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D E C I S I O N
of 20 August 2002

Case Number: T 0281/00 - 3.5.2

Application Number: 93916069.3

Publication Number: 0650634

IPC: H01F 1/053

Language of the proceedings: EN

Title of invention:

Magnetic materials and method of making them

Patentee:

The University of Sheffield

Opponent:

Siemens AG

Headword:

-

Relevant legal provisions:

EPC Art. 56, 113(1), 114(2), 116(1)

EPC R. 67

Keyword:

"Inventive step - (no)"

"Admissibility of documents filed in response to preliminary opinion of the opposition division - (yes)"

"Announcement of decision to disregard documents in advance of oral proceedings - substantial procedural violation - (no)"

"Reimbursement of appeal fee - (no)"

Decisions cited:

T 0736/99

Catchword:

-



Case Number: T 0281/00 - 3.5.2

D E C I S I O N
of the Technical Board of Appeal 3.5.2
of 20 August 2002

Appellant: Siemens AG
(Opponent) Postfach 22 16 34
D-80506 München (DE)

Representative: -

Respondent: The University of Sheffield
(Proprietor of the patent) Western Bank
Sheffield
South Yorkshire S10 2TN (GB)

Representative: Allard, Susan Joyce
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Decision under appeal: Interlocutory decision of the Opposition Division
of the European Patent Office posted 24 January
2000 concerning maintenance of European patent
No. 0 650 634 in amended form.

Composition of the Board:

Chairman: R. G. O'Connell
Members: M. Ruggiu
P. Mühlens

Summary of Facts and Submissions

I. This is an appeal by the opponent as sole appellant against the interlocutory decision of the opposition division proposing to maintain European patent No. 650 634 in amended form.

II. Claim 1 as approved by the opposition division is worded as follows:

"1. A method for the preparation of a two-phase magnetic material comprising as the major phase a crystalline alloy of one or more rare earth metals, boron and iron or a mixture of iron and cobalt, substantially all of the crystallites of which have a size of less than 35 nanometres, and as the minor phase α -Fe, which method comprises the steps of

(i) melt spinning an alloy consisting of up to 12 atomic percent of one or more rare earth metals, 3 to 7 atomic percent of boron and the balance iron or a mixture of iron and cobalt, whereby the alloy is quenched under conditions such that a mixture of crystalline and amorphous material is produced,

ii) subjecting the material from step (i) to an annealing treatment under conditions such that controlled crystal growth occurs to provide the crystalline alloy phase, substantially all of which has a crystallite size of less than 35 nanometres, the resulting materials having a remanence in excess of the theoretical value of 0.8 Tesla."

III. Grounds of opposition were *inter alia* that the subject-matters of the claims were not patentable by virtue of Article 56 EPC since they did not involve an inventive step.

IV. Eleven prior art documents were cited in the notice of opposition, of which :

D4: Zeitschrift für Metallkunde, vol. 81, H3, 1990,
pages 157 to 165

remains relevant to the present decision.

V. In a communication dated 13 February 1998 giving the opposition division's preliminary opinion on the parties' arguments as expressed in the notice of opposition and the proprietor's response thereto, the opposition division noted that: "The documents cited by the opponent are silent on the improvement of the remanence by grain size control and are mostly concerned with alloy materials outside the compositional ranges indicated in the patent."

VI. By letter dated 9 June 1998 the proprietor endorsed the preliminary opinion of the opposition division.

VII. By letter dated 3 August 1998 the opponent asserted that the mention in D4 at page 160, right-hand column, third sentence, of increased remanence resulting from strong coupling ("This is a consequence of small α -Fe inclusions whose moments become aligned due to the strong coupling to the surrounding Φ -particles." (ie $\text{Nd}_2\text{Fe}_{14}\text{B}$ particles), would be understood by the person skilled in the art as an allusion to the fact that reducing grain size improved remanence - which, in turn, was common general knowledge in the art. As

evidence to support this latter contention the opponent included with his letter the following three new prior art documents and cited the relevant short passages in each of these documents:

D12: Journal de Physique, Colloque C8, Supplement to no. 12, vol. 49, pages 669 to 670, December 1988

D13: J. Appl. Physics, vol. 64, No. 10, pages 5299 to 5301, 15 November 1988

D14: IEEE Transactions on Magnetism, vol. 27, No. 4, pages 3588 to 3600, July 1991

VIII. The proprietor did not respond to the opponent's letter of August 1998 citing documents D12 to D14. There followed a summons dated 26 March 1999 to oral proceedings on 14 December 1999 as requested by both parties. Annexed to the summons was a communication which listed, at point 5, the documents cited in the opposition, including D12 to D14 and included, at the bottom of this list the following:

"Remark: Documents D12 to D14 were filed after the expiry of the opposition period. Since they are not any more relevant than other documents already on file, they will be disregarded as being late filed."

Point 7 of this annex repeated the summons formula and added:

"Matters to be discussed are the question of inventive step in the light of the disclosures of D1 - D11, having regard to the technical problem underlying the patent-in-suit, as analysed in the communication of 13.02.1998; and the objection under Art. 83 EPC raised by the opponent."

- IX. By letter dated 22 October 1999 the opponent indicated that the opposition division's view that D12 to D14 were not more relevant than the documents D1 to D11 already on file could only be accepted if it meant that the common general knowledge in the art documented therein was regarded by the opposition division as either already documented in D1 to D9 or as being notorious in the art in the sense of not requiring substantiation by evidence. He repeated his contention that the documents in question should be admitted as an aid to interpreting the important passage in D4 at page 160 cited in the notice of opposition.
- X. By fax dated 12 November 1999 the proprietor expressed his agreement "with the Opposition Division's decision as set out in the annex to the Summons of 26 March 1999 to disregard documents D12 to D14" and, while maintaining his request that the patent be maintained in its amended form, informed the division that he would, in view of the costs involved, not be represented at the oral proceedings.
- XI. At the oral proceedings it appears from the minutes that the opposition division "re-asserted the position" that documents D12 to D14 could not be introduced into the proceedings, but qualified this position by making "clear that they could be referred to, but only in connection with any possible terminology clarification". The decision under appeal reproduced the "remark" quoted at point VIII above with a change of tense from "will be disregarded" to "were disregarded".
- XII. In the statement of grounds of appeal the appellant opponent requested that D12 to D14 be admitted and in addition submitted the following published documents originating from the respondent proprietor of which D15

and D17 constituted prior art and D16 was a postpublished comment on some of the prior art documents cited by the appellant:

D15: Material Letters, vol. 13, pages 194 to 198, April 1992

D16: Journal of Magnetism and Magnetic Materials, vol. 128, pages 302 to 306, 1993

D17: Journal of Magnetism and Magnetic Materials, vol. 101, pages 360 to 362, 1991

XIII. The respondent proprietor did not file any response to the statement of grounds of appeal.

XIV. In a reasoned communication dated 11 April 2002 accompanying a summons to oral proceedings, which proceedings had been requested by the appellant opponent, the board advised the parties *inter alia* that it might be appropriate for the board to review the opposition division's decision to disregard the documents D12 to D14.

XV. The respondent proprietor made no substantive written submission in response to the board's communication, but informed the board by fax dated 23 July 2002, that he would, on grounds of cost, not be represented at the oral proceedings. The latter took place on 20 August 2002.

XVI. The appellant opponent argued essentially as follows:

Admissibility of documents D12 to D14

The decision under appeal had not addressed the opponent's argument based on the common general knowledge in the art that remanence was enhanced by small crystallite size as alluded to in D4 and evidenced by documents D12 to D14. Hence the opposition division's decision to exclude these documents on the grounds that they were not more relevant than other documents already on file was not well-founded. The opposition division had been unduly influenced by the absence of the proprietor in the oral proceedings before the opposition division in adhering to its previously announced decision to exclude these documents.

Inventive step (Claim 1)

The statement of the objective technical problem allegedly solved by the method specified in claim 1 of the opposed patent as set out at column 1, line 54 to column 2, line 22 was misleading in respect of the reference to the aspect "without the need for any modifiers". Prior art document D15, which originated from the proprietor of the opposed patent, explicitly acknowledged that high remanence, ie in excess of the theoretical Stoner-Wohlfarth value of $0.5 M_s$, where M_s is the saturation magnetisation, had been demonstrated in Nd-Fe-B alloy compositions (for which $M_s = 1.6 \text{ T}$ giving a theoretical remanence $B_r = 0.8 \text{ T}$), with and without Si or other modifiers. Thus, as the respondent proprietor himself acknowledged in D15, the problem of dispensing with modifiers had already been solved before the priority date of the opposed patent; cf D15, page 196, right column, last paragraph: "...the enhanced remanence is observed also for alloys not containing silicon...".

In that context reference had been made by the proprietor himself (in D15) to prior art document D12 which was one of the documents submitted by the opponent (now appellant) in its submission dated 3 August 1998 in response to the arguments contained in the proprietor (now respondent)'s response and in the communication of the opposition division and which the opposition division disregarded as late-filed and irrelevant.

In fact prior art document D12 disclosed all the features of claim 1 apart from the precise composition of the starting material. D12 was entitled "Novel permanent magnetic materials made by rapid quenching" and in the introductory section thereof it was explained that melt spinning had been employed widely in the previous decade (ie the eighties) to prepare amorphous alloys, but that it was also possible, by a variation of the wheel speed, to obtain partially crystallised alloys, characterised by a high concentration of nuclei and small crystallites. A modest heat treatment of the latter alloys then led to a microstructure consisting of much smaller grains than would have been obtained by normal casting procedures. Later in D12 (page 669, bottom of the left hand column) it was mentioned that the composition of the materials studied comprised as crystallisation products Fe_3B , $\text{Nd}_2\text{Fe}_{14}\text{B}$ and some $\alpha\text{-Fe}$, while further on (page 669, bottom of the right hand column) it was explained that this microcrystalline structure had crystallite sizes of 10nm for $\text{Nd}_2\text{Fe}_{14}\text{B}$ grains and 30 nm for Fe_3B grains. The remanence of the materials was reported as being 1.2 T, which, as was pointed out, corresponded to a ratio of remanence over the saturation magnetisation of 0.75 which was much higher than the theoretical value of 0.5 (corresponding to a remanence of 0.8 T).

Starting from D12 as closest prior art, the objective technical problem was therefore to find alternative melt-spun Nd-Fe-B alloy compositions obtainable by the method specified in D12 which could have similar or better magnetic properties, in particular high remanence. This was a routine task for the person skilled in the art of researching and developing improved magnetic materials. In considering the possibilities of developing the work done in D12 the person skilled in the art would consider the results reported in D4 relating to these materials and in particular he would appreciate the significance of figure 9 on page 160 of that document. This figure comprised a graph of remanence as a function of alloy composition and related to a ternary Nd-Fe-B alloy composition series where the B was kept constant (5 atomic %) and the Nd concentration varied between 5 and 27.5 atomic %. As stated in the description of figure 9, the remanence J_r increased with decreasing Nd concentration and in the vicinity of the $Nd_2Fe_{14}B$ phase (ie the stoichiometric ratio of around 12 atomic percent Nd) the remanence J_r partly exceeded the theoretical limit of $0.8 T = \frac{1}{2} J_s$ for an isotropic material. This was explicitly stated in D4 to be "a consequence of small α -Fe inclusions whose moments become aligned due to the strong coupling to the surrounding Φ (ie $Nd_2Fe_{14}B$) particles ". The person skilled in the art was aware that the precipitation of such an α -Fe minor phase was favoured when the Nd concentration dropped below the stoichiometric value of 12%; cf D12, page 669, left-hand column, line 5 from the bottom and D4, page 158, right-hand column, lines 25 to 27.

For the skilled person, therefore, the teachings of D12 and D4 converged in pointing to the fact that high remanence could be achieved in melt-spun Nd-Fe-B alloy compositions having sufficiently low Nd - ie tending

below the stoichiometric concentration for the equilibrium phase - to provoke the formation of α -Fe grains as a minor phase and sufficiently small crystallite size - of the order of 10 to 30 nm - for the main $\text{Nd}_2\text{Fe}_{14}\text{B}$ phase to favour magnetic coupling between the grains of the respective phases. In this way the person skilled in the art would arrive at a method for the preparation of magnetic material having all the features of claim 1 of the opposed patent, without any inventive step being involved.

XVII. The respondent proprietor submitted neither written nor oral arguments.

XVIII. The appellant opponent requested that the decision under appeal be set aside and that the patent be revoked.

XIX. The respondent proprietor made no explicit request. Following the principle that a party may not be presumed to have surrendered a right (*A jure nemo recedere praesumitur*), the board construes this silence as a request that the appeal be dismissed.

Reasons for the Decision

1. The appeal is admissible.

2. *Admissibility of prior art documents D12 to D14*

2.1 An opposition division has a discretionary power under Article 114 (2) EPC to disregard evidence which has not been submitted in due time. This power has to be exercised reasonably after hearing the parties, including oral proceedings if requested. Accordingly,

in the judgement of the board, it constitutes a potential substantial procedural violation to announce - or appear to announce - a final decision on the admissibility of evidence in a communication annexed to a summons to oral proceedings as was done in this case. In the event, however, the opposition division did allow the opponent to argue the case for admission of the documents at the oral proceedings, thus repairing the formal deficiency in the annex to the summons. It is clear that there was a risk here that the formulation in the annex created an expectation in the mind of the proprietor that he could rely on this as the final decision on admissibility and dispense with representation at the oral proceedings. Since, however, the opposition division, after hearing the opponent, did not admit the documents, there is no need for the board to address the question of whether such an expectation would have been legitimate.

- 2.2 As to the substantive reasons given by the opposition division for disregarding the documents D12 to D14, a general purpose formula has been used which affords little insight into the opposition division's thinking on the matter. On the face of it, the new evidence was directly responsive and relevant to the pivotal reasoning in the opposition division's preliminary opinion of February 1998, last sentence of point 2: "The documents cited by the opponent are silent on the improvement of the remanence by grain size control and are mostly concerned with alloy materials outside the compositional ranges indicated in the patent."
- 2.3 In its decision T 736/99 of 20 June 2002 (not published in the EPO Official Journal) at point 2.3.2, the present board (in a different composition) had occasion to make the following observation:

"The exercise of discretion pursuant to Article 114(2) EPC in opposition appeal proceedings is a matter of striking a balance between the values of procedural expediency and certainty on the one hand and legal closure within the centralised opposition system provided for in the EPC on the other. Generally the boards have applied the criteria of relevance and procedural complication to help resolve the conflict between these incommensurables, with the hurdle of relevance set higher the later the submission. In some recent decisions the criterion of complexity of the legal and technical issues raised by the late submission has been relied on as an additional or alternative criterion."

- 2.4 The reply to a first communication setting out a preliminary opinion of the opposition division is a relatively early stage in the overall opposition and appeal procedure - not to mention the perspective of a possible subsequent national revocation procedure - so that the balance referred to above requires the hurdle of relevance to be set lower than in any stage of the appeal procedure. In particular it seems inappropriate to invoke this criterion effectively to block a focussed convergent response to a specific argument from the opposition division which is potentially determinative of the outcome of the opposition.
- 2.5 Hence the board judges that, in substance, the opposition division has not shown that it exercised its discretion reasonably in depriving the opponent's direct response to the argument in the preliminary opinion dated 13 February 1998 of its evidential substantiation and hence its force, by its ruling that such evidence was late-filed and not more relevant than other documents already on file.

2.6 For the above reasons the board considers it appropriate to admit documents D12 to D14 to the appeal procedure notwithstanding the procedural decision in the contrary sense in the first instance procedure.

3. *Novelty (Claim 1)*

The novelty of the subject-matter of claim 1 is not contested by the appellant opponent.

4. *Inventive step (Claim 1)*

4.1 The appellant opponent has submitted an argument based on a combination of prior art documents D12 and D4, starting from D12 as closest prior art, which the board finds persuasive.

4.2 Despite the fact that the board notified the parties in its communication dated 11 April 2002 accompanying the summons to oral proceedings that it might be appropriate for the board to review the opposition division's decision to disregard prior art documents D12 to D14 in the first instance proceedings, the respondent proprietor made no written substantive comment and - as foreshadowed in a fax dated 23 July 2002 - was not represented at the oral proceedings on grounds of cost. Although there has been no first instance consideration of the appellant opponent's argument, it would not be appropriate, in the judgement of the board, to remit the case to the opposition division for such consideration. Firstly, the respondent proprietor has not requested remittal; secondly, he has not availed himself of the opportunity afforded him in the appeal proceedings to comment on the issue of admissibility of these documents; thirdly,

it would be unfair to the appellant opponent, considering that the latter had sought from a relatively early stage in the opposition procedure to have these documents admitted.

- 4.3 In the judgement of the board, the method for the preparation of a two-phase magnetic material specified in claim 1 is derivable in an obvious manner from a combination of D4 and D12 and common general knowledge in the art and is therefore not considered as involving an inventive step within the meaning of Article 56 EPC. Hence the patent as approved by the opposition division in the decision under appeal and the invention to which it relates do not meet the requirements of the EPC.

5. *Reimbursement of the appeal fee (Rule 67 EPC).*

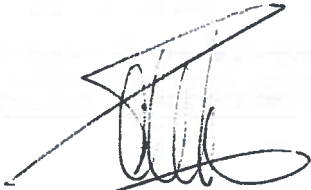
Since the board has concluded that the procedural irregularity involved in the potentially misleading formulation in the annex to the summons to oral proceedings before the opposition division did not in the end lead to a substantial procedural violation the question of reimbursement of the appeal fee under Rule 67 EPC does not arise. Nor has reimbursement been requested.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The patent is revoked.

The Registrar:

A handwritten signature in black ink, appearing to be 'M. Kiehl', written over a horizontal line.

M. Kiehl

The Chairman:

A handwritten signature in black ink, appearing to be 'R. G. O'Connell', written over a horizontal line.

R. G. O'Connell