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Datasheet for the decision of 7 November 2019

Case Number: T 0832/16 - 3.2.06

Application Number: 04714777.2

Publication Number: 1608854

IPC: F01N3/08, F01N3/20, B01D53/94

Language of the proceedings: EN

Title of invention:
EXHAUST-GAS PURIFICATION SYSTEM FOR THE SELECTIVE CATALYTIC REDUCTION OF NITROGEN OXIDES IN THE LEAN EXHAUST GAS OF INTERNAL COMBUSTION ENGINES AND METHOD OF EXHAUST-GAS PURIFICATION

Patent Proprietor:
Umicore AG & Co. KG

Opponent:
Johnson Matthey Public Limited Company

Headword:

Relevant legal provisions:
EPC Art. 123(2), 123(3), 83, 111(1)
RPBA Art. 13(1)

Keyword:

Grounds for opposition - added subject-matter (yes)
Late-filed auxiliary request 3 - request clearly allowable (no)
Amendments - auxiliary request 4 - added subject-matter (no)
Sufficiency of disclosure - auxiliary request 4 (yes)
Remittal to the department of first instance - (yes) - auxiliary request 4 (yes)

Decisions cited:

Catchword:

Europäisches Patentamt
European Patent Office
Office européen des brevets

Beschwerdekammern

Boards of Appeal

Chambres de recours

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Case Number: T 0832/16 - 3.2.06

D E C I S I O N
of Technical Board of Appeal 3.2.06
of 7 November 2019

Appellant: (Patent Proprietor)	Umicore AG & Co. KG Rodenbacher Chaussee 4 63457 Hanau-Wolfgang (DE)
Respondent: (Opponent)	Johnson Matthey Public Limited Company 5th Floor 25 Farringdon Street London EC4A 4AB (GB)
Representative:	Lang, Johannes Bardehle Pagenberg Partnerschaft mbB Patentanwälte, Rechtsanwälte Prinzregentenplatz 7 81675 München (DE)
Decision under appeal:	**Decision of the Opposition Division of the European Patent Office posted on 4 February 2016 revoking European patent No. 1608854 pursuant to Article 101(3)(b) EPC.**

Composition of the Board:

Chairman	M Hannam
Members:	P. Cipriano
	J. Hoppe

Summary of Facts and Submissions

I. The appellant (patent proprietor) filed an appeal against the revocation of European Patent No. 1 608 854 by the opposition division.

II. The appellant requested that the decision of the opposition division be set aside and the patent be maintained as granted or, auxiliarily, according to auxiliary request 1 or 2 filed with its grounds of appeal.

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

IV. The following documents are relevant to the present decision:

D3 WO 00/21647
D4 EP 1 069 286 A2
D6 WO 02/14657 A1

V. The Board issued a summons to oral proceedings and a subsequent communication containing its provisional opinion, in which it indicated *inter alia* that the subject-matter of claim 1 of the main request seemed to extend beyond the content of the application as originally filed.

VI. With letter dated 13 September 2019, the respondent withdrew its opposition and indicated that it would not attend the scheduled oral proceedings.

VII. With letter dated 20 September 2019, the appellant filed an additional auxiliary request 3.

VIII. Oral proceedings were held before the Board on 7 November 2019 in the absence of the respondent. During the oral proceedings the appellant withdrew auxiliary requests 1 and 2 and filed a further auxiliary request 4.

At the end of oral proceedings the appellant requested:
that the decision under appeal be set aside and the patent be maintained as granted (main request)
or as an auxiliary measure
that the patent be maintained in amended form based on the claims of auxiliary request 3, filed with letter dated 20 September 2019 or
auxiliary request 4 filed during the oral proceedings.

IX. Claim 1 of the main request reads as follows:
"An exhaust-gas purification system for the selective catalytic reduction of nitrogen oxides, which, includes at least one catalyst (3) having catalytically active components for the selective catalytic reduction and through which the lean exhaust gas of an internal combustion engine flows,

wherein an NOx storage catalyst (5) is applied onto a diesel particulate filter and arranged upstream of the SCR catalyst (3) and metering means (8) for supplying a precursor compound of ammonia to the exhaust gas is located between the NOx storage catalyst (5) and the SCR catalyst and wherein for storing nitrogen oxides, the NOx storage catalyst includes storage components on the basis of cerium oxide, activated with at least one of the platinum group metals platinum, palladium, rhodium or iridium, and additionally an oxidizing catalyst on the basis of support oxides from the group consisting of aluminum oxide, silicon dioxide, cerium oxide, zirconium oxide, titanium oxide or mixed oxides

thereof which are coated with at least one of the platinum group metals platinum, palladium, rhodium and iridium."

Claim 1 of auxiliary request 3 reads:
"An exhaust-gas purification system for the selective catalytic reduction of nitrogen oxides, which includes at least one catalyst (3) having catalytically active components for the selective catalytic reduction and through which the lean exhaust gas of an internal combustion engine flows,

wherein an NOx storage catalyst (5) is applied onto a diesel particulate filter in the form of a coating and arranged upstream of the SCR catalyst (3) and metering means (8) for supplying a precursor compound of ammonia to the exhaust gas is located between the NOx storage catalyst (5) and the SCR catalyst and wherein for storing nitrogen oxides, the NOx storage catalyst includes storage components on the basis of cerium oxide, which are coated with platinum, and additionally platinum as an oxidizing catalyst on a support based on aluminum oxide, wherein the storage components on the basis of cerium oxide includes cerium oxide as a mixed oxide with zirconium oxide."

Claim 1 of auxiliary request 4 reads:
"A method of removing nitrogen oxides from the lean exhaust gas of an internal combustion engine by selective catalytic reduction using ammonia, wherein a NOx storage catalyst is based on a mixed oxide of cerium oxide and zirconium oxide and the internal combustion engine is operated continuously with a lean air/fuel mixture and the resulting lean exhaust gas is routed first over the NOx storage catalyst and subsequently over an SCR catalyst for the selective

catalytic reduction, wherein a compound decomposable into ammonia is supplied to the exhaust gas between the NOx storage catalyst and the SCR catalyst, and wherein the NOx storage catalyst is coated on a diesel particulate filter which is regenerated from time to time by increasing the exhaust gas temperature to the ignition temperature of the diesel soot collected on the filter and at the same time the NOx storage catalyst is automatically desulfated."

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

Main request - Article 100(c) EPC

The subject-matter of claim 1 was a combination of originally filed claims 1, 2, 4 and 5 with the disclosure of the preferred storage component cerium oxide on page 5, third complete paragraph, of the PCT publication of the application.

The second sentence of the third paragraph of page 5 of the application provided a general disclosure from which the skilled person recognized that the storage components on the basis of cerium oxide provided advantageous effects that were not structurally and functionally linked with the other components. Thus and since cerium oxide was the only basis for a preferred storage component explicitly used in the whole application, the skilled person recognized that cerium oxide was applicable as storage component in general to all the possible embodiments "according to the invention".

Admittance of auxiliary request 3

The added feature was disclosed on page 9, third paragraph. The claim was now directed to the specific embodiment of comprising the NOx storage catalyst of page 5, last paragraph.

Auxiliary request 4

The deletion of the apparatus claims and of the option "cerium oxide" in the method claim overcame all the objections put forward until now.

Remittal

The appellant did not present any further arguments as regards the remittal of the case.

XI. The arguments of the respondent as far as relevant to the present decision may be summarised as follows:

Main request - Article 100(c) EPC

The ground for opposition under Article 100(c) EPC prejudiced maintenance of the patent as granted. A combination of claims 1, 2, 4 and 5 with features from page 5 of the description as filed did not provide the basis for the subject-matter of claim 1. Page 5, lines 14 to 21, disclosed broadly that different oxidation components for nitrogen monoxide may be used in the NOx storage catalyst. Whilst there was a specific disclosure of a cerium oxide based NOx storage catalyst in the application as originally filed, this was solely in combination with a coating of at least one platinum group metal. Originally filed claim 4 and the first complete paragraph on page 5 disclosed a list of possible storage component materials including generally rare earth elements and not specifically

cerium oxide as defined in feature "wherein for storing nitrogen oxides, the NOx storage catalyst includes storage components on the basis of cerium oxide, activated with at least one of the platinum group metals platinum, palladium, rhodium or iridium" (hereinafter referred to as feature a).

Reasons for the Decision

1. Main request - Article 100(c) EPC

1.1 Claim 1 is a combination of originally filed claims 1 and 2 with the following two additional features:

(a) wherein for storing nitrogen oxides, the NOx storage catalyst includes storage components on the basis of cerium oxide, activated with at least one of the platinum group metals platinum, palladium, rhodium or iridium, and

(b) additionally an oxidizing catalyst on the basis of support oxides from the group consisting of aluminum oxide, silicon dioxide, cerium oxide, zirconium oxide, titanium oxide or mixed oxides thereof which are coated with at least one of the platinum group metals platinum, palladium, rhodium and iridium.

1.2 There is no specific disclosure of feature (a) in the application as originally filed. Originally filed claim 4 and the first complete paragraph on page 5 disclose a list of possible storage component materials that include rare earth elements but not specifically cerium

oxide as defined in feature (a). On the other hand, the first sentence of the third paragraph of page 5 discloses an "especially preferred" combination of storage components on the specific basis of cerium oxide but only coated with aluminium and in combination with platinum as an oxidizing catalyst on a support based on aluminium oxide, not in combination with any of the other platinum group metals and support materials defined in claim 1.

1.3 The argument from the appellant that the second sentence of the third paragraph on page 5 was a general disclosure for the use of cerium oxide in all possible embodiments of the invention, is not found persuasive by the Board.

This sentence follows the first sentence in the same paragraph which discloses a ("especially preferred") specific combination of storage components on the basis of cerium oxide with other specific components and also the more general disclosures of compounds suitable for the NOx storage catalyst from the previous paragraphs referred to above. The skilled person reading this second sentence would interpret it simply as an explanatory remark of the advantages that the storage components on the basis of cerium oxide exhibit (the lowest light-off temperatures) when used in the NOx storage catalyst disclosed in the sentence and in the paragraphs immediately before.

The following two paragraphs on pages 5 and 6 also refer to this "especially preferred" embodiment. The term "here" at the beginning of the first following paragraph discloses the advantages of using mixed cerium oxides and links the possible use of cerium oxide and mixed oxides to the especially preferred

embodiment. The second following paragraph discloses the advantages of using aluminium oxide as a support for platinum, which is the combination of materials of the "especially preferred" embodiment. The skilled person reading the description would thus not take the second sentence of the third paragraph on page 5 in isolation from and out of context with the remaining combined disclosure of pages 5 and 6.

1.4 The subject-matter of claim 1 of the main request thus extends beyond the content of the application as filed such that the ground for opposition under Article 100(c) EPC prejudices maintenance of the patent as granted. Accordingly, the main request is not allowable.

2. Admittance of auxiliary request 3

2.1 Auxiliary request 3 was filed with letter dated 20 September 2019.

2.2 Having been filed after the filing of the appellant's complete case, the admittance of this request is subject to the discretion of the Board according to Article 13(1) RPBA, such discretion being exercised in view of *inter alia* the complexity of the new subject-matter submitted, the current state of the proceedings and the need for procedural economy.

In order to be in line with the requirement of procedural economy, amendments should be *prima facie* allowable in the sense that they at least overcome the objections raised against previous requests without giving rise to any new ones.

2.3 This request was filed to overcome the objections under Article 123(2) EPC in the previous request. Relative to claim 1 of the main request, the feature regarding the application of the catalyst reads

"an NOx storage catalyst (5) is applied onto a diesel particulate filter in the form of a coating",

and the features (a) and (b) discussed above under the main request have been replaced by

"wherein for storing nitrogen oxides, the NOx storage catalyst includes storage components on the basis of cerium oxide, which are coated with platinum, and additionally platinum as an oxidizing catalyst on a support based on aluminum oxide, wherein the storage components on the basis of cerium oxide includes cerium oxide as a mixed oxide with zirconium oxide".

2.4 In its communication issued prior to oral proceedings containing the Board's provisional opinion regarding auxiliary request 1, the Board had stated that

"The feature added to claim 1 of auxiliary request 1 'an NOx storage catalyst (5) is applied onto a diesel particulate filter in the form of a coating' does not seem to correspond to the basis cited by the appellant on page 9, third paragraph, wherein both an oxidation catalyst and a NOx storage catalyst may be applied in the form of a coating.

In addition, the catalyst 5 disclosed in this paragraph seems to be the one of the embodiment of figure 1. It may need to be discussed whether the extraction of this single feature from such an embodiment and its

insertion into the claim creates a combination of features that was not previously disclosed. Presently, the Board is of the opinion that such an extraction is not permissible and that claim 1 does not fulfill the requirement of Article 123(2) EPC."

Since no arguments were presented by the appellant in reply to the preliminary opinion, nor during the oral proceedings on this matter, the Board sees no reason to alter its provisional opinion in this regard.

2.5 Thus, at least for the reason that claim 1 of auxiliary request 3 contains the feature regarding the application of the catalyst from the auxiliary request 1 commented in the above extract of the communication of the Board, the subject-matter of the present claim 1 also *prima facie* extends beyond the content of the earlier application as filed, contrary to Article 123(2) EPC.

2.6 It is further noted that the claim now defines more generally that the NOx storage catalyst includes platinum as an oxidizing catalyst (located) on a support based on aluminium oxide, whereas the granted claim specifically defined that the basis of the support was coated with platinum. By replacing the more specific application method (coating) of the platinum on the basis of support oxides by the simple relative position (platinum on a support), the claim now encompasses further non-continuous ways for the platinum to be applied onto the basis that do not form a coating, e.g. by incorporating/adding the platinum to the ingredient mixture when forming the support basis of aluminium oxide or by physically forming localized punctual non-continuous deposits on the support.

Claim 1 therefore *prima facie* also fails to fulfill the requirement of Article 123(3) EPC.

2.7 Since *prima facie* the requirement of at least Article 123(2) EPC is not fulfilled, the Board exercised its discretion under Article 13(1) RPBA not to admit auxiliary request 3 into the proceedings.

3. Auxiliary request 4

3.1 Auxiliary request 4 was filed during the oral proceedings. In comparison to the main request, it consisted of the deletion of the apparatus claims and of the deletion of the option "cerium oxide" as basis for the NOx storage catalyst in the remaining independent method claim. The deletion of the option "cerium" and of the apparatus claims does not extend the protection conferred by the patent which therefore necessarily meets the requirement of Article 123(3) EPC.

3.2 The subject-matter of claim 1 is a combination of originally filed claims 13, 14 and 16 and corresponds to granted claim 10. Such a claim has been consistently pursued in the main request since the outset of the opposition proceedings, now simply with the deletion of the option "cerium oxide" as basis for the NOx storage catalyst.

3.3 The respondent raised objections to the method claims under Article 100(c) EPC / Article 123(2) EPC neither during the opposition nor during the appeal proceedings and the Board also sees no reason to find otherwise. Thus, the Board finds that the subject-matter of claim 1 of auxiliary request 4 meets the requirement of Article 123(2) EPC.

3.4 Regarding Article 83 EPC, the Board reasoned in its communication (see item 2 thereof) that the disclosure is sufficient for the skilled person to carry out a method of removing nitrogen oxides from the lean exhaust gas of an internal combustion engine as defined in claim 1. Several examples, such as paragraphs [0023], [0034] and [0035] of the patent, disclose specifically the use of a mixed oxide of cerium and zirconium oxide. Claim 1 of auxiliary request 4 does not define the use of any other storage compound, such as alkali metals or alkaline-earth metals, which are therefore not part of the invention.

Since no further arguments were made by the parties in reply to its preliminary opinion, nor during the oral proceedings on this matter, the Board sees no reason to alter its provisional opinion in this regard, and thus confirms same herewith. The invention of claim 1 of auxiliary request 4 thus meets the requirement of Article 83 EPC.

3.5 As evident from the foregoing, all the objections raised in the respondent's complete case with respect to claim 1 of the previous requests and claim 10 of the main request discussed under Article 123 EPC have also been overcome by the amendments to auxiliary request 4.

The request also does not give rise to new objections under Articles 123 EPC and 83 EPC. Thus, only the objection to the presence of an inventive step made in the reply to the grounds of appeal under point I.4 on page 10 remains to be assessed.

3.6 The Board thus exercised its discretion under Article 13(1) RPBA and admitted auxiliary request 4 into the

proceedings and concluded that auxiliary request 4 fulfills the requirements of Articles 83 and 123 EPC.

4. Remittal

4.1 In the decision under appeal, the opposition division relied on D6 to decide on the matter of novelty and used this as a promising starting point for the assessment of inventive step of the apparatus claim 1 of the requests pending at the time. On the other hand, an inventive step objection to the subject-matter of claim 10 of the main request at that time (which corresponds to claim 1 of the current auxiliary request 4) relied on a combination of D3 and D4, yet this was not part of the decision of the opposition division.

Absent the reasoning based on an analysis of D3 and D4 in the decision of the opposition division, the Board would find itself in a position to consider such objections for the first time. A consequence would also be the party losing the opportunity of having an examination of the claimed subject-matter before two instances. The appellant has also not had the opportunity to develop its inventive step arguments with respect to the subject-matter of claim 1 of auxiliary request 4.

With the appellant not having objected to remittal of the case, the Board avails itself of its power under Article 111(1) EPC to remit the case back to the department of first instance for further prosecution of inventive step.

Order

For these reasons it is decided that:

The decision under appeal is set aside.

The case is remitted to the opposition division for further prosecution based on claim 1 of auxiliary request 4, filed during the oral proceedings.

The Registrar: The Chairman:

M. H. A. Patin M. Hannam

Decision electronically authenticated