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D E C I S I O N
of 15 December 2005

Case Number: T 0994/02 - 3.3.06

Application Number: 89304919.7

Publication Number: 0342917

IPC: C11D 1/02

Language of the proceedings: EN

Title of invention:
Detergent composition

Patentee:
UNILEVER PLC, et al

Opponent:
HENKEL KGaA
The Procter & Gamble Company

Headword:
Tallow-coconut/UNILEVER

Relevant legal provisions:
EPC Art. 54, 56

Keyword:
"Novelty and inventive step (yes)"

Decisions cited:
T 0951/91, T 0969/92, T 0312/94

Catchword:
-



Case Number: T 0994/02 - 3.3.06

D E C I S I O N
of the Technical Board of Appeal 3.3.06
of 15 December 2005

Appellant 1:
(Opponent 01)

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Representative:

-

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Decision under appeal:

Interlocutory decision of the Opposition
Division of the European Patent Office posted
29 August 2002 concerning maintenance of the
European patent No. 0342917 in amended form.

Composition of the Board:

Chairman: G. Dischinger-Höppler
Members: G. Raths
A. Pignatelli

Summary of Facts and Submissions

I. This appeal is from the interlocutory decision of the Opposition Division concerning maintenance in amended form of European patent No. 0 342 917 relating to a detergent composition.

II. Claim 1 of the patent as granted read:

"1. A detergent composition for washing fabrics, which composition contains

(i) from 4% to 30% by weight of a surfactant system comprising an anionic surfactant and also a nonionic surfactant where the weight ratio between the anionic surfactant and the nonionic surfactant lies between 10:1 and 1:2, and

(ii) detergency builder characterised in that the anionic surfactant comprises at least 80% by weight of alkyl sulphate of mixed alkyl chain length such that at least 10% by weight of the alkyl chains present in the alkyl sulphate are C₁₂ chains, at least 20% by weight of said alkyl chains are C₁₈ chains and the weight ratio of C₁₂ alkyl chains to C₁₈ alkyl chains is in the range 9:4 to 1:6."

III. The decision of the Opposition Division was based on a set of three claims of the main request, Claim 1 of the main request differing from Claim 1 as granted in that

"10%" was replaced with "15%", "20%" with "25%" and "9:4 to 1:6" with "2:1 to 1:5".

Claims 2 and 3 read as follows:

"2. A detergent composition according to claim 1 in which the alkyl sulphate is a mixture of tallow alkyl sulphate and coconut alkyl sulphate in a weight ratio of 3:1 to 1:3 preferably from 2:1 to 1:2.

3. A detergent composition according to claim 1 or claim 2 in which the nonionic surfactant has an HLB of less than 10.5."

IV. Two notices of opposition were filed against the granted patent wherein the opponents sought revocation of the patent on the grounds of Article 100(a) EPC for lack of inventive step (Articles 52(1) and 56 EPC); in addition, opponent 1 sought revocation of the patent on the grounds of Article 100(c) EPC for added subject matter (Article 123(2) EPC) and Article 100(b) EPC for lack of sufficiency of disclosure (Article 83 EPC).

V. The following documents had been cited during the opposition proceedings:

- (1) EP-B-0 085 448;
- (3) CD Symposium Lectures, R Wegner, Raw Materials and Compounds for Formulated Detergents (Düsseldorf 1983);
- (5) Akzo Chemie, ELFAN KT 550;
- (7) US-A-3 598 747 and
- (14) Kirk Othmer, Encyclopedia of Chemical Technology, Vol. 22 (1983), page 355.

The patent proprietor filed document

(1a) EP-A-0 085 448

in substitution of document (1) which was published after the filing date of the patent in suit.

In reaction to and based on that new document, opponent 2 raised a novelty objection under Articles 52(1) and 54 EPC.

VI. In its decision the Opposition Division held that the subject-matter of the claims of the then pending main request (see hereinabove point III) fulfilled the requirements of the EPC.

1. In respect of novelty, examples I and V of document (1a) did not directly and unambiguously disclose that "AS", an abbreviation appearing in the listing of the components of the compositions of examples I and V was an alkyl sulfate derived from coconut; hence, the specific amounts of C₁₂ and C₁₈ alkyl chains as well as their ratio were not disclosed in and could not be inferred from document (1a).

Therefore, the subject-matter of Claim 1 was novel and met the requirements of Articles 52(1) and 54 EPC.

2. As to inventive step, the combination of a coconut and tallow alcohol sulfate (representing components having respectively the C₁₂ and the C₁₈ alkyl chains) in a detergent composition had provided an unexpected effect of cleaning performance over a broad temperature range.

There would have been no direct hint to combine the two kinds of alcohol sulfates in order to improve that performance.

A skilled person would have prepared two different compositions to obtain the best possible performance, the one for use at high temperatures and the other one for use at low temperatures since according to document (3) the washing performance of the fatty alcohol sulfates was dependent on the alkyl chain length in the sense that fatty alcohol sulfates having a C₁₂₋₁₄ alkyl chain have a good cleaning performance at low temperatures whereas those having a C₁₆₋₁₈ alkyl chain have a good cleaning efficiency at high temperatures.

Therefore, the skilled person would not have expected that the washing performance of the mixture of both C₁₂₋₁₄ and C₁₆₋₁₈ fatty alcohol sulfates would have been better than that of the individual fatty alcohol sulfates.

VII. This decision was appealed by opponents 1 and 2 (hereinafter appellants 1 and 2).

VIII. Under cover of the letter dated 14 November 2005 the patent proprietor (hereinafter respondent) filed a first auxiliary request consisting of two claims.

Appellant 2 under cover of the letter dated 30 November 2005 submitted a test report displaying stain removal tests at washing temperatures of 30°C and 60°C; coconut alkyl sulfate was evaluated against a 50:50 mixture of

C₁₂:C₁₄ alkyl sulfate and against a 1/3:1/3:1/3 C₁₂:C₁₃:C₁₄ alkyl sulfate mixture.

IX. Oral proceedings before the Board took place on 15 December 2005.

X. The appellants orally and in writing raised objections only with respect to novelty and inventive step.

(i) As to novelty,

only appellant 2 raised an objection; its arguments can be summarized as follows:

The subject-matter of Claim 1 of the main request would be anticipated by the compositions according to examples I and V of document (1a) which comprise, as anionic surfactants, TAS, i.e. tallow alcohol sulfate and "AS".

The abbreviation "AS", designated in the description as sodium linear C₁₂₋₁₄ alcohol sulfate, meant coconut alkyl sulfate, although it was not clear why this definition did not appear in examples I and V, the reason probably being that it was so usual to name coconut oil sulfate just "AS".

Further, the only two specific examples of alkyl sulfates mentioned in document (1a) were tallow alkyl sulfate and coconut alkyl sulfate; since coconut oil was one of the cheapest raw materials it was used with a high probability.

With reference to T 312/94 and T 969/92 both stating in essence that the whole document should be taken into consideration when interpreting its content, the actual disclosure of document (1a) would point to AS being coconut alcohol sulfate.

(ii) The arguments of appellants 1 and 2 in respect of inventive step can be summarized as follows:

(a) Document (1a) could be taken as the starting point for evaluating inventive step; the compositions according to examples I and V comprised C₁₂₋₁₄ alcohol sulfate and tallow alcohol sulfate; according to the patent in suit, compositions comprising blends of these sulfates in the claimed amounts and ratios produced a benefit over compositions comprising each of these sulfates alone; however, there was no evidence that the particular compositions of Claim 1 were superior to the compositions used in examples I and V of document (1a).

In the absence of such a proof, the problem underlying the patent in suit was to provide an alternative to the compositions of examples I and V of document (1a).

(b) Since however coconut AS had been disclosed as a preferred alkyl sulfate material by document (1a), it was a prima facie alternative to use this material. Documents (3) and (14) taught that short alkyl chains were appropriate for washing at low temperatures and long alkyl chains at high temperatures; therefrom the skilled person would

deduce that washing at both high and low temperatures required a combination of these two chain lengths; as document (5) disclosed ELFAN KT 550, a mixture of coconut and tallow alcohol sulfate, a product commercially available and recommended for use in heavy duty detergents and detergents for fine fabrics, it would have been obvious to replace the alkyl sulfate materials in the compositions according to examples I and V of document (1a) with ELFAN KT 550 in order to obtain a good washing performance over the whole range of washing temperatures.

- (c) Any superior cleaning performance achieved with the blend over each of coconut and tallow alcohol sulfate alone would lead to the expectation of achieving satisfactory cleaning performance over a broad temperature range and would be a sufficient motivation to use ELFAN KT 550 in the detergent composition of document (1a).
- (d) It was not plausible that the alleged benefit would be achieved over the whole scope of Claim 1 since Claim 1 was directed to C₁₂ and C₁₈ chains but was silent on the presence of C₁₄ chains which represent a significant proportion in coconut alkyl sulfate; myristyl alkyl sulfate (bearing C₁₄ chains) would be known to have a solubilising effect on C₁₆ and C₁₈ chains (document (7)).
- (e) Appellant 2 indicated that its test report had been filed in relation to the respondent's auxiliary request and that it was at the

discretion of the Board to consider those tests in relation to the main request.

The examples of the patent in suit were no evidence that any blend gives results being significantly better than either coconut AS (i.e. alkyl sulfate) alone or tallow AS alone at both 30°C and 60°C.

XI. The respondent refuted the arguments of the appellants.

Novelty

It would have been directly and unambiguously derivable from document (1a) only that the compositions of examples I and V contain C₁₂₋₁₄ alcohol sulfate; there would be no evidence that specifically coconut alcohol sulfate was used in those compositions.

Inventive step

Document (1a) did not teach the proportions of carbon chain length distribution according to Claim 1. Further, there was no motivation in the prior art to modify the compositions of examples I and V of document (1) in such a way that they would fall within the scope of Claim 1 in order to achieve an improved cleaning performance.

Even if the skilled person could replace the C₁₂₋₁₄ alkyl sulfate in the examples of document (1a) with coconut alkyl sulfate, this would not be done in the expectation of achieving improved detergency.

XII. The appellants requested that the decision under appeal be set aside and the European patent No. 0 342 917 be revoked.

The respondent requested that the appeals are dismissed (main request) or that the decision under appeal is set aside and a patent is granted on the basis of Claims 1 and 2 filed with letter dated 14 November 2005 (first auxiliary request).

Reasons for the Decision

Main request

1. *Novelty*

1.1 Appellant 2 had argued that the subject-matter of Claim 1 would be anticipated by the compositions according to examples I and V of document (1a).

The appellant's reasoning was that the actual disclosure of document (1a) would exclusively point to coconut alcohol sulfates. In particular, the abbreviation "AS" would designate coconut alkyl sulfates (see point X(i)).

1.2 The Board does not agree.

The column listing the components of the compositions according to examples I and V just mentions the abbreviation "AS" (document (1a), page 19, line 14). The previous page of the description (page 18, lines 1, 2 and 4) reads:

"In the Examples which follow, the abbreviations used have the following designation:

.....

AS : Sodium linear C₁₂₋₁₄ alcohol sulfate".

It follows therefrom that "AS" has only the above mentioned meaning in the examples I and V.

If - as correctly claimed in accordance with T 312/94 and T 969/92 by appellant 2 (see point X(i)) - the description is taken into consideration for interpreting the content of the examples, attention is drawn to the following passage in the description:

"The alkane chains of the foregoing non-soap anionic surfactants can be derived from natural sources such as coconut oil or tallow, or can be made synthetically as for examples using the Ziegler or Oxo processes." (document (1a), page 8, lines 4 to 7)

So, apart from the possibility of deriving the alkyl sulfate materials from tallow or coconut oil as suggested in document (1a) on page 6, lines 30 to 35, there was also the option to use either the Ziegler or the Oxo process for manufacturing synthetically the alkane chains of the anionic surfactants.

If in the examples I or V "AS" should exclusively have meant - as alleged by appellant 2 - coconut alkyl sulfate, this definition would have appeared in the column on page 18 of document (1a). Since, however, it is expressly stated that "AS" refers to the examples

"which follow" there is no room for giving the meaning of "AS" another definition than "sodium linear C₁₂₋₁₄ alcohol sulfate", wherein the amount of C₁₂ alcohol sulfate is unspecified.

As a consequence, the weight percentage of C₁₂ alkyl chains has not been disclosed and thus also the weight ratio of C₁₂ alkyl chains to C₁₈ alkyl chains is missing.

It follows that document (1a) does not disclose directly and unambiguously the subject-matter of Claim 1. Consequently, the subject-matter of Claim 1 is novel and thus meets the requirements of Article 54(1)(2) EPC.

2. *Inventive step*

2.1 The invention relates to detergent compositions for washing fabrics. An objective of the patent in suit was to provide a surfactant system based on primary alcohol sulfates (PAS) and which was able to give a good combination of performance levels at a range of temperatures ([006], page 2, lines 23 to 24).

2.2 The Board concurs with the appellants' view that document (1a) is a reasonable starting point for evaluating inventive step because this document concerns detergent compositions suitable for heavy duty laundering purposes having improved cleaning performance especially on greasy, oily and lipid soils without detriment to detergency performance on clay soils and without detriment to the soil suspending or fabric whitening characteristics of the compositions, across the range of wash temperatures and under

realistic soil fabric load and multi wash-rinse-wear cycle conditions (page 3, lines 1 to 9).

- 2.3 The composition according to example I of document (1a) contains 6 % by weight sodium linear C₁₂₋₁₄ alcohol sulfate (AS) and 2 % tallow alcohol sulfate (TAS), the composition according to example V 9% AS and 3% TAS, as well as nonionic surfactants and a builder.

Moreover document (1a) discloses that the above products provide excellent grease/oil and lipid/oil removal performance simultaneously with good clay soil detergency and whiteness maintenance under realistic multi-cycle wash wear conductions, including low wash temperatures (page 20, lines 1 to 5).

- 2.3.1 The Board observes that at a washing temperature of 30°C the anionic surfactant system as defined in Claim 1 gave a relative improvement of the soil removing effect of about 20% compared to coconut sulphate alone and tallow alkyl sulphate alone (see examples 1 to 3). Moreover, it can be inferred from examples 4 to 6 that a satisfying soil removal performance is also achieved at a washing temperature of 60°C.

As to examples 7 to 12 the anionic surfactant system as defined in Claim 1 gave, at a washing temperature of 30°C, a relative improvement of the soil removing effect of about 27% compared to tallow alkyl sulphate alone, and the soil removing performance was as good as that of coconut alkyl sulphate alone (see examples 7 to 9). Moreover, it can be inferred from examples 10 to 12 that at a washing temperature of 60°C, the invention

composition's soil removing performance was improved by 11.6% compared to coconut alkyl sulphate alone and was 8.5% less effective compared to tallow alkyl sulphate alone, what can be qualified as a satisfying soil removal performance.

The % soil removal at a washing temperature of 30°C of the invention compositions according to examples 14, 20 and 23 was better than that of compositions containing coconut alkyl sulphate alone or tallow alkyl sulphate alone, whereas the % soil removal of the invention composition according to example 17 was as good as that of the composition containing coconut alkyl sulphate and was about 13.9 % better compared to those containing tallow alkyl sulphate.

Invention example 30 shows a better performance for removal of fat, oil and ink/oil stains than compositions containing coconut or tallow alkyl sulphate.

The 50/50 mixture of coconut and tallow alkyl sulphate of invention example 34 had a better performance than the coconut alkyl sulphate alone (page 8, lines 48 to 49).

Consequently, the data provided in the examples of the patent in suit show an improvement in the washing performance at temperatures ranging from 30 to 60°C of compositions containing anionic surfactants of the claimed chain length distribution as compared with compositions where this chain length distribution is different.

2.3.2 The data supplied by appellant 2 under cover of the letter dated 30 November 2005, i.e. two weeks before the oral proceedings before the Board, are not considered here taking into account the necessity of procedural economy and the principles of good faith in relation to the respondent (T 951/91, OJ EPO 1995, 202, point 5.15) because they have been filed too late for the respondent to prepare e.g. experimental counter-evidence without postponement of the oral proceedings.

Apart from that, appellant 2 had conceded at the oral proceedings that the data had been supplied in relation to the respondent's auxiliary request and not provided any argument why they should be considered in relation to the main request.

2.4 In the light of the advantages achieved by the claimed invention compositions compared to those outside Claim 1, in particular of the compositions comprising ELFAN 280, a trademark for a coconut alcohol sulfate which can be taken as representing the anionic components in examples I and V of document (1a), the Board sees the technical problem underlying the patent in suit as the provision of a detergent composition having an improved soil removing performance at low washing temperatures, i.e. 30°C, while maintaining a satisfying soil removing efficiency at higher temperatures i.e. 60°C.

2.5 According to the patent in suit this technical problem is solved by detergent compositions as defined in Claim 1, which compositions comprise in particular an anionic surfactant comprising at least 80% by weight of alkyl sulphate of mixed alkyl chain length such that at

least 15% by weight of the alkyl chains present in the alkyl sulphate are C₁₂ chains, at least 25% by weight of said alkyl chains are C₁₈ chains and the weight ratio of C₁₂ alkyl chains to C₁₈ alkyl chains is in the range 2:1 to 1:5.

Therefore, the Board is satisfied that the claimed subject-matter plausibly solves the existing technical problem.

- 2.6 It remains to be assessed whether the technical solution to the above mentioned problem involves an inventive step or, in other words, whether the cited prior art would have suggested to a person skilled in the art to solve the above-indicated technical problem in the proposed way.
- 2.7 The appellants argued that the skilled person would have replaced "AS" of compositions I or V by coconut alcohol sulfate and thus he would have arrived at the claimed invention.
- 2.8 The Board does not agree.

Document (1a) suggests to use a variety of different alkyl sulfate materials as anionic surfactants (see 1.2 above).

Document (5) only indicates the formula C_{12/18}H_{25/37}SO₄Na and describes the composition of the commercial product "ELFAN KT 550" as being coco/tallow alcohol sulfate; further, it is said that this product can be used in widely divergent detergent compositions.

In order to arrive at the claimed subject-matter, an incentive should have pointed to the replacement of both "AS" and "TAS" in the examples I and V of document (1a) by ELFAN KT 550. But this document does not give that incentive to the skilled person. In particular, there is no suggestion in the prior art that the above defined technical problem could be solved by a composition in accordance with Claim 1 comprising said commercial product in an amount of at least 80% by weight based on the anionic surfactant system.

Documents (3) and (14) disclosed that the washing performance of the fatty alcohol sulfates depend on the length of the alkyl chain. C₁₂₋₁₄ alkyl sulfates have their maximum performance in the low temperature range, whereas C₁₆₋₁₈ alkyl sulfates perform best at high washing temperatures.

In the Board's judgement, these documents do not give any information about the soil removing activity of tallow alkyl sulphate and/or coconut alkyl sulphate at low washing temperatures of about 30°C, let alone an incentive to the skilled person that by using the specific mixture of coconut and tallow alkyl sulphates as claimed, with the proviso that the weight ratio of C₁₂ alkyl chains to C₁₈ alkyl chains is 2:1 to 1:5, an improved soil removing performance could be realised at low washing temperatures, while maintaining a satisfying soil removing efficiency at higher temperatures.

2.9 In this context, the Board observes that a skilled person, in the expectation of obtaining a good washing

performance in the low and in the high temperature range (document (3), page 57, lines 10 to 13) could have used a mixture of coconut alkyl sulphate and tallow alkyl sulphate as anionic surfactants since such possibility is not excluded. According to the established case law of the Boards of Appeal for determining lack of inventive step, it is however necessary to show that considering the teaching of the relevant prior art as a whole, without using hindsight based on the knowledge of the claimed invention, the skilled person would have done so in order to arrive at the claimed solution of the technical problem to be solved.

However, as indicated above (point 2.8), a skilled person then trying to solve the technical problem underlying the patent in suit, would not have had any reason to replace the most preferred anionic surfactants "AS" and "TAS" in document (1a) by the mixture of anionic surfactants as now claimed.

- 2.10 The other prior art on file is less relevant since it does not contain any hint from which the skilled person could have expected a beneficial washing performance by using the particular alkyl sulfate mixture of Claim 1 in the compositions of examples I or V of document (1a).
- 2.11 In conclusion, the Board finds that the detergent compositions according to Claim 1 of the patent in suit involve an inventive step in the sense of Article 56 EPC.

Since dependent claims 2 and 3 relate to particular embodiments of the compositions according to Claim 1, these claims derive their patentability from Claim 1.

3. In the light of the above findings, it is not necessary to consider the respondent's auxiliary request.

Order

For these reasons it is decided that:

The appeals are dismissed.

The Registrar:

The Chairman:

G. Rauh

G. Dischinger-Höppler