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D E C I S I O N
of 24 September 2002

Case Number: T 0081/97 - 3.3.6

Application Number: 90909723.0

Publication Number: 0479846

IPC: C11D 1/825

Language of the proceedings: EN

Title of invention:
Liquid detergent composition

Patentee:
UNILEVER PLC, et al

Opponent:
(01) Henkel Kommanditgesellschaft auf Aktien
(02) Albright & Wilson Limited
(03) Novo Nordisk A/S

Headword:
Liquid detergent/UNILEVER

Relevant legal provisions:
EPC Art. 56

Keyword:
"Inventive step (yes) - non obvious addition of a further compound"

Decisions cited:
-

Catchword:
-



Case Number: T 0081/97 - 3.3.6

D E C I S I O N
of the Technical Board of Appeal 3.3.4
of 24 September 2002

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Decision under appeal: Decision of the Opposition Division of the
European Patent Office posted 19 November 1996
revoking European patent No. 0 479 846 pursuant
to Article 102(1) EPC.

Composition of the Board:

Chairman: P. Krasa

Members: P. Ammendola
C. Holtz

Summary of Facts and Submissions

- I. This appeal is from the decision of the Opposition Division to revoke the European patent No. 0 479 846 relating to a liquid detergent composition for lack of an inventive step.
- II. Respondents 01 to 03 (Opponents 01 to 03) had sought revocation of the patent on the grounds of insufficient disclosure as well as of lack of novelty and inventive step (Articles 100(a) and (b) EPC).
- During the opposition proceedings the following documents were cited, inter alia, by the parties:
- Document (4): EP-A-0 086 614
- Document (5): EP-A-0 346 995.
- III. In its decision the Opposition Division held that the subject-matter of claim 1 of the Patent Proprietors' main and auxiliary requests lacked an inventive step vis-à-vis Document (4).
- IV. The Appellants (Patent Proprietors) filed with the grounds of appeal four sets of amended claims and requested the maintenance of the patent in amended form on the basis of the set of claims labelled as "main request". The remaining three sets of amended claims were filed as first, second and third auxiliary requests, respectively.

The Appellants requested also oral proceedings in case none of the preceding requests were considered allowable by the Board. In the grounds of appeal some passages of

Document (11): EP-A-0 151 884
(cited in the patent in suit at page 2) were mentioned.

V. Only Respondents 02 (Opponents 2) replied to the grounds of appeal. They too requested oral proceedings.

VI. After the Board had summoned the parties to oral proceedings, Respondents 01 (Opponents 1) informed the Board with letter of 9 October 2001 that they would not attend.

On 5 December 2001 Respondents 02 withdrew from the proceedings by fax and informed the Board that they would not attend the oral proceedings either, and the Appellants, with a fax of the same date, abandoned the main, first and second auxiliary requests.

Then, with a fax of 6 December 2001, the Appellants withdrew their request for oral proceedings and requested that the procedure be continued in writing, in particular for adaptation of the description to the set of claims forming the only remaining request (i.e. the set of claims according to the third auxiliary request filed with the grounds of appeal).

VII. The Board cancelled the oral proceedings and invited the Appellants to provide the announced amended description.

The Appellants filed with letter of 11 December 2001

amended pages 2 to 5 and 7 to 10 of the description.

In reply to a communication from the Board, the Appellants submitted with letter of 14 February 2002 amended set of seven claims as their only request. It comprises only one independent claim 1 which reads as follows:

"1. An aqueous detergent-active structured liquid detergent composition in the form of an aqueous dispersion of lamellar droplets, comprising:

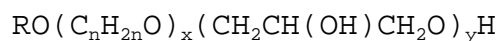
(a) a first nonionic surfactant having an HLB of 12.0 or more;

(b) a second nonionic material at a level of more than 3% by weight selected from:

(i) C₆-C₂₀ aliphatic alcohols;

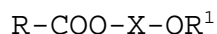
(ii) alkoxyated C₈-C₂₄ fatty acids or fatty amides containing from 1-3 alkoxy groups of 2-4 C atoms;

(iii) nonionics of the following formula:



wherein R is an alkyl or alkenyl group having from 9 to 25 carbon atoms, n is 2 to 4, x is from 1 to 3, y is from 1-3, the alkylene oxide and glycerol groups are arranged in random or block formation, preferably the molecule is terminated with at least one glycerol group;

(iv) esters of fatty acids with reducing hexose or pentose sugars of the formula:



wherein R is an alkyl or alkenyl group, R¹ is an alkyl group having from 1 to 4 carbon atoms and X is carbohydrate moiety containing one hexose or pentose unit

or mixtures thereof;

the total amount of nonionic surfactant being from 10

to 35% by weight;

(c) optionally an anionic surfactant material up to a level of 50 weight % of the total of components a, b and c;

the composition further containing deflocculating polymers having a hydrophilic backbone and at least one hydrophobic side chain."

The remaining claims 2 to 7 of the Appellants' request are all dependent on claim 1.

VIII. In the grounds of appeal the Appellants discussed the presence of an inventive step for the subject-matter of claim 1 of the then third auxiliary request, which was substantially the same as that of claim 1 of the present sole request. In particular, they maintained that Document (4) would not represent the most relevant state of the art since it would not disclose the same kind of "lamellar droplet suspension" as the patent in suit.

They argued that the reference to Document (11) at page 2 line 21 of the patent in suit would identify the "lamellar droplets" mentioned in the patent in suit as the structures corresponding to the "spherulites" of Document (11) and, therefore, that the teaching in Document (11) that the "spherulite" containing systems were different from the lamellar systems of Document (4) would also apply to the patented "lamellar droplets" compositions.

The Appellants further maintained in particular that Document (5) demonstrated that the presence of the specific deflocculating polymers would lead to stable compositions having a high level of nonionic

surfactants.

- IX. None of the Respondents provided any comments either on the claims according to the Appellants' only remaining request or on the amended description.

In their letter of 18 July 1997 Respondents 02 had already acknowledged the novelty of the claimed subject-matter, but maintained that Document (4) would clearly disclose systems comprising lamellar droplets and that it would not be justified to derive from the reference to Document (11) at page 2 line 21 of the patent in suit that "lamellar droplets" in the patent in suit and "spherulites" in Document (11) should have a perfectly coincident meaning.

Respondents 02 therefore concluded that the Appellants would have provided neither convincing arguments demonstrating that Document (4) does not represent the closest state of the art nor experimental evidence showing that the stability of the composition of the invention was superior to that of the compositions of Document (4). Since the patent in suit would not disclose any surprising effect even for the additional use of a deflocculating polymer, no technical problem had been solved by the claimed subject-matter.

- X. The Appellants requested that the decision under appeal be set aside and that the patent be maintained with claims 1 to 7 filed with letter of 14 February 2002, page 6 of the published patent and amended pages 2 to 5 and 7 to 10 filed with letter of 11 December 2001.

Respondents 01 and 03 made no request.

Respondents 02 withdrew from the proceedings.

Reasons for the Decision

1. *Articles 54, 83, 84, 123(2) and (3) EPC*

The Board is satisfied that the amended claims and description according to the only valid request of the Appellants comply with the requirements of Articles 54, 83, 84, 123(2) and (3) EPC.

It is not necessary to give further details in this respect since no objections were raised in these regards during the appeal proceedings.

2. *Inventive step concerning the subject-matter of claim 1*

2.1 Claim 1 of the Appellants sole request defines a liquid detergent composition in the form of an aqueous dispersion of lamellar droplets comprising at least two non-ionic surfactants and deflocculating polymers.

The technical problem addressed in the patent in suit is that of providing **stable** fluid compositions containing **significant levels** of nonionic surfactants (compare page 2, lines 57-59 of the patent specification).

2.2 At variance with the decision of the Opposition Division, the Appellants have maintained that Document (4) would not disclose the most relevant state of the art, since it would not describe the same kind of "dispersions of lamellar droplets" as the patent in suit.

2.3 In the Appellants' opinion the patent in suit would define the lamellar droplets of the invention as corresponding to the "spherulites" of Document (11) (see page 2, line 21 of the granted patent) and such document would further clarify that these "spherulites" are different from the "lamellar" compositions of Document (4) (see in Document (11) page 6, lines 23-24 and from page 8, line 2 to page 9, line 46). The Appellants concluded, therefore, that in the patent in suit the expression lamellar droplets would define structures **different** from those disclosed in Document (4).

However, the Board observes that the cited line 21 at page 2 of the patent in suit states **exclusively** that the structure labelled as "spherulite" in Document (11) is considered as a "lamellar droplet" in the patent in suit.

As observed by the Respondents 02, this is **not equivalent** to a statement limiting the meaning of "lamellar droplets" in the patent in suit **exclusively** to the definition of "spherulites" given in Document (11). For instance, the sentence at page 2, line 21 of the patent in suit does **not exclude** that "lamellar droplets" as used therein may also indicate **further** structures (such as those in the dispersions of Document (4)) **in addition** to the "spherulites" of Document (11).

Therefore, it cannot be convincingly proven on the basis of the disclosure of Document (11) that there are **any differences** between the "lamellar droplets" of the patent in suit and the corresponding structures disclosed in Document (4).

2.4 On the other hand, the patent in suit provides at page 2, lines 41-44 the following **direct** description of what kind of structure is "generally believed" to be present in dispersions of lamellar droplets, i.e. a description of the structure that should be expected in the dispersions according to present claim 1 too:
"The dispersed detergent-active structure in these liquids is generally believed to consist of an onionlike configuration comprising concentric bilayers of detergent active molecules, between which is trapped water (aqueous phase). These configurations of detergent-active material are sometimes referred to as lamellar droplets."

A very similar definition can be found in Document (4) for a structure possibly present in the lamellar dispersions disclosed in this document (see in Document (4) page 16, lines 22-35 and page 21, lines 1-18, in particular page 21, lines 13-18: *"The builder is suspended in a system which may comprise a network of "G" phase and/or spheroids or vesicles, which may have an onion like structure, or outer shell, formed from successive layers of surfactant e.g. as "G" phase, and which may contain at least one of the predominantly aqueous phases, e.g. the electrolyte solution, or more probably the "L1 " micellar solution."*)

Therefore, the Board concludes that "aqueous dispersion of lamellar droplets" disclosed in the patent in suit and those of Document (4) **may** have substantially the same structure.

2.5 In view of the above and taking into consideration that Document (4) mentions the same technical problem

addressed in the patent in suit too (compare page 2 lines 57-59 of the patent in suit with the disclosure in Document (4) from page 40, line 18 to page 41, line 16), the Board comes to the conclusion that the appealed decision has correctly identified in Document (4) the document describing the most relevant state of the art for the assessment of inventive step.

- 2.6 The Appellants have maintained that Document (5) demonstrated that compositions comprising the specific deflocculating polymer defined in present claim 1 were stable despite the high level of nonionic surfactant and, therefore, that the presently claimed composition credibly solved the technical problem addressed in the patent in suit.

However, Document (5) does not provide any stability comparison between compositions according to present claim 1 and those according to Document (4).

Therefore, in the absence of any experimental evidence that the stability of the claimed compositions is **superior** to that of the compositions according to Document (4) and in view of the fact that also the compositions disclosed in Document (4) are explicitly defined as "stable" or "non-sedimenting" (see the above cited portions of Document (4)), the technical problem addressed in the patent in suit (see above item 2.1) **must be** considered already solved by the compositions disclosed in Document (4).

- 2.7 In the opinion of Respondents 02 (see page 4 of the latter of 18 July 1997), **since no improvement** has been demonstrated as deriving from the additional presence of the deflocculating polymers in the patented

compositions vis-à-vis the compositions of Document (4), **then no technical problem** has been solved and, therefore, **no inventive step** is presented by the subject-matter of present claim 1.

This reasoning is however not convincing.

It is constant practice of the Boards of Appeal that, if the specific problem described in the patent in suit has already been solved by the prior art, the problem to be objectively solved by the claimed subject-matter is then reformulated as that of providing an **alternative** solution.

Of course, it remains then to establish whether, having regard to the state of the art, the claimed subject-matter represents an **obvious** or a **non obvious** solution to such technical problem, i.e. whether it involves an inventive step or not.

The Board considers, therefore, that the reformulated technical problem which may be objectively considered as being solved by the presently claimed compositions vis-à-vis those of Document (4) is that of providing **further** stable dispersions of lamellar droplets of nonionic surfactants as an **alternative** to the dispersions disclosed in Document (4).

- 2.8 The presently claimed suspensions are distinguished from those disclosed in Document (4) mainly in that they comprise additionally "deflocculating polymers" with a specific structure.

Accordingly, it is necessary in the present case to determine if the skilled person would have considered it **obvious** in view of the state of the art to solve the problem of providing further stable structured dispersions of nonionic surfactants **by adding** to the compositions of Document (4) "deflocculating polymers" according to the definition given in present claim 1.

- 2.9 The mandatory presence of the "deflocculating polymers" was not defined in the independent claims considered by the Opposition division and, therefore, its relevance for the assessment of inventive step was not discussed in the appealed decision.

Respondents 02 have **not** provided any argument demonstrating that it would have been **obvious** for the skilled person to use polymers with a hydrophilic backbone and at least one hydrophobic side chain in **stable** detergent compositions in the form of aqueous dispersion of lamellar droplets, such as those disclosed in Document (4).

- 2.10 The Board observes that the available Documents relevant to assess inventive step (i.e. those published before the priority date of the present application, excluding Document (5) which was published after this date) do **not mention** explicitly or implicitly **any** polymers having a hydrophilic backbone and at least one hydrophobic side chain, i.e. polymers according to the definition given in present claim 1 for the "deflocculating polymers".

- 2.11 The Board has noticed that Document (4) discloses at page 30, lines 10 to 26 also a list of polymeric "agglomeration inhibitors" as possible components of

the structured and stable surfactant dispersions. Since "flocculation" or "agglomeration" of dispersed particles are comparable phenomena, the Board has investigated whether the "deflocculating polymers" defined in present claim 1 may be considered so similar to the polymeric agglomeration inhibitors explicitly disclosed in Document (4) as to represent an **obvious alternative** thereto.

In this respect the Board notes, however, that in **all** the polymer classes mentioned in Document (4) as "agglomeration inhibitors" hydrophobic and hydrophilic groups are **uniformly distributed** along the macromolecular structure. This is self-evident from the fact that all agglomeration inhibitors disclosed in Document (4) are **either** polymers of monomers belonging to a **single** chemical class such as polyacrylates, polycarboxylates and polyvinylpyrrolidone, **or randomly modified** natural homopolymers such carboxymethyl cellulose, carboxymethyl starch and lignosulphonate. Moreover, Document (4) does not indicate any specific kind of macromolecular structure (e.g. linear, branched, ladder, crosslinked, core/shell etc.) for any of these polymeric agglomeration inhibitors.

On the contrary, the deflocculating polymers defined in present claim 1 must have a **backbone/side-chains** structure and are provided with a **substantially inhomogeneous** distribution of the hydrophobic and hydrophilic groups along such macromolecule structure, so that the **hydrophilicity** of the macromolecule **backbone** must be **higher** than that of the macromolecule **side chains**.

Considering these substantial structural **differences** and in the absence of **any information** as to their **bearing** on the properties of the resulting compositions, deflocculating polymers having a hydrophilic backbone and at least one hydrophobic side chain do **not** represent an **obvious alternative** to the "agglomeration inhibitors" mentioned in Document (4).

- 2.12 For these reasons, a skilled person would not have tried with a reasonable expectation of success the claimed composition as a solution to the problem of providing **further** stable dispersions of lamellar droplets of nonionic surfactants in **alternative** to the dispersions disclosed in Document (4).

Therefore, the Board considers that the subject-matter of claim 1 of the only request of the Appellants satisfies the requirements of Article 56 EPC.

3. *Inventive step concerning the subject-matter of claims 2 to 7*

Claims 2 to 7 refer to specific embodiments of claim 1 and derive their patentability from this claim.

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 claims 1 to 7 submitted with the letter of 14 February 2002, page 6 of the published patent and amended pages 2 to 5 and 7 to 10 filed with letter of 11 December 2001.

The Registrar:

The Chairman:

G. Rauh

P. Krasa