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**Datasheet for the decision
of 11 August 2010**

Case Number: T 0036/09 - 3.3.06

Application Number: 00202579.9

Publication Number: 1070755

IPC: C10L 1/18

Language of the proceedings: EN

Title of invention:

Liquid mixture consisting of diesel gas oils and oxygenated compounds

Patentee:

SNAMPROGETTI S.p.A.

Opponent:

BASF SE

Headword:

Diesel gas oil/SNAMPROGETTI

Relevant legal provisions:

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Relevant legal provisions (EPC 1973):

EPC Art. 54(1)(2), 56

Keyword:

"Admissibility of late filed evidence (no)"

"Novelty (yes)"

"Inventive step (yes)"

Decisions cited:

T 0711/90, T 0425/98

Catchword:

-



Case Number: T 0036/09 - 3.3.06

D E C I S I O N
of the Technical Board of Appeal 3.3.06
of 11 August 2010

Appellant: BASF SE
(Opponent) D-67056 Ludwigshafen (DE)

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Decision under appeal: Decision of the Opposition Division of the
European Patent Office posted 27 October 2008
rejecting the opposition filed against European
patent No. 1070755.

Composition of the Board:

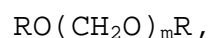
Chairman: P.-P. Bracke
Members: L. Li Voti
U. Tronser

Summary of Facts and Submissions

I. The present appeal is from the decision of the Opposition Division to reject the opposition against the European patent no. 1 070 755, granted with a set of 8 claims, claim 1 of which reads as follows:

"1. A liquid mixture having a cetane number higher than 40 characterized in that it consists of:

- a typical diesel gas oil cut having a boiling point ranging from 150 to 380°C and a density ranging from 0.76 to 0.935 g/ml at 15°C;
- one or more compounds selected from dialkyl-polyformals represented by the formula



wherein

R is a $\text{C}_n\text{H}_{2n+1}$ alkyl chain,

m is an integer equal to or greater than 2 and less than or equal to 6,

n is an integer ranging from 1 to 10,

wherein the concentration of said dialkyl-polyformals in the gas oil ranges from 1 to 20% by volume."

Claims 2 to 5 relate to particular embodiments of the liquid mixture of claim 1.

Claims 6 to 8 relate to the liquid mixture of claim 1 wherein cetane raisers are added to the typical diesel gas oil cut.

II. In its notice of opposition the Opponent sought revocation of the patent on the grounds of Article 100(a) EPC 1973, because of lack of novelty and inventive step of the claimed subject-matter, and referred *inter alia* to the following documents:

(1): US-A-5746785;

(2): WO 86/03511 and

(6): Römpps Chemie-Lexikon, 8th edition, 1981, page 948, "Dieselkraftstoffe".

III. The Opposition Division found in its decision *inter alia* that

- document (1) disclosed a diesel fuel containing a mixture of dimethyl polyformals (MTPOM); however, this document did not disclose the composition or any individual component of such a mixture; therefore, document (1) did not disclose a diesel fuel containing dialkyl polyformals wherein m is an integer from 2 to 6 and the claimed subject-matter could not be considered to represent a selection from a single list of specifically disclosed elements;
- the granted claims thus were novel over the cited prior art;
- moreover, starting from the teaching of document (2), the skilled person would not have selected the dialkyl polyformals disclosed in document (1) as alternative to the oxygenated derivatives disclosed in document (2) in order to provide a

diesel fuel composition having an increased cetane number as shown in the patent in suit and in the experimental evidence submitted by the Patent Proprietor;

- therefore, the claimed subject-matter also involved an inventive step.

IV. An appeal was filed against this decision by the Opponent (Appellant).

The Appellant submitted with fax of 19 July 2010 further submissions containing an experimental report accompanied with documents (E1), (E2) and (E3).

V. As regards the admissibility of the evidence filed with fax of 19 July 2010 the Appellant submitted during oral proceedings that the written submissions contained a clear analysis of the experimental report and of the arguments based on it; moreover, this evidence related to arguments already submitted in the statement of the grounds of appeal; therefore, even though the evidence had been submitted only less than one month before the oral proceedings of 11 August 2010, it could not be considered to disadvantage the other party and should be admitted.

Furthermore, the Appellant submitted in writing and orally *inter alia* that

- document (1) disclosed a diesel fuel containing a mixture of MTPOM of various molecular weights wherein m was an integer from 1 to 10; therefore, the mixture disclosed in document (1) contained

also at least some compounds wherein m was an integer from 2 to 6 and the selection of such a range of compounds could not be considered to establish novelty; since all other features of the diesel fuel were either implicitly or explicitly disclosed in document (1), the subject-matter of claims 1 to 5 lacked novelty;

- as regards inventive step, the claimed subject-matter lacked inventive step either in the light of the teaching of documents (1) or (2) taken alone or of the combination of document (2) with document (1).

VI. The Respondent (Patent Proprietor) submitted in writing and orally *inter alia* that

- it had not sufficient time left for evaluating and verifying the evidence submitted with fax of 19 July 2010 without an adjournment of the oral proceedings; therefore, this evidence was not to be admitted into the proceedings;
- document (1) did not contain any specific disclosure of the individual components of the mixture of MTPOM used; therefore, it could not disclose a mixture containing solely components wherein m was an integer from 2 to 6; the claimed subject-matter thus was novel over the cited prior art;
- as regards inventive step, document (1) clearly taught that dimethyl polyformals were not able to increase the cetane number of diesel fuel;

therefore, the skilled person would not have find any incentive to replace the oxygenated derivatives used in document (2) with one of the dialkyl polyformals of the patent in suit in order to increase the cetane number of diesel fuel;

- therefore, the claimed subject-matter involved an inventive step.

VII. The Appellant requests that the decision under appeal be set aside and that the patent be revoked.

VIII. The Respondent requests that the appeal be dismissed or the patent be maintained on the basis of the auxiliary request submitted with the letter dated 1 October 2008.

Reasons for the Decision

1. *Respondent's main request (patent as granted)*

1.1 Admissibility of late filed experimental evidence and documents (E1) to (E3)

1.1.1 The above evidence has been submitted on 19 July 2010 more than one year after the Respondent's reply of 8 July 2009 to the statement of the grounds of appeal and the Appellant had not informed in the meantime the other party and the Board of its intention to submit additional evidence.

Therefore, the Respondent had less than one month left before oral proceedings for preparing the case in the light of the new evidence and new arguments submitted

by Appellant. This is, independently on the complexity of the newly submitted evidence, a much shorter time than that passed between the Respondent's reply to the statement of the grounds of appeal and the filing of the Appellant's new experimental report and certainly not sufficient time for preparing any possible experimental counter evidence.

Therefore, the Board finds that the admission of this new evidence into the proceedings without adjourning oral proceedings would have adversely affected the Respondent even if it relates to arguments already submitted in the statement of the grounds of appeal and that its admission would have been contrary to the principle of equal treatment of the parties.

The Board thus concludes that the experimental report submitted with letter of 19 July 2010 and the accompanying documents (E1) to (E3) were not to be admitted into the proceedings.

1.2 Novelty

1.2.1 Claim 1 relates to a liquid composition consisting of a diesel oil cut and a specific additive (see point I above).

1.2.2 The used wording "consisting of" indicates unequivocally that the claimed composition is made of the components listed in the claim, which components make up the composition to 100% (see for example, T 711/90, point 2 of the reasons and T 425/98, point 3.1 of the reasons).

Therefore, the composition of claim 1 may comprise only a typical diesel gas oil cut, i.e. the heaviest part of a medium distillate containing also both straight-run distillates and analogous cuts coming from conversion processes (see paragraph 2 of the patent in suit), and dialkyl polyformals of the formula given in claim 1 wherein m is an integer from 2 to 6, i.e. dialkyl polyformals having 2 to 6 oxymethylene groups, in an amount of 1 to 20% by volume of the gas oil.

1.2.3 Document (1) discloses a liquid composition comprising a diesel fuel and a mixture of alkoxy-terminated polyoxymethylenes, i.e. dialkyl polyformals, having a molecular weight of about 80 to 350 and at least one oxymethylene group (see claim 1 and column 2, lines 20 to 27). In particular, it discloses a mixture of a diesel fuel DF-2 and 15% by volume of MTPOM, i.e. a mixture of methoxy-terminated polyoxymethylenes (dimethyl polyformals) having a molecular weight from about 80 to about 350 (see column 3, lines 25 to 28 and 42 to 45; table 1).

Since the molecular weight of dimethyl formal, i.e. a MTPOM with only one oxymethylene group, is 76 and that of a MTPOM with two oxymethylene groups is 106, a mixture having a molecular weight of 80 contains necessarily a consistent amount of dimethyl formal which is not one of the components of claim 1. Moreover, a mixture of MTPOM with a molecular weight of 350 contains necessarily a substantial amount of components wherein m is an integer above 6 since the molecular weight of a MTPOM with 10 oxymethylene groups is 346, which components are also not encompassed by the wording of claim 1.

Moreover, document (1) does not contain an individualised disclosure of any other specific component of the mixture of MTPOM used; therefore, it does not disclose any of the components of claim 1 containing 2 to 6 oxymethylene groups in an amount of 1 to 20% by volume of the diesel fuel.

- 1.2.4 The Board finds also that, in order to arrive at the claimed subject-matter from the disclosure of document (1), it is necessary to select a **specific amount of undisclosed specific components** of the mixture of MTPOM from the broader teaching of this document and **to exclude the presence** of other MTPOM wherein m is not an integer from 2 to 6.

Therefore, document (1) does not disclose the specific limited class of compositions claimed in the patent in suit.

The subject-matter of claim 1 thus is novel over document (1).

- 1.2.5 The same reasoning applies to claims 2 to 5 according to the main request which relate to specific embodiments of the subject-matter of claim 1.

- 1.2.6 The novelty of claims 6 to 8 was not contested by the Appellant.

1.3 *Inventive step*

- 1.3.1 The present invention concerns a liquid mixture consisting of diesel gas oil and specific dialkyl polyformals (paragraph 1 of the patent in suit).

The description of the patent in suit explains that there was a striving towards diesel products having a higher cetane number and that there existed in the prior art alternative processes for improving the quality and the cetane number of gas oil as well as additives which could be blended with gas oil in order to improve the cetane number (see paragraphs 4, 5, 7, 8 and 10).

According to the description the technical problem underlying the invention is considered to be the provision of alternative additives which provide an increased cetane number and an increased oxygen percentage when blended with gas oil (paragraph 15).

- 1.3.2 Document (1) concerns the improvement of the lubricity and smoke generation properties of a diesel fuel without compromising its autoignition capacity (column 1, lines 14 to 18 and 34 to 57). Moreover, this document states that the oxygenated additives used have a negligible effect on the cetane rating (column 4, lines 1 to 3).

Document (2) relates to the use of oxygenated additives for improving the quality of gas oil and teaches that these additives can be used to improve *inter alia* the cetane number (see page 2, lines 1 to 4; page 2, last line to page 3, line 6).

Even though both documents (1) and (2), by using oxygenated additives, relate to an improvement of the oxygen percentage of a gas oil, only document (2) concerns both technical problems addressed to in the patent in suit; therefore, document (2) has to be chosen as the most suitable starting point for the evaluation of inventive step instead of document (1) which does not concern the increase of the cetane number of gas oil.

- 1.3.3 Since document (2) already provided oxygenated additives which improve the cetane number and the oxygen percentage of gas oil (see the above mentioned passages of document (2) as well as page 6, line 29 to page 7, line 1; table 1 on page 7 and example 8), the alleged technical problem underlying the invention can only be formulated as the provision of other additives which also provide increased cetane number and oxygen percentage when blended with gas oil.

The Board cannot agree in this respect with the Appellant's opinion that the technical problem underlying the invention would not regard the improvement of the cetane number of diesel gas oil but only the provision of a mixture having a cetane number above 40. In fact, the technical feature of claim 1 regarding the cetane number of the claimed composition intends only to limit the extent of the claim, which excludes mixtures having a lower cetane number, but has no relation to the technical problem underlying the invention clearly indicated in the patent in suit, i.e. the increase of the cetane number and oxygen percentage of a gas oil.

The patent in suit contains some examples which show the efficiency of the chosen additives in increasing the cetane number of gas oil (see paragraphs 18, 19 and table A). Moreover, the Respondent had submitted before the department of first instance experimental evidence, which was incorporated in its letter of 8 July 2009 during appeal (pages 17 and 21), showing that the chosen additives improve the cetane number and the oxygen percentage of gas oil.

Therefore, the Board has no reason to doubt that the technical problem mentioned above has been successfully solved by means of the subject-matter of claim 1.

- 1.3.4 Even though document (2) discloses some additives which bring about technical advantages similar to those achieved in the patent in suit (see point 1.3.3 above), the compounds used in document (2) differ from those of the patent in suit insofar as they do not contain oxymethylene groups but oxyalkylene groups having 2 to 6 carbon atoms (see page 2, lines 5 to 17). For example, example 8 relates to an additive containing butyloxy groups and capable of increasing the cetane number.

This document does not contain any suggestion to use different compounds having oxymethylene groups for solving a similar technical problem.

Moreover, even though dialkyl polyformals containing oxymethylene groups were known from document (1) (see point 1.2.3 above), this document contained a clear teaching that such additives would not increase the

cetane number of gas oil (see column 4, lines 1 to 3 of document (1)).

The Board finds also that the Appellant's allegation that the skilled person would have been able to obtain an increased cetane number by reworking the teaching of document (1), as allegedly shown in the Appellant's experimental report submitted with the letter of 17 May 2005 before the department of first instance, is not relevant for the evaluation of inventive step.

In fact, the composition of MTPOM disclosed in document (1) and reworked by the Appellant is unknown and may contain compounds outside the extent of claim 1 as explained in point 1.2.3 above and there was no teaching in the prior art at the priority date of the patent in suit that MTPOM could improve the cetane number of a diesel fuel.

Therefore, the skilled person would not have tried the class of compounds of document (1) as alternative to the compounds used in document (2) with the expectation of increasing the cetane number of gas oil.

- 1.3.5 Furthermore, the skilled person, starting from the teaching of document (2), would have been aware that not all the additives exemplified in this document were able to provide an increased cetane number (see table 1 on page 7; examples 6, 7, 9, 10, 13, 15 and 20). Therefore, looking for further compounds capable of providing both increased oxygen percentage and cetane number, he would have first looked for other compounds encompassed by the broad structural general formula of the oxygenated compounds indicated in this document

(page 2, lines 5 to 18) but different from those exemplified in table 1 and would have had no reason to expect that a structural modification of this general formula could bring about an improvement of the cetane number.

Moreover, the teaching of document (1) discussed in point 1.3.4 hereinabove would have rather led the skilled person away from trying compounds having a structural formula containing oxymethylene groups as required in claim 1 according to the main request for solving the above mentioned technical problem.

1.3.6 Therefore, the Board concludes that the claimed subject-matter involves an inventive step over the cited prior art.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:

G. Rauh

P.-P. Bracke