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Datasheet for the decision of 21 November 2008

Case Number: T 0751/07 - 3.2.02

Application Number: 99952827.6

Publication Number: 1184472

IPC: C22C 16/00

Language of the proceedings: EN

Title of invention:
Zirconium-based alloy for elements used in nuclear reactor cores

Patentee:
Federalnoe Gosudarstvennoe Unitarnoe Predpryatie

Opponent:
FRAMATOME ANP

Headword:
-

Relevant legal provisions:
EPC Art. 52(1), 56
RPBA Art. 13(1)

Keyword:
"Inventive step (no)"

Decisions cited:
-

Catchword:
-

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Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number: T 0751/07 **-** 3.2.02

D E C I S I O N
of the Technical Board of Appeal 3.2.02
of 21 November 2008

Appellant: (Opponent)
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Decision under appeal:
Decision of the Opposition Division of the European Patent Office posted 23 February 2007 rejecting the opposition filed against European patent No. 1184472 pursuant to Article 102(2) 1973 EPC.

Composition of the Board:

Chairman: T. Kriner
Members: S. Chowdhury
A. Pignatelli

Summary of Facts and Submissions

I. The appellant (opponent) lodged an appeal against the decision of the opposition division relating to European patent No. 1 184 472, rejecting its opposition to the grant thereof. The decision was dispatched on 23 February 2007.

The appeal was received on 19 April 2007 and the fee for the appeal was paid on the same date. The statement setting out the grounds of appeal was received on 29 June 2007.

II. The opposition was filed against the entire patent and based on Article 100 (a) EPC 1973 (lack of novelty and inventive step), and Article 100 (b) EPC 1973. The opposition division decided that the patent met the requirements of Articles 52(1) and 83 EPC, and rejected the opposition, accordingly.

III. Oral proceedings were held before the Board on 21 November 2008, at which the following requests were submitted:

The appellant (opponent) requested that the decision under appeal be set aside and that the European patent No. 1 184 472 be revoked.

The respondent (patentee) requested that the appeal be dismissed. After being informed, towards the end of the oral proceedings, of the Board's decision regarding inventive step of claim 1 as granted, the respondent requested that it be allowed to file an auxiliary request.

IV. The following documents were of particular interest in the appeal procedure:

D5: A. V. Nikulina: "Metal Science Aspects of Zirconium-Base Reactor Material Production in the Soviet Union", ASTM 9th International Symposium on Zirconium in the Nuclear Industry, Presented on the occasion of the Award of the W. J. Kroll Zirconium Metal Kobe Japan 1990, pages 85 to 105, 107 to 110

D7: EP-B1-0 198 570.

V. Independent claim 1 of the patent as granted reads as follows: -

"A zirconium-based alloy for the components of the active core of nuclear reactors, comprising niobium, iron, oxygen, carbon, and silicon, featured by a structure comprising an α-solid zirconium solution, CHARACTERIZED in that said alloy further comprises nickel, with the following ratio of the constituents (on a weight percent basis):

niobium 0.5 - 3.0
iron 0.005 - 0.05
oxygen 0.03 - 0.2
carbon 0.001 - 0.04
silicon 0.002 - 0.1
nickel 0.003 - 0.02
zirconium being the balance,

and the structure of the alloy further comprises particles of the β Nb-phase which are sized below 0.1 µm and are uniformly distributed in said α-solid

zirconium solution, the niobium content of the β Nb particles being within 60 - 95%."

Claims 2 to 6 are dependent claims.

VI. The parties argued as follows:

Appellant

D5 showed that it was normal practice in Russia to produce Zr-Nb alloys containing Ni. Starting from the alloys of D5 it was obvious for the person skilled in the art to provide a uniform distribution of fine particles, as taught by D7.

Respondent

There was no motivation in the prior art for providing a uniform distribution of fine particles of the β Nb-phase in the alloys of D5. This document already taught a different solution to the problem of corrosion, which was to provide a high iron content, and it went in a different direction. Therefore, it would not have been obvious to provide fine β Nb-phase particles which were uniformly distributed in the α-solid zirconium solution.

Reasons for the decision

1. The appeal is admissible.

2. *Inventive step*

2.1 The patent in suit relates to a zirconium-based alloy for use in the active core of nuclear reactors, where a number of requirements are imposed upon the alloys, inter alia regarding corrosion resistance in water and high-temperature steam. Accordingly, the patent claims a zirconium-based alloy comprising niobium, iron, oxygen, carbon, silicon, and nickel in defined amounts, wherein the structure comprises an α-solid zirconium solution in which particles of the β Nb-phase which are sized below 0.1 µm are uniformly distributed, and the niobium content of the β Nb particles are within 60 - 95%.

2.2 Document D5 discloses a similar alloy for the same use (page 5, first paragraph), and it studies the influence of alloying elements on water and steam corrosion. It describes a binary alloy with niobium, having the same composition and crystal structure as the presently claimed alloy (see D5: Table 2 on page 13, the last alloy composition, and Table 3), but it is silent with regard to the size and distribution of the particles of the β Nb-phase. Hence it does not disclose particles of the β Nb-phase which are sized below 0.1 µm and are uniformly distributed in the α-solid zirconium solution.

At the oral proceedings the respondent agreed with the above analysis, in particular that claim 1 of the patent in suit was distinguished from the alloy in Table 2 of D5 only by the particle size of the β Nb-phase and its uniform distribution.

2.3 The technical problem solved by these features is, inter alia, to improve the corrosion properties of the alloy (see paragraph [0011] of the patent). It is generally desirable in the art of zirconium-based alloys for the components of the active core of nuclear reactors to be corrosion resistant (D5, page 5, first paragraph and D7, first paragraph).

2.4 D7 describes a similar Zr-Nb binary alloy and is also concerned with the corrosion resistance of this alloy (page 2, line 25). D7 states that a microstructure where the second phase β Nb particles are homogeneously dispersed in the zirconium matrix in extremely fine particle size provides excellent corrosion resistance (page 2, lines 29 to 33). The particle size employed in D7 is finer than in the patent in suit (Table IV of D7).

2.5 Therefore, the person skilled in the art starting from the alloy of D5 would use this teaching of D7 in order to improve the corrosion characteristics of the alloy thereof. The actual mechanics of achieving fine particle size and uniform distribution would be routine for the skilled person, as admitted by the respondent.

2.6 Claim 1 does not involve an inventive step, accordingly.

2.7 The respondent argues that D5 already teaches to improve the corrosion characteristics of the alloy thereof by going down a different path, so that the person skilled in the art would have no need to study D7. This argument is not persuasive since the skilled person would use whatever methods were known, in combination, until the required degree of corrosion

resistance was achieved, so long as the methods were not incompatible, which is the case here.

3. *Auxiliary request*

At the end of the oral proceedings, after having been informed of the decision of the Board on the question of inventive step of the granted claim 1, the representative of the respondent asked to be allowed to file a new request. The reason for doing so was that he felt surprised by the argument which formed the basis of the Board's considerations that the subject-matter of granted claim 1 lacked an inventive step.

According to Article 13(1) RPBA any amendment to a party's case after it has filed its grounds of appeal or reply may be admitted and considered at the Board's discretion. The discretion shall be exercised in view of inter alia the current state of the proceedings and the need for procedural economy. The need for procedural economy means that a balance has to be found between the right of the parties to react to developments in the proceedings on the one hand and the public interest that proceedings come to a conclusion in a reasonable period of time on the other hand.

In the present case the objection of lack of inventive step and the line of argument, based on Documents D5 and D7, were raised by the appellant before the oral proceedings (see appellant's telefax of 21 October 2008, page 10, 8th paragraph and page 11, second complete paragraph), so that the respondent should not have been surprised by this. Thus, the Board cannot see any procedural reason which could justify the filing of a

new request at the end of the discussion on inventive step at the oral proceedings.

The admission of a new request would also delay the proceedings not only because a new request would have to be examined but also because the Board should then, for reasons of equal treatment, have to consider the admission into the proceedings of the late-filed Document D16, a long and complex document, which was filed by the Opponent shortly before the oral proceedings and which could become relevant due to the amendments of the request. The result could even have been that a completely new case arose and that the oral proceeding would have to be postponed.

Since there are no reasons justifying the filing of the new request, and the filing of the new request would delay the proceedings, the delay would not be in the public interest, which requires that proceedings should come to a conclusion in a reasonable period of time.

The Board therefore decided not to admit the new request.

Order

For these reasons, it is decided that:

1. The decision under appeal is set aside.

2. The patent is revoked.

The Registrar | The Chairman

V. Commare | T. Kriner