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D E C I S I O N
of 17 May 2006

Case Number: T 0651/05 - 3.3.06

Application Number: 96941374.9

Publication Number: 0876444

IPC: C10G 45/58

Language of the proceedings: EN

Title of invention:

High purity paraffinic solvent compositions, and process for their manufacture

Patentee:

ExxonMobil Research and Engineering Company

Opponent:

Shell Internationale Research Maatschappij B.V.
Chevron U.S.A. Inc.

Headword:

Paraffinic solvent/EXXON

Relevant legal provisions:

EPC Art. 84, 123(2)

Keyword:

"Admissibility of amendments (no):
- amendment not directly and unambiguously derivable from application as filed (main request, first and fourth auxiliary requests)
- introduction of vague terms creates unclarity due to different equally valid interpretations (main request, second and third auxiliary requests)"

Decisions cited:

G 0009/91

Catchword:

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Case Number: T 0651/05 - 3.3.06

D E C I S I O N
of the Technical Board of Appeal 3.3.06
of 17 May 2006

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Decision under appeal: Decision of the Opposition Division of the
European Patent Office posted 18 March 2005
revoking European patent No. 0876444 pursuant
to Article 102(1) EPC.

Composition of the Board:

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

Summary of Facts and Submissions

- I. This appeal is from the decision of the Opposition Division to revoke European patent No. 0 876 444 relating to high purity paraffinic solvent compositions and a process for their production.
- II. Two notices of opposition had been filed against the granted patent, wherein the Opponents sought revocation of the patent on the grounds of Article 100(c) EPC due to extension beyond the content of the application as filed (Article 123(2) EPC), on the grounds of Article 100(b) EPC due to insufficient disclosure (Article 83 EPC) and on the grounds of Article 100(a) EPC due to lack of novelty and lack of inventive step (Articles 52(1), 54(2) and 56 EPC). The oppositions were based on a variety of documents.
- III. In its decision, which was based on amended sets of claims according to a main request and an auxiliary request, the Opposition Division held that the amended claims of the main request met the requirements of Article 123(2) EPC but not those of Article 84 EPC, whereas the amended claims of the auxiliary request violated the provisions of Article 123(2) EPC.
- IV. This decision was appealed by the Patent Proprietor (hereinafter Appellant) who filed amended sets of claims in a new main and four auxiliary requests under cover of a letter dated 3 April 2006. The Opponents (hereinafter Respondents) filed submissions in reply.
- V. Upon requests made by all parties, oral proceedings before the Board of Appeal were held on 17 May 2006, in

the course of which the Appellant replaced the claims of the second to fourth auxiliary requests by new sets of claims.

The independent claims of the main request are identical with the corresponding granted claims and read:

"1. A high purity solvent composition which comprises a mixture of C₈ to C₂₀ n-paraffins and iso-paraffins boiling in the range 320° to 650°F (160° to 343.3°C); and which composition has (i) a molar ratio of iso-paraffins : n-paraffins from 0.5 : 1 to 9 : 1, and the iso-paraffins of the mixture contain greater than 50 percent of the mono-methyl species based on the total weight of the iso-paraffins in the mixture; (ii) a pour point in the range of from -20°F to -70°F (-28.9 to -56.7°C) and (iii) a viscosity in the range 1.82 cSt to 3.52 cSt (1,82 to 3.52 mm²/s) at 25°C.

6. A process for the production of the high purity solvent composition defined in any one of the preceding claims, comprising:

contacting a C₅₊ paraffinic feed, at least a fraction of which boils above 700°F (371°C) with hydrogen over a dual functional catalyst to effect hydroisomerization and hydrocracking reactions and 700°F+ (371°C+) conversion levels ranging from 20 percent to 90 percent on a once through basis based on the weight of total feed, to produce a crude fraction boiling between about C₅ and 1050°F (565.6°C);

topping said crude fraction by atmospheric distillation to produce a low boiling fraction having an upper end boiling point between 650°F (343.3°C) and 750°C (398.9°C) and a high boiling fraction having an initial boiling point between 650°F and 750°F (343.3°C to 398.9°C);

recovering from the low boiling fraction a said high purity solvent composition boiling in the range 320-650°F (160° to 343.3°C)."

The claims of the main request differ from the granted claims inter alia in that Claim 5 has been amended by introducing the term "produced by hydroisomerization and hydrocracking of Fischer-Tropsch waxes and" to read

"5. A solvent composition as claimed in any preceding claim, produced by hydroisomerization and hydrocracking of Fischer-Tropsch waxes and containing negligible amounts of aromatics, sulfur and nitrogen compounds."

The set of claims of the first auxiliary request differs from that of the main request essentially by the deletion of Claims 5 and 8 and by correspondingly renumbering of Claims 6, 7, 9 and 10.

Claim 1 of the second auxiliary request differs from Claim 1 of the main request by replacing the term "which comprises a mixture of C₈ to C₂₀ n-paraffins and iso-paraffins boiling in the range 320°to 650°F (160° to 343.3°C); and which composition has" by the term "characterized as a mixture of n-paraffins and iso-paraffins which composition has a carbon number ranging

from C₁₀ to C₁₆, boils in the range 350-550°F (176.7 to 287.8°C), and has".

Claim 1 of the third auxiliary request reads:

"1. A process for the production of a high purity solvent composition characterized as a mixture of n-paraffins and iso-paraffins which has a carbon number ranging from C₁₀ to C₁₆, comprising:

contacting a C₅₊ paraffinic feed, at least a fraction of which boils above 700°F (371°C) with hydrogen over a dual functional catalyst to effect hydroisomerization and hydrocracking reactions and 700°F+ (371°C+) conversion levels ranging from 20 percent to 90 percent on a once through basis based on the weight of total feed, to produce a crude fraction boiling between about C₅ and 1050°F (565.6°C);

topping said crude fraction by atmospheric distillation to produce a low boiling fraction having an upper end boiling point between 650°F (343.3°C) and 750°F (398.9°C) and a high boiling fraction having an initial boiling point between 650°F and 750°F (343.3°C to 398.9°C);

recovering from the low boiling fraction a said high purity solvent composition boiling in the range 350-550°F (176.7 to 287.8°C);

and which composition has (i) a molar ratio of iso-paraffins : n-paraffins from 0.5 : 1 to 9 : 1, and the iso-paraffins of the mixture contain greater than 50 percent of the mono-methyl species based on the total weight of the iso-paraffins in the mixture; (ii) a pour point in the range of

from -20°F to -70°F (-28.9 to -56.7°C) and (iii) a viscosity in the range 1.82 cSt to 3.52 cSt (1,82 to 3.52 mm²/s) at 25°C."

Claim 1 of the fourth auxiliary request differs from that of the third auxiliary request by replacing the term "characterized as" by "which is".

VI. The Appellant, submitted orally and in writing that the amendments made to the claims were allowable under Articles 123 and 84 EPC. In particular, it was argued

- that the amendments made to Claim 5 of the main request did not introduce a problem under Article 84 EPC since the amendment only limited the scope of protection;
- that the feature relating to the boiling range of the mixture in Claim 1 of the first auxiliary request did not add subject-matter which extended beyond the content of the application as filed (Article 123(2) EPC) since that feature was disclosed in original Claim 4, in particular, when taken in combination with the description of the application as filed;
- that Claim 1 of the second to fourth auxiliary requests was not in breach of Article 84 or 123(2) EPC since it was apparent from the application as filed that the mixture of paraffins was essentially identical with the solvent composition.

VII. The Respondents submitted that the Appellant's late filed requests were not admissible and maintained that

the claims of all requests were not allowable since they contained amendments which introduced non-clarity and subject-matter which extended beyond the content of the application as filed.

VIII. The Appellant requested that the decision under appeal be set aside and the case be remitted to the department of first instance for further prosecution on the basis of the claims according to the main or first auxiliary request submitted under cover of the letter dated 3 April 2006 or the claims according to one of the auxiliary requests two to four submitted during oral proceedings.

The Respondent requested that the appeal be dismissed.

Reasons for the Decision

1. Admissibility of the requests

Under the circumstances of the present case, the Appellant's late filed requests are held to be admissible since they constitute, in the Board's judgment, an attempt to overcome the Respondent's continued objections against the previous requests. No further details need to be given here, since the appeal fails on the grounds of Articles 84 and 123(2) EPC for the reasons set out below.

2. *Amendments (Articles 84 and 123(2) EPC)*

2.1 Main Request

The Appellant argued that the amendment made to Claim 5 changes its technical meaning only by limitation of its scope. This narrower scope was already encompassed by the composition of Claim 5 as granted which also contained the term "negligible amounts of aromatics, sulfur and nitrogen compounds". This term was, therefore, not open to objection under Article 84 EPC since it did not arise out of the amendment.

The Board does not agree since according to decision G 9/91 of the Enlarged Board of Appeal, in case of amendments of the claims in the course of opposition or appeal proceedings, such amendments are to be fully examined as to their compliance with the requirements of the EPC (OJ EPO 1993, 408, point 19). Consequently, amended claims are also open to examination under the aspects of Article 84 EPC.

In the present case, Claim 5 limits the solvent composition defined in the previous claims to those obtained by hydroisomerization and hydrocracking of Fischer-Tropsch (FT) waxes, whereas the composition of Claim 5 as granted was not restricted with regard to any particular source or origin from which it is derived. This implies, in the Board's view, necessarily, a change of the meaning or quality of the term "negligible" introduced by that amendment, since it is uncontested that the amounts of aromatics, sulfur and nitrogen compounds depend on the origin and/or pre-treatment of the composition.

The Board is, therefore, not only entitled but, according to G 9/91 (loc. cit.), actually obliged to assess whether the amended claim fulfils the requirements of the convention, including that of Article 84 EPC.

The term "negligible" is vague and not defined in the specification. Whilst it is indicated in the application as filed that slack waxes, which are no longer covered by the claim, are usually freed from aromatics and hetero-atom compounds to preferably contain sulfur and nitrogen levels of less than 5 ppm or 2 ppm, respectively (page 4, last to lines to page 5, line 2), no values are given for FT waxes after hydroisomerization and hydrocracking.

The Appellant argued that the content of aromatics, sulfur and nitrogen compounds in FT waxes was generally known in the art and, therefore, it was clear to those skilled in the art what was meant in the specific technical field of FT waxes by "negligible amounts of aromatics, sulfur and nitrogen compounds".

However, even if there existed general technical knowledge as to the content of these compounds in FT waxes, it remains nevertheless unclear whether such values are to be regarded as "negligible" or whether the inventions opts for still lower amounts, in particular since Claim 5 requires both, that the composition is produced by hydroisomerization and hydrocracking of FT waxes **and** that it contains negligible amounts of aromatics, sulfur and nitrogen compounds.

The Board concludes, therefore, that Claim 5 of the main request does not meet the requirements of Article 84 EPC.

Apart from the above, the Board notes that the main request is not allowable since Claim 1 thereof suffers further from the same deficiencies under Article 123(2) EPC as claim 1 of the first auxiliary request (see below).

2.2 First auxiliary request

Claim 1 requires that the solvent composition comprises **a mixture of C₈ to C₂₀ n-paraffins and iso-paraffins boiling** in the range 320° to 650°F.

Originally disclosed is a solvent composition comprising a mixture of C₈ to C₂₀ n-paraffins and iso-paraffins (Claim 1), wherein the **solvent mixture boils** within a range of from 320° to 650°F (Claim 4).

The Appellant argued that the term "solvent mixture" in original Claim 4 was synonymous with the term "mixture" in original Claim 1. This was apparent from the whole content of the original description. Reference was specifically made to the expressions "iso-paraffins of the mixture" and "paraffinic solvent mixture" mentioned on pages 2 and 3 of the application as filed.

The Board does not concur with the Appellant's view; in particular, no identity between the solvent mixture of original Claim 4 and the mixture of paraffins of

original Claim 1 can be established for the following reasons:

- The Appellant chose to give original Claim 1 the wording "... **solvent composition** which comprises a **mixture of paraffins** ...". The solvent composition of original Claim 1 is, therefore, not limited to paraffins but may contain substantial amounts of other, in particular, non-paraffinic components which are not defined.
- The Appellant further chose to define in original Claim 4 the composition of Claim 1 as one "wherein the **solvent mixture** boils at a temperature ranging from about 320°F to about 550°F".
- Identity between the terms "solvent mixture" and "mixture of paraffins" would exist if identity could be established for the terms "solvent composition" and "mixture of paraffins".
- However, a direct and unambiguous limitation of the solvent composition to the mixture of paraffins cannot be derived from the other original composition claims which further specify characteristics of either the mixture of paraffins (Claim 2), the mixture (Claim 3), the solvent mixture (Claims 4, 5 and 7), the solvent (Claim 6) or the paraffinic mixture (Claim 8).
- Neither does the corresponding part of the description of the application as filed allow identifying the solvent composition as the mixture of paraffins. This part is set out on pages 2

and 3 (3. Summary of the Invention) and reads
(emphasis added by the Board):

"The present invention accordingly, to meet these and other needs, relates to a high purity **solvent composition comprising a mixture of paraffins** having from about 8 to about 20 carbon atoms, i.e. C₈-C₂₀, preferably from about C₁₀-C₁₆, carbon atoms, in the molecule. The **solvent composition has an isoparaffin:n-paraffin ratio** ranging from about 0.5:1 to 9:1, preferably from about 1:1 to about 4:1. **The isoparaffins of the mixture** contain greater than fifty percent, 50%, mono-methyl species, ... , **based on the total weight of the isoparaffins in the mixture**. Preferably, **the isoparaffins of the mixture contain** greater than 70 percent of the mono-methyl species, **based on the total weight of the isoparaffins in the mixture**. The **paraffinic solvent mixture** boils within a range of from about 320 to about 650°F, and preferably within a range from about 350°F to about 550°F. In preparing the different solvent grades, the **paraffinic solvent mixture** is generally fractionated into cuts having narrow boiling range, i.e.,"

- It is irrelevant whether the ratio isoparaffins:n-paraffins or the percentage of mono-methyl species of the isoparaffins is related to the solvent composition or mixture of paraffins since in both cases the ratio or percentage would be dependent only on the relative amounts of iso-paraffins and/or n-paraffins.

- However, the term "paraffinic solvent mixture" used in the last two sentences and in relation to the boiling range suggests, in the Board's view, identity with the term "solvent composition comprising a mixture of paraffins" used in the first sentence, since a paraffinic solvent mixture is a solvent mixture having a paraffinic character but does not necessarily consist merely of paraffins.

The Board, therefore, concludes that there is no basis in the application as filed for a solvent composition comprising a mixture of paraffins which boils within the range of 320 to 650°F. Therefore, Claim 1 of the first auxiliary request does not meet the requirements of Article 123(2) EPC.

2.3 Second auxiliary request

Claim 1 relates to "a ... solvent composition **characterised as** a mixture of ... paraffins which composition has a carbon number ranging from C₁₀ to C₁₆, boils in the range of 350-550°F ...".

In the Appellant's opinion there was no lack of clarity introduced by the amendment, in particular by the term "characterised as" since the meaning of that phrase was that the solvent composition was essentially a mixture of paraffins. This was apparent from the whole disclosure of the application as filed, in particular, from the term "paraffinic solvent composition" used throughout the application and from the disclosed relationship between the invention and the prior art solvents NORPAR and ISOPAR which are constituted almost

entirely of paraffins. Thus, the term "characterised as" had the same meaning as "consisting of" in the sense of "consisting essentially of" or "including only normal impurities".

The term "characterised as" is not defined in the application as filed but from the term itself, the Board concurs with the Appellant's definition given in its letter dated 3 April 2006 (page 8), namely to mean "having the character of". This term, on the other hand, does not necessarily mean physical and chemical identity but includes similarity of the features. Moreover, a mixture of paraffins may have a variety of different chemical and physical characters so that it may or may not be sufficient for a composition to be considered as having the character of paraffins if it has e.g. a similar oily or waxy appearance as paraffins but is otherwise quite different.

In particular, the Board does not see any reasons to conclude that a solvent composition which has the character of a mixture of paraffins necessarily consists of such paraffins since other components may be present in considerable amounts without dominating the "character" of the composition, i.e. without destroying e.g. the oily or waxy appearance of the composition.

It is also not possible to clarify the meaning of the term "characterised as" by the phrase "paraffinic solvent composition" used in the application as filed (e.g. title; page 1, first paragraph; page 3, line 1) since as explained above under 2.2, this latter phrase

would also simply mean that the composition may contain considerable amounts of other components.

The particular prior art solvents, NORPAR and ISOPAR, referred to in the application as filed are disclosed as "constituted almost entirely of C₁₀-C₁₅ linear ... paraffins" (page 1, second paragraph) or "constituted of mixtures of highly branched paraffins" (page 2, lines 1 to 5), respectively. It would have been only logical to use the same expression in relation to the invention, if it was intended to indicate the same level of purity. Instead, the Appellant chose to use vague terms like "comprising", "characterised as" or "paraffinic" in order to define the claimed composition.

However, whatever the purity of the NORPAR and ISOPAR solvents may be, the processes for their production via the ENSORB process or from alkylate bottoms (page 1, second paragraph and page 2, first paragraph) are fundamentally different to the process disclosed in the application as filed for the claimed solvents. Therefore, any particular purity of the NORPAR and ISOPAR solvents does not automatically transfer to the claimed solvents.

For these reasons, the Board finds that the term "characterised as" introduces non-clarity contrary to the provisions of Article 84 EPC.

2.4 Third auxiliary request

Claim 1 is formulated as a "product-by-process" and contains also the phrase "a ... solvent composition **characterised as** a mixture of ... paraffins".

The claim "comprises" several process steps but is not restricted to those. Therefore, the term "characterised as" does not get a more specific meaning via the process steps. In particular, it does not change its meaning into "consisting of" since it covers processes having process steps which introduce components other than the paraffins.

Therefore, the above objection under Article 84 EPC to Claim 1 of the second auxiliary request applies mutatis mutandis to Claim 1 of the third auxiliary request.

2.5 Fourth auxiliary request

Claim 1 relates to "a process for the production of a high purity solvent composition **which is** a mixture of n-paraffins and iso-paraffins which has a carbon number ranging from C₁₀ to C₁₆" and comprises the same process steps as Claim 1 of the third auxiliary request.

As indicated above under points 2.2 to 2.4, the application as filed does not provide any basis for a composition consisting (essentially) of n-paraffins and iso-paraffins having a carbon number ranging from C₁₀ to C₁₆, in particular, if the process features are open to modification. Apart from the fact that Claim 1 is not restricted thereto, the Board might agree that the particular process conditions disclosed in the

application as filed (page 9 to 10) leading to sample No. 2 could give a solvent composition consisting (essentially) of a mixture of C₁₀ to C₁₆ n- and iso-paraffins. However, such particular process conditions are not reflected in Claim 1 and the composition of sample No. 2 would not fulfil the pour point and viscosity requirement of Claim 1 (see Tables 2 and 3 of the application as filed).

The Board, therefore, finds that the amendments made in Claim 1 of the fourth auxiliary request violates the provisions of Article 123(2) EPC.

3. Since no allowable request is on file, there is no basis for further prosecution of the present case.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:

G. Rauh

P. Krasa