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Datasheet for the decision of 2 April 2025

Case Number: T 0009/24 - 3.3.05

Application Number: 17165429.6

Publication Number: 3214058

IPC: C04B35/553, A61K41/00, G21K1/00, G21C5/12, C04B35/626

Language of the proceedings: EN

Title of invention:
USE OF MAGNESIUM FLUORIDE SINTERED COMPACT AS NEUTRON MODERATOR

Patent Proprietor:
University of Tsukuba
Daico Mfg Co. Ltd.

Opponent:
Nikkei Sangyo Co., Ltd

Headword:
MAGNESIUM FLUORIDE SINTERED COMPACT AS NEUTRON MODERATOR/ University of Tsukuba, Daico

Relevant legal provisions:
EPC Art. 76(1), 123(2)
EPC R. 103(1)(a)

Keyword:

Amendments - allowable (yes)
Divisional application - added subject-matter (no)
Reimbursement of appeal fee - substantial procedural violation (no)

Decisions cited:

T 0162/04

Catchword:

Europäisches Patentamt
European Patent Office
Office européen des brevets

Beschwerdekammern

Boards of Appeal

Chambres de recours

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Case Number: T 0009/24 - 3.3.05

D E C I S I O N
of Technical Board of Appeal 3.3.05
of 2 April 2025

Appellant: (Patent Proprietor 1)	University of Tsukuba 1-1-1, Tennodai Tsukuba-shi, Ibaraki 305-8577 (JP)
Appellant: (Patent Proprietor 2)	Daico Mfg Co. Ltd. 676-3 Kuze Nakahisa-cho Minami-ku Kyoto-shi, Kyoto 601-8207 (JP)
Representative:	Ter Meer Steinmeister & Partner Patentanwälte mbB Nymphenburger Straße 4 80335 München (DE)
Respondent: (Opponent)	Nikkei Sangyo Co., Ltd 5-12 Matsubara-cho Shimizu-ku Shizuoka-shi, Shizuoka 424-0825 (JP)
Representative:	Hoffmann Eitle Patent- und Rechtsanwälte PartmbB Arabellastraße 30 81925 München (DE)
Decision under appeal:	**Decision of the Opposition Division of the European Patent Office posted on 24 October 2023 revoking European patent No. 3214058 pursuant to Article 101(3)(b) EPC.**

Composition of the Board:

Chairman	E. Bendl
Members:	J. Roider
	O. Loizou

Summary of Facts and Submissions

I. The patent proprietor's appeal lies from the opposition division's decision to revoke the European patent EP 3 214 058 B1 because the requirements of Article 76(1) EPC were not met.

II. The following document, which has already been cited in the opposition proceedings, is referred to:

D15 H.K. Chen et al., "Oxidation characteristics of MgF_2 in air at high temperature", IOP Conf. Ser.: Mater. Sci. Eng. 170 (2017)

III. In the communication under Article 15(1) RPBA, the board expressed the preliminary opinion that the main request on file (claims as granted) met the requirements of Article 76(1) EPC and that the case should be remitted to the opposition division for further prosecution.
The board further expressed the preliminary opinion that reimbursement of the appeal fees was not justified.

IV. By letter of 30 December 2024, following the communication under Article 15(1) RPBA, the opponent submitted further arguments and conditionally withdrew the request for oral proceedings, *inter alia*, if the case was to be remitted for further prosecution as proposed by the board.

V. In the communication of 20 January 2025 the board informed the parties that even after considering the opponent's further arguments, it saw no reason to

depart from its preliminary opinion both with respect to Article 76(1) EPC and with respect to the request to reimburse the appeal fees as set out in the communication under Article 15(1) RPBA.

VI. By letter of 27 January 2025, the patent proprietor also withdrew the request for oral proceedings on the condition that the board did not deviate from its preliminary opinion.

VII. Claim 1 of the main request reads as follows:

"1. Use of a fluoride sintered body, consisting of MgF_2 of a compact polycrystalline structure having a bulk density of 2.90g/cm^3 or more and having a bending strength of 10MPa or more and a Vickers hardness of 71 or more as regards mechanical strengths, as a neutron moderator."

VIII. The appellant (patent proprietor) argued that the requirements of Article 76(1) EPC and Article 123(2) EPC were met. It moreover requested reimbursement of the appeal fees.

IX. The opponent (respondent) argued that the requirements of Article 76(1) EPC and Article 123(2) EPC were not met.

X. Requests with regard to the substance:

(a) The appellant (patent proprietor) requested that the decision under appeal be set aside and that the patent be maintained as granted, i.e. that the opposition be rejected, or, in the alternative, that the patent be maintained in amended form on the basis of auxiliary requests 1 to 4, resubmitted

together with the statement of grounds of appeal.

(b) The respondent (opponent) requested that the appeal be dismissed.

Reasons for the Decision

1. Main request, Article 100(c) EPC together with Article 76(1) EPC

1.1 The opponent agreed with the reasons in paragraph 15.2.3 of the impugned decision, according to which the feature *"a fluoride sintered body consisting of MgF_2"* in claim 1 did not have a basis in the parent application as originally filed (PAOF). In particular, the PAOF did not disclose the disputed feature "*consisting of MgF_2*" contained in claim 1 and it was not implicitly disclosed, either.

1.2 However, paragraph [0062] of the PAOF discloses that the sintered body of MgF_2 has a bulk density of 2.90 g/cm^3 or more. This sintered body has a bending strength of at least 10 MPa and a Vickers hardness of at least 71 (paragraph [0063]). According to paragraph [0065], it is made by pulverising high-purity MgF_2, adding 0.1-1 wt.% of a sintering aid, moulding, followed by cold isostatic pressing, primary sintering at 550°C-600°C in air and secondary sintering below the starting temperature of foaming, in an inert atmosphere.
All the examples illustrating the invention use pure MgF_2 as a starting material and 0.2% carboxymethyl cellulose (CMC) as a sintering aid. It is known that CMC decomposes at the primary sintering temperature.

There is no indication in the patent in suit that the manufacturing process introduces anything more than minor impurities into the MgF_2 sintered body. Moreover, the opponent has failed to demonstrate that this was the case, as is apparent from the following assessment.

1.3 In essence, the opponent argued that, in view of the manufacturing process and the purity of the raw material, the PAOF did not provide a valid basis for the disputed feature.

1.3.1 In particular, it was contended that the PAOF did not contain a definition of the level of acceptable impurity that was implied in the feature *"consisting of MgF_2"*. The PAOF did not not have any explicit literal disclosure support for the purity level associated with the expression *"consisting of MgF_2"*.

1.3.2 Since the manufacturing process undisputedly created impurities (sintering aid, ball mill wear, oxidation process), this feature had to be interpreted broadly, otherwise it could not be in line with the gold standard. It was noteworthy that the board's preliminary opinion used an abstract impurity level as the critical criterion to decide if the requirements under Article 76(1) EPC were met.

1.3.3 In the light of rounding conventions, the opposition division concluded that a fluoride sintered body comprising up to 0.5% of substances other than MgF_2 could be regarded as technically pure; however, the opponent was of the opinion that, despite the ultimately correct decision, the level of impurity assumed by the opposition division was too high, particularly in view of the patent proprietor's assertion that the MgF_2 was of the highest purity and

in view of the existence of MgF_2 raw materials of significantly higher purity.

1.3.4 The opponent argued that there were several indicators supporting the view that the disputed feature was not implicitly disclosed:

(a) The PAOF specified a number of purity levels for the raw material, but did not provide any information regarding the product. It could thus be inferred that the term *"consisting of MgF_2"* did not necessarily imply the highest level of purity.

(b) The description pertained solely to the purity of the starting material, which was not necessarily equivalent to the purity of the resulting product. It was not reasonable to assume that the purity of MgF_2 remained unaffected by the manufacturing process. Indeed, for manufacturing, the MgF_2 raw material was pulverised in a ball mill for a period of one week. Ball mills were prone to abrasion, which contaminated the raw material. Moreover, a sintering aid was added to the MgF_2 raw material.

(c) Finally, the primary sintering stage was carried out in air, which unavoidably resulted in the conversion of a considerable amount of MgF_2 into MgO.

A consideration based on plausibility as to the purity level after the manufacturing did not satisfy the gold standard.

1.3.5 Moreover, a third party could not readily ascertain what purity of the MgF_2 sintered body fell within the scope of claim 1.

1.4 As the opponent is relying on these arguments, it bears the burden of proof.

1.4.1 The question of the level of purity of the starting material is not relevant in the present case. The disputed feature *"consisting of MgF_2"* is self-explanatory and will be understood by the skilled reader as referring to essentially pure products. All of the starting materials mentioned by the opponent are essentially pure products (T 162/04, point 3.2 of the Reasons).

1.4.2 As set out in detail below, it has not been demonstrated by the opponent and it is not apparent that the manufacturing process has significantly altered the composition of the products. It can therefore only be concluded that the product has essentially the same composition as the starting material.

(a) The opponent did not demonstrate that, under such conditions, the ball mill will contaminate the material to such an extent that the milled product can no longer be considered to consist of MgF_2, i.e., essentially pure MgF_2.

(b) Furthermore, there is no evidence that MgF_2 was converted into MgO during the primary sintering step in quantities that would be considered more than an impurity.
In D15, 1g of MgF_2 powder, ground to 200 mesh, was placed in a 50 x 28 x 10 mm^3 alumina crucible in a furnace. It is evident that air could readily penetrate the powder.

Under such conditions, D15 demonstrates that powdered MgF_2 can undergo partial oxidation at 600°C (i.e. 1-2% according to Table 2 of D15). However, the experimental design does not allow it to be concluded that the powder according to the patent in suit, compressed into a block of 220 x 220 x 85 mm^3, underwent comparable oxidation, even when considering the significantly larger particle size of the powder in D15. In particular, it is not apparent and it was not demonstrated that air can penetrate such a large block of compressed powder to the same extent as the powder sample in D15. Any assumption of this nature must be regarded as mere speculation.

The respondent argued that the differences in process and design between the opposed patent and document D15 were not sufficient to account for oxidation reduced by a factor of 1250.

However, heterogeneous reactions can be strongly limited by material transport phenomena.
Without a detailed analysis, it is not possible to estimate whether or not a factor of 1250 is exceeded. Such an analysis is not available.

The addition of the sintering aid does not change the fact that the sintered MgF_2 body is essentially pure, either. Only CMC and calcium stearate were mentioned as sintering aids (paragraphs [0078] and [0081]).
The addition of 0.1-1% already represents a low quantity of sintering aid. There is no evidence to suggest that the residues of the sintering aid remained in the MgF_2 sintered body in quantities

that could not be considered an impurity.

1.5 The question of whether third parties could not easily determine what purity of the MgF_2 sintered body falls within the scope of claim 1 is not relevant for the assessment of compliance with Article 76(1) EPC.

1.6 The requirements of Article 76(1) EPC are fulfilled.

1.7 The description as originally filed of the patent in suit also contains the above-cited paragraphs of the PAOF.

The requirements of Article 123(2) EPC are therefore fulfilled for the same reasons as under Article 76(1) EPC.

2. Reimbursement of appeal fees

According to Rule 103(1)(a) EPC the reimbursement of appeal fees is ordered if such reimbursement is equitable by reason of a substantial procedural violation (Case Law of the Boards of Appeal, 10th edition, 2022, V.A.11.1).

The appellant argued that the opposition division had applied incorrect legal standards in the assessment of Articles 123(2) and 76(1) EPC, thereby confusing the assessment of Article 123(2) EPC with that of Article 83 EPC. The opposition division's conclusions were thus so obviously wrong that the appellant considered them to constitute a procedural violation, bringing about unjustified costs for it.

The board does not recognise a substantial procedural violation.
It is not apparent that the opposition division confused the requirements of Article 123(2) EPC and Article 83 EPC. It instead appears that the opposition division assessed whether, in the light of D15, the manufacturing process in the patent in suit inevitably resulted in a product that could not be considered to consist of MgF_2.

This would at most constitute an error of judgement rather than an error of law and does not amount to a substantial procedural violation. For this reason the decision under appeal is the object of the reviewing appeal procedure before the Boards of Appeal (Case Law of the Boards of Appeal, 10th edition, 2022, V.A.11.6.10 b), c) and g)).

The board therefore considers that reimbursement of the appeal fees is not justified.

3. Remittal of the case to the opposition division

As the decision under appeal only concerns the requirements of Article 100(c) EPC, these circumstances are considered to represent special reasons within the meaning of Article 11 RPBA.

The Board accordingly decided to remit the case for further prosecution, as requested by the appellant.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the opposition division for further prosecution.

The Registrar: The Chairman:

C. Vodz E. Bendl

Decision electronically authenticated