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D E C I S I O N
of 30 April 2002

Case Number: T 0906/99 - 3.4.3

Application Number: 93201456.6

Publication Number: 0560464

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Language of the proceedings: EN

Title of invention:
Superconductive oxide materials

Applicant/Patentee:
MATSUSHITA ELECTRIC INDUSTRIAL CO., LTD

Opponent:
Siemens AG
Hoechst AG

Headword:

-

Relevant legal provisions:

EPC Art. 100(b), 106
EPC R. 88

Keyword:

"Sufficiency (no) (the requirement of reproducibility without undue burden is no satisfied)"
"Effect of the correction of a priority date of a state of the art document pursuant to Article 54(3) on a third party (not relevant)"

Decisions cited:

T 0528/92, J 0006/91, G 0002/98

Catchword:

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Case Number: T 0906/99 - 3.4.3

D E C I S I O N
of the Technical Board of Appeal 3.4.3
of 30 April 2002

Appellant: MATSUSHITA ELECTRIC INDUSTRIAL CO., LTD.
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Representative: Hoechst AG
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Decision under appeal: Decision of the Opposition Division of the
European Patent Office posted 27 July 1999
revoking European patent No. 0 560 464 pursuant
to Article 102(1) EPC.

Composition of the Board:

Chairman: R. K. Shukla
Members: M. Chomentowski
M. B. Guenzel

Summary of Facts and Submissions

- I. The European patent No. 0 560 464 was granted on the basis of the European patent application No. 93 201 456.6, which was a divisional application of the earlier European patent application with publication No. 0 331 292. The European patent claimed the priority of the filing of Japanese applications JP 26128/88, JP 26129/88 and JP 26130/88 all three with the filing date 5 February 1988.

The only claim of the European patent No. 0 560 464 concerned a superconductive oxide material which consisted, at least partially, of $ABiCuO$, where A was a mixture of at least one of Mg and Ca and at least one of Sr and Ba, the atomic ratio of A/Bi/Cu falling within a pentagonal area in a ternary composition diagram of A, Bi and Cu, defined by the points 3/2/3, 5/3/5, 6/3/5, 4/2/3 and 6/4/5 and the material having a superconductive transition temperature above 84 K.

- II. Oppositions were filed against the European patent on the grounds that the subject-matter of the patent was not patentable having regard *inter alia* to the prior art document

EP-B-0 418 244,

claiming the priority of filings on 4 and 8 February 1988,

and that the patent did not disclose the invention in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art

(Articles 100(a) and (b) EPC).

III. The European patent, which had been requested by the appellant to be maintained in amended form, was revoked by the opposition division by a decision dispatched on 27 July 1999 on the ground that the subject-matter of claim 1 was not new having regard to the content of EP-B-0 418 244 (Articles 54(3) and (4) and 100(a) EPC).

The only claim forming the basis of the above decision read as follows:

"A superconductive oxide material having a superconductive transition temperature above 84 K, which consists, at least partially, of $ABiCuO$, where A is a mixture of at least one of Mg and Ca and at least one of Sr and Ba, the superconductive oxide material being formed **from a starting mixture** in which the atomic ratio of A/Bi/Cu **in said starting mixture** falls within a **quadrilateral** area in a ternary composition diagram of A, Bi and Cu, defined by the points 5/3/5, 6/3/5, 4/2/3 and 6/4/5."

(Amendments with respect to the claim as granted have been emphasised by the Board).

In its decision, the opposition division, however, concluded that taking into account the disclosure of the invention as a whole and the common general knowledge in the art, the skilled person was in a position to achieve the superconductive oxide material as defined in the claim. In particular, Examples of the superconductive oxide materials contained in Table 1 of the patent in suit demonstrated that the

superconductive oxide materials as claimed could be successfully produced. Thus, the invention as claimed complied with the requirement of Article 100(b) EPC.

- IV. The patent proprietor lodged an appeal against this decision on 16 September 1999 paying the appeal fee on the next day. A statement setting out the grounds of the appeal was filed on 2 December 1999.
- V. At the oral proceedings held on 30 April 2002, the appellant (proprietor), in response to objections raised by the respondents (opponents) and the Board pursuant *inter alia* to Article 100(c) EPC against claim 1 of the appellant's main and auxiliary requests, submitted a new request replacing all the previous requests. The only claim of this request reads as follows:

"A superconductive oxide material having a superconductive transition temperature above **100 K**, which consists, at least partially, of $ABiCuO$, where A is a mixture of **Ca and Sr, and optionally further includes Ba and/or Mg**, the atomic ratio of A/Bi/Cu falling within a quadrilateral area in a ternary composition diagram of A, Bi and Cu, defined by the points **3/2/3**, 5/3/5, 6/3/5, and 6/4/5."

(Emphasis added by the Board to the main differences with respect to the claim forming the basis of the decision of the opposition division).

- VI. The appellant submitted essentially the following arguments:

Sufficiency

The patent in suit contains sufficient information for a skilled person using his common general knowledge in the specific technical field to carry out the invention. In particular, Table 1 contains several examples of superconductive materials according to the claim. Indeed, Table 2 of the patent in suit shows different results, but spread of results cannot be avoided, especially in a new field as that of the subject-matter in dispute. Therefore, the invention is sufficiently disclosed.

Novelty - Effect of the correction of priority date of a potential prior art by the decision J 6/91, OJ 1994, 349

The potential prior art document EP-B-0 418 244 which is a European patent is based on a PCT application filed on 3 February 1989 and which initially claimed the priority date of 8 February 1988. The PCT publication occurred on 10 August 1989 as WO-A-89/07087 and the European Regional phase was entered on 5 July 1989. A second (earlier) priority date of 4 February 1988 was added by the decision **J 6/91** of 1 December 1992 by way of correction of an error, following a request of rectification on 9 March 1990, i.e. after the publication, on 6 September 1989, of the parent application EP-A-0 331 292 for the present patent in suit.

For the purpose of Article 54(3) EPC it is "the content of the European patent application **as filed**" which needs to be taken into consideration. The correction of

the priority date which was allowed by the Board of Appeal in J 6/91 should not have the effect of introducing material in the state of the art with an earlier relevant date long after the relevant date of such state of the art should be established.

The effect on the rights of third parties of this change in the priority date resulting in EP-B-0 418 244 becoming potentially relevant as an Article 54(3) EPC against European patent applications which had already been published, seems not to have been considered in the decision J 6/91. According to the decision **G 2/98**, OJ 2001, 413, item 9 of the reasons, there is a principle of equal treatment of the applicant and third parties. In the present case, this principle does not seem to have been respected.

Therefore, a substantive point of law arises as a result of the correction of the priority date and this matter should be referred to the Enlarged Board of Appeal.

VII. The respondents arguments against the allowability of the appellant's request can be summarised as follows:

Sufficiency of disclosure of the invention

Table 1 and Table 2 of the patent in suit show 6/4/5 compositions, i.e., compositions forming one of the summits of the quadrilateral area defining the claimed superconductive materials. The Examples of these compositions 6/4/5 in Table 1 are indicated as having transition temperatures above 100 K, i.e., in accordance with the claim. However, the Examples of the

same compositions 6/4/5 in Table 2 are indicated with transition temperatures which are not above 100 K; these compositions of Table 2 are thus outside the scope of the claim. The information in the patent in suit does not give reasons for these contradictory results. Therefore, the disclosure in the patent in suit is not sufficient for carrying out the invention in a reproducible way, so that the appellant's main and only request is not allowable (Article 100(b) EPC).

Admissibility of new requests filed by the appellant at the appeal stage

It follows from Article 106 EPC that in appeal proceedings a patent proprietor and appellant may only pursue claims which were the subject of the first-instance decision; claims which were not the subject of the contested decision cannot be the subject of the appeal because the appellant was not adversely affected by such a decision with respect to that request (cf. **T 528/93** of 23 October 1996, in particular item 1 of the reasons). Therefore, requests of the appellant which were not the subject of the appealed decision, as is the case in particular with the new requests which were submitted in preparation for the oral proceedings before the Board are not admissible.

Thus, the question, whether the decision T 528/93 should be followed, is relevant and should be referred to the Enlarged Board of Appeal.

Reasons for the Decision

1. The appeal is admissible.
2. *Admissibility of the appellant's request*

The respondents demand for referring to the Enlarged Board of Appeal a question concerning the admissibility in appeal proceedings of requests which had not been the subject of the contested decision was not directed specifically against the main and only request of the appellant which forms the basis of the present decision. Taking also into account the conclusion of the present case (see hereunder), the requested referral was not pertinent for this decision.

3. *Sufficiency of disclosure*

- 3.1 The main and only request, as defined in the only claim, concerns a superconductive oxide material having a superconductive transition temperature above **100 K**, which consists, at least partially, of ABiCuO , where A is a mixture of **Ca and Sr, and optionally further includes Ba and/or Mg**, the atomic ratio of A/Bi/Cu falling within a **quadrilateral** area in a ternary composition diagram of A, Bi and Cu, defined by the points **3/2/3, 5/3/5, 6/3/5, and 6/4/5**.

- 3.2 In the patent in suit (see page 2, lines 38 to 47), a method of preparing superconductive oxide materials is disclosed whereby mixtures of weighed amounts of one or both of magnesium and calcium oxides, one or both of strontium and barium oxides, bismuth oxide and copper oxide are formed so as to give atomic ratios A/Bi/Cu of 5/3/5 to 3/2/3 and also other A/Bi/Cu ratios, the oxides are thoroughly mixed and the mixture is calcined

at 800 to 850°C, crushed, formed, and then sintered at 830 to 870°C. The compositions and characteristics of the materials obtained are shown in Table 1.

A method of preparing a further series of compositions of the A₂BiCuO type made in the same manner as described above is disclosed in the patent in suit (see page 3, line 58 to page 4, line 3); the thoroughly mixed oxides are calcined at 800 to 850°C, the mixture is then crushed, formed, and sintered at 850°C. The compositions and characteristics of the materials obtained are shown in Table 2.

3.3 The following Examples of Table 1 are not comprised in the scope of the claim:

Example 13 of Table 1 does not comprise calcium and is thus not in accordance with the claim.

The compositions of Examples 4 (6/5/4), 6 (1/1/1) and 7 (2/1/2) of Table 1 do not fall within the quadrilateral area defined in the claim. This can be seen, for Example 4, from the description of the former main request filed with the statement setting out the grounds of the appeal, whereby this composition is disclosed as not being comprised in the pentagonal area (3/2/3, 5/3/5, 6/3/5, 4/2/3 and 6/4/5); this pentagonal area encompasses the quadrilateral area (3/2/3, 5/3/5, 6/3/5 and 6/4/5) of the present main and only request. For Examples 6 and 7, this can also be derived from the graph accompanying that former request. Moreover, from the same graph, it can also be seen that the compositions (4/2/3) of Examples 8 and 12 are not comprised within the area defined in the claim.

3.4 Examples 1 and 10 (5/3/5) of Table 1 have a transition temperature of 105 K and 101 K, respectively. Examples 5 (6/3/5) and 14 (3/2/3) of Table 1 have a transition temperature of 102 K and 105 K, respectively. Thus, according to Table 1, in the quadrilateral area defined in the claim, the three summits (5/3/5), (6/3/5) and (3/2/3) are well within the scope of the claim.

It is to be noted that none of these compositions are reported in Table 2.

3.5 The remaining compositions in Table 1 are all (6/4/5) compositions, i.e., corresponding to the fourth summit of the quadrilateral area defined in the claim:

Example 2, with Sr = 3.8, Ca = 2.2, Ba = 0, Mg = 0, Bi = 4 and Cu = 5, thus $(3.8 + 2.2 + 0 + 0 = 6/4/5)$, which has a transition temperature of 108 K;

Example 3, with Sr = 3.5, Ca = 2.5, Ba = 0, Mg = 0, Bi = 4 and Cu = 5, which has a transition temperature of 110 K;

Example 9, with Sr = 2.0, Ca = 2.0, Ba = 1, Mg = 1, Bi = 4 and Cu = 5, which has a transition temperature of 106 K;

Example 11, with Sr = 4.0, Ca = 0.5, Ba = 1, Mg = 0.5, Bi = 4 and Cu = 5, which has a transition temperature of 110 K.

The respondents have pointed out that the superconductive oxide materials were not sufficiently defined in the main and only request, and that this was

particularly the case for the 6/4/5 materials, whereby, contrary to the 6/4/5 materials of Table 1, the 6/4/5 materials disclosed in Table 2 did not have a transition temperature above 100 K.

Thus, in Table 2:

Example 2, with Sr = 3.0, Ca = 3.0, Ba = 0, Mg = 0, Bi = 4 and Cu = 5, has a transition temperature of 80 K; and

Example 10, with Sr = 2.0, Ca = 2.0, Ba = 1, Mg = 1, Bi = 4 and Cu = 5, has a transition temperature of 80 K.

It can be seen from the foregoing that the only Examples of these 6/4/5 materials which have exactly the same composition formula, i.e., Example 9 of Table 1 and Example 10 of Table 2, have largely different transition temperatures, i.e., 106 K and 80 K respectively, so that Example 10 of Table 2 does not fall within the scope of the main and only request.

As mentioned here above, the materials of Table 2 are disclosed as being made in the same manner as those of Table 1. Moreover, the disclosed sintering temperature of 850°C for the compositions of Table 2, in particular of the Example 10, falls within the sintering temperature range of 830°C to 870°C employed for the compositions, in particular Example 9 of Table 1.

3.5.1 Also, all the other Examples of the 6/4/5 materials, i.e., Examples 2, 3 and 11 of Table 1 and Example 2 of Table 2, have different proportions of the constituent

elements. Here again, the Example of Table 2 has a largely different transition temperature, i.e., 80 K.

Thus, for these further materials, it is not clear whether, with a sintering temperature of 850°C, it is feasible to prepare in a reproducible manner the claimed materials, or whether this result is caused for instance by the different composition formulas. In this last respect, it is to be noted that, for all these Examples, the amount in Bi and Cu remains the same, so that it is only the amount of the elements Sr, Ca and, optionally, Ba and Mg, which could cause the reported difference in transition temperature.

The appellant, asked by the Board about these contradictory results concerning the 6/4/5 materials, argued that there were several positive results and that, especially in a new area of technology such as that of the cuprate oxide ceramic superconducting materials, it can happen that same conditions do not allow to obtain the same results.

Although the Board accepts this submission, the question remains whether the conditions necessary to produce the claimed compositions are sufficiently disclosed.

It follows from the above that in so far as the composition 6/4/5, i.e. the fourth summit of the quadrilateral area defined in the claim is concerned, the transition temperature above 100 K is not consistently obtained. Contrary to the submission of the appellant, the transition temperatures of the compositions 6/4/5 reported in Table 2 cannot merely be regarded as a spread of transition temperature of above

100 K reported in Table 1. In the Board's view, the results reported in Table 2 and the corresponding description in fact demonstrate, as stated above, that the 6/4/5 composition also shows a transition temperature of around 80 K.

Thereby, it is *prima facie* not possible to determine whether differences in the method of the preparation or different composition of the constituent elements or a combination of both is the cause of the conflicting results. There is thus no sufficient information in the patent in suit which would have enabled the skilled person at the priority date of the subject patent to prepare in a reproducible manner a 6/4/5 superconductive oxide composition having a transition temperature above 100 K without undue burden. Consequently, the requirement of reproducibility without undue burden, for one of the compositions defining the subject-matter in dispute, is not satisfied.

3.6 Therefore, in the Board's judgement, the patent in suit does not disclose the invention in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art and, consequently, the main and only request of the appellant is not allowable (Article 100(b) EPC).

4. For this reason, it is not necessary to assess whether the subject-matter of the only claim is new having regard to the EP-B-0 418 244 claiming priority dates of 4 and 8 February 1988 and, thus, there is no need to refer to the Enlarged Board of Appeal the question of the Appellant concerning the effect on third parties of

a correction of priority dates of an application.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:

D. Spigarelli

R. K. Shukla