

Internal distribution code:

- (A) Publication in OJ
(B) To Chairmen and Members
(C) To Chairmen
(D) No distribution

D E C I S I O N
of 23 November 2005

Case Number: T 0016/04 - 3.3.06

Application Number: 96937247.3

Publication Number: 0874894

IPC: C11D 3/386

Language of the proceedings: EN

Title of invention:

A peracid based dishwashing detergent composition

Patentee:

Diversey IP International BV

Opponent:

The Procter & Gamble Company

Headword:

PAP-based dishwashing composition/DIVERSEY

Relevant legal provisions:

EPC Art. 56

Keyword:

"Inventive step (yes): non-obvious improvement of starch soil removal in dishwashing - no 'bonus effect'"

Decisions cited:

T 0021/81; T 0192/82

Catchword:

-



Case Number: T 0016/04 - 3.3.06

D E C I S I O N
of the Technical Board of Appeal 3.3.06
of 23 November 2005

Appellant:
(Opponent)

The Procter & Gamble Company
One Procter & Gamble Plaza
Cincinnati, OHIO 45202 (US)

Representative:

Morelle, Evelyne Charlotte Isabelle
N.V. Procter & Gamble Services Company S.A.
Temselaan 100
B-1853 Strombeek-Bever (BE)

Respondent:
(Proprietor of the patent)

Diversey IP International BV
World Headquarters
Tower B, 8th floor
Schipol Boulevard 209
NL-1118 BH Luchthaven Schipol Airport (NL)

Representative:

Ruschke, Hans, Edvard
Ruschke Hartmann Becker
Pienzenauerstrasse 2
D-81679 München (DE)

Decision under appeal:

Decision of the Opposition Division of the
European Patent Office posted 3 November 2003
rejecting the opposition filed against European
patent No. 0874894 pursuant to Article 102(2)
EPC.

Composition of the Board:

Chairman: P. Krasa
Members: P. Ammendola
U. Tronser

Summary of Facts and Submissions

- I. This appeal is from the decision of the Opposition division rejecting the opposition against the European patent No. 0 874 894, relating to a dishwashing detergent composition based on amylase and epsilon-phthalimidoperoxyhexanoic acid (hereinafter "PAP").
- II. The patent as granted comprised fifteen claims, whereby claims 1 and 11 were independent and read:
- "1. *A warewashing composition for a mechanical dishwashing machine comprising:*
- (a) an effective amount of an epsilon-phthalimidoperoxyhexanoic acid (PAP)*
- (b) an effective amount of an α -amylase enzyme which, when incubated at 55°C in a solution of 2mM sodium citrate, 1mM epsilon phthalimidoperoxyhexanoic acid in 36 ppm water at pH 8.0, has a half-life of two minutes or greater based on an activity vs. time plot obtained via monitoring colour development at 405nm of solution samples incubated with p-nitrophenyl- α -D-maltoheptaoside as substrate and gluco amylase and α -glucosidase as coupled enzymes; and*
- (c) 1% by weight to 75% by weight of a builder, provided that a 1% aqueous solution of the warewashing composition has a pH of from 6 to 9. "*

"11. A method of cleaning dishware in a machine dishwashing machine comprising:

(a) applying an effective amount of a detergent composition comprising:

(i) an amylase enzyme which, when incubated at 55°C in a solution of 2mM sodium citrate, 1mM epsilon phthalimidoperoxyhexanoic acid in 36 ppm water at pH 8.0, has a half-life of two minutes or greater based on an activity vs. time plot obtained via monitoring colour development at 405nm of solution samples incubated with p-nitrophenyl- α -D-maltoheptaoside as substrate and gluco amylase and α -glucosidase as coupled enzymes;

(ii) epsilon-phthalimidoperoxyhexanoic acid (PAP); and

(iii) 1% by weight to 75% by weight of a builder,

provided that a 1% aqueous solution of the warewashing composition has a pH of from 6 to 9, and

(b) rinsing the detergent composition from the cleaned dishware to substantially provide clean dishes."

Claims 2 to 10 and 12 to 15 of the granted patent defined preferred embodiments of the composition of claim 1 and of the method of claim 11, respectively.

III. The Opponent, in its notice of opposition, had sought revocation of the patent in suit on the grounds of lack of novelty and of inventive step (Article 100(a) in combination with Articles 52(1), 54 and 56 EPC) as well as for insufficient disclosure (Article 100(b) EPC). It had cited, *inter alia*, the following documents:

D1 = WO-A- 94/18314

D3 = WO-A- 94/02597

D11 = WO-A- 95/10588

D13 = WO-A- 94/14951

D14 = EP-A- 0 208 491.

IV. In its decision, the Opposition division found, *inter alia*, that it was not evident that the bleach-resistant amylases disclosed in D1 would have the half-life required in claim 1 of the patent in suit.

It also found that the dishwashing detergent compositions disclosed generically in D11 could represent a reasonable starting point for the assessment of inventive step, since also this prior art addressed the general goal of dishwashing, i.e. achieving better cleaning.

The Opposition division considered that the Opponent had failed to present any convincing argument or evidence casting doubts on the credibility of the superior cleaning performance of the patented

composition vis-à-vis the prior art. Hence, it found that the technical problem credibly solved by the patented composition vis-à-vis the prior art disclosed in D11 was that of achieving a better cleaning performance, in particular excellent starch removal (hereinafter "SR") and tannin removal (hereinafter "TR"). However, D11 only mentioned the possibility of using enzymes in general and did not mention bleach-resistant amylases. On the other hand, none of D3, D13 and D14 disclosed the possibility of using PAP in combination with the specific bleach-resistant amylases mentioned therein, nor that these enzymes would display superior amylolytic activity in the pH range between 6 and 9. Therefore, the combination of the prior art disclosed in D11 with that of any of D3, D13 or D14 would not render predictable the improved cleaning performance obtained by the patented composition.

V. The Opponent (hereinafter "Appellant") lodged an appeal against this decision. In the statement setting out the grounds of appeal it contested only the findings of the Opposition division in respect of the presence of inventive step vis-à-vis the prior art disclosed in D11 in combination with D3, D13 or D14.

VI. The Appellant argued in writing substantially as follows.

According to the prior art disclosed in D11 the preferred detergent compositions comprised PAP and a builder and produced aqueous solutions with a pH between about 7 or 8 to 10. Hence, the only feature of the patented compositions which was not disclosed in D11 was the presence of an effective amount of a

α -amylase enzyme having certain half-life characteristics.

The technical problem objectively solved by the patented compositions vis-à-vis this prior art was to select amylases which would have improved stability in a bleach-containing composition.

Since D11 already mentioned the possibility of using enzymes in general and amylases in particular, the skilled person wishing to put this teaching into practice in order to formulate a bleach-containing composition, would obviously have preferred to use bleach-resistant amylases rather than the standard amylases which were known to be inactivated by bleaching agents (hereinafter these latter will be indicated as "standard amylases"). Hence the skilled reader of D11 would have immediately arrived in an area within the scope of the opposed patent without any need for inventive step.

The disclosure of D3, D13 and D14 confirmed that the skilled person was well aware of the existence of the bleach-resistant amylases.

Even if the existence of a surprising synergistic effect was accepted, as submitted by the Patent proprietor (hereinafter "Respondent"), this would only be a wholly irrelevant "bonus effect". In this respect, the Appellant referred to the Case Law of the Boards of Appeal of EPO, 4th Edition 2001, page 138 under the heading "Bonus effect" and to decision T 21/81 (OJ EPO, 1983, 15).

VII. The Respondent maintained in writing, *inter alia*, that the technical problem solved by the composition of the invention vis-à-vis the compositions of the prior art disclosed in D3, D13 and D14 was that stated in the patent in suit, i.e. to obtain a dishwashing detergent composition with improved performance over a full range of solids and stains, including excellent SR and TR.

This superior cleaning performance had been achieved by the unexpected finding that at pH between 6 and 9 the presence of PAP increased the stability of bleach-resistant amylases and provided superior TR with respect to several other peroxy bleaching agents.

On the other hand, PAP was not expressly cited in any of D3, D13 and D14. Moreover, no documents suggested the possibility of increasing the enzyme activity by adding PAP to them.

D11 disclosed instead detergent compositions designed for solving the completely different technical problem of avoiding silver tarnishing upon use of environmental friendly bleaches, such as peroxy acids or perborates. This document did not disclose that the examples using PAP achieved a superior cleaning performance or that the pH used in said examples was chosen in order to maximize the activity of the PAP. Actually, D11 also mentioned other bleaching agents different from PAP, such as perborate in examples 1 and 3. In conclusion, in D11 the combination of PAP and an appropriate pH was only disclosed to be relevant for achieving an anti-tarnishing effect and not for improving any kind of soil removal.

Hence, the skilled person aiming at dishwashing composition with an improved cleaning performance would have started from D11 and would have arrived at the presently claimed detergent compositions only by making a number of selections, none of which was obvious in view of this aim.

- VIII. Since both parties had filed a subsidiary request for oral proceedings, the Board summoned them to a hearing scheduled for 23 November 2005. The Appellant, with a fax of 9 November 2005, and the Respondent, with a fax of 21 November 2005, informed then the Board that they would not be represented at the scheduled oral proceedings.
- IX. The Appellant requested in writing that the decision under appeal be set aside and that the European patent No. 0 874 894 be revoked.
- X. The Respondent requested in writing that the appeal be dismissed and that the patent be maintained as granted.
- XI. At the end of the oral proceedings the Chairman announced the decision of the Board.

Reasons for the Decision

1. The Board is satisfied that the subject-matter of the claims of the patent as granted is novel and that the patented invention is sufficiently disclosed. Since the Appellant has not contested the positive findings of the Opposition division in these respects, no reasons need to be given.

2. *Inventive step (Article 100(a) EPC in combination with Articles 52(1) and 56 EPC): claim 1*

2.1 The detergent composition for machine dishwashing defined in claim 1 as granted (see above point II of Facts and Submissions) produces upon a certain dilution in water a pH from 6 to 9 and comprises effective amounts of PAP and of a bleach-resistant amylase (characterized by a certain half-life in the presence of PAP), in combination with 1 to 75% by weight of a builder.

In view of paragraphs 6, 9, 10 and 31 it is apparent that this composition aims at achieving an "excellent" level of both TR and SR from soiled dishware in machine dishwashing.

2.2 According to the established jurisprudence of the Boards of Appeal (see, for instance, The Case Law of the Boards of Appeal of the EPO, 4th Edition 2001, I.D.3.3), the prior art representing the starting point for the assessment of inventive step according to the problem-solution approach should relate to the same or to a similar technical problem as the patent in suit.

2.2.1 The Board notes that the skilled person is undisputedly aware that detergent compositions of the prior art comprising bleach-resistant amylases and bleaching agents should have excellent levels of TR and SR in combination. As a matter of fact, dishwashing compositions comprising bleach-resistant amylases (such as those disclosed in D1, D3, D13 and D14) have been specifically developed with the aim to avoid the

decrease of amylase activity known to occur when effective bleaching agents are added to the standard amylases.

The Board notes additionally that even the inventors of the patent in suit have explicitly made reference to this prior art as disclosed in D3, D13 and D14 (see paragraphs 5 and 21 of the patent in suit).

However, the patent in suit also states in paragraph 5 that *"it has been observed that the mere replacement of standard amylases with the bleach-resistant varieties in conventional formulations resulted in poorer, rather than improved, overall performance"*. Since this statement is given without any reference to specific previous publications it is not clear if it reflects information available only to the Respondent itself or rather to some background knowledge of the skilled person.

Nevertheless, the Board notes that in particular D3 aims at further improving the amylolytic activity displayed by bleach-resistant amylases during dishwashing in the presence of bleaching agents. This is expressly indicated at page 1 of D3, lines 11 to 21, stating that:

*"It has been found that the activity level and the stability in the presence of oxidizing agents of the prior art mutant amylases is open to improvement, and thus the purpose of this invention is the provision of a mutant α -amylase with **an improved activity level and improved stability in the presence of oxidizing agents** in comparison to the prior art mutant amylases. In this*

*context the term "stability in the presence of oxidizing agents" refers ... to the stability in the washing solution or dishwashing solution during the washing process or **dish washing process...*** (emphasis added by the Board). Moreover, this citation also discloses the possible presence of standard hypochlorite generating or peroxy bleaching agents in the dishwashing detergent compositions (see page 5, line 1, and page 6, lines 13 to 21).

Therefore, even if the skilled person would actually be aware (as possibly implied by paragraph 5 of the patent in suit) that the level of SR provided by the detergent compositions of D3 would not be satisfactory, he would still necessarily consider the detergent compositions disclosed in this citation as representative of the prior art providing the highest level of SR and TR in combination.

Hence, the Board concludes that the dishwashing detergent compositions containing bleach-resistant amylases and bleaching agents disclosed in D3 represent the best performing prior art addressing substantially the same technical problem of the patent in suit. Hence, they represent the reasonable starting point for the assessment of inventive step.

2.2.2 The Appellant in its grounds of appeal has instead started from the prior art disclosed in D11.

However, the Board finds this not appropriate, because this citation is focused **exclusively** on avoiding silver tarnishing and, possibly, on the use of environmentally friendly compositions (see in D11, for instance, page 1,

lines 5 to 10, in combination with, lines 29 to 34 of the same page, and with the disclosure from page 2, line 18 to page 3, line 18). Therefore, D11 is not dealing with the same technical problem as the patent in suit.

Moreover, the skilled reader of D11 would also consider that this citation mentions the optional use of amylases in general (see the paragraph bridging pages 25 and 26) and quotes as only specific example thereof a standard amylase, i.e. Termamyl[®] (see page 26 line 5). Therefore, not only D11 is silent on the possibility of using specifically bleach-resistant amylases, but discloses to the skilled person exclusively anti-tarnishing compositions containing strong bleaching agents and standard enzymes, i.e. compositions necessarily displaying an expectedly very low amylase activity.

Accordingly, a skilled person, who aims at an excellent TR and SR in combination and who is undisputedly aware that bleach-resistant amylases have been specifically disclosed to be more active than standard amylases in bleach-containing dishwashing compositions, (i.e. by the prior art disclosed e.g. in D3) would not start from the dishwashing detergent compositions disclosed in D11 for their anti-tarnishing properties and which are expected to provide low SR.

- 2.3 D3 provides only a generic definition of the detergent compositions comprising the bleach-resistant amylases. Moreover, since this citation does not mention PAP and indicates as suitable any pH of the washing liquor between 7 and 11 (see page 4, line 29), it is evident

that the patented composition differs from this prior art in that

- (a) PAP is selected as bleaching agent and
- (b) the pH range of 6 to 9 of the aqueous solution of the composition is different from (although largely overlapping with) the pH range present in the aqueous solutions of the detergent compositions of D3.

2.4 According to the patent in suit, these features distinguishing the patented compositions from those of D3 produce an **improvement** of amylase activity (see, in particular, in paragraph 6 "*... certain bleaches, bleach-bleach-resistant enzymes, builders and wash conditions have actually been found to enhance enzyme activity and improve enzyme stability...*" in connection with e.g. paragraph 85 "*Unexpectedly, the amylolytic activity of the formulation containing the α -amylases according to the invention was synergistically enhanced by addition of the peracid at a pH of 8.5...*"; and with Table 6 wherein the amylase activity of the examples containing the bleach-resistant amylase according to the invention, i.e. Duramyl[®], and PAP is superior to that of the PAP-free sample based on Termamyl[®]). The patent in suit therefore demonstrates that the level of amylase activity achieved by the patented detergent composition is even superior to that produced by a standard amylase, e.g. Termamyl[®], **in the absence** of any bleaching agents.

2.4.1 The Board also finds that, as correctly observed already by the Opposition division (see above point IV and page 9 of the decision under appeal, lines 9 to 24),

the Appellant has failed to present any evidence or reasoning depriving of credibility the superior SR that the patent in suit attributes to the composition of claim 1. Nor has the Appellant presented in the appeal proceedings further arguments in this respect.

Hence, the Board has no reason for doubting the statements in the patent in suit that the selection of PAP and of a pH of the aqueous dishwashing solution of 6 to 9 produces a level of SR superior to that achieved by the compositions of the prior art disclosed in D3 even in the absence of any bleaching agent.

2.4.2 The Board therefore comes to the conclusion that the subject-matter of claim 1 has credibly solved vis-à-vis the dishwashing detergent compositions of the relevant prior art the technical problem of **simultaneously achieving in dishwashing excellent TR** (i.e. that produced by strong bleaching agents) **in combination with an improved level of SR** (i.e. even superior to that obtainable by amylases in the absence of any bleaching agents).

2.5 Since the available documents disclose only that the activity of enzymes in dishwashing solutions is negatively affected by bleaching agents, the skilled person has no reason to expect that the activity of the bleach-resistant amylases in the dishwashing solutions of the detergent compositions of D3 could be **improved** by replacing with PAP the other bleaching agents used therein.

Hence, the Board concludes already for this reason that the PAP-containing dishwashing detergent composition of

claim 1 of the patent in suit provides a non-obvious solution to the technical problem posed.

2.6 The Board wishes additionally to stress that even if one hypothesises (for the sake of an argument in favour of the Appellant), that the skilled person would have started from the prior art disclosed in D11 (which in fact he would not have done, see above point 2.2.3), still the **improved** SR provided by the patented composition would be relevant for the definition of the technical problem credibly solved, also vis-à-vis these anti-tarnishing compositions of the prior art. Therefore, in this hypothetical case, the existing technical problem vis-à-vis the prior art disclosed in D11 would **not** be "*to select enzymes which have improved stability in the bleach-containing composition*" of this prior art (see grounds of appeal, paragraph 14 and also paragraph 19; it should be noted that by this language an element of the technical solution is inadmissibly incorporated into the definition of the technical problem), but rather the same already identified above vis-à-vis the prior art disclosed in D3 (see point 2.4.3). Since the bleach-resistant amylases are only known to perform in the presence of bleaching agents **less well** than standard amylases in the absence of bleaching agent, the skilled person starting from D11 could not expect that the desired **improved** level of SR could be achieved despite the presence of bleaching agents, by simply replacing the standard amylases by the bleach-resistant ones.

Thus, even starting from the prior art disclosed D11 the skilled person would not have arrived at the

composition claimed without exercising inventive ingenuity.

2.6.1 The Appellant has also maintained that the skilled person aiming at solving the technical problem according to the above-reported definition given in paragraphs 14 and 19 of the grounds of appeal would have in any case added bleach-resistant amylases - such as those disclosed in any of D3, D13 and D14 - to the dishwashing detergent compositions of D11. It has referred to the jurisprudence of the Boards of Appeal identified above in point VI and argued that the superior level of SR achieved by the composition claimed vis-à-vis dishwashing compositions free from bleaching agents would only be a "bonus effect", wholly irrelevant for the assessment of inventive step.

2.6.2 The jurisprudence of the Boards of Appeal has indicated that a technical effect of a claimed invention may be considered a "bonus effect" only when the skilled person has no alternative other than arriving at the claimed subject-matter in order to solve another reasonable technical problem (see, for instance, the "one-way street" situation described in decision T 192/82, OJ EPO 1984, 415, also mentioned in the section of the Case Law of the Boards of Appeal of EPO, 4th Edition 2001, cited by the Appellant).

The Appellant did not demonstrate that here such a "one-way street" situation exists. Even if for the sake of argument one accepted as a technically reasonable aim the argument formulated in paragraphs 14 and 19 of the grounds of appeal (see above point 2.6) and, thus, considered it as obvious to add bleach-resistant

amylases to the dishwashing detergent compositions disclosed in D11, still he could, rather than using the bleach-resistant amylases of D3, D13 or D14, equally use e.g. the bleach-resistant amylase of D1 (which has not been demonstrated to display the half-life required in present claim 1, see point 1 of the decision under appeal not contested by the Appellant) and, thus, would not arrive at the composition claimed. Moreover, he also could, rather than adding bleach-resistant amylases to the dishwashing detergent compositions disclosed in the specific examples in D11 containing PAP and whose aqueous solutions produce a pH of e.g. 8.5 to 8.8, equally add them to those PAP-containing examples of D11 wherein the pH is 11 (see in examples 5 the samples with anti-tarnishing compounds 2 or 4 of table 9; or example 6; or in examples 13 the samples with anti-tarnishing compounds 2 to 4 of table 20; or those with compounds 2 or 4 in table 21, example 14) or to those examples of D11 containing perborate or peracetic acid (see examples 1 and 3; samples A or B of Tables 7 or 13). Also in all these other cases the skilled person would not arrive at the composition claimed. Hence, the presence of these alternatives demonstrates that in the present case no so called "one-way street" situation is at hand. Consequently, the Appellant's argument fails that the improved SR achieved by the patented composition amounts to a "bonus effect" which should be disregarded when evaluating inventive step.

2.7 Therefore, the Board finds that the subject-matter of claim 1 is based on an inventive step and, thus, complies with the requirements of Article 56 EPC.

3. *Inventive step (Article 100(a) EPC in combination with Articles 52(1) and 56 EPC): claims 2 to 15*

The reasoning given above in respect of the subject-matter of the independent claim 1 applies also to the preferred embodiments thereof defined in claims 2 to 10.

Since the machine dishware cleaning method defined in claims 11 to 15 is based on the application of the detergent composition of claim 1, the subject-matter of these claims is found to comply with the requirements of Article 56 EPC for the same reasons given above.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:

G. Rauh

P. Krasa