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Bezeichnung der Erfindung: Engine parts
Title of invention:
Titre de l'invention :

Klassifikation / Classification / Classement : C 04 B 35/48

ENTSCHEIDUNG / DECISION
vom / of / du 21 May 1987

Anmelder / Applicant / Demandeur : NGK INSULATORS, Ltd.

Patentinhaber / Proprietor of the patent /
Titulaire du brevet :

Einsprechender / Opponent / Opposant :

Stichwort / Headword / Référence :

EPÜ / EPC / CBE Article 54(3)

Kennwort / Keyword / Mot clé : "Novelty, conflicting European application"

Leitsatz / Headnote / Sommaire

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Case Number : T 279/85

D E C I S I O N
of the Technical Board of Appeal 3.3.1
of 21 May 1987

Appellant : NGK INSULATORS, Ltd.
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Decision under appeal : **Decision of Examining Division 028 of the European Patent Office dated 26 June 1985 refusing European patent application No. 81 303 281.0 pursuant to Article 97(1) EPC**

Composition of the Board :

Chairman : F. Antony
Member : J. Arbouw
Member : G.D. Paterson

Summary of Facts and Submissions

I. European patent application No. 81 303 281.0, filed on 16 July 1981 and published on 8 December 1982 with publication No. 66022, claiming priority from a prior application on 21 May 1981 in Japan (JP 75 623/81), was refused by a decision dated 26 June 1985 of the Examining Division of the European Patent Office. The decision was based on Claims 1 to 5. Claim 1 was worded as follows:

"1. An engine part, characterized by comprising a component (23) of partially stabilized zirconia having a four point bending strength of at least 50 kg/mm^2 in which the difference of thermal expansion at an optional temperature in thermal expansion during heating up and thermal shrinkage during cooling down is less than 0.4%."

II. The ground for the refusal was that the subject-matter of Claims 1, 2, 3 and 5, insofar as the Contracting States Germany, France and Great Britain were concerned, was not novel having regard to the disclosure in EP-36 786, in view of Article 54(3) EPC. The senior patent described engine parts falling within the claims of the application.

III. The Applicants filed an appeal against this decision on 10 August 1985 with payment of the fee, and submitted a Statement of Grounds on 28 October 1985. Further submissions were received on 30 October 1985 and 10 January 1986, the latter together with new Claims 1 to 4 for DE, FR and GB and new Claims 1 to 5 for the other designated States, and with proposed amendments in the description. The Appellants submitted that the new claims for DE,FR and GB were directed to an engine part which is a ceramic-metal composite body having a stabilized

zirconia part and a metal part secured together. The subject-matter of these claims was novel over EP 36 786 since this document does not disclose engine parts also comprising metal parts.

IV. In a communication dated 23 October 1986 the Board informed the Appellant of its provisional opinion that the claims for DE, FR and GB were still not novel over EP 36 786.

V. In a letter received on 16 March 1987, the Appellant submitted further new Claims 1 to 5 for DE, FR and GB.

VI. The Appellants request that the impugned decision be set aside and that a European patent be granted on the basis of the Claims 1-5 for DE, FR and GB filed on 16 March 1987 and amended in the consultation by telephone on 16 April 1987, and on the basis of Claims 1-5 filed on 10 January 1986 and amended in the consultation by telephone on 16 April 1987 for the other designated Contracting States. The claims read:

For: AT, CH, IT, LI, NL and SE

"1. A ceramic engine part which comprises a partially stabilized zirconia part (11, 13) mainly consisting of either a tetragonal crystal phase of zirconia or a mixture of tetragonal crystal phase of zirconia and a cubic phase of zirconia and containing a monoclinic crystal phase of zirconia in an amount less than 10%, and having a four point bending strength of more than 50 kg/mm^2 and a thermal expansion hysteresis which provides for a maximum difference in expansion percents of 0.4% existing between the thermal expansion heating curve and the thermal shrinkage cooling curve at any temperature occurring between room temperature and 1000°C.

2. An engine part as claimed in Claim 1 wherein the thermal expansion coefficient of the partially stabilized zirconia part is more than 10 x 10^{-6}/°C.

3. An engine part as claimed in Claim 1 or Claim 2 which is a ceramic-metal composite body in which said partially stabilized zirconia part is bonded with or without the use of a bonding layer to a metal component (12, 22).

4. An engine part as claimed in Claim 3 wherein the difference between the thermal expansion coefficient of the partially stabilized zirconia part and that of the metal component is less than 3 x 10^{-6}/°C.

5. An engine part as claimed in any of Claims 1 to 4, wherein the said maximum difference between the thermal expansion heating curve and the thermal shrinkage cooling curve is less than 0.3%."

For: DE, FR and GB

"1. A ceramic engine part which is a ceramic-metal composite body which has a partially stabilized zirconia part (11, 23) and a metal part (12, 22) bonded together with or without the use of a bonding layer, said partially stabilized zirconia part mainly consisting of either a tetragonal crystal phase of zirconia or a mixture of tetragonal crystal phase of zirconia and a cubic phase of zirconia and containing a monoclinic crystal phase of zirconia in an amount less than 10%, and having a four point bending strength of more than 50 kg/mm^2 and a thermal expansion hysteresis which provides for a maximum difference in expansion percents of 0.4% existing between the thermal expansion heating curve and the thermal

shrinkage cooling curve at any temperature occurring between room temperature and 1000°C.

2. An engine part as claimed in Claim 1 wherein the thermal expansion coefficient of the partially stabilized zirconia part is more than 10 x 10^{-6}/°C.

3. An engine part as claimed in Claim 1 or Claim 2 wherein the difference between the thermal expansion coefficient of the partially stabilized zirconia part and that of the metal part is less than 3 x 10^{-6}/°C.

4. An engine part as claimed in any of Claims 1 to 3, wherein the said maximum difference between the thermal expansion heating curve and the thermal shrinkage on cooling curve is less than 0.3%.

5. An engine part as claimed in any one of Claims 1 to 4, which is a part which in use contacts high temperature gases."

Reasons for the Decision

1. The appeal complies with Articles 106 to 108 and Rule 64 EPC and is therefore admissible.

2. There is no formal objection to the current version of the claims since they are adequately supported by the original disclosure.

Claim 1 for DE, FR and GB is based on original Claims 1 and 3 together with page 3, lines 8-27, page 4, lines 32-35 and page 5, lines 16-21 of the description.

Claim 1 for the other designated States is based on original Claim 1 together with page 3, lines 8-27 and page 4, lines 32-35 of the description.

Claims 2-4 for DE, FR and GB correspond to original Claims 2,4 and 5 for these designated States is based on page 2, lines 28-35 of the description.

Claims 2-5 for the other designated States are based on the original Claims 2-5.

3. The ceramic engine parts according to the current version of the claims for DE, FR and GB are composite metal-ceramic bodies in which the metal part and the ceramic part are bonded together. EP 36 786 (see page 24, lines 20-21) mentions that partially stabilized zirconia can, inter alia, be used in machine parts for internal combustion engines. However, this brief general statement cannot be interpreted as disclosing engine parts in which the partially stabilized zirconia ceramic and a metal part are bonded together. Therefore, the subject-matter of the new claims for DE, FR and GB is novel over EP 36 786.

4. Since the only ground for refusal - lack of novelty for the designated States DE, FR and GB pursuant to a document comprised in the state of the art under Article 54(3) EPC - is no longer valid for the new set of claims for these designated States, the decision under appeal must be set aside. However, the patent sought cannot be granted since the substantive examination has not yet been completed. The Board therefore makes use of its power under Article 111(1) EPC to remit the case to the Examining Division for further prosecution.

Order

For the above reasons, it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the Examining Division for further prosecution on the basis of the two sets of claims set out in paragraph VI above.

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