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D E C I S I O N
of 13 March 2001

Case Number: T 0876/96 - 3.3.1

Application Number: 92107425.8

Publication Number: 0512425

IPC: C10M 173/00

Language of the proceedings: EN

Title of invention:
Water-soluble lubrication composition

Applicant/Patentee:
YUSHIRO CHEMICAL INDUSTRY CO. LTD.

Opponent:

-

Headword:
Lubricant/YUSHIRO

Relevant legal provisions:
EPC Art. 56

Keyword:
"Inventive step (no) - obvious solution"

Decisions cited:

-

Catchword:

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Boards of Appeal

Chambres de recours

Case Number: T 0876/96 - 3.3.1

D E C I S I O N
of the Technical Board of Appeal 3.3.1
of 13 March 2001

Appellant: YUSHIRO CHEMICAL INDUSTRY CO. LTD.
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Decision under appeal: Decision of the Examining Division of the
European Patent Office posted 3 May 1996 refusing
European patent application No. 92 107 425.8
pursuant to Article 97(1) EPC.

Composition of the Board:

Chairman: A. J. Nuss
Members: J. M. Jonk
J. P. B. Seitz

Summary of Facts and Submissions

- I. This appeal lies from the decision of the Examining Division refusing European patent application No. 92 107 425.8, published under No. 512 425, and relating to a water-soluble lubrication composition.
- II. The Examining Division held that the subject-matter of the set of Claims 1 to 7 filed with letter dated 3 November 1992 lacked inventive step in view of documents
- (1) US-A-2 214 634, and
 - (2) FR-A-1 554 002.
- III. Claim 1 of said set of claims read as follows:
- "1. A water-soluble lubricant composition comprising
- a) at least one etheric non-ionic surfactant and
 - b) at least one alkaline earth metal, zinc or lead (II) carboxylate or sulphonate,
- said composition containing 0.5 or less parts per weight of nitrogen based on 100 parts by weight of the composition."
- IV. The Examining Division held in particular that the compositions as claimed in the application in suit only differed from those as described in the cited documents by the selection of a particular surfactant. However, in the absence of any surprising effect, the selection of this component would not involve an inventive step.

- V. Oral proceedings before the Board were held on 13 March 2001.
- VI. The Appellant defended the patentability of the subject-matter of the present application (i) on the basis of the set of claims forming the basis for the decision under appeal as main request, (ii) on the basis of Claims 1 to 7 filed with letter dated 13 September 1996 as first auxiliary request, and (iii) on the basis of Claims 1 to 6 as submitted during the oral proceedings before the Board as second auxiliary request.

Claim 1 of the first auxiliary request corresponded to Claim 1 of the present main request as indicated under point III above, except that the component as defined under b) was restricted to

"at least one alkaline earth metal carboxylate or sulphonate in admixture with an excess base".

Claim 1 of the second auxiliary request also corresponded to said Claim 1 of the main request, except that the component as defined under a) was restricted to

"at least one etheric non-ionic surfactant selected from polyoxyethylene alkyl ethers, polyoxyethylene alkylphenyl ethers, polyoxyethylene alkyl naphthyl ethers and polyoxyethylene abiethyl ethers"

- VII. The Appellant argued with respect to his main request that the presence of a surprising effect would not be a requirement for inventive step, but that for assessing

inventive step rather the question had to be answered whether the cited prior art would provide an incentive to the skilled person to prepare the claimed compositions. Concerning the Board's position supported by

- (3) "Ullmanns Encyclopädie der technischen Chemie",
Band 20 (1981), section "Schmierstoffe",
point 9.10, pages 559 and 560,

that it was common general knowledge at the priority date of the application in suit that non-ionic surfactants could be applied in water soluble lubricant compositions, he noted that according to the prior art as a whole different types of surfactants could be used, such as anionic, cationic and non-ionic surfactants. Furthermore, he argued that the prior art as a whole did not provide any incentive to the skilled person that the objects of the claimed invention as indicated in the application in suit, namely the provision of compositions having excellent lubricating, rust inhibiting, antiseptic, metal corrosion preventing and antifoaming properties, could be achieved by the compositions now claimed.

Concerning his first auxiliary request, he argued with respect to the Board's position, supported by document (3), section "Schmierstoffe", point 9.4, pages 549 to 551, that it was common general knowledge at the priority date of the present application to apply ultrabasic alkaline earth metal carboxylates or sulphonates in lubricant compositions in order to neutralise acids, nitrogen oxides and sulphur oxides, that the prior art as a whole did not give any pointer to the skilled person to provide lubricant compositions

having improved properties concerning air pollution and comprising the specific combination of the components as defined under a) and b), and the limited amount of nitrogen.

With respect to his second auxiliary request, the Appellant argued that the relevant prior art did not suggest the particular selection of the specified non-ionic surfactants.

VIII. The Appellant requested that the decision under appeal be set aside and a patent be granted on the basis of

- (1) his main request filed with letter dated 3 November 1992,
- (2) his first auxiliary request filed with letter dated 13 September 1996, or
- (3) his second auxiliary request filed during the oral proceedings before the Board.

IX. At the conclusion of the oral proceedings the Board's decision was pronounced.

Reasons for the Decision

1. The appeal is admissible.
2. *Main request*
 - 2.1 Compliance with Article 123(2) EPC
 - 2.1.1 Present Claim 1 is supported by Claim 1 in combination

with Claim 2 (concerning the condition that the composition contains 0.5 or less part per weight of nitrogen based on 100 parts per weight of the composition), and Claim 3 (concerning the presence of at least one etheric non-ionic surfactant) of the patent application as filed.

Furthermore, present Claims 2 to 7 are supported by the Claims 4, 5, 6, 10, 11 and 12, respectively, of the application as filed.

2.1.2 Thus, all claims of this request meet the requirement of Article 123(2) EPC.

2.2 Novelty

2.2.1 After examination of the citations on file, the Board has reached the conclusion that the subject-matter as defined in all claims is novel. Since this issue was not in dispute, it is not necessary to give further reasons for this finding.

2.3 Inventive step

2.3.1 The remaining issue to be dealt with is whether the subject-matter of the present claims involves an inventive step.

2.3.2 Article 56 EPC states that an invention is held to involve an inventive step if, having regard to the state of the art (in the sense of Article 54(2) EPC), it is not obvious to a person skilled in the art.

2.3.3 For deciding whether or not a claimed invention meets this criterion, the Boards of Appeal consistently apply

the problem and solution approach, which involves essentially

- (a) identifying the closest prior art,
- (b) assessing the technical results (or effects) achieved by the claimed invention when compared with the closest state of the art established,
- (c) defining in the light thereof the technical problem which the invention addresses and successfully solves,
- (d) verifying that the defined technical problem is solved by the embodiments encompassed within the claimed solution, and
- (e) examining whether or not a skilled person starting from the closest prior art **would** arrive at something falling within Claim 1 by following the suggestions made in the prior art in the sense of Article 54(2) EPC.

If the technical results of the invention provide some improvement over the closest prior art, the problem can be seen as providing such improvement, provided this improvement necessarily results from the claimed features for all that is claimed. If, however, there is no improvement, but the means of implementation are different, the technical problem can be defined as the provision of an alternative to the closest prior art.

- 2.3.4 In the present case, the Board considers - in agreement with the Appellant - that the closest state of the art is document (1).

This document relates to emulsifiable or soluble cutting oil compositions comprising a water-insoluble soap of a naphthenic acid or an unsaturated higher

fatty acid, an emulsifier and a mineral oil (see page 1, left column, first paragraph; and page 1, right column, first paragraph). After dilution with water, these compositions provide emulsified cutting oils having improved cooling and lubricating properties, while being substantially non-corrosive and non-injurious to health (see page 1, left column, lines 27 to 52; page 1, right column, lines 27 to 31; and page 2, left column, lines 56 to 59). Suitable soaps of naphthenic acid comprise **calcium naphthenate, and preferably zinc and/or lead naphthenate** (see page 1, right column, lines 31 to 35). As emulsifier any suitable one may be applied, but it is preferred to employ a mixture comprising mahogany soaps and **sulphonated fatty material** (see page 1, right column, lines 6 to 9 and 46 to 51).

Furthermore, when questioned by the Board at the oral proceedings, the Appellant did not contest that this prior art document did not comprise any suggestion that the cutting oil compositions disclosed therein should contain a nitrogen compound as a desirable or even mandatory component, whereas the description of the prior art in the application in suit (see page 2, lines 10 to 34) suggests that water-soluble lubricant compositions usually contained a nitrogen compound for giving them lubricity and the property of preventing metal corrosion in an aqueous system, but also indicates that the presence of such a nitrogen compound contributed to environmental pollution and foaming problems.

Therefore, the Board concludes that the compositions disclosed in this document (1) differ from those defined in present Claim 1 of the application in suit

only in that the latter comprise a non-ionic surfactant.

- 2.3.5 With respect to this closest prior art, the Appellant contended that the claimed compositions did not only have good or even improved properties as regards environment pollution, lubricity and corrosion prevention, but also showed improved antifoaming and antiseptic properties.

In this context, he referred in particular (i) to the composition of Example Product 11 (see Table 2) comprising 5 parts per weight of polyoxyethylene lauryl ether, 5 parts per weight of barium salt of lanolin fatty acid, and a nitrogen content of 0.13 part per weight, (ii) to the composition of Comparative Product 11 (see Table 4) comprising said etheric non-ionic surfactant and said barium salt in the same amounts, but having a higher nitrogen content of 0.98 parts per weight, and (iii) to the test-results indicated in Tables 9, 10 and 11.

However, all comparative tests given in the application in suit do not relate to the closest prior art represented by document (1). Moreover, all these comparative tests have been carried out by using Example Products and Comparative Products comprising the same etheric non-ionic surfactant in the same or comparable amounts, so that any difference in properties is unlikely to be attributable to the use of an etheric non-ionic surfactant, which represents - as indicated above under point 2.3.4 - the sole characterising feature of the compositions of the present application in the light of the closest prior art.

- 2.3.6 In these circumstances, it is the Board's view that in the light of the closest prior art the technical problem underlying the application in suit in its present scope can only be seen in the provision of further water soluble lubricant compositions having comparable properties.
- 2.3.7 The present patent application suggests, as the solution to this problem, the provision of compositions as defined in present Claim 1 comprising at least one etheric non-ionic surfactant.
- 2.3.8 Having regard to the test-examples and the results indicated in the specification of the application in suit, in particular in the Tables 5 to 11, the Board considers it plausible that the technical problem as defined above has been solved.
- 2.3.9 The question now is whether the prior art as a whole would have suggested to a person skilled in the art solving the technical problem indicated above in the proposed way.
- 2.3.10 Document (1) discloses - as indicated above under point 2.3.4 - lubricating cutting oil compositions which only differ from the lubricant compositions now claimed in that the latter comprise a specific surfactant, namely, at least one etheric non-ionic surfactant.

However, according to the technical teaching of document (1) any suitable emulsifier may be applied (see page 1, right column lines 6 and 7). Moreover, in the Board's judgment, it was already common general knowledge at the priority date of the present application that etheric non-ionic surfactants were

suitable emulsifiers in water soluble lubricant compositions and could be used instead of those indicated in document (1) (see for instance document (3), pages 559 and 560).

Therefore, the Board concludes that, in the light of the prior art as a whole, the claimed solution of the above defined technical problem amounts merely in using another well known type of emulsifier for the same purpose.

- 2.3.11 It follows that the subject-matter of present Claim 1 of this request lacks inventive step and, thus, does not comply with Article 56 EPC.

Claims 2 to 7 fall with Claim 1, since the Board can only decide on the request as a whole.

3. *First auxiliary request*

- 3.1 The subject-matter of Claim 1 of this request differs from that of Claim 1 of the main request in that component b) is restricted to at least one alkaline earth metal carboxylate or sulphonate in admixture with an excess base.

The dependent Claims 2 to 7 of this request correspond to those of the main request.

3.2 Compliance with Article 123(2) EPC

- 3.2.1 The subject-matter of the claims of this auxiliary request finds its basis in the patent application as filed as indicated under points 2.1.1 and 2.1.2 above.

In addition, the restricted definition of component b) finds its support on page 6, last paragraph to page 7, first paragraph, of the application as filed.

Thus the claims of this auxiliary request comply with Article 123(2) EPC.

3.3 Novelty and inventive step

3.3.1 As in the case of the main request, the Board sees no objections concerning the novelty of the claimed subject-matter.

3.3.2 This leaves the issue of whether the subject-matter of the claims of this request involves an inventive step.

3.3.3 In view of the fact that the compositions of present Claim 1 - like those of Claim 1 of the main request - comprise at least one non-ionic surfactant, the Board has reached the conclusion that document (1) also represents the closest prior art with respect to the claimed subject-matter of this auxiliary request. This was not contested by the Appellant.

3.3.4 Having regard to this closest prior art, the Appellant contended that the compositions of Claim 1 of this request showed improved properties in preventing air pollution, since the ultrabasic salts catches SO_x generated during incineration and discard of a waste fluid even when the lubricant contains a sulphur compound as an extreme pressure agent (see also page 7, first paragraph, of the application as filed).

3.3.5 However, in view of the fact that the lubricating cutting oil compositions of document (1), as

illustrated by the examples therein, do not contain sulphur or nitrogen containing compounds, in the Board's judgment, air pollution problems as indicated by the Appellant actually did not exist for this state of the art. Moreover, the Board observes that present Claim 1 does not require the presence of nitrogen or sulphur containing compounds either.

- 3.3.6 In these circumstances, it is the Board's view that in the light of the closest prior art represented by document (1) the technical problem underlying the application in suit as now claimed can again only be seen in the provision of alternative water soluble lubricant compositions having comparable properties.
- 3.3.7 The present patent application suggests, as the solution to this problem, the provision of compositions as defined in Claim 1 of this request, which comprise at least one etheric non-ionic surfactant and at least one ultrabasic alkaline earth metal carboxylate or sulphonate.
- 3.3.8 Having regard to the technical information in the present application, the Board has no doubt that the technical problem as defined above has been solved.
- 3.3.9 The remaining question is thus whether the prior art as a whole would have suggested to a person skilled in the art the solution of said technical problem as presently claimed.
- 3.3.10 Since present Claim 1 relates to compositions comprising at least one etheric non-ionic surfactant, the considerations of the Board with respect to this issue of inventive step for the main request indicated

above (see point 2.3.10) equally apply to the present auxiliary request.

3.3.11 Furthermore, concerning the use of an **ultrabasic** alkaline earth metal carboxylate or sulphonate as defined in present Claim 1 under b), it is the Board's view that at the priority date of the application in suit it was already common general knowledge that such ultrabasic salts, and in particular ultrabasic Ba-sulphonates, could be used in lubricant compositions as surfactants and as corrosion reducing agents having the capability to neutralise acids formed at ageing, as well as acidic NO_x and SO_x impurities generated in using, incineration or discarding of the lubricant fluids (see for instance document (3), in particular page 550, left column, third paragraph, and page 551, left column, second, third and fourth paragraph).

3.3.12 In view of these considerations, in the Board's judgment, a skilled person faced with the technical problem defined above would arrive at compositions as presently claimed without the necessity of any inventive activity.

3.3.13 Thus, the Board concludes that the subject-matter of Claim 1 of this request does not involve an inventive step either.

4. *Second auxiliary request*

4.1 The subject-matter of Claim 1 of this request differs from that of Claim 1 of the main request only in that component a) is restricted to at least one of the specified etheric non-ionic surfactants.

Dependent Claims 2 to 6 of this request correspond to Claims 2 to 5 and 7, respectively, of the main request.

4.2 Compliance with Article 123(2) EPC

4.2.1 The subject-matter of the claims of this auxiliary request finds its basis in the patent application as filed as indicated under points 2.1.1 and 2.1.2 above.

In addition, the restricted definition of component a) finds its support on page 5, lines 4 to 7.

Thus, all claims of this request comply with Article 123(2) EPC.

4.3 Novelty and inventive step

4.3.1 In view of the fact, that the compositions of present Claim 1 only differ from those as defined in Claim 1 of the main request in that they comprise at least one of the **specified** etheric non-ionic surfactants, in the Board's judgment, the considerations of the Board with respect to the issues of novelty and inventive step indicated above with respect to the main request equally apply to this second auxiliary request.

In this context, the Board observes that the Appellant did not even indicate some technical effect, which could be attributed to the etheric non-ionic surfactants now specified. Therefore, in the light of document (1) representing the closest prior art, the technical problem underlying the application in suit in its scope now claimed can again only be seen in the provision of further useful water soluble lubricant compositions having comparable properties.

4.3.2 Regarding this request, the Appellant argued in particular that the prior art as a whole did not provide any incentive to the skilled person that the surfactants as specified in present Claim 1 of this request could be applied in water soluble lubricant compositions.

4.3.3 However, the Board observes that - as indicated under point 2.3.10 above - it was already common general knowledge at the priority date of the present application that etheric non-ionic surfactants were suitable emulsifiers in water soluble lubricant compositions.

Furthermore, in the Board's judgment, it was also common general knowledge at the priority date of the present patent application that the emulsifying properties of etheric non-ionic surfactants are substantially due to their polyoxyethylene rests (see for instance document (3), page 559, right column, first paragraph; and page 560, left column, second paragraph).

Thus, in view of his common general knowledge, the skilled person would have immediately understood that in particular non-ionic surfactants containing polyoxyethylene rests would be suitable emulsifiers for providing water soluble lubricant compositions.

4.3.4 Therefore, the Board concludes that it was obvious to the skilled person faced with the above defined technical problem to try the etheric non-ionic surfactants now claimed.

4.3.5 It follows that the subject-matter of present Claim 1

of this second auxiliary request lacks inventive step too, and for this reason does not comply with Article 56 EPC.

Claims 2 to 6 of this request fall with Claim 1, since - as indicated above - the Board can only decide on the request as a whole.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:

M. Maslin

A. Nuss