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**Datasheet for the decision
of 21 December 2011**

Case Number: T 2378/09 - 3.3.01

Application Number: 00910196.5

Publication Number: 1161514

IPC: C10M 159/18

Language of the proceedings: EN

Title of invention:

Molybdenum containing compounds as additives for lubricant compositions

Applicant:

Chemtura Corporation

Headword:

Lubricant composition/CHEMTURA

Relevant legal provisions:

EPC Art. 56

Keyword:

"Inventive step - (yes) - non-obvious solution"

Decisions cited:

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Catchword:

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Case Number: T 2378/09 - 3.3.01

D E C I S I O N
of the Technical Board of Appeal 3.3.01
of 21 December 2011

Appellant: Chemtura Corporation
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Representative: Serravalle, Marco
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Decision under appeal: Decision of the Examining Division of the
European Patent Office posted 12 October 2009
refusing European patent application
No. 00910196.5 pursuant to Article 97(2) EPC.

Composition of the Board:

Chairman: P. Ranguis
Members: J.-B. Ousset
D. S. Rogers

Summary of Facts and Submissions

- I. An appeal was filed against the decision of the examining division to refuse the European patent application No. 00 910 196.5.
- II. The examining division considered that neither the main request filed with the letter of 6 August 2009 nor the auxiliary request filed during oral proceedings fulfils the requirements of Article 56 EPC in view of document (1) (US-A-4 285 822).
- III. Regarding the auxiliary request which was identical to the main request before the Board (see point VI below), the examining division considered, in particular, that the carboxylic acid amides used in document (1) as a basic nitrogen compound encompassed the carboxylic amide obtained by reaction of a vegetable oil and the diamine b defined in claim 1. Indeed, the carboxylic acid moiety of the carboxylic acid R^2COOH might be a fatty acid derived from a vegetable oil and the definition of the hydrocarbyl amine moiety could not be confined to the preferred polyamines, i.e. tri-ethylene tetra-amine or tetra-ethylene penta-amine but, to the contrary, encompassed all the hydrocarbyl amines, including the diamines b defined in claim 1.

Furthermore, document

(4) US-A-4 765 918

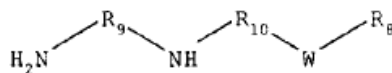
was not considered by the examining division to be the closest state of the art contrary to the applicant's opinion.

- IV. With its statement setting out the grounds of appeal, the appellant submitted as sole request, the originally filed version of the claims.
- V. In its communication annexed to the invitation to the oral proceedings, the board gave its preliminary and non-binding opinion as to whether the main request involved an inventive step and further introduced document (5) (US-A-3 574 576), which was referred to in document (1). Document (5) disclosed hydrocarbyl polyamine derivatives, which are N-substituted by an aliphatic hydrocarbon chain (see column 4, lines 1-5).
- VI. With its response to the board's communication, the appellant filed a new main request and two auxiliary requests on which the present decision is based

Claim 1 of the main request reads as follows:

" 1. A lubricating oil additive comprising the reaction product of

- (a) a vegetable oil,
- (b) a diamine of the formula:



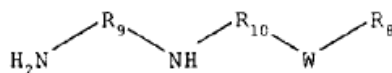
- (c) carbon disulfide, and
- (d) a molybdenum compound,

wherein R₈ is an alkyl group of 1 to 40 carbon atoms, R₉ and R₁₀ are independently selected aliphatic or aromatic moieties, W is oxygen, sulfur, or -CH₂ -."

Independent claim 9 of the main request reads as follows:

" 9. A lubricating composition comprising a lubricating oil and an additive comprising the reaction product of

- (a) a vegetable oil,
- (b) a diamine of the formula:



- (c) carbon disulfide, and
- (d) a molybdenum compound,

wherein R₈ is an alkyl group of 1 to 40 carbon atoms, R₉ and R₁₀ are independently selected aliphatic or aromatic moieties, and W is oxygen, sulfur, or -CH₂ -."

VII. The appellant's arguments can be summarized as follows:

- The limitation to "vegetable oil" in independent claims 1 and 9 of the main request (originally claims 1 and 10) was based on claims 9 and 18 as originally filed.
- Document (1) did not disclose vegetable oil.
- The hydrocarbyl polyamines mentioned in document (1) and described in document (5) were not to be

used to form carboxylic amide derivatives according to document (1).

- Document (5) did not relate to sulfurized molybdenum containing lubricating compositions but only to hydrocarbyl polyamines as detergents in lubricants.

VIII. The appellant requested that the decision under appeal be set aside and that a patent be granted in the following version:

on the basis of claims 1-17 of the main request; or on the basis of the claims of either first auxiliary request or second auxiliary request, all of the above being filed under cover of a letter dated 22 November 2011.

IX. At the end of the oral proceedings, the decision of the board was announced.

Reasons for the Decision

1. The appeal is admissible.

Main request

2. Formal matters

- 2.1 In both independent claims 1 and 9, the expression "an unsaturated or saturated ester or acid" has been replaced by the expression "a vegetable oil".

2.1.1 Support for this amendment is to be found on page 11, beginning of the last paragraph, of the description as originally filed.

2.2 The amended subject-matter of the main request therefore fulfils the requirements of Article 123(2) EPC.

3. Inventive step

3.1 The appellant concurs with the board that document (1) represents the closest prior art. It discloses lubricating oil additives containing inter alia an acidic molybdenum compound, carbon disulfide and an oil-soluble basic nitrogen containing composition (see top of column 2, "Summary of the invention"). The said oil-soluble basic nitrogen containing composition can typically be carboxylic acid amides (see column 2, line 66). Said amides can be made out of a carboxylic acid having at least 12 aliphatic carbon atoms in the principal aliphatic chain (see column 3, lines 54 to 57) - the said aliphatic carbon chain could be either saturated to unsaturated (see claim 5) - and a hydrocarbyl polyamine (see column 3, line 60). Since the wording of claim 1 of the present application mentions that the claimed additive is a reaction product of inter alia a vegetable oil with a diamine, an amide derivative is formed in the additive of claim 1 of the present application. Since the aliphatic group of the carboxylic acids of document (1) can be unsaturated (see claim 5 of document (1)), it overlaps with the carboxylic groups of the vegetable oil used in claim 1 of the present application. Therefore, the only structural difference between the claimed matter and

document (1) lies in the fact that the specific group of diamines (see feature b)) of claim 1 of the present application is not described in document (1).

3.2 Consequently, the problem underlying the present application can be seen in the provision of an alternative lubricating oil additive.

3.3 The proposed solution is represented by the additive described in claim 1 of the current application.

3.3.1 The experimental results given with the specific examples in the description show it is plausible that that the said problem is solved (see examples 1 to 20 and antifriction, antiwear, extreme pressure properties and oxidation stability set out in Tables 1 to 7).

3.3.2 It should be verified whether this solution is based on an inventive approach.

3.3.3 The board concurs with the appellant that the teaching of document (1) properly construed by one skilled in the art is confined as far as carboxylic amide compositions are concerned to the information set out in col. 3, lines 50 to 68. This paragraph reads:

"... These compositions are ordinarily prepared by reacting (a) a carboxylic acid ... with (b) an amine or a hydrocarbyl polyamine, such as an ethylene amine, to give a mono or polycarboxylic acid amide. Preferred are those amides, prepared from (1) a carboxylic acid ... and (2) an ethylene amine, especially triethylene tetra or tetraethylene pentaamine or mixtures thereof." (see also claims 5 and 6).

3.3.4 The appellant explained that, when trying to solve the problem set out at point 3.2 above, the person skilled in the art would not have considered the specific classes of polyamines detailed in document (5) (see column 4, lines 1 to 14), although these polyamines can be branched, because this "Another class of compounds" (see column 4, line 1) relates to hydrocarbon polyamines as mentioned in column 2, line 67, which are used as they are, namely without reaction with a carboxylic acid to obtain carboxylic acid amides. Document (4) also deals with lubricating oil additives (see column 1, "Field of the invention"). However, the diamine compounds used in the additive compositions of document (4) (see column 2, line 40) are also unbranched polyamines. Furthermore, due to the sulfur source, no dithiocarbamic derivative can be formed. Thus, the teaching of document (4) would not lead the person skilled in the art to the claimed invention in combination with document (1). In conclusion, the person skilled in the art, starting from document (1) and trying to solve the problem recited in point 3.2, would find neither in document (4) nor in document (5) the necessary information allowing him to arrive at the claimed matter without inventive skills. The board accepts this explanation.

3.4 Independent claim 1 as well as dependent claims 2 to 8 are thus inventive. Since independent claim 9 as well as dependent claims 10 to 17 all have the same features as claim 1, they are also regarded as inventive (Article 56 EPC).

3.5 As the main request fulfils the requirements of the EPC, the examination of auxiliary requests 1 and 2 is superfluous.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The case is remitted to the department of first instance with the order to grant a patent with the following claims and a description to be adapted:
Claims 1-17 of the main request filed under cover of a letter dated 22 November 2011.

The registrar:

The Chairman:

P. Ranguis