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

Case Number: T 0108/14 - 3.3.05

Application Number: 04770889.6

Publication Number: 1666433

IPC: C04B35/565, C04B35/63,
C04B35/66

Language of the proceedings: EN

Title of invention:

SiC REFRACTORY COMPRISING SILICON NITRIDE BONDED THERETO

Patent Proprietor:

NGK Insulators, Ltd.
NGK Adrec Co., Ltd.

Opponent:

Saint-Gobain Centre de Recherches et d'Etudes Européen

Headword:

SiC-Si NITRIDE REFRACTORY/NGK

Relevant legal provisions:

EPC Art. 123(2)

Keyword:

All requests - Amendments extend beyond the content of the application as filed

Decisions cited:

T 0472/88, T 0522/91, T 0759/91, T 1170/07, T 1095/09

Catchword:



Beschwerdekammern
Boards of Appeal
Chambres de recours

European Patent Office
D-80298 MUNICH
GERMANY
Tel. +49 (0) 89 2399-0
Fax +49 (0) 89 2399-4465

Case Number: T 0108/14 - 3.3.05

D E C I S I O N
of Technical Board of Appeal 3.3.05
of 12 May 2016

Appellant: NGK Insulators, Ltd.
(Patent Proprietor 1) 2-56, Suda-cho, Mizuho-ku
Nagoya-shi, Aichi 467-8530 (JP)

Appellant: NGK Adrec Co., Ltd.
(Patent Proprietor 2) 3040, Misano,
Mitake-cho
Kani-gun,
Gifu 505-0112 (JP)

Representative: TBK
Bavariaring 4-6
80336 München (DE)

Respondent: Saint-Gobain Centre De Recherches
(Opponent) Et D'Etudes Européen 18 avenue d'Alsace Les
Miroirs
92400 Courbevoie (FR)

Representative: Tanty, François
Cabinet Nony
3, rue de Penthièvre
75008 Paris (FR)

Decision under appeal: **Decision of the Opposition Division of the
European Patent Office posted on 20 November
2013 revoking European patent No. 1666433
pursuant to Article 101(3) (b) EPC.**

Composition of the Board:

Chairman G. Glod
Members: J.-M. Schwaller
 C. Vallet

Summary of Facts and Submissions

- I. The present appeal lies from the decision of the opposition division to revoke European patent No. 1 666 433, with claim 1 as granted reading as follows:

"1. A silicon nitride-bonded SiC refractory which contains SiC as a main phase and a secondary bond phase essentially consisting of Si₃N₄ and Si₂N₂O along with at least one element selected from Al, Ca, Fe, Ti, Zr and Mg in terms of oxide, and which has a bending strength of 150 to 300 MPa and a bulk density of 2.6 to 2.9, and which contains the at least one element selected from the group consisting of Al, Ca, Fe, Ti, Zr and Mg in an amount of 0.1 to 3% by mass in terms of oxide."

- II. According to the contested decision, the subject-matter of claim 1 of the respective eleven requests then on file, extended beyond the content of the application as filed, and so none of them met the requirements of Article 123(2) EPC.

In particular, the opposition division held that there was no basis in the application as filed for the substitution of the feature *"refractory which contains SiC as a main phase and Si₃N₄ and/or Si₂N₂O as a secondary phase"* with the feature *"refractory which contains SiC as a main phase and a secondary bond phase **essentially consisting of Si₃N₄ and Si₂N₂O along with at least one element selected from Al, Ca, Fe, Ti, Zr and Mg in terms of oxide**"*.

Auxiliary request 11, which was submitted on 15 October 2013 during oral proceedings before the

opposition division, was not admitted into the proceedings because it was late-filed and prima facie not allowable under Articles 123(2) and 84 EPC. Furthermore, it included parts from the description and so it formed an abuse of proceedings, as both the opposition division and the opponent were not prepared to discuss it.

- III. In its grounds of appeal dated 25 March 2014, the proprietor (the "appellant") declared the maintenance of all the requests submitted in opposition, except auxiliary request 10.
- IV. By letter of 18 July 2014, the opponent ("the respondent") filed a set of observations in which it held that the different sets of claims on file infringed Articles 123(2), 83 and 54 EPC.
- V. By letters of 2 December 2014 and 8 February 2016, the appellant submitted further observations, but it did not maintain auxiliary request 9.
- VI. By letter dated 18 April 2016, the board sent a communication expressing its preliminary non-binding opinion that none of the requests on file appeared to meet the requirements of Article 123(2) EPC and that auxiliary request 11 was not to be admitted into the proceedings.
- VII. At the oral proceedings, which took place on 12 May 2016, the discussion focused on Article 123(2) EPC issues and admissibility of auxiliary request 11.
- VIII. After having closed the debate, the chairman established the parties' request as follows:

The appellant requested that the decision under appeal be set aside and that the patent be maintained as granted (main request) or in amended form on the basis of one of the sets of claims according to auxiliary requests 1 to 8 as filed with letter of 13 September 2013, or alternatively, on the basis of the claims according to auxiliary request 11 dated 15 October 2013.

The respondent requested that the appeal be dismissed.

Reasons for the Decision

1. Main request - Article 123(2) EPC
 - 1.1 It is undisputed that claim 1 as granted has no literal basis in the application as filed. The question thus arises whether the subject-matter of this claim is, as required by the jurisprudence, directly and unambiguously derivable from the application documents as originally filed.
 - 1.2 In the application as filed, the invention was defined as follows in claim 1:

"1. A silicon nitride-bonded SiC refractory which contains SiC as a main phase and Si₃N₄ and/or Si₂N₂O as a secondary phase and which has a bending strength of 150 to 300 MPa and a bulk density of 2.6 to 2.9."

In the particular embodiment according to claim 5, the invention was further specified as follows:

"5. The silicon nitride-bonded SiC refractory according to any of claims 1 to 4, which contains at least one member selected from the group consisting of Al, Ca,

Fe, Ti, Zr and Mg, in an amount of 0.1 to 3% by mass in terms of oxide."

1.3 In the patent as granted, the invention was defined differently (see point I above), in particular as regards the secondary phase, which is now defined as being a *"secondary bond phase **essentially consisting of Si₃N₄ and Si₂N₂O along with at least one element selected from Al, Ca, Fe, Ti, Zr and Mg in terms of oxide**"*, and the question thus arises as to whether there is a direct and unambiguous disclosure in the application as filed for this amended definition of the secondary phase, in particular as regards the features emphasised in bold.

1.4 The board did not find any basis in the original application documents for a secondary phase essentially consisting of Si₃N₄, Si₂N₂O and one or more oxides of Al, Ca, Fe, Ti, Zr and Mg. Moreover, the sole compositional analysis of a refractory according the invention (example 2) reveals the presence of at least a further component, namely SiO₂ in an amount of 1.75 mass % (see table 3, page 16 as filed).

1.5 The appellant argued that the SiO₂ in the refractory of example 2 was exclusively located, as explained at page 12, lines 15 to 25, on its surface in the form of a strong oxide film, as a result of a heat treatment in air at 1300 to 1500°C of the final refractory.

The passage at page 8, lines 4 to 10 furthermore made clear that, apart from those compounds defined in claim 1 at issue, no further compounds, in particular those in form of a glassy phase or cristobalite, were present in the refractory according to the invention.

- 1.6 These arguments do not convince the board because, as explained by the respondent, a substantial part of the SiO_2 identified in the refractory of example 2 is necessarily located between the SiC grains of the main phase, i.e. in the secondary phase as a result of:
- the mandatory presence of 0.01 to 2.00% of oxygen in the nitrogen atmosphere used for firing the raw materials (see page 12, lines 3 to 5);
 - the presence of oxygen in a bound form in Al_2O_3 and Fe_2O_3 (see Table 1);
 - the post-treatment in air mentioned at page 12, lines 15 to 25.

As all these oxygen atoms inevitably react at high temperature with the Si powder present in the starting raw materials (page 13, lines 15 to 18 and Table 1), the presence of SiO_2 in the secondary bond phase, in addition to the $\text{Si}_2\text{N}_2\text{O}$ already defined in claim 1, is evident to the skilled person.

- 1.7 The board also cannot accept the argument that a glass phase and cristobalite were explicitly excluded from the secondary phase, since the passage at page 8, lines 4 to 10, merely discloses that the *"refractory of the present invention is preferred to contain at least one member selected from the group consisting of Al, Ca, Fe, Ti, Zr and Mg, in an amount of 0.1 to 3% by mass in terms of oxide, from the standpoint of [...], **control** of the amount of cristobalite to be formed, and **control** of the amount of glass phase to be formed"*, and so this passage merely means that the cristobalite and the glass phase are "controlled", not that these phases are excluded.

- 1.8 The appellant further argued that, according to decision T 1170/07, the substitution of the expression

"consisting essentially of" for the term "comprising" was allowable.

The board notes that, according to T 1170/07, the expression "consisting essentially of" excluded the presence in the claim of further active agents useful in the treatment of a specific disease but allowed the presence of additional compounds which were not active agents according to this definition, for instance the carrier for said active agent.

For the board, this decision does not apply to the case at issue because it is not directly and unambiguously derivable from the application as filed, which "active agents" are useful or not for the primary phase and for the secondary bond phase, respectively.

- 1.9 The board is further aware of certain jurisprudence (e.g. T 1095/09, reasons 6; T 0759/91, reasons 2.2; T 0522/91, reasons 2.2; T 0472/88, reasons 3) according to which the expression "consisting essentially of" was found to be clear and to allow the presence of other components in addition to the components mandatory in the claimed composition, provided that the essential characteristics of the claimed composition were not materially affected by their presence.

In the present case, however, the application as filed is silent as regards the components which, in addition to those defined in claim 1 at issue, could be allowed in the claimed refractory without affecting its essential characteristics. The board furthermore notes that the application as filed also does not disclose whether SiO₂, which is explicitly disclosed as being present in the refractory according to example 2 of the

patent, affects the essential characteristics of the claimed refractory composition or not.

It follows that in the present case, the expression "essentially consisting of" is not unambiguous, since the meaning of essential is not evident from the application.

1.10 As a consequence of the above considerations, the limitation of the secondary bond phase to **"essentially consisting of Si_3N_4 and Si_2N_2O along with at least one element selected from Al, Ca, Fe, Ti, Zr and Mg in terms of oxide"** is not directly and unambiguously derivable from the application as filed, so this amendment does not meet the requirements of Article 123(2) EPC.

1.11 Since the main request does not meet the requirements of the EPC, it cannot be allowed.

2. Auxiliary requests 1 to 8 - Amendments

As the wording of the respective claim 1 of each auxiliary request at stake comprises the expression "*and a secondary bond phase essentially consisting of Si_3N_4 and Si_2N_2O along with at least one element selected from Al, Ca, Fe, Ti, Zr and Mg in terms of oxide*", which for the reasons indicated above extends beyond the content of the application as filed, these reasons apply mutatis mutandis to auxiliary requests 1 to 8. It is undisputed that the amendments introduced in the respective claim 1 of these auxiliary requests do not change the meaning of the expression under debate.

Therefore the auxiliary requests 1 to 8 are not

allowable under Article 123(2) EPC either.

3. Auxiliary request 11 - Admissibility

Since the opposition division decided not to admit this request into the proceedings, the role of the board is limited to reviewing the opposition division's exercise of discretion conferred by Article 114(2) EPC.

In the case at issue, the department of first instance held auxiliary request 11 to be *prima facie* not allowable under Article 123(2) EPC, as it also contained the feature "essentially consisting of" that had been objected to for higher ranking requests.

Since the board comes to the same conclusion regarding the non-allowability under Article 123(2) EPC of the feature "essentially consisting of", the board does not see any misuse of the discretionary power by the department of first instance and auxiliary request 11 is therefore not admitted into the appeal proceedings either.

4. As none of the sets of claims underlying the proposed requests meets the requirements of the EPC, the appeal cannot succeed and the decision to revoke the patent is confirmed.

Order

For these reasons it is decided that:

The appeal is dismissed

The Registrar:

The Chairman:



C. Vodz

G. Glod

Decision electronically authenticated