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D E C I S I O N
of 25 November 1998

Case Number: T 0962/95 - 3.3.1

Application Number: 89304919.7

Publication Number: 0342917

IPC: C11D 1/02

Language of the proceedings: EN

Title of invention:
Detergent composition

Applicant:
Unilever PLC, et al

Opponent:
-

Headword:
Detergent composition/UNILEVER

Relevant legal provisions:
EPC Art. 56

Keyword:
"Inventive step (yes) - unexpected effect"

Decisions cited:
-

Catchword:
-



Case Number: T 0962/95 - 3.3.1

D E C I S I O N
of the Technical Board of Appeal 3.3.1
of 25 November 1998

Appellants:

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Decision under appeal:

**Decision of the Examining Division of the
European Patent Office posted 21 July 1995
refusing European patent application
No. 89 304 919.7 pursuant to Article 97(1) EPC.**

Composition of the Board:

Chairman: P. Krasa
Members: J. M. Jonk
S. C. Perryman

Summary of Facts and Submissions

I. This appeal lies from the Examining Division's decision refusing the European patent application No. 89 304 919.7 (publication number 342 917), which related to a detergent composition, on the ground that the subject-matter of the main request and the auxiliary requests 1 to 3 then on file lacked inventive step in view of:

(1) GB-A-1 399 966, and

(2) Data sheet "Elfan KT 550" by AKZO Chemie, dated July 1983.

The decision of the Examining Division also indicated that the claims of the fourth auxiliary request then on file would be allowable.

II. In reply to written submissions by the Appellants, the Board drew the Appellants' attention to document

(3) Kirk-Othmer, Encyclopedia of Chemical Technology, Vol. 22 (1983), page 355.

III. Oral proceedings before the Board were held on 25 November 1998.

IV. During these oral proceedings, the Appellants submitted new Claims 1 to 5 as main request in order to meet the Board's objection that the composition as claimed according to the main claim then on file did not appear

to provide the alleged effects within its whole scope. They also filed four auxiliary requests.

Claim 1 of the new main request read as follows:

"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."

- V. The Appellants argued that the closest state of the art was represented by document (1) and that in the light of this closest state of the art the technical problem underlying the present patent application was the provision of a detergent composition having an improved soil removing performance at low washing temperatures, while minimising the reduction of the soil removing efficiency at higher temperatures. Concerning the improved soil removing performance they relied on the examples of the present patent application. Moreover, they argued that the solution of this technical problem was not obvious in the light of the cited prior art.

- VI. The Appellants requested that the decision under appeal be set aside and that a patent be granted on the basis of the main request or of one of the first, second or third auxiliary requests, all submitted on 25 November 1998, or the fourth auxiliary request as submitted at the oral proceedings on 8 February 1995 confirmed in writing with letter of 24 April 1995.
- VII. At the conclusion of the oral proceedings the Board's decision was pronounced.

Reasons for the decision

1. The appeal is admissible.

Main request

2. Present Claim 1 is supported by Claim 1; page 5, second paragraph (amount of surfactant system); Claim 7 and page 5, third paragraph (nonionic surfactant); Claim 9 and page 5, last paragraph (ratio anionic to nonionic surfactants); page 7, second paragraph (builder); and Claim 4 and page 4, first paragraph (amount of alkyl sulphate) of the originally filed patent application.

Claim 2 is supported by Claim 2 and page 3, third paragraph, of the originally filed patent application.

Claims 3, 4 and 5 correspond to the originally filed Claims 5, 6 and 8 respectively.

Thus all the claims comply with the requirements of Article 123(2) EPC.

3. The Board is satisfied that the subject-matter of the present claims is novel. Since the Examining Division already acknowledged novelty for claims having a broader scope than the present ones, it is not necessary to give reasons for this finding.
4. This leaves the issue of whether the subject-matter of the present claims involves an inventive step.
 - 4.1 The Board concurs with the Appellants' point of view that the closest state of the art is document (1). This document, like the present patent application, concerns detergent compositions containing a particular mixture of anionic and nonionic surfactants having an effective detergent performance (see page 1, lines 11 to 20, and page 9, line 85 to page 10, line 40).

It discloses in particular compositions comprising:

- (A) **10% to 30% by weight of a surfactant system** comprising
 - (i) an anionic surfactant which is a **sodium or potassium salt of a sulphated C₈₋₁₈ fatty alcohol**, a sodium or potassium salt of a C₉₋₂₀ alkyl sulphonic acid, or mixtures thereof, and
 - (ii) a **nonionic surfactant** produced by reacting one mole of a C₁₀₋₁₅ fatty alcohol with from 3 to 10 moles of ethylene oxide and having a HLB of 10 to 13.5;

- (B) 10% to 89% of an **organic and/or inorganic salt**;
and
- (C) 1% to 9% of water (see page 2, lines 41 to 69).

According to Example I such a composition contains **22% by weight of a surfactant system** consisting of **sodium tallow alkyl sulphate** and a **nonionic surfactant** as specified therein in a **weight ratio of 4.5 to 1**; 74% by weight of **sodium carbonate**; and 4% by weight of water.

Moreover, it discloses that **mixtures of alkyl sulphates** can be used and that highly preferred sulphates are sodium or potassium salts of **tallow alkyl sulphate** and **coconut alkyl sulphate** (see page 3, lines 6 to 10).

- 4.2 In view of the fact that the first instance considered document (2) as the closest state of the art, the Board notes that this document relates to a commercial product of Akzo Chemie named "ELFAN KT 550". It discloses in particular that the product is the sodium salt of a coconut/tallow alkyl sulphate having the formula $C_{12/18}H_{25/37}SO_4Na$ and a molecular weight of 342. Moreover, it indicates that it can be used in heavy duty detergent compositions ("Grobwaschmittel"), detergent compositions for fine fabrics ("Feinwaschmittel"), washing pastes ("Waschpasten") and in hand detergents ("Handreiniger"). Therefore, this document does not relate to **detergent compositions** as specified in present Claim 1, i.e. compositions containing a surfactant system comprising an anionic surfactant and a nonionic surfactant in a certain weight ratio, whereby the anionic surfactant comprises at least 80% by weight of alkyl sulphate of mixed alkyl chain length. In the Board judgment, this disqualifies document (2) as the closest state of the art.
- 4.3 In the light of the advantage achieved by the claimed invention compared to the composition according to Example I of document (1), the Board sees the technical problem underlying the present patent application - in agreement with the Appellants - as the provision of a detergent composition having an improved soil removing performance at low washing temperatures, while maintaining a satisfying soil removing efficiency at higher temperatures.
- 4.4 According to present patent application this technical problem is solved by detergent compositions as defined

in present 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 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.

4.5 Having regard to the Examples 1 to 6 of the present patent application concerning compositions comprising a nonionic surfactant having an HLB of 11,7 in conformity to the compositions according to document (1) (see page 3, lines 47 to 57), the Board considers it plausible that the technical problem as defined above has been solved. In this context, the Board observes that at a washing temperature of 30°C the anionic surfactant system as defined in present Claim 1 gave a relative improvement of the soil removing effect of about 20% compared to coconut sulphate alone and tallow sulphate alone (see Examples 1 to 3). Moreover, it can be deduced from Examples 4 to 6 that at a washing temperature of 60°C a satisfying soil removal performance is achieved. Therefore, the Board is satisfied that the claimed subject-matter plausibly solves the existing technical problem.

4.6 The question now is whether the cited prior art would have suggested to a person skilled in the art solving the above-indicated technical problem in the proposed way.

4.7 Although it is true, that document (1) - as indicated above under point 4.1 - relates to detergent compositions which, with the exception of the anionic surfactant, are similar to those of present Claim 1, it clearly teaches that **tallow alkyl** sulphate shows substantially the same fabric laundering performance as **coconut alkyl** sulphate (see e.g. Example I and in particular the passage on page 6, lines 44 to 51), and that alkyl **sulphates** provide substantially the same laundering performance as alkyl **sulphonates** and **mixtures** of such sulphate and/or sulphonate surfactants (see e.g. Example II, in particular the passage on page 7, lines 44 to 62). Therefore, in the Board's judgment, this document does not give any pointer to the skilled person that the technical problem underlying the present patent application as defined above could be solved by a detergent composition comprising alkyl sulphates having mixed C₁₂ and C₁₈ alkyl chain lengths as now claimed.

4.8 Document (2) - as indicated above under point 4.2 - only discloses the composition of the commercial product "ELFAN KT 550" and that this product can be used in widely divergent detergent compositions. Therefore, also this document does not give an incentive to the skilled person that the above defined technical problem could be solved by a composition in accordance with present Claim 1 comprising said commercial product in an amount of at least 80% by weight based on the anionic surfactant system, and in addition a certain amount of a nonionic surfactant and a builder.

4.9 Document (3) discloses that with increasing chain length of sulphates from straight-chain primary alcohols higher temperatures are required to attain maximum detergency and wetting effect (see the first paragraph under "*Alcohol sulphates*"). However, in the Board's judgment, this document does 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 an improved soil removing performance at low washing temperatures could be realised, while maintaining a satisfying soil removing efficiency at higher temperatures.

4.10 In this context, the Board observes that a skilled person in view of the disclosure of document (1) **could** have used a mixture of coconut alkyl sulphate and tallow alkyl sulphate as anionic surfactants since such possibility was not excluded. However, according to the established case law of the boards of appeal for determining lack of inventive step, it is 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 arrived at the **claimed solution of the technical problem to be solved**. However, as indicated above, a skilled person, when trying to solve the technical problem underlying the present patent application, would not have had any reason to replace the most preferred anionic surfactants by a mixture of anionic surfactants as now claimed.

4.11 In conclusion the Board finds that the detergent compositions according to present Claim 1 involves an inventive step in the sense of Article 56 EPC.

Since dependent Claims 2 to 5 relate to particular embodiments of the compositions claimed in Claim 1, these claims are also allowable.

Auxiliary requests

5. In the light of the above findings, it is not necessary to consider the Appellant's 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 grant a patent on the basis of the main request submitted on 25 November 1998 and a description to be amended.

The Registrar: The Chairman:

E. Görgmaier

P. Krasa