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Datasheet for the decision of 06 March 2009

Case Number: T 0736/06 - 3.3.06

Application Number: 96905397.4

Publication Number: 0809687

IPC: C11D 3/386

Language of the proceedings: EN

Title of invention:
Detergent composition comprising an amylase enzyme and a nonionic polysaccharide ether

Patentee:
THE PROCTER & GAMBLE COMPANY

Opponent:
Clariant Verwaltungsgesellschaft mbH
Henkel AG & Co. KGaA

Headword:
Detergent/PROCTER

Relevant legal provisions:
EPC Art. 54, 56

Relevant legal provisions (EPC 1973):
-

Keyword:
"Inventive step - main request (no) - obvious alternative - first auxiliary request (yes)"

Decisions cited:
-

Catchword:
-

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Case Number: T 0736/06 **-** 3.3.06

D E C I S I O N
of the Technical Board of Appeal 3.3.06
of 06 March 2009

Appellant: (Opponent)
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-

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Decision under appeal: **Interlocutory decision of the Opposition Division of the European Patent Office posted 16 March 2006 concerning maintenance of European patent No. 0809687 in amended form.**

Composition of the Board:

Chairman: P.-P. Bracke
Members: G. Dischinger-Höppler
J. Van Moer

Summary of Facts and Submissions

I. This appeal is from the interlocutory decision of the Opposition Division concerning maintenance of the European patent No. 0 809 687 in amended form on the basis of the then pending main request, the independent Claim 1 reading:

"1. A detergent composition comprising at least 5% of a surfactant system, and a bleaching compound characterised in that said detergent composition comprises the combination of a nonionic polysaccharide ether having a molecular weight of more than 10000 with an amylase enzyme selected from bacterial amylase, fungal amylase or mixtures thereof such that said detergent composition has an activity of at least 0.001 KNU (Kilo Novo Units) per gram or at least 0.01 FAU (Fungal Alpha Amylase Units) per gram, wherein said nonionic polysaccharide ether is a methyl cellulose ether."

II. Two notices of opposition had been filed against the granted patent, wherein the Opponents sought revocation of the patent, inter alia, on the grounds of Article 100(a) EPC for lack of novelty and lack of inventive step (Articles 52(1), 54 and 56 EPC). The opposition was based, amongst others on the following documents

D2 WO-A-9502678,

D3 DE-A-1 940 654,

D9 WO-A-9402597 and

D23 US-A-4 732 693.

III. In its decision, the Opposition Division held that the subject-matter claimed in accordance with the amended main request fulfilled the requirements of the EPC. It was found that the claimed subject-matter was not only novel over the disclosure of document D3 but also based on an inventive step.

In particular, it was held that the experiments submitted by Opponent II were defective and, therefore, irrelevant. In contrast, example 1 of the patent in suit showed that the claimed subject-matter brought about an improvement in the removal of starch-based stains. Starting from document D9 as the closest prior art, and considering the other cited prior art, there was no hint that this effect could be obtained by the claimed combination of amylase and methyl cellulose ether (hereinafter "methyl cellulose").

IV. This decision was appealed by the Opponent II, now Appellant.

In the course of the appeal proceedings, the Appellant filed further experimental evidence.

The Proprietor, now Respondent, maintained the main request and the four auxiliary requests which are pending from the opposition proceedings. In addition, further amended sets of claims were filed in auxiliary request 5 to 9. However, for the present decision, only the first auxiliary request is relevant.

Claim 1 of this request differs from that of the main request in that at the very end the term "and has a degree of substitution of from 0.5 to 2.0" has been added.

V. Upon requests made by both parties, oral proceedings before the Board of Appeal were held on 06 March 2009.

VI. The Appellant orally and in writing, submitted in essence the following arguments:

- The subject-matter claimed in the main request was not novel over the disclosure of document D3.

- The Appellant's experiments filed during the appeal proceedings showed no improvement in the removal of starch-based stains by the claimed combination of amylase and methyl cellulose.

- The subject-matter claimed in the main request was not inventive in view of document D3 alone or in view of document D9 as the closest prior art when combined with the disclosure of documents D2, D3 or D23. Concerning the former approach, it was held to be obvious for someone skilled in the art to exchange the ethyl cellulose used in the examples of document D3 by methyl cellulose since the latter was also suggested in document D3 as an alternative. The molecular weight of the cellulose of more than 10 000 was usual in the art. Apart from that, no technical effect was based on this particular molecular weight.

- The same applied to the first auxiliary request since the specified degree of substitution of the cellulose did not provide any particular technical effect.

VII. The Respondent refuted all the arguments presented by the Appellant. Concerning inventive step, it was submitted

- that all of the Appellant's experimental data were defective and designed not to work. In contrast, example 1 of the patent in suit illustrated that the claimed addition of cellulose improved the activity of amylase under stressed washing conditions;

- that document D9 was the closest prior art. However, none of the other prior art suggested that cellulose which was known as anti-redeposition agent could improve the activity of amylase;

- document D3 was less relevant as the closest prior art since it was not concerned with the removal of starch-based stains or with a washing under stressed conditions such as washing at low temperatures. In contrast to the patent in suit, document D3 was concerned with the separation of enzymes and bleaches by coating the bleaches with water-insoluble cellulose.

- Hence, the Respondent maintained that the claimed subject-matter was based on an inventive step.

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

The Respondent requested that the appeal be dismissed or, in the alternative, to maintain the patent on the basis of the claims according to one of the nine auxiliary requests.

Reasons for the Decision

1. Main request - inventive step

Since the Respondent's main request fails for lack of inventive step, no details need to be given concerning the requirements of Article 54 EPC.

1.1 The patent in suit relates to a detergent composition comprising amylase enzymes and nonionic polysaccharide ethers, namely a methyl cellulose ether (page 2, paragraph [0001]). In addition, the composition comprises, apart from a surfactant system, also a bleaching compound. Specifically, the surfactant system is present at a ratio of at least 5%, the methyl cellulose has a molecular weight of more than 10 000 and the amylase is a bacterial amylase in an amount such that the composition has an activity of at least 0.001 KNU (Kilo Novo Units) and/or a fungal amylase in an amount such that the composition has an activity of at least 0.01 FAU (Fungal Alpha Amylase Units) (Claim 1, page 2, paragraph [0012] and page 3, paragraph [0021]).

It is explained in the description of the patent in suit that the starched-based stain removal performance

of amylase containing detergents is affected if the washing is carried out under stressed conditions. Such conditions are short washing, low temperature, high staining and, in particular, the presence of bleach agents (page 2, paragraph [0003]).

Hence, the technical problem sought to be solved by the subject-matter claimed in the patent in suit consists in providing a detergent composition having an improved starched-based stain removal performance under stressed washing conditions (page 2, paragraph [0004]).

1.2 The Appellant argued that its experiments filed during appeal proceedings were based on several examples and a spectroscope was used for measurement. However, it was shown that no improvement with respect to the removal of starchy stains was achieved by the claimed combination of amylase and cellulose. In contrast, the patent in suit contained one single example only and the less objective grading by expert panellists. Moreover, this single example was insufficient insofar as no comparison was made to show the influence on stain removal by the cellulose alone. Therefore no evidence was on file verifying that the above stated technical problem was actually solved by the claimed combination of features.

1.3 It has to be observed that the example of the patent in suit compares the performance of three formulations of a detergent composition which differ from each other essentially in that the first formulation contains neither amylase nor cellulose, the second one contains amylase but no cellulose and the third one contains both, amylase and cellulose. The grading by the expert

panellists shows that the second formulation removes starch stains on cotton slightly better than the first one, whereas the third formulation clearly performs best under the same circumstances.

It is true, as noted by the Appellant, that the performance has not been tested with a formulation containing cellulose but no amylase. However, as neither the cited prior art nor the Appellant's arguments give rise to assume that cellulose might affect at all the removal of starchy stains, any findings in this respect would be part of the invention. Hence, the omission of a comparison with cellulose in the absence of amylase does not constitute a defect of the example in the patent in suit.

On the other hand, the Board is convinced by the Respondent's argument that the formulations on which the Appellant based its experiments would fail from the outset since they include necessarily cellulase enzyme in combination with cellulose. It is in fact generally known in the art that cellulase has the function to digest cellulose. Therefore, little effect could be expected from the presence of cellulose in the Appellant's experiments since it would be consumed, at least in part, by the cellulase enzyme if no precautionary measures are taken. No such measures are described in the experiments.

Hence, the Appellant's argument that combinations of cellulase enzyme together with cellulose in detergent compositions were disclosed in the prior art and also not excluded from Claim 1 must also fail since a skilled reader would recognise that precaution is

necessary if it is intended that the function of the cellulose should not consist in being digested by the cellulase.

The Board holds, therefore, that the Appellant's experiments are not suitable to render implausible the evidence present in the patent in suit.

1.4 The Appellant argued that document D3 also dealt with the improvement of the starched-based stain removal performance of detergents containing both amylase and peroxy bleaching agents, hence with the stain removal performance under stressed conditions (page 1, first and second paragraph).

In the Respondent's view, however, document D3 did not relate to starch-based stains. Instead, it was concerned with insoluble cellulose coatings suitable for high temperature washing. Document D3 was therefore less relevant for the assessment of inventive step.

1.5 It is true that all of the examples in document D3 which are concerned with the washing performance of the detergent formulations, are carried out as boil wash on stains based on a mixture of blood, milk and ink (page 26). However, as explicitly mentioned in the first paragraph, document D3 relates particularly to detergents containing enzymes suitable for the removal of starch-based stains. The Board is convinced that amylase which is mentioned as a suitable component in the detergent composition of document D3 (page 5, first paragraph, page 6, lines 10 to 16 and page 20, lines 9 to 10) and is exemplified in various compositions

(page 24, line 4 and page 25, line 4) is the enzyme of choice for this purpose.

Apart from that, the subject-matter of Claim 1 does not relate to a low temperature washing method but to a detergent composition which does not exclude methyl cellulose in the form of a water-insoluble coating.

The Board agrees, therefore, with the Appellant that document D3 is a suitable starting point for the assessment of inventive step.

1.6 According to document D3, the above mentioned technical problem of improving the starched-based stain removal performance of detergents containing amylase in the presence of peroxy bleaching agents has already been solved by coating the peroxy bleach with water-insoluble cellulose, thereby separating the bleach from the enzyme (page 1, third paragraph).

Specifically, document D3 discloses in example 6E a detergent composition comprising more than 5% of a surfactant system, percarbonate as a bleaching compound, ethyl cellulose as a coating on the bleach and amylase, in particular bacterial amylase, having an activity of 75 000 SKBE/g (page 5, lines 6 to 9, page 20, lines 9 to 10, page 22, last paragraph and Number 6 in the Table on page 24). The parties agreed that the amount of amylase used in example 6E corresponds to an amylase activity of the composition of at least 0.001 KNU.

The composition as claimed differs therefore from that of example 6E of document D3 in that it contains methyl

cellulose having a molecular weight of more than 10 000 instead of ethyl cellulose.

1.7 The Respondent argued that example 1 of the patent in suit showed an improvement of the performance on starch-based stain removal if the composition contained, in addition to the amylase, a methyl cellulose of a molecular weight greater than 10 000 (pages 12 to 14, paragraphs [0099] to [0103]).

1.8 It is observed that the example nor any other part of the patent in suit contains any indication that methyl cellulose performed better than ethyl cellulose or that the performance depended on the particular molecular weight.

Therefore, the technical problem actually solved by the claimed composition in view of example 6E of document D3 may be defined, less ambitiously, to consist in the provision of an alternative composition having a similar starchy stain removal performance.

However, document D3 already suggests - amongst others - methyl cellulose as a substitute for ethyl cellulose (page 1, last paragraph to page 2, first paragraph). Further, the Respondent did not contest that molecular weights of above 10 000 are usual for methyl celluloses and suitable in document D3 to produce water-insoluble coatings.

Hence, the Board concludes that a skilled person would have considered methyl cellulose having a molecular weight of above 10 000 - just as any other cellulose mentioned in document D3 (paragraph bridging pages 1

and 2) - as a substitute for ethyl cellulose used in example 6E of document D3 in the expectation to provide an alternative detergent composition having a similar performance in removing starch-based stains.

In the light of document D3 alone, a skilled person would thus arrive in an obvious manner at the subject-matter claimed in the main request.

1.9 For these reasons, the Board finds that the subject-matter of Claim 1 is not based on an inventive step and does not comply with the requirements of Articles 52(1) and 56 EPC.

2. First auxiliary request

Claim 1 of the first auxiliary request differs from that of the main request by specifying that the methyl cellulose has a degree of substitution (ds) of 0.5 to 2.0.

2.1 The amendment is limiting and based on page 5 of the application as filed where the lower limit of 0.5 as well as the preferred upper limit of 2.0 is disclosed. Hence, Claim 1 is allowable under the provisions of Articles 123(2) and (3) EPC.

The claimed detergent composition also meets the requirement of novelty (Article 54 EPC) since none of the cited prior art documents discloses methyl cellulose having a ds of 0.5 to 2.0 in combination with the other features of Claim 1.

2.2 Inventive step

2.2.1 The Appellant argued that the ds was not specified in the example of the patent in suit. Therefore, no particular effect was apparent for the now claimed detergent composition containing specifically methyl cellulose having a ds of 0.5 to 2.0. Hence, the selection of the specific ds was arbitrary.

2.2.2 The Board notes that the specific ds is disclosed as a preferred embodiment (patent, page 3 paragraph [0020] in combination with Claim 4) and that the first auxiliary request was already filed before the Opposition Division. However, the Appellant has never argued, let alone demonstrated that the effect obtained in Example 1 of the patent in suit would not be achieved with the methyl cellulose as now claimed.

The Board holds therefore, that the technical problem solved by the claimed subject-matter in view of document D3 remains the same, namely to provide an alternative composition having a similar starchy stain removal performance (see above point 1.8).

Further, the Board observes that the parties agreed on the fact that it belongs to the common general knowledge of those skilled in the art that the solubility in water of cellulose decreases as its ds increases.

However, document D3 teaches a ds within the range of 2.5 to 3.0 for methyl cellulose (page 2, line 1) and that the coating produced therefrom has to be water-insoluble, even at 50°C. Hence, in order to liberate

the bleach from the coating, the latter is not dissolved in the washing water at that temperature but, rather, blast open due to thermal expansion (page 2, lines 9 to 13).

The Board concludes, therefore, that document D3 advices against the using of water-soluble methyl cellulose or a methyl cellulose having a ds lower than 2.5.

2.2.3 Both parties shared the view that a coating could also be produced with methyl cellulose having a ds of 2.0 and lower.

The Respondent, however, argued that such a cellulose was water-soluble so that any coating had to be formed from an aqueous solution. Since further, a peroxy bleach would dissolve in an aqueous solution, the water-soluble cellulose was not suitable for providing a coating on a peroxy bleach.

This was refuted by the Appellant who was of the opinion that a coating of water-soluble cellulose could as well be produced from an organic solvent as was suggested in document D3 for the water-insoluble cellulose (page 23, line 4).

2.2.4 None of the parties was able to base its arguments on evidence. Hence, there remains a doubt as to whether a skilled person, in accordance with the teaching of document D3, could provide on a peroxy bleach a coating of methyl cellulose having a ds as low as 0.5 to 2.0. However, in the present circumstances the burden to proof is on the Appellant. Therefore, the benefit of

doubt is in the favour of the Respondent, with the consequence that it must be assumed that a skilled person would have considered methyl cellulose having a ds of 0.5 to 2.0 unsuitable for the purpose of document D3 since it would not form a coating on the bleach.

2.2.5 The Board, therefore, concludes that it is not obvious for someone skilled in the art to use methyl cellulose having a ds in the range of 0.5 to 2.0 in the expectation to provide an alternative detergent composition having a similar performance in removing starchy stains than the compositions disclosed in document D3.

2.2.6 No other conclusion is obtained if document D9 is used as the starting point for the assessment of inventive step.

Document D9 is concerned with the need for oxidation stable α-amylases as additives for detergents (page 1, lines 5 to 15). This technical problem has been solved by using a specific mutant α-amylase (page 1, lines 23 to 31).

Detergent compositions disclosed in document D9 comprise at least 5% of a surfactant system (page 6, lines 8 to 9), a bleach as the oxidation agent and the specific mutant α-amylase. Other conventional detergent ingredients may be present, inter alia anti-soil-redeposition agents (page 5, last line to page 6, line 5). However, cellulose is not mentioned in document D9.

Hence, the claimed subject-matter differs from those compositions at least in that methyl cellulose having a molecular weight of at least 10 000 and a ds of 0.2 to 2.0 in combination with bacterial and/or fungal amylase is used instead of the specific mutant α-amylase.

Contrary to the Appellant's opinion, the evidence present in the patent in suit is held to be plausible (point 1.3 above). Therefore, the technical problem credibly solved by the claimed detergent composition when compared with the disclosure of document D9 is not merely to provide a detergent containing an alternative anti-redeposition agent as suggested by the Appellant but consists in the provision of a further detergent composition wherein the amylase activity is maintained in the presence of an oxidising bleaching agent.

It remains to be decided whether, in view of the available prior art documents, it was obvious for someone skilled in the art to solve the above stated technical problem by the means claimed, namely by adding methyl cellulose having a molecular weight of at least 10 000 and a ds of 0.2 to 2.0 in combination with bacterial and/or fungal amylase instead of the specific mutant α-amylase.

Document D9 does not contain any hint suggesting that cellulose could be suitable to maintain the activity of the amylase in the presence of a bleaching agent.

The same applies to the other prior art, namely documents D2, D3 and D23, cited by the Appellant in combination with document D9.

Document D2 teaches that the performance of cellulose as anti-redeposition agent in a detergent composition (page 1, second paragraph) might be affected by the presence of a perborate bleach (page 1, fourth paragraph) and suggests to use percarbonate instead of perborate in order to overcome this deficiency. Whilst amylase amongst a variety of different enzyme materials may also be present in the detergent composition (page 19, second to fifth paragraph), nothing suggests that the cellulose might improve the performance of the amylase in the presence of bleach.

The same is true for document D3, whose teaching is contrary to what is claimed, namely that it is important to have a higher ds so that a water-insoluble coating may be formed on the peroxy bleach in order to prevent an undesired interaction of amylase and bleach.

Document D23 also uses in a detergent composition (column 2, lines 3 to 12) cellulose as a soil release agent and to prevent released soil from redeposition on the fabric during the washing process (column 3, lines 5 to 13). Amongst other optional detergent adjuncts, enzymes, such as proteases and amylases are mentioned but there is no hint that the performance of the amylase in the presence of bleach could be improved by the cellulose.

2.2.7 Hence, the Board concludes that a skilled person was not guided by the cited prior art to combine in a detergent composition the particular cellulose with the specified bacterial or fungal amylase in the expectation to provide a further detergent composition

wherein the amylase activity is maintained in the presence of an oxidant.

Therefore, the subject-matter of the first auxiliary request is held to be based on an inventive step (Articles 52(1) and 56 EPC).

Order

For these reasons it is decided that:

The decision under appeal is set aside.

The case is remitted to the first instance with the order to maintain the patent with the following documents:

- Claims 1 to 9 of the first auxiliary request
- a description to be adapted.

The Registrar: The Chairman:

G. Rauh P.-P. Bracke