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D E C I S I O N
of 3 June 2004

Case Number: T 0515/03 - 3.2.3

Application Number: 99925695.1

Publication Number: WO-A-9961184

IPC: B22F 1/00, C22C 1/04

Language of the proceedings: EN

Title of invention:

Method to agglomerate metal particles and metal particles
having improved properties

Applicant:

Cabot Corporation

Opponent:

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Headword:

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Relevant legal provisions:

EPC Art. 56

Keyword:

"Inventive step - additional effect"

Decisions cited:

T 0456/91

Catchword:

-



Case Number: T 0515/03 - 3.2.3

D E C I S I O N
of the Technical Board of Appeal 3.2.3
of 3 June 2004

Appellant: Cabot Corporation
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Decision under appeal: Decision of the Examining Division of the
European Patent Office dated 5 November 2002,
posted on 14 November 2002, refusing European
application No. 99925695.1 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. In the oral proceedings of 5 November 2002 the examining division refused European patent application 99 925 695.1 - the written decision was posted on 14 November 2002 - in the light of

(D3) DATABASE WPI Section Ch, Week 9304 Derwent Publications Ltd., London, GB; Class L03, AN 93-033288 XP002116084 & JP 04 362101 A (SHOWA CABOT SUPER METAL KK), 15 December 1992 (1992-12-15) -& PATENT ABSTRACTS OF JAPAN vol. 17, no. 2333 (M-1407), 12 May 1993 (1993-05-12) & JP 04 362101 A (SHIYOUWA KIYABOTSUTO SUUUPAA METARU KK), 15 December 1992 (1992-12-15) and

(D3') Translation of JP 04 362101 A (D3) into English.

II. Against the above decision of the examining division the applicant - appellant in the following - lodged an appeal on 21 January 2003 paying the fee on the same day and filing the statement of grounds of appeal on 24 March 2003 in which he dealt with the issues of clarity, novelty and inventive step.

III. Following the board's communication pursuant to Article 11(1) RPBA in which the board expressed its provisional opinion with respect to clarity and inventive step the appellant maintained the main request with claims 1 to 36 filed with the statement of grounds of appeal on 24 March 2003. Claim 1 (method claim) thereof reads as follows (typing error in line 1 "voporizable" corrected into "vaporizable" by the board):

"A method to agglomerate tantalum and/or niobium, comprising:

- a) combining a volatilizable or vaporizable liquid with particles comprising tantalum and/or niobium in an amount to form a paste without forming a slurry;
- b) compacting the paste by vibrating said paste in a container or by applying pressure to said paste;
- c) drying the compacted paste by means of vacuum drying, whereby most, if not all of the liquid present is removed, to form a cake; and
- d) heat treating the cake."

IV. The appellant essentially argued as follows:

- since the board in its provisional opinion expressed doubts with respect to inventive step, namely inversion of method steps, only, the appellant has conducted comparative experiments on the basis of tantalum powders, one according to above claim 1, another according to a reversed order of steps (b) and (c) as "vibrate powder after drying" and still another in which the vibration step has been omitted as "soak with no vibration";
- the comparative experiments disclose the clear influence of the powder's above pre-treatment with respect to the particle size distribution (in the table "SCRN-TECH..."), the flow properties and Scott-Density;

- since improved flow densities are essential for the preparation of capacitor anodes and since it could not be expected from (D3/D3') that a reversion of the order of the vibrating and drying step would result in improved flow properties the subject-matter claimed is based on an inventive step.
- V. The appellant requested that the decision under appeal be set aside and that a patent be granted on the basis of the following documents:
- claims 1 to 36 according to the **main request** filed on 24 March 2003;
 - description: pages 1 to 18 filed on 26 May 2004;
 - Figures 1 to 4 (sheets 1/4 to 4/4) as originally filed.

Reasons for the Decision

1. The appeal is admissible.
2. *Amendments*
 - 2.1 Claim 1 is a combination of features disclosed in originally filed claims 1, 2 (vibrating in a container), 3 (applying pressure), 23 (paste), page 3, line 17 (without forming a slurry) and page 6, lines 7 to 9 (vacuum drying to remove the liquid).
 - 2.2 Claims 2 to 12 correspond to originally filed claims 4 to 9, 22, 10 to 13 and claim 13 partly to originally

filed claims 14/15, claims 14 to 21 to originally filed claims 18 to 28, claim 22 to originally filed page 4, lines 5/6, claims 23 and 24 to originally filed claims 29 and 30; claim 25 is based on originally filed claim 33 and page 14, lines 7 to 17, claims 26 to 33 to originally filed claims 34 to 37 and 41 to 44; claims 34 and 35 are based on originally filed claims 46 and 47/48 whereas claim 36 is based on originally filed claims 45/46 and paragraph bridging pages 7/8.

2.3 Summarizing, the requirements of Article 123(2) EPC are met.

3. *Clarity*

3.1 The examining division came to the result that the features "paste" and "slurry" are unclear and did not allow a distinction to be made between the claimed subject-matter and that of (D3').

3.2 It has, however, to be considered that the present application W0-A-99/61184 itself contains a definition, see page 3, lines 16 to 23, page 4, lines 2 to 5 and page 5, lines 20 to 23, since a paste is defined as something like "toothpaste" and that too much water leads to a "slurry" in which not only all pores have liquid in them but rather there is a surplus of liquid on top of the wetted powder.

3.3 Summarizing, appellant's findings with respect to clarity appear to be convincing since the requirements dealt with in T 0456/91 (unpublished) appear to be fulfilled, Article 84 EPC.

4. *Novelty*

In the impugned decision the examining division did not question novelty of the subject-matter of claim 1 in the light of the nearest prior art to be considered (D3/D3'), and, since the board is also of the opinion that (D3/D3') do not disclose all features of claim 1, no detailed discussion of novelty is necessary and the crucial issue to be decided is inventive step.

5. *Inventive step*

5.1 The nearest prior art is (D3/D3') - in the following (D3') is referred to - from which document a tantalum powder is known which is agglomerated by method steps including combining it with a volatilizable or vaporizable liquid in an amount to form a paste, dehydrating and drying the paste, compacting the paste to form a cake and finally heat treating the cake, see (D3') paragraphs [0004] and [0005].

5.2 Since claim 1 is a **method** claim **the order** of treating steps is of crucial importance for the product to be achieved by such method.

5.3 **Contrary** to the disclosure of (D3') claim 1 is based on the following order of method steps:

(a) combining tantalum powder with...liquid ...to form a paste

(b) compacting the paste by...

(c) drying the compacted paste... to form a cake

(d) heat treating the cake.

5.4 *Prima facie* the inversion of method steps - known **per se** from the nearest prior art document (D3') - would appear to be obvious and to be without any surprising or unexpected effect with respect to the product obtained by such a method.

5.5 Following the board's communication pursuant to Article 11(1) RPBA in which the board informed the appellant about **the inversion** of the method steps and raised doubts with respect to inventive step - claimed is a compacting step before the drying step/known from (D3') is the other way round - the appellant conducted comparative experiments on the basis of tantalum powders, namely on the basis of:

- the method steps set out in claim 1, presented as "water agglomeration according to invention";
- method steps (b) and (c) of claim 1 being reversed, presented as "vibrate powder after drying";
- omitting the compaction/vibrating step (also disclosed in D3/D3'), presented as "soak with no vibration".

5.6 The above comparative experiments, see Table "Water agglomeration experiments" filed on 27 April 2004 disclose the clear influence of the way in which the powder was pretreated with respect to the particle size distribution (in the Table "SCRN-TECH..."), the flow

properties in mg/sec ranging from 287.0 to 273.0 to 235.0 and Scott-Density.

5.7 Since improved **flow properties** of the powder are essential for the preparation of capacitor anodes - see in this respect (D3'), Table 1 and corresponding text and paragraphs [0011] / [0012] setting out the superior molding characteristics, superior specific capacitance and in insulation breakdown characteristics - claim 1 is based on an **unexpected effect** leading to a **superior tantalum powder** with respect to (D3'). Since the reversion of the compacting and drying step is not rendered obvious by (D3') claim 1 consequently defines novel and inventive subject-matter. Claim 1 is therefore allowable under Articles 84, 54 and 56 EPC.

5.8 Claims 2 to 23 are dependent method claims, claim 24 relates to the product obtainable by the above method claims being followed by dependent claims 25 to 33. Claims 34 and 35 relate to a capacitor component comprising the particles of claims 24 to 33 whereas claim 36 is a use claim related to the method claims 1 to 23, all claims being also allowable.

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 a patent with the following documents, the typing error in claim 1 and page 1, line 23, being corrected by the board, ("voporizable" being corrected to "vaporizable"):
 - claims 1 to 36 filed on 24 March 2003,
 - description: pages 1 to 18 filed on 26 May 2004,
 - drawings: Figures 1 to 4 as originally filed.

The Registrar:

The Chairman:

A. Counillon

C. T. Wilson