BESCHWERDEKAMMERN DES EUROPÄISCHEN PATENTAMTS | BOARDS OF APPEAL OF THE EUROPEAN PATENT OFFICE | CHAMBRES DE RECOURS DE L'OFFICE EUROPEEN DES BREVETS

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File Number: T 618/90 - 3.3.1

Application No.: 82 304 723.8

Publication No.: 0 075 411

Title of invention: Metal working using lubricants containing basic alkali metal salts

Classification: C 10 M 141/08

D E C I S I O N
of 27 February 1992

Proprietor of the patent: The Lubrizol Corporation

Opponent: Exxon Chemical Patents Inc.

Headword: Lubricants/Lubrizol

EPC Articles 54 and 56

Keyword: "Novelty (confirmed) after amendment"
"Inventive step - remitted to Opposition Division for further examination

Headnote

Europäisches Patentamt | European Patent Office | Office européen des brevets

Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number : T 618/90 - 3.3.1

D E C I S I O N
of the Technical Board of Appeal 3.3.1
of 27 February 1992

Appellant : (Proprietor of the patent)	The Lubrizol Corporation 29400 Lakeland Boulevard Wickliffe, Ohio 44092 (US)
Representative :	Crisp, David N. D. Young & Co 10 Staple Inn London WC1V 7RD (GB)
Respondent : (Opponent)	Exxon Chemical Patents Inc. 1900 East Linden Avenue Linden, New Jersey 07036 (US)
Representative :	Franck, Peter Dr., UEXKÜLL & STOLBERG Patentanwälte Beselerstrasse 4 W-2000 Hamburg 52 (DE)
Decision under appeal :	**Decision of Opposition Division of the European Patent Office dated of 20 March 1990, with written reasons issued on 25 May 1990, revoking European patent No. 0 075 411 pursuant to Article 102(1) EPC.**

Composition of the Board :

Chairman : K.J.A. Jahn
Members : R.W. Andrews
E.M.C. Holtz

Summary of Facts and Submissions

I. European patent No. 0 075 411 in respect of European patent application No. 82 304 723.8, which was filed on 8 September 1982, was granted on 24 June 1987 (cf. Bulletin 87/26).

II. A notice of opposition, which was filed on 22 March 1988, requested the revocation of the patent on the grounds of insufficiency and lack of novelty and inventive step. The opposition was supported by the following documents:

(1) US-A-2 412 633
(2) US-A-3 714 042
(3) US-A-4 119 549 and
(4) CA-A-1 055 700

III. By a decision delivered orally on 20 March 1990, with written reasons being issued on 25 May 1990, the Opposition Division revoked the patent.

The Opposition Division held that the subject-matter of Claim 17, or this claim amended in the manner proposed by the proprietor, lacked novelty in the light of document (1) and that the subject-matter of Claim 1, although novel, did not involve an inventive step in view of the disclosure of documents (3) and (4).

In the Opposition Division opinion, the available experimental data did not support the assertion that the combination of components (B) and (C) of the lubricant gave rise to a synergistic effect.

IV. An appeal was lodged against this decision on 16 July 1990 and the appeal fee was duly paid. In the Statement of

Grounds of Appeal filed on 24 September 1990, a further submission on 31 January 1992 and during oral proceedings held on 27 February 1992, the Appellant contended that document (4) disclosed that the basic alkali metal sulphonates obtained by the process described therein function as detergents and dispersants in crankcase lubricating oil, serve as anti-screen clogging agents in furnace fuel oil or as smoke suppressants in diesel fuels. However, amongst a long list of other possible applications there is a mention of metal-working lubricants. Also there is a reference to several types of extreme pressure agents, including sulphurised dipentene and sulphurised terpene, in a long recital of additives, which may be combined with basic alkali metal sulphonates. Nevertheless, there was no specific suggestion in document (4) (or document (3)) that sulphurised materials should be combined with basic alkali metal salts in the preparation of metal-working lubricants rather than for any other purpose. Therefore, there was no direct and unambiguous disclosure of the claimed method in document (4) or in any of the other cited documents. The Appellant also maintained that the subject-matter of granted Claim 17 was novel having regard to the disclosure of document (1).

With respect to inventive step, the Appellant argued that it could not be predicted from the cited prior art and, particularly from either or both of documents (3) and (4) that the combination of components (B) and (C) would give rise to the surprising and unexpected synergistic effects demonstrated by the experimental data filed during the examination, opposition and appeal proceedings. In fact, the skilled person would expect that the addition of a detergent to an extreme pressure agent would reduce its effectiveness due to its dilution thereby. However, the Appellant has discovered that basic alkali metal salts

function as extreme pressure agents and their addition to sulphurised olefins leads to an improvement in methods of lubricating metals during working.

V. In his letter of 19 February 1992, the Respondent indicated that he would not be present at the oral proceedings. In this letter and his submission filed on 13 June 1991, the Respondent contended that the subject-matter of Claim 1 and 17 of the Appellant's main request lacked novelty in the light of documents (4) and (1) respectively.

The Respondent also argued that the claimed subject-matter did not involve an inventive step having regard to each of documents (2), (3) and (4) alone or the combination of documents (3) and (4). The Respondent further alleged that, since it was obvious to use the combination of additives, any synergistic effect could not be used to establish the presence of an inventive step. In any case, the skilled person would expect that an additive combination would result in an improved performance as compared with the use of a single additive.

VI. The Appellant requested that the decision under appeal be set aside and that the patent be maintained:

a) as granted (main request); alternatively
b) as granted, but with the words "during working thereof" added in Claim 17 after the words "metal workpiece (first auxiliary request); or
c) as granted, but with the deletion of Claim 17 (second auxiliary request); or
d) on the basis of Claims 1 to 15 as submitted in Appendix A on 24 September 1990 (third auxiliary request); or

(e) on the basis of Claims 1 to 15 as submitted in Appendix B on 24 September 1990 (fourth auxiliary request); or

(f) on the basis of Claims 1 to 14 as submitted in Appendix C on 24 September 1990 (fifth auxiliary request); or

(g) on the basis of Claims 1 to 14 as submitted during the oral proceedings (sixth auxiliary request).

Indpendent Claims 1 and 14 of the sixth auxiliary request read as follows:

"1. A method for lubricating metal during working thereof which comprises applying to said metal a composition comprising (A) a major amount of a lubricating oil; (B) a minor amount of a basic alkali metal salt of at least one acidic organic compound, or a borated complex of said basic alkali metal salt; and (C) a minor amount of at least one sulfurization product of an aliphatic, arylaliphatic or alicyclic olefinic hydrocarbon containing from 3 to 30 carbon atoms, said sulfurization product containing a substantial amount of active sulfur, wherein said component B has been prepared by contacting, at a temperature between the solidification temperature of the reaction mixture and its decomposition temperature:
(B-1) at least one acidic gaseous material selected from carbon dioxide, hydrogen sulfide and sulfur dioxide, with
(B-2) a reaction mixture comprising
(B-2-a) at least one oil-soluble sulfonic acid, or derivative thereof susceptible to overbasing;
(B-2-b) at least one alkali metal selected from lithium, sodium and potassium, or a hydroxide, alkoxide, hydride or amide thereof;
(B-2-c) at least one lower aliphatic alcohol; and

(B-2-d) at least one oil-soluble carboxylic acid or functional derivative thereof; and wherein component C is prepared by reacting at 50-300°C, under superatmospheric pressure, sulfur and hydrogen sulfide with at least one olefinic compound containing 3 to 30 carbon atoms to form a sulfurized mixture, 0.3 - 3.0 gram-atoms of sulfur and 0.1 - 1.5 moles of hydrogen sulfide being used per mole of olefinic compound; and removing from said sulfurized mixture substantially all low boiling materials including unreacted olefin, mercaptan and monosulfide.

14. A metal workpiece having on the surface thereof a film of a composition as defined in any one of the preceding claims."

The Respondent requested that the appeal be dismissed.

VI. At the conclusion of the oral proceedings, the Board's decision to remit the case to the Opposition Division for further prosecution on the basis of Claims 1 to 14 in accordance with the Appellant's sixth auxiliary request was announced.

Reasons for the Decision

1. The appeal is admissible.

2. There are no objections under Article 123 EPC to any of the versions of the claims. In particular, the insertion of the expression "during the working thereof" in Claims 17 and 15 in accordance with the first and fourth auxiliary requests is allowable since the presence of a film on the surface on the working piece results

automatically from the method of Claim 1 of each of these requests. Claim 1 of the third, fourth and fifth requests represents a combination of Claims 1 and 3 as granted (cf. also Claims 1, 3 and 12 as filed). Claim 1 in accordance with the sixth auxiliary request is a combination of granted Claims 1, 3 and 12 (cf. Claims 1, 3, 12 and 13 as filed).

3. The first question to be decided is whether the subject-matter of Claim 1 in accordance with the main request and the first to fifth auxiliary requests is novel having regard to document (4).

Claim 1 in accordance with the main request and the first and second auxiliary requests relates to a method for lubricating metal wherein a composition comprising (A) a major amount of a lubricating oil, (B) a minor amount of a basic alkali metal of at least one acidic compound or a borated complex thereof and (C) a minor amount of sulphurised olefinic hydrocarbon is applied to the metal during working. Claim 1 of the third, fourth and fifth auxiliary requests is concerned with the same process except that component (B) is a basic lithium, sodium or potassium sulphonate prepared in a specified manner.

3.1 In accordance with the established jurisprudence of the Boards of Appeal (cf. Decisions T 124/87 "Dupont/Copolymer", OJ EPO 1989, 491, paragraph 3.2; T 12/81 "Diastereomers, OJ 1982, 262, paragraph 5; and T 198/84 "Thiochloroformates, OJ 1985, 209, paragraph 4 T 666/89 "Washing Composition/Unilever" (to be published), in order to decide this question it is necessary to consider whether the disclosure of document (4) is such as to make the method claimed in accordance with the above-mentioned requests available as a technical teaching to the skilled person.

3.2 Therefore, it is necessary to determine the nature and the extent of the information actually imparted to the skilled person by this document as distinct from its literal disclosure.

3.3 Document (4) discloses a process for the preparation of stable oil-soluble dispersion of a basic lithium, sodium and potassium sulphonate by intimately contacting at a temperature of about 25° to about 200°C in the presence of a substantially inert organic liquid diluent gaseous carbon dioxide, sulphur dioxide, hydrogen sulphide or a mixture thereof, with a reaction mixtures comprising one or more oil-soluble sulphonic acids or derivations thereof susceptible to overbasing, one or more alkali metals selected from sodium, potassium and lithium or hydroxides, alkoxides, hydrides or amides thereof, one or more lower aliphatic mono- or dihydric alcohols and one or more oil-soluble carboxylic acids of the formula $R-(COOH)_n$ wherein R is a substantially saturated aliphatic hydrocarbon radical having at least 8 carbon atoms and n is 1 to 6, or derivatives thereof: the ratio of equivalents of the carboxylic acid component to equivalents of sulphonic acid component being in the range from 1:1 to about 1:20 the ratio of equivalents of the alkali metal component to equivalents of the sulphonic acid component being in the range 4:1 to about 40:1 and the ratio of equivalents of alcoholic component to equivalents of the sulphonic acid component being in the range of about 1:1 to about 80:1 and lubricating compositions comprising a major proportion of lubricating oil and from 0.001 to 30% by weight, based on the composition, of the basic alkali metal sulphonates so prepared (cf. Claims 1, 22, 24, 26, 28, 30 and 32).

Thus, document (4) discloses components (A) and (B) of the composition used in the method in accordance with the main and the first to fifth auxiliary requests.

3.4 According to the paragraph bridging pages 30 and 31 of document (4), the basic alkali metal sulphonate dispersions obtained by the process claimed therein can be employed in a variety of lubricating compositions including crankcase lubricating oils, automatic transmission fluids, trans-axle lubricants, gear lubricants, metal working lubricants, and hydraulic fluids.

In such applications the basic alkali metal sulphonate dispersions can be used alone or in combination with lubricant additives such as other detergents, of the ash-containing type, ashless dispersants, viscosity index improvers, pour point depressants, anti-foam agents, extreme pressure agents, anti-wear agents, rust inhibiting agents, oxidation inhibitor, corrosion inhibitors, deicers, anti-knock agents and other smoke suppressants (cf. page 32, lines 15 to 23).

Finally, the paragraph bridging pages 34 and 35 contains examples of extreme pressure agents, corrosion-inhibiting agents and oxidation-inhibiting agents. Sulphurised dipentene and sulphurised terpene, which are known extreme pressure agents and which fall within the definition of component (C) of Claim 1 in accordance with the above-mentioned requests, are given as examples of organic sulphides and polysulphids. Other types of compounds mentioned in this paragraph are chlorinated aliphatic hydrocarbons, phosphosulphurised hydrocarbons, di- and tri-hydrocarbon phosphites, metal thiocarbamates and Group II metal salts of phosphorodithioic acids.

Therefore, various passages of this document disclose a metal working lubricant (i.e. a method of metal working) and components (A), (B) and (C) of the metal working composition.

3.5 Thus, in order to reach a conclusion regarding novelty it is necessary to decide whether the skilled person reading document (4) would, as a matter of course, combine the various passages referred to above to arrive at a method for lubricating metal during working falling within the terms of Claim 1 in accordance of the main and the first to fifth auxiliary requests.

It is common general knowledge in the field of metal cutting operations, such as broaching, drilling, milling, turning, planing, reaming, hobbing and grinding, that, due to the conditions of high pressure and temperature encountered between the sliding chip and the tool face, extreme pressure agents are used in cutting oils. It is also well known that extreme pressure lubrication, with chemical reaction of additives occuring at the metal-metal contact, is used in machining low and high carbon steel, high alloy steels, brass, bronze, copper, aluminium and titan ium (cf. for example, Encyclopedia of Chemical Technology, Kirk-Othmer, 2nd Edition, Volume 19, page 500, 1969).

Therefore, the skilled person reading document (4) in the light of his common general knowledge would immediately associate the reference to metal working lubricants with extreme pressure agents and hence sulphurised dipentene and sulphurised terpene. In other words, the skilled person would automatically combine the various passages of document (4) referred to above.

In the Board's judgement, therefore, document (4) discloses a method of lubricating metal during working thereof having all the features of Claim 1 in accordance with the main and the first to fifth auxiliary requests. Thus, these requests must be rejected.

Insofar as the Appellant submitted that the generic disclosure of document (4) did not anticipate the subject-matter of Claim 1 of the above-mentioned request, he was ignoring the case law of the Boards of Appeal as laid down in the decisions referred to above whereby the evaluation of novelty is not confined only to the examples in an earlier document, but must be extended to all the information contained therein.

3.6 Claim 1 in accordance with the sixth auxiliary request includes the features that the basic alkali metal sulphonates and the sulphurised olefinic hydrocarbon are prepared in a specified manner.

3.7 Document (4) is wholly silent regarding the method by which the sulphurised dipentene and sulphurised terpene referred to therein are prepared. Therefore, the subject-matter of Claim 1 of the sixth auxiliary request is novel with respect to the disclosure of document (4).

3.8 Document (3) discloses a process for the preparation of a sulphurised compositon comprising reacting, at about 50 to 300°C under superatmospheric pressure in the presence of a catalyst, 0.7 to 1.2 gram-atoms of sulphur and 0.1 to 1.5 moles of hydrogen sulphide with 1 mole of a terminal aliphatic monoolefinic compound containing 3 to 30 carbon atoms and removing from the sulphurised mixture substantially all low boiling materials including unreacted olefin, mercaptan and monosulphide (cf. Claim 1), i.e. the process referred to in Claim 1 of the above-mentioned request.

The sulphurised composition so obtained may be used in metal working lubricants and may be combined with other additives, such as oil-soluble and basic salts of alkali and alkaline earth metals with sulphonic acids, carboxylic

acids or organic phosphorus acids having at least one direct carbon to phosphorus linkage (cf. column 7, line 36 and column 9, lines 4 to 16). However, the method disclosed for preparing the basic salts (cf. column 9, lines 26 to 49) is not the one referred to in Claim 1 of the sixth auxiliary request. Therefore, the subject-matter of this claim is also novel with respect to this document.

3.9 Document (2) discloses a composition prepared by a process comprising mixing (A) a basic alkali metal complex selected from sulphonate, sulphonate-carboxylate and carboxylate complexes with up to an amount equivalent to the total basicity thereof of (B) a high molecular weight aliphatic carboxylic acid or anhydride having a least 25 aliphatic carbon atoms per carboxy group at a temperature of about 25°C to the decomposition temperature of the process mass (cf. Claim 1). Although this document discloses that this composition may be used in cutting oils and metal working lubricants (cf. column 7, lines 18 and 45) and that it may be used in combination with sulphurised dipentene and sulphurised terpene (cf. column 9, lines 3 and 4), the subject-matter of Claim 1 of the sixth auxiliary request is novel since the present component (B) is different from the composition of this document and there is no disclosure relating to the preparation of the sulphurised dipentene and sulphurised terpene.

3.10 Document (1) discloses a lubricant composition comprising from about 1 to about 10% of castor oil, castor amide or glycerol monoricinoleate, from about 0.1% to about 2% of a sulphurised terpene, a small amount of a soap of a preferentially oil-soluble petroleum sulphonic acid and a major proportion of a hydrocarbon lubricating oil (cf. Claim 1). This disclosure was considered by the Opposition

Division to destroy the novelty of original Claim 17 (corresponding to Claim 14 of the sixth auxiliary request).

The subject-matter of the present Claim 14 is distinguished from the disclosure of this document not only by the references to the processes from preparing components (B) and (C) of the composition referred to therein, but also by the fact that the sulphonate of document (1) is a normal or neutral salt (cf. column 6, line 43 to 54 where it is indicated that the sulphonates fail completely to neutralise acid products).

3.11 Therefore, in the Board's judgement, the subject-matter of the claims in accordance with the sixth auxiliary request is novel.

4. It is now necessary to decide whether the subject-matter of Claim 1 in accordance with the sixth auxiliary request involves an inventive step.

4.1 In the Board's view, document (4) represents the closest prior art in the light of which the technical problem underlying the disputed patent is to be determined.

For the reasons given above, the Board considers that this document discloses a method for lubricating metal during the working thereof comprising applying to said metal a composition comprising (A) a lubricating oil, (B) a basic alkali metal sulphonate prepared by the method referred in Claim 1 of this request and (C) a sulphurised dipentene or sulphurised terpene (not prepared by the process referred to in the said Claim 1).

Thus, if the technical problem is to be seen in providing an improved (as opposed to an alternative) method of lubricating metal during the working thereof, as compared to the one disclosed in document (4), it would be necessary to demonstrate that a composition falling within the definition of the above-mentioned Claim 1 performed better than one containing the same components (A) and (B) and sulphurised dipentene or sulphurised terpene obtained by a different process (for example, reacting sulphur with said olefin) as component (C).

Since this technical problem in the light of document (4) was defined for the first time during the oral proceedings, the Board has decided to remit the case to the Opposition Division to allow the Appellant time to provide the evidence necessary to demonstrate that the proposed solution successfully solves it.

Order

For these reasons, it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the Opposition Division for further prosecution on the basis of Claims 1 to 14 as submitted during oral proceedings (sixth auxiliary request).

The Registrar: **The Chairman:**

E. Görgmaier K.J. A. Jahn

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