BESCHWERDEKAMMERN DES EUROPÄISCHEN PATENTAMTS

BOARDS OF APPEAL OF THE EUROPEAN PATENT OFFICE

CHAMBRES DE RECOURS DE L'OFFICE EUROPEEN DES BREVETS

Internal distribution code:
(A) [ ] Publication in OJ
(B) [ ] To Chairmen and Members
(C) [ ] To Chairmen
(D) [X] No distribution

Datasheet for the decision of 25 July 2013

Case Number: T 0389/11 - 3.2.03

Application Number: 08161538.7

Publication Number: 1995005

IPC: B22F 1/00, C22B 34/24, B22F 9/20, B22F 9/22

Language of the proceedings: EN

Title of invention:
Low oxygen refractory metal powder for powder metallurgy field and background of the invention

Applicant:
H.C. Starck Inc.

Headword:
-

Relevant legal provisions:
EPC Art. 76(1), 54, 56

Keyword:
"Subject-matter extends beyond content of earlier application (no)"
"Selection invention (no)"
"Purity of a material - inventive step (yes)"

Decisions cited:
T 0279/89, T 0803/01

Catchword:
Case Law of Boards of Appeal 6th Edition, II.B.6.2, I.C.4.1.4.

Europäisches Patentamt | European Patent Office | Office européen des brevets

Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number: T 0389/11 - 3.2.03

D E C I S I O N
of the Technical Board of Appeal 3.2.03
of 25 July 2013

Appellant: (Applicant)
H.C. Starck Inc.
45 Industrial Place
Newton
Massachusetts 02461-1951 (US)

Representative:
Maiwald Patentanwalts GmbH
Elisenhof
Elisenstrasse 3
D-80335 München (DE)

Decision under appeal:
Decision of the Examining Division of the European Patent Office posted 3 August 2010 refusing European patent application No. 08161538.7 pursuant to Article 97(2) EPC.

Composition of the Board:

Chairman: U. Krause
Members: G. Ashley
I. Beckedorf

Summary of Facts and Submissions

I. European patent application EP-A-08 161 538.7 is a divisional of application EP-A-00 959 289 (corresponding to WO-A-01/012364), and relates to powders of tantalum, niobium and their alloys, which have an oxygen content of less than 100 ppm. The examining division considered that the claimed subject-matter of the main and two auxiliary requests lacked novelty, hence decided to refuse the application.

II. The decision of the examining division was posted on 3 August 2010. The appellant (the applicant) filed notice of appeal on 6 October 2010, paying the appeal fee on the same day. A statement containing the grounds of appeal, together with sets of claims as main, first and second auxiliary requests, was received on 13 December 2010.

III. In accordance with Article 15(1) of the Rules of Procedure of the Boards of Appeal, the board issued a preliminary opinion of the case. In response, the appellant filed with the letter of 20 June 2013 two further sets of claims as third and fourth auxiliary requests.

IV. Oral proceedings were held on 25 July 2013.

V. Requests

The appellant requested that the decision be set aside and that a patent be granted on the basis of the set of claims according to a new main request, which was

equivalent to the fourth auxiliary request filed with the letter of 20 June 2013.

VI. Claims

Claim 1 of the parent application (WO-A-01/012364) reads as follows:

"1. A process for producing metal powders comprising the steps of:

- providing a hydride powder of a first metal, said first metal being selected from the group consisting of tantalum, niobium and alloys of said metals with each other or one or both of them with other metals, the hydride having an oxygen content of under 300 ppm,

- heating said metal hydride in the presence of a metal having a higher affinity for oxygen,

- removing the metal having a higher affinity for oxygen from the metal, to form a powder of the first metal having an oxygen content of less than 300 ppm."

Dependent claim 3 of the parent application defines the final oxygen content of the powder:

"3. The process of claim 1 wherein the final oxygen content of the metal powder is less than 100 ppm."

Claim 1 of the main request reads as follows:

"1. A metal powder obtainable by a process for producing metal powders comprising the steps of:

- providing a hydride powder of a first metal being selected from the group consisting of tantalum, niobium and alloys of said metals with each other or one or both of them with other metals, the hydride having an oxygen content of under 300 ppm;

- mixing said metal hydride with a metal having a higher affinity for oxygen and heating the mixture;

- removing the metal having a higher affinity for oxygen from the metal, to form a powder of the first metal with an oxygen content of less than 100 ppm."

Dependent claims 2 to 5 concern preferred embodiments of the powder of claim 1.

VII. Prior Art

The following documents are relevant for this decision:

D1: US-A-5 242 481
D2: US-A-4 722 756

D1 was cited in the decision of the examining division and D2 was cited on the search report.

VIII. Submissions of the Appellant

(a) Article 76(1) EPC

The appellant argued that the claims of the main request correspond to claims 2 to 6 of the application, which in turn are based on claims 3 to 7 of the parent

application. Claim 1 is drafted as a "product by process" claim, ie the metal powder is defined in the context of the process for making it, as is disclosed in the parent application. The claimed subject-matter thus meets the requirements of Article 76(1) EPC.

(b) Novelty and Inventive Step

The examining division had concluded that the claimed oxygen content, less than 100 ppm, lacked novelty with respect to D1, which disclosed a range of less than 300 ppm, since the criteria for novelty of a sub-range as set out in T 279/89 had not been met.

The appellant submitted that this approach is incorrect, as the claimed range cannot be considered as a sub-range of that of D1. In particular, D1 discloses a range, the bottom value of which is not zero, but a value that can be realistically attained by the method described in D1 for reducing the oxygen content. There is no disclosure in D1 that the method is capable of producing powders having an oxygen content of less than 100 ppm. Since the method used in the present application is different from that of D1 and results in powders having less than 100 ppm of oxygen, the claimed powder is new and inventive.

Reasons for the Decision

1. The appeal is admissible.

2. Article 76(1) EPC

2.1 Claim 1 of the parent application (WO-A-01/012364) defines a process, according to which a powder of tantalum, niobium or their alloys is formed which has an oxygen content of under 300 ppm. Dependant claim 3, referring to claim 1, states that the final oxygen content of the metal powder is less than 100 ppm.

2.2 A metal powder with an oxygen content of less than 100 ppm is thus disclosed in the parent application. However the examining division was of the opinion that such a powder was disclosed only when obtained by the process of claim 1 (see point 1 of the communication of 9 October 2008).

2.3 The board agrees with the examining division, as nowhere in the parent application is a metal powder having less than 100 ppm oxygen mentioned, other than in the context of a process as defined in claim 1. Consequently, it is appropriate to draft present claim 1 as a product-by-process claim.

2.4 The process of claim 1 of the parent application defined the step of heating the metal hydride in the presence of a metal having a higher affinity for oxygen, whereas present claim 1 refers to the step of mixing the metal hydride with a metal having a higher affinity for oxygen and heating the mixture.

This amendment finds support in the parent application for the following reasons.

The step of mixing or blending is disclosed in Example 3 in the context of preparing tantalum powder having an oxygen content as defined in dependent claim 3 and granted claim 1. A further example is mentioned in the "Summary of the invention", which concerns the preparation of a tantalum powder with a oxygen content of less than 300 ppm. Examples 1 and 2 also refer to mixing.

It is clear that the mixing step is merely a general step that is not just limited to tantalum hydride and magnesium or calcium, but can be used for blending other hydrides and metals. There is no teaching in the parent application that, for certain combinations of hydrides and metals, mixing is unsuitable or cannot be carried out. Consequently it is reasonable for the skilled person to assume that it is also used for all of the hydrides and metals defined in claim 1.

2.5 The amendments therefore meet the requirements of Article 76(1) EPC.

3. Novelty and Inventive Step (Articles 54 and 56 EPC)

3.1 As set out above, claim 1 has been drafted as a product by process claim in order to comply with Article 76(1) EPC. It is, however, well established that a product per se must be novel and inventive, and is not rendered so merely because it is made by a new and inventive process (see Case Law of the Boards of Appeal, 6th Edition, II.B.6.2). For a process feature to have any relevance in a product claim it must result in a discernible physical characteristic in the product.

In the present case, claim 1 defines a powder of tantalum, niobium and their alloys with an oxygen content of less than 100 ppm. These are the features of the product of claim 1, hence it is necessary to determine if such a product is disclosed in the prior art.

3.2 The examining division held that the claimed powder lacks novelty over D1, which concerns powders of tantalum, niobium or their alloys having an oxygen content of less than 300 ppm.

In reaching its decision, the examining division argued that the claimed oxygen content (less than 100 ppm) is a sub-range of that disclosed in D1 (less than 300 ppm). Since the criteria for novelty of a sub-range (ie sufficiently narrow, sufficiently far removed from prior art values and a purposive selection, as set out in T 279/89) were not met, the claimed subject-matter lacked novelty.

3.3 The problem addressed by the present invention is to reduce as far as possible the oxygen content in the metal, as it is seen to be an impurity element. The approach to cases dealing with the purity of a material is set out in T 803/01 (see in particular points 4.6.3 and 5.3), and is summarised in section I.C.4.1.4 of the Case Law of the Boards of Appeal (6th Edition). To establish novelty and inventive step, it must be shown that prior art techniques have failed to achieve the claimed degree of purity. Thus, the assessment of novelty and inventive step of the product is inextricably linked to the purification process.

3.4 The process defined in claim 1 (an example of which is given in Example 3 in the description) differs from that of D1 principally in that a metal hydride having an oxygen content of under 300 ppm is used as the starting material, rather than a metal powder having an oxygen content of less than 1000 ppm, as disclosed in D1 (column 3, lines 21 to 30).

The process of D1 is said to result in a product having an oxygen content preferably between about 100 and about 300 ppm (column 4, lines 4 to 6). The examining division emphasised (point 1.4 of the decision) that the value "about 100 ppm", being an end point of a range, is specifically disclosed and cannot be distinguished from the upper value of the range defined in claim 1 (100 ppm). However, the examples in D1 give oxygen contents of 155, 140, 135, 130 ppm for tantalum and 175 ppm for niobium; these are clearly above the level of 100 ppm. The skilled person reading D1 would thus not reach the conclusion that the process of D1 results in a product having an oxygen level below 100 ppm.

The claimed powder is therefore novel.

3.5 Starting from D1, the problem to be solved is to reduce the oxygen content yet further. The proposed solution of starting with a hydride instead of a metal leads to a material having an oxygen content of less than 100 ppm, as demonstrated in Example 3 of the application.

3.6 Document D2 discloses a process for reducing the oxygen content in tantalum and/or niobium (columbium)

materials. Although Examples 1 to 10 and 12 all concern metallic tantalum as the starting material, Example 11 starts from tantalum hydride. The hydride powder is heated in hydrogen gas, and the water vapour formed by the reaction of hydrogen with the oxygen in the powder is then "gettered" by a more oxygen-active metal than tantalum, in this example, zirconium. However, the oxygen content is not reduced to less than 100 ppm by the process; it is 1140 ppm in the hydride starting powder and is present in a comparable amount in the tantalum powder end product (see the Table in column 11, lines 30 to 37 of D2).

Whereas the process of D1 involves heating metal powder with a metal having a higher affinity for oxygen, the process of D2 involves heating a hydride powder in a hydrogen atmosphere, as described above. D1 and D2 thus concern different processes and it is unreasonable to combine the teachings of these documents. Consequently, tantalum hydride is not an obvious alternative to tantalum metal as a starting material for the process of D1.

In addition, even if D1 and D2 were to be combined, there is no indication in D2 that use of a hydride starting powder results in an oxygen content below 100 ppm.

3.7 The subject-matter of claim 1 is not obvious in light of D1 and D2. There is no indication in the available prior art that a powder of tantalum, niobium and their alloys can be produced with an oxygen content of less than 100 ppm. The metal powder of claim 1 is thus novel and has an inventive step.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the Examining Division with the order to grant a patent with claims 1 to 5 of the main request (equivalent to the fourth auxiliary request filed with the letter of 20 June 2013), and a description to be adapted.

The Registrar: The Chairman:

C. Spira U. Krause