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D E C I S I O N
of 11 May 2006

Case Number: T 0343/04 - 3.2.03

Application Number: 97928746.3

Publication Number: 0912278

IPC: B22F 3/10, C22C 32/00, G21F 1/08

Language of the proceedings: EN

Title of invention:
Metal matrix compositions for neutron shielding applications

Applicant:
COGEMA LOGISTICS

Opponent:
-

Headword:
-

Relevant legal provisions:
EPC Art. 56, 84

Keyword:
"Inventive step - no - combination of prior art and general knowledge"
"Support by the description (no)"
"Failure to appear at an oral proceedings"

Decisions cited:
-

Catchword:
-

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Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number: T 0343/04 - 3.2.03

D E C I S I O N
of the Technical Board of Appeal 3.2.03
of 11 May 2006

Appellant: COGEMA LOGISTICS
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Decision under appeal: **Decision of the Examining Division of the European Patent Office posted 17 October 2003 refusing European application No. 97928746.3 pursuant to Article 97(1) EPC.**

Composition of the Board:

Chairman: U. Krause
Members: G. Ashley
J.-P. Seitz

Summary of Facts and Submissions

I. This appeal lies from the decision of the examining division to refuse European patent application No. 97 928 746.3 (International publication number WO-A-98/00258).

II. During the examination proceedings, the applicant had requested grant of a patent based on the claims as published with the application, and oral proceedings in the event that the examining division was considering an adverse decision. In response to the summons to attend oral proceedings, the applicant filed a further set of claims as an auxiliary request, whilst stating that he would not attend the oral proceedings.

At the end of the oral proceedings, held in the absence of the applicant, the examining division decided to refuse the application on the basis that it did not meet the requirements of Rule 29(2) and Articles 84, 52, 54 and 56 EPC. The decision was posted on 17 October 2003.

III. The applicant filed an appeal on 12 December 2003 against the decision, paying the appeal fee at the same time. The grounds of appeal were filed with a letter dated 25 February 2004, together with a request to grant a patent on the basis of amended claims according to a main request or one of three auxiliary requests; the appellant also field an auxiliary request for oral proceedings.

IV. The Board issued a communication pursuant to Article 11(1) of the Rules of Procedure of the Boards of Appeal, together with a summons to oral proceedings, as requested by the appellant. The communication set out a provisional opinion concerning *inter alia* novelty and inventive step of the claimed subject-matter with respect to the following documents that had been cited by the examination division:

D1: US-A-5 486 223

D2: Handbook of Chemistry and Physics, 74th Edition, pages 4-5 to 4-6, CRC Press, Boca Raton, USA, 1995.

D3: GB-A-2 157 316

The communication also referred to US-A-5 156 804 (D4), a document cited in the international search report, but not referred to by the examining division.

V. In response to the communication, the appellant submitted, with a letter dated 11 April 2006, amended claims as a main and three auxiliary requests, together with arguments in favour of their patentability. In a telefax dated 25 April 2006, the appellant's representative informed the Board that he would not be attending the oral proceedings.

Oral proceedings were held on 11 May 2006 in the absence of the appellant.

VI. Claim 1 of the main request reads as follows:

"1. A boron carbide-metal matrix neutron shielding composite, said neutron shielding composite being in the form of a canister for containing spent fuel assemblies and other nuclear material, or in the form of a container for storing nuclear waste, and said neutron-shielding composite having a composition of 10 to 60 weight % boron carbide, 40 to 90 weight % of a metal matrix material selected from the group consisting of aluminum and alloys thereof, and wherein less than 6 weight % of one or more metal additives selected from the group consisting of silicon, iron and aluminum used to improve the chelating properties of the metal matrix material by forming intermetallic bonds therewith is (are) present in said composite, wherein the composite is castable, extrudable, and has a tensile strength greater than or equal to 50 kpsi and a yield strength greater than or equal to 45 kpsi, and wherein about 20% of boron in the boron carbide is a naturally occurring isotope B^{10} so as to efficiently absorb neutrons."

Independent claim 4 is also directed to a boron carbide-metal matrix neutron shielding composite in the form of a canister or container. Independent claim 5 concerns a canister defined in terms of composition and processing steps. Dependent claims 2, 3 and 6 to 8 refer to preferred embodiments of the subject-matter of independent claims 1 and 5 respectively.

Claim 1 of the first auxiliary request is the same as that of the main request. Claim 1 of the second and third auxiliary requests further specifies the

additives included in the boron carbide as being "in an amount of 0.1 to 0.4 weight % silicon, 0.5 (*sic*) to 0.4 weight % iron, and 0.05 to 0.4 weight % aluminum".

VII. Main Arguments of the Appellant

In essence the appellant argued that the claimed subject-matter is new, since none of the cited documents discloses the composite material in the form of a canister or a container for storing nuclear materials.

There is no indication in D1 that the material described there contains about 20% of the B^{10} isotope, and there is no mention of the properties, such as thermal shock resistance and thermal conductivity, that are important in a material for nuclear shielding applications. The proposed uses for the material, such as bicycle frames and golf clubs, give no indication that it would be suitable for nuclear applications. In addition, the skilled person would not expect that such a material, having a B^{10} content as low as about 20%, would be suitable for use as a neutron shield.

The fact that, in the provisional opinion issued by the Board, the argument against inventive step was based on three documents is an indication of inventiveness.

VIII. Requests

The appellant requested in his letter of 11 April 2006 that the decision under appeal be set aside and that a patent be granted on the basis of either the main request or one of the three auxiliary requests filed

with the same letter. Should the Board be contemplating an inventive step objection based on document D4, the appellant requested that the case be remitted to the department of first instance.

Reasons for the Decision

1. The appeal is admissible.

2. *Claim 1 of the Main Request*

Novelty (Article 54 EPC)

2.1 Claim 1 is directed to a particular material in the form of a canister or container for nuclear products. Since none of the available documents discloses all the of the features of claim 1, novelty is not in question. In particular, neither D1 nor D3 describes *inter alia* the material in the form of a canister or container for the nuclear industry.

Inventive Step (Article 56 EPC)

2.2 The problem underlying the present application is to improve the mechanical and manufacturing properties of metal matrix composite materials containing boron carbide, which are used for neutron shielding applications (see page 2 of the application, last paragraph).

Document D3 also relates to materials used for neutron shielding applications (see page 1, lines 5 to 16). D3 discloses a core material comprising a composite

containing 0.05 to 50% boron carbide in a matrix of aluminium or aluminium alloys, which is combined with a mantel and formed into a billet for extrusion into the desired shape (see page 1, lines 31 to 36). The material of D3 is said to provide the necessary stability and screening, whilst being simpler to manufacture (see page 1, lines 13 to 16). Since D3 concerns the same type of material and relates to a similar problem as set out in the application, it forms an appropriate starting point for the assessment of inventive step.

The appellant argues that D3 does not disclose a canister or container specifically for storing nuclear materials. However, D3 relates to materials for use in nuclear technology in general (see page 1, line 14) and rods and pipes are given as specific examples (page 1, lines 24 to 25). Although a container is not explicitly mentioned in D3, such materials are routinely made into containers for nuclear materials and no inventive activity could be associated with this particular use of the material.

2.3 The subject-matter of claim 1 therefore differs principally from that of D3 in terms of the definition of the boron carbide - aluminium composite material.

2.4 Starting from D3 the objective problem to be solved can be seen as how to improve further the mechanical properties of the composite material.

2.5 D1 discloses a boron carbide metal matrix composite containing 12 to 15% boron carbide and 85 to 88% aluminium alloy, to which is added 0.1 to 0.4% silicon,

0.05 to 0.4% iron and 0.05 to 0.4% aluminium (see column 3, lines 53 to 55, 62 to 63 and column 4, lines 41 to 44). The resulting material has an ultimate tensile strength of 70 to 104 ksi and a yield strength of 61 to 98 ksi (see column 6, lines 9 to 11), which meet the requirements given in claim 1. D1 is cited in the introduction to the application (see page 3, first paragraph).

The appellant argues that there is nothing in D1 to motivate the skilled person to use the material for nuclear applications. None of the examples given in column 3, lines 46 to 48 of D1 concern the nuclear industry, and there is no mention of using boron carbide having about 20% B^{10} isotope in order to absorb neutrons.

Although there is no explicit mention in D1 itself that the material is used for nuclear applications, the skilled person using his general knowledge would recognise the suitability of the material for such applications. D2 is a extract from a standard handbook giving properties and characteristics of all the elements, and thus is cited, not specifically as a piece of prior art, but as evidence of the general knowledge of the skilled person. It is therefore not a question of combining three pieces of prior art, as argued by the appellant.

D2 explains that boron contains naturally about 20% of the B^{10} isotope and that this is commonly used as a shield for nuclear radiation. This is also confirmed in the introduction to the patent application (see page 1, second paragraph). Although it is possible to prepare

high purity boron by chemical reduction, such a process would be expensive and complex compared to obtaining it from a mineral. It can therefore be assumed that the boron used for the materials of both D3 and D1 comes from a mineral source, such as identified in D2, and thus would inherently contain about 20% B^{10} isotope. Although the appellant argues (without providing any evidence for the allegation) that prior art nuclear-shielding materials use boron carbide enriched by the B^{10} isotope, claim 1 defines a content of about 20%, which merely corresponds to that which is found naturally; no explanation is provided as to how neutron shielding is achieved whilst having an allegedly lower content of B^{10} isotope.

2.6 Thus, the skilled person starting from D3 and wishing to improve the mechanical properties of the composite material would consult D1, which teaches a composite that is lighter, stronger, stiffer and has a higher fatigue strength (see column 1, lines 18 to 25). Given that it is common knowledge that boron-containing materials contain about 20% B^{10} isotope and are used for nuclear applications (see D2), the skilled person would recognise the boron carbide - aluminium metal matrix composite of D1 as being ideal for the nuclear applications of D3. The subject-matter of claim 1 of the main request thus lacks an inventive step in light of the combined teachings of D3 and D1 and the common knowledge of the skilled person.

3. *Auxiliary Requests*

Claim 1 of the first auxiliary request is the same as that of the main request, and consequently lacks an

inventive step for the same reasons. Claim 1 of the second and third auxiliary requests further specifies the additives included in the boron carbide as being "in an amount of 0.1 to 0.4 weight % silicon, 0.5 to 0.4 weight % iron, and 0.05 to 0.4 weight % aluminum". The lower limit of 0.5 weight % for iron is above the upper limit of 0.4 weight %, and thus is obviously an error. The correct value can be derived from the description on page 8, last paragraph, as being 0.05 weight %. Since these amounts are also given in D1 (see column 3, lines 62 to 63), claim 1 according to auxiliary requests two and three also lacks an inventive step.

4. *Document D4*

D4 has not been taken into consideration in arriving at the decision, and consequently the request of the appellant to remit the case to the department of first instance is not applicable.

5. *Article 84 EPC*

The appellant submitted amended claims together with the letter of 11 April 2006, after which the appellant's representative announced that, having requested oral proceedings, he would not be attending them. Similarly, before the examining division, the applicant had submitted claims as an auxiliary request, whilst stating at the same time that he would not be participating in the oral proceedings.

The purpose of filing amended claims prior to an oral proceedings should be to address objections raised thus far in the proceedings; they should then form the basis of the discussion at the oral proceedings, so that if any further minor amendments are necessary they can be carried out with the approval of the applicant or his attorney.

Article 84 EPC requires that the claims are supported by the description. In the present case, the amended claims are directed to a composite material in the form of a canister or a container, whereas the description implies that the invention also relates to the material *per se* (see for example page 5, second complete paragraph, and page 6, lines 6 to 7); the description is therefore contrary to the claims. An amended description was not filed prior to the oral proceedings, and hence the application fails to meet the requirements of Article 84 EPC.

Should any of the requests have been found allowable, then it would have been necessary for the appellant to have provided an amended description. Since the appellant was not present at the proceedings, the Board would have been faced with the choice of either continuing the proceedings in writing, remitting the case to the department of first instance, or refusing the application under Article 84 EPC. The first two options lead to undue delay in the proceedings, and are contrary to Article 11(3) of the Rules of Procedure of the Boards of Appeal, which states that the Board shall not be obliged to delay any step of the proceedings, including its decision, by reason only of the absence at the oral proceedings of any party duly summoned who

may then be treated as relying only on its written case. In addition Article 11(6) of the Rules of Procedure of the Boards of Appeal stipulates that the Board shall ensure that each case is ready for decision at the conclusion of the oral proceedings, unless there are special reasons to the contrary. The failure of the appellant to appear at the oral proceedings, which he had himself requested, cannot be considered as being a "special reason". In such a situation, if the application does not meet all the requirements of the EPC, there is a real risk of it being refused.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

A. Vottner U. Krause