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DECISION
of 5 September 2003

Case Number: T 0134/00 - 3.3.6

Application Number: 93902205.9

Publication Number: 0623163

IPC: C10L 1/14

Language of the proceedings: EN

Title of invention:
Additives and fuel compositions

Patentee:
Exxon Mobil Chemical Patents Inc.

Opponent:
Clariant GmbH

Headword:
Additives and fuel compositions/EXXON

Relevant legal provisions:
EPC Art. 54, 56
EPC R. 57(a)

Keyword:
"Novelty (main request) - no"
"Novelty (first auxiliary request) - yes"
"Reformulation of the technical problem - necessary: available experimental evidence not making credible the presence of an unexpected improvement for all the possible combinations of components encompassed by claim 1"
"Inventive step (first auxiliary request) - no: provision of an alternative: obvious to try"
"Admissibility of an amendment (second auxiliary request) - no: superfluous amendment which does not arise from any of the grounds for opposition"

Decisions cited:

T 0511/92, T 0585/92

Catchword:

Disclaimer (originally disclosed) relating to the components of a fuel additive is not limiting the scope of a claim to a fuel comprising this additive (points 1.2.1 and 1.2.2)



Case Number: T 0134/00 - 3.3.6

D E C I S I O N
of the Technical Board of Appeal 3.3.6
of 5 September 2003

Appellant: ExxonMobil Chemical Patents Inc.
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Decision under appeal: Decision of the Opposition Division of the
European Patent Office posted 3 December 1999
revoking European patent No. 0623163 pursuant
to Article 102(1) EPC.

Composition of the Board:

Chairman: P. Krasa
Members: L. Li Voti
C. Rennie-Smith

Summary of Facts and Submissions

- I. The present appeal is from the decision of the Opposition Division to revoke European patent No. 0 623 163 relating to additives and fuel compositions.
- II. A notice of opposition was filed against the patent, wherein the Respondent (Opponent) sought revocation of the patent on the grounds of Article 100(a) EPC, in particular because of an alleged lack of novelty and inventive step of the claimed subject-matter.

The opposition was based *inter alia* upon the following document:

(9): US-A-3850587

- III. In its decision, the Opposition Division found in particular that
- document (9), dealing with the same technical problem as the patent in suit, represented the closest prior art;
 - this document disclosed fuel compositions similar to those claimed in the patent in suit and comprising an ethylene-vinyl acetate copolymer (hereinafter referred to as **EVA**) and a demulsifier derived from a phenolic resin;
 - even though the compositions exemplified as tests 7 to 9 in Table II of document (9) contained only 0.5 to 1.5 ppm of demulsifier, this document

taught that the demulsifier could be present in an amount of up to 50 ppm;

- the comparative tests of Table 3 of the patent in suit showed a synergistic improvement of the cold flow properties of the fuel for a specific combination of demulsifier and cold flow improving agents; these tests could not be taken, however, as evidence of the achievement of a similar effect throughout all the possible combinations encompassed by claim 1 of the patent in suit;

- the claimed subject-matter thus lacked an inventive step in the light of document (9).

IV. An appeal was filed against this decision by the Patent Proprietor.

Following a communication by the Board, the Appellant filed under cover of a letter dated 21 August 2003 three sets of amended claims A, B or C to be considered, respectively, as main, first and second auxiliary requests and an experimental report.

During the oral proceedings, held before the Board on 5 September 2003, the Appellant filed an amended set of claims A to be considered as main request.

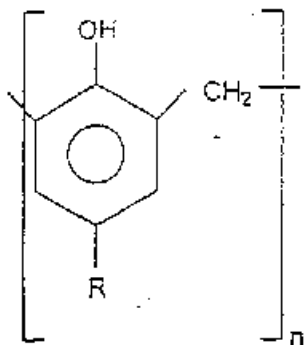
Claim 1 of set A (**main request**) reads as follows:

"1. A fuel oil composition consisting of a mixture of a major proportion of a middle distillate fuel oil and a minor proportion of an additive composition comprising

(i) one or more non-metallic flow improving oil soluble addition products or condensates capable of improving, either jointly or singly, one or more cold flow properties of a fuel oil, selected from one or more of:

(a) an ethylene-vinyl ester copolymer, (b) a comb-like polymer, (c) a polar nitrogen-containing compound or compounds comprising an amine salt or an amide or both formed by reacting at least one molar proportion of a hydrocarbyl substituted amine with a molar proportion of a hydrocarbyl acid having 1 to 4 carboxylic acid groups or its anhydride, and

(ii) a non-metallic oil soluble demulsifier for fuel oil-water emulsions, said demulsifier having a hydrophobic part and a hydrophilic part and being a condensate comprising, as the hydrophobic part, a part derived from a precursor having one or more groups capable of a condensation reaction to form oxyalkylated groups, bonded to one or more oxyalkylated groups comprising the hydrophilic part, wherein the precursor for the demulsifier comprises a phenolic resin of the general formula



where R represents an aliphatic hydrocarbyl group having from 3 to 24 carbon atoms, and n represents an integer from 4 to 20, optionally together with one or

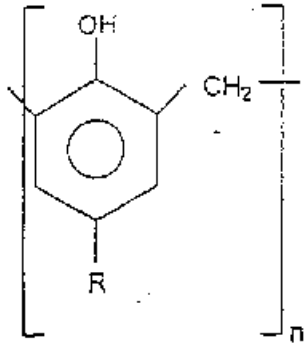
more additional demulsifiers, wherein the demulsifier is present at a concentration of from 5 to 50 ppm by weight based on the weight of the middle distillate fuel oil, provided that the component (i) is not a combination of a substituted succinic acid derivative and an ethylene-vinyl acetate copolymer."

Claim 1 of set B (**first auxiliary request**) reads as follows:

"1. An additive composition in admixture with a major proportion of a middle distillate fuel oil, the additive composition constituting a minor proportion and comprising

(i) a non-metallic flow improving oil soluble condensate capable of improving one or more cold flow properties of a fuel oil, the flow improving condensate being a polar nitrogen-containing compound which is the amide-amine salt formed by reacting 1 molar portion of phthalic anhydride with 2 molar portions of dihydrogenated tallow amine, and

(ii) a non-metallic oil soluble demulsifier for fuel oil-water emulsions, said demulsifier having a hydrophobic part and a hydrophilic part and being a condensate comprising, as the hydrophobic part, a part derived from a precursor having one or more groups capable of a condensation reaction to form oxyalkylated groups, bonded to one or more oxyalkylated groups comprising the hydrophilic part, wherein the precursor for the demulsifier comprises a phenolic resin of the general formula



where R represents an aliphatic hydrocarbyl group having from 3 to 24 carbon atoms, and n represents an integer from 4 to 20."

Claim 1 of set C (**second auxiliary request**) differs from claim 1 of set B only insofar as the claim contains, after (ii) as just cited, the additional wording "provided that the component (i) is not a combination of a substituted succinic acid derivative and an ethylene-vinyl acetate copolymer."

All three sets of claims are accompanied by a dependent claim 2, relating to a specific embodiment of the claimed composition, and by claims 3 and 4 relating to the use of the additive compositions defined in the product claims.

V. As regards novelty of the subject-matter of claim 1 of set A, the Appellant submitted in writing and in the oral proceedings before the Board that:

- the disclaimer contained in claim 1 of the main request excluded compositions containing a combination of a substituted succinic acid derivative and an EVA as cold flow improving component (i);

- even if claim 1 were to be interpreted as encompassing fuel compositions comprising succinic acid derivatives as additional components, document (9) did not disclose all the features of claim 1 in combination and in particular did not disclose the use of the specific demulsifier of claim 1 in the required amount;
- the subject-matter of claim 1 of the main request had thus to be regarded as being novel.

As regards inventive step of all requests the Appellant submitted that:

- the claims related to a combination of fuel additives comprising a selected demulsifier and showing surprisingly a synergistic improvement of the fuel low temperature properties, as shown in examples 15 to 18 in Table 3 of the patent in suit;
- document (9) did not contain any suggestion that the demulsifier used in the disclosed compositions would have any influence on the cold flow properties of the fuel; on the contrary, it regarded the combination of succinic acid derivative and EVA as responsible for the obtained effect (column 9, lines 36 to 38);
- the experimental report filed under cover of a letter dated 21 August 2003 showed, additionally, that a combination of EVA, a selected demulsifier and a reaction product of phthalic anhydride and dihydrogenated tallow amine was superior to a

similar combination containing the succinic acid derivative used in document (9) instead of that reaction product;

- therefore, the prior art did not suggest the use of the claimed combination of components for achieving a synergistic improvement of the fuel low temperature properties.

VI. The Respondent argued in writing and in the oral proceedings *inter alia* that:

- the fuel composition of claim 1 of the main request had to be interpreted as still encompassing succinic acid derivatives as possible further components; therefore, this claim lacked novelty in the light of the disclosure of document (9), especially considering the combination of claim 6 of this document with the preferred demulsifier concentrations listed in Table I.

As regards inventive step of the first auxiliary request it submitted that

- it was obvious for the skilled person to add to the fuel compositions known from document (9) additional known cold flow improving components and no evidence had been provided that the addition of the known amide-amine salt formed by reacting 1 molar portion of phthalic anhydride with 2 molar portions of dihydrogenated tallow amine brought about a surprising advantage;

- the claimed subject-matter thus lacked inventive step.

Finally, claim 1 of set C differed from claim 1 of set B only insofar as it contained the additional wording "provided that the component (i) is not a combination of a substituted succinic acid derivative and an ethylene-vinyl acetate copolymer."

Since component (i) was already identified in the claim to be a different compound, i.e. a specific amide-amine salt, this amendment did not add any further limitation to the previous claim and was thus superfluous. Therefore, this amendment could not be considered to arise from any of the grounds for opposition and contravened the requirements of Rule 57(a) EPC.

- VII. The Appellant requests that the decision of the first instance be set aside and the patent be maintained on the basis of one of the set of claims A (filed during the oral proceedings) or B or C (both of them filed on 21 August 2003).

The Respondent requests that the appeal be dismissed.

- VIII. At the end of the oral proceedings, the chairman announced the decision of the Board.

Reasons for the decision

1. *Set A (main request)*

1.1 Articles 123(2) and (3) and 84 EPC

The Board is satisfied that the amended claims according to this request comply with the requirements of Articles 123(2) and (3) and 84 EPC.

Since this request fails on other grounds further details are unnecessary.

1.2 Novelty

1.2.1 Claim 1 relates to a fuel oil composition consisting of a mixture of a major proportion of a middle distillate fuel oil and a minor proportion of an additive composition comprising

- (i) one or more non-metallic flow improving oil soluble addition products or condensates selected from one or more of (a) an EVA, (b) a comb-like polymer and (c) a polar nitrogen-containing compound formed by reacting at least one molar proportion of a hydrocarbyl substituted amine with a molar proportion of a hydrocarbyl acid having 1 to 4 carboxylic acid groups or its anhydride, and
- (ii) from 5 to 50 ppm by weight based on the weight of the middle distillate fuel oil of a specific non-metallic oil soluble demulsifier, the precursor of which comprises a phenolic resin.

The wording of claim 1 thus requires that the additive composition comprises at least the components of type (i) and (ii). However, it can also comprise other additive components.

Claim 1 also requires as a disclaimer already disclosed in the application as originally filed that component (i) is not a combination of a substituted succinic acid derivative and an EVA (see above point IV).

This alleged disclaimer is therefore directed to exclude this specific combination only as component (i) and not from the total fuel composition.

- 1.2.2 It is undisputed that many additives of fuel oil compositions may have more than one function in the final composition and it is also undisputed that it cannot be determined in the final fuel oil composition if a specific additive has been added for one particular purpose or another. Therefore, the above mentioned disclaimer does not exclude that one or both of the specified additives, i.e. EVA and the succinic acid derivative, may be present in the claimed fuel composition as further additives, e.g. as a component (iii), in addition to components (i) and (ii), or that one of them, e.g. EVA, may be present as additive (i) and the other one as further additive (iii).

The Board concludes therefore that the alleged disclaimer contained in claim 1 does not exclude the presence of the two specified components in the total fuel composition and is not apt to limit further the claimed composition. Therefore, it can be disregarded

for the assessment of the patentability of the claimed subject-matter.

- 1.2.3 According to the established jurisprudence of the Boards of Appeal, a prior art disclosure is novelty destroying if it discloses directly and unambiguously the subject-matter in question (see e.g. T 0511/92, unpublished in OJ EPO, point 2.2 of the reasons for the decision).

The embodiment reported in claim 6 of document (9) is a fuel composition comprising a major amount of a middle distillate hydrocarbon fuel and a small proportion of additives comprising a demulsifier as claimed in claim 1, an EVA which is a flow improving additive according to class (i) of the attacked claim 1, a succinic acid derivative and an aromatic monocarboxylic acid which are additives not excluded by the wording of claim 1 as explained hereinabove. This embodiment finds its counterpart in the generic teaching of column 2, lines 29 to 53; column 5, lines 38 to 65 and column 6, lines 57 to 58 of the description.

Document (9) also indicates also the necessary concentrations of the various components in order to improve the cold flow properties of the fuel in which they are contained (see column 7, lines 17 to 19 and the following Table I). According to Table I the demulsifier must be contained in a preferred range of 0.5 to 15 ppm, which largely overlaps with the range of 5 to 50 ppm according to claim 1 of the patent in suit.

The Board is therefore convinced that the skilled person would understand these preferred concentrations

for the demulsifier to apply to any used demulsifier and thus also to the specific demulsifier of the embodiment of claim 6.

Therefore, the Board concludes that document (9) discloses directly and unambiguously all the features of claim 1 in combination. The subject-matter of claim 1 thus lacks novelty.

Since the main request must be dismissed on these grounds, there is no need to deal with the other objections raised by the Respondent against this request.

2. *Set B (first auxiliary request)*

2.1 *Articles 123(2) and (3) and 84 EPC*

The Board is satisfied that the amended claims according to this request comply with the requirements of Articles 123(2) and (3) and 84 EPC.

Since this request fails on other grounds further details are unnecessary.

2.2 *Novelty*

Claim 1 of this request requires the presence of an amide-amine salt formed by reacting 1 molar portion of phthalic anhydride with 2 molar portions of dihydrogenated tallow amine as component (i).

Since this specific component (i) is not disclosed in document (9), the subject-matter of this claim is novel.

Novelty was also not challenged by the Respondent.

2.3 Inventive step

2.3.1 Claim 1 of set B relates to a mixture of a minor proportion of an additive composition with a major proportion of a middle distillate fuel oil, wherein the additive composition necessarily comprises an amide-amine salt formed by reacting 1 molar portion of phthalic anhydride with 2 molar portions of dihydrogenated tallow amine as component (i) and a specific non-metallic oil soluble demulsifier, the precursor of which comprises a phenolic resin as component (ii). The additive composition of claim 1 can moreover still encompass other additive components.

According to the description of the patent in suit, additives suitable for improving the cold flow properties of fuel oils were known in the art (page 2, lines 3 to 10). There was, however, still a need to improve the performance of these known additives (page 2, lines 17 to 18).

Thus, according to the patent in suit, the alleged technical problem underlying the claimed invention should be seen in the provision of additional components that are not by themselves cold flow improving agents and which, in combination with known cold flow improving agents, lead to an optimisation, in

the present case a synergistic improvement, of the cold flow properties of the fuel in which they are used.

- 2.3.2 The Board finds, in agreement with both parties, that document (9) represents the most reasonable starting point for evaluating inventive step, since it deals with the use of a combination of additives for improving the cold flow properties of a middle distillate fuel (see column 2, lines 29 to 54 and column 6, lines 50 to 57).

This document discloses a fuel composition comprising a major amount of a middle distillate hydrocarbon fuel and a small proportion of additives comprising *inter alia* a demulsifier as claimed in claim 1 and an EVA which is a cold flow improving additive as explained in point 1.2.3 above.

Therefore, the composition of this document differs from the subject-matter of claim 1 insofar as it does not contain an amide-amine salt formed by reacting 1 molar portion of phthalic anhydride with 2 molar portions of dihydrogenated tallow amine.

- 2.3.3 The comparative tests contained in the patent in suit (see Table 3 on page 12) show that the selected demulsifier (ii) has in itself no cold flow improving properties (see examples 13 and 14) and that the addition of the demulsifier to a combination of EVA and the amide-amine salt nevertheless leads to a further improvement of the cold flow properties of the fuel (see examples 18 and 16). The experimental report filed under cover of a letter of 21 August 2003 confirms that such a combination is very effective in improving the

cold flow properties, as compared to other cold flow increasing formulations.

However, this experimental evidence is based on compositions always comprising the further cold flow improving component EVA, which is not an essential component of claim 1. The Opposition Division remarked in its decision (point 4.4. of the grounds for the decision) that this evidence could not be considered sufficient to establish that such a synergistic improvement of the cold flow properties of the fuel composition was achieved for all possible compositions encompassed by claim 1 (for example for a composition not comprising EVA).

In a case such as the present, where the patent was revoked by the Opposition Division, the Appellant has the burden of demonstrating that the decision under appeal was not correct (see e.g. T 585/92, OJ EPO 1996, 129, point 3.2 of the reasons for the decision). In the present case the Appellant has not discharged this burden.

Moreover, the Board observes that the available evidence does not establish that this effect can be achieved for any possible ratio of the various components, for example when using greater amounts of demulsifier and smaller amounts of flow improving component (i).

In the present case the alleged technical problem lies in the achievement of an unexpected improvement based on a synergistic effect by the use of a component which was known to have no effect by itself. The Board finds

that in these circumstances the required supporting evidence should be so comprehensive that the data shown in such evidence can be reasonably extrapolated across the whole scope of the claim.

Instead the available experimental evidence, as already explained above, supports the presence of an effect only for a specific combination of components and even then not for any possible ratio of components (i) and (ii). The Appellant had moreover simply submitted that it is its belief that the same effect would be achieved with the other embodiments covered by claim 1. Such an unsupported statement cannot however discharge the Appellant from its burden of proving that the effect used to define the underlying technical problem is displayed by all claimed compositions.

The Board concludes that the Appellant has not credibly shown that the desired increase in cold flow properties can be achieved with any possible composition covered by claim 1. Therefore, this alleged improvement must be disregarded in defining the technical problem underlying the claimed invention, which thus must be reformulated in less ambitious terms as the provision of an alternative additive composition having cold flow improving properties.

In the light of the indications contained in the patent in suit, the Board is satisfied that the above technical problem has been successfully solved.

- 2.3.4 Document (9) envisages the possibility of using "other additives" in the flow improving concentrate (column 5, lines 38 to 40).

Therefore, even though document (9) does not suggest any further cold flow improving agents apart from those specifically indicated in its disclosure, it is the Board's judgement that the skilled person, faced with the above mentioned technical problem, would have considered the possibility of replacing one or part of the cold flow improving agents disclosed in document (9) with other known agents such as the amide-amine salt of claim 1, which was undisputedly a known cold flow improving agent at the priority date of the patent in suit.

Since there was no prejudice in the prior art against the use of such a cold flow improving agent in a fuel composition in combination with other additives, it was obvious for the skilled person to try a composition modified in such a way.

For these reasons, the Board concludes that the subject-matter of claim 1 lacks inventive step. Therefore, this request has also to be dismissed.

3. Set C (second auxiliary request)

Claim 1 of set C differs from claim 1 of set B only insofar as it contains the additional wording "provided that the component (i) is not a combination of a substituted succinic acid derivative and an ethylene-vinyl acetate copolymer."

Since component (i) is already identified in the claim as "being a polar nitrogen-containing compound which is the amide-amine salt formed by reacting 1

molar portion of phthalic anhydride with 2 molar portions of dihydrogenated tallow amine", this additional wording is contradictory to the definition of component (i) being only an amide-amine salt and it does not add any further limitation to claim 1 of set B.

This was also conceded by the Appellant in its letter of 21 August 2003 (point 1, last full paragraph).

Therefore, this amendment cannot be considered to arise from any of the grounds for opposition and contravenes the requirements of Rule 57(a) EPC. Consequently, the second auxiliary request is not admitted.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:

G. Rauh

P. Krasa