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**Datasheet for the decision
of 6 October 2023**

Case Number: T 0077/21 - 3.3.06

Application Number: 13155780.3

Publication Number: 2767579

IPC: C11D1/02, C11D1/62, C11D3/386,
C11D11/00

Language of the proceedings: EN

Title of invention:
Method of laundering a fabric

Patent Proprietor:
The Procter & Gamble Company

Opponents:
Henkel AG & Co. KGaA
Unilever PLC/Unilever NV

Headword:
Removal of cationically charged fabric softeners/PG

Relevant legal provisions:
EPC Art. 56

Keyword:
Inventive step - (no)

Decisions cited:

Catchword:



Beschwerdekammern

Boards of Appeal

Chambres de recours

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Case Number: T 0077/21 - 3.3.06

D E C I S I O N
of Technical Board of Appeal 3.3.06
of 6 October 2023

Appellant: Henkel AG & Co. KGaA
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Appellant: Unilever PLC / Unilever NV
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Decision under appeal: **Decision of the Opposition Division of the
European Patent Office posted on 27 November
2020 rejecting the opposition filed against
European patent No. 2767579 pursuant to Article
101(2) EPC.**

Composition of the Board:

Chairman J.-M. Schwaller
Members: L. Li Voti
 J. Hoppe

Summary of Facts and Submissions

- I. Both opponents filed an appeal against the decision of the opposition division to reject the opposition against European patent no. 2 767 579, claim 1 of which reads as follows:

"1. A method of laundering a fabric, comprising the steps of:

i) contacting a fabric with a lipid esterase in the wash cycle of a washing operation;

ii) contacting the fabric from step (i) with a cationically charged fabric softening active, wherein the cationically charged fabric softening active is a substrate for the lipid esterase;

iii) contacting the fabric from step (ii) with a laundry detergent composition, wherein the laundry detergent composition comprises an anionic deterative surfactant, wherein the anionic deterative surfactant is present at the ratio of anionic surfactant to fabric on a weight to weight basis of from 1:150 to 1:500."

- II. In their respective statement of grounds of appeal, the appellants submitted that the subject-matter of above claim 1 lacked an inventive step *inter alia* over the content of document **D6** (WO 2012/136427 A1). Opponent 2 also cited **D8** (Enzymes in Detergency, by Jan H. van Ee et al., 1997, Chapter 6: "Application of Lipases in Detergents", A.M. Wolff et al., pages 93-106) and further filed document **D10** (EP 0 724 624 B1).

With its reply, the patent proprietor/respondent defended the patent as granted and filed auxiliary requests 1 to 8 and experimental report **D11**.

III. After having received the board's preliminary opinion, the respondent filed experimental report **D12** on 8 September 2023 and the appellants submitted further arguments in letters dated 8 and 15 September 2023, respectively. In reply to respondent's submission Opponent 2 submitted further observations dated 19 September 2023 and Opponent 1 announced its non-attendance to the scheduled oral proceedings.

IV. At the oral proceedings held on 6 October 2023 the respondent withdrew auxiliary requests 1 to 8. The final parties' requests were established to be as follows:

Both appellants requested that the decision under appeal be set aside and that the European patent be revoked.

The respondent requested that the appeals be dismissed.

Reasons for the Decision

Inventive step (Article 56 EPC) - claim 1 as granted

1. According to paragraphs [0004] and [0005] of the patent in suit, the cleaning performance of laundry detergents having a low amount of surfactants is reduced because of the loss of anionic surfactants interacting with cationic surfactants carried-over on fabric from previous washing cycles. There was thus a need for effectively removing carried-over cationic surfactant on fabric in the presence of low anionic surfactant levels, at low wash temperatures and at short wash cycles. As a solution, the patent proposes a method of laundering fabrics comprising the steps of

- i) contacting a fabric with a lipid esterase (in the following "lipase");
- ii) contacting the fabric from step (i) with a cationically charged fabric softening active, which is a substrate for the lipid esterase (in the following "ester quat"); and
- iii) contacting the fabric from step (ii) with a laundry detergent composition comprising an anionic deterative surfactant present at a weight ratio of anionic surfactant to fabric of from 1:150 to 1:500.

2. The parties agreed that D6 was the closest prior art for evaluating inventive step, as said document (page 1, lines 11-17 and page 3, lines 8-11) deals with the reduction of the loss of performance of a laundry washing composition comprising low anionic surfactant levels, due to the carry-over of cationic fabric conditioners from previous washing cycles.

2.1 The best starting point is represented by the method of laundering disclosed in example 1/process 2 of D6 (page 39, lines 4-13 in combination with the passage from page 34, line 22 to page 35, Table 1; page 35, lines 5-9 and Table 2 on page 36; page 38, lines 1-14 including Table 5), in which method, in a first step, a fabric ballast load is washed and contacted with the laundry detergent composition 1 or 2 of Table 5, comprising (see Table 2) anionic surfactants, and protease, amylase and mannanase as enzymes.

The board notes in this respect that since - as stated in paragraphs [0026] and [0027]) of the patent in suit and as shown in its examples - the lipase of step (i) defined in claim 1 as granted may be applied by using the same laundry detergent composition as in step (iii), it thus follows from the disclosure of D6, that

the first step of the method in this document differs from step (i) of claim 1 at issue only in that the detergent composition 1 or 2 used does not comprise a lipase.

Since in D6, in a second step, the cationically charged fabric softening active disclosed in Table 1 (i.e. the ester quat HTTEAQ, a hardened tallow triethanolamine ester quat, and thus a cationic surfactant substrate for the lipase of the type used in the method of the patent in suit) is added to the final rinse of the washing cycle and thus contacted with the fabrics from the first step, this second step thus corresponds to step (ii) as claimed.

According to D6, as a further step, the fabrics are submitted after drying to the same wash and rinse cycle described above, including thus a contact with the laundry detergent composition 1 or 2 of Table 5 comprising anionic surfactants, as required by step (iii) of claim 1 at issue.

However, in the wash step of D6 only 35 ml of the laundry detergent composition 1 or 2 (Table 5) - which comprise respectively (Table 2) about 10% and 7% by weight of anionic surfactant - are contacted into the wash with 3kg of fabric (D6: page 38, lines 12-14), which means - assuming that the density of the washing liquid is 1g/ml - that the amount of anionic surfactant added is about 3.5g and 2.45g respectively, i.e. a weight ratio of anionic surfactant to fabric of 1:857 and 1:1224 respectively, which is outside the range (1:150 to 1:500) defined in step (iii) of claim 1 at issue.

It follows that the method of laundering disclosed in example 1/process 2 of D6 **differs from** that of claim 1 at issue in that the composition used in step (i) does not comprise a lipase and in that the weight ratio of anionic surfactant to fabric in step (iii) is smaller.

- 2.2 In its example 1, the patent in suit (paragraphs [0130] - [0139]) compares the cationic surfactant (ester quat) carry-over on fabrics in a method including four wash cycles according to six different treatments, with steps (i) and (iii) being carried out with a detergent composition comprising a lipase or not, and the treatments including the addition of an ester quat according to step (ii) or not, with only treatments 4 and 6 being thus according to claim 1 at issue.

According to Tables 2 and 3 of the patent, negative optical b values are measured on the fabrics, thus indicating a complexation of bromophenol blue dye with the cationic surfactant (see paragraphs [0136]-[0138]). Further, the negative optical b value measured after treatment 4 (also 6 for polycotton) is similar to that measured after treatment 3 (also 5 for polycotton), in which step (ii) was absent, so that there was no ester quat carry-over on the fabric.

The optical b value measured after treatment 2, in which the detergent composition did not comprise a lipase and step (ii) was carried out, is instead much more negative than the one measured after treatment 1 differing in that step (ii) was absent and also more negative than the one measured after treatments 4 and 6 described above, thus indicating an increased ester quat carry-over.

Thus, these tests show clearly that the method according to claim 1 at issue provides reduced ester quat carry-over on the fabric with respect to a treatment using a laundry detergent composition without lipase.

- 2.2.1 But even though the laundry detergent compositions and washing conditions applied in the tests of the patent in suit are very different from those used in the method of D6, the board considers for the sake of argument in the respondent's favour that the tests of the patent show an improvement over the closest prior art, and the board accepts that the technical problem convincingly solved by the claimed invention can be formulated as stated by the respondent during oral proceedings, namely as the provision of an improved method of laundering fabric for removing cationic surfactants (i.e. ester quats) in a subsequent wash.

It is thus not necessary to discuss and decide on the admissibility of the further experimental reports D11 and D12, filed by the respondent during appeal in order to support the alleged superiority of the claimed method over the closest prior art.

- 2.3 It is thus to be decided whether it was obvious or not to the skilled person, faced with the above technical problem, to add a lipase to the laundry detergent composition in the first wash step of example 1/process 2 of D6 and to use a reduced weight ratio of anionic surfactant to fabric, as required by step (iii) of claim 1 as granted.

- 2.3.1 Regarding the amount of anionic surfactant to be used with respect to the fabric load, there is no indication in the patent that this feature has any influence on

the final effect to be achieved. By the way this was not disputed by the respondent.

The board notes that in D6 the weight ratio of anionic surfactant to fabric was also not mentioned as critical in D6, so that the skilled person would possibly have put into practice the method of example 1/process 2 on various fabric loads, including smaller loads of for example 1 kg fabric (instead of 3 kg), and thus would have arrived without inventive skill at a weight ratio of anionic surfactant to fabric within the range (1:150 to 1:500) required by claim 1 at issue. Therefore, in the board's view, this difference cannot support the presence of an inventive step.

- 2.3.2 It is correct that D6 does not teach that the ester quats deposited onto the fabrics during the rinse can be removed from the fabrics nor that their carry-over is reduced because of any of the deterative components possibly used, but D8 - a textbook relating in particular the benefits of lipase in detergency - which represents the common general knowledge of the skilled person explicitly states (page 96, chapter IV, first full paragraph) that lipase hydrolyses esters containing long-chain fatty acids or triglycerides, with such a teaching manifestly extending to any type of compound comprising long-chain fatty acid ester groups.

In view of this teaching, the board agrees with the appellants that it was common general knowledge that lipase was capable of hydrolysing ester quats, since the latter comprise such long-chain fatty acid ester groups. It is thus not necessary to discuss the admissibility of D10 nor the arguments based on the combination of D6 with **D3** (WO 95/11292 A1), raised for

the first time by appellant/opponent 2 during oral proceedings.

D8 (page 102) further explains that lipase can deposit through the wash onto triglycerides-containing soil and that it modifies (hydrolyses) the soil during the drying cycle, so that it can be removed in subsequent wash cycles. A similar behaviour is thus to be expected against other similar substrates present on the fabric that can be hydrolysed by a lipase, for example such substrates containing long chain fatty acid ester groups, like ester quats, when deposited on the fabric.

2.4 Since lipase is explicitly indicated in the description of D6 (page 16, line 26) as being the preferred enzyme for laundry detergent compositions to be used in the disclosed method of laundering and since lipase is also explicitly defined as an optional enzyme in the independent method claim 1 of D6, for the board it was obvious to the skilled person faced with the technical problem formulated above and taking into account the above common general knowledge, to add a lipase in the detergent composition used in the wash step of the method of example 1/process 2 with the expectation of removing in subsequent wash cycles ester quats deposited on the fabric, and thus reducing ester quats carry-over.

2.5 It follows from the above considerations that it was thus obvious to the skilled person, starting from the closest prior art, to modify the therein disclosed method in the way indicated above and thus arrive without inventive skill at a method having all the features of claim 1 at issue, which thus lacks an inventive step within the meaning of Article 56 EPC.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The patent is revoked.

The Registrar:

The Chairman:



A. Pinna

J.-M. Schwaller

Decision electronically authenticated