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D E C I S I O N
of 23 October 2001

Case Number: T 0200/99 - 3.2.3

Application Number: 94907740.8

International Publication Number: WO 94/17939

IPC: B22F 1/00, C22C 33/02

Language of the proceedings: EN

Title of invention:
Sponge-iron powder

Applicant:
Höganäs AB

Opponent:
-

Headword:
-

Relevant legal provisions:
EPC Art. 56

Keyword:
"Inventive step - (yes) after amendment"

Decisions cited:
-

Catchword:
-

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Case Number: T 0200/99 - 3.2.3

D E C I S I O N
of the Technical Board of Appeal 3.2.3
of 23 October 2001

Appellant: Höganäs AB
SE-26383 Höganäs (SE)

Representative: Thylén, Eva Matilda
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Decision under appeal: **Decision of the Examining Division 2.3.09.015 of the European Patent Office dated 12 October 1998 refusing European patent application No. 94 907 740.8 pursuant to Article 97(1) EPC.**

Composition of the Board:

Chairman: C. T. Wilson
Members: F. Brösamle
J. P. Seitz

Summary of Facts and Submissions

I. With decision of the 12 October 1998 the examining division refused European patent application No. 94 907 740.8.

II. Against the above decision the applicant - appellant in the following - appealed on 26 November 1998 paying the appeal fee on the same day and filing the statement of grounds of appeal on 8 February 1999.

III. Following the board's Communication pursuant to Article 110(2) EPC in which the board raised objections on the basis of

(D1) EP-A-0 079 320,

(D2) WO-A-92/21783,

(D3) DE-B-1 045 436,

(D4) "Powder Metallurgy International", vol. 23, No. 5, 1991, pages 285-290, and

(D5) DE-A-1 905 764 (cited in the application),

the appellant filed new claims 1 to 5 and a revised description together with his letter of 7 March 2001, received on 10 March 2001.

IV. Claim 1 thereof reads as follows:

"1. A composition comprising a powder, blended during grinding, of sponge iron and hard-phase material, the content of hard-phase material amounting

to 5-80% by volume and the hard-phase material being selected from NbC, TiN, TiC, Al_2O_3, SiC, Cr_3C_2, VC, Mo_2C, WC and/or combinations thereof."

V. The appellant argued that the board in its above communication had not objected to the subject-matter of the claims concerning a composition according to the first and second auxiliary request of the statement of grounds of appeal, on which the newly filed claims are based. He further contended that the revised description meets the requirements of the EPC.

VI. Appellant's requests are as follows:

(a) to set aside the impugned decision and

(b) to grant a patent on the basis of

- claims 1 to 5 filed with letter of 7 March 2001,

- description: pages 1 to 5 filed with letter of 7 March 2001,

- drawings: Figures 1 to 4 as originally filed.

Reasons for the Decision

1. The appeal is admissible.

2. *Amendments*

2.1 Claim 1 is restricted to a "content of hard-phase material amounting to 5-80% by volume". The upper limit

thereof can be seen from originally filed claim 1 and the lower limit is derivable from the examples, see WO-A-94/17939 page 4, lines 7/8 and 9/10.

2.2 The further restriction to a lower limit of 10% by volume according to claim 2 is to be derived from WO-A-94/17939 page 4, lines 1/2 and 4/5.

2.3 Summarizing, claims 1 to 5 are not open to an objection under Article 123(2) EPC.

3. *Novelty*

3.1 Claim 1 is a composition claim which excludes **one**-powder compositions since the hard-phase material is prescribed to amount from 5 to 80% by volume. As indicated in the board's preliminary above communication (D1) to (D5) revealed in the search are not novelty-destroying documents in respect of the subject-matter of claim 1, Article 54 EPC.

4. *Inventive step*

4.1 In known powder compositions being based on atomised iron or carbonyl iron it is not possible to achieve an extremely fine powder which is well suited for the production of compacted and sintered products.

4.2 Starting from this technical background it is the object of the invention to achieve a smaller particle size than by other types of iron powder.

4.3 This object is solved by the features laid down in claim 1 in that sponge iron and a hard-phase material are used; these constituents are blended during

grinding whereby the content of hard-phase material amounts from 5 to 80% of volume and the hard-phase material is selected from NbC, TiN, TiC, Al_2O_3, SiC, Cr_3C_2, VC, Mo_2C, WC and/or combinations thereof.

4.4 In Figures 1 to 6 of the present patent application the advantages of **sponge** iron are shown in that an increased grinding time leads to a **decreased** particle size - contrary to an atomised powder according to which an increased grinding time can even lead to an **increased** particle size. Apart from the advantage of sponge iron being essentially cheaper than atomised iron and carbonyl iron, the powder composition claimed can be produced by significantly less energy-intensive and less complicated grinding procedures than when producing the known powder compositions.

It follows therefrom that the use of sponge iron leads to an unexpected effect not known from the prior art such as (D1) to (D5).

4.5 Contrary to claim 1 which is based on sponge iron powder (D1) is based on a **chromium** containing iron instead of iron, (D3) is based on a **Ni**-**Ti**-alloy instead of iron and (D5) is silent about **hard-phase materials** so that these documents teach away from the subject-matter of claim 1.

4.6 From (D4) it is known to mix iron powder and hard-phase material for sintering purposes. What is, however, not known from (D4) is the use of a powder of **sponge** iron, see page 285, right column, paragraph three ("... have been chosen as admixtures to iron powder.") or see page 286, Table 2 "Atomized iron". Like (D4) document

(D2) is based on iron and not on **sponge** iron so that a skilled person confronted with the above object of the invention to be solved was not led by (D2) or (D4) - either singly or in combination - to the subject-matter of claim 1.

4.7 Summarizing, the subject-matter of claim 1 is not rendered obvious by the prior art documents to be considered so that claim 1 meets the requirements of Article 56 EPC and is allowable.

4.8 Claims 2 to 5 refer to embodiments of the subject-matter of claim 1 with respect to the amount of hard-phase material, alloying additives, average particle size and the form of the composition and are also allowable.

4.9 The description and drawings meet the requirements of the EPC and can form the basis for grant of a patent.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the first instance with the order to grant the patent with the following documents:

- claims 1 to 5, received on 10 March 2001;

- description: pages 1 to 5, received on 10 March

2001,

with the following amendments

- page 1, line 8: "Iron" to be replaced by "iron";
- page 1, line 29: "F Thummler" to be replaced by "F. Thümmler";

- drawings: Figures 1 to 4 as originally filed.

The Registrar: The Chairman:

A. Counillon C. T. Wilson