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**Datasheet for the decision
of 2 July 2019**

Case Number: T 0534/16 - 3.3.06

Application Number: 08869916.0

Publication Number: 2242830

IPC: C11D3/386, C11D3/40, C11D3/12

Language of the proceedings: EN

Title of invention:
Enzyme and fabric hueing agent containing compositions

Patent Proprietor:
The Procter & Gamble Company

Opponents:
Henkel AG & Co. KGaA
UNILEVER PLC/ UNILEVER N.V.

Headword:
Enzyme and fabric hueing agent / PROCTER & GAMBLE

Relevant legal provisions:
EPC Art. 56, 100(b)

Keyword:

Admissibility of the new ground of opposition under article
100(b) EPC : no

Inventive step (main request) : no - improvement not plausible
across the entire breadth of claim 1 (auxiliary request 1) :
yes

Decisions cited:

G 0010/91, T 0848/04, T 0197/10, T 2221/10, T 2283/13

Catchword:



Beschwerdekammern

Boards of Appeal

Chambres de recours

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Case Number: T 0534/16 - 3.3.06

D E C I S I O N
of Technical Board of Appeal 3.3.06
of 2 July 2019

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Decision under appeal: **Interlocutory decision of the Opposition**
Division of the European Patent Office posted on

5 January 2016 maintaining European Patent No.
2242830 in amended form.

Composition of the Board:

Chairman	J.-M. Schwaller
Members:	L. Li Voti
	C. Heath

Summary of Facts and Submissions

- I. The present appeals from the two opponents and from the patent proprietor are against the decision of the opposition division to maintain European patent n° 2 242 830 in amended form on the basis of the claims of auxiliary request 1 filed with letter dated 27 October 2016.
- II. In their grounds of appeal, the opponents raised objections under Articles 83, 54 and 56 EPC. Opponent 1 also filed some new documents.
- III. In its reply of 27 October 2016 to the opponents' appeals, the proprietor filed seven sets of amended claims as auxiliary requests 1 to 7, with auxiliary request 1 corresponding to the set of claims considered by the opposition division to comply with all the requirements of the EPC. It also requested *inter alia* not to admit document D29 into the proceedings.
- IV. Claim 1 as granted (main request) reads as follows:

"1. A laundry detergent composition comprising:

*(a) a glycosyl hydrolase having enzymatic activity towards both xyloglucan and amorphous cellulose substrates, wherein the glycosyl hydrolase is selected from GH families 5, 13 **[should read 12; see point 2.1 below]**, 44 or 74; and*

(b) a fabric hueing agent, said fabric hueing agent being selected from the group consisting of dyes, dye-clay conjugates, and mixtures thereof; and

(c) a deterative surfactant."

Claim 1 according to auxiliary request 1 differs from claim 1 as granted as follows (amendments put in evidence by the board):

"1. A laundry detergent composition comprising:

(a) a glycosyl hydrolase...selected from GH ~~families~~
family 5, 12, 44 or 74..."

V. The following documents are of relevance for the present decision:

D12: Enzymes in Detergency, edited by J.H.van Ee et al., 1997, pages 175-202;

D13: EP 1876226 A1;

D15: WO 2006/055787 A1

D20: Experimental Report submitted by Opponent 2 on 17 April 2013 in opposition case against EP 1876226 B1

D22: WO 99/002663 A1

D23: WO 01/62903 A1

D29: Appendix 1, Supplementary results, accompanying Novozyme letter of 30 June 2005 in case EP 01905635.7

D30: Experimental Evidence 1 (Whitezyme whiteness performance with hueing dye), filed by the patent proprietor with letter of 16 October 2015.

VI. In reply to the board's preliminary opinion, opponent 1 filed inter alia the further document D39:
B. Henrissat, Biochem. J. (1991) 280, 309-316,

and opponent 2 referred to decision **T 2283/13**.

VII. During the oral proceedings, inventive step of claim 1 of the Main Request against a combination of D15 with D23 and/or D29 was discussed. Subsequently, Auxiliary Request 1 was discussed for a possible lack of inventive step based on a combination of D15 and D23 and/or D29. Documents D12, D13, D20, D22, D30 and D39 were also discussed. Other documents were no longer relied upon.

VIII. The final requests of the parties were the following:

The proprietor requested that the decision under appeal be set aside and that the patent be maintained as granted (main request), or alternatively, that the opponents' appeals be dismissed (and that the patent be upheld in the version maintained by the opposition division), or that the patent be maintained on the basis of one of auxiliary requests 2 to 7 filed with letter dated 27 October 2016.

The opponents requested that the decision under appeal be set aside and that the patent be revoked.

Reasons for the Decision

1. Admissibility of the ground under article 100(b) EPC

1.1 This ground for opposition was filed late by opponent 1 during opposition. The opposition division did not find the objections raised in respect of article 83 EPC to be prima facie relevant and decided not to admit them into the proceedings.

- 1.2 Although opponent 1 reiterated this ground in its statement of grounds and in its reply to the proprietor's appeal, the board reminds that it is established jurisprudence that fresh grounds may be considered in appeal proceedings only with the approval of the patentee (G 10/91 of 31 March 1993, headnote point 3).
- 1.3 In the present case, as the proprietor explicitly declared that this ground should not be admitted into the proceedings (letter of 27 October 2016, page 9, last paragraph), the board has no reason to admit it and disregards all the facts and evidence submitted by the parties in this respect.
2. Main request - Inventive step
 - 2.1 Claim 1 concerns a laundry detergent composition comprising a glycosyl hydrolase having enzymatic activity towards both xyloglucan and amorphous cellulose substrates and selected from GH families 5, 12, 44 or 74, a fabric hueing agent selected from the group consisting of dyes, dye-clay conjugates and mixtures thereof, and a deterative surfactant (all parties acknowledged the reference to GH family "13" in claim 1 of the patent in suit to be a typographical error which should read instead GH family 12).
 - 2.2 Interpretation of claim 1
 - 2.2.1 As regards the meaning of the wording "enzymatic activity towards both xyloglucan and amorphous cellulose substrates", the proprietor argued that the enzymatic activity in question was to be read as having the threshold values reported in paragraphs [0020] and [0024] of the patent in suit, i.e. a specific activity

towards xyloglucan of greater than 50000 XyloU/g and towards amorphous cellulose of greater than 20000 EBG/g according to the respective assay described in the patent.

- 2.2.2 The board notes that it is established jurisprudence that if the wording of a claim is in itself clear and unambiguous, it does not need interpretation in the light of the description and restrictive definitions contained in the description of the term present in the claim must be disregarded (T 197/10, point 2.3 and T 2221/10, point 33).
- 2.2.3 In this respect it is known in the art that glycosyl hydrolases can be classified in different ways, the first way being based on the structural characteristic and amino acid sequence; the enzymes are thus classified in GH families, like GH 5, 12, 44 or 74 of claim 1 (see e.g D39: abstract and full passage bridging left and right columns on page 309, as well as document D12: chapter III.E on pages 183-186). Another way of classification is based on the type of reaction catalysed by the enzyme and on its specific activity against a substrate; glycosyl hydrolases are thus classified in the class EC 3.2.1.x, the number to be chosen for x relating to the specific substrate activity (see D12: chapter III.A on pages 178-180 and D39, page 309, left column second full paragraph).
- 2.2.4 For the board, it is thus evident that the skilled person at the priority date of the patent was able to determine whether or not an enzyme could be held active towards one or more specific substrates. This is confirmed by the cited prior art, for example document D22 which was discussed during oral proceedings and which illustrates (page 3, lines 1-28 and page 58,

lines 27-38) known glycosyl hydrolases having both activities towards xyloglucan and amorphous cellulose and which differentiates them from enzymes having essentially no activity against xyloglucan (page 3, lines 4-7).

2.2.5 Since claim 1 does not recite any specific value for the enzymatic activity, the board agrees with the respondents that said claim thus merely encompasses any glycosyl hydrolase belonging to the selected GH families and having a detectable activity against both xyloglucan and amorphous cellulose.

2.3 As explained in the description (paragraph [0002] of the patent), hueing agents are incorporated into laundry detergent products to impart visual benefits to the fabric. However, it is difficult to deliver consumer acceptable visual benefits and there remains a need to improve the fabric hueing profile of these laundry detergent compositions.

According to the patent the problem underlying the invention is thus to provide a laundry detergent composition comprising a hueing agent and which is able to provide improved whiteness perception and hueing profile.

2.4 As regards the closest prior art, all parties agreed that document D15, which has (see page 1, lines 15 to 25) a similar purpose as the patent in suit, is a suitable starting point for evaluating inventive step. In particular it was agreed that anyone from the laundry detergent compositions of example 10/I, III or V may represent the closest embodiment to the invention.

2.5 As regards the technical problem to be solved in view of D15, the proprietor maintained that it consisted in the provision of a laundry detergent composition comprising a hueing agent and providing improved whiteness perception and hueing profile, whilst the opponents argued that it consisted in the provision of an alternative laundry detergent composition comprising a hueing agent and providing good whiteness perception and hueing profile.

2.5.1 It is not disputed that the patent in suit lacks any comparison with respect to the closest prior art and that it does not contain any disclosure that a composition according to claim 1 at issue would provide a better whiteness perception and hueing profile than a composition comprising different glycosyl hydrolases, such as those known from D15, which is neither cited nor discussed in the patent in suit either.

2.5.2 The board notes that the experimental evidence D30 nevertheless shows that a laundry composition comprising the hueing dye "Direct Blue 71" and the GH family 44 glycerol hydrolase "Whitezyme", a variant of the enzyme XYG1006 disclosed in D23, also indicated in the patent (paragraphs [0018] and [0019]) as being the preferred enzyme, has a better whiteness performance and thus provides better whiteness perception and hueing profile than a similar composition comprising the glycerol hydrolase "Celluclean", which belongs to GH family 5, which however was considered for the sake of argument as not being active towards both xyloglucan and amorphous cellulose.

Even though this test does not show a direct comparison with a composition according to the closest prior art, which according to D15 (Example 10/I, III or V)

comprises a glycerol hydrolase selected from "Carezyme", "Celluzyme" or "Endolase", it is clear from the teaching of D15 (page 7, lines 21-27, in particular line 24) that any enzyme belonging to the Endo EC 3.2.1 class is suitable for achieving the effects shown in this document, with the above three specific enzymes having been chosen because of their commercial availability. Therefore, since Celluclean is an endo-beta-1,4-glucanase belonging to the EC class 3.2.1.4 (see D13, paragraph [0001]), it can be expected to achieve similar effects as the specific enzymes Carezyme, Celluzyme and Endolase known from D15.

Therefore it is credible from D30, as argued by the proprietor, that Whitezyme provides better whiteness perception and hueing profile than those enzymes used in the examples of D15.

And even though the experiments in D30 do not use a dye conjugate as hueing agent as required in D15, this fact renders the result of this experiment even more surprising, since D15 (claim 1) requires the presence of a dye conjugate in order to obtain better whiteness perception.

The board thus finds that the experiment in D30 convincingly shows that an enzyme according to claim 1 at issue and belonging to GH family 44 provides better whiteness perception and hueing profile than the known prior art compositions.

- 2.5.3 However, since the patent in suit does not contain any indication that the selected glycerol hydrolases would perform better than other known glycosyl hydrolases, e.g. those from D15, it has to be decided whether it is plausible to expect a similar improvement across the

entire breadth of claim 1 at issue, namely by using a glycosyl hydrolase belonging to the other GH families (5, 12 or 74) for which no evidence for an effect has ever been provided.

2.5.4 It is not in dispute that the glycosyl hydrolases encompassed by claim 1 are not only structurally different from one another, since they belong to different GH families, but also show activities against xyloglucan and amorphous cellulose which are very different from those of Whitezyme tested in D30. This is for example directly apparent from a comparison between the enzyme *Bacillus licheniformis* xyloglucanase 1 of D22 (page 58) - also cited on page 3, line 23 of the patent as being a member of GH family 12 enzyme according to claim 1 - which has a xyloglucanase activity of kCat 16.5 with kM 1.1, and the preferred enzyme of the patent XYG1006, of which Whitezyme is a variant, which according to D23 (page 66, lines 21-22) has a much higher activity of kCat 200/s with kM 0.2 g/l.

2.5.5 For the board, bearing in mind such great variations in activity and structure within the enzymes covered by claim 1 at issue, it is not plausible to assume that all classes of glycosyl hydrolase encompassed by claim 1 at issue would provide a similar improvement over those known from D15 as the one evidenced for the specific enzyme Whitezyme (as shown in D30).

It thus follows that the technical problem solved is to be reformulated as the provision of an alternative laundry detergent composition comprising a hueing agent and providing good whiteness perception and hueing profile.

It remains thus to be decided whether it was obvious for the skilled person looking for an alternative composition to choose one of the enzymes falling under the scope of claim 1 instead of the glycerol hydrolases specifically used in the examples of D15.

- 2.5.6 In this respect, D15 teaches (page 3, lines 12-32; page 7, lines 4-8 and 21-27) that for obtaining improved whiteness perception and hueing profile it is convenient to use a stripping agent, such as a class EC 3.2.1 enzyme, like one of those used in the examples - which were selected for their commercial availability - or alternatively a xyloglucanase.

It follows that, instead of the enzymes used in the examples of D15, it would have been obvious for the skilled person to try any specific prior art xyloglucanase known as being suitable for being incorporated into laundry detergent compositions.

- 2.5.7 As it is not disputed that the enzymes disclosed in the prior art quoted in paragraph [0018] of the patent are xyloglucanases which are commonly known as suitable for being included into laundry detergent compositions (see for example D22: page 66, lines 26-28; D23 (example 4) or D29), the skilled person would have expected such enzymes to be a suitable alternative to those enzymes used in the examples of D15 and he would have tried them with the expectation of obtaining similar whiteness perception and hueing profile improvements.

- 2.5.8 The board thus concludes that the subject-matter of claim 1 lacks an inventive step under Article 56 EPC, with the consequence that the main request is not allowable.

3. Auxiliary request 1 - Inventive step

3.1 Claim 1 according to this request differs from claim 1 as granted in that the composition has been restricted to a glycosyl hydrolase belonging to GH family 44.

3.2 With respect to this claim the parties acknowledged the closest prior art to be represented by D15 as well.

D29, alternatively cited by opponent 2, relates to laundry detergent compositions not comprising hueing dyes. For this reason this document cannot be a suitable starting point for the evaluation of inventive step since it has not the same purpose as the patent, namely improving the whiteness perception and hueing profile of hueing agents containing composition.

3.3 As regards the technical problem underlying the invention, as explained above, the experimental report D30 convincingly shows that by using a GH family 44 enzyme an improvement in whiteness perception and hueing profile can be obtained over those known from D15.

3.3.1 The opponents' argument that some other enzyme(s) belonging to the family GH 44 might have a different level of activity as Whitezyme, with the consequence that similar improvements might not be obtained, has not been substantiated and, in the absence of such an evidence, this argument is not accepted.

3.3.2 Nor did the opponents provide any evidence that a specific amount of glycosyl hydrolase or a specific ratio of said enzyme to hueing dye were essential for obtaining the improvement shown in D30.

In particular, the fact that in D20 only specific combinations Celluclean - which enzyme belongs to GH family 5 - and hueing dyes were found to provide a synergistic whiteness perception is not relevant for the present case, as the result obtained for the very different enzyme Celluclean cannot be extrapolated to the enzyme Whitezyme used in experimental report D30.

3.3.3 The board further finds the case law cited by the opponents, wherein the achievement of an alleged effect across the whole breadth of the claim was not accepted, is not applicable to the present case.

In particular **T 848/04** concerned a case in which the achievement of a synergistic effect between a lipase and an amine was obtained by using specific ratios of the two components (points 2.6-2.8 of the reasons); the present case however does not concern a synergistic effect but an improvement over a similar combination of two components (D15) which already brought about a similar effect.

In case **T 2283/13** the board decided that the alleged synergistic increase in whiteness improvement had not been made plausible across the entire breadth of claim 1 (see points 6.4.3, 6.5, 6.6 and 6.9 of the reasons), but the opponent had filed its own experimental reports (Annexes 1 and 2: point IV and XII of the decision) and the proprietor made submissions implicitly corroborating that the claimed compositions were not effective under all conditions (points 6.6. and 6.6.2). Therefore, in this case the board was confronted not only with the achievement of a synergistic effect but also with a different legal situation than in the present case, in which the opponents did not file experimental reports diverging from D30 and the

proprietor did not make submissions of the type mentioned above.

3.3.4 It follows that the opponents have not discharged their burden of proof that the technical problem of providing improved whiteness performance and hueing profile was not solved over the entire breadth of the claimed subject-matter.

3.4 It remains thus to be decided whether it was obvious for the skilled person trying to further improve the whiteness perception and hueing profile of the compositions of D15 to choose one of the enzymes falling under the scope of claim 1 at issue, instead of the glycosyl hydrolase specifically used in the examples of D15.

3.4.1 It is undisputed that enzymes in accordance with claim 1 at issue were known from D23 (example 4) and that they were taught to be suitable for laundry detergent compositions. It is also manifest that the compositions according to D23 could comprise the enzymes used in the examples of D15 (see D23, lines 11-12). However, D23 does not contain any hint that would have prompted the skilled person to try, among the large number of available glycerol hydrolases, the enzyme disclosed in D23 instead of the specific enzymes of the closest prior art D15 with the expectation of providing better whiteness perception than the other known glycosyl hydrolases.

3.4.2 The opponents stated that the pre-published document D29, introduced into the proceedings during opposition and considered in the decision under appeal (page 7, paragraph VI), would already show the superiority of the enzymes of D23. D29 would in particular show that

the enzyme XYG1006 - known from D23 - in an anti-redeposition test provided better whiteness performance than Endolase, one of the enzymes used in D15.

Therefore, it would have been obvious for the skilled person to try this enzyme instead of Endolase in order to further improve whiteness perception, since this property was also due to the antiredeposition effect.

- 3.4.3 The board does not accept this argument because the tests carried out in D29 were made without hueing dye and, as indicated in the first paragraph under the heading "Iron-oxide post-staining", post-staining was required for visualising the xyloglucanase effect since the difference in whiteness just after londrometer wash was low. Therefore, this test actually shows that under normal washing conditions no significant improvement of the whiteness perception is achieved by using the enzyme of D23.

In contrast, in the tests according to D30 the improvement in reflectance in a similar antiredeposition test is clearly obtained after washing and without need of a post-staining visualisation. Moreover, the result obtained in this test includes not only the antiredeposition effect but also the contribution to whiteness perception of the hueing dye, which is absent in D29. Therefore, the tests of D29 and D30 are completely different and not comparable.

For the board the skilled person would thus not have derived from D29 that an enzyme according to D23 could be useful for improving the whiteness perception and hueing profile of a composition according to the closest prior art D15.

3.5 Also the arguments brought by the opponents that the result obtained in D30 was to be expected since bacterial enzymes were more efficient in antiredeposition than fungal enzymes, as shown in D12 (table 3 on page 188), and thus it would have been obvious for the skilled person that a bacterial enzyme like XYG1006 according to D23 performs better than the fungal enzymes Celluzyme, Carezyme or Endolase cannot convince the board.

In fact, D12 does not refer to the enzymes of D23 but to different bacterial cellulases (see page 187). Moreover D30 already shows an improvement over the use of Celluclean which is itself a bacterial enzyme (D13, paragraph [0001]) and, as explained above, is an enzyme suitable for preparing the compositions of D15.

3.6 It follows from the above considerations that the prior art does not contain any teaching that would have prompted the skilled person to replace the enzymes used in the examples of D15 with an enzyme in accordance with claim 1 at issue with the expectation of further improving whiteness perception and hueing profile.

3.7 The board therefore concludes that the subject-matter of claim 1 according to the auxiliary request 1 (and of claims 2-9, which depend thereon) involves an inventive step within the meaning of Article 56 EPC.

4. It follows that none of the appeals succeed.

Order

For these reasons it is decided that:

All appeals are dismissed.

The Registrar:

The Chairman:



A. Pinna

J.-M. Schwaller

Decision electronically authenticated