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Datasheet for the decision of 21 April 2008

Case Number: T 0991/04 - 3.3.05

Application Number: 01000356.4

Publication Number: 1221338

IPC: B01D 53/94

Language of the proceedings: EN

Title of invention:
Process for preparing a NO_x trap

Applicant:
Ford Global Technologies, Inc.

Opponent:
-

Headword:
Modified platinum NO_x trap

Relevant legal provisions:
EPC Art. 83
EPC R. 139

Relevant legal provisions (EPC 1973):
EPC R. 88

Keyword:
"Sufficiency of disclosure (yes)"
"Correction of error (allowable)"

Decisions cited:
G 0003/89, G 0002/95

Catchword:
-

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Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number: T 0991/04 - 3.3.05

D E C I S I O N
of the Technical Board of Appeal 3.3.05
of 21 April 2008

Appellant: (Applicant)
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Decision under appeal: **Decision of the Examining Division of the European Patent Office posted 18 May 2004 refusing European application No. 01000356.4 pursuant to Article 97(1) EPC.**

Composition of the Board:

Chairman: G. Raths
Members: E. Waeckerlin
S. Hoffmann

Summary of Facts and Submissions

I. The appeal is from the decision of the examining division refusing European patent application No. 01 000 356.4.

II. The independent claims 1 and 2 of the application as filed read as follows:

"1. A method for improving the sulphur tolerance of a nitrogen oxide trap used to treat exhaust gases from an internal combustion engine, said method comprising the steps of:
locating in the exhaust gas passage of the internal combustion engine a nitrogen oxide trap material comprising:
(a) a porous support material comprising mostly ***O****-alumina;*
(b) metals consisting essentially of (1) 0.5 to 5 wt% precious metal selected from the group consisting of platinum, palladium and rhodium, the precious metal being deposited on the support material, (2) 1-20 wt.% NO_x *sorption metal selected from the group consisting of alkali metals, alkaline earth metals and cerium and praesodymium, and (3) 1-20 wt% of a sulphur-suppressing metal selected from the group consisting of caesium, zinc, and a combination of caesium and zinc, the amount of the metals being individually based on the weight of the support material;*
exposing the nitrogen oxide trap to engine exhaust gases having a lean of stoichiometric air/fuel ratio whereby the trap absorbs nitrogen oxides from the exhaust gas; and
purging the absorbed nitrogen oxide from the trap by

subjecting the nitrogen oxide traps to engine exhaust gases whose air/fuel ratio is stoichiometric or rich of stoichiometry."

"2. A method for preparing a nitrogen oxide trap with improved sulphur tolerance for use in treating exhaust gases from an internal combustion engine, the method comprising the steps of:
*(a) preparing a porous support material comprising mostly **O**-alumina;*
(b) impregnating the porous support material with a platinum solution wherein the solution comprises 0.5 to 5 wt% platinum and a solvent;
(c) impregnating the platinum impregnated support material with a solution of barium, wherein the solution comprises 1-20 wt% barium and a solvent; and
(d) impregnating the platinum/barium impregnated porous support material with a solution of a sulphur-suppressing metal selected from the group consisting of caesium, zinc and a combination of caesium and zinc, wherein the solution comprises 1-20 wt% sulphur-suppressing metal and a solvent; and
(e) drying the porous support material to remove the solvent."

III. In the contested decision, the examining division held that the term "**O**-alumina" used in the claims and the description was unknown in the concerned technical field and had no technical meaning in the art. Since "**O**-alumina" did not exist, the application 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 (Article 83 EPC).

The applicant's argumentation according to which "**O**-alumina" was a typographic error and should be read as "γ-alumina" was not convincing. It was commonly known that alumina existed in various crystalline forms, such as α-, β-, γ- and θ-alumina, and that these forms were used as a carrier for catalysts. The application as originally filed did not contain any hint or suggestion that the correct meaning of the term "**O**-alumina" was "γ-alumina". Therefore the typographic error was not a case for correction under Rule 88 EPC.

The examining division did not deny that the term "γ-alumina" was used throughout the priority document. However, referring to the decision of the Enlarged Board of Appeal G 2/95, the examining division considered that it was not possible to substitute "**O**-alumina" by "γ-alumina", because the priority document could not be used for the purpose of correcting errors under Rule 88 EPC.

IV. In the grounds of appeal, the appellant submitted *in essence* the following:

The mistake that occurred in the present application was a translation error which occurred during the electronic processing of the text of the application. The original US application from which priority is claimed was sent as an electronic file to the European representative in order to be revised into a form more suitable for filing in Europe. While the document was being edited, the screen image correctly displayed the term γ-alumina. However, when printed, an incompatibility occurred, resulting in "**O**-alumina" appearing in the printed document. The skilled reader

would immediately have known that this was a mistake, because there is no such material as "**O**-alumina", and because the symbol prefixing the word "alumina" is not the capital letter "O-" but a symbol "**O**-" resembling the letter O but having some other significance, typical of an ASCII conversion error. Therefore the skilled reader would have set about discovering what was the intended meaning.

The first thing to resolve the problem would have been to look at the original, in this case the priority document. In view of the decision G 2/95 it had to be accepted, however, that the priority document could not be used for guidance.

Therefore the skilled reader would have considered the discussion of prior art contained in the description, in the hope of determining which type of alumina is used. He would have had to look no further than the first reference in the description, namely EP-A-0 613 714. This reference tells the reader immediately that the alumina is "γ-alumina" and none other, so the appellant argued.

The appellant concluded that the replacement of the term "**O**-alumina" by "γ-alumina" is clearly within the limits of what a skilled person would derive directly and unambiguously, using common general knowledge and seen objectively and relatively to the date of filing, from the whole of the documents forming the content of the application.

Furthermore, the appellant observed that the person skilled in the art would have recognised that the

alumina, regardless of its type, is acting only as a porous support, and its composition is not at the heart of the invention. There exist numerous patent applications relating to catalytic converters and NO_x traps that make no reference to the type of alumina to use for the porous support, recognising that the person skilled in the art is fully aware of the material of choice. Therefore, if "**O**-alumina" would mean some suitable alumina of unspecified type, then the meaning would not be changed by deleting the prefix.

V. The appellant requested that the application be allowed to proceed while substituting γ-alumina for **O**-alumina, wherever it appears in the specification.

As an auxiliary request the appellant requested that the specification be revised to delete the prefix "**O**-" so as to leave references only to alumina of unspecified type.

Reasons for the Decision

Requests

1. Both the main and the auxiliary request are directed to the correction of the specification by amending the term "**O**-alumina". No explicit request regarding the claims has been made by the appellant. In the board's view the term "specification" has to be construed in the present case as comprising both the description and the claims of the application. Accordingly the requests for amendment made by the appellant apply likewise to the description and the claims.

Main request

Sufficiency of disclosure - Article 83 EPC

2. The board agrees with the findings of the examining division that the term "**O**-alumina" does not belong to the conventional designations of aluminium oxides (alumina), and that the application as filed contains no explanation of the proper meaning of the term. Therefore the question arises whether the application as filed is sufficiently disclosed in accordance with Article 83 EPC. This has to be decided by appraising the disclosure contained in the application as a whole, particularly the examples and other parts of the description, in the light of the skilled person's common general knowledge at the relevant date.

2.1 Claim 1 of the application is directed to a method for treating exhaust gas emissions which comprises locating a specific NO_x trap material in an exhaust gas passage of an internal combustion engine, absorbing nitrogen oxides from the exhaust gas, and purging the absorbed nitrogen oxides. The nitrogen oxide trap material comprises various metals loaded on what is called *"a porous support material comprising mostly **O**-alumina"*. According to the description the expression *"mostly **O**-alumina"* means that the support material comprises more than 50 % by weight, preferably more than 80 %, of *"this alumina"* (see page 5, lines 30-32).

2.2 The method for preparing the nitrogen oxide trap material is set out in Claim 2. The process comprises five steps (a) to (e), respectively, including as step

(a) the preparation of what is called *"a porous support material comprising mostly **θ**-alumina"*.

2.3 How the method can be put into practice is illustrated in some detail by example 1 of the description. As far as the preparation of the porous support material is concerned, it is stated in the example that *"cordierite substrate is washcoated with Al_2O_3 from a water soluble source of Al such as the nitrate salt and deposited to 2.2 g/in^3 (30 - 35 wt%); dried at 80 °C for 6 hr. and heat treated at 600 °C for 6 hr. in air."* (see page 11, lines 21 - 24).

2.4 The board notes that all techniques used according to example 1 for preparing the porous support material, namely washcoating with alumina from an aqueous solution of an aluminium salt, drying at 80 °C and thermal treatment at 600 °C in air, are conventional operations and as such well known to the skilled person. Therefore, the skilled person could have simply applied the procedure disclosed in example 1 in order to produce the required material. In the board's view this would not have constituted an undue burden, nor would it have required an inventive activity on the part of the skilled person.

2.5 In this respect, example 1 is significant, particularly the part relating to the preparation of the porous support material. According to said example the substrate is washcoated with alumina, dried and subsequently heat treated at 600 °C for 6 hours (see page 11, lines 21 - 24). It is well known that controlled heating of hydrated aluminium hydroxides leads to the formation of transition alumina of various

types of alumina. Depending on the conditions of the heat treatment, in particular the temperature of calcination, one or more specific types of alumina are produced, for example α-, γ- or θ-alumina. It is common general knowledge that at 600 °C only two types coexist, namely α- and γ-alumina, whereas all other types require either lower or higher temperatures (see, for example, Kirk-Othmer, Encyclopedia of chemical technology, third edition, vol 2, 1978, page 227, Figure 5). Hence, as a matter of principle, the porous support material obtained in accordance with example 1 comprises α- and γ-alumina. Consequently, since it is stated in the description that the support material may include α-alumina only in *"very small amounts"* (see page 5, line 33 to page 6, line 2), it follows that the only other type of alumina which can be present is the γ-type.

3. Having regard to the requirement of sufficiency of disclosure it is immaterial that the porous support material is wrongly designated in claims 1 and 2, and in the description, as comprising *"mostly **O**-alumina"*. As long as this material is identifiable as the only one encompassed by the claims, an improper designation of said material is no hindrance for carrying out the invention.

4. Under these circumstances and in the absence of any concrete evidence or verifiable facts to the contrary, the board concludes that the application as filed fulfils, *a priori*, the requirement of Article 83 EPC.

5. The board is not convinced, however, by the appellant's argument according to which the application EP-A-0 613 714 discloses immediately that the alumina

is γ-alumina and non other. Said document relates to a catalyst and process for purifying exhaust gases, whereby the catalyst comprises a "porous support" loaded with various ingredients. In the claims the composition of the porous support is not specified (see Claims 1 to 16). According to the description the material of the support is preferably prepared by immersing cordierite into a slurry of *"100 parts of an alumina powder, 70 parts of alumina sol containing alumina in an amount of 10 % by weight, 15 parts of an aqueous aluminium nitrate solution containing aluminium nitrate in an amount of 40 % by weight and 30 parts of water."* Thereafter the product thus obtained is dried and *"burned at 600 °C for 1 hour, thereby forming an alumina coating layer thereon"* (see EP-A-0 613 714, page 7, lines 10 - 15). The board notes that no information is given regarding the type of alumina powder used in the slurry. Therefore, although it is likely that γ-alumina is formed under these conditions, it cannot be excluded that the support material contains major amounts of other forms of alumina, for example α-alumina.

5.1 EP-A-0 613 714 contains only one explicit reference to "γ-alumina", namely in a section referring to some unspecified prior art (see page 3, lines 12 - 16). In the board's view such a reference to the prior art does not disclose directly and unambiguously that the alumina used in the catalyst and process according to EP-A-0 613 714 and, by implication, in the processes according to the present application is also inevitably γ-alumina.

Request for correction under Rule 139 EPC 2000 (Rule 88 EPC 1973)

6. The board agrees with the appellant's submission according to which a skilled reader, on encountering the term "**O**-alumina" in the application documents, would immediately recognise that this is a mistake. Although it is usual to designate specific types of alumina by symbols prefixing the word "alumina", Greek letters such as α-, β-, γ-, δ-, η- and θ- are used for this purpose. The prefix "**O**-" does not occur in any of the conventional systems for naming alumina. Moreover nothing in the text of the application suggests that the term "**O**-alumina" is intended to refer to some new type of alumina for which a new name would be required. The conclusion is therefore that during the drafting of the text of the application the term "**O**-alumina" was incorporated in the description and the claims by mistake.

7. In view of the appellant's requests to substitute or delete the prefix "**O**-", the question arises whether the error can be corrected under Rule 139 EPC 2000, second sentence (Rule 88 EPC 1973, second sentence). Therein it is laid down that a request for correction concerning the description, claims or drawings is only allowable provided that the correction is obvious in the sense that a skilled person would derive directly and unambiguously, using common general knowledge, from the application that nothing else would have been intended than what is offered as the correction.

8. Having regard to the decisions G 3/89 by the Enlarged Board of Appeal the priority document may not be used

for a correction under Rule 88 EPC, second sentence (see OJ EPO 1993, 117, reasons 7). This was confirmed subsequently in the decision G 2/95 (see OJ EPO 1996, 555, reasons 2). Thus, it has to be investigated what a skilled person would derive directly and unambiguously, using common general knowledge, on the date of filing from the application.

9. On the basis of example 1 contained in the application as filed the skilled person would conclude that nothing else can have been intended by the mistaken term "**O**-alumina" than γ-alumina (see above, point 2.5). Therefore, in the board's view the correction offered by the appellant is in conformity with the requirements of Rule 88 EPC, second sentence.

10. Thus, the appellant's main request to substitute γ-alumina for **O**-alumina wherever it appears in the description and the claims can be granted.

Auxiliary request

11. Under these circumstances there is no need to discuss the auxiliary request in detail. Nevertheless the board observes that the deletion of the prefix "**O**-" before the word "alumina" would not be acceptable under the terms of Article 123(2) EPC.

11.1 Although it is a usual pragmatic approach for a skilled reader, who encounters a term in a document which is unintelligible, to proceed at first by ignoring the term and trying to make sense of the rest, this course of action is not a way of determining the author's intention in relation to the unintelligible term, so as

to be able to correct it. The fact that the prefix "**O**-" has no commonly recognised meaning in the naming of alumina hydrates does not mean that its deletion is permissible. There remains a residual clear meaning in the unintelligible term, namely that a specific type of alumina is intended, and suppressing this fact would result in a different technical teaching. In the text as originally filed it is taught that the type of alumina is significant, whereas in the proposed amended text the reader would be taught, at least implicitly, that the type of alumina is not significant.

Remittal to the first instance for further prosecution

12. The decision under appeal was based only on the objection under Article 83 EPC. It has now been found that the subject-matter of the independent process claims 1 and 2, respectively, are sufficiently disclosed for a skilled person to carry it out without undue burden. Hence it remains to be assessed whether the claimed subject-matter is novel (Article 54 EPC) and whether it involves an inventive step (Article 56 EPC).

13. The board considers that in the present case it is appropriate to exercise its discretion under Article 111 EPC and to remit the case to the first instance for further prosecution, so as to examine these outstanding substantive issues.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the first instance for further prosecution on the basis of the application documents as filed, but with the amendment that the term "**O**-alumina" is replaced wherever it occurs in the claims and the description by the term "γ-alumina".

The Registrar: The Chairman:

S. Sánchez Chiquero G. Raths