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BOARDS OF APPEAL OF THE EUROPEAN PATENT OFFICE

CHAMBRES DE RECOURS DE L'OFFICE EUROPEEN DES BREVETS

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Application No.: 83 200 604.3

Publication No.: 0 094 118

Title of invention: Low phosphate laundry detergent compositions

Classification: C11D 1/835

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 Article 56

Keyword: "Inventive step (confirmed)"

Headnote

Europäisches Patentamt | European Patent Office | Office européen des brevets

Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number : T 413/90 - 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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Decision under appeal :
Decision of the Opposition Division of the European Patent Office of 9 February 1990, posted on 28 March 1990, concerning maintenance of European patent No. 0 094 118 in amended form.

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. 0 094 118 in respect of European patent application No. 83 200 604.3, which was filed on 28 April 1983, was granted on 3 September 1986 (cf. Bulletin 86/36).

II. A notice of opposition, which was filed on 27 May 1987, requested the revocation of the patent on the grounds of lack of novelty and inventive step. The opposition was supported, inter alia, by the following documents:

(1) US-A-3 721 633
(2) DE-A-2 948 921 (EP-A-0 004 121) and
(4) US-A-4 239 659.

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

(6) US-A-3 707 535
(7) The Journal of the American Oil Chemists' Society, Volume 47, pages 162 to 167, 1970 and
(8) Technical Bulletin, Triton CG-110 (Rohm & Haas).

III. By a decision delivered orally on 9 February 1990, with the corresponding interlocutary decision being issued on 28 March 1990, the Opposition Division maintained the patent on the basis of Claims 1 to 5 filed on 8 January 1990.

The Opposition Division held that the claimed subject-matter was novel and involved an inventive step. The Opposition Division considered that, in the light of the closest state of the art as represented by document (2), the aim of the invention was to provide a detergent

softening composition with excellent cleaning properties in both hard and soft water conditions and excellent fabric softening with respect to a wide range of soils and fabrics. The Opposition Division decided that the partial replacement of the cationic softener and of the non-ionic detergent by the selected alkylpolyglucoside led to the maintenance or improvement of the cleaning and softening properties in the washing of mixed textile fabrics under real washing conditions.

IV. An appeal was lodged against this decision on 21 May 1990 with payment of the prescribed fee. In his statement of grounds of appeal filed on 20 July 1990 and during the oral proceedings held on 11 December 1991, the Appellant contended that the claimed subject-matter was obvious in the light of the teaching of document (2) or (4) combined with that of documents (1), (6) and (8). The Appellant also maintained that his experimental evidence demonstrated that a technical effect was not present and, therefore, cannot be used as an indication of inventive step.

V. The Respondent denied that it was obvious to modify the compositions of document (2) by adding the specified alkylpolyglucosides in view of the disclosures in documents (1), (6) and (8). The Respondent argued that document (7) clearly showed that a wide range of sugar-based surfactants do not have softening properties and that there is nothing in document (8) to suggest that the alkylpolyglucoside disclosed therein would be any better than those of document (7) in this respect.

The Respondent contended that the data in the disputed patent showed that replacing the ethoxylate in whole or in part by an alkylpolyglucoside surprisingly improved the softening effect without reducing the cleaning effect.

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 the main or subsidiary request submitted during oral proceedings.

The only independent claim of the main request reads as follows:

"A low phosphate laundry detergent composition, having a pH in the laundry solution of greater than 7, comprising from 5% to 100% by weight of a surfactant mixture containing:

a non-ionic detergent surfactant having an HLB of from 5 to 14; or a mixture of such surfactants;

a quaternary ammonium cationic surfactant having 2 chains which contain an average of from 16 to 22 carbon atoms, or a mixture of such surfactants, characterised in that:

the surfactant mixture contains in addition an alkylpolyglucoside detergent surfactant of the formula $R^2O(C_nH_{2n}O)_t(glucosyl)_x$ where R^2 is C_{12-18} alkyl, n is 2 or 3, t is 0 to 10 and x is 1 1/2 to 3;

the weight ratio of non-ionic surfactant to alkylpolyglucoside surfactant being not greater than 7:1; and the weight ratio of non-ionic surfactant + alkylpolyglucoside surfactant to quaternary ammonium cationic surfactant being in the range from 2:1 to 12:1."

Claim 1 in accordance with the auxiliary request relates to the use of the specified alkylpolyglucoside as a softening additive in a low phosphate detergent

composition containing the specified alkylpolyglucoside, a non-ionic detergent surfactant as defined above and a quarternary ammonium cationic surfactant as defined above.

VII. At the conclusion of the oral proceedings, the Board's decision to maintain the patent on the basis of the claims of the main request was announced.

Reasons for the Decision

1. The appeal is admissible.

2. There are no formal objections under Article 123 EPC to either sets of claims. Thus Claim 1 finds a basis in Claim 1 as filed in combination with page 5, lines 1 to 10 of the published patent application (cf. also granted Claim 1 in combination with column 3, line 49 to column 4, line 7 of the printed patent specification). Claims 2 and 3 correspond to Claims 2 and 10 as filed respectively (cf. also granted Claims 2 and 4).

3. The disputed patent relates to laundry detergent compositions comprising non-ionic surfactants having HLB values of from 5 to 14 and quaternary ammonium cationic surfactants having 2 chains which contain an average of from 16 to 22 carbon atoms. Document (2), which is considered to represent the closest prior art, discloses similar laundry detergent compositions (cf. Claim 1).

A disadvantage of these prior art compositions was considered to be that the presence of the quaternary ammonium cationic surfactant led to discolouration of white fabrics repeatedly washed with the compositions.

In the light of this closest state of the art, the technical problem underlying the disputed patent is to be seen in providing a laundry detergent composition of this type in which this discolouration is reduced while maintaining effective detergency and fabric softening.

According to the disputed patent this problem is essentially solved by including in this prior art composition an alkylpolyglucoside of the specified formula in such an amount that the weight ratio of non-ionic surfactant to alkylpolyglucoside is not greater than 7:1.

With respect to the question of whether this technical problem has been successfully solved, the Board considers that the "Base" composition of Example A of the disputed patent and the composition of Example 1 of the Experimental Report submitted on 19 November 1991 are representative of compositions falling within the teaching of document (2). In view of the comparison between the "Base" compositions and compositions A, C, E, F, G and H as discussed in the paragraph bridging the left- and right-hand columns of page 7 of the disputed patent and the smaller difference in the Ciba Geigy whiteness between the eighth and first cycles for Example 2 as compared in Example 1 of the above-mentioned Experimental Report, the Board considers that it is plausible that the technical problem underlying the disputed patent is satisfactorily solved.

The experimental evidence filed by the Appellant in his statement of grounds of appeal on 20 July 1990 provided no data with respect to softening and discolouration. The results demonstrated that, under these particular circumstances, the cleaning performance of the claimed composition was slightly inferior to a prior art composition. However, since to solve the above-defined

technical problem an improvement in cleaning is not required, these results cannot lead to the conclusion that this technical problem has not been solved.

4. After examination of the cited prior art, the Board has concluded that the claimed subject-matter is novel. Since novelty is no longer in dispute, it is not necessary to give detailed reasons for this finding.

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

5.1 As previously mentioned, document (2) discloses laundry detergent compositions comprising non-ionic surfactants having the formula $R(OC_2H_4)_nOH$, wherein R is a C_{10-18} primary alkyl group and n is an average of about 2 to about 9 and having an HLB of from 5 to 14 or a mixture of such surfactants and quaternary ammonium cationic surfactants having 2 chains which contain an average of from about 16 to 22 carbon atoms, or a mixture of such surfactants; the ratio of said non-ionic to said cationic surfactant being in the range of from about 2:1 to about 9:1 (cf. Claim 1).

According to this document these laundry detergent compositions may also contain mixtures of non-ionic surfactants, some of which do not fall within the above definition, provided that at least one of the non-ionic surfactants contained in the mixture falls within the said definition of the required non-ionic surfactant, and that the required non-ionic surfactant is contained in an amount such that it falls within the required non-ionic/cationic ratio (cf. page 9, lines 5 to 20).

Although this document clearly teaches that these prior art compositions may contain non-ionic surfactants other

than those defined in Claim 1, there is no mention in the comprehensive list of suitable non-ionic surfactants of sugar-based surfactants let alone the present alkylpolyglucosides. Therefore, the teaching of this document by itself would not provide the skilled person with any indication pointing in the direction of the proposed solution.

5.2 Document (4) discloses a detergent composition comprising a non-ionic surfactant having an HLB of from about 5 to about 17 and a quaternary ammonium cationic surfactant having a single long chain alkyl group; the ratio of non-ionic surfactant to cationic surfactant being from about 3:1 to about 15:1 (cf. Claim 1). According to column 6, lines 17 to 25 of this document, the above defined quaternary ammonium cationic surfactants may be mixed with other types of cationic surfactants such as sulphonium, phosphonium and di- or tri-long chain quaternary ammonium materials, provided the amount of required quaternary ammonium surfactant contained in the composition falls within the non-ionic:cationic ratio requirements specified above. Thus, an essential component of this prior art composition is a quaternary ammonium cationic surfactant falling outside the definition in the present Claim 1. In the view of this essential difference, the Board cannot agree with the Appellant that this document could constitute an alternative to document (2) as the closest prior art. Furthermore, the teaching of this document would be of no assistance to the skilled person faced with the present technical problem.

5.3 Document (6) discloses a process for preparing alkylglycosides in which the degree of polymerisation is from 2 to 50 and the alkyl chain contains from 8 to 25 carbon atoms (cf. Claim 1 in combination with column 3, lines 43 to 54). According to column 3, lines 55 to 58

these alkylglycosides may be employed for a variety of purposes, such as, detergents, gelling agents, lubricants, wetting agents, dyeing assistants, textile softeners and food emulsifiers. In the absence of any experimental evidence to support this statement, the skilled person would initially carry out tests to verify its accuracy, particularly in view of the disclosure in document (7) that an alkylpolyglucoside falling within the terms of the present Claim 1 had no softening effect on cotton fabric (cf. Table XIII on page 165 and the last two lines of the paragraph headed "Textile Lubricant" on page 167). The fact that the alkylpolyglucosides in accordance with the present Claim 1 do not possess a softening effect has been confirmed by the experimental evidence submitted by the Respondent on 28 February 1991.

Thus, even if the skilled person were to consider that a possible solution to the technical problem underlying the disputed patent might be to replace some of the quaternary ammonium cationic surfactant of the composition of document (2) by another softening agent, he would not contemplate using the specified alkylpolyglucosides which, contrary to the statements in document (6), do not possess any softening properties. Therefore, the skilled person would not combine the teaching of document (2) with that of document (6) in the expectation of solving the present technical problem.

5.4 Document (8) discloses that the alkylpolyglucoside Triton CG-110 is a low irritating non-ionic surfactant having good detergency, wetting and soil removal, which is compatible with anionic, cationic, non-ionic and amphoteric materials (cf. points 3 and 4 on page 1). Furthermore, the skilled person is aware that the only essential difference between this alkylpolyglucoside and the ones specified in the present Claim 1 lies in the

length of the alkyl chain. However, this document does not provide any teaching which would enable the skilled person to deduce that the use of alkylpolyglucosides of a slightly different composition would solve the problem of reducing the discolouration resulting from the repeated use of the compositions of document (2).

5.5 Document (1) discolses a built liquid detergent composition comprising a builder selected from sodium nitriloacetate, potassium nitriloacetate and potassium polyphosphate and a C_{8-25}alkylglycoside containing 2 to 50 monomeric units (cf. Claim 1). According to column 2, lines 31 to 36 of this document preferred alkylglycosides are alkylglycosides of C_{10-14}alkanols containing 1 to 4 glucose units. Thus, these prior art built detergent compositions contain alkylpolyglucosides which embrace those defined in the present Claim 1.

Since this document is solely concerned with the technical problem of providing a stable, homogeneous, aqueous built detergent composition which did not require a hydrotrope to prevent phase separation (cf. column 1, lines 55 to 59), the skilled person, faced with the above-defined technical problem, would have had no incentive or reason to combine its teaching, even if it is construed in the light of the disclosure of documents (6) and (8), with that of document (2) or (4).

6. Therefore, in the Board's judgement, the proposed solution to the present technical problem is not obvious. Thus, the subject-matter of Claim 1 in accordance with the main request involves an inventive step. Claims 2 and 3, which relate to preferred embodiments of the compositions according to Claim 1, are also allowable.

7. 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 main request submitted during oral proceedings.

The Registrar: The Chairman:

E. Görgmaier K.J.A. Jahn