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D E C I S I O N
of 25 February 1999

Case Number: T 0645/95 - 3.3.5

Application Number: 87106000.0

Publication Number: 0243894

IPC: B01J 35/10

Language of the proceedings: EN

Title of invention:

Hydroprocessing catalyst and support having bidisperse pore structure

Patentee:

W.R. Grace & Co.-Conn.

Opponent:

Akzo Nobel N.V.

Headword:

Catalyst support/GRACE

Relevant legal provisions:

EPC Art. 123(2), 84

Keyword:

"Main request: disclaimer not allowable"
"Auxiliary request: lack of clarity"

Decisions cited:

T 0170/87

Catchword:



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Boards of Appeal

Chambres de recours

Case Number: T 0645/95 - 3.3.5

D E C I S I O N
of the Technical Board of Appeal 3.3.5
of 25 February 1999

Appellant:
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Decision under appeal: Decision of the Opposition Division of the
European Patent Office posted 26 May 1995
revoking European patent No. 0 243 894 pursuant
to Article 102(1) EPC.

Composition of the Board:

Chairman: R. K. Spangenberg
Members: M. M. Eberhard
M. B. Günzel

Summary of Facts and Submissions

- I. European Patent No. 0 243 894 based on application No. 87 106 000.0 was granted on the basis of fifteen claims.
- II. The Respondent (Opponent) filed a notice of opposition requesting revocation of the patent on the ground of lack of novelty of the subject-matter of all claims, except claims 3 and 6, with respect to the disclosure of GB-A-2 091 120 (hereinafter D1). The Appellant (Patentee) requested rejection of the opposition and informed the Opposition Division that comments on the notice of opposition would not be filed.
- III. The Opposition Division revoked the patent on the ground of lack of novelty. According to the decision, D1 disclosed a composition having a bimodal pore size distribution and comprising particles of (i) fibrous clay and (ii) an oxide. The Opposition Division took the view that the pore diameters and pore volumes indicated in D1 for the clay particles, oxide particles and catalyst support were prejudicial to the novelty of the catalyst support according to claim 1 of the patent in suit. The methods of independent claims 5 and 7 were also considered to lack novelty over the teaching of D1.
- IV. The Appellant lodged an appeal against this decision and filed amended claims together with the statement of grounds of appeal. On 16 September 1996, he submitted two sets of amended claims 1 and 5, as a main request and an auxiliary request respectively, in replacement of the previous amended claims. The Appellant further submitted experiment results concerning a reproduction of the disclosure of D1. Claim 1 of the main request reads as follows:

"1. A catalyst support adapted for use as a catalyst support for hydrotreating heavy feeds containing large metal bearing molecules, said support having a bimodal micropore size distribution characterized in that the micropores have an average pore diameter of less than 60 nm (600 Å) and that said support comprises formed particles made of two different refractory oxides, which are no compounds of oxygen with more than one metallic element or with an organic radical, differing in their micropore size, namely

- a) one oxide having small micropores of an average pore diameter of less than 10 nm (100 Å) suitable for desulfurization; and
- b) the other oxide having large micropores of an average pore diameter of 10 to less than 60 nm (100 to less than 600 Å) suitable for demetallization;

the pore volume of the large micropore region comprising 10 to 90% and that of the small micropore region comprising 10 to 90% of the total pore volume."

Claims 1 and 5 of the auxiliary request have the following wording:

"1. A catalyst support adapted for use as a catalyst support for hydrotreating heavy feeds containing large metal bearing molecules, said support having a bimodal micropore size distribution characterized in that the micropores have an average pore diameter of less than 60 nm (600 Å) and that said support comprises formed particles made of two different refractory oxides, which are aluminas or alumina and silica, differing in their micropore size, namely

- a) one oxide having small micropores of an average pore diameter of less than 10 nm (100 Å) suitable for desulfurization; and

- b) the other oxide having large micropores of an average pore diameter of 10 to less than 60 nm (100 to less than 600 Å) suitable for demetallization;

the pore volume of the large micropore region comprising 10 to 90% and that of the small micropore region comprising 10 to 90% of the total pore volume."

"5. A method of making the catalyst support of claims 1 to 4 comprising

- a) forming particles of a refractory oxide powder of

i) one oxide, which are aluminas or alumina and silica, having small micropores of an average pore diameter of less than 10 nm (100 Å) suitable for desulfurization; and

ii) another oxide, which are aluminas or alumina and silica, having large micropores of an average pore diameter of 10 to less than 60 nm (100 to less than 600 Å) suitable for demetallization;

the pore volume of the large micropore region comprising 10 to 90% and that of the small micropore region comprising 10 to 90% of the total pore volume; and

- b) calcining the particles."

V. The parties relied upon three additional documents at the appeal stage, namely Webster's Third New International Dictionary, 1986, page 1613 (D2); Römpfs Chemie-Lexikon, 8th Edition, 1987, pages 3845-3847 (D3); Webster's Third New International Dictionary, 1986, page 2117 (D4).

In a communication dated 1 December 1998, the Board pointed out, inter alia, that claims 1 and 5 of the main request did not seem to meet the requirements of Article 123(2) EPC and indicated the reasons for this preliminary opinion. Reference was made to the

definition of the term "oxide" given in Römpps Chemie-Lexikon, 1985, vol. 4, pages 2949-2950 (D5). The communication also contained considerations about the novelty and inventive step of the catalyst support according to claim 1 of the auxiliary request. An objection of lack of clarity was raised against claim 5 of the auxiliary request.

The Appellant did not reply to the communication dated 1 December 1998. Oral proceedings were held on 25 February 1999 in the absence of the Appellant who had informed the Board on 20 November 1998 that he was withdrawing his request for oral proceedings and would not attend the oral proceedings.

- VI. In his letter accompanying the amended claims filed on 16 September 1996, the Appellant argued that in claims 1 and 5 of the main request the refractory oxides were more clearly defined by means of a disclaimer excluding all oxygen-containing compounds which were not binary compounds but contained more than one metallic element or an organic radical. The patent application as originally filed, for example on page 10, lines 11-24, and in claims 3 and 6 gave a further explanation and examples of the type of oxides which should be considered to fall under the expression "refractory oxides", ie alumina and silica. When considering the proper and specific definition of silicates in D3, these products could not be referred to as oxides as such. However, for the sake of clarity claims 1 and 5 contained a disclaimer excluding "double, multiple, or complex oxides" and, for completeness, also organic oxides as defined in point 2) of D2. The Appellant further argued that the subject-matter of claim 1 was novel since clay

materials were not included in the definition of the refractory oxides stated in claim 1. Arguments were submitted in favour of the inventive step of the claimed catalyst support.

- VII. The Respondent argued inter alia that claims 1 and 5 of the main request contravened Article 123(2) EPC since the restrictions placed on the refractory oxides were not mentioned anywhere in the description. As D1 was not an accidental anticipation but the closest prior art, the disclaimer was not allowable. Furthermore, claims 1 and 5 of both requests did not meet the requirements of Article 123(3) EPC because the deletion of the word "composition" resulted in a product being different from the product defined in the granted claims. The Respondent raised objections to the clarity of claims 1 and 5 of both requests. It was not clear whether the pore size distributions stated in the claims were those of the starting refractory oxides or concerned the final catalyst. The expression "refractory oxide" indicated in the claims did not mean an oxide withstanding high temperatures since Catapal alumina, ie a boehmite, was used in the examples. Furthermore, the phrase "one oxide, which are aluminas or alumina and silica" inserted in claim 5 of the auxiliary request was not clear and required construction. The Respondent further submitted that the clays mentioned in D1 were oxides according to the definition given in D5. This definition was in conformity with the broad definition of oxides used in the catalyst field where gibbsite and boehmite were all considered as aluminas.
- VIII. The Appellant requested in writing, as a main request, that the decision under appeal be set aside and that the patent be maintained with amended claims 1 and 5 according to the main request submitted on 16 September 1998 and claims 2-4, and 6-17 as granted and, as an

auxiliary request, with amended claims 1 and 5 according to the auxiliary request filed on the same date and claims 2-4 and 6-17 as granted. The Repondent requested that the appeal be dismissed.

Reasons for the Decision

1. The appeal is admissible.

Main request: Amendments

2. The question arises whether or not the underlined features incorporated into claim 1 introduce subject-matter extending beyond the content of the application as filed. The said features place a restriction on the refractory oxides which the catalyst support is made of since refractory oxides which are compounds of oxygen with more than one metallic element, ie double oxides such as spinels, or multiple oxides are excluded. The application as filed does not expressly mention the presence or the absence of refractory oxides which are "compounds of oxygen with more than one metallic element" in the catalyst support. On page 10, lines 11-24, to which the Appellant referred, only alumina and silica are indicated as examples of oxides which can be used to obtain the desired bimodal pore size distribution. The exemplified catalyst supports comprise two different aluminas or alumina and silica, the latter possibility being also stated in original claim 6. The sub-group of refractory oxides consisting of "compounds of oxygen with more than one metallic element" is neither directly and unambiguously derivable from this disclosure nor from the other information contained in the original application.

Therefore, the exclusion of this sub-group from the claimed subject-matter is not disclosed in the application as filed.

It appears that the Appellant considered the underlined features as a disclaimer excluding the presence of clay materials. According to the case law, it is permissible to exclude a special state of the art from the claimed subject-matter by means of a disclaimer, even if the original application gives no basis for such an exclusion (see for example decision T 170/87, OJ EPO 1989, 441). In other words, even if the original application does not disclose this exclusion, the claim may meet the requirements of Article 123(2) EPC in certain circumstances. However, as already pointed out in the Board's communication of 1 December 1998, a disclaimer is permissible only in very exceptional circumstances, such as in the case of an accidental anticipation. In the present case, assuming for the sake of argument that the subject-matter of claim 1 would lack novelty over the catalyst support of D1 in the absence of a disclaimer, this anticipation would not be an accidental one since D1 belongs to the same technical field as the patent in suit and also concerns catalyst supports having a bimodal pore size distribution, which are useful for hydrotreating heavy hydrocarbonaceous feedstocks containing metals, sulphur and asphaltenes. Furthermore, the catalyst support of D1 contains a fibrous clay (those clays generally occurring as aluminosilicates, magnesium silicates and aluminomagnesium silicates) as the component providing the pore volume peak in the 200-800 Å diameter pore region and a precalcined inorganic oxide (for example alumina, silica, magnesia, zirconia, titania) as the component providing the pore volume peak in the pore diameter region of 50-100 Å (see page 1, lines 50-55; page 2, lines 2-5 and 24-30; claims 1-3, 7 and 8). However, the disclaimer incorporated into claim 1

excludes refractory oxides which are "compounds of oxygen with more than one metallic element". In the Board's judgement, this exclusion does not correspond to the teaching of D1 itself where the component providing the larger average pore diameter is a fibrous clay, but seems, rather, to be based on the definition given in Webster's Dictionary (D2), item 1b, for the term "oxide", namely "a compound of oxygen with one or more metallic elements". Therefore, the said exclusion cannot be considered to represent a disclaimer of the disclosure of D1.

As the exclusion of refractory oxides which are "compounds of oxygen with more than one metallic element" is, on the one hand, not disclosed in the application as filed and, on the other hand, does not constitute a disclaimer of an accidental anticipation, claim 1 of the main request does not comply with the provisions of Article 123(2) EPC.

Auxiliary request: Clarity of claim 5

3. Claim 5 has been amended in such a manner that it does not meet the requirement of clarity. According to claim 5, the method of making the catalyst support of claims 1 to 4 comprises the step of "forming particles of a refractory oxide powder of i) one oxide, which are aluminas or alumina and silica, having small micropores ...and ii) another oxide, which are aluminas or alumina and silica, having large micropores...". Taking into account that the expression "one oxide" is usually not used to designate a mixture of two different oxides and that, according to claim 1, the formed particles are made of two different refractory oxides differing in their micropore size, ie two different aluminas or alumina and silica, it is not clear whether the underlined features of claim 5 should be construed as applying to each individual oxide taken separately or

to the mixture of the first oxide i) with the second oxide ii). As already pointed out in the Board's communication, if each oxide were a mixture of alumina and silica, this embodiment would not be consistent with the explanation on page 10, second full paragraph, of the original description or with the examples. Although the Appellant was informed of this lack of clarity in the Board's communication, he did not amend this claim nor did he reply to the said communication. It follows from the above that claim 5 of the auxiliary request does not meet the requirements of Article 84 EPC.


4. For the reasons given above, claim 1 of the main request and claim 5 of the auxiliary request are not allowable and, thus, these requests must fail.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:



S. Hue

The Chairman:



R. Spangenberg

Gu
H.B

