BESCHWERDEKAMMERN DES EUROPÄISCHEN PATENTAMTS

BOARDS OF APPEAL OF THE EUROPEAN PATENT OFFICE

CHAMBRES DE RECOURS DE L'OFFICE EUROPEEN DES BREVETS

Publication in the Official Journal ~~Yes~~ / No

File Number: T 224/90 - 3.3.1

Application No.: 82 201 170.6

Publication No.: 0 075 994

Title of invention: Detergent compositions containing mixture of alkylpolysaccharide and amine oxide surfactants and fatty acid soap

Classification: C11D 3/22

# D E C I S I O N
of 11 December 1991

Proprietor of the patent: THE PROCTER & GAMBLE COMPANY

Opponent: Hüls Aktiengesellschaft

Headword: Alkylpolyglucoside/Procter

EPC Articles 54 and 56

Keyword: "Novelty (confirmed)"
"Inventive Step (confirmed) - non-obvious combination"

## Headnote

Case Number : T 224/90 - 3.3.1

# D E C I S I O N
## of the Technical Board of Appeal 3.3.1
## of 11 December 1991

Appellant : (Opponent)
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Respondent : (Proprietor of the patent)
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Decision under appeal :
Decision of Opposition Division of the European Patent Office of 29 November 1989, posted on 29 January 1990, rejecting the opposition filed against European patent No. 0 075 994 pursuant to Article 102(2) EPC.

Composition of the Board :

Chairman : K.J.A. Jahn
Members : R.W. Andrews
J.-C. Saisset

**Summary of Facts and Submissions**

I. European patent No. 0 075 994 in respect of European patent application No. 82 201 170.6, which was filed on 22 September 1982, was granted on 21 January 1987 (cf. Bulletin 87/04).

II. A notice of opposition, which was filed on 17 October 1987, requested the revocation of the patent on the ground of lack of inventive step. The opposition was supported, inter alia, by the following documents:

(1) DE-B-0 593 422
(2) US-A-4 230 592
(3) DE-A-2 732 734 and
(5) EP-A-0 070 074.

After expiry of the time allowed for filing notice of opposition, the following relevant documents were also referred to:

(9) Chemie Lexikon, Römpp, 5th Edition (1962), Volume III, page 4591 and
(10) Technical Bulletin, Triton CG 110 (Rohm & Haas)

III. By a decision delivered orally on 29 November 1989, with the corresponding interlocutory decision being issued on 29 January 1990, the Opposition Division maintained the patent on the basis of Claim 1 filed on 25 October 1989 as amended during oral proceedings and Claims 2 to 10 filed on 25 October 1989.

The Opposition Division held that the claimed subject-matter was novel and involved an inventive step. The Opposition Division considered that the differences between the present compositions and those disclosed in

document (1) resulted in the former compositions providing excellent detergency without causing unacceptable damage to the washing machine and having the advantage of being able to provide different sudsing patterns. None of the cited documents suggested that the present compositions would have these advantageous properties.

IV. An appeal was lodged against this decision on 20 March 1990 with payment of the prescribed fee. In his Statement of Grounds of Appeal filed on 26 May 1990 and during the oral proceedings held on 11 December 1991, the Appellant contended that the subject-matter of Claim 1 lacked novelty in the light of the disclosure of document (5).

The Appellant also argued that the claimed subject-matter did not involve an inventive step in the light of the teaching of documents (1), (2), (3) and (10). The Appellant also maintained that, in the assessment of inventive step, documents other than those relating to laundry detergent compositions must be taken into consideration.

Finally the Appellant alleged that the compositions did not provide the claimed technical effect and, therefore, cannot be used in the assessment of inventive step.

V. The Respondent contended that the disclosures relating to Triton CG 110 and Triton BG 10 and the numerous vague and generic disclosure of vast ranges of alkylpolyglucosides and other sugar-based surfactants did not provide any relevant information to the detergent formulator and gave no indication that the defined composition would possess the disclosed surprising properties.

The Respondent also emphasised that cetyl maltoside disclosed in document (1) did not fall within the scope of the present claims and that the presence of monocyclic components in the alkylpolyglucosides as defined is essential since the desirable properties of the claimed compositions are not obtained starting from a disaccharide such as maltose or sucrose.

VI. The Appellant requested that the decision under appeal be set aside and that the patent be revoked. The Respondent requested that the patent be maintained on the basis of claims in accordance with the main or auxiliary request submitted during the oral proceedings. The only independent claim of the main request reads as follows:

"A liquid laundry detergent composition comprising:
from 1% to 20% by weight, of an alkylpolyglucoside detergent surfactant having the formula $R^2O(C_nH_{2n}O)_t$ (glucosyl)$_x$ wherein $R^2$ is alkyl that contains from 12 to 18 carbon atoms, n is 2 or 3, t is 0 to 10 and x is a number from 1.5 to 3;
from 0% to 40% by weight, of a water-soluble detergency builder, and mixtures thereof;
from 0% to 10% by weight, of a water-soluble synthetic anionic detergent surfactant;
up to 80% by weight of water;
from 1% to 10% by weight, of an amine oxide detergent surfactant; and
from 1% to 10% by weight, of a water-soluble soap which has an unsaturated straight chain of from 16 to 22 carbon atoms."

Claim 1 in accordance with the auxiliary request relates to the use as a liquid laundry detergent of a composition as defined in Claim 1 of the main request.

VII. At the conclusion of the oral proceedings, the Board's decision to maintain the patent in accordance with the Respondent's main request was announced.

**Reasons for the Decision**

1. The appeal is admissible.

2. There are no formal objections under Article 123 EPC to any of the claims. Thus, Claim 1 in accordance with both requests finds a basis in Claim 1 as filed in combination with page 3, lines 20 to 29, page 14, lines 10 to 13 and page 21, lines 8 to 21 of the published patent application (cf. also granted Claim 1 and page 3, lines 4 to 12 of the printed patent specification). Claims 2 to 7 of both requests correspond to Claims 3, 4, 5, 6, 8 and 13 as filed respectively (cf. also granted Claims 2 to 6 and 8).

3. The patent in suit relates to a liquid laundry detergent composition which does not damage washing machines containing an alkylpolyglucoside of the specified formula as one of the detergent surfactant ingredients (cf. page 2, lines 20 to 41).

In the Board's judgement, the Journal of the American Oil Chemists' Society, Volume 47, pages 162 to 167, 1970 (document (14)), which was introduced by the Board into the proceedings, represents the closest state of the art. This document discloses solid and liquid laundry detergent compositions containing alkylpolyglucosides, some of which fall under the formula specified in Claim 1 in accordance with both of the Respondent's requests. In addition to 15% alkylpolyglucoside, the solid formulations consist of 35% sodium triphosphate, 10% sodium metasilicate, 39% sodium

carbonate and 1% sodium carboxy methyl cellulose. The liquid compositions contain 15% alkylpolyglucoside, 35% tetrapotassium pyrophosphate, 10% sodium carboxy methyl cellulose and 49% distilled water (cf. Table X on page 165).

In the light of this closest prior art the technical problem underlying the disputed patent is to be seen in providing a clear liquid laundry detergent composition with good detergency which does not damage washing machines and which is suitable for commercial exploitation.

According to the patent in suit, this technical problem is solved by a composition containing an alkylpolyglucoside of the specified formula, an amine oxide detergent surfactant and a water-soluble soap which has an unsaturated straight chain of from 16 to 22 carbon atoms.

In view of the Example in the disputed patent and the results of Experiments 1, 2 and 4 in the Experimental Report submitted by the Respondent on 14 November 1991 (a corrected version being filed on 4 December 1991), the Board considers it plausible that this technical problem has been satisfactorily solved. Thus, compositions containing an alkylpolyglucoside as defined, an amine oxide and, optionally, sodium stearate gave very stable foams, i.e. the same foam height after rotating for five minutes followed by standing for five minutes, whereas with a composition containing an alkylpolyglucoside as defined, an amine oxide and sodium oleate the foam height was reduced from 13.5 cm to 3.5 cm under the same condition. Similarly, the presence of sodium stearate, in contrast to sodium oleate, gave rise to an unsightly scum in the rinse water and formed a thick gel rather than a free flowing, clear liquid (cf. Example 1, Compositions 1

and 3).

4. After examination of the cited prior art, the Board has concluded that the claimed subject-matter is novel.

Document (5), which, at first glance, appears to be comprised in the state of the art, pursuant to Article 54(3) and (4) EPC, discloses a foaming composition comprising an alkylpolyglucoside, an anionic cosurfactant selected from sulphates, sulphonates, saturated or unsaturated soaps and mixtures thereof and from about 2% to about 10% of an auxiliary foam booster selected from amides, amine oxides and mixtures thereof (cf. the paragraph bridging pages 9 and 10 in combination with the paragraph bridging pages 6 and 6a). However, since the subject-matter was first disclosed in United States patent application No. 0 371 747 filed on 26 April 1982, it is only entitled to this priority date. In the Board's judgement, document (5) does not belong to the prior art in the above-mentioned sense and, therefore, cannot destroy the novelty of the subject-matter of the present claims, since it was disclosed in the United States patent application No. 0 371 690 also filed on 26 April 1982.

In view of the fact that the European patent corresponding to document (5) is still in the opposition stage, it was not possible and unnecessary for the Board to consider whether the claims of the two patents assigned to the same patentee with the same priority date are in conflict with each other (self collision: cf. Guidelines for Examination Chapter IV, 6.4).

5. It still remains to be decided whether the claimed subject-matter involves an inventive step.

5.1 According to document (14), higher alkylpolyglucosides are non-ionic surfactants which show good functionality in various applications, including detergents. They are good foamers with low surface tension, are compatible with inorganic builders, and are biodegradable (cf. Abstract on page 162).

From the results summarised in Table X on page 165, the authors of this paper concluded that, with respect to liquid formulations, the alkylpolyglucosides performed excellently even in hard water (cf. the paragraph headed "Detergency" in the left-hand column of page 167).

The information contained in this document would provide the skilled person with the incentive to further investigate these products with respect to their surfactant properties and laundry detergent formulations containing them.

The Respondent admitted that it was well known in the detergent field to use mixtures of surfactants for the purpose of producing an effect not obtainable with any one of the components taken separately. Therefore, in seeking to solve the technical problem underlying the disputed patent, the skilled person would immediately consider using blends of the alkylpolyglucosides with other surfactants.

Furthermore, the skilled person is aware that the alkylpolyglucoside, Triton CG 110, is compatible with anionic, cationic, non-ionic and amphoteric materials (cf. document (10), page 1, point 4). Since the only essential difference between the alkylpolyglucoside and the ones specified in the present Claim 1 lies in the length of the alkyl chain, the skilled person would assume that the alkylpolyglucosides falling under the present definition

would also be compatible with such materials.

However, in view of the fact that it is known that alkylpolyglucosides are good foamers (cf. documents (10) and (14), the skilled person would be extremely reluctant to blend them with amine oxides since these are recognised as being foam boosters and an excessive amount of foam is not desirable, particularly for products for use in drum-type washing machines.

5.2 Document (3) discloses a shampoo containing, by weight
A about 3 to 25 or 30% of a amine oxide:
B about 2 to 20 or 30% of a polyoxyethylenehexitan mono-$C_{10-20}$ fatty acid ester with 5 or 10 to 100 mols ethylene oxides per mol;

C about 6 to 30% of a non-ionic surfactant selected from a $C_{10-20}$ alkoxy polyoxyethanol, wherein the ethylene oxide content including the $CH_2CH_2O$ of the ethanol is about 6 to 20 mols per mol and a $C_{10-20}$ alkylglycoside; and

D about 25 to 89% water (cf. paragraph bridging pages 6 and 7).

Thus, the document discloses a composition comprising both an amine oxide and alkylglycoside, preferably a $C_{10-18}$ alkylmonoglucoside which is outside the scope of the present definition (cf. page 12, lines 12 to 14 in combination with page 36, lines 2 and 3). Although it must be assumed that a person skilled in the formulation of detergents would have knowledge of this document, in view of the present technical problem, he would regard its teaching as being irrelevant, since he is aware that, in contrast to laundry detergent compositions, shampoos should produce, good, stable foams.

5.3 Document (1) discloses the addition of 10 to 15% of cetyl maltoside (a specific compound in which the symbol x is 2) to normal soap (of example 1). However, it is wholly silent with respect to whether the soap is saturated or unsaturated. The Appellant alleged that "normal" soap meant a mixture of saturated and unsaturated soap. In his opinion, document (9) supported this allegation. This view was contested by the Respondent. In these circumstances where the Board, as in this case, cannot discover the truth on the basis of its own knowledge, the party who relies on such an allegation must fail (cf. T 219/83 OJ 1986, 211). Moreover, document (9), which was issued in 1962, i.e. long after the date of publication of document (1) in 1931 cannot be used to construe this old document.

In the Board's judgement, the combination of the teaching of this document with that of document (3) to arrive at a composition comprising an alkylpolyglucoside, an amine oxide and an unsaturated soap can only be made with the benefit of hindsight.

5.4 Having regard to the partial problem of avoiding damage to washing machines due to excessive foaming it could be argued that, since it is known to minimise detergent foaming tendencies by adding foam regulators and that the foaming of detergents based on alkylbenzenesulphonates and fatty alcohol polyglycol ethers are effectively controlled by soaps with a broad chain length spectrum, it would be obvious to control the foaming of a detergent composition comprising an alkylpolyglucoside and an amine oxide by including a soap therein.

However, such argumentation overlooks the fact that it is recognised that several limitations are attached to the use of soaps and foam regulators, for example,

satisfactory foam regulation only occurs if a sufficiently high calcium ion concentration is assured and the foam regulating power of soap is substantially reduced with detergents based on other surfactants.

Moreover, as demonstrated by the example of the disputed patent and experiment 4 of the above-mentioned Experimental Report, it is essential that the soap has an unsaturated straight chain of 16 to 22 carbon atoms in order to avoid the formation of scum, to provide a free flowing, clear liquid and to effectively suppress foam generated by a surfactant system composed of an alkylpolyglucoside and amine oxide. There is no evidence before the Board that just unsaturated soaps inhibit foaming.

5.5 Document (2) discloses an aqueous cleaning solution containing potassium hydroxide, amino trimethylphosphonate, a cycloaliphatic dicarboxylic acid, sodium glucoheptonate or sodium gluconate, a linear alcohol alkoxylate and an alkylglucoside, for example, Triton BG-10 (cf. table in column 2). Thus, not only is the structure of the unsaturated carboxylic acid completely different from the present unsaturated soaps, but also the alkaline nature of these solutions render them unsuitable for laundry purposes. In view of this, the teaching of this document would not provide any indication pointing in the direction of the claimed solution to the present technical problem.

5.6 Therefore, in the Board's judgement, the proposed solution to the technical problem underlying the patent in suit is not obvious. Thus, the subject-matter of Claim 1 in accordance with the main request involves an inventive step. Claims 2 to 7, which relate to preferred embodiments of the composition according to Claim 1, are also

allowable.

6. In view of this finding, it is not necessary to consider the Respondent's auxiliary request.

**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 on the basis of the claims in accordance with the main request submitted during oral proceedings.

The Registrar: The Chairman:

E. Görgmaier K.J.A. Jahn