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**Datasheet for the decision  
of 9 July 2013**

**Case Number:** T 1516/10 - 3.2.06

**Application Number:** 01976709.4

**Publication Number:** 1329601

**IPC:** F01N3/28, D04H1/42, D04H1/46

**Language of the proceedings:** EN

**Title of invention:**  
HOLDING AND SEALING MATERIAL FOR CATALYTIC CONVERTER AND  
METHOD OF MANUFACTURING THE HOLDING AND SEALING MATERIAL

**Patent Proprietor:**  
IBIDEN CO., LTD.

**Opponent:**  
3M Innovative Properties Company

**Relevant legal provisions:**  
EPC Art. 123(2)  
RPBA Art. 13(1)

**Keyword:**  
Amendments - intermediate generalisation



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Case Number: T 1516/10 - 3.2.06

**D E C I S I O N**  
**of Technical Board of Appeal 3.2.06**  
**of 9 July 2013**

**Appellant:** IBIDEN CO., LTD.  
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**Decision under appeal:** **Decision of the Opposition Division of the  
European Patent Office posted on 11 May 2010  
revoking European patent No. 1329601 pursuant to  
Article 101(3) (b) EPC.**

**Composition of the Board:**

**Chairman:** M. Harrison  
**Members:** G. de Crignis  
K. Garnett

## Summary of Facts and Submissions

- I. European patent No. 1 329 601 was revoked by the opposition division by way of its decision posted on 11 May 2010.
  
- II. The opposition division held that the subject-matter of claim 1 according to the main request (claim 1 as granted) did not meet the requirement of Article 123(2) EPC. The first auxiliary request in its first and second version and the second auxiliary request were not admitted into the proceedings.
  
- III. The appellant filed an appeal against this decision and paid the appeal fee. A statement setting out the grounds of appeal was received at the European Patent Office together with the request to set aside the decision of the opposition division and to maintain the patent as granted (main request), in the alternative to maintain the patent in an amended form according to one of auxiliary requests 1 to 8.
  
- IV. With its communication annexed to a summons to oral proceedings, the Board indicated that in respect of the requirements in Article 123(2) EPC and Article 84 EPC, it had serious doubts concerning whether any of the requests were allowable. As regards the requirement of Article 123(2) EPC and the main request, the Board stated *inter alia* that the claimed thickness range of the holding and sealing material "before being assembled" appeared to be disclosed in a section concerned with part of the assembly process, rather than with the product claimed, such that no disclosure of the combination of the features as defined in claim 1 appeared to be present.

V. With letter of 10 June 2013 the appellant filed amended claims as new first and second auxiliary requests replacing all the previous auxiliary requests.

VI. Oral proceedings were held on 9 July 2013.

The appellant requested that the decision under appeal be set aside and the patent be maintained as granted, alternatively on the basis of the first auxiliary request filed with the letter dated 10 June 2013, alternatively on the basis of the second auxiliary request filed during the oral proceedings (at approximately 14:15 h).

The respondent requested that the appeal be dismissed.

VII. Claim 1 as granted (main request) reads:

"A holding and sealing material (1) disposed between a catalyst carrier (3) and a metal shell (2) covering the catalyst carrier, the holding and sealing material (1) comprising a fiber aggregate mainly comprised of alumina-silica based ceramic fibers having a mullite crystal content of 10 wt% or less, and the fiber aggregate having been subjected to a needle punch treatment, characterized in that the thickness of the holding and sealing material (1) before being assembled is about 1.1 to 4.0 times as large as the size of the gap between the catalyst carrier (3) and the metal shell (2)."

Claim 1 of the first auxiliary request corresponds to claim 7 as granted and reads:

"A method for manufacturing a holding and sealing material (1) for a catalytic converter disposed between

a catalyst carrier (3) and a metal shell (2) covering the catalyst carrier, the method comprises the steps of:

performing fiber spinning using as a raw material an aqueous solution composed of a mixture of an aluminum salt, a silica sol and an organic polymer to prepare alumina-silica based ceramic fibres;

stacking the alumina-silica based ceramic fibers to prepare a fiber aggregate;

subjecting said fiber aggregate to a needle punch treatment; and

baking said fiber aggregate subjected to the needle punch treatment to prepare a holding and sealing material (1) comprising a fiber aggregate having a mullite crystal content of 10 wt% or less, wherein the thickness of the holding and sealing material (1) before being assembled is about 1.1 to 4.0 times as large as the size of the gap between the catalyst carrier (3) and the metal shell (2)."

Claim 1 of the second auxiliary request filed at about 14:15 h (labelled by the appellant as the "New second auxiliary request") corresponds to the above claim and additionally includes the feature:

"winding the holding and sealing material (1) around the outer periphery of the catalyst carrier (3), thereby fixing it, and press-fitting the holding and sealing material (1) wound around the catalyst carrier (3) in the metal shell (2),"

which was inserted into the claim before the final feature concerning the thickness ratio starting with "wherein...".

VIII. The arguments of the appellant were essentially the following:

Claim 1 of the main request complied with Article 123(2) EPC. The feature "holding and sealing material (1) disposed between a catalyst carrier and a metal shell (2)" could be read only such that the "gap" was filled by the holding and sealing material. Such interpretation was the only meaningful interpretation since claim 1 also included the feature setting out the thickness of the holding and sealing material before being assembled in relation to the size of the gap. The fact that it was defined as a "holding material" between the carrier and shell, implied that it had to fulfil the function of "holding" between these two parts, which excluded the presence of a further mat.

There was no link between the method feature concerning the thickness ratio and any other process features. Hence, the thickness ratio feature was of a general nature and thus could be added to the product features in claim 1 as filed without adding any further features. Merely because page 10, lines 20 *et seq* used reference numerals when referring to the sealing material, this did not link that disclosure to any specific embodiment. Since the thickness ratio feature applied generally to the filed application, it also applied to the embodiments concerning the fiber aggregate having a mullite crystal content of 10 wt% or less as a preferred feature - such as set out on page 3, lines 17 to 24, page 4, lines 22 to 24, page 4, line 30 to page 5, line 2, page 5, lines 18 to 25, page 8, lines 5 to 7, claims 1 and 7 - and could thus be combined with the subject-matter of claim 1 as originally filed without the necessity of adding further features of the manufacturing procedure.

The point in time when the thickness of the holding and sealing material "before being assembled" had to be

compared to the size of the gap was the moment just after the needle punch treatment. The presence of an organic binder was only a preferred feature and was not linked to any other preferred feature. Hence, the subject-matter of claim 1 was disclosed in the application as filed.

In the first auxiliary request, the product claims had been deleted. The filing of this request was a direct reaction to the objections submitted in the communication of the Board and this request should be admitted. The subject-matter of claim 1 corresponded to granted claim 7 and thus did not raise new issues. The feature concerning the thickness ratio represented a general process feature which could be added to the manufacturing steps of claim 7 as originally filed. This was the only method claim in the application as filed and so the combination of the added features with the generally defined method of claim 7 as filed should be allowable.

Claim 1 of the second auxiliary request was amended by including the process steps for completing the catalytic converter. The added features were based on the disclosure at page 14, lines 7 to 11 of the application as filed and thus met the requirement of Article 123(2) EPC. Due to these features being added, claim 1 included all the method steps which were relevant for disposing the holding and sealing material between the catalyst carrier and the metal shell. No further steps of the method were required; any other steps described were only preferred aspects. The limitation to the "press-fitting" of the holding and sealing material provided the link to the disclosure on page 10, lines 20 to page 11, line 4, which disclosed the thickness ratio feature. The previous objections

were thus overcome so that the second auxiliary request should be admitted into proceedings.

IX. The arguments of the respondent were essentially the following:

The opposition division correctly decided that the main request violated Article 123(2) EPC as the amendment made during prosecution regarding the thickness of the holding material in relation to the gap size led to the introduction of new subject-matter. There was no disclosure that the term "disposed between" should be understood such that the holding and sealing material would completely fill the gap. Additionally, the thickness feature was defined as applying "before being assembled", which was anyway a method step which did not specify when in time such definition had to apply in relation to the diverse manufacturing steps.

Concerning the method as set forth in claim 1 of auxiliary request 1, no method including such a thickness feature was disclosed in the application as filed. Such feature was disclosed in the application as filed, but only in relation to a method for making the catalytic converter and thus directed to the assembly of the whole system. This assembly included further steps that were not present in claim 1, without any unambiguous basis existing for this omission. For this reason, the requirement of Article 123(2) EPC was not met.

The new second auxiliary request should not be admitted into proceedings. It was filed at a late stage during the oral proceedings, although it could have been filed earlier. Moreover, it did not *prima facie* overcome the objections to the previous requests. Not all



interrelated method steps were included in the claimed method contrary to Article 123(2) EPC. The inserted terms "thereby fixing it" and "press-fitting" raised further clarity issues (Article 84 EPC) in the context of the claim.

## **Reasons for the Decision**

### *1. Main request*

1.1 Claim 1 was amended compared to claim 1 as originally filed during prosecution of the application by the addition of the feature

*"the thickness of the holding and sealing material (1) before being assembled is about 1.1 to 4.0 times as large as the size of the gap between the catalyst carrier (3) and the metal shell (2)".*

1.2 This feature is literally disclosed in the originally filed description on page 10, lines 20 to 22, indicating the claimed ratio as a preferred embodiment of such material.

1.3 The added feature forms part of a manufacturing method. The procedure for manufacturing the holding and sealing material per se is disclosed in the application as filed starting on page 11, line 15. Claim 1 of the application as filed is however directed to the features of a product which has a holding and sealing material disposed between a catalyst carrier and a metal shell covering the catalyst carrier, and not to a method. The process step of selecting the ratio of the thickness of the holding and sealing material to a gap

which presents itself during manufacture is however necessary when completing the manufacture of the catalytic converter, since this includes the step of disposing the mat material between the carrier and the shell. Such method steps are described on page 14, lines 7 to 11 of the application as filed. The purpose of this ratio selection is given on page 10, lines 20 to page 11, line 4 and is thus clearly related to a step in production before assembly, not least due to the words "before being assembled". Nowhere can a disclosure be found which combines the method step of selecting a thickness ratio of the holding and sealing material (as defined in granted claim 1) with the structural features of the final product as defined in claim 1 of the application as filed. Whilst one (i.e. the series of method steps used) will have an effect on the other (i.e. the product), the resulting structural features in the final product are not disclosed in the application as filed. The combination of part of a method step into claim 1, i.e. to a product as in claim 1 as filed, thus lacks any basis in the application as filed.

- 1.4 In so far as any basis might exist for introduction of such a method step at all (and putting aside any problems of lack of clarity that might result therefrom), the method step as introduced does not stand in isolation but is disclosed in the application as filed as a part - even if it is stated that the exact thickness of between about 1.1 to 4.0 times itself is preferable - of a method of assembly which itself has many further steps such as for example baking of the needle-punched aggregate and defined contents of organic binder in the mat material. There is no unambiguous disclosure that this single method step, even if some aspect of that particular method

step might be preferred, is to be extracted in isolation (from the description) and added to other product features (i.e. those in claim 1 as filed).

- 1.5 Accordingly, there is no clear and unambiguous disclosure in the application as filed for the feature "the thickness of the holding and sealing material (1) before being assembled is about 1.1 to 4.0 times as large as the size of the gap between the catalyst carrier (3) and the metal shell (2)" in combination with the further features in claim 1.
- 1.6 Concerning the appellant's view that the only meaningful interpretation of such feature could be that the "gap" was filled by such mat material, because it had the function to hold and seal, the Board does not disagree as such. However, the extent to which the claimed material might perform a holding and sealing function within a catalytic converter does not relate to the issue of the disclosure in any particular embodiment nor to the disclosure of the claimed product as in present claim 1.
- 1.7 Moreover, although the appellant argued that the thickness ratio feature was of a general nature and was understood to be applicable to all embodiments this does not correspond to the disclosure in the application. To the contrary, such feature is linked to an (admittedly undefined) point in time after the needle punch treatment (in view of the feature relating to the chronological order, namely "before being assembled"). However, in view of further method steps following the needle punching step such as baking (under specific temperature and time conditions), impregnating (with an organic binder) and compressing the mat, it would be necessary to know when to

determine such ratio in order to verify and determine it as a product feature. Therefore, such determination would need to be linked to and established at a defined time in a process sequence in relation with the further process features. Also for this reason, the thickness ratio feature is not disclosed unambiguously as being of a general nature applicable to all embodiments.

1.8 Moreover, the appellant considered the presence of an organic binder - and therefore also a related application step - as being merely a preferred and thus optional feature even though such addition would influence the thickness of the mat further. Accordingly, although it is evident that the addition of an organic binder certainly would be done before assembling the device, the skilled person does not receive any information as to whether the claimed thickness "before being assembled" applies in such a case before or after the addition of an organic binder. Thus, in terms of a product claim (such as claim 1), there is no unambiguous disclosure as to when exactly to determine the claimed thickness and certainly not that there is a disclosure that this can be chosen as and when required irrespective of the other method steps involved.

1.9 Thus, claim 1 has been amended in a way that it contains subject-matter which extends beyond the content of the application as filed, contrary to the requirement set out in Article 123(2) EPC. Hence, the main request is not allowable.

## 2. *First auxiliary request*

2.1 According to Article 13(1) of the Rules of Procedure of the Boards of Appeal (RPBA), it lies within the

discretion of the Board to admit any amendment to a party's case after it has filed its grounds of appeal or reply.

2.2 This request was filed in reply to the communication of the Board annexed to the summons to oral proceedings. Its claim 1 is identical to claim 7 as granted and concerns the method for manufacturing the holding and sealing material. Such request is a direct response to the Board's comments in the communication sent prior to oral proceedings which set out that the feature objected to under Article 123(2) EPC concerned a manufacturing step and was not unambiguously disclosed in relation to the product as defined in claim 1 of the main request. Hence, the Board exercised its discretion and admitted the new first auxiliary request into the proceedings. No objection was raised by the respondent concerning admittance of this request into proceedings.

2.3 Claim 7 as granted is based on claim 7 as filed, however without the thickness feature before being assembled. As set out for the main request above, the requirement relating to the thickness ratio of the holding and sealing material to the gap is however only disclosed linked to the method of assembling a catalytic converter, which further requires at least that the holding and sealing material be fitted into the gap, such as disclosed on page 14, lines 7 to 11, which states:

*"Then, the holding and sealing material 1 prepared through the above described steps is wound around the outer periphery of the catalyst carrier 3 and thereby fixed, followed by carrying out press fitting, canning or rolling-up to complete the catalytic converter 5."*

- 2.4 However, the claimed method does not include any of the aforementioned manufacturing steps. Hence, there is no clear and unambiguous disclosure in the application as filed for combining the isolated feature "the thickness of the holding and sealing material (1) before being assembled is about 1.1 to 4.0 times as large as the size of the gap between the catalyst carrier (3) and the metal shell (2)" together only with the remaining features of claim 1 (i.e. those taken from claim 7 as filed), but only together with specific methods of assembly which were originally disclosed in combination for manufacturing a holding and sealing material for a catalytic converter disposed between a catalyst carrier and a metal shell covering the catalyst carrier.
- 2.5 Concerning the claimed thickness ratio, its upper limit is related in particular to press-fitting of the mat into the space between a catalyst carrier and a metal shell (page 11, line 3), whereas its lower limit is disclosed as being necessary for sealing performance (page 10, line 28 - 32). Consistently therewith, Example 1 is related specifically to press-fitting of the mat material (page 16, line 7 to 11) and does not disclose a generally applicable manufacturing method.
- 2.6 No indication for the point in time within the manufacturing procedure for determining the thickness is present in the description although the thickness varies in the course of the procedure as for example via the included compression step after the impregnation of the mat material with organic binder (page 13, lines 31 - 33). Therefore also the appellant's view that the point in time for determining the thickness would be after needle punching but before assembling is not precise enough in view of the disclosure. The procedure for manufacturing the product

of Example 1 (page 14, line 13 to page 16, line 11) includes (after needle punching) a baking step and an impregnation with organic binder which is followed by compressing the mat material in its thickness direction (page 16, line 30 - 34) and wherein a resultant bulk density for the mat material of about 0.15 g/cm<sup>3</sup> is disclosed. No thickness of the resultant mat material is indicated, nor are any details disclosed with respect to the gap of the catalytic converter, but only that press fitting has been applied for completing it. The further examples do not add further details but refer to Example 1 for assembling of the catalytic converter (page 16, line 32, page 17, line 9/10).

2.7 Hence, the argument of the appellant that the thickness ratio feature had a general nature and therefore could be linked generally to the claimed method is not supported by any unambiguous disclosure in the application as filed (as also already set out under point 1.6 above). Hence, there is no disclosure that the thickness ratio feature can be combined with the method steps in claim 7 as filed, unless further method steps are included.

2.8 Therefore, claim 1 is not allowable as it contravenes Article 123(2) EPC.

3. *Second auxiliary request*

3.1 As already set out under item 2.1 above, according to Article 13(1) RPBA, it lies within the discretion of the Board to admit any amendment to a party's case after it has filed its grounds of appeal or reply.

3.2 Claim 1 according to the second auxiliary request is based on claim 1 of the first auxiliary request -

concerning the method - and includes additionally the feature

*"winding the holding and sealing material (1) around the outer periphery of the catalyst carrier (3), thereby fixing it, and press-fitting the holding and sealing material (1) wound around the catalyst carrier (3) in the metal shell (2);"*.

3.3 The paragraph on page 14, lines 7 to 11, of the application as filed provides a disclosure of this wording. However, the wording in this paragraph additionally refers to the holding and sealing material 1 as being "prepared through the above described steps" (see point 2.3 above). Hence, this reference clearly identifies the manufacturing steps set out in the previous paragraphs as concerning a specific embodiment wherein a holding and sealing material is disclosed via specifically identified manufacturing steps. However, claim 1 does not specify all these defined manufacturing steps.

3.4 These manufacturing steps include for example that before needle-punching the long fibres which are obtained through the spinning step are chopped into a predetermined length to form relatively short fibres, the chopped fibres being dispersed in water and the obtained dispersion being caused to flow into a molding jig to pressurize and dry the fibre dispersant, thereby obtaining the mat-like material with fibres stacked thereon (page 12, lines 7 to 14). The chopping of the fibres and the use of a molding jig are manufacturing steps which provide definite characteristics to the holding and sealing material. Hence, in omitting these manufacturing steps, the claimed method is an inadmissible intermediate generalisation of the



disclosed method, contrary to the requirement of Article 123(2) EPC.

- 3.5 The appellant argued that the feature of the thickness ratio was, in the description as filed, linked throughout to the manufacturing step of press-fitting. In support of its contention the appellant cited page 11, line 3, page 14, lines 6 to 11, page 16, line 7 to 11 linked to example 1 and page 16, lines 16 to 18 linked to all examples, as well as page 17, lines 9 to 11. However, the crucial issue is that there are further steps - as set out under point 3.4 above - disclosed as being linked to the steps of completing the catalytic converter - irrespective of whether press-fitting is carried out.
- 3.6 The appellant's view that any steps not included were only preferred or not essential when viewed by a skilled person is not supported by any evidence, nor does this correspond to any disclosure in the application as filed. To the contrary, the Board considers, in particular, the chopping of the spun fibres into predetermined lengths and the dispersion of these fibres in water as representing essential and necessary steps which form the particular mat-like material in the molding jig. It is only such a fibre aggregate which is subjected to a needle punch treatment according to the description in the patent in suit. Therefore, there is no disclosure for any other, more general, manufacturing procedure, and thus the skilled person would only conclude that at least these additional process steps were disclosed as functionally integral steps of carrying out the method.
- 3.7 Thus, the objection under Article 123(2) EPC is at least *prima facie* not overcome by the amendments in the

second auxiliary request and for such reason the Board exercised its discretion not to admit the second auxiliary request into the proceedings (Article 13(1) RPBA).

- 3.8 Since the request was not admitted, it is not necessary to consider the further objections of the respondents regarding the alleged lack of clarity of the terminology "press-fitting" and "thereby fixing" in claim 1.

## Order

**For these reasons it is decided that:**

The appeal is dismissed.

The Registrar:

The Chairman:



M. H. A. Patin

M. Harrison

Decision electronically authenticated