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D E C I S I O N
of 6 May 2004

Case Number: T 0438/02 - 3.3.6

Application Number: 94926670.4

Publication Number: 0719321

IPC: C11D 3/386

Language of the proceedings: EN

Title of invention:

Light duty liquid or gel dishwashing detergent compositions
containing protease

Patentee:

THE PROCTER & GAMBLE COMPANY

Opponent:

Henkel KGaA

Headword:

Protease/THE PROCTER & GAMBLE COMPANY

Relevant legal provisions:

EPC Art. 54, 56, 83, 123

Keyword:

"Novelty (main request, first auxiliary request): no"

"Disclaimer (second auxiliary request): not allowable since
anticipation was not accidental"

"Inventive step (third auxiliary request) - yes: ex post facto
analysis not allowable"

Decisions cited:

G 0001/03

Catchword:

-



Case Number: T 0438/02 - 3.3.6

D E C I S I O N
of the Technical Board of Appeal 3.3.6
of 6 May 2004

Appellant: Henkel KGaA
(Opponent) VTP (Patente)
D-40191 Düsseldorf (DE)

Representative: -

Respondent: The Procter & Gamble Company
(Proprietor of the patent) One Procter & Gamble Plaza
Cincinnati,
Ohio 45202 (US)

Representative: Engisch, Gautier
Procter & Gamble
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Decision under appeal: Decision of the Opposition Division of the
European Patent Office posted 12 March 2002
rejecting the opposition filed against European
patent No. 0719321 pursuant to Article 102(2)
EPC.

Composition of the Board:

Chairman: P. Krasa
Members: G. N. C. Raths
V. Di Cerbo

Summary of Facts and Submissions

I. This appeal is from the decision of the Opposition Division to reject the opposition against the European patent No. 0 719 321 relating to light duty liquid or gel dishwashing detergent compositions containing protease.

II. Claim 1 of the patent as granted reads:

"1. A light-duty liquid or gel dishwashing detergent composition comprising by weight:

(a) from 5% to 99% of detergent surfactant selected from the group consisting of polyhydroxy fatty acid amides; nonionic fatty alkylpolyglycosides; C₈₋₂₂ alkyl sulfates; C₉₋₁₅ alkyl benzene sulfonates, C₈₋₂₂ alkyl ether sulfates; C₈₋₂₂ olefin sulfonates; C₈₋₂₂ paraffin sulfonates; C₈₋₂₂ alkyl glyceryl ether sulfonates; fatty acid ester sulfonates; secondary alcohol sulfates; C₁₂₋₁₆ alkyl ethoxy carboxylates; C₁₁₋₁₆ special soaps; ampholytic detergent surfactants; zwitterionic detergent surfactants; and mixtures thereof; and

(b) from 0,001% to 0,08% active protease; preferably, the protease is selected from the group consisting of serine proteolytic enzyme obtained from *Bacillus subtilis*, *Bacillus licheniformis* and mixtures thereof,

(c) from 1% to 20% of a suds booster selected from the group consisting of betaines, amine oxide semi-polar non-ionics, sultaines, complex betaines, cationic surfactants and mixtures thereof;
said composition having a pH between 4 and 11."

III. The opposition had been filed on the grounds of Article 100(a),(b) EPC, in particular, for lack of insufficiency of disclosure, and for lack of novelty and inventive step relying, *inter alia*, on the following documents:

(1) US-A-5 030 378;

(2) DE-A-3 640 799 and

(3) WO-A-92-08 777.

IV. The Opposition Division found that the invention was sufficiently disclosed and, with respect to novelty, that documents (1) and (2) did not anticipate the claimed subject-matter because document (1) related to heavy duty laundry detergent compositions and not to dish washing detergents and the compositions of documents (1) and (2) did not disclose the concentration of the protease.

Further, in respect of inventive step, the Opposition Division found that the use of protease for improving the mildness to the skin was not taught by documents (1) or (2).

V. The appellant (opponent) filed an appeal against this decision. It raised objections under Article 83 EPC:

1) the upper limit of 99 weight % of component (a) was a concentration which could not be employed, because the addition of the lowest weight % values possible of components (b) and (c) exceeded 100 weight %;

2) the concentration of component (c) which could be betaine and/or sultaine was limited to a maximum of 20 weight % whereas component (a), which was the ampholytic or zwitterionic component, and, hence, could also be a betaine or a sultaine, could be present at a concentration of up to 99 weight %; hence, there was a contradiction between the maximum allowable amount of 20 weight % for component (c) and the possibility to exceed this limit by using up to 99 weight % of component (a).

With respect to novelty, the appellant argued that due to the term "comprising" the presence of further components such as monoethanolamine and tetraethylenpentine-ethoxylate was not excluded in the compositions of Claim 1 of the patent in suit. Therefore, the reasoning of the Opposition Division for not considering document (1), in particular, composition A of example I, as novelty destroying was wrong.

Under cover of the letter dated 13 December 2001, the appellant, in the course of the opposition proceedings, filed documents

(4) Novo Enzyme Produkt Liste, April 1985 and

(5) Alcalase®, Novo Enzymes, June 1976

as further evidence for the enzyme activity in Anson units (abbreviated to AU)(2,5 AU/g, Alcalase® 2.5L, document (4); 45 AU/g, Alcalase®, pure enzyme, document (5)).

The Opposition Division had decided not to introduce documents (4) and (5) into the proceedings since their date of publication was missing. The date of publication of documents (4) and (5) is now known since, under cover of the letter dated 12 July 2002 (statement of grounds of appeal), the appellant submitted the missing pages bearing the publication date.

Therefore, the concentration of the protease of the composition A of example I of document (1) and of example 3 of document (2) could be derived from the indication of the enzyme activity expressed in AU; hence, this additional information concerning the concentration of the protease should support the argument that there was a lack of novelty.

With respect to inventive step, the appellant submitted the following:

The roughness of textile fabrics is smoothed with cellulase (see document

- (6) Henrik Malmos, "Enzyme in Waschmitteln", Seife-Öle-Fette-Wachse, 117. Jhg; Nr.5/1991, pages 174-177,

filed under cover of the letter dated 12 July 2002 (statement of grounds of appeal)).

By analogy, the roughness of skin may be smoothed with protease. Document (3) solved the same technical problem, i.e. improvement of mildness to the skin manifested by detergent compositions. Compositions

containing calcium or magnesium ions and a particular alkyl ethoxy carboxylate were suggested in document (3) as a solution to this technical problem. In the light of this citation, the claimed subject-matter was lacking an inventive step, because the skilled person who was looking for detergent compositions displaying improved mildness to the skin would have taken into consideration the analogy relating to textile fabrics, and, thus, would have arrived at the solution as claimed by adding a protease to the compositions disclosed in document (3).

VI. The respondent (proprietor) refuted the arguments of the appellant.

VII. During the oral proceedings before the Board, which took place on 6 May 2004, the respondent replaced the auxiliary requests on file by three auxiliary requests designated 1st, 2nd and 3rd auxiliary request.

Claim 1 of the 1st auxiliary request is identical to Claim 1 of the patent as granted (main request) but the set of claims of this request contains amendments to claims 3 and 4 which have however not to be cited here for understanding this decision.

Claim 1 of the 2nd auxiliary request differs from Claim 1 of the main request in that the following passage has been added at the end of the claim:
"with the proviso that the composition does not comprise 7,2% C₁₃ linear alkylbenzene sulfonic acid, 10,8% C₁₄₋₁₅ alkyl polyethoxylate sulfuric acid, 2,5% alkyl sulfuric acid, 6,5% C₁₂₋₁₃ alcohol polyethoxylate, 1,2% C₁₂ alkyl trimethylammonium chloride, 13% C₁₂₋₁₄

fatty acid, 2% oleic acid, 4% citric acid, 0,3% sodium diethylenetriamine pentaacetate, 1,5% tetraethylene pentamine ethoxylate, 2% monoethanolamine, 1,7% sodium hydroxide, 4% potassium hydroxide, 7,2% 1,2 propane diol, 7,75% ethanol, 1% sodium formate and water to the balance of 100%."

Claim 1 of the 3rd auxiliary request is the former claim 2 of the main request which differs from Claim 1 of the main request in that at the beginning of the claim "A" was replaced by "A process of washing dishes with a" and "ethylene oxide condensates" was inserted between "betaines," and " ,amine oxide semi-polar nonionics" .

Claim 2 reads: "The use of 0,001% to 0,08% active protease in a light duty liquid or gel dishwashing detergent composition, for improving the feel of skin."

Claim 3 reads: "The use of 0,001% to 0,08% active protease for the manufacture of a light duty liquid or gel dishwashing detergent composition for improving skin mildness of the composition, and/or for improving the dryness to skin."

Claims 4 to 10 concerned preferred embodiments of Claims 1, 2 and 3.

VIII. The appellant (opponent) requested that the decision under appeal be set aside and the patent in suit be revoked.

The respondent requested that the appeal be dismissed and that the patent be maintained as granted (main

request), or alternatively on the basis of the claims of auxiliary requests 1 to 3 filed at the oral proceedings.

IX. At the end of the oral proceedings the Chairman announced the decision of the Board.

Reasons for the Decision

1. *Sufficiency of disclosure*

1.1 The composition according to Claim 1 allows for a maximum of 99 weight % of a detergent surfactant, a minimum of 0,001 weight % of active protease and a minimum of 1 weight % of a suds booster.

The appellant argued that the skilled person cannot carry out the invention since the sum of these three values is above 100 weight %.

The Board does not agree. The objection raised by the appellant concerns rather clarity than lack of sufficiency of disclosure. The skilled practitioner will have no difficulty to manufacture compositions comprising these three components without exceeding the respective upper concentration limits, compositions for which all the components add up to 100% by weight. The skilled practitioner will also be aware that because of the lack of clarity caused by the values given for the lower limits of the components (b) and (c), he is free to adjust the amounts of these components as necessary if for component (a) a concentration of 99 weight % (or of a value close to 99 weight %) is used.

1.2 Claim 1 allows for 5% to 99% by weight of ampholytic or zwitterionic surfactants as component (a), as well as for 1% to 20% by weight of betaines or sultaines for component (c). The appellant argued that on the one hand there was a maximum allowable amount of 20% by weight for betaines and sultaines, which fell within the definition of zwitterionic or ampholytic surfactants, and on the other hand, this maximum value could be exceeded by adding more betaines or sultaines by assigning them to component (a). Since the skilled person was not taught how to solve this inconsistency, the description of the invention was insufficient.

The Board cannot accept this argument. Even if the definition of zwitterionic or ampholytic surfactants encompasses betaines or sultaines, the maximum amount of these two particular classes of zwitterionic surfactants is clearly limited by the maximum allowable amount of 20% for component (c). Hence, there is no lack of consistency to be found in Claim 1, let alone, of an insufficiency of disclosure of the invention.

1.3 Consequently the Board concludes that the claimed invention has been disclosed in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art. Thus, the requirements of Article 83 EPC are met.

2. *Main request*

2.1 Novelty

- 2.1.1 Claim 1 is directed to a light-duty liquid or gel dishwashing detergent composition comprising by weight:
- (a) from 5% to 99% of detergent surfactant;
 - (b) from 0,001% to 0,08% active protease;
 - (c) from 1% to 20% of a suds booster;
- said composition having a pH between 4 and 11."

The novelty of such compositions was attacked on the basis of document (1), in particular example IA, and document (5).

- 2.1.2 The composition A according to example I of document (1) comprises
- (a) 7,2 wt% of a C₁₃ linear alkylbenzene sulfonic acid and 10,8 wt % of C₁₄₋₁₅ alkyl polyethoxylate sulfuric acid and 6,5 wt% of C₁₂₋₁₃ alcohol polyethoxylate;
 - (b) protease enzyme;
 - (c) 1,2 wt% C₁₂-alkyl trimethylammonium chloride;
- the pH could be adjusted at 7,5 to 7,1, 7,3, 8,0 and 8,5 (column 10, lines 56 to 58).

In view of the fact that example IA gives classes of chemical compounds for the components (a) and (c), does not specify the amount used for the protease enzyme and allows various pH values, it is clear that it has to be understood as a generic recipe which has to be read in combination with other passages of the citation to gain supplemental information where necessary.

In respect of the concentration of the protease enzyme, Protease A was added at 2000 ppm in water; document (1) disclosed that Protease A "...provided significantly better through the wash cleaning of enzyme-sensitive

stains...than did equivalent amounts (providing either 0,0012, 0,015 or 0,03 Anson units of activity per gram of composition) of the commercially available proteolytic enzymes Alcalase®..." (column 10, lines 42 to 52).

Thus, whereas example IA of document (1) puts emphasis on compositions comprising protease A, the above mentioned passages also clearly disclose compositions comprising Alcalase® in amounts giving the mentioned activity.

According to document (5), in the case of Alcalase®, 1 Anson unit per gram corresponds to 2% of the pure enzyme (page 4, left column, lines 28 to 30). This would mean that 0,0012, 0,015 or 0,03 Anson units correspond to 0,0024, 0,030 or 0,06 wt% of the pure enzyme.

So, there is a correlation between the enzyme activity in AU per gram of composition and the concentration of Alcalase® in weight % of the composition. For a composition actually providing 0,0012 AU of Alcalase® the concentration was consequently 0,0024 weight %, a value which falls within the respective range defined in Claim 1 of the patent in suit i.e. 0,001 to 0,08% by weight of active enzyme.

Since Alcalase® is listed among the proteolytic enzymes suitable for the invention according to the patent in suit, as is Protease A (patent in suit, page 5, lines 47 and 53), the compositions AI of document (1) display all the features of the claimed compositions.

2.1.3 It follows that the subject-matter of Claim 1 is not novel. Thus, the requirements of Article 54(1)(2) are not met and, therefore, the main request cannot be allowed.

3. *1st Auxiliary request*

3.1 Novelty

Claim 1 of auxiliary request is identical to Claim 1 of the main request; therefore, the same reasoning as set out under 2.1.2 applies.

The 1st Auxiliary request I cannot be allowed either.

4. *2nd Auxiliary request*

4.1 Article 123(2) EPC

4.1.1 Claim 1 of the 2nd auxiliary request differs from Claim 1 of the main request in that the passage "with the proviso that the composition does not comprise ...the remaining being water" (see point VII) was added at the end of the claim.

4.1.2 The basis for said passage is found in document (1) and concerns the composition A of example I of said document (see column 9, line 50 to column 10, line 25).

4.1.3 The amendment is a disclaimer which has no basis in the application as filed and which is introduced to restore novelty by delimiting Claim 1 against document (1). Said document relates to liquid laundry detergent

compositions containing anionic surfactants, builder and proteolytic enzyme and aims at an improved cleaning performance of enzyme sensitive stains (column 1, lines 18 to 24). The patent in suit relates to light duty liquid or gel dishwashing detergent compositions containing a protease.

Both the laundry detergent compositions and the dishwashing detergent compositions have one basic objective in common, the removal of soil. In fact, this basic objective is the very reason and technical justification for the existence of detergent compositions. It follows that normally a skilled person, an expert in detergents, dealing with dishwashing detergent compositions will always keep in mind also the state of the art relating to laundry detergent compositions, and vice versa. This holds also if a skilled person aims at solving a specific technical problem which goes beyond the mere cleaning of a substrate and may or may not be mentioned in the respective citations.

Therefore, the state of the art disclosed in document (1) is not so unrelated and so remote from the subject-matter claimed in the patent in suit that the person skilled in the art would never have taken it into consideration when making the invention now claimed. Thus document (1) is not an accidental anticipation under Article 54(2) EPC and the exclusion of its contents from Claim 1 of the patent in suit by a disclaimer having no basis in the application as filed is not admissible and the amendment of Claim 1 violates Article 123(2) EPC (see G 01/03, order, 2.1, second dash).

5. *3rd Auxiliary request*

5.1 Articles 84 and 123(2) EPC

Claim 1 differs from Claim 1 of the main request in that "Process for washing dishes with a" was inserted between "A" and "light duty liquid or gel" at the beginning of Claim 1 and in fact corresponds to Claim 2 of the main request.

The wording of claims 2 and 3 are given in point VII, above.

The concentration range of "0,001 % to 0,080 % active protease" was already present in Claim 1 of the patent as granted and was then incorporated in Claims 2 and 3 of the 3rd auxiliary request. The basis for the upper value of 0,08% by weight of the range 0,001% to 0,08% by weight is found in example V (application as filed, ingredients M and O, page 25, line 23) and was not contested during the opposition and the appeal proceedings.

Claims 4 to 10, i.e. renumbered claims 5 to 11 of the main request, in which the word "composition" was deleted, concerned preferred embodiments of Claims 1, 2 and 3.

No objections were raised under Article 84 EPC, and also for the Board the wording of the claims leaves no doubt as to clarity.

Therefore, the Board is satisfied that all the claims meet the requirements of Articles 84 and 123(2) EPC.

5.2 Novelty

Claim 1 is directed to a process of washing dishes with a light duty liquid or gel dishwashing detergent composition comprising 0,001 to 0,08% by weight of active protease.

Claims 2 and 3 are directed to the use of 0,001 to 0,08% by weight of active protease in and for the manufacture of a light duty liquid or gel dishwashing detergent composition, respectively.

Document (1) concerns laundry washing, but not dish washing, and is therefore not novelty destroying with respect to Claims 1, 2 and 3 which are concerned with dish washing. As to the composition according to example 3 of document (2), the pH, a feature of Claim 1 of the patent in suit, is missing. Further, document (2) addresses storage stability and cleaning performance (page 2, lines 17 and 18) but not mildness to the skin, and is therefore not novelty destroying with respect to Claims 2 and 3 which are directed to the use of dishwashing detergents for improving skin mildness.

Since none of the cited prior art documents discloses a process of washing dishes with a light duty liquid or gel dishwashing detergent composition or a protease to be used for obtaining mildness to the skin, the Board is satisfied that the subject-matter of Claim 1 is new.

The requirements of Article 54(1)(2) EPC are met.

5.3 Inventive step

The objective of the patent in suit relates to the use of a protease in light-duty dishwashing detergent compositions for improving the feel of skin (page 3, lines 1 to 4).

Document (3) deals with the problems of mildness to the skin of liquid or gel dishwashing compositions.

Document (3) is taken as the starting point for evaluating inventive step because it deals with the same problem as the patent in suit. It teaches that a particular alkyl ethoxy carboxylate surfactant mixture exhibits good grease removal while manifesting mildness to the skin (page 2, lines 6 to 9). This dual benefit is enhanced when the composition has a pH of from 7 to 11 and contains a small amount of divalent ions, e.g. magnesium or calcium.

5.3.1 When reformulating the problem underlying the patent in suit in the light of document (3), the following has to be taken into consideration:

The compositions according to document (3) comprised alkyl ethoxy carboxylates and alkyl ethoxy sulfates as surfactants, whereas the compositions according to the patent in suit comprised only alkoxy ethyl sulfates.

The compositions of examples I, J and K of the patent in suit contained alkyl ethoxy sulfates as surfactants, and magnesium and calcium ions as divalent ions.

Although document (3) pointed to the presence of a particular surfactant, namely alkyl ethoxy carboxylate

in light-duty liquid or gel dishwashing detergent compositions, this surfactant can be put on the same footing as the alkyl ethoxy sulfates because both the carboxylates, among which the particular carboxylate as defined in document (3), and the sulfates are on the list of detergent surfactants to be used according to the patent in suit (page 3, lines 39 and 56). Therefore the compositions according to document (3) can be compared with the compositions according to the patent in suit.

The problem underlying the patent in suit may therefore be reformulated as the provision of an improvement in overall skin condition manifested by light duty liquid or gel dishwashing detergent composition

The composition G according to the patent in suit containing 0,050 weight percent of Protease B was compared to the composition H containing Protease B in an amount of 0,15 wt%, thus exceeding the upper limit of 0,08% of the claimed range; the composition G was also compared to composition F which did not contain protease B, and thus can be accepted as a composition representing the state of the art according to document (3). The compositions J and K according to the patent in suit containing 0,050 and 0,010% by weight of Protease B were compared to the composition I, which did not comprise protease at all, which thus also represents the state of the art according to document (3). The compositions according to the patent in suit showed improvements in overall skin condition (page 12, lines 20 to 23 and 51 to 53) over those compositions having a protease content not satisfying the requirements of Claim 1.

Thus, the technical problem as defined above was solved by the claimed process of washing dishes with a light duty liquid or gel dish washing detergent composition.

5.3.2 The question which remains to be decided is whether the process according to the patent in suit involves an inventive step or not.

5.3.3 The patent in suit teaches to use the protease in a concentration of 0,001% to 0,08% by weight active protease in order to obtain mildness to the skin.

In the patent in suit, the comparative tests proved that the lower range of 0,001 weight % and the upper range of 0,08 weight % were critical for providing the desired effect (see 5.3.1).

Since the problem of skin mildness addressed by document (3) was solved in a way different from that of the patent in suit, namely without any proteolytic enzyme, the skilled person did not find a pointer to proteolytic enzymes in this document. Proteolytic enzymes were however mentioned in document (1) which related to heavy duty liquid laundry detergents. But the objective of this document was the improvement of cleaning performance, particularly through-the-wash, on enzyme sensitive stains but not the improvement of skin mildness. Therefore, the skilled person trying to solve the problem of feel of skin would not have consulted document (1).

The respondent referred to document (6) which disclosed the fabric softening effect of cellulase on cellulose

textiles. There are cellulases which attack those cotton parts which form micro fibres and thus cause roughness (page 176, paragraph 4). It pointed to the analogy between skin, a protein containing surface, and cotton fabric, a cellulose textile. It argued that the softening effect of cellulase on cellulose is comparable to the softening effect of protease on skin. Protease, so the respondent, would act on the protein rich hand surface. The rough, damaged surface portions would be removed so that a smooth and soft surface would appear. It concluded that, therefore, the use of a proteolytic enzyme was obvious. As to the concentration range, this could be established by routine experiments (see letter dated 12 July 2002, page 5, item C).

The Board does not accept this line of reasoning since it is based on an *ex post facto* analysis. The start of the analysis requires that a skilled person had first to make the analogy between skin and cotton fabric. The description of the desquamatory action provided to detergent compositions by a protease is however found in the patent in suit (page 5, line 56 to page 6, line 4) and not in document (6) which did not bring protease in connection with skin feel. Therefore, the skilled person did not find an incentive in document (6) to use protease in detergent compositions for improving the feel of skin.

Hence the use of a protease for the purpose of improving the feel of skin (see Claims 2 and 3) and the process of washing dishes (see Claim 1) with a detergent composition containing a protease, in a

specific concentration range, as described in the patent in suit, involve an inventive step.

Hence, Claims 1, 2 and 3 meet the requirements of Article 56 EPC.

The dependent claims 4 to 10 derive their patentability from independent Claims 1 to 3.

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 claims 1 to 10 of the third auxiliary request submitted at the oral proceedings, and a description to be adapted.

The Registrar:

The Chairman:

G. Rauh

P. Krasa