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**Datasheet for the decision
of 27 October 2009**

Case Number: T 0812/08 - 3.2.07

Application Number: 98922257.5

Publication Number: 1009545

IPC: B05D 7/00

Language of the proceedings: EN

Title of invention:

Tough-coated hard powders and sintered articles thereof

Applicant:

Toth, Richard Edmund

Opponent:

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Headword:

-

Relevant legal provisions:

EPC Art. 83, 84, 111(1), 123(2)

EPC R. 115(1)

Relevant legal provisions (EPC 1973):

-

Keyword:

"Admissibility of amendments (yes)"

"Clarity (yes)"

"Sufficiency of disclosure (yes)"

"Remittal to department of first instance for further prosecution"

Decisions cited:

-

Catchword:

-



Case Number: T 0812/08 - 3.2.07

D E C I S I O N
of the Technical Board of Appeal 3.2.07
of 27 October 2009

Appellant:

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Decision under appeal:

Decision of the Examining Division of the
European Patent Office posted 13 November 2007
refusing European application No. 98922257.5
pursuant to Article 97(1) EPC.

Composition of the Board:

Chairman: H. Meinders
Members: H. Hahn
E. Dufrasne

Summary of Facts and Submissions

- I. The applicant lodged an appeal against the decision of the Examining Division to refuse the European patent application No. 98 922 257.5.

The Examining Division held that the independent claims 1 and 14 of the set of claims 1-23 as filed per fax on 25 August 2006 and as amended at the oral proceedings of 16 October 2007, i.e. claims 5 and 6 and the term "about" of claim 23 had been deleted, did not comply with Article 84 EPC. Additionally, the application was considered not to comply with Article 83 EPC taking account of the functional definition "said layer consisting essentially of a second metal compound ..." which imposed an undue burden of experimentation on the person skilled in the art to try to find out all possible combinations fulfilling said result.

- II. The independent claims 1 and 14 underlying the impugned decision read as follows:

"1. A sintered material comprising a plurality of core particles, consisting essentially of one or more first metal compounds each having the formula M_aX_b where M is a metal selected from the group consisting of titanium, zirconium, hafnium, vanadium, niobium, tantalum, chromium, molybdenum, tungsten, aluminium, and silicon, X represents one or more elements selected from the group consisting of nitrogen, carbon, boron and oxygen, and a and b are numbers greater than zero up to and including four;

an intermediate layer on each of the core particles, the intermediate layer consisting essentially of a second metal compound, different in composition from the or each first metal compound and having a higher relative fracture toughness than the compound or compounds of the core particles, the second metal compound being capable of bonding with the or each first metal compound and being capable of bonding with a metal selected from the group consisting of iron, cobalt and nickel, thereby forming coated particles; and
a binder overlaying the intermediate layer on the coated particles and constituting a layer comprising iron, cobalt, nickel, their mixtures, their alloys or their intermetallic compounds."

"14. A powder consisting essentially of a plurality of coated particles, the majority of the coated particles comprising:
core particles, consisting essentially of a first metal compound having the formula M_aX_b , where M is a metal selected from the group consisting of titanium, zirconium, hafnium, vanadium, niobium, tantalum, chromium, molybdenum, tungsten, aluminium, and silicon, X represents one or more elements selected from the group consisting of nitrogen, carbon, boron and oxygen and a and b are numbers greater than zero up to and including four, and
a layer on each of the core particles, the said layer consisting essentially of a second metal compound, different in composition from the first metal compound and having a higher relative fracture toughness, the second metal compound being capable of bonding with said first metal compound and being capable of bonding

with a metal selected from the group consisting of iron, cobalt and nickel."

- III. With its grounds of appeal dated 14 March 2008 the appellant requested to set aside the decision and to grant a patent on the basis of the sets of claims submitted as new main request or as an auxiliary request, filed with said grounds of appeal. In case that the Board should consider a decision other than according to the aforementioned requests, oral proceedings were requested.
- IV. According to the attendance note of the telephone conversations held on 9 and 10 September 2009 between the registrar and the representative of the appellant, the representative gave its consent to arrange for oral proceedings on 27 October 2009 and agreed with a shorter period of notice of the summons than prescribed by Rule 115(2) EPC.
- V. With a communication dated 15 September 2009 and annexed to the summons the Board gave its preliminary opinion with respect to the claims of the main request as well as of the auxiliary request, annexing 31 pages of NIST property data summaries concerning fracture toughness values of alumina, aluminium nitride, boron carbide, diamond, mullite, silicon carbide, silicon nitride, titanium diboride, titanium carbide, titanium nitride, tungsten carbide, and zirconium nitride.
- VI. With letter dated 30 September 2009 the appellant submitted, as response to the Board's communication, new sets of claims as an amended main request together with first to fourth auxiliary requests and modified

description pages in combination with ten documents in order to support its arguments concerning the allowability of the amendments made therein.

VII. With fax dated 22 October 2009 the Board submitted a further document to the appellant and stated that it might be relevant with respect to the issue of clarity.

VIII. Oral proceedings before the Board were held on 27 October 2009. The issues of clarity and of subject-matter extending beyond the content of the application as originally filed were discussed with respect to claims 1 of the main request and the first to third auxiliary requests, all as filed with the letter dated 30 September 2009. After these discussions the appellant filed a new main request and withdrew all requests filed with said letter.

The appellant requested that the decision under appeal be set aside and that a patent be granted on the basis of the above mentioned main request (claims 1 to 14).

At the end of the oral proceedings the Board announced its decision.

IX. Claims 1 and 8 of the main request under consideration read as follows:

"1. A sintered material comprising a plurality of core particles, consisting of one or more first metal compounds selected from the group consisting of: TiN, TiCN, TiB₂, TiC, ZrC, ZrN, VC, VN, Al₂O₃, Si₃N₄ and AlN,

an intermediate layer on each of the core particles consisting of WC;
and a binder overlaying the intermediate layer on the coated particles and constituting a layer consisting of iron, cobalt, nickel, their mixtures, their alloys or their intermetallic compounds."

"8. A powder consisting of a plurality of coated particles, the majority of the coated particles comprising:
core particles, consisting of a first metal compound selected from the group consisting of: TiN, TiCN, TiB₂, TiC, ZrC, ZrN, VC, VN, Al₂O₃, Si₃N₄ and AlN;
and a layer of WC on each of the core particles."

X. The appellant argued essentially as follows:

The subject-matter of independent claims 1 and 8 of the main request has been restricted to core particles consisting of the preferred stoichiometric core materials and the preferred intermediate layer compound WC, which is based on claims 1, 10 and 11, respectively claims 29, 35 and 36 of the application as originally filed. Since WC has the highest fracture toughness value of all the mentioned metal compounds (see appellant's letter dated 16 July 2007, page 6, table) omitting the - now inherent - feature "having a fracture toughness higher than the compound or compounds of the core particles" of claims 1 and 8 does not contravene Article 123(2) EPC. Likewise the omission of the - now redundant - feature concerning the "bondability" of WC to the said core particles and to the binder layer consisting of iron, cobalt, nickel or their mixtures, their alloys or their intermetallic

compounds, does not contravene Article 123(2) EPC either since it belongs to the common general knowledge in this field that these compounds bond to each other and the layer could not be provided on the particles in absence of bondability between WC and any of the compounds comprised in said list. Furthermore, a sintered material cannot be formed with different materials, which do not bond with each other. Therefore the subject-matter of claims 1 and 8 complies with Article 123(2) EPC.

Since all the objected terms have been removed from claims 1 and 8 they also meet the requirements of Article 84 EPC.

As the list of first metal compounds has been limited to eleven compounds while the compound of the intermediate layer has been restricted to WC and the binder metals are limited to iron, cobalt and nickel or their mixtures, their alloys or their intermetallic compounds it is apparent that the subject-matter of claims 1 and 8 cannot impose an undue burden to the person skilled in the art to execute the invention of the claims so that the application also complies with Article 83 EPC.

Reasons for the Decision

1. *Allowability of amendments (Article 123(2) EPC)*
 - 1.1 The subject-matter of independent claims 1 and 8 of the single request is principally based on claims 1, 10 and 11, and claims 29, 35 and 36 respectively of the

application as originally filed (corresponding to the published WO-A-98 51419). With respect to the further amendments made to claims 1 and 8 the Board considers that:

1.1.1 The replacement of the definition "consisting **essentially** of ..." which was comprised in the claims 1, 10, 11, 29, 35 and 36 as originally filed by the term "**consisting of** ..." in the context of the definition of the first metal compound(s) of the core particles and the intermediate layer or the layer of the second metal compound, respectively, is derivable from several embodiments in the description (see e.g. page 15, lines 16 to 25; page 16, lines 4 to 8; page 19, lines 24 to 29; page 21, lines 9 to 16; page 22, lines 10 to 22; page 23, lines 12 to 19; page 26, lines 3 to 10; figure 1). Likewise the replacement of the definition "said outer layer comprising iron, cobalt, nickel, ..." of claim 1 as originally filed with "said outer layer **consisting of** ..." is derivable from the application as originally filed (see e.g. page 9, lines 12 to 14; page 22, lines 13 to 15; page 26, lines 5 and 6).

1.1.2 WC has by far the highest fracture toughness value compared to the fracture toughness values of the eleven first metal compounds now specified in claims 1 and 8 (see appellant's letter dated 16 July 2007, page 6, table). Furthermore, WC has a different composition than any of said eleven first metal compounds specified in claims 1 and 8.

Therefore the two conditions originally present in the now omitted feature "**a second metal compound, different**

in composition from said first metal compound and having a fracture toughness higher than the compound or compounds of the core particles" are inherently fulfilled by any combination of WC and any first metal compound now specified. The omission of said features from claims 1 and 8 is therefore considered not to contravene Article 123(2) EPC.

1.1.3 Likewise, the omission of the feature concerning the "bondability" (in "... **being capable of bonding with said first metal compound and being capable of bonding with a metal selected from the group consisting of iron, cobalt and nickel**") of WC to the core particles and to the binder layer consisting of iron, cobalt, nickel or their mixtures, their alloys or their intermetallic compounds, is considered not to contravene Article 123(2) EPC. Firstly, it belongs to the common general knowledge that these compounds bond to each other (see e.g. page 21, lines 9 to 16 of the application as originally filed) and secondly, the WC layer could not be provided in the absence of bondability between WC and any of the eleven compounds comprised in said list of the first metal compounds. Furthermore, a sintered material cannot be formed with different materials if they do not bond with each other.

1.1.4 Therefore the subject-matter of claims 1 and 8 complies with Article 123(2) EPC.

2. *Clarity (Article 84 EPC)*

2.1 The amendments made to independent claims 1 and 8 resulted in that **all** the expressions which were considered to render the independent claims 1 and 14

underlying the impugned decision unclear (see point II above):

- i) "said layer consisting essentially of a second metal compound, different in composition from said first metal compound and having a higher relative fracture toughness";
- ii) "said second metal compound being capable of bonding with said first metal compound and being capable of bonding with a metal selected from the group consisting of iron, cobalt and nickel";
- iii) "greater than zero"; and
- iv) the expression "comprising" in the context of the binder definition

have either been replaced by clear features or deleted altogether.

2.2 Claims 1 and 8 of the single request are thus considered to comply with Article 84 EPC.

3. *Sufficiency of disclosure (Article 83 EPC)*

3.1 The subject-matter of claim 1 has been restricted to a sintered material comprising a plurality of core particles consisting of one or more first metal compounds selected from the specified eleven stoichiometric compounds, each of them having an intermediate layer consisting of WC and a binder overlaying said WC layer constituting a layer consisting of iron, cobalt, nickel, their mixtures, their alloys or their intermetallic compounds. Claim 1 thus covers a straightforward and reasonably limited number of possible combinations of metal compounds and binder metals with WC, which are sintered together. The

Board therefore concludes that claim 1 no longer imposes an undue burden of experimentation to the person skilled in the art to execute the invention.

3.2 The above conclusion is also valid with respect to the powder of independent claim 8 which has been restricted to a plurality of coated particles the majority of which has core particles consisting of a stoichiometric first metal compound selected from the same eleven metal compounds as mentioned in claim 1 and a WC layer on each of the core particles. Thus the subject-matter of independent claim 8 now covers only eleven possible combinations of a metal compound and WC, which neither imposes an undue burden on the skilled person to execute the invention.

3.3 The claims 1 and 8 are therefore considered to meet the requirements of Article 83 EPC.

4. *Remittal to the department of first instance (Article 111(1) EPC)*

The impugned decision is silent with respect to the issue of novelty and inventive step.

Furthermore, the description has not yet been adapted to the claims. It further appears that dependent claim 13 - defining that "the core particles consist of **said cubic boron nitride**" - is inconsistent with the subject-matter of independent claim 8 which no longer covers cBN core particles (Article 84 EPC).

Therefore the Board considers it appropriate, in accordance with Article 111(1) EPC, to remit the case

to the department of first instance for further prosecution. Thereby the appellant also has the opportunity to have the case examined with respect to patentability without loss of an instance.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the department of first instance for further prosecution on the basis of the main request (claims 1 to 14) filed during the oral proceedings.

The Registrar:

The Chairman:

G. Nachtigall

H. Meinders