generally indicating the group of alloys A1 to A28. However, tables 1-1 and 1-2 which disclose in detail the compositions of these alloys, make clear which alloys of this group belong to the invention and which not. Therefore, there is no contradiction between the claims and the description and the drawings, so that the requirements of Article 84 EPC are satisfied.

4. Since the appellant did not request oral proceedings and the respondent requested oral proceedings only for

the case that the Board did not grant its main request, the Board was able to decide the case in the written proceedings.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

V. Commare T. Kriner

Decision electronically authenticated