Datasheet for the decision of 14 June 2012

Case Number: T 1920/09 - 3.3.07
Application Number: 06001438.8
Publication Number: 1685899

Language of the proceedings: EN

Title of invention: Honeycomb structure body

Applicants: IBIDEN CO., LTD.

Headword:
-

Relevant legal provisions: EPC Art. 54(3)

Keyword: "Novelty (no) - unusual parameter feature representing the only difference from the prior art - Presumption of lack of novelty not displaced by evidence (Main and First to 14th Auxiliary Requests)"

Decisions cited: T 1764/06

Catchword: -
Case Number: T 1920/09 - 3.3.07

DECISION
of the Technical Board of Appeal 3.3.07
of 14 June 2012

Appellants: IBIDEN CO., LTD.
(Applicants)
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Decision under appeal: Decision of the Examining Division of the European Patent Office posted 6 March 2009 refusing European patent application No. 06001438.8 pursuant to Article 97(2) EPC.

Composition of the Board:

Chairman: J. Riolo
Members: G. Santavicca
M-B. Tardo-Dino
Summary of Facts and Submissions

I. The appeal lies from a decision of the Examining Division, posted on 6 March 2009, refusing European patent application 06 001 438.8 filed on 24 January 2006 and claiming priority from Japanese application 2005-025406 of 1 February 2005 as well as from international application PCT/JP2005/022589 of 8 December 2005.

II. The decision under appeal was based on amended Claims 1 to 7 (Main Request) submitted during the oral proceedings held on 11 February 2009 as well as on amended Claims 1-7 (First Auxiliary Request), 1-5 (Second Auxiliary Request) and 1-7 (Third Auxiliary Request), all submitted with letter of 12 January 2009. Claim 1 of each of those requests read as follows (Compared to Claim 1 as filed, the amendments to Claim 1 of the Main Request are in bold (addition) or in strike-through (deletion)):

Main Request

"1. A honeycomb structure in which plural honeycomb units are adhered through the intermediary of an adhesive layer and in the honeycomb unit plural cells are juxtaposed to each other in the longitudinal direction thereof through the intermediary of a cell wall, said honeycomb structure including a catalyst for reaction of converting gas, characterized in that each of the plural cells of the honeycomb unit has unsealed openings at both ends thereof in the longitudinal direction and the ratio of the specific surface area of the honeycomb unit to that of the adhesive layer is 1.0
or greater from 1.1 to 10 in the finally completed honeycomb structure, wherein the specific surface area is measured by a single point method in accordance with JIS-R-1626."

First Auxiliary request

"1. A honeycomb structure in which plural honeycomb units are adhered through the intermediary of an adhesive layer and in the honeycomb unit plural cells are juxtaposed to each other in the longitudinal direction thereof through the intermediary of a cell wall, characterized in that each of the plural cells of the honeycomb unit has unsealed openings at both ends thereof in the longitudinal direction and the ratio of the specific surface area of the honeycomb unit to that of the adhesive layer is 1.0 or greater, wherein the specific surface area is measured by a single point method in accordance with JIS-R-1626, and the specific surface area of the adhesive layer is from 10 m²/g to 100 m²/g."

Second Auxiliary request

"1. A honeycomb structure in which plural honeycomb units are adhered through the intermediary of an adhesive layer and in the honeycomb unit plural cells are juxtaposed to each other in the longitudinal direction thereof through the intermediary of a cell wall, characterized in that each of the plural cells of the honeycomb unit has unsealed openings at both ends thereof in the longitudinal direction and the ratio of the specific surface area of the honeycomb unit to that of the adhesive layer is 1.0 or greater from 1.1 to 10,
wherein the specific surface area is measured by a single point method in accordance with JIS-R-1626, and the honeycomb unit contains alumina."

**Third Auxiliary request**

"1. A gas converting apparatus comprising a honeycomb structure in which plural honeycomb units are adhered through the intermediary of an adhesive layer and in the honeycomb unit plural cells are juxtaposed to each other in the longitudinal direction thereof through the intermediary of a cell wall, characterized in that each of the plural cells of the honeycomb unit has unsealed openings at both ends thereof in the longitudinal direction, the ratio of the specific surface area of the honeycomb unit to that of the adhesive layer is 1.0 or greater, wherein the specific surface area is measured by a single point method in accordance with JIS-R-1626, and the specific surface area of the adhesive layer is from 10 m²/g to 100 m²/g."

III. In the decision under appeal, it was inter alia held that:

**Main Request**

(a) The requirements of Article 84 EPC were not fulfilled, for the following reasons:

(i) Since the ratio of the specific surface areas of honeycomb unit and adhesive or coating layers defined in Claim 1 was not commonly used in the prior art, not even by the applicants themselves in their own patent applications, no meaningful
comparison with the prior art was possible, which amounted to lack of clarity.

(ii) Also, since the surface area for calculating the ratio was not measured on the assembled honeycomb but on particular sample materials prepared elsewhere (i.e. assembled ex-situ), the claimed ratio was not representative of the real ratio in the unit of the final honeycomb, so Claim 1 was also not concise.

(iii) Finally, the meaning of the term "honeycomb unit" in Claim 1 was not clear. In particular, it was not clear what unit was meant thereby, e.g. the one after extrusion, or calcining, or washcoating, or the one after catalyst impregnation. So the specific surface area of the honeycomb unit as well as the ratio calculated therefrom could not be clearly and reliably determined.

(b) As to novelty, two earlier applications of the applicants were considered, which were state of the art under Article 54(3) EPC, namely:

D8: EP-A-1 674 147 (filed on 26 December 2005 and claiming priority from Japanese application 2004-375816 of 27 December 2004 as well as from international application PCT/JP2005/021188 of 14 November 2005); and,


D8 and D9 did not mention the specific surface of the honeycomb units. They nevertheless disclosed the same process of manufacture and thus inevitably also disclosed the subject-matter of
Claim 1, which could not be novel (Article 54(3) EPC).

**Auxiliary Requests**

(c) Despite the further limitations introduced in Claim 1 of each respective auxiliary request, the objections under Article 84 EPC (lack of clarity and conciseness) and Article 54(1)(3) EPC (lack of novelty over D8 and D9) applied *mutatis mutandis*. So none of the auxiliary requests were allowable.

IV. In their statement setting out the grounds of appeal, the appellants *inter alia* enclosed 4 sets of amended claims as Main and First to Fourth Auxiliary Requests. Claim 1 of each of those requests read as follows:

**Main Request**

Compared to Claim 1 of the Main Request underlying the decision under appeal, Claim 1 no longer contains the features: "said honeycomb structure including a catalyst for reaction of converting gas" and "in the finally completed honeycomb structure".

**First Auxiliary Request**

This request is identical to the First Auxiliary Request underlying the decision under appeal.

**Second Auxiliary Request**
Compared to Claim 1 of the Second Auxiliary Request underlying the decision under appeal, the term "alumina" has been restricted to "γ-alumina"

Third Auxiliary Request

This request is identical to the Third Auxiliary Request underlying the decision under appeal.

Fourth Auxiliary Request

This request is identical to the Main Request submitted with letter of 12 January 2009, i.e. the Main Request before the modifications carried out during the oral proceedings before the Opposition Division, hence not dealt with in the decision under appeal.

V. In a communication by the Board in preparation for oral proceedings the points that needed to be debated and decided were indicated, inter alia the compliance of the amendments to the claims of all the requests with Article 123(2) EPC, as well as a number of issues under Article 83 and 84 EPC, and novelty over D8 and D9. Also, the Board requested a copy of the Japanese Industrial Standard JIS-R-1626 as mentioned in the application.

VI. In their letter of 14 May 2012, the appellants maintained the claims requests previously filed and enclosed further sets of amended claims as 5th to 14th Auxiliary Requests as well as a copy of the Japanese Industrial Standard JIS-R-1626 (1996). Claim 1 of each of 5th to 14th Auxiliary Requests read as follows:
5th Auxiliary Request

"1. A honeycomb structure in which plural honeycomb units are adhered through the intermediary of an adhesive layer and in the honeycomb unit plural cells are juxta posed to each other in the longitudinal direction thereof through the intermediary of a cell wall, wherein a cell is a region separated by a cell wall of the honeycomb unit, characterized in that each of the plural cells of the honeycomb unit has unsealed openings at both ends thereof in the longitudinal direction and the ratio of the specific surface area of the honeycomb unit to that of the adhesive layer is 1.0 or greater from 1.1 to 10, wherein the specific surface area of the honeycomb unit is the total of surface area(s) of the honeycomb unit(s) per unit mass or a unit weight of the honeycomb unit(s), wherein the specific surface area is measured by a single point method in accordance with JISR-1 626 (1996) using a BET measuring apparatus."

6th Auxiliary Request

Compared to Claim 1 of the 5th Auxiliary Request, Claim 1 of the 6th Auxiliary Request further comprises the features "wherein the specific surface area of the honeycomb units is determined from samples by cutting the honeycomb units into cylinder-shaped pieces with a diameter of 15 mm and a length of 15 mm, and wherein the specific surface area of the adhesive layer is determined from pastes for the adhesive layers which are dried at 150°C for two hours and subsequently heat treated at 500°C for solidification, followed by cutting into cubes with a side length of 15 mm".
7th Auxiliary Request

Compared to Claim 1 of the 5th Auxiliary Request, Claim 1 of the 7th Auxiliary Request further comprises the feature "and the specific surface area of the adhesive layer is from 10 m²/g to 100 m²/g".

8th Auxiliary Request

Compared to Claim 1 of the 6th Auxiliary Request, Claim 1 of the 8th Auxiliary Request further comprises the feature "and the specific surface area of the adhesive layer is from 10 m²/g to 100 m²/g".

9th Auxiliary Request

Compared to Claim 1 of the 5th Auxiliary Request, Claim 1 of the 9th Auxiliary Request further comprises the feature "and the honeycomb unit contains γ-alumina".

10th Auxiliary Request

Compared to Claim 1 of the 6th Auxiliary Request, Claim 1 of the 10th Auxiliary Request further comprises the feature "and the honeycomb unit contains γ-alumina".

11th Auxiliary Request

"1. A gas converting apparatus comprising a honeycomb structure in which plural honeycomb units are adhered through the intermediary of an adhesive layer and in the honeycomb unit plural cells are juxtaposed to each other in the longitudinal direction thereof through the
intermediary of a cell wall, wherein a cell is a region separated by a cell wall of the honeycomb unit, characterized in that each of the plural cells of the honeycomb unit has unsealed openings at both ends thereof in the longitudinal direction, the ratio of the specific surface area of the honeycomb unit to that of the adhesive layer is 1.0 or greater, wherein the specific surface area of the honeycomb is the total of surface area(s) of the honeycomb unit(s) per unit mass or a unit weight of the honeycomb unit(s), wherein the specific surface area is measured by a single point method in accordance with JISR-1 626 (1996) using a BET measuring apparatus, and the specific surface area of the adhesive layer is from 10 m²/g to 100 m²/g."

12th Auxiliary Request

Compared to Claim 1 of the 11th Auxiliary Request, Claim 1 of the 12th Auxiliary Request further comprises the features "wherein the specific surface area of the honeycomb units is determined from samples by cutting the honeycomb units into cylinder-shaped pieces with a diameter of 15 mm and a length of 15 mm, and wherein the specific surface area of the adhesive layer is determined from pastes for the adhesive layers which are dried at 150°C for two hours and subsequently heat treated at 500°C for solidification, followed by cutting into cubes with a side length of 15 mm."

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13th Auxiliary Request

"1. A honeycomb structure in which plural honeycomb units are adhered through the intermediary of an adhesive layer and in the honeycomb unit plural cells are juxtaposed to each other in the longitudinal direction thereof through the intermediary of a cell wall, wherein a cell is a region separated by a cell wall of the honeycomb unit, said honeycomb structure including a catalyst for converting exhaust gas, characterized in that each of the plural cells of the honeycomb unit has unsealed openings at both ends thereof in the longitudinal direction and the ratio of the specific surface area of the honeycomb unit to that of the adhesive layer is 1.0 or greater from 1.1 to 10 in the finally completed honeycomb structure, wherein the specific surface area is measured by a single point method in accordance with JISR-1 626 (1996) using a BET measuring apparatus.".

14th Auxiliary Request

Compared to Claim 1 of the 13th Auxiliary Request, Claim 1 of the 14th Auxiliary Request further comprises the features "wherein the specific surface area of the honeycomb units is determined from samples by cutting the honeycomb units into cylinder-shaped pieces with a diameter of 15 mm and a length of 15 mm, and wherein the specific surface area of the adhesive layer is determined from pastes for the adhesive layers which are dried at 150°C for two hours and subsequently heat treated at 500°C for solidification, followed by cutting into cubes with a side length of 15 mm".
VII. Oral proceedings took place on 14 June 2012. After the closure of the debate and the deliberation by the Board the decision was announced orally.

VIII. The appellants have essentially argued as follows:

(a) As regards clarity, in particular the objections that the specific surface area was an unusual parameter and that the surface area was measured ex situ in the working examples:

(i) the determination of the specific surface area of any given compound or composition was well within the normal skills of the person skilled in the art, and could be carried out by standard methods such as the one referred to in Claim 1. Deriving from the fact that no prior art document referred to the ratio of specific surface areas the automatic conclusion that the claim was not clear, was not in line with the practice of examining clarity.

(ii) It was clear to the skilled person what had to be applied to attain a ratio as specified in Claim 1, even if the evaluation were carried out ex situ. No evidence had been provided that substantiated the doubts of the Examining Division that drastically different values for the specific surface area would be obtained if the specific surface area were determined on the assembly. Nor were these doubts derivable from the prior art. As regards the objection that it was not clear from Claim 1 which honeycomb
unit was meant (i.e. after extrusion, calcination, washcoating or impregnation), it was readily apparent from the description that the claimed honeycomb structure related to the structure after assembly, thus after all steps required to assemble the honeycomb.

(iii) Thus, the claimed subject-matter was clear.

(b) As to novelty, D8 did not disclose any values for the specific surface area of the honeycomb unit. Its Paste 7, if it corresponded to Paste 1 of the present application as alleged by the Examining Division, would have had a surface area of only 5 m²/g, which was too low a value for fulfilling the claimed range. Finally, the decision on D8 was based on a "reasonable expectation", which was not the standard for assessing novelty in compliance with the established case law. So the claimed subject-matter was also novel over D8. As regards D9, the argument that an adhesive paste having the composition of Paste 5 of the present application was used, on the assumption that the surface area was measured in accordance with D8, was a speculation that could not deprive Claim 1 of novelty. So, the claimed subject-matter was novel.

Auxiliary Requests

(c) The claims of the auxiliary requests were based on the application as filed (Article 123(2) EPC).

(d) As to clarity and novelty, basically the same arguments offered for the Main Request applied to the claims of the auxiliary requests. In particular,
the claims of a patent application were always interpreted in the light of description and figures.

(e) Also, Claim 1 of each of the auxiliary requests contained further limitations such as the specific surface area of the adhesive layer and the presence of gamma alumina, or was directed to an apparatus for gas conversion or contained a catalyst for converting exhaust gas. Some of the latest requests contained a definition of the cell and/or how the specific surface areas were measured.

IX. The appellants (applicants) requested that the decision under appeal be set aside and that a patent be granted on the claims of the Main Request, submitted with the statement setting out the grounds of appeal, or on the claims of any of 1st to 4th Auxiliary Requests, also submitted with the statement setting out the grounds of appeal. Alternatively, that a patent be granted on the basis of any of 5th to 14th Auxiliary Requests, submitted with letter of 14 May 2012. Finally, that adaptation of the description be deferred until the final wording of the claims has been agreed upon or to remit the case to the first instance for further prosecution.

Reasons for the Decision

1. The appeal is admissible.

Admissibility of 5th to 14th Auxiliary Requests
2. The claims of 5th to 14th Auxiliary Requests were submitted on 14 May 2012, i.e. one month before the oral proceedings. Hence, the admissibility of these requests is at the discretion of the Board, as set out in Article 13 of the Rules of Procedure of the Boards of Appeal of the EPO (RPBA).

2.1 The submission was in response to the communication by the Board dated 16 April 2012, in which the claims of the previous requests had been objected to as inter alia lacking basis (Article 123(2) EPC) and clarity (Article 84 EPC).

2.2 These claims requests did not raise issues which the Board could not reasonably be expected to deal with during the oral proceedings.

2.3 Therefore, the claims requests have been admitted.

Main Request

Novelty

3. According to the decision under appeal, the process of Claim 1 of the Main Request is not novel over either of D8 and D9. D8 is a European patent application pursuant to Article 54(3) EPC, as it was published on 28 June 2006, i.e. after the filing date of the present application (24 January 2006). The same goes for D9, an international application published on 18 August 2005, i.e. after the priority date of the present application, i.e. 1 February 2005. The Board has no reason to deviate from the decision under appeal on this issue, for the following reasons:
The disclosure of D8

3.1 D8 (Claim 1) discloses a honeycomb structural body comprising having [sic] pillar-shaped honeycomb structural porous ceramic members formed by arranging a plurality of cells side by side through cell walls and a sealing material layer interposed between the mutual ceramic members for bonding a plurality of the porous ceramic members in the presence of the sealing material layer, characterized in that the sealing material layer has a specific surface area of 10 to 100 m²/g.

In D8 (paragraph [0022]), the specific surface area of the sealing material is represented by BET specific surface area (m²/g) per unit weight of the sealing material and measured by a one-point method according to JIS-R-1626 (1996) prescribed by the Japanese Industrial Standards.

As shown in Figures 1, 2(a) and 2(b) of D8, the honeycomb structure 20 comprises a plurality of honeycomb units 30, adhered through the intermediary of an adhesive layer 23, whereby in the honeycomb units plural cells 32 are juxtaposed to each other in the longitudinal direction thereof through the intermediary of a cell wall 33. Each of the plural cells 32 of the honeycomb unit 30 has unsealed openings at both ends thereof in the longitudinal direction. The specific surface area of the adhesive layer 23 is from 10 to 100 m²/g (paragraph [0012], Claims 1 and 4). That specific surface is measured by a single point method in accordance with JIS-R-1626 (Paragraph [0022]) (see also paragraphs [0088] and [0089]). The honeycomb
structure of D8 uses a material having a high specific surface area for making the cell walls, in order that catalyst components can be widely dispersed and carried on such a cell wall (Paragraph 0031, last sentence). This high specific surface area of the cell walls of the honeycomb unit, is however not quantified in D8, let alone the ratio thereof with the specific surface area of the adhesive layers.

3.2 Thus, the Board agrees with the only argument of the appellants, as summarised in Point VIII.b, supra, that D8 does not mention any ratio of a specific surface area of the honeycomb unit to that of the adhesive layer of 1.0 or greater, nor any ratio of a specific area of the honeycomb unit to that of the coating layer of 1.0 or greater. This fact, which certainly constitutes a difficulty for assessing novelty, is however not decisive, as it merely represents a parametrical definition of a product that could well be defined otherwise, for instance by the process of manufacture from which the parametrically defined product is inevitably obtained.

3.3 A comparison of the present application with the process of D8 shows that:

3.3.1 The aim of the manufacturing process of D8 is to provide honeycomb structures, being excellent in bonding strength and thermal shock resistance, by using sealing material layers having high bonding strength and excellent durability, in order that the honeycomb has high conversion efficiency of the exhaust gas and a high removal efficiency of the particles included in the exhaust gas (Paragraphs [0008] to [0010]). Hence,
D8, as well as the present application (page 3, lines 15-17), address conversion efficiency.

3.3.2 D8 discloses how to control the specific surface area of the adhesive sealing material (paragraph [0023]) and the specific surface area of the honeycomb unit (paragraphs [0040] to [0056]), and also discloses how to generally produce the honeycomb structure (paragraphs [0057 to [0070]).

3.3.3 D8 (paragraphs [0079] to [0087], Table 1) illustrates the production of an alumina honeycomb structure, made up as follows:

(a) A paste for the heat-resistant sealing material having the same starting materials of the paste illustrated in the present application (page 23, lines 8-16) and overlapping compounding ratios (compare Table 1 of D8 with Table 1 of the present application, wherefrom it is apparent that Paste 7 of D8 corresponds to Paste 1 of the present application).

(b) An alumina honeycomb unit prepared from starting materials (paragraph [0083]) identically corresponding to the starting materials used in the present application for producing an alumina honeycomb unit (page 27, lines 4-14), under process conditions (paragraph [0084]) which are identical to those used in the corresponding embodiment of the present application (page 27, lines 15-21).
(c) An adhesive layer provided on the surface of the honeycomb unit, by drying and firing under conditions (paragraph [0086]) which are identical to those used in the corresponding embodiment of the present application (paragraph bridging pages 27 and 28).

(d) A coating layer of the same composition as the sealing layer applied on the outer surface of the honeycomb structure, as in the present application.

3.4 It is apparent from the above that, for the embodiments illustrated in D8, the same starting materials and process conditions have been used as disclosed in the present application. Hence, there is a strong presumption that the corresponding products should be the same.

3.5 Since the applicants decided to formulate the definition of the invention by an unusual parameter, the onus to convincingly establish novelty over the illustrated embodiments of D8 lies on them. The EPO cannot carry out comparative tests to establish whether the embodiments illustrated by D8 fulfil the condition specified in Claim 1 for the specific surface areas of honeycomb units and adhesive materials, i.e. to assess whether the claimed subject-matter is novel.

3.6 Although D8 is an earlier application by the appellants, who thus might well have provided all of the necessary evidence concerning the embodiments of D8, no evidence whatsoever has ever been provided by the appellants in order to discharge their onus of proof. Therefore, the presumption that the claimed honeycomb structure is not
novel having regard to the disclosure of D8 has not been displaced by evidence. No benefit of doubt can be accorded in this respect (e.g. T 1764/06 of 24 June 2010, acknowledged in EPO Board of Appeal Case Law, Special Edition 2 of OJ EPO 2010).

3.7 However, a European patent can only be granted on inventions which inter alia are novel (Article 52(1) EPC).

3.8 Therefore, in the absence of convincing evidence, novelty cannot be acknowledged having regard to D8 (Article 54(3) EPC).

First to 14th Auxiliary Requests

4. D8 also discloses the further features of all the auxiliary requests, as follows:

4.1 The sealing material layer for the honeycomb structural body of D8 can have a specific surface area of 10 to 100 m$^2$/g (Claim 8), and it is usable for bonding pillar-shaped honeycomb structural porous ceramic members formed by arranging a plurality of cells side by side through cell walls with each other (Claim 9).

4.2 The honeycomb structural body according to D8 can have a ceramic member that is mainly composed of alumina (Claim 6). As regards alumina, gamma-alumina is illustrated in the examples of D8 (Paragraph [0080] and Table 1).

4.3 The honeycomb structural body of D8 is for use as an exhaust gas converting apparatus of vehicles (Claim 7).
4.4 As disclosed in Paragraphs [0086] to [0089] of D8, the specific surface area of the adhesive is determined, by using a BET measuring device, from pastes for the adhesive layers which are dried at 150°C for 2 hours and subsequently heat treated at 500°C for solidification, followed by cutting cubes of 15 mm side length.

4.5 The honeycomb structural body of D8 can comprise a sealing material layer, which is provided on an outermost peripheral portion of a honeycomb block formed by bonding a plurality of the ceramic members (claim 2), wherein the sealing material layer has an adhesiveness (claim 4) and can comprise an inorganic binder and inorganic particles and/or inorganic fibres (claim 5).

5. Consequently, the honeycombs known from D8 do prejudice the novelty of the claimed subject-matter of all of the claims requests submitted by the applicants.

Novelty over D9

6. In view of the decision made on D8, the Board need not decide on the novelty over D9.

Conclusion

7. None of the claims requests on file fulfil the requirements of the EPC.
Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

S. Fabiani J. Riolo