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**Datasheet for the decision
of 9 January 2009**

Case Number: T 0187/07 - 3.3.06

Application Number: 95913363.8

Publication Number: 0752460

IPC: C10G 45/02

Language of the proceedings: EN

Title of invention:

Method of hydrotreating hydrocarbon oil and fuel oil
composition

Applicant:

IDEMITSU KOSAN COMPANY LIMITED

Opponent:

-

Headword:

Hydrotreating crude oil/IDEMITSU

Relevant legal provisions:

EPC Art. 84, 54

Relevant legal provisions (EPC 1973):

-

Keyword:

"Main and first auxiliary request: clarity (no)"

"Second auxiliary request: novelty (no)"

Decisions cited:

-

Catchword:

-



Case Number: T 0187/07 - 3.3.06

D E C I S I O N
of the Technical Board of Appeal 3.3.06
of 9 January 2009

Appellant:

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Representative:

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Decision under appeal:

Decision of the Examining Division of the
European Patent Office posted 12 July 2006
refusing European application No. 95913363.8
pursuant to Article 97(1) EPC 1973.

Composition of the Board:

Chairman: P.-P. Bracke
Members: G. Dischinger-Höppler
U. Tronser

Summary of Facts and Submissions

I. This appeal is from the decision of the Examining Division to refuse the European patent application No. 95 913 363.8 relating to a method of hydrotreating hydrocarbon oil and fuel oil compositions.

II. Upon citation of several documents in regard of novelty and inventive step of the claimed subject-matter, inter alia of document

D1 EP-A-0 514 549,

the Applicant (hereinafter Appellant) eventually filed in the course of the examining proceedings the amended sets of claims according to a main and an auxiliary request on which the appealed decision was based.

In its decision, the Examining Division held that these requests did not fulfil the requirements of Article 84 EPC since the parameter "average pore diameter" used in the claims was not clear due to the fact that the method of measurement of this parameter was not disclosed although there existed in the art different suitable methods which did not give the same results. This was evident from the Appellant's own experiments filed under cover of a letter dated 14 February 2006.

III. With its statement of grounds of appeal the Appellant filed amended sets of claims in a new main and auxiliary request as well as document

D2 "Particle Size Measurement", by Terence Allen;
Volume 2, fifth edition, 1997, published by
Chapman & Hall, Table of Contents and pages 104 to
105 and 148 to 151

to support its argument that a skilled person would
assume that the most appropriate method for measuring
the pore diameters mentioned in Claim 1 of the then
pending requests was the nitrogen adsorption method.

IV. In a communication dated 2 September 2008 and annexed
to the summons for oral proceedings, the Board gave
reasons for its preliminary opinion that the pending
sets of claims did not comply with the requirements of
Articles 123(2) and 84 EPC, the latter concerning the
pore diameter. In particular, it was indicated that the
problem in the present case was not how a skilled
person would assume that porosity should be measured
but rather how a skilled person can be sure of what is
actually covered by the claimed subject-matter to
prevent any possible problems of infringement.

In the present case, however, there existed in the art
a variety of different methods for measuring the pore
size distribution and the average pore diameter, such
as mercury porosimetry, use of various liquids of
different molecular sizes, examination under optical
and electron microscopes and gas adsorption. This was
evident from the introduction of chapter 3 of document
D2 which was filed by the Appellant as piece of general
knowledge in the art (page 104, second and third
paragraphs).

Since further the Appellant's own evidence relied on by the Examining Division (point II above) showed a considerable difference (30 to 50%) in the measured pore size depending on whether the mercury porosimetry was applied (result about 100 Å) or the gas adsorption porosimetry (result about 130 to 150 Å), it was apparent that the definition of the parameter "average pore diameter" depended on the method of measurement.

Hence, the parameter as such was vague since it was not indicated how it had been obtained.

- V. In its letter of response dated 6 November 2008, the Appellant filed again amended claims in a new main and auxiliary request.

Claim 1 of the main request read:

"1. A process for hydrotreating a crude oil or a crude oil from which the naphtha fraction has been removed, in the presence of a catalyst (A) comprising at least one metal selected from the group consisting of the metals each belonging to any of the groups 6, 8, 9 and 10 of the Periodic Table, said metal being supported on at least one carrier selected from the group consisting of alumina/boria carrier, a carrier containing metal-containing aluminosilicate, alumina/phosphorus carrier, alumina/alkaline earth metal compound carrier, alumina/titania carrier and alumina/zirconia carrier; and a demetallization catalyst (B) in combination with catalyst (A), whereby the catalyst (A) and the demetallization catalyst are packed in that order in a tubular reactor; wherein the demetallization catalyst (B) comprises at least one metal selected from the

group consisting of the metals each belonging to any of the groups 6, 8, 9 and 10 of the Periodic Table; said metal being supported on an inorganic oxide, an acidic carrier or a natural mineral; and said demetallization catalyst having an average pore diameter of 100 Å at the smallest."

Claim 1 of the auxiliary request read:

"1. A process for hydrotreating a crude oil or a crude oil from which the naphtha fraction has been removed, in the presence of a catalyst comprising (A) at least one metal selected from the group consisting of the metals each belonging to any of the groups 6, 8, 9 and 10 of the Periodic Table, said metal being supported on a carrier containing iron-containing aluminosilicate; and (B) a demetallization catalyst in combination with (A), whereby the catalyst (A) and the demetallization catalyst are packed in that order in a tubular reactor; wherein the demetallization catalyst has an average pore diameter of 120 Å which comprises Ni/Mo supported on alumina in an amount of 10% by weight expressed in terms of oxides thereof based on the whole amount of the catalyst."

The Appellant maintained its previous arguments with regard to the pore diameter and corresponding clarity problem and drew attention to 9 European patents where a pore parameter was contained in the claims but no definition of the manner of determination of the pore parameter was given.

VI. During the oral proceedings held on 9 January 2009 before the Board of Appeal, the Appellant filed amended sets of claims in a new main and first auxiliary request to overcome the objections under Article 123(2) EPC raised in the Board's communication. The respective Claim 1 of these requests each differs from that of the previous main and auxiliary requests in that the term "whereby the catalyst (a) and the demetallization catalyst are packed in that order" is replaced by "whereby the demetallization catalyst and the catalyst (A) are packed in that order".

Concerning the objection under Article 84 EPC, no new arguments were presented by the Appellant.

However, he filed a second auxiliary request, Claim 1 thereof differing from Claim 1 of the main request by omitting the term "wherein the demetallization catalyst (B) comprises at least one metal selected from the group consisting of the metals each belonging to any of the groups 6, 8, 9 and 10 of the Periodic Table; said metal being supported on an inorganic oxide, an acidic carrier or a natural mineral; and said demetallization catalyst having an average pore diameter of 100 Å at the smallest".

The Appellant argued that apart from the fact that any problem under Article 84 EPC was overcome due to the deletion of the feature concerning the pore diameter, Claim 1 of the second auxiliary request covered embodiments which were not foreshadowed in the prior art cited by the Examining Division.

VII. The Appellant requested that the decision under appeal be set aside and that a patent be granted in the following version: Claims 1 to 5 of the main request, Claims 1 to 3 of the first auxiliary request or Claims 1 to 5 of the second auxiliary request respectively submitted during oral proceedings.

Reasons for the Decision

1. Main request and first auxiliary request

1.1 According to Article 84 EPC the patent claims must define the subject-matter for which protection is sought and be clear. The importance of the clarity requirement is due to the necessity of legal certainty, as the purpose of the claims is to enable the protection conferred by a patent to be determined (see Case Law of the Boards of Appeal of the European Patent Office, 5th edition, 2006, chapter II.B.).

In the present case, the question at issue is whether the parameter "average pore diameter" mentioned in Claim 1 to define the demetallization catalyst used in the claimed process fulfils the above requirements.

1.2 The Appellant orally and in writing admitted that the application in suit did not disclose how the parameter "average pore diameter" was measured. However, in his opinion, a person skilled in the art would know from document D2 that the pore diameter "will have to be determined" by the nitrogen adsorption method since this was the most common method in the art. Therefore, so the Appellant argued, the clarity problem was not as

big as might be assumed on the basis of the lack of precise instructions concerning the measurement of the specified pore diameters.

He further argued that it was not at all the general custom to define the manner of determination of a pore diameter and referred in this regard to 9 European patents where a pore parameter was contained in the claims but a definition of the manner of determination of that parameter was missing. In the Appellant's opinion these documents were not necessarily vague and the present case should be handled in the same manner for reasons of equal treatment and fairness.

1.3 However, none of these arguments is suitable to confer an unambiguous meaning to the claimed parameter.

1.3.1 There is no doubt that in order to determine pore parameters, there exist several methods in the art. Document D2 mentions amongst others the mercury porosimetry and gas absorption, in particular nitrogen absorption (page 104, second paragraph to page 105, sixth paragraph).

The Appellant himself relied on document D2 as evidence for the general knowledge of those skilled in the art. In the Appellant's favour, the Board accepts that the art disclosed in document D2 represents general knowledge even at the priority date of the application in suit in spite of the fact that document D2 as the fifth edition was published after the priority date of the application.

However, there is nothing in document D2 which suggests that catalysts like those used in the claimed process require particularly the application of the nitrogen absorption method to determine their average pore diameter.

The pages of document D2 which were filed by the Appellant concentrate on a comparison of the mercury porosimetry and the nitrogen absorption method, thus ignoring all the other methods also mentioned in that document. It is stated that gas absorption is more widely used than mercury porosimetry (page 105, first paragraph), but it is also mentioned that the methods are complementary and judicious choice of the constants in the relevant equations is necessary to get an agreement (page 149, last full paragraph). In the Board's opinion, this indicates that depending on the particular conditions used in the respective methods, there exist differences in the results. This is corroborated by the Appellant's own evidence (point II above) showing a considerable difference (30 to 50%) in the measured pore size depending on the applied method (about 100 Å according to the mercury porosimetry and 130 to 150 Å according to the nitrogen absorption method).

Hence, if a particular catalyst has a pore diameter of 100 or 120 Å if measured according to the nitrogen absorption method, it would meet the requirement of Claim 1 of the main and first auxiliary request whereas it would not meet that requirement if measured according to the mercury porosimetry. In other words if a parameter like a pore diameter is an essential feature of a claimed subject-matter and considerably

dependent on the method of measurement, it is indispensable that this method is indicated in order to enable those skilled in the art to determine the protection conferred by the claimed subject-matter.

- 1.3.2 The Board notes that the 9 European patents referred to by the Appellant were published within a period of 24 years. The question of how large in the same period of time the number of European patents might be wherein the pore parameter was rightfully defined may be left aside since in any case the Appellant has no right for equal treatment in a case of wrongfulness.

Hence, the argument that there exist European patents wherein the method of measuring a pore size as an essential feature was not defined is irrelevant.

- 1.4 Having regard to the above, the Board concludes that Claim 1 of both, the main and the first auxiliary request do not fulfil the requirement of Article 84 EPC since the feature of the pore diameter renders the claimed subject-matter vague.

2. *Second auxiliary request*

Claim 1 of the second auxiliary request differs from that of the main request in that the definition of the demetallization catalyst has been deleted, including the feature concerning the average pore diameter (see point VI above).

The amendment clearly overcomes the clarity problem present in Claim 1 of the higher ranking requests but changes the claimed subject-matter so as to cover

embodiments where catalysts (A) and (B) are identical. This was not disputed by the Appellant and is in agreement with the original disclosure of the application in suit, namely in that the catalyst (B) may consist of the same metals as catalyst (A) and be also supported on an inorganic oxide (page 41, last five lines to page 42, line 6).

In this embodiment, however, the order of the catalysts within the tubular reactor is redundant.

As further, Claim 1 does not require any separation of the catalysts (A) and (B), it simply covers a process of hydrotreating crude oil in the presence of a catalyst comprising at least one metal selected from the groups 6, 8, 9 and 10 of the Periodic Table and an inorganic oxide as carrier, such as alumina/boria.

Such a process is known from document D1 which discloses the hydrotreatment in a hydrotreating unit 6 of a crude oil from which the naphtha fraction may have been removed, in the presence of a catalyst comprising a metal of the VIth group of the Periodic Table and a metal of the VIIIth group of the Periodic Table supported on a support such as silica and/or alumina, zeolite, boron oxide and a mixture thereof (page 5, lines 21 to 31). Example 3 discloses specifically a hydrotreating catalyst comprising Ni and Mo supported on an alumina/boria carrier.

The application as filed does not disclose as an essential or specific feature that the reactor has to be tubular. This feature is mentioned only in the examples and comparative examples of the application in

suit and comparative example 1 is in the Appellant's own opinion representative for the process of document D1 (see Statement of Grounds of appeal, page 7).

Therefore, no difference between the claimed process and the hydrotreatment disclosed in document D1 can be derived merely from the fact that document D1 does not explicitly mention the shape of the hydrotreating unit 6.

The Board concludes, therefore, that Claim 1 covers an embodiment which is anticipated in the prior art with the consequence that it is not allowable under Article 54 EPC.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:

G. Rauh

P.-P. Bracke