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D E C I S I O N
of 17 February 1995

Case Number: T 0126/93 - 3.3.1

Application Number: 86108427.5

Publication Number: 0206280

IPC: C10M 169/04

Language of the proceedings: EN

Title of invention:
Improved mist lubrication process and composition

Patentee:
HENKEL CORPORATION (a Delaware corp.)

Opponent:
Fina Research S.A.

Headword:
Mist Lubrication/HENKEL

Relevant legal provisions:
EPC Art. 56

Keyword:
"Inventive step (yes) - improvement not acknowledged in the
absence of proper comparative tests - unobvious alternative"

Decisions cited:
T 0155/88

Catchword:
-



Case Number: T 0126/93 - 3.3.1

D E C I S I O N
of the Technical Board of Appeal 3.3.1
of 17 February 1995

Appellant: Fina Research S.A.
(Opponent) Zone Industrielle C
B-7181 Feluy (BE)

Representative: -

Respondent: HENKEL CORPORATION (a Delaware corp.)
(Proprietor of the patent) 300 Brookside Avenue
Ambler, PA 19002 (US)

Representative: Patentanwälte
Grünecker, Kinkeldey,
Stockmair & Partner
Maximilianstrasse 58
D-80538 München (DE)

Decision under appeal: Decision of the Opposition Division of the
European Patent Office of 9 November 1992, posted
4 December 1992 rejecting the opposition filed
against European patent No. 0 206 280 pursuant to
Article 102(2) EPC.

Composition of the Board:

Chairman: A. J. Nuss
Members: P. Krasa
R. E. Teschemacher

Summary of Facts and Submissions

- I. European patent No. 0 206 280 concerning an improved mist lubrication process and compositions and based on the application 86 108 427.5 was granted on the basis of nine claims, Claim 1 of which reads as follows:

"1. A lubricant composition suitable for misting comprising:

- (1) 45 to 95 parts by weight of a synthetic ester having a viscosity of 0.15 to 3 cm²/s (15 to 300 centistokes) at 40°C and selected from the group consisting of
 - (a) polyol esters derived from an aliphatic polyol having from 2 to 8 hydroxyl groups and 3 to 12 carbon atoms and an aliphatic monocarboxylic acid or a mixture of aliphatic monocarboxylic acids having from 5 to 20 carbon atoms;
 - (b) trimellitate esters derived from trimellitic acid or trimellitic anhydride and an aliphatic alcohol having from 5 to 16 carbon atoms; and
 - (c) polymeric fatty acid esters derived from a polymeric fatty acid containing 75% or more C₃₆ dimer acid and a C₁₋₁₃ mono-functional alcohol;
- (2) 8 to 40 parts by weight, on a 100% polymer basis, polyisobutylene having an average molecular weight from 4,000 to 10,000; and
- (3) 0.1 to 1 part by weight, on a 100% polymer basis, polyisobutylene having an average molecular weight from 25,000 to 300,000; and

said composition having a viscosity of 1.25 to 7.5 cm²/s (125 to 750 centistokes) at 40°C."

II. Notice of opposition was filed against the European patent by the Appellant (Opponent), raising objection under Article 100(a) EPC, in particular against inventive step, and citing, inter alia, the following documents:

- (7) FR-A-2 187 894
- (8) Abstract of JP-A-5 213 504
- (10) T. D. Newingham, "Designing a Mist Oil",
Lubrication Engineering 1977, 128-132
- (12) US-A-3 855 135
- (13) US-A-3 607 749.

III. The Opposition Division rejected the opposition by a decision delivered orally on 9 November 1992, with written reasons posted on 4 December 1992. In its decision the Opposition Division found in essence

- that the document (7), representing the closest state of the art, disclosed compositions comprising synthetic esters as base lubricants, but did neither disclose the addition of two polyisobutylenes having different average molecular weights (= AMW) nor the vaporisation of the lubricants concerned;
- that none of the other cited documents disclosed the use of two polyisobutylenes with different AMW in the specific amounts claimed in the patent in suit for reducing stray mist,

and concluded that, therefore, the subject-matter of the patent in suit had not been obvious to the skilled person.

IV. The Appellant lodged an appeal against this decision. He submitted in his Statement of Grounds of Appeal that the subject-matter of the patent in suit was not novel in view of document (7). Alternatively, he submitted that it was obvious in view of various combinations of the documents (7), (8), (10), and (13).

V. In the oral proceedings, held on 17 February 1995, and after the chairman having indicated to the parties that the Board actually considered citation (12) to be an appropriate starting point for the assessment of inventive step, the Appellant - after having dropped the novelty objection raised in the statement of grounds of appeal on the basis of citation (7) - eventually argued that it would have been obvious for a skilled person being aware of the mist lubricants of document (12) to suggest further compositions for mist lubrication by applying the combined teachings of the citations (10), (12), and (13) to the compositions known from document (7), whereby document (8) was no longer used to support the objection of obviousness.

He argued in particular that the beneficial effect of high molecular weight polyisobutylene (= PIB) on the misting properties of lubricating oils was known from citation (10) as was their shearing to less effective low molecular weight PIB (page 129, right hand column, lines 19 to 24, in combination with page 130, right hand column, second paragraph below the table). The Appellant maintained that the skilled person knew from document (13), which admittedly was silent on the misting of the lubricants concerned, that lower molecular weight polymers protected high molecular weight polymeric viscosity index (VI) improvers against shear degradation independently from the base oil used (column 1, lines 49 to 58), and from document (12) that

two different polymers could be used to improve the misting properties of a lubricating oil, and would have applied this teaching to the synthetic lubricants of document (7).

The Appellant concluded that, therefore, the subject-matter of the patent in suit was obvious.

- VI. The Respondent (patent Proprietor) submitted firstly that the objection concerning lack of inventive step was based on an incorrect analysis of document (7) and, secondly, that the skilled person would not have combined document (10) with document (13), as the latter did not address the technical problem of achieving a high amount of reclassified oil; but even when combining these two citations, the skilled person would not arrive at the claimed invention, as neither document (10) nor document (13) disclosed the use of two types of polyisobutylenes with the particular features of the patent in suit. Document (12) on the other hand was teaching away from the subject-matter in suit, as disclosing that PIB should not be used alone as mist controlling agent but together with polymethacrylates (column 3, lines 46 to 53). According to the Respondent, it would have required of the skilled person to make about 4 distinct steps to arrive at the claimed invention when taking document (12) as the starting point for evaluating inventive step, which, so he argued, was ample evidence that the claimed subject-matter was inventive.

- VII. The Appellant requested that the decision under appeal be set aside and the European patent No. 0 206 280 be revoked.

The Respondent requested that the appeal be dismissed.

At the end of the oral proceedings the chairman announced the Board's decision to dismiss the appeal.

Reasons for the Decision

1. The appeal is admissible.

2. *Novelty*

None of the cited documents discloses a mist lubricant composition comprising all the features of Claim 1 of the patent in suit, which claim is therefore novel. As this was no longer in dispute eventually, it is not necessary to deal with this issue in detail.

3. *Problem and solution*

3.1 The patent in suit relates to a lubricant composition suitable for mist lubrication (see Claim 1). Such compositions are known from document (12), which aims at low stray fog production and a high amount of reclassified oil (see the paragraph bridging columns 2 and 3), objectives which the patent in suit is also addressing (page 3, lines 47 to 64 and page 4, lines 15 to 16). Therefore, the Board considers document (12), which was already discussed in the patent in suit (page 2, lines 26 to 30), as disclosing the most relevant piece of prior art and as constituting the appropriate starting point for evaluating inventive step.

3.2 Document (12) discloses in particular a mixture of a mineral lubricating oil with an effective amount of a polymer additive selected from, inter alia, polyolefins, polyacrylates, and polymethacrylates; as polyolefins a

PIB with an viscosity AMW in the range of from 10 000 to 2 000 000 is suggested, which provides a satisfactory lubricant, if applied in combination with a polymethacrylate which compensates for the tendency of the PIB to decrease the total oil output (see column 2, lines 6 to 16, in combination with column 3, lines 58 to 60, and column 3, lines 46 to 53). Document (12) further discloses that a very narrow molecular weight range is required for a given polymer in order to obtain sufficient reclassification and low stray fog (column 3, lines 19 to 23).

- 3.3 Having regard to the state of the art acknowledged in the description and, thus, also to document (12), the patent in suit suggests that the underlying technical problem should be seen in providing an improved mist lubricant composition (and process) - see page 2, lines 3 to 4, and 26 to 30. However, no valid comparison of the claimed compositions with those of citation (12) was provided by the Respondent either in the patent in suit or in the course of the proceedings before the EPO. According to the patent in suit the mist properties were determined in accordance with the procedure of ASTM D 3705-78 (page 7, lines 14 to 15), whereas in document (12) a "Norgren" test apparatus is applied (column 10, line 66 to column 11, line 40). In view of the different test methods, the percentages which can be found e.g. in the table on top of column 12 of document (12) for manifold losses, reclassified oil, and stray fog cannot be compared with the respective data of the examples IIA or IIIA of the patent in suit, as was rightly pointed out by the Appellant and was not contested by the Respondent.

For this reason the Board cannot accept that the problem underlying the patent in suit consists in providing lubricant compositions having improved misting properties as compared with those of document (12).

- 3.4 It follows from the preceding that the technical problem to be solved is to be seen in providing an alternative lubricant composition suitable for mist lubrication.

Having regard to the examples which appear in the patent in suit, and which demonstrate that embodiments falling within the range of compositions claimed show a favourable balance of misting properties, in particular high mist output and a high ratio of reclassified oil (examples IIA and IIIA), the Board is satisfied that the stated technical problem has been credibly solved by the lubricating compositions presently claimed.

4. *Inventive Step*

- 4.1 According to Claim 1 of the patent in suit the lubricant compositions have a viscosity of 1.25 to 7.5 cm²/s at 40 °C and comprise

- (1) 45 to 95 parts by weight of a synthetic ester with a viscosity of 0.15 to 3 cm²/s at 40 °C and selected from the groups of specific polyol esters, trimellitate esters, and polymeric fatty acid esters, all as defined in Claim 1,
- (2) 8 to 40 parts by weight of PIB having an AMW from 4 000 to 10 000, and
- (3) 0.1 to 1 part by weight of PIB having an AMW from of 25 000 to 300 000.

- 4.2 These lubricant compositions differ from those known from document (12), in essence, by the different base oil and by the different second component of the

polymeric additive, i.e. the PIB with a low AMW (component (2) of present Claim 1) which replaces the polymethacrylate of the compositions known from document (12). No indication can be found in this citation that such a replacement would not only overcome the drawback of PIB (see above no. 3.2) but also yield a mist lubricant with a satisfactory total oil output. Rather to the contrary, the statement in column 3, lines 19 to 23 "For a given polymer a **very narrow molecular range** and/or concentration range in the lubricant is required in order to obtain sufficient reclassification for proper lubrication and no visible stray fog" (emphasis added), in the Board's judgement, would lead the skilled person away from using as a mist control additive two fractions of a polymer, differing only in the AMW.

4.3 Document (10), a study based on experimental work, is concerned with designing of mist oils and in particular with the effect of polymeric mist control additives on the oil mist (page 128, left hand column, first paragraph). While it seems to favour polymethacrylate with a viscosity AMW between 300 000 and 400 000 as the mist control additive, it also discloses the use of PIB to that end (page 131, right hand column, nos. 1 and 4 of the conclusions, and page 130, right hand column, the second paragraph). In this respect it adds nothing to the technical information contained in citation (12). However, it mentions a further problem, which is the degradation of the high AMW polymers into less effective low AMW polymers due to shear forces. No suggestion is made in document (10) as to how this problem could be overcome.

4.4 This stability problem and its solution are the gist of the disclosure of document (13) relating to VI improvers. It is suggested there, to protect the high

AMW polymeric VI improvers by adding a substantially shear-stable polymer having a low AMW, preferably below 10 000, to the lubricant, e.g. "... poly-isobutylenes, and poly α -olefins such as poly 4-methylpentene-1, polyesters such as the polymethacrylates, and polyethers" (column 1, lines 49 to 53, in combination with column 1, line 70 to column 2, line 5). In the "example", a poly-4-methylpentene-1 (molecular weight = 4 000), a PIB (molecular weight = 2 000), or a polymethacrylate (molecular weight = 20 000) were used to protect a polyalkylmethacrylate having a molecular weight of about 500 000, without any preference for the one or the other being recognisable (column 2, lines 55 to 70). This document not being concerned with mist lubrication, actually does not provide the slightest information about any possible effect of the suggested polymeric additives on the misting behaviour of the disclosed lubricants. Therefore, when trying to solve the existing technical problem, the skilled person could find no pointer in document (13) that a particular low AMW PIB of component (2) of present Claim 1 would, in combination with another PIB having a higher AMW (i.e. with component (3) according to the patent in suit) solve this problem.

This finding is confirmed by the fact that the technical teaching of document (13), which was published about three and a half years prior to document (10), was not even mentioned by the author of this study as a possibility to overcome the stability problems of polymeric mist control additives which he was clearly aware of (see above no. 4.3). This is a strong indication that those skilled in the art did not consider document (13) to be of any relevance when it came to designing new mist lubricants.

4.5 For these reasons, the Board concludes that there exists no technical teaching - resulting from a combination of documents (12), (10), and (13) - which would have induced the skilled person to select the particular combination of the components (2) and (3) of the present Claim 1 as lubricant additive for any base oil, including such as known from document (7), when trying to design a mist oil with an acceptable balance of properties as an alternative to the mist oils disclosed in document (12).

Citation (7) itself refers to lubricants for two-cycle engines comprising synthetic esters as a base. On pages 4 and 5 seven different groups - some of them comprising even several sub-groups - are enumerated. Among them, also trimellitate and polyol esters are mentioned (page 4, lines 25 to 27, and page 4, line 28 to page 5, line 7), i.e. two classes of polymers which also come into question as component (1) of the mist lubricants according to present Claim 1. The lubricants disclosed in document (7) may also comprise oligomers or polymers of olefins such as PIB of moderate molecular weight (in the magnitude of 1 000) or with relatively high molecular weight (e.g. of the magnitude of some tenthsousands) or copolymers of ethylene or propylene, and so on (page 6, lines 6 to 30).

As the technical problem underlying the patent in suit is not addressed in document (7), this citation contains neither any information regarding which groups of possible synthetic base oils were eligible for further development with a view to solving the existing technical problem nor any pointer to the particular features of the polymeric additive (components (1) and (2) of present Claim 1) to be combined with such a base oil. This leads the Board to observe that a skilled person would also not have arrived at the claimed

lubricant composition if citation (7) had been used as starting point for assessing inventive step, as suggested by the Appellant at an earlier stage of the proceedings.

4.6 The Board cannot accept the Appellant's argument either that the Examples IIB, IIC, IIIB, and IIIC, which according to him are to be seen as embodiments of the state of the art as represented by document (7), would demonstrate that compositions in accordance with this citation could also serve for mist lubrication. Thus, on the basis of the information contained in the said document, the skilled person could in no way arrive at such knowledge; if at all, then only after having read the patent in suit, i.e. through a typical ex post facto analysis, which is not permissible.

4.7 In the Board's judgement the lubricant of Claim 1 must thus be regarded as a non-obvious alternative to that known from document (12). Accordingly, the subject-matter of Claim 1 involves an inventive step in the sense of Article 56 EPC. Claim 8 relates to a lubrication process based on the same inventive concept and derives its patentability from that of Claim 1 as do the dependent Claims 2 to 7, and 9, relating to particular embodiments of Claims 1 and 8, respectively.

5. At the oral proceedings the Appellant further objected that Claims 1 to 7 of the patent in suit are composition claims which are not limited to their application in the field of mist lubrication, which is certainly correct. However, the Appellant's inference is invalid that, therefore, these claims comprise non-patentable subject-matter, as far as they relate to the, allegedly, non-inventive use of the compositions concerned as lubricants in general. Under the EPC a claimed invention directed to a product is allowable if, in addition to

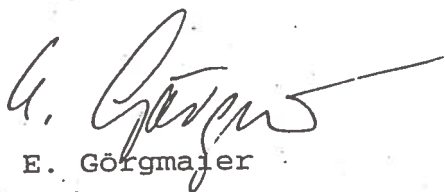
its composition, there is also disclosed its technical use to which a finding of inventive step may be linked. However, if this condition is satisfied, the claims need not be limited to such use (T 155/88, No. 4.1.1 of the Reasons for the Decision, not published in the OJ EPO).

Order


For these reasons it is decided that:

The appeal is dismissed.

The Registrar:


E. Görgmaier

The Chairman:


A. Nuss