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**Datasheet for the decision
of 15 July 2009**

Case Number: T 1998/07 - 3.2.08

Application Number: 00304153.0

Publication Number: 1057899

IPC: C22C 19/05

Language of the proceedings: EN

Title of invention:

Compositions and single-crystal articles of hafnium-modified
and/or zirconium-modified nickel-base superalloys

Applicant:

GENERAL ELECTRIC COMPANY

Headword:

-

Relevant legal provisions:

EPC Art. 123(2), 84, 83

Keyword:

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Decisions cited:

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Catchword:

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Case Number: T 1998/07 - 3.2.08

D E C I S I O N
of the Technical Board of Appeal 3.2.08
of 15 July 2009

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

Representative: Szary, Anne Catherine
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 16 July 2007
refusing European patent application
No. 00304153.0 pursuant to Article 97(1) EPC.

Composition of the Board:

Chairman: T. Kriner
Members: R. Ries
U. Tronser

Summary of Facts and Submissions

- I. The appellant (applicant) lodged an appeal against the decision of the examining division dated 16 July 2007 to refuse European patent application No.00304153.0.

The examining division reasoned that claim 1 then on file comprised added subject matter and lacked clarity and, therefore, failed to satisfy the requirements of Articles 123(2) and 84 EPC. Moreover, an insufficiency of disclosure was found pursuant to Article 83 EPC since it was neither derivable nor clear from the claims how to modify the base alloy compositions by the modifying elements and how the final composition of the single crystal article set out in claim 1 should read after the modification.

- II. The appeal was received at the European Patent Office on 21 September 2007 and the appeal fee was paid on the same date. The statement setting out the grounds of appeal was received on 26 November 2007.

Subsequent to a phone conversation with the Board, the appellant filed amended application documents enclosed with its letters dated 16 June 2009 and 13 July 2009. He requested that the decision under appeal be set aside and a patent be granted on the basis of claims 1, 6 to 12 submitted on 13 July 2009, claims 2 to 5 submitted on 16 June 2009, description pages 1 to 9 submitted on 16 June 2009, figures 1 and 2 as originally filed. Oral proceedings were requested should a negative decision be contemplated by the Board.

III. The wording of claim 1 of this request is as follows:

"1. An article comprising substantially a single crystal and having a composition, in weight percent, consisting of

a base alloy composition of from 4 to 20 percent cobalt, from 1 to 10 percent chromium, from 5 to 7 percent aluminum, from 0 to 2 percent molybdenum, from 3 to 8 percent tungsten, from 4 to 12 percent tantalum, from 0 to 2 percent titanium, from 0 to 8 percent rhenium, from 0 to 6 percent ruthenium, from 0 to 1 percent niobium, from 0 to 0.1 percent carbon, from 0 to 0.01 percent boron, from 0 to 0.1 percent yttrium, and from 0 to 0.15 percent hafnium;

and as modifying element(s) (a) 0.1 to 0.5 percent zirconium, or, alternatively, (b) 0.1 to 0.5 percent zirconium plus 0.2 to 2.0 percent hafnium replacing the hafnium content of the base alloy, the balance being nickel and incidental impurities."

Claims 2 to 12 which are all dependent upon claim 1 relate to preferred embodiments of the article set out in claim 1.

Reasons for the Decision

1. The appeal is admissible.
2. Amendments to the claims; Articles 123(2) and 84 EPC
 - 2.1 The elemental ranges of the composition of the article set out in amended Claim 1 derive from original claim 1 whereby the modifying element(s) to be added to the

base alloy have been restricted to include either (a) zirconium alone or alternatively (b) hafnium plus zirconium within the specified ranges.

The optional presence of 0 to 0.15 percent hafnium in the base alloy composition, additionally featuring in amended claim 1, finds support on page 4 lines 23 to 31 of the application as filed. Its inclusion is necessary in view of Article 84 EPC to prevent contradiction between claim 1 and the dependent claims which relate to preferred base alloy compositions comprising small amounts of hafnium within this range. As disclosed on page 7, lines 9 to 18 of the application as filed originally, the hafnium content is as indicated in the base alloy composition, if zirconium is the only modifying element. If, however, a combination of hafnium plus zirconium is added as modifying elements, the hafnium content in the base composition is replaced by the hafnium content in its specified range of from 0.2 to 2.0 percent and zirconium is within 0.1 to 0.5 percent. Hence the term "replacing the hafnium content of the base alloy" in amended claim 1 is supported by the application as originally filed.

- 2.2 In the absence of any other disclosure in the application, it goes without saying that the modifying elements are added to the base alloy composition at the expense of the balance nickel. The wording "*alloy composition consisting of ...the compulsory and optional components... the balance being nickel and incidental impurities*" defines a "closed composition" from which elements other than those mentioned are excluded. Consequently, the alloy composition of the claimed articles is clearly defined in amended claim 1.

2.3 According to the originally filed application on page 3, line 24 to page 4, line 5, the term "*substantially single crystal*" is meant to include the presence of a number of low angle grain boundaries and some incidental small regions having other crystalline orientations. In view of these technical explanations the technical term "*substantially single crystal*" featuring in claim 1 is rated as being clear and likewise satisfies the provisions of Article 84 EPC.

Hence, amended claim 1 meets the requirements of Articles 123(2) and 84 EPC.

2.4 Dependent claims 2 to 5 correspond to claims 2, 3, 5 and 6, respectively.

2.5 Amended claims 6 to 12 are based on dependent claim 7 as originally filed and on original claim 1. For the sake of clarity and better comprehension, the numerous preferred embodiments of the claimed article featuring in original claim 7 have been split up to form seven separate dependent claims.

Hence there are no objections to the wording of claims 1 to 12 with respect to Article 84 and 123(2) EPC.

3. Article 83 EPC

Turning to the objection under Article 83 EPC raised by the examining division, the Board cannot identify any reason or difficulty as to why a person skilled in the art of metallurgy should not be able to put into

practice the claimed article, all the more so as the preferred method for practising the invention is disclosed in detail on pages 8 and 9 of the application.

Hence there is no objection under Article 83 EPC.

4. Since the request for oral proceedings was conditional on a negative decision, which condition is not met, no oral proceedings are necessary.

5. Remittal to the first instance

5.1 Since the first instance has not yet examined whether the present application as amended meets the requirements of novelty and inventive step, the Board considers it appropriate, in accordance with Article 111(1) EPC, to remit the case to the first instance for further prosecution.

5.2 Given the current situation of the file, it appears appropriate to postpone adapting the description until the final version of the claims is available.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the first instance for further prosecution on the basis of the following documents:

Claims 1, 6 to 12 submitted with letter of 13 July 2009,
Claims 2 to 6 submitted with letter of 16 June 2009,

Description pages 1 to 9 submitted with letter of
16 June 2009,

Figures 1, 2 as originally filed.

The Registrar:

The Chairman:

V. Commare

T. Kriner