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**Datasheet for the decision
of 28 April 2022**

Case Number: T 1480/20 - 3.3.06

Application Number: 17164416.4

Publication Number: 3208327

IPC: C11D3/386

Language of the proceedings: EN

Title of invention:

Automatic dishwashing detergent composition

Applicant:

The Procter & Gamble Company

Headword:

Protease + amylase combination/PROCTER & GAMBLE

Relevant legal provisions:

EPC Art. 56

RPBA 2020 Art. 12(4), 12(6)

Keyword:

Inventive step (Main request) - (no)

Admissibility of the auxiliary requests filed with the
statement of grounds of appeal - (no)

Decisions cited:

Catchword:



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Case Number: T 1480/20 - 3.3.06

D E C I S I O N
of Technical Board of Appeal 3.3.06
of 28 April 2022

Appellant: The Procter & Gamble Company
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Decision under appeal: **Decision of the Examining Division of the
European Patent Office posted on 10 February
2020 refusing European patent application No.
17164416.4 pursuant to Article 97(2) EPC.**

Composition of the Board:

Chairman J.-M. Schwaller
Members: L. Li Voti
R. Cramer

Summary of Facts and Submissions

- I. The applicant's appeal is against the decision of the examining division to refuse European patent application no. 17 164 416.4 in particular on the ground that the then claimed subject-matter lacked inventive step over D10 (WO 2007/079938 A2).
- II. With its statement of grounds the Appellant filed a main request and auxiliary requests 1 to 4.
- III. On 2 November 2021 the board issued a communication under Article 15(1) RPBA to which the Appellant did not reply.
- IV. At the oral proceedings held on 28 April 2022 the appellant requested as the main request that the decision under appeal be set aside and that a patent be granted on the basis of the set of claims dated 11 November 2019 and resubmitted with the statement of grounds of appeal, or alternatively, on the basis of the claims of any of auxiliary requests 1 to 4 also filed with the statement of grounds of appeal.
- V. Claim 1 of the **main request** has the following wording:

"1. An automatic dishwashing detergent composition comprising:

a) at least 0.1mg of active protease per gram of composition, wherein the protease is a variant of a protease that has at least 95% identity with the amino acid sequence of SEQ ID NO: 1, wherein said variant comprise substitutions in one or more of the following positions: 60, 94, 97-102, 105, 116, 123-128, 150, 152,

160, 183, 203, 211, 212, 213, 214 and 216 as compared with the protease in SEQ ID NO:1; and

b) at least 0.05 mg of an active low temperature amylase per gram of composition, wherein the low temperature amylase is an amylase that demonstrates at least 1.2 times the relative activity of SEQ ID NO: 3 at 25°C, wherein relative activity is the fraction derived from dividing the activity of the enzyme at the temperature assayed versus its activity at its optimal temperature measured at a pH of 9; and

c) 10% wt or less of phosphorous-containing ingredients."

Claim 1 according to **auxiliary request 1** differs therefrom in that the protease variant comprises substitutions in more than one of the positions listed.

Claim 1 according to **auxiliary request 2** differs from claim 1 according to the main request in that the protease variant comprises substitutions in one or more of the following positions: 116, 126, 127, 128 and 160.

Claim 1 according to auxiliary request 3 differs from claim 1 according to the main request in that the low temperature amylase is selected from

(i) variants with one or more substitutions in the following positions versus SEQ ID NO:2 : 9, 26, 30, 33, 82, 37, 106, 118, 128, 133, 149, 150, 160, 178, 182, 186, 193, 195, 202, 203, 214, 231, 256, 257, 258, 269, 270, 272, 283, 295, 296, 298, 299, 303, 304, 305, 311, 314, 315, 318, 319, 320, 323, 339, 345, 361, 378, 383, 419, 421, 437, 441, 444, 445, 446, 447, 450, 458, 461, 471, 482, 484 that also preferably contain the deletions of D183* and G 184*

(ii) variants exhibiting at least 95% identity with SEQ ID NO: 4, the wild-type enzyme from Bacillus sp. 707.

Claim 1 according to auxiliary request 4 differs from claim 1 according to the main request in that the low temperature amylase is a variant with either:

(i) one or more, preferably three or more substitutions in the following positions versus SEQ ID NO: 2 : 9, 26, 149, 182, 186, 202, 257, 295, 299, 323, 339 and 345; and optionally with one or more, preferably all of the substitutions and/or deletions in the following positions: 118, 183, 184, 195, 320 and 458, which if present preferably comprise RI 18K (sic), O183*(sic), GI84*(sic), NI95F (sic), R320K and/or R458K or

(ii) at least one substitution in the following positions versus SEQ ID NO: 4 : M202, M208, S255, R172, and/or M261.

Reasons for the Decision

1. *Main request* - Inventive step (Article 56 EPC)
- 1.1 Claim 1 concerns an automatic dishwashing detergent composition comprising a combination of specified protease and amylase enzymes and 10% wt or less of phosphorous-containing ingredients.

According to the description (page 1, lines 4-7; page 2, lines 4-8 and page 7, lines 7-10) the objective of the alleged invention is the provision of an automatic dishwashing composition which provides excellent cleaning and finishing benefits across a wide range of temperatures, including low temperature, and is environmentally friendlier than traditional compositions.

1.2 D10 (page 2, last two paragraphs; page 7, lines 9-16; page 11, third full paragraph; page 12, lines 20- 21; page 101, second and third full paragraphs), which concerns washing compositions, including automatic dishwashing compositions, comprising an amylase variant and having excellent cleaning performance also at low temperature, and so providing energy saving, thus aims at a similar objective as the present application and is therefore a suitable starting point for the evaluation of inventive step.

1.3 As explained in the board's preliminary opinion the closest prior art is represented by one of the automatic dishwashing compositions illustrated in either example 1 or 4 of D10.

It is not in dispute that the modified α -amylase used in these examples is a variant of the α -amylase AA560, such as for example Stainzyme[®] and derivatives thereof (page 13, last paragraph; page 52, third full paragraph), which is a low temperature amylase according to the present application (see page 12, lines 26-28 and page 13, lines 7-8), and in particular according to claim 1 at issue, as it demonstrates at least 1.2 times the relative activity of SEQ ID NO: 3 at 25°C. Moreover, the amylase is used in said examples in amounts in accordance with claim 1 at issue, namely 0.006 and 0.0048 weight percent, corresponding to 0.06 to about 0.05 mg per gram of composition.

It follows that this closest prior art differs from the subject-matter of claim 1 of the main request only in that D10 is silent as to whether the compositions of said examples also comprise a protease and an amount of phosphorous-containing ingredients as required by the claim at issue.

1.4 D10 however teaches (page 76, last full paragraph to page 77, line 2; page 78, first full paragraph) that the use of a protease in combination with the selected amylase variant consistently improves the performance also at low temperature, and so it is credible that the claimed composition solved the technical problem of providing an automatic dishwashing composition showing improved cleaning and finishing benefits across a wide range of temperatures, including low temperature.

The appellant, referring to experimental reports A, B and C, however argued that the claimed composition would not simply provide a generic cleaning and finishing improvement over D10, but a specific improvement in the cleaning of starchy soil and in the prevention of grit formation.

1.4.1 The board notes that grit formation is identified in the present application (page 1, lines 18-21) as being a frequent problem found in automatic dishwashing, the mechanism of which is not well understood. Experimental reports A and B, which concern the prevention of grit formation, contain a comparison of a composition according to claim 1 at issue against one comprising a combination of a protease and an amylase not according to claim 1, but not one according to the closest prior art also aiming at excellent cleaning and finishing performance at low temperature. It is noted that the description does also not identify any state of the art with respect to which the alleged improvement was supposed to be achieved. It follows that the experimental reports A and B, which do not comprise any comparison with the closest prior art, are not apt at showing any superiority in the prevention of grit formation.

It is further noted that the description (page 4, lines 9-11) teaches explicitly that compositions able to prevent grit formation and providing good cleaning and finishing results comprise a high level of the selected amylase of at least 0.2 mg per gram of composition.

Since claim 1 of the main request requires at least 0.05 mg only, it cannot be plausibly concluded that this alleged advantage, even if accepted, can be obtained across the entire scope of claim 1.

- 1.4.2 Experimental report C shows that a combination of a protease (Blaze[®]), which as stated in the grounds of appeal (page 2, fourth full paragraph) has substitutions at positions 9, 15, 66, 212 and 239 with respect to SEQ ID NO:1, and of an amylase (Powerase[®]) according to claim 1 at issue provides a synergistically improved cleaning performance against triple corn starch soil.

The present application being however completely silent about a synergistic improvement of the cleaning performance against any type of starchy soil, this effect has thus only been shown for a combination of a specific amylase (Powerase[®]) with the specific protease Blaze[®] comprising a substitution at position 212 and further substitutions not recited in claim 1 at issue.

It is also not possible to derive from report C whether the shown cleaning performance is superior to that already expected in the light of the teaching of D10 (page 59, lines 7-8 and third and last paragraphs; page 78, second full paragraph to page 79, second full paragraph), namely that the combination of the mutants of α -amylases AA560 with proteases brings about an improved performance.

Moreover, even though the improvement shown in this experimental report would be considered to be unexpectedly high, it is noted that the protease class recited in claim 1 requires only some compulsory substitutions which can also be multiple and different from that at position 212 of the protease Blaze[®]. Moreover this protease class could also comprise other multiple substitutions at different positions like in the protease used in experimental report C.

It thus follows that in the absence of further evidence, it is not plausible that the entire range of proteases encompassed by claim 1 at issue would provide in combination with any possible amylase encompassed by the wording of claim 1 a similar performance against the removal of triple corn starch soil as the one obtained with the combination of Blaze[®] and Powerase[®].

Therefore, it cannot be concluded that the alleged advantage, even if accepted, is definitively obtained across the entire scope of claim 1.

1.4.3 As regards the amount of phosphorous-containing ingredients, that should be lower than 10% by weight according to claim 1 at issue, neither the description nor the experimental reports make credible the achievement of any advantage in performance by selecting such a reduced amount of these ingredients. To the contrary, the only example contained in the application concerns a composition comprising much greater amounts of STPP (sodium tripolyphosphate).

1.4.4 It follows that the objective technical problem seen in the light of example 1 or 4 of D10 (as representing the closest prior art) and convincingly solved across the entire scope of claim 1 can only be formulated as the

provision of an automatic dishwashing composition having improved cleaning and finishing benefits across a wide range of temperatures, including low temperature.

- 1.5 It remains to be decided if it was obvious for the skilled person faced with the above technical problem to add to the closest prior art compositions i) a protease as defined in claim 1 at issue and ii) less than 10 wt% of phosphorous-containing ingredients.
- 1.5.1 The board notes in this respect that D10 teaches explicitly that the combination of the mutants of α -amylases AA560 with proteases (page 59, lines 7-8 and third and last paragraphs; page 78, second full paragraph to page 79, second full paragraph) brings about an improved performance at low temperature, and this also in automatic dishwashing compositions. In particular D10 teaches that the most preferred protease is represented by BLAP variants of *Bacillus lentus* protease DSM 5483 (page 59, third full paragraph and pages 78-79 and claims 21-22). As already stated in the decision under appeal and the board's preliminary opinion, and not disputed by the appellant, such a protease is one according to claim 1 at issue.
- 1.5.2 In particular D10 (page 78, lines 12-17) states that the combination of the above amylases with the classes of proteases described in the passage bridging pages 77 and 78 not only provides better performance, but also that this better performance is due to a reciprocal advantageous interaction between the two enzymes, which in the board's view can only be understood as a synergistic interaction.

Therefore the board cannot agree with appellant's unsupported statement that the effect stated in D10 would only relate to the expectable better efficiency on mixed soil due to the fact that the effect of a first type of enzyme on a type of soil would render the remaining different type of soil more accessible to the second different type of enzyme.

In the board's view, owing to the said explicit teaching in D10, it was obvious for the skilled person to use the suggested combination of enzymes also in examples 1 and 4 of D10 in order to provide an automatic dishwashing composition having improved performance, i.e. better cleaning and finishing, also at low temperature.

- 1.5.3 As regards the amount of phosphorous-containing ingredients, D10 not only discloses generically that it can be lower than 10% by weight (see pages 38, lines 12-16) but also that such ingredients do not need to be present (page 38, lines 29-30). Moreover D10 (page 48, lines 13-16) discloses that a preferred builder mixture for automatic dishwashing compositions is one not comprising phosphorous-containing ingredients.

Therefore, in the board's view, it was obvious for the skilled person to formulate also the builder mixture of example 1 or 4 of D10 without phosphorus.

- 1.6 It follows from the above considerations that the subject-matter of claim 1 at issue was obvious from the known prior art, and so lacks inventive step over D10.

2. *Admissibility of auxiliary requests 1 to 4*

2.1 These requests are new and have not been filed before the examining division, they thus amount to an amendment of the party's case, and their admissibility is governed by the provisions of Articles 12(4) and (6) RPBA 2020.

According to these provisions the party has to provide reasons for submitting the requests for the first time in the appeal proceedings. If such reasons have been provided, the requests can be admitted at the board's discretion exercised in view of, *inter alia*, the suitability of the amendment to address the issues which led to the decision under appeal, and the need for procedural economy (Article 12(4) RPBA 2020). They can however not be admitted if they should have been submitted before the first instance (Article 12(6) RPBA 2020).

2.2 The appellant has indicated in its statement of grounds of appeal the basis for the amendments and argued that they would provide more distance from the subject-matter of D10 by specifying the nature of proteases and/or amylase enzymes, and that they would focus on the enzymes for which an effect has been shown. During the oral proceedings the appellant furthermore emphasised that with these amendments it was in particular intended to rely on the enzymes used in the experimental reports.

2.3 The board notes that the appellant has not explained in its statement of grounds why the amended claims were filed for the first time in the appeal proceedings, why they would be more distant from the disclosure of D10 and why the claimed restricted subject-matter would be supported by the experimental evidence on file and also would overcome the objections raised in the decision

under appeal, which considered for example (point I. 3.1) the submitted experimental evidence not apt to show an effect over the closest prior art, as also decided by the board with regard to the main request.

2.4 The board further remarks that during the oral proceedings before the examining division the appellant renounced, even after having been explicitly asked by the chairman, to file other requests in addition to the one (now the main request) filed about one month before oral proceedings. In view of all these considerations, in the board's view it is manifest that the appellant could and should have filed these additional requests before the examining division, so that the board decided under Article 12(4) and (6) RPBA 2020 not to admit them into the proceedings.

3. As none of the sets of claims underlying the proposed requests meets the requirements of the EPC or are admissible, the appeal cannot succeed and the decision to reject the application is confirmed.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:



A. Pinna

J.-M. Schwaller

Decision electronically authenticated