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Datasheet for the decision of 19 January 2015

Case Number: T 0307/11 - 3.3.05

Application Number: 04025973.1

Publication Number: 1508357

IPC: B01D39/20, C04B38/00

Language of the proceedings: EN

Title of invention:
Honeycomb filter and ceramic filter assembly

Patent Proprietor:
IBIDEN CO., LTD.

Opponents:
SAINT-GOBAIN CENTRE DE RECHERCHES ET D'ETUDES EUROPEEN
Young Thought Limited
c/o D.C. O'Connell, Haseltine Lake

Headword:
Through-pore fraction/IBIDEN

Relevant legal provisions:
RPBA Art. 13(1), 13(3)
EPC Art. 83, 100(b)

Keyword:
Late-filed requests (admitted)
Late filed evidence (admitted)
Sufficiency of disclosure - lack of guidance
Sufficiency of disclosure - all requests (no)

Decisions cited:
T 0435/91, T 0409/91, T 0575/05, T 0817/11, T 1641/11

Catchword:

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Case Number: T 0307/11 - 3.3.05

D E C I S I O N
of Technical Board of Appeal 3.3.05
of 19 January 2015

Appellant: (Patent Proprietor)	IBIDEN CO., LTD. 1, Kanda-cho 2-chome Ogaki-shi, Gifu-ken 503-8604 (JP)
Representative:	Hager, Thomas Johannes Hoefer & Partner Patentanwälte Pilgersheimer Strasse 20 81543 München (DE)
Respondent 1: (Opponent 1)	SAINT-GOBAIN CENTRE DE RECHERCHES ET D'ETUDES EUROPEEN "Les Miroirs" - 18, Avenue d'Alsace 92400 COURBEVOIE (FR)
Representative:	Lucas, Francois Saint-Gobain Recherche 39, quai Lucien Lefranc B.P. 135 93303 Aubervilliers Cedex (FR)
Respondent 2: (Opponent 2)	Young Thought Limited c/o D.C. O'Connell, Haseltine Lake 120 Redcliff Street Redcliff Quay Bristol BS1 6HU (GB)
Representative:	Reverzani, Cristina Haseltine Lake LLP Theatinerstrasse 3 80333 München (DE)
Decision under appeal:	**Decision of the Opposition Division of the European Patent Office posted on 3 December 2010 revoking European patent No. 1508357 pursuant to Article 101(3)(b) EPC.**

Composition of the Board:

Chairman	G. Raths
Members:	A. Haderlein
	M. Blasi

Summary of Facts and Submissions

I. The present appeal lies from the decision of the opposition division to revoke European patent EP 1 508 357. The patent in suit concerns a honeycomb filter and ceramic filter assembly.

II. The opposition division found that none of the requests forming the basis of the impugned decision complied with the requirement of sufficiency of disclosure.

III. The proprietor of the patent (appellant) filed an appeal against the opposition division's decision. It submitted the following document:

D22: Analysis report of Quantachrome Corporation

IV. In their reply to the statement of grounds of appeal, opponent 1 (respondent 1) and opponent 2 (respondent 2) requested that the appeal be dismissed.

V. Respondent 1 withdrew its opposition by its letter dated 13 March 2012.

VI. In a communication dated 16 October 2014, the board conveyed its preliminary opinion to the parties.

VII. Respondent 2 informed the board by its letter dated 28 August 2014 that it would not attend the oral proceedings to which the parties had been summoned.

VIII. The appellant made further submissions by its letter dated 19 December 2014, submitting the following documents and English translations thereof:

A1: Hidehiko Tanaka: "New Approach to Sintering and Grain Growth Theories", Materia Japan, No. 8, 2009, pages 404 to 411

A2: S. Munemiyja and Y. Inomata: SiC Ceramics, 1st Edition, published by Uchida Rokakuho Publication Co., Ltd. 1988, pages 163 to 164

A3: Specification data sheet of super high purity silicon carbide

A4: S. Munemiya and Y. Inomata: SiC Ceramics, 1st Edition, published by Uchida Rokakuho Publication Co., Ltd. 1988, page 155

A5: Specification datasheet of C-1000F

It also filed a new main request and auxiliary requests 1 and 2.

IX. Claim 1 of the main request and of the auxiliary requests reads as follows (amendments with respect to claim 1 of the main request being underlined or struck through):

Main request

"1. An exhaust gas purifying apparatus (1) including a honeycomb filter assembly (521) arranged in a casing located in an exhaust gas passage of an internal combustion engine (2), said honeycomb filter assembly (521) being made of a plurality of filters that are formed from a sintered porous ceramic body and adhered to one another by a ceramic seal layer (522), characterized in that:

the plurality of filters has an average pore

diameter of 5 to 15 µm, an average porosity of 30 to 50% and 20% or more through pores, wherein said ceramic body is a sintered porous silicon carbide and said honeycomb filter assembly has a total volume 1/2 to 1.5 times the total displacement of the internal combustion engine, wherein

the filter is formed from a sintered porous silicon carbide body, and the impurities included therein is 5wt% or less and wherein the impurities include Al, Fe, O and free C."

Auxiliary request 1

"1. An exhaust gas purifying apparatus (1) including a honeycomb filter assembly (521) arranged in a casing located in an exhaust gas passage of an internal combustion engine (2), said honeycomb filter assembly (521) being made of a plurality of filters that are formed from a sintered porous ceramic body and adhered to one another by a ceramic seal layer (522), characterized in that:

the plurality of filters has an average pore diameter of 8 to 12 µm, an average porosity of 35 to 49% and 20-50% through pores, wherein said ceramic body is a sintered porous silicon carbide and said honeycomb filter assembly has a total volume 1/2 to 1.5 times the total displacement of the internal combustion engine, wherein

the filter is formed from a sintered porous silicon carbide body, and the impurities included therein is 5wt% or less and wherein the impurities include Al, Fe, O and free C."

Auxiliary request 2

"1. An exhaust gas purifying apparatus (1) including a

honeycomb filter assembly (521) arranged in a casing located in an exhaust gas passage of an internal combustion engine (2), said honeycomb filter assembly (521) being made of a plurality of filters that are formed from a sintered porous ceramic body and adhered to one another by a ceramic seal layer (522), characterized in that:

the plurality of filters has an average pore diameter of 8 to 12 µm, an average porosity of 35 to 49% and 20-50% through pores, wherein said ceramic body is a sintered porous silicon carbide and said honeycomb filter assembly has a total volume 1/2 to 1.5 times the total displacement of the internal combustion engine~~, wherein~~

~~the filter is formed from a sintered porous silicon carbide body, and the impurities included therein is 5wt% or less and wherein the impurities include Al, Fe, O and free C~~."

X. The relevant arguments of the appellant may be summarised as follows:

There was no passage in the description of the patent in suit that would correspond to the reference "below" in paragraph [0105] of the patent specification. Nevertheless, the through-pore fraction could be adjusted by controlling the impurities of the filter. In particular, blind pores were rarely formed if impurities such as B, Fe or free C were absent from the filter material. This was known in the art as evidenced by A1, A2 and A4. In the patent, the through-pore fraction was adjusted by adjusting the mixing ratio between the SiC raw materials used, which were available on the market. A3 showed an SiC material available on the market having an impurity content of below 2.2 ppm. Using such a material would lead to a

filter having substantially no closed pores and no blind pores, whereas the SiC material C-1000F of A5 had impurity levels of below 3.5%, leading to a small amount of closed pores. The reason therefor was that impurities promoted sintering, leading to an increase in closed pores, whereas in the absence of impurities grain growth was promoted, leading to an increase in through pores and a decrease in blind and closed pores. Apart from using a starting material comprising a certain amount of impurities, claim 1 also covered the addition of impurities up to a level of 5 wt.%. Therefore, filters having a low through-pore fraction could also be obtained.

XI. The relevant arguments of respondent 1 (submitted before it withdrew its opposition) may be summarised as follows:

There was no teaching in the patent in suit as to how to obtain a through-pore fraction over essentially the whole scope claimed. The patent only indicated that the mixture ratio, the sintering temperature and the sintering time were adjusted to obtain the various parameters, including the through-pore fraction. The skilled person, therefore, was at a loss as to how to adjust the through-pore fraction throughout the range claimed.

XII. Respondent 2 did not file any arguments.

XIII. The appellant requested that the decision under appeal be set aside and that the European patent be maintained in amended form on the basis of the claims of the main request or alternatively on the basis of the claims of one of auxiliary requests 1 and 2, all filed by its letter dated 19 December 2014.

Respondent 2 requested that the appeal be dismissed.

Reasons for the Decision

1. Admission of the main request, auxiliary requests 1 and 2 and documents A1 to A5

1.1 The main request and auxiliary requests 1 and 2 as well as documents A1 to A5 and their English translations were filed on 19 December 2014, i.e. after the oral proceedings had been arranged. Hence, it was at the discretion of the board to admit them into the proceedings (Article 13(1),(3) EPC).

1.2 The main request and auxiliary requests 1 and 2 were filed in reaction to the preliminary opinion conveyed in the communication from the board expressing its concerns with regard to sufficiency of disclosure relative to the feature "through-pore fraction". Likewise, documents A1 to A5 and their English translations were filed in order to overcome the board's concerns.

1.3 For the above reasons and because the amendments to the appellant's case did not raise issues which the board or respondent 2 could not reasonably have expected to deal with without adjournment of the oral proceedings, the board exercised its discretionary power under Article 13(1),(3) RPBA and admitted the requests and the documents into the proceedings.

2. Sufficiency of disclosure - all requests

2.1 Statutory law and jurisprudence of the boards of appeal

2.1.1 A European patent must disclose the invention in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art (Articles 83 and 100(b) EPC).

2.1.2 According to the established jurisprudence of the boards of appeal, the requirement of sufficiency of disclosure is met only if the invention as defined in the independent claim can be performed by the person skilled in the art within the whole area claimed without the burden of an undue amount of experimentation, taking into consideration common general knowledge and the whole information content of the patent in suit (see also T 435/91, OJ 1995, 188, Reasons 2.2.1, third paragraph; T 409/91, OJ 1994, 653, Reasons 2, first paragraph, penultimate sentence).

2.1.3 The requirement of sufficiency of disclosure is not met in particular if the patent lacks guidance and this lack of guidance cannot be overcome drawing on common general knowledge (cf. also T 575/05, Reasons 1, fourth and fifth paragraphs; T 817/11, Reasons 2.3 to 2.6).

2.2 The present case

2.2.1 Lack of guidance and drawing on common general knowledge as a remedy

At issue are
(1) the through-pore fraction,
(2) adjustment of the through-pore fraction by means of the amount of impurities,

(3) adjustment of the amount of impurities by means of the mixture ratio of SiC powders,
(4) common general knowledge,
(4.1) evidence, and
(4.2) evaluation of the evidence.

2.2.2 (1) The through-pore fraction

According to respondent 1, the patent contained a lack of guidance since the skilled person was at a loss as to how to adjust the through-pore fraction over the whole range claimed.

2.2.3 (2) Adjustment of the through-pore fraction by means of the amount of impurities

According to the appellant, the through-pore fraction was adjusted by controlling the amount of impurities present in the porous filter.

(a) The board observes that the term "impurities" is indeed mentioned in the patent in suit in paragraph [0100] and in claims 6 and 7 as granted. These passages of the patent in suit relate to a preferred maximum amount of impurities present. The patent in suit, however, does not mention that the through-pore fraction is controlled by the amount of impurities present in the porous filter. This is conceded by the appellant.

(b) The only information in the patent in suit concerning the adjustment of the through-pore fraction is contained in paragraph [0105], where it is stated that "[t]he mixture ratio, sintering temperature, sintering time, etc. were changed as described below (sic) to adjust the pore diameter, porosity, and the

through pore existence rate relative to the pores" (emphasis added by the board). As conceded by the appellant at the oral proceedings before the board, there is no passage in the patent that would correspond to the reference "below" in the above passage of paragraph [0105].

2.2.4 (3) Adjustment of the amount of impurities by means of the mixture ratio of SiC powders

According to the appellant, the amount of impurities present in the porous filter was adjusted in the examples of the patent in suit by adjusting the mixture ratio of SiC powder having a relatively high amount of impurities and of SiC powder having a relatively low amount of impurities.

Although the term "mixture ratio" is mentioned in paragraph [0105], there is no information in the patent in suit that would have led the skilled person to the conclusion that changing the mixture ratio would lead to a different impurities level, leading to a different through-pore fraction.

2.2.5 Conclusion

The board thus concludes that the patent lacks guidance with respect to the through-pore fraction, since from the patent specification alone there is no information available that would allow the skilled person to adjust the through-pore fraction over the whole scope claimed, i.e. 20% and more (main request) or 20 to 50% (auxiliary requests 1 and 2). In particular, from the patent specification alone it is not apparent at all that the through-pore fraction is to be adjusted by adjusting the level of impurities contained in the

sintered honeycomb filter.

2.2.6 (4) Common general knowledge

The question that arises is whether the skilled person could have overcome this lack of guidance by drawing on common general knowledge.

(4.1) Evidence

To support its view that the lack of guidance could be overcome by drawing on the common general knowledge of the skilled person, the appellant filed documents A1 to A5. It also filed document D22.

(a) A1 is from the year 2009, i.e. about 10 years after the priority date. Moreover, common general knowledge is represented by basic handbooks and textbooks on the subject in question; it does not normally include scientific articles (see also T 1641/11, Reasons 3.6, third paragraph). As can be seen from its translation, A1 is a paper published in a scientific journal (cf. "New (sic) Approach to sintering and grain growth theory") and, thus, cannot be considered a basic handbook or textbook. For these reasons, A1 cannot serve to show what was common general knowledge at the priority or filing date of the patent in suit.

(b) A2 is from 1988 and is a basic handbook (cf. "Basic/Application/Product") and, thus, can serve to show what was common general knowledge at the priority or filing date of the patent in suit. The board notes that A2 neither explicitly nor implicitly mentions the term "through pores", let alone the term "through-pore fraction" or an equivalent expression. Furthermore, A2 does not teach to use "impurities" in general for

adjusting the properties of the sintered SiC product. Rather, A2 teaches that in the absence of an addition of an "additive" such as boron (B) or carbon (C) grain growth takes place, which in turn inhibits densification.

(c) A4 appears to be an excerpt from the same textbook as A2. A4 teaches that specific compounds including B and C are needed in order to effectively sinter SiC. A4 neither implicitly nor explicitly refers to the through-pore fraction. Moreover, as with A2, A4 does not refer to the use of "impurities" in general, but to specific compounds to be used as additives in the sintering of SiC.

(d) A3 and A5 were provided by the appellant to support its submission that by adjusting the mixing ratio between two SiC powders having different impurity levels, the impurity level of the resulting mixture could be adjusted and, thus, the through-pore fraction could be adjusted. According to the appellant, the through-pore fraction was adjusted in the examples of the patent in suit by using this approach.

(e) D22 was submitted by the appellant to support its contention that a well-known measuring method allowed the through-pore fraction to be determined.

(4.2) Evaluation of the evidence

(a) The board concludes from the evidence submitted in order to prove common general knowledge, i.e. in particular documents A2 and A4, that it was common at the priority date of the patent in suit to use specific sintering additives in order to control the density of the sintered product. In other words, it was common to

use sintering additives in order to control the porosity of the sintered article. A2 and A4 fail, however, to establish that it was common general knowledge to use those additives, let alone impurities in general, to control the through-pore fraction of the sintered article.

(b) According to the appellant, on the one hand, in the presence of impurities, the sintering mechanism was enhanced, leading to a decrease in porosity and an increase in the formation of closed pores and, thus, leading to a decrease in the through-pore fraction. On the other hand, in the absence of impurities the grain growth mechanism was enhanced, leading to a decrease in the formation of closed pores and blind pores and, thus, leading to an increase in the through-pore fraction.

(c) The board acknowledges that it was common general knowledge to adjust the density, and thus the porosity, of the sintered SiC article by adjusting the amounts of sintering additives such as boron (B) or carbon (C). This is clearly evidenced by A2 and A4. Nevertheless, the board is not convinced that an increase in porosity necessarily leads to an increase in the through-pore fraction, i.e. the volume of through pores divided by the sum of the volumes of the blind, closed and through pores.

(d) The board of course accepts that an increase in porosity necessarily leads to an increase in the total pore volume, i.e. the sum of the volume of the blind pores, the closed pores and the through pores. But this does not mean that only the through-pore volume is increased. Rather, an increase in porosity by using less sintering additive very likely also leads to an

increase in the volume of the blind pores for the same reasons as for the increased through-pore volume, i.e. because of enhanced grain growth and less sintering.

(d) Thus, it cannot be concluded that an increase in porosity necessarily leads to an increase in the through-pore fraction.

For the same reasons, the board also does not find it convincing that, as submitted by the appellant, the through-pore fraction was adjusted in the patent in suit by adjusting the mixing ratio between two SiC powders having different levels of impurities.

(e) Finally, D22 is of no help in this context. D22 was submitted with the statement of the grounds of appeal in order to establish that it was possible to determine the through-pore fraction. No information is derivable from D22 that would enable the skilled person to adjust the through-pore fraction.

2.3 Final conclusion

It follows that the lack of guidance on how to adjust the through-pore fraction over the whole scope claimed, i.e. at least in a range from 20 to 50%, cannot be overcome by drawing on the common general knowledge of the skilled person. As the range of 20 to 50% is covered by claim 1 of each of the main and the two auxiliary requests, this reasoning applies to all of these requests.

Thus, the requirement of Article 83 EPC is not met for any of the main request or auxiliary requests 1 and 2.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

C. Vodz G. Raths

Decision electronically authenticated