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**Datasheet for the decision
of 10 August 2006**

Case Number: T 1208/03 - 3.3.01

Application Number: 95937060.2

Publication Number: 0792334

IPC: C10M 105/34

Language of the proceedings: EN

Title of invention:

Ester based lubricant and use in four-stroke engines

Patentee:

UNICHEMA CHEMIE B.V.

Opponent:

FUCHS PETROLUB AG

Headword:

Ester based lubricants/UNICHEMA

Relevant legal provisions:

EPC Art. 100(c), 100(a), 123(2), 56

Keyword:

"Main request: disclosure of a combination of features as claimed - support in the application as filed (yes)"
"Auxiliary request: inventive step (yes) - non-obvious solution"

Decisions cited:

G 0010/91, T 0201/83

Catchword:

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Case Number: T 1208/03 - 3.3.01

D E C I S I O N
of the Technical Board of Appeal 3.3.01
of 10 August 2006

Appellant: UNICHEMA CHEMIE B.V.
(Patent Proprietor) Buurtje 1
NL-2802 BE Gouda (NL)

Representative: Humphries, Martyn
Uniqema Limited
Uniqema Intellectual Property Dept.
Wilton Centre
GB-Redcar TS10 4RF (GB)

Respondent: FUCHS PETROLUB AG
(Opponent) Friesenheimer Strasse 17
D-68169 Mannheim (DE)

Representative: Schupfner, Georg
Müller Schupfner
Patentanwälte
Postfach 1753
D-21236 Buchholz (DE)

Decision under appeal: Decision of the Opposition Division of the
European Patent Office posted 30 September 2003
revoking European patent No. 0792334 pursuant
to Article 102(1) EPC.

Composition of the Board:

Chairman: A. J. Nuss
Members: C. M. Radke
J. Van Moer

Summary of Facts and Submissions

I. The Appellant (Proprietor of the Patent) lodged an appeal on 24 November 2003 against the decision of the Opposition Division posted on 30 September 2003 by which the European patent no. 0 792 334 was revoked. On 6 February 2004 he filed a written statement setting out the grounds for appeal.

II. The decision under appeal was based on claims 1 to 19 as granted (Main Request), and on claims 1 to 11 as granted (Auxiliary Request), the independent claims 1 and 12 reading as follows:

"1. Use of an ester based lubricant comprising at least one ester of a saturated, branched chain aliphatic monohydric alcohol having at least 8 carbon atoms and a saturated, branched chain aliphatic monocarboxylic acid having at least 10 carbon atoms, said ester having:

(a) a kinematic viscosity at 40 °C of at most 35 cSt,

(b) a non-polarity index (NPI)

$$\text{NPI} = (\text{total number of carbon atoms} \times \text{molecul. weight}) / (\text{number of carboxylate groups} \times 100)$$
of at least 100,

(c) an evaporation loss according to Noack (determined according to European Standard CEC L-40-T-82) of at most 10%, and

(d) a pour point below -30 °C,

in lubricating four-stroke engines.

12. An ester based lubricant comprising at least one ester of an alcohol selected from the group consisting of iso-tridecanol, 2-octyl decanol, 2-octyl dodecanol, 2-hexyl dodecanol, and mixtures thereof, and a

saturated, branched chain aliphatic monocarboxylic acid having at least 10 carbon atoms, said ester having:

- (a) a kinematic viscosity at 40 °C. of at most 35 cSt,
- (b) a non-polarity index (NPI)

$$\text{NPI} = (\text{total number of carbon atoms} \times \text{molecul. weight}) / (\text{number of carboxylate groups} \times 100)$$

of at least 100,

- (c) an evaporation loss according to Noack (determined according to European Standard CEC L-40-T-82) of at most 10%, and

- (d) a pour point below -30 °C,

in which the acid number of the crude ester is reduced by reaction with a glycidyl ester of preferably branched chain monocarboxylic acids."

III. Inter alia, the following documents were cited during opposition and/or appeal proceedings:

(D1) Guerbet-Alkohole für chemisch-technische Anwendungen, edition 1, December 1984, Henkel KGaA

(D2) US-A-2 757 139

(D4) GB-C-706 205

(D5) DE-B-17 68 765

(D6) EP-A-0 089 709

IV. The Opposition Division held that grounds under Article 100(c) EPC prejudiced the maintenance of the patent based on the Main Request and that the subject-matter of the claims of the Auxiliary Request was not based on an inventive step.

As to the Main Request, the Opposition Division deemed that the features of claim 12 which were deemed to be

based on original claims 1, 6 and 8, were not disclosed in combination in the application as originally filed.

As to the Auxiliary Request, the Opposition Division gave the following reasons: Document (D1) disclosed that Rilanit G 16-IP was 2-hexyldecyl isopalmitate and that it met all the requirements (a) through (d) of claim 1 as granted. Due to the fact that the esters in (D1) were recommended as lubricants in engine oils and taking into account the physical data of Rilanit 16-IP given in (D1), the person skilled in the art looking for ester lubricants for use in four-stroke engines would have selected Rilanit G 16-IP for that use, so that the subject-matter of claim 1 of the auxiliary request was not based on an inventive step.

V. Oral proceedings before the Board were held on 10 August 2006.

During the oral proceedings, the Appellant submitted claims 1 to 15 of a new Main Request. These claims differ from the claims as granted in that

- in claim 1 the alcohol starting materials for forming the esters have been restricted to the alcohols mentioned in claim 12 as granted, i.e. to "iso-tridecanol, 2-octyl decanol, 2-octyl dodecanol, 2-hexyl dodecanol, and mixtures thereof";
- dependent claims 5, 6, 10 and 18 as granted have been deleted and the remaining claims and references have been renumbered accordingly.

VI. The Appellant requested that the decision under appeal be set aside the patent be maintained on the basis of claims 1 to 15 of the Main Request filed during the

oral proceedings, or on the basis of the claims of any of the Auxiliary Requests B and C filed with the letter dated 6 February 2004, where claim 10 of Auxiliary Request C was deleted as requested in the letter dated 10 July 2006, or on the basis of the claims of any of the Auxiliary Requests D through H filed with the letter dated 10 July 2006.

The Respondent requested that the appeal be dismissed.

- VII. The Appellant argued that no grounds under Article 100(c) EPC applied as claim 1 of the Main Request was supported by
- claim 1 as originally filed combined with
 - the specific use disclosed in particular on page 1, lines 3 to 5 of the application as filed, and
 - the three alcohols disclosed in claim 6 as originally filed. As far as the fourth alcohol, i.e. 2-octyl dodecanol, was concerned, Isofol-20 disclosed on page 5, lines 7-8, of the application as filed was identified on page 11, line 5 to be 2-octyl dodecanol.

Claim 9 of the Main Request was based on claims 1, 6 and 8 as originally with 2-octyl dodecanol being disclosed as mentioned above.

The Appellant also deemed the subject-matter of the claims of the Main Request to be based on an inventive step; the combination of the teaching of the closest prior art (i.e. document (D6)) with that of document (D1) could not render the subject-matter claimed obvious because none of the esters disclosed in (D1) fell under the scope of the esters defined in the present claims.

VIII. The Respondent (Opponent) argued that the combination of the features of original claims 1, 6 and 8 was not disclosed in the application as originally filed. Moreover he considered the disclosure of 2-octyl dodecanol on page 5 of the application as filed to be ambiguous as Isofol-20 was referred to as an iso-C20 alcohol, i.e. as mixture of alcohols or as an alcohol of undefined branching.

During the oral proceedings, the Respondent declared that he did not consider the subject-matter of the claims of the Main Request to lack novelty.

He was of the opinion that the subject-matter of claim 1 of the Main Request was not inventive in view of the teachings of documents (D6), (D1) and optionally (D2); he also deemed the subject-matter of claim 9 of the Main Request to be obvious in view of the teaching of (D1) if combined with that of (D5).

The Respondent raised a fresh ground under Article 100(b) EPC in his letter dated 30 August 2004 (see the fourth paragraph on page 3). During the oral proceedings before the Board, the Appellant stated that he did not agree that such fresh grounds for opposition were introduced into the appeal procedure.

IX. At the end of the oral proceedings the decision of the Board was announced.

Reasons for the Decision

1. The appeal is admissible.
2. *Article 100(b) EPC*

The Appellant did not agree that this fresh ground for opposition be introduced into appeal proceedings (see point VIII above).

According to the decision G 10/91 (published in OJ EPO 1993, 420):

"Fresh grounds for opposition may be considered in appeal proceedings only with the approval of the patentee." (see point 3 of the Opinion).

Consequently, the Board had no power to consider the new ground for opposition under Article 100(b) EPC.

Main Request

3. *Article 100(c) EPC*
- 3.1 Claim 1

It was not disputed that the combination of the features of claims 1 and 6 as originally filed was admissible in terms of support by the application as originally filed. Claim 6 as originally filed refers to original claim 1. Therefore, the restriction of the esters as originally claimed in claim 1 to those derived from the three alcohols mentioned in original claim 6 is directly and unambiguously disclosed in the application as filed.

The fourth alcohol mentioned in claim 1, i.e. 2-octyl dodecanol, is disclosed in the application as originally filed as follows:

The paragraph bridging pages 4 and 5 of the application as filed mentions the alcohols and the passage on page 5, lines 12-32 the monocarboxylic acids from which the esters may be produced. Page 5, lines 7 and 8 discloses: "... iso-C₂₀ alcohol (such as Isofol-20, ex Condea) ...". Page 11, lines 5 and 6 discloses: "2-octyldodecanol (Isofol 20, Trade Mark, ex Condea Chemie GmbH, Germany)". This reference on page 11 thus identifies Isofol 20 to be 2-octyl dodecanol.

The Respondent argued that the two references to Isofol 20 in the application as filed were ambiguous. The statement on page 5, lines 7 and 8 defined Isofol 20 as an iso-C₂₀ alcohol, which could be any branched C₂₀-alcohol or a mixture of such alcohols. This would have puzzled a person skilled in the art as this information was in contrast with the statement on page 11, lines 5 and 6 of the application as filed which described Isofol 20 as being 2-octyl dodecanol. To him, the information in the application as filed on Isofol 20 was thus ambiguous.

The Board does not share this view as it is not in line with the facts. Indeed, the wording on page 5, line 7, of the application as filed, namely "... iso-C₂₀ alcohol (such as Isofol-20, ex Condea) ..." (emphasis added), mentions Isofol-20 merely as an example of an iso-C₂₀ alcohol. This wording thus does not imply a restriction to mixtures of iso-C₂₀ alcohols but clearly

covers any single species of a branched alcohol having 20 carbon atoms. The statement on page 11, lines 5 and 6, of the application as originally filed reveals that Isofol 20 is indeed a single compound, namely 2-octyl dodecanol.

Therefore, the application as filed not only clearly includes the general information on page 5, lines 7-8, that Isofol 20 may be used when preparing the esters defined in present claim 1; it also unambiguously defines Isofol 20 to be 2-octyl dodecanol. Consequently, the inclusion of this alcohol in the list of the alcohols mentioned in claim 1 of the Main Request is not objectionable.

The use of the esters in lubricating four-stroke engines is directly disclosed in the first paragraph on page 1 of the application as filed which reads as follows: "The present invention relates to ester based lubricants for four-stroke engines,".

Consequently, the amendments in claim 1 of the Main Request do not prejudice the maintenance of the patent under Article 100(c) EPC.

3.2 Claim 9

This claim corresponds to claim 12 as granted and is directed to the products as such (see point V above); it combines the features of claims 1, 6 and 8 as originally filed with 2-octyl dodecanol additionally cited as a starting material for making the esters claimed.

As far as 2-octyl dodecanol is concerned, reference is made to point 3.1 above.

Regarding the remaining features of claim 9 (i.e. "in which the acid number of the crude ester is reduced by reaction with a glycidyl ester of preferably branched chain monocarboxylic acids."), the Respondent argued as follows: The combination of the features of claims 1, 6 and 8 as originally filed was not directly disclosed in the application as filed. He agreed with the argument in point 2 of the reasons of the decision under appeal that examples II and III of the application as filed could not serve as a basis for said combination; the specific esters and the specific glycidyl ester used therein could not be generalised as to serve as a basis for the claim.

The fact that both claims 6 and 8 as originally filed are only dependent on claim 1 led the Respondent to the conclusion that the claims as originally filed disclosed either the combination of original claims 1 and 6 or that of original claims 1 and 8, but not the combination of original claims 1, 6 and 8.

The Board does not share this view for the following reasons. According to the jurisprudence of the Boards of Appeal, the requirement of Article 123(2) EPC is not met (and grounds under Article 100(c) EPC apply) unless the skilled person can directly and unambiguously derive the amended information as a combination of features available in the application as filed (see, e.g., T 0201/83, published in OJ EPO 1984, 481, in particular point 3 of the reasons). The test if an amendment gives rise to objections under Article 100(c)

EPC thus refers to the skilled person. The skilled person reading the claims of the application as originally filed would not only derive the literally disclosed combination of original claims 1 and 8, but also additional information.

The high acid number in the crude ester is due to unreacted acid present, i.e. due to an impurity. In contrast to this, the selection of particular alcohols as starting materials has an effect on the chemical structure of the ester as such. Hence there is no link between the selection of the alcohols as starting materials for the esterification on the one side and the treatment of the crude ester in order to reduce its acid content on the other. Consequently, the person skilled in the art would have treated the crude ester as specified in claim 8 as originally filed if he considered the acid number to be too high, no matter if the alcohol starting materials fell under the broader definition of claim 1 or if the selection of the alcohols only consisted of 2-octyl dodecanol and the three alcohols mentioned in claim 6 as originally filed. For this reason, the person skilled in the art would have directly and unambiguously derived from the application as filed the combination of the features of claims 1 and 8 as originally filed, limited to those esters derived from the three alcohols listed in claim 6 as originally filed and - for the reasons given in point 3.1 above - to those derived from 2-octyl dodecanol.

Consequently, the amendments in claim 9 of the Main Request also do not prejudice the maintenance of the patent under Article 100(c) EPC.

3.3 It was not disputed that dependent claims 2-8 and 10 to 15 of the Main Request are based on claims 2-4, 7-9 and 11 of the application as originally filed.

3.4 Consequently, no grounds under Article 100(c) EPC prejudice the maintenance of the patent based on the Main Request.

4. *Novelty*

The Respondent acknowledged during the oral proceedings that the subject-matter of the claims of the Main Request was novel. This subject-matter differs from the one disclosed in (D1) in that (D1) does not disclose esters based on the combinations of alcohols and acids defined in the only independent claims 1 and 9 of the Main Request.

5. *Inventive step*

5.1 The patent in suit "relates to ester based lubricants for four-stroke engines" (see section [0001] of the patent and page 1, lines 3-5, of the application as originally filed).

Document (D6) is the only prior art document cited which deals with the use of ester based lubricants in four-stroke engines and thus is considered to represent the closest prior art for assessing inventive step.

This document discloses in particular testing of lubricants based on higher alcohol carbonates in the engines of Mercedes 240 D and Alfa Romeo "Alfetta" (see

(D6), claim 1 and page 10, lines 16-17). It was not disputed that these are four-stroke engines.

- 5.2 There is no evidence showing a particular technical effect or improvement of the esters claimed vis-à-vis those used in (D6). Hence, the problem to be solved in view of the closest state of the art can only consist in providing alternative esters for use in lubricants for four-stroke engines.

As the solution to this problem it is now suggested to use the esters of claim 9 of the patent in suit (which corresponds with claim 12 as granted; see point II above).

Having regard to the parameters (a) to (d) of the esters as defined in claim 9, the Board accepts that the technical problem as stated above is solved within the whole claimed area.

- 5.3 The Respondent argued in essence that when trying to solve the above-stated technical problem the person skilled in the art would have considered those of the esters disclosed on the last page of document (D1) with the most promising characteristics in view of the intended use, i.e. those having a low pour point and a low viscosity. The two esters retained on this basis were 2-hexyldecyl isopalmitate (Rilanit G 16-IP) and 2-octyldodecyl isononoate (Rilanit G 20-IN). In view of this selection he would have concluded that those esters were most suitable which were derived from branched alcohols having from 16 to 20 carbon atoms and branched monocarboxylic acids having from 9 to 16 carbon atoms. In addition to that, document (D2)

disclosed lubricants based on esters derived from a branched C₁₆-alcohol and a C₁₃-acid. Therefore, so he argued, it was obvious for the person skilled in the art to select as the starting materials for the esters the branched alcohols mentioned in claims 1 and 9 of the main request which have 13, 18 and 20 carbon atoms on the one hand and branched monocarboxylic acids having at least 10 carbon atoms on the other. The treatment according to claim 9 of the Main Request of the crude ester with a glycidyl ester in order to reduce its acid number was obvious in view of the teaching of document (D5).

The Board agrees with the Respondent to the extent that the skilled person looking for alternative ester based lubricants for four-stroke engines would have selected esters having low pour points and acceptable viscosities from those listed on the last page of document (D1). Among these, the following Rilanit types have low setting point (and thus low pour points).
G 16-A (i.e. 2-hexyldecyl adipate),
G 16-IP (i.e. 2-hexyldecyl isopalmitate) and
G 20-IN (i.e. 2-octyldecyl isononoate).

The person skilled in the art had, however, no reason to look for esters other than those disclosed in document (D1). One reason for this is that the parameters given for the three esters mentioned above on the last page of that document (i.e. the acid numbers, the viscosities, the viscosity indices, the setting points and the evaporation losses) show that they are perfect candidates as a basis for lubricants for use in four-stroke engines; no modification in their chemical structure is indeed required for that

purpose. Another reason is that even a small variation in the starting materials for preparing the esters might render the product unsuitable for use in four-stroke engines. The Board observes that the replacement of the 2-hexyldecanol in Rilanit G 16-A by 2-octyl dodecanol to yield Rilanit G 20-A leads to a dramatic increase in the setting point from less than -60°C to -9°C . A setting point of -9°C (i.e. a pour point of about -6°C) is however not acceptable in four-stroke engines; the respective ester could not provide enough lubrication at cold starts of the engine in winter. Contrary to the Respondent, the Board does not regard document (D2) to be relevant as it relates to lubricants for turbo-jet or turbo-prop aircraft engines (see column 1, lines 29-31) and clearly excludes that both the acid and the alcohol starting materials are branched (see column 1, lines 67-69).

Hence, the subject-matter of claim 9 is based on an inventive step.

- 5.4 The Board observes that, as a product claim, claim 9 is directed to particular esters and contains only one limitation with respect to independent claim 1, namely "...in which the acid number of the crude ester is reduced by reaction with a glycidyl ester of preferably branched chain monocarboxylic acids."

This limitation does not contribute to the solution of the underlined technical problem in that parameters (a) to (d) are not affected. Moreover, as the Appellant confirmed, the reduction of the acid number of ester lubricants by treating them with glycidyl esters of monocarboxylic acids was known from document (D5) (see

claim 1 and page 3, left-hand column, lines 25-40; see Appellant's letter dated 6 February 2004, paragraph 8.3.2).

Hence, the same conclusion as for claim 9 applies to independent claim 1 directed to the use of the esters in lubricating four-stroke engines.

The remaining claims 2 to 8 and 10 to 15 are dependent claims directed only to preferred embodiments of either claim 1 or claim 9.

5.5 Consequently, the subject-matter of the claims of the Main Request is based on an inventive step.

6. Hence, no grounds under Article 100 EPC prejudice the maintenance of the patent based on the claims of the Main Request. Therefore there is no reason to deal with any of the auxiliary requests.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the first instance with the order to maintain the patent with the following documents:
Claims 1 to 15 of the new Main Request filed at the oral proceedings on 10 August 2006 and a description yet to be adapted.

The Registrar:

The Chairman:

N. Maslin

A. J. Nuss