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D E C I S I O N
of 5 February 1999

Case Number: T 0392/96 - 3.3.1

Application Number: 92901186.4

Publication Number: 0567468

IPC: C10M 173/02

Language of the proceedings: EN

Title of invention:
Conveyer lubricant compatible with synthetic plastic containers

Applicant:
Ecolab Inc.

Opponent:
-

Headword:
Conveyor lubricant/ECOLAB

Relevant legal provisions:
EPC Art. 56, 111(1)

Keyword:
"Inventive step (yes) - unobvious improvement"

Decisions cited:
-

Catchword:
-

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Case Number: T 0392/96 - 3.3.1

D E C I S I O N
of the Technical Board of Appeal 3.3.1
of 5 February 1999

Appellant: Ecolab Inc.
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Representative: Desaix, Anne
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Decision under appeal: **Decision of the Examining Division of the European Patent Office posted 16 November 1995 refusing European patent application No. 92 901 186.4 pursuant to Article 97(1) EPC.**

Composition of the Board:

Chairman: A. J. Nuss
Members: P. P. Bracke
W. Moser

Summary of Facts and Submissions

I. The appeal lies from the Examining Division's decision, dispatched on 16 November 1995, refusing European patent application No. 92 901 186.4 (WO 92/13049) due to lack of inventive step over the teaching of document

(1) WO 90/10053,

since the claimed lubricants were only a selection of those described in document (1) and an advantage or surprising effect had not been shown.

II. In support of his submission that the lubricating properties of the claimed lubricants were improved with regard to those described in document (1), the Appellant (Applicant) filed with telefax of 13 March 1996 data resulting from a study comparing the coefficient of friction (COF) between two metal surfaces after treatment with a reference lubricant containing triethanol amine and a C_{18} fatty acid and after treatment with lubricant compositions containing C_{10-15} alkyl amine ethoxylate (having an average of about 15 moles of ethylene oxide per molecule) and either a C_{18} fatty acid (rel. COF 1.04), a mixture of C_{12} and higher fatty acids (rel. COF 1.00), octanoic acid (rel. COF 1.31) or propionic acid (rel. COF 1.38), wherein the "rel. COF" is the COF of the tested lubricant/COF of the reference lubricant.

III. In response to a communication of the Board of Appeal the Appellant filed on 25 September 1998 a set of 25

claims, of which the independent Claims 1, 11 and 18 read:

"1. An aqueous liquid conveyor lubricant concentrate which is compatible with synthetic polymeric packaging materials, the concentrate comprising:

(a) a balance water;

(b) 2-40 wt-% of a hydrotope; and

(c) 1-70 wt-% of a fatty acid diamine salt having the formula:

$[(R^1)(R^2)N(R^5)NH(R^3)(R^4)]^+(R^6COO)^-$, or
$[(R^1)(R^2)NH(R^5)NH(R^3)(R^4)]^{++}(R^6COO)_2^-$;

wherein R^1 is a C_{10-18} aliphatic group; R^2, R^3, and R^4 are independently hydrogen or an alkoxy group containing one to five alkylene oxide units; R^5 is a C_{1-5} alkylene group; and R^6 is a C_{10-18} aliphatic group."

"11. A process for lubricating the load bearing surface of a conveyor system comprising the step of coating the load bearing surface of the conveyor system with a sufficient lubricating amount of a conveyor lubricant comprising at least

(a) a major proportion of water, and

(b) 50 to 10,000 ppm (w/v) of a fatty acid diamine salt having the formula:

$[(R^1)(R^2)N(R)^5NH(R^3)(R^4)]^+(R^6COO)^-$, or
$[(R^1)R^2)NH(R^5)NH(R^3)(R^4)]^{++}(R^6COO)_2^-$

wherein R^1 is a C_{10-18} aliphatic group; R^2, R^3, and R^4 are independently hydrogen or an alkoxy group containing one to five alkylene oxide units; R^5 is a C_{1-5} alkylene group; and R^6 is a C_{10-18} aliphatic group."

"18. A solid conveyor lubricant concentrate dilutable with an aqueous base to form a use solution which is compatible with synthetic polymeric packaging materials, the concentrate comprising:

(a) 5-70 wt-% of a fatty acid diamine salt having the formula:

$[(R^1)(R^2)N(R^5)NH(R^3)(R^4)]^+(R^6COO)^-$, or
$[(R^1)(R^2)NH(R^5)NH(R^3)(R^4)]^{++}(R^6COO)_2^-$

wherein R^1 is a C_{10-18} aliphatic group; R^2, R^3, and R^4 are independently hydrogen or an alkoxy group containing one to five alkylene oxide units; R^5 is a C_{1-5} alkylene group; and R^6 is a C_{10-18} aliphatic group; and

(b) an amount of a solidification agent effective for solidifying the concentrated lubricant."

IV. The Appellant requested that the contested decision be set aside and that a patent be granted on the basis of the set of claims filed on 25 September 1998.

Reasons for the Decision

1. The appeal is admissible.

2. *Amendments*

Present Claim 1 is a combination of the lubricant features described in original Claim 1 and the amounts of hydrotope and fatty acid diamine salt described on pages 11, lines 4 to 6, and page 14, lines 18 to 20, of the application as filed.

Claim 2 is supported by the teaching on page 11, lines 9 to 12, and by the amount mentioned on page 15, line 2. Claim 3 specifies the sequestrant as a chelating agent as mentioned on page 13, lines 9 to 14, and the amount as cited on page 15, line 3.

Present Claims 4 to 10 correspond with Claims 4 to 10 of the application as filed.

Present Claims 11 and 13 are combinations of the process features described in Claims 15 and 17 respectively of the application as filed with the amounts of fatty acid diamine mentioned on page 15, line 25 to page 16, line 1 of the application as filed. Present Claim 12 specifies the R^1 and the R^5 substituents as in Claim 16 of the application as filed.

Claims 14 to 16 correspond to Claims 18 to 20 of the application as filed.

Claim 17 further specifies that the diamine salt is a C_{10-18} fatty acid diamine salt, as mentioned on page 6, lines 19 to 22, of the application as filed.

Claims 18 to 22 correspond to Claims 22 to 26 respectively of the application as filed, with Claim 18 further containing the amount of fatty acid diamine salt described in Claim 27 of the application as filed.

Claims 23 to 25 correspond to Claims 28 to 30 of the application as filed.

Therefore, Claims 1 to 25 do not contravene Article 123(2) EPC.

3. *Novelty*

Having examined the prior art cited in the International Search Report, the Board has reached the conclusion that the process according to the present claims is not disclosed in any of the documents belonging to that prior art.

The Board therefore concludes that the claimed process is novel over the cited prior art, which was not contested by the Examining Division.

4. *Inventive step*

4.1 It has never been contested by the Appellant that document (1) represents the closest state of the art.

Document (1) discloses lubricant compositions which are suitable for lubricating conveyor systems used in the bottling of beverages in synthetic polymeric packaging materials (page 1, lines 5 to 12; page 6, lines 8 to 14, and page 14, lines 13 to 20 and 24 to 28) and which may contain diamine-salts of formula $RNH(CH_2)_3N^+H_3\ X^-$ or $RN^+H_2(CH_2)_3N^+H_3\ 2X^-$, wherein R may **generally** be C_{6-22} alkyl and X^- may be a C_{1-20} alkyl-COO^- anion (see formula (IIb) and (IIc) on page 9 and the meanings of R and X^- on page 7, lines 14 and 15 and page 8, lines 2 and 3). Although these lubricants are stated to be suitable for being combined with polyethyleneterephthalate (PET) (see page 14, lines 24 to 27), the only diamine-salts of formula (IIb) or (IIc) **specifically** disclosed are the **acetates** mentioned in examples 2, 6, 8 to 13 and 17.

4.2 According to the application in suit, fatty acid soaps, which were commonly used as lubricating ingredient of conveyor lubricants (page 1, lines 21 to 30), were generally incompatible with PET (page 1, line 31 to page 2, line 3) and, therefore, a need existed for conveyor lubricants having superior lubricity and compatibility with synthetic polymeric packaging materials (page 2, lines 22 to 25).

Since the diamines described in document (1) were not acknowledged in the application in suit, and since such diamines were known from that document to be compatible with eg PET, the technical problem to be solved by the claimed lubricants has to be reformulated in view of this more relevant prior art in that lubricants having **superior lubricity** are to be provided by the claimed

invention.

4.3 The solution offered in the application in suit to the above-stated objective problem is a lubricant as defined in Claim 1.

The data, provided with letter of 13 March 1996 (see point II. above), clearly show that compositions containing a salt of the C_{10-15} alkyl amine ethoxylate with either a mixture of C_{12}, C_{14} and C_{16} fatty acids or C_{18} fatty acids have a rel. COF equal to or close to 1, whereas the salts with lower fatty acids, ie C_3 or C_8 fatty acids, have a higher rel. COF, which illustrates that the lubricity of the claimed lubricants is superior to that of lubricants in the prior art.

Therefore, the Board is satisfied that the claimed lubricants provide for superior lubricity over the lubricants disclosed in document (1).

4.4 Thus, in view of the cited state of the art, the only remaining question to be decided is whether a skilled person could have expected, from the lubricants known from document (1), that the ones claimed at present would improve lubricity.

4.5 Since document (1) contains only lubricating data for salts of an alkyl fatty acid below C_{10} (acetate salts), this document does not suggest that C_{10-18} fatty acid salts provide improved lubricity.

Consequently, in the Board's view, a skilled person when trying to solve the above-stated problem could not

derive from document (1) that the diamine-salts according to Claim 1 would provide for superior lubricity.

4.6 The question of inventive step has to be considered, however, in the light of **all prior art on file**. Therefore, in order to give the Appellant the possibility of having his case examined and decided by two instances, the Board invokes its discretionary power under Article 111(1) EPC and remits the case to the Examining Division for further prosecution.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the Examining Division for further prosecution on the basis of claims 1 to 25 filed on 25 September 1998.

The Registrar: The Chairman:

E. Görgmaier A. Nuss