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D E C I S I O N
of 6 June 2006

Case Number: T 0447/04 - 3.2.02

Application Number: 99965370.2

Publication Number: 1141428

IPC: C22C 9/00

Language of the proceedings: EN

Title of invention:

Low restivity materials with improved wear performance for electrical current transfer and methods for preparing same

Applicant:

Victorian Rail Track, et al

Opponent:

-

Headword:

-

Relevant legal provisions:

EPC Art. 56

Keyword:

"Inventive step (no) "

Decisions cited:

T 0150/82

Catchword:

-



Case Number: T 0447/04 - 3.2.02

D E C I S I O N
of the Technical Board of Appeal 3.2.02
of 6 June 2006

Appellant: Victorian Rail Track
589 Collins Street
Melbourne, VIC 3000 (AU)

Representative: Benech, Frédéric
146-150, Avenue des Champs-Élysées
F-75008 Paris (FR)

Decision under appeal: Decision of the Examining Division of the
European Patent Office posted 4 November 2003
refusing European application No. 99965370.2
pursuant to Article 97(1) EPC.

Composition of the Board:

Chairman: T. K. H. Kriner
Members: R. Ries
A. Pignatelli

Summary of Facts and Submissions

I. This appeal is against the decision of the examining division dated 4 November 2003 to refuse European patent application No. 99965370.2.

II. The application was refused on the grounds that the application did not meet the novelty requirement of Article 54 EPC, did not involve an inventive step (Article 56 EPC) and failed to satisfy the clarity requirements of Article 84 EPC, having particular regard to the documents

D1: PATENT ABSTRACTS OF JAPAN, volume 017, No. 708 (C-1147), 24 December 1993, & JP-A-05239598 (TOSHIBA CORP) 17 September 1993, and

D2: Metals Handbook, Ninth Edition, 1998, volume 7, Powder Metallurgy, American Society for Metals, USA, pages 630 to 636.

III. On 23 December 2003 the appellant (applicant) lodged an appeal against the decision and paid the prescribed fee on the same day. A statement of grounds of appeal was filed on 3 March 2004.

The appellant implicitly requested that the decision under appeal be set aside and that a patent be granted on the basis of the revised set of claims 1 to 21 enclosed with the statement of grounds of appeal to replace claims 1 to 31 underlying the appealed decision. The appellant essentially argued that the new set of claims included former method claims 1 to 16 which were found allowable by the examining division, and

indicated the parts of the application as filed, which support new claims 17 to 21.

Independent claims 1 and 18 to 21 read as follows:

"1. A method of preparing a copper-graphite composite material as defined in any preceding claim, comprising the steps of:

purifying copper powder by annealing copper powder in a reducing atmosphere and cleaning it;
mixing the purified copper and a graphite powder; under conditions to substantially prevent oxidation on the copper powder;
compacting the mixed powder to produce a compact, and sintering the compact at elevated temperature for a time sufficient to form the copper-graphite composite material.

18. A copper-graphite composite material the direct result of the method of any one claims 1 - 17.

19. A pantograph for a train or tram including a copper-graphite composite material as defined in claim 16 as an electrical contact for collecting power from overhead power lines.

20. An electrical power transmission system including a pantograph as defined in claim 17 as a power collector.

21. A copper-graphite composite material according to claim 16, wherein the weight percentage proportion of copper in the composite is at least 68%."

IV. In an annex to the summons to oral proceedings, which had been requested by the appellant on an auxiliary basis, the Board referred to documents

D3: US-A-4 919 717 and

D4: US-A-3 661 571

and substantiated in detail why the subject matter of any of claims 1 to 21 did not appear to involve an inventive step vis-à-vis the technical disclosure of documents D2, D3 or D4. The appellant's attention was also drawn to editorial and clarity deficiencies in the wording of the claims and to the particular requirements to be satisfied for the allowability of "product-by-process" claims.

In a letter received by the Office on 25 April 2005, the appellant requested not to proceed further with the oral proceedings, but to decide on the basis of the arguments that had already been submitted.

Reasons for the Decision

1. The appeal is admissible.
2. The relevant prior art:
 - 2.1 Like the method set out in claim 1, document D2 is concerned with a powder-metallurgical (P/M) method for producing copper-graphite composite contact materials (cf. D2, pages 634, 635: Types of Materials, Manufacturing). Copper powder in the form of reduced

oxide powder, atomised spheroids, electrolytic or flake powder is blended with graphite, compacted at moulding pressures ranging from 100 to 200 MPa, and sintered between 500 and 1000°C.

2.2 Likewise, document D3 discloses a P/M process, which comprises the steps of

(i) providing a powder mixture consisting of 80 to 95% Cu, 2 to 15% Ni and 2 to 5% graphite,

(ii) compacting the mixture with a pressure between 1 to 5 t/cm² (~100 to 500 MPa) and

(ii) sintering the compact in a controlled atmosphere of 3 to 100% H₂ + 0 to 5% CO₂ + 0 to 92 N₂ at a temperature between 970°C and 1030°C (cf. D3, column 1, lines 16 to 29; lines 48 to column 2, line 3: examples 1 and 2).

It is noted that the copper is preferably in a spongy form having a purity of 99.5% and oxygen content lower than 2000 ppm (cf. D3, column 1, lines 48 to 55).

2.3 According to the process disclosed in document D4, copper oxide powder is directly reduced to produce a porous mass of metallic copper, in which particles of colloidal graphite are isolated from another and uniformly dispersed. The graphite content is about 12 percent by weight. This product is mixed with tin powder, compressed under a pressure of about 10t/cm² and sintered in a muffle furnace for 2 hours at 750°C in a vacuum of 10⁻³ mm Hg to form a compact (cf. D4, column 2, lines 34 to 58).

3. The claimed process:

3.1 The Board concurs with the position of the examining division that a distinction between the process claimed in the application and the known methods could be seen in that none of the prior art methods provides for "purifying by annealing the copper powder in a reducing atmosphere and cleaning it", as referred to in the claimed process.

It is, however noted that the high-purity copper powder used in the known methods is directly obtained from reducing copper oxide (cf. D2, page 634, third column, last paragraph; D4, column 2, lines 34 to 44) or in spongy form (cf. D3, column 1, lines 52 to 55). A purification step for Cu particles in a reducing atmosphere to remove surface oxide films and/or further unwanted impurities from the Cu particles, as required in the claimed process, is therefore redundant, all the more so since the application is silent about any technical effect achieved by such a purification step.

Consequently, the subject matter of claim 1 lacks an inventive step with respect to the technical disclosure given in either document D2, D3 or D4.

3.2 The preferred embodiments of the claimed process, as set out in dependent claims 3 to 7 and 11 to 17, are concerned with the specific parameters for compaction and sintering, and are also disclosed in documents D2 to D4. The selection of the appropriate temperature level for the annealing and cleaning step (claim 2) and of the optimum conditions for compacting the powder (pressure level, HIPing, dynamic or tow-directional

compacting; claims 3, 8 and 9) to bring about a high density compact is considered to fall within the normal competence of a person skilled in the field of powder metallurgy. It is further known that, depending on the load spectra under service conditions, the compact can comprise further additives such as Zn, Sn or Fe (see e.g. D2, page 635, column 1, 1. paragraph; D4, column 2, lines 45 to 49).

The dependent claims therefore do not in substance comprise technical features which in combination with those of claim 1 would give rise to patentable subject matter, since they concern features which are either known from documents D2 to D4 or whose use lies within the normal competence of a person skilled in the art.

4. The claimed products:

- 4.1 Independent claims 18 to 21 are concerned with a product produced by the claimed process (in fact claims 19 to 21 refer to a material as defined in claims 16 or 17, which however relate to a method rather than a material). More importantly, claims 18 to 21 fail to specify any particular technical feature justifying a patentable distinction between the claimed contact material and that of the prior art.

According to decision T 150/82 (OJ EPO 1984, 309), such product-by-process claims are admissible only if

- (i) the products themselves fulfil the requirements for patentability and
- (ii) there is no other available information enabling the satisfactory definition of the product by reference to its composition, structure and/or some other

parameter (cf. also Case Law of the Boards of Appeal of the EPO, 4th edition, 2001, II.B.6).

The claim to a "product-by-process" is further construed as being implicitly limited to the features conferred on the product by the relevant claimed process steps.

4.2 It is, however, not discernable from the application which particular technical feature(s) (e.g. microstructure, mechanical, electrical or tribological properties) are a consequence of the claimed method and thus may provide a patentable distinction between the composites of claims 18 to 21 and those obtained by the methods of the prior art D2, D3 or D4. No arguments elucidating this point were submitted by the appellant.

4.3 As to claims 19 and 20, it is widely known in the art to use the copper-graphite composite material for such applications as voltage switchgear devices, circuit breakers, contactors, electric motor brushes etc (see for example D1, abstract; D2, page 634 paragraph: Metal graphite brushes; D3, column 1, lines 5 to 13).

Hence, claims 18 to 21 do not comprise patentable subject matter either.

5. Claims 1 to 21 enclosed with the grounds of appeal are, therefore, not allowable.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:

V. Commare

T. K. H. Kriner