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**Datasheet for the decision
of 12 January 2016**

Case Number: T 0324/13 - 3.2.08

Application Number: 05254716.3

Publication Number: 1627930

IPC: C22C19/05

Language of the proceedings: EN

Title of invention:

Stable, high-temperature nickel-base superalloy and single-crystal articles utilizing the superalloy

Patent Proprietor:

GENERAL ELECTRIC COMPANY

Opponent:

Siemens Aktiengesellschaft

Headword:

Relevant legal provisions:

EPC R. 111
EPC Art. 54, 56

Keyword:

Novelty - selection invention

Decisions cited:

Catchword:



**Beschwerdekammern
Boards of Appeal
Chambres de recours**

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Case Number: T 0324/13 - 3.2.08

D E C I S I O N
of Technical Board of Appeal 3.2.08
of 12 January 2016

Appellant: Siemens Aktiengesellschaft
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Decision under appeal: **Decision of the Opposition Division of the
European Patent Office posted on 24 January 2013
rejecting the opposition filed against European
patent No. 1627930 pursuant to Article 101(2)
EPC.**

Composition of the Board:

Chairwoman P. Acton
Members: M. Alvazzi Delfrate
D. T. Keeling

Summary of Facts and Submissions

- I. By its decision posted on 24 January 2013 the opposition division rejected the opposition against the European patent No.1627930.

- 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. Moreover the refund of the appeal fee is requested. The request of oral proceedings, originally submitted with the notice of appeal, was withdrawn with letter of 11 August 2015.

The respondent (patent proprietor) did not make any specific request but merely stated its agreement with the decision of the opposition division.

- IV. Claims 1 and 4 of the patent as granted read as follows:

"1. A composition of matter consisting of, in weight percent, from 0.4 to 6.5 percent ruthenium, from 3 to 8 percent rhenium, from 5.8 to 10.7 percent tantalum, from 4.25 to 17.0 percent cobalt, from 0.1 to 2.0 percent hafnium, from 0.02 to 0.4 percent carbon, from 0.001 to 0.005 percent boron, from 0 to 0.02 percent yttrium, from 1 to 4 percent molybdenum, from about 1.25 to 10 percent chromium, from 0.5 to 2.0 percent niobium, from 0.05 to 0.5 percent zirconium, from 5.0 to 6.6 percent aluminum, from 0 to 2.0 percent titanium, from 3.0 to 7.5 percent tungsten, and from 0.1 to 6 percent of an element selected from the group

consisting of platinum, iridium, rhodium, and palladium, and combinations thereof, balance nickel and incidental impurities."

"4. An article comprising a substantially single crystal piece (40) having a composition consisting of, in weight percent, from 0.4 to 6.5 percent ruthenium, from 3 to 8 percent rhenium, from 5.8 to 10.7 percent tantalum, from 4.25 to 17.0 percent cobalt, from 0.1 to 2.0 percent hafnium, from 0.02 to 0.4 percent carbon, from 0.001 to 0.005 percent boron, from 0 to 0.02 percent yttrium, from 1 to 4 percent molybdenum, from 1.25 to 10 percent chromium, from 0.5 to 2.0 percent niobium, from 0.05 to 0.5 percent zirconium, from 5.0 to 6.6 percent aluminum, from 0 to 2.0 percent titanium, from 3.0 to 7.5 percent tungsten, and from 0.1 to 6 percent of an element selected from the group consisting of platinum, iridium, rhodium, and palladium, and combinations thereof, balance nickel and incidental impurities."

V. The following prior art documents were cited in appeal:

D2: US -A- 2003/0041930;

D9: EP -B- 0 297 785.

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

Request to refund the appeal fee

In the decision of 24 January 2013 point 3.8 concerning novelty was incomplete and no reasoning in respect of inventive step was provided. Hence, the appeal fee should be refunded.

Novelty

The claimed scope covered the presence of all five the elements Ru, Pt, Ir, Rh and Pd. The choice of these five elements from the list of six elements disclosed in D2 was not narrow, because only Os was omitted. Furthermore the numerical ranges of the contents of these elements were not the result of a narrow selection.

Whether the numerical ranges selected for the different alloying elements were novel had to be considered for each element in isolation.

Since the patent in suit claimed large ranges for the alloying elements, it allowed for variations in the properties of the alloy. Hence, the person skilled in the art would have worked in the range of overlap with D2.

Therefore, the subject-matter of claim 1 lacked novelty.

Inventive step

Even if novelty were to be acknowledged, inventive step would be lacking, in particular because D2 already dealt with the optimisation of microstructure and mechanical properties.

- VII. The respondent stated its agreement with the decision of the opposition division and their finding that the claims of the patent were novel over D2 and involved an inventive step over D2 when read alone or in combination with D9.

Reasons for the Decision

1. Request to refund the appeal fee

The decision of the opposition division in the version posted on 24 January 2013 stopped in the midst of paragraph 3.8. However, the decision as available online from the EPO register on the same date was complete as it comprised the whole of paragraph 3.8 and additional paragraphs 3.9 to 5, considering also the issue of inventive step. Hence, the Board is satisfied that the opposition division issued a reasoned decision, as foreseen by Rule 111(2) EPC.

Moreover, with the communication of 13 August 2014 a copy of this complete decision was delivered to the parties, who were able to take a position on it. Hence the reasoned decision of the opposition division was also notified to the parties as required by Rule 111(1) EPC.

Therefore, the Board sees no reason to refund the appeal fee.

2. Novelty

2.1 For an invention to lack novelty its subject-matter, i.e. the combination of the claimed features, must be clearly and directly derivable from the prior art. In the view of this Board in its present composition this principle applies in general, in particular also in the case of numerical ranges.

2.2 D2 relates to a high strength superalloy, whose composition is defined by the ranges disclosed in the abstract. D2 does not disclose any specific example. The following table shows the composition in wt% according to present claim 1 (which corresponds, save for the use of the term "about" in connection with Cr, to that of claim 4) in comparison with the composition disclosed in D2 (see abstract).

Element	Claim 1	D2
Re	3-8	0-5
Ta	5.8-10.7	6-12
Co	4.25-17.0	0-15
Hf	0.1-2.0	0-0.8
C	0.02-0.4	0-0.05
B	0.001-0.005	0-0.02
Y	0-0.02	-
Mo	1-4	0-3
Cr	1.25-10	3-12
Nb	0.5-2.0	0-2.0
Zr	0.05-0.5	0-0.1
Al	5.0-6.6	4-7
Ti	0-2.0	0-0.7
W	3.0-7.5	3-10
Ru	0.4-6.5	0-10 of at least one of Ru/Pt/Rh/Ir/Pd/Os
at least one: Pt/Rh/ Ir/Pd	0.1-6	
V	-	0-1.0
Ni	bal.	bal.

2.3 D2 aims at a eutectic γ - γ' free microstructure with a modified γ' morphology (paragraph [0001]). It is clear for the person skilled in the art, considering the teaching of D2, that the contents of the different alloying elements cannot be varied independently from each other, since they all influence the formation of this microstructure. Hence, contrary to what is maintained by the appellant, the ranges of the contents of the different alloying elements cannot be considered in isolation. Already for this reason the claimed composition represents a narrow selection within the composition disclosed in D2.

Moreover, the claimed selection of the content of B and the claimed selection within the domain of 0-10 wt% of at least one of Ru/Pt/Rh/Ir/Pd/Os disclosed in D2 are narrow selections also when taken alone. Hence, also for these reasons the claimed composition is a narrow selection within the ranges disclosed in D2.

Accordingly, the claimed composition is not simply a re-wording of the ranges disclosed in D2 but rather a narrow selection within the composition disclosed in the abstract of D2.

2.4 Nonetheless, in order to establish novelty it must also be verified that D2 does not provide, for instance by means of examples, a clear and unambiguous teaching to work in the area covered by present claim 1.

As explained above, D2 does not comprise specific examples. In the absence of such examples and of any indication to the contrary, the teaching conveyed by D2 to the person skilled in the art is to work in the

middle of the ranges disclosed in this document. Accordingly, in the case of B, for which D2 discloses a range of 0-0.02, there is no teaching to work within the presently claimed range (0.001-0.005), which is removed from the middle of the prior art range. Moreover, to arrive at the claimed invention it would also be necessary to select among the "at least one of Ru/Pt/Rh/Ir/Pd/Os" the appropriate elements, i.e. Ru and at least one of Pt/Rh/Ir/Pd while at the same time excluding Os. Also in this respect no teaching is provided by D2.

2.5 Therefore, an alloy according to claim 1 is not clearly and directly derivable from the prior art. Accordingly, the subject-matter of claim 1 is novel.

2.6 For the same reasons this conclusion applies also to the subject-matter of claim 4.

3. Inventive step

3.1 The problem solved by the claimed invention starting from D2 can be seen in the provision of a superalloy with reduced microstructural instability and improved high temperature mechanical properties (paragraph [0007]).

This problem is solved by the composition of claim 1, wherein the selected B content provides sufficient strength while avoiding excessive incipient melting (paragraphs [0027] and [0028]). Furthermore, Ru stabilizes the microstructure against detrimental TCP formation (paragraph [0021]) and Pt, Ir, Rh and Pd provide creep strength (paragraph [0037]).

- 3.2 It is true that D2 also deals with the control of the microstructure and the optimisation of the mechanical properties (paragraphs [0001] and [0002]). However, D2 does not provide any hint that advantages in this respect could be obtained by a composition according to present claim 1. Accordingly, D2 alone does not render it obvious to select a composition according to claim 1.
- 3.3 Nor is this teaching provided by D9, which was considered in the decision under appeal for assessing inventive step (point 4). D9 does not mention at all the elements Ru/Pt/Rh/Ir/Pd/Os, so that it cannot teach to select contents of these elements according to claim 1. Moreover, although it describes reducing the B content to not more than 0.005% (page 4, lines 14-29) D9 teaches at the same time to reduce C and Zr contents to values which fall outside the claimed ranges (page 4, lines 12-32). Hence, applying the teaching of D9 in respect of B would also result in the choice C and Zr contents which would differ from the requirements of claim 1. Hence, the combination of D2 and D9 would not lead to the claimed invention either.
- 3.4 Accordingly, the subject-matter of claim 1 involves an inventive step.
- 3.5 For the same reasons, this conclusion applies also to the subject-matter of claim 4.

Order

For these reasons it is decided that:

1. The appeal is dismissed.
2. The request to refund the appeal fee is rejected.

The Registrar:

The Chairwoman:



S. Sánchez Chiquero

P. Acton

Decision electronically authenticated