BESCHWERDEKAMMERN DES EUROPÄISCHEN PATENTAMTS

BOARDS OF APPEAL OF THE EUROPEAN PATENT OFFICE

CHAMBRES DE RECOURS DE L'OFFICE EUROPEEN DES BREVETS

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File Number: T 214/90 - 3.3.1

Application No.: 82 200 871.0

Publication No.: 0 070 077

Title of invention: Foaming Surfactant compositions

Classification: C11D 1/83

D E C I S I O N
of 10 October 1991

Proprietor of the patent: The Procter & Gamble Company

Opponent: Hüls Aktiengesellschaft
Henkel Kommanditgesellschaft auf Aktien

Headword:

EPC Article 56

Keyword: "Inventive step (confirmed) - non-obvious alternative"

Headnote

Case Number : T 214 / 90 - 3.3.1

D E C I S I O N
of the Technical Board of Appeal 3.3.1
of 10 October 1991

Appellant : (Opponent)
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Decision under appeal :
Interlocutory decision of the Opposition Division of the European Patent Office dated 07 February 1990 concerning maintenance of European patent No. 0 070 077 in amended form.

Composition of the Board :

Chairman : R.W.Andrews
Members : J:M.Jonk
J.A.Stephens-Ofner

Summary of Facts and Submissions

I. European patent No. 0 070 077 in respect of European patent application No. 82 200 871.0, which was filed on 12 July 1982, was granted on 21 January 1987 (cf. Bulletin 87/04).

II. Notices of opposition, which were filed on 17 October 1987 and 29 October 1987 (by duly confirmed telex), requested the revocation of the patent on the grounds of insufficiency and lack of inventive step. The oppositions were supported, inter alia by the following documents:

(1) US-A-3 838 318
(2) Chemiker Zeitung, Vol, 4, pages 169 to 173, 1979
(3) US-A-3 721 633
(6) US-A-3 547 828
(11) Technical Bulletin, Triton CG-110 (Rohm & Haas)
(12) Journal of the American oil Chemists' Society, Vol. 47, 162 to 167, 1970

During the course of the opposition and appeal proceedings the following documents were referred to:

(30) Fette, Seife, Anstrichmittel, Die Ernährungsindustrie, Vol. 68, pages 551 to 556, 1966

(31) Nonionic surfactants, Martin J. Schick, pages 683 and 693 to 697, 1967

(35) Rivista Italiana, essenze, profumi, piante officineli, aromi, saponi, cosmetici, aerosol, year LVI, No 10, pages 567 to 572, 1974 and

(39) Manufacturing Chemist & Aerosol News, page 27, May 1981.

III. By an interlocutory decision dated 7 February 1990 the Opposition Division maintained the patent on the basis of Claims 1 to 10 on 9 October 1989.

The Opposition Division held that the subject-matter of the amended Claim 1 was novel and involved an inventive step. In the Opposition Division's opinion, the claimed compositions, which provide readily rinsable foams, differed from the disclosed in the closest prior art as represented by document (30) in the nature of the alkylpolyglucosides (APG) and the presence of 5 to 60% by weight of an alkylpolythoxylate sulphate. However, none of the cited prior art suggested that the use of APG's in combination with an alkylpolythoxylate sulphate and/or the selection of the APG'S defined in Claim 1 would provide useful granulate compositions.

IV. Appeals were lodged against this decision on 20 and 29 March 1990 and the prescribed fees duly paid. Statements of Grounds of Appeal were filed on 6 June 1990. In these statements and submissions filed on 20 and 26 September 1991 and during the oral proceedings held on 10 October 1991, the Appellants put forward the following arguments:

Appellants 01 contended that the disclosure of document (30) combined with that of document (11) rendered the claimed subject-matter obvious, particularly since the APG's used in the claimed compositions cannot be considered as being a selection. This Appellant has also argued that, in assessing inventive step, documents other

than those relating to granulate compositions must be considered. In this Appellant's opinion the claimed subject-matter can also be arrived at in an obvious manner by combining the teaching of documents (1), (2) and (3).

Appellant 02 maintained that the claimed subject-matter was obvious in the light of the teaching of the cited prior art combined in the following manner:

document (30) + document (11) or (35) + document (31)
document (30) + document (11) or (35) + document (12).

This Appellant also argued that the term "agglomeration" in the present Claim 1 was unclear and that the disclosure of the patent was insufficient in the absence of any examples illustrating the claimed compositions.

V. The Respondent argued that the disclosure of document (11) and the numerous vague and generic disclosures of vast ranges of APG'S and other sugar based surfactants do not provide any relevant information and do not suggest the defined compositions.

The Respondent has also contended that the term "agglomeration" is perfectly clear to the skilled person and that, despite the lack of any example illustrating the claimed composition, the disclosure of the disputed patent was sufficient.

VI. The Appellants requested that the decision under appeal be set aside and the patent revoked. The Respondent requested that the appeal be dismissed and that the patent be maintained on the basis of the claims submitted in the course of the oral proceedings by way of main request, or on the basis of the claims likewise submitted by way of auxiliary request.

Claim 1 in accordance with the Respondents main request reads as follows:

"A light-duty detergent granule composition comprising

(1) from 5% to 60% by weight of an alkyl benzene sulfonate cosurfactant in which the alkyl group contains from 10 to 13 carbon atoms said alkyl benzene sulfonate neutralised with one or more cationic moieties;

(2) from 5% to 60% by weight of an alkylpolyethoxylate sulfate cosurfactant in which the alkyl group contains from 10 to 16 carbon atoms and there are from 1 to 6 ethoxylate groups, said alkylpolyethoxylate sulfates neutralised with one or more cationic moieties;

(3) from 5% to 80% by weight of a water-soluble inorganic salt selected from the group consisting of sodium and potassium sulfates, chlorides, carbonates, phosphates and mixtures thereof, characterised in that the composition also includes 5 to 60% by weight of an alkylpolyglucoside surfactant of the formula $R^2O(C_nH_{2n}O)_tZ_x$ where Z is derived from glucose, R^2 is an alkyl group containing 12 to 18 carbon atoms, n is 2 or 3, t is 0 to 10, and x is from 1.5 to 4, and including less than 10% unreacted fatty alcohol and less than 50% short chain alkylpolyglucoside, and in which the composition has been made by agglomeration".

Claim 1 in accordance with the auxiliary request is directed to the use of the specified alkylpolyglucosides to provide a stable foam having quick rinsability in light duty detergent granule composition.

VII. At the conclusion of the oral proceedings the Board's decision to maintain the patent on the basis of 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 the claims of the main request since they are adequately support the original disclosure and do not extend the protection conferred. Thus, Claim 1 is based on Claim 1 as filed and granted and page 4, lines 21 to 30, page 5, lines 3 to 6 and page 8, lines 11 and 12 of the published patent application (cf. also column 3, lines 18 to 31 and 45 and 46 and column 4, lines 61 of the printed patent specification). Claims 2 to 4 correspond respectively to Claims 5, 2 and 3 as filed and granted.

3. In the Board's opinion, the term "agglomeration" is clear to the skilled person in the detergent field. This opinion is supported by page 422 of Volume 22 of Kirk-Othmer, Encyclopedia of Chemical Technology (Third Edition) where it is stated that the process of agglomeration is intermediate between spray-drying and dry-blending. In agglomeration (also termed spray-mixing), a spray of water or other liquid is aimed at dry powder under agitation.

3.1 The allegation of insufficiency is based on the fact that the preparation of granules in accordance with the present Claim 1 is not exemplified insofar as the alkylpolyethoxylate sulphate cosurfactant is not present in the granules obtained in Example 1. However, the technique of agglomeration or spray-mixing is so well known in the detergent field, that it must be considered

to be well within the competence of the skilled person to modify the present Example in order to produce granules containing all the four components.

This allegation was also supported by the Appellant's claim that alkyl polythoxylate sulphates are only supplied as liquids which, in their opinion would make it very difficult or even impossible to incorporate this surfactant in a composition by a spray-mixing. Against this the Respondent's expert stated that it was possible to obtain this cosurfactant in solid form. The Board is unable to resolve this conflict and, in the absence of further evidence, finds, in accordance with the Board's established jurisprudence relating to the onus of proof in appeals against decisions of the Opposition Division, in favour of the Respondent (Patentee) on this issue of insufficiency.

4. The disputed patent relates to a light duty detergent granule composition comprising a mixture of anionic surfactants and a water-soluble inorganic salt. Document (30), which is regarded as representing the closest state of the art, discloses light duty granule composition containing 20 to 30% alkylbenzenesulphonate, 0 to 10% fatty alcohol sulphate, 0 to 3% fatty acid alkanolamide, 0 to 10% polyphosphate and the remainder sodium sulphate (cf. second paragraph in the right-hand column on page 551).

Appellant 02 disputed whether this document represented th closest prior art in view of the developments that had taken place since its publication in 1966. However, it is the only document before the Board which discloses light duty detergent granule compositions, and therefore must be considered to represent the closest state of the art.

In the light of this prior art the Board sees the technical problem underlying the patent in suit in providing an alternative to these known compositions.

This technical problem is solved by agglomerating the mixture of ingredients specified in Claim 1.

5. After examination of the cited prior art, the Board has concluded that the claimed subject-matter is novel. Since novelty is not in dispute, it is not necessary to give detailed reasons for this finding.

6. It still remains to be decided whether the requirement of inventive step is met by the claimed subject-matter.

6.1 Documents (11) and (35) disclose that the alkylglucoside Triton CG-110 is a low irritating nonionic surfactant which is compatible with anionic, cationic, nonionic and amphoteric materials. The product also possesses good detergency, wetting and soil removal and excellent foaming properties with the foam exhibiting stability. In view of these properties document (1) recommends, inter alia, that the product be used in hand dishwashing detergent or all purpose household detergent. Document (35) emphasises the possible cosmetic application of the product in, for example, shampoos and skin cleansing compositions, such as soaps and bubble baths.

According to document (11) and the analysis of three examples of Triton CG-110 submitted by Appellant 02 on 26 September 1991, the product contains about 35 to 41% of monoglucoside, about 30 to 40% of oliglucoside, less than 2% of fatty alcohol and no butyl glucoside. The degree of polymerisation (symbol x in the present Claim 1) is about 1.5 to 1.7 and the alkyl group (present symbol R) is a 50:50 ratio of C_8 and C_{10}. Thus, the essential difference

between the alkylglucosides as defined in the present Claim 1 lies in the length of the alkyl chain (represented by the symbol R).

6.2 Similarly, document (39) describes the properties and possible cosmetic uses of Triton CG-110. According to this document Triton CG-110 is expected to show high flash foam, comparable to anionics, better foam stability than anionics, hard water tolerance and compatibility with nonioncs, anionics and cationic surfactants while being readily biodegradable. Accordingly this document recommends it for a variety of cosmetic and toiletry applications including soaps and synthetic bars to produce creamy foams and help prevent excessive skin degreasing; shampoos and bubble baths to produce a good mild cleaning product; skin creams, lotions and makeup, aiding emulsion stability, while giving good skin feel with mildness.

6.3 However it should be borne in mind that these documents and the other documents referring to alkylpolyglucosides have been cited in the knowledge of the proposed solution to the technical problem underlying the disputed patent. Faced with this technical problem the skilled person has a large number of possibilities open to him with no particular indication in the prior art or his common general knowledge to lead him in the direction of the proposed solution.

6.4 Even if the argument that the fact that the skilled person is aware that the sugar based surfactants are biodegradable, mild to the skin and unlike petroleum based products , are derived from renewable resources would provide him with the incentive to employ them in light duty granule compositions is accepted, the skilled person would consider that Triton CG-110 solved the problem and would then have no reason to search for other solutions.

Not only would the skilled person have no reason to continue along this route, he would be discouraged from doing so by the knowledge of the difficulties involved in the manufacture of alkylpolyglucosides with long alkyl chains on a commercial scale even though documents (1) and (6) disclose processes for their preparation.

Thus, document (1) describes a process for the preparation of C_{6-18} alkylglucosides and C_{6-18} alkyloligoglucosides comprising reacting glucose with a straight or branched primary alcohol having 6 to 18 carbon atoms in the presence of an acid catalyst at about 80° to 130°C, removing the water of reaction substantially a fast as it is formed, controlling the catalyst concentration and temperature so that solubilisation of the glucose and formation of the desired product occurs, while oligomerisation is substantially avoided, and using a molar ratio of alcohol to glucose such that decreasing glucose solubility with rising alcohol molecular weight is compensated for by increasing said molar ratio (cf. Claims 1 and 2).

Since the amount of excess alcohol to be removed and the difficulties involved in its removal with increasing molecular weight, the skilled person, in the absence of any foreseeable advantages, would not consider using alkylpolyglucosides with alkyl radicals containing more than the 10 carbon atoms of Triton CG-110.

Document (6) discloses the preparation of mixtures of alkylglucosides, alkyloliglucosides and alkanols by reacting glucose and a lower alkanol, preferably n-butanol, in the presence of an acid catalyst to form a mixture of lower alkylglucosides which are then reacted with higher alkanols (cf. column 2, lines 16 to 61). For

the reasons given above the teaching of this document would not prompt the skilled person, even if he had considered for to use alkylpolyglucosides for environmental and ecological reasons, to look further than Triton CG-110.

6.5 Document (12) discloses the physical and functional properties of some high alkylpolyglucosides in which x varies from 1.3 to 9.0 and R from C_{10} to C_{18}. In various tables in this document the results of a foam test, surface tension measurements, a toxological investigation and a test designed to evaluate the detergent effectiveness of heavy duty solid and liquid compositions are reported (cf. Tables III, V, IX and X).

However, the document provides the skilled person with no incentive to propose alkylpolyglucosides as a solution to the present technical problem rather than any other surfactant, or if he were to elect to use alkylpoly-glucoside, why he should move away from Triton CG-110 to the higher alkyl derivatives.

6.6 Document (3) discloses built liquid detergent compositions comprising a builder selected from sodium and nitriloacetate, potassium nitriloacetate and potassiuim polyphosphate and a C_{8-25} alkylglucoside containing 2 to 50 monomeric units (cf. Claim 1). According to column 2, lines 31 to 36, preferred alkylglucosides are those derived from alkanols having 10 to 14 carbon atoms and 1 to 4 glucose units. Even if the obligatory presence of a builder in these prior art compositions is ignored, this document does not provide the skilled person with any teaching that would induce him to include the specified alkylpolyglucosides in the known compositions to solve the technical problems underlying the disputed patent. In the light of the above-mentioned manufacturing difficulties,

the skilled person would be deterred from contemplating using the higher alkylpolyglucosides referred to in column 2. If he were to consider alkylpolyglucosides at all as a possible solution he would concentrate his attention on such products as Triton CG-110.

6.7 Document (31) (cf. also GB-A-976 088 (9) and Journal of the American Oil Chemists' Society, Vol 38, pages 10 to 412, 1961 (32)) discloses the results obtained by washing soiled cotton swatches using alkylsucrose as the surfactant. The alkylsucroses are discrete compounds obtained by reacting sodium sucrate in dimethyl sulphoxide with higher alkyl bromides (cf. documents (9)and (32). It is appropriate to point out that, in the Board's judgment the present Claim 1 correctly construed does not include compositions containing individual alkylglucosides since it is clearly indicated in the body of the patent specification that the symbol x represents an average value (cf. column 2, lines 401 to 42).

On pages 693 of this document, it is stated that the relative cost of sugar-based surfactants has mitigated against their acceptance regardless of lack in toxicity, "softness" or effectiveness except for speciality purposes. In view of this statement, the skilled person searching for an alternative to light duty detergent compositions of document (30) would leave sugar-based detergents out of his considerations.

6.8 Document (2) provides information relating ingredients (1) of (2) of the claimed compositions. However, it would not provide the skilled person with any reason to modify the compositions of document (30) in the manner proposed.

7. Therefore in the Board's judgment, the proposed solution to the technical problem underlying the patent in suit is not obvious. Thus, the subject-matter of Claim 1 involves an inventive step. Claims 2 to 4, which relate to preferred embodiments of the compositions in accordance with Claim 1, are also allowable.

8. In view of the above 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 Opposition Division with the order to maintain the patent on the basis of the claims submitted by way of the main request during the course of the oral proceedings.

The Registrar

E. Görgmaier

The Chairman

R.W. Andrews