

**Internal distribution code:**

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

**D E C I S I O N**  
**of 3 September 2002**

**Case Number:** T 0257/98 - 3.3.6

**Application Number:** 89312893.4

**Publication Number:** 0373850

**IPC:** C11D 3/386

**Language of the proceedings:** EN

**Title of invention:**

Enzyme-containing detergent compositions and their use

**Patentee:**

UNILEVER PLC, et al

**Opponent:**

Henkel Kommanditgesellschaft auf Aktien  
The Procter & Gamble Company

**Headword:**

Lipase-containing detergent composition/UNILEVER

**Relevant legal provisions:**

EPC Art. 56

**Keyword:**

"Inventive step (no) - claimed subject-matter encompasses obvious embodiments (obvious alternatives to prior art compositions) "

**Decisions cited:**

T 0495/91, T 0881/92

**Catchword:**

-



Case Number: T 0257/98 - 3.3.6

**D E C I S I O N**  
**of the Technical Board of Appeal 3.3.6**  
**of 3 September 2002**

**Appellant:** UNILEVER N.V.  
(Proprietor of the patent) Weena 455  
3013 Al  
NL-Rotterdam (NL)

**Representative:** Waldren, Robin Michael  
Lloyd Wise, Treager & Co.  
Commonwealth House  
1-19 New Oxford Street  
London WC1A 1LW (GB)

**Respondent 01:** Henkel  
(Opponent 01) Kommanditgesellschaft auf Aktien  
TTP / Patentabteilung  
D-40191 Düsseldorf (DE)

**Representative:** -

**Respondent 02:** The Procter & Gamble Company  
(Opponent 02) One Procter & Gamble Plaza  
Cincinnati, Ohio 45002 (US)

**Representative:** Lawrence, Peter Robin Broughton  
GILL JENNINGS & EVERY  
Broadgate House  
7 Eldon Street  
London EC2M 7LH (GB)

**Decision under appeal:** Decision of the Opposition Division of the  
European Patent Office posted 19 January 1998  
revoking European patent No. 0 373 850 pursuant  
to Article 102(1) EPC.

**Composition of the Board:**

**Chairman:** P. Krasa  
**Members:** P. Ammendola  
C. Holtz

## Summary of Facts and Submissions

- I. This appeal is from the decision of the Opposition Division revoking European patent No. 0 373 850 concerning lipase enzyme-containing detergent compositions.
- II. The Respondents (Opponents I and II) had requested revocation of the patent in its entirety on the grounds of Article 100(a) EPC, maintaining that the claimed subject-matter lacked novelty and inventive step. In addition, Respondents II had requested revocation of the patent on the grounds of Article 100(b) EPC.

The following documents were cited *inter alia* to support the grounds of opposition:

- Document (2) JP-A-63132998 (German translation)
- Document (3) JP-A-63078000 (German translation)
- Document (5) EP-A-0206390
- Document (8) JP-A-59172659 (English translation)
- Document (9) WO-A-88/09367
- Document (10) "Lipases", by Borgström and Brockman (Editors), Elsevier, 1984, p.494
- Document (13) "Surface Active Agents", by Schwartz, Perry and Berch, Interscience Pub., Vol. 1, 1949, p. 53 to 66 and Vol. 2, 1958, p. 59 to 61 and 550 to 551

III. During the opposition proceedings the Appellant (Patent Proprietor) filed, under cover of a letter dated 23 October 1997, new experimental data and an amended claim 1, which reads as follows:

*"1. An enzyme-containing detergent composition for washing fabrics, comprising:*

- 1) 1 to 60% by weight of a surfactant system consisting of*
  - (a) a primary alcohol sulphate having a chain length in the range of C<sub>12</sub> to C<sub>18</sub>, in an amount of more than 50% and less than 100% by weight of the surfactant system; and*
  - (b) a further surfactant selected from the group consisting of anionic surfactants other than primary alcohol sulphates, nonionic surfactants, cationic surfactants and mixtures thereof, in an amount of more than 0% and less than 50% by weight of the surfactant system; and*
- 2) lipase enzyme in an amount in the range 50 to 30,000 (LU) lipase units per gram of the surfactant system or of the detergent composition, together with conventional detergent adjuncts."*

The Appellant requested the maintenance of the patent in amended form on the basis of such amended independent claim 1 and of dependent claims 2 to 6 as in the granted patent.

IV. The Opposition Division held that the experimental data provided by the parties were not sufficient to demonstrate the presence of an unexpected advantage across the whole claimed range of compositions and, therefore, that the claimed subject-matter did not involve an inventive step vis-à-vis Document (5).

V. The Appellant filed an appeal against this decision and maintained orally and in writing that the set of claims according to their request - as mentioned in point III, above - which were attached to the decision under appeal complied with the requirements of Articles 123, 84 and 54 EPC.

In particular, it presented *inter alia* the following arguments in support of an inventive step (Article 56 EPC) :

- the problem underlying the invention was explicitly defined at page 2, lines 43 to 44 of the patent specification: i.e. providing lipase-containing detergent compositions (based on anionic surfactants) in which the enzyme activity was relatively less inhibited;
- this problem had already been addressed and solved in the state of the art described in Document (5) which, therefore, represented a suitable starting point for the assessment of inventive step;
- Document (5) did not indicate the necessity of using any specific kind of anionic surfactant, while the detergent composition now claimed was characterized by a specific surfactant mixture comprising a major amount of primary alkyl sulphonates (hereafter indicated as PAS).

The Appellant conceded that PAS were conventional anionic surfactants, that the lipases to be used in the claimed composition might as well have been those defined in claim 1 of Document (5) and that none of the examples given in the patent in suit were in accordance with claim 1 due the weight% of impurities unavoidably present in the commercial products identified by trade names used in these experiments.

It maintained however that the examples filed by the letter of 23 October 1997 complied with all features defined in present claim 1 and that such experimental evidence was sufficient to demonstrate a surprisingly reduced lipase inhibition in the claimed composition vis-à-vis that observed in comparative examples based on conventional anionic/non-ionic surfactants at least with respect to soil produced by liquid fats (such as olive oil).

The Appellant further argued that the notional person skilled in the art in general considered a lipase-containing detergent composition advantageous only if the produced fat soil detergency was substantially superior to that of the corresponding enzyme-free compositions, the difference being implicitly attributed to the (non-inhibited) lipase activity. However, the provided "Delta" values demonstrated that the increase of fat soil detergency due to the lipase enzyme activity was surprisingly superior to the corresponding increase caused by the presence of lipase enzymes in successful commercial compositions, i.e. those based on LAS-surfactants.

This effect was not predictable from the disclosure of Document (5) or of the other available state of the art.

Finally, from the examples of Documents (2) or (3) the person skilled in the art would have considered PAS less advantageous than other anionic surfactants.

VI. The Respondents' objections with respect to the presence of inventive step for the subject-matter of claim 1 (Article 56 EPC) comprised *inter alia* the following arguments:

- the comparative examples referred to by the Appellant in the letter dated 23 October 1997 were not representative of the disclosure of Document (5) and the examples illustrating the alleged invention were limited exclusively to a specific lipase and to anionic/nonionic surfactant systems; for this reason alone, these experimental data did not support an inventive step for the whole range of claimed compositions vis-à-vis Document (5);
- moreover, no substantial improvement in detergency was derivable from the table at page 7 of the submissions dated 23 October 1997 when comparing the reflectance values given for the claimed compositions with those of comparative compositions based on LAS surfactants;
- therefore, the only technical problem credibly solved by the claimed compositions vis-à-vis the prior art disclosed in Document (5) was to provide further lipase-containing detergent compositions;
- this problem was solved by replacing the LAS surfactants in the compositions disclosed in the examples of Document (5) by another conventional anionic surfactant, i.e. PAS;
- however, the disclosure of Document (5) was not confined to its examples and the generic definition of the anionic surfactant given in this document clearly encompassed PAS surfactants, as was evident from Document (13), cited at column (4), lines 23 to 33, of Document (5);
- therefore, in so far as the claimed compositions encompassed the use of the lipases which were known from Document (5) to be not completely

inhibited even by the tenside system comprising the highly inhibitory LAS surfactants, it was obvious to expect the same reduced inhibition also with respect to similar surfactant systems in which the LAS was substituted by any other conventional anionic surfactant, i.e. such as PAS, independently of whether the latter was also well known to have a highly or slightly inhibiting effect on lipase activity.

At the oral proceedings before the Board on 3 September 2002 the Respondents no longer maintained the objection under Article 100(b) EPC.

VII. The Appellant requested that the decision under appeal be set aside and that the patent be maintained with claims 1 to 6 as attached to the decision under appeal.

Respondents I and II requested that the appeal be dismissed.

VIII. At the end of the oral proceedings the chairman announced the decision of the Board.

## **Reasons for the Decision**

*Claim 1 of the Appellant's sole request*

1. *Article 123, 84, and 54 EPC*

The Board is satisfied that the subject-matter of present claim 1 complies with the requirements of Articles 123, 84 and 54 EPC.

As the Appellant's request fails for lack of inventive step, no further reasons need be given.



2. *Article 56 EPC*

2.1 The problem addressed in the patent in suit and the relevant state of the art.

2.1.1 Claim 1 concerns lipase-containing detergent compositions for removing fat soils from fabrics. They comprise a surfactant system, whose major component is PAS, i.e. an anionic surfactant.

2.1.2 In the section of the patent in suit with the heading "Prior Art" (see page 2, lines 6 to 37) it is acknowledged that lipase-containing detergent compositions are known.

The aim of the invention is defined at page 2, lines 41 to 44, as "*providing lipase-containing detergent composition in which the enzyme is relatively less inhibited*" than in the prior art compositions.

The Appellant initially maintained that such definition identifies the problem addressed in the patent in suit.

2.1.3 According to the case law of the Boards of Appeal of the EPO, the definition of the technical problem to be solved should normally start from the technical problem actually described in the patent in suit in relation to the closest state of the art indicated there. Only if it turns out that an incorrect state of the art was used or that the technical problem disclosed has in fact not been solved or has not been correctly defined for some reason(s), is it appropriate to consider another problem which objectively existed. The definition of artificial and technically unrealistic problems is to be avoided. (See, for example, T 495/91 of 20 July 1993, No. 4.2 of the Reasons for the Decision, and T 881/92 of 22 April 1996, No. 4.1 of the

Reasons for the Decision, neither published in the OJ, as well as the other decisions cited in "Case Law of the Boards of Appeal of EPO", fourth edition 2001, page 107, point I.D.4.3).

- 2.1.4 In the present case the explicit definition of the aim of the invention given in the patent in suit is not accepted by the Board, since it does not correspond to a realistic technical problem in the field of detergent compositions: the formulator of novel detergent compositions is not directly interested in the extent of enzyme activity *per se* (but rather in the extent of soil removal that is produced by the enzyme-containing detergent composition).

However, by considering the whole disclosure of the patent in suit it is possible to identify the technical problem referred to by the passage at page 2, line 43 to 44, in the patent in suit.

- 2.1.5 In particular, the following information may be found in the patent in suit and in the prior art referred to therein:

- even though the patent (see at page 2, lines 41 to 42, "many detergent-active materials") does not identify explicitly which component(s) of the detergent formulations are considered responsible for the inhibition of lipase activity, it defines at page 3, lines 5 to 6, the anionic LAS surfactants as "*highly inhibitory*" and uses as comparative examples compositions based on LAS surfactants;
- also Documents (3) and (5), which are prior art acknowledged at page 2, lines 17 to 20 and 30 to 33, of the patent in suit, disclose (see Document (3) page 2, fourth paragraph, and the

comparative examples; Document (5) column 2, lines 3 to 11, and the comparative examples) the fact that certain anionic tensides inhibit the activity of certain lipases in detergent compositions.

Moreover, from the experimental comparisons given in these documents cited in the patent in suit it is evident:

- that the person skilled in the art considers a lipase-containing detergent composition advantageous when the produced fat soil detergency is substantially superior to that of the corresponding enzyme-free composition, the difference being implicitly attributed to the non-inhibited lipase activity,
- that certain lipase-containing detergent compositions are advantageous despite the presence of anionic surfactants.

2.1.6 It is therefore evident that the prior art relevant for the patent in suit is represented by two different classes of detergent compositions comprising lipase enzymes and based on conventional anionic surfactants or mixtures thereof with other tensides:

- (a) the non-advantageous lipase-containing compositions, e.g. those used as comparative examples in Documents (3) and (5), in which the substantially inhibited enzyme activity produces little or no substantial increase of fat soil removal vis-à-vis the corresponding enzyme-free compositions, and

(b) the advantageous lipase-containing compositions, those claimed in Documents (3) and (5), in which the enzyme activity is sufficient to produce a significant increase of fat soil removal vis-à-vis the corresponding enzyme-free compositions.

2.1.7 In view of this prior art cited in the patent in suit, it is apparent that the definition of the aim of the invention given at page 2, lines 43 to 44, of the patent in suit (i.e. "*providing detergent formulations in which the activity of added lipase is relatively less inhibited.*") can only refer to the technical problem of providing **advantageous** lipase-containing detergent compositions.

On the other hand, from the above reasoning it is also evident that the inventors of the patent in suit were also aware that Documents (3) and (5) had addressed and solved the same technical problem considered in the patent in suit.

Therefore, the realistic technical problem addressed in the patent in suit can only be that of **providing an alternative to the advantageous lipase-containing detergent compositions already known from the prior art.**

2.1.8 Therefore, either of Documents (3) and (5) cited in the patent in suit, as well as Document (2) (whose disclosure is substantially equivalent to that of Document (3)) offer themselves as a possible starting point for evaluating whether the subject-matter of claim 1 involves an inventive step or not.

However, only Document (5) defines explicitly at column 2, lines 22 to 31, the object of obtaining detergency improvement by the "inclusion" of the lipase in detergent compositions comprising anionic surfactants.

Therefore, the Board agrees with the Appellant that Document (5) represents a suitable starting point for the assessment of inventive step.

2.2 Technical problem solved

2.2.1 In the experimental evidence provided under cover of the letter dated 23 October 1997 by the Appellant the comparative examples are not representative of the disclosure of Document (5).

2.2.2 At the oral proceedings before the Board, the Appellant initially maintained that this evidence demonstrated that the claimed compositions provided superior detergency of liquid fat soils in comparison to that obtainable in corresponding compositions based on the most successful commercial anionic surfactants: i.e. LAS.

Accordingly, - so the Appellant argued - it was apparent from these comparative examples in the patent that the problem underlying the invention explicitly defined at page 2, lines 43 to 44 of the patent specification was **not** to be given the meaning identified above in point 2.1.7, but rather that of providing lipase-containing detergent compositions having **a superior detergency as compared to the prior art compositions which were commercially successful** and, therefore, presumably having a level of fat soil detergency satisfactory for the user.

2.2.3 The Board observes that, even disregarding the fact that this alleged definition of the technical problem addressed in the patent in suit is not consistent with the prior art's section in the patent in suit which is clearly focused on the already known advantageous enzyme-containing compositions, the reflectance values reported in the table at page 7 of the submissions of 23 October 1997 for the claimed compositions are not significantly superior to those of the lipase-containing comparative compositions based on LAS surfactants. Therefore, the available experimental evidence does not demonstrate the alleged superior fat soil detergency of the compositions defined in claim 1 as compared to those based on LAS-surfactants.

2.2.4 The Appellant then maintained that any novel lipase-containing detergent composition which provided removal of soils significantly superior to the corresponding enzyme-free composition represented a relevant technical improvement, at least in terms of larger choice of alternatives for the person skilled in the art (i.e. the detergent formulator), independently of whether the overall detergency was superior or not to that observed in conventional LAS-containing detergent compositions.

Accordingly, in these experimental data the advantage of the invention was represented not by the obtained detergency values in themselves, but by the relatively large increase of detergency with respect to the corresponding enzyme-free compositions, i.e. the "Delta" values in the table at page 7 of the letter dated 23 October 1997.

In particular, these data demonstrated that the liquid fat soil detergency of the claimed compositions was significantly superior as compared to that of corresponding enzyme-free compositions. These

significant differences were clearly to be attributed to the enzyme activity and were superior to the corresponding non-significant differences observed when adding lipases to comparative compositions containing LAS-surfactants.

Accordingly the Appellant concluded: these experimental comparisons credibly demonstrated that in the claimed compositions the lipases were less inhibited than in detergent compositions containing other conventional anionic surfactants, such as those of the LAS-type.

- 2.2.5 In this respect, the Board observes that the significantly superior detergency of the examples of the claimed compositions as compared to that of the corresponding enzyme-free compositions is characteristic for the advantageous lipase-containing compositions of the "b)" class as defined above (see item 2.1.6), while the non-significant "Delta" values observed for the comparative examples based on LAS-surfactants are those which characterize the non-advantageous lipase-containing compositions of the "a)" class also defined above.

Therefore, the technical problem that according to the Appellant's latter argumentation was credibly solved by the compositions defined in claim 1 coincides with that identified above in point 2.1.7 as addressed in the patent in suit (i.e. providing further lipase-containing detergent formulations in which, despite the presence of anionic surfactants, the enzyme activity is sufficient to produce a significant increase of the fat soil removal as compared with that of the corresponding enzyme-free compositions).

2.2.6 In the Board's judgement the Appellant's reasoning is therefore convincing: this experimental evidence demonstrates that certain claimed compositions have solved the realistic technical problem addressed in the patent in suit.

2.2.7 In particular, in view of the fact that these experimental comparisons are based on examples containing as a "further" surfactant a conventional nonionic tenside, the Board considers that the provided evidence is sufficient to demonstrate that any other claimed compositions in which the "further" surfactant is a nonionic surfactant and in which the lipase enzyme is "Lipolase®" solves as well the realistic technical problem addressed in the patent in suit.

Moreover, the Board observes that the lipase enzyme used in the examples of the claimed composition is practically fully inhibited in the LAS-containing comparative examples. This fact ensures that the Lipolase® enzyme used in the experiments of 23 October 1997 may be considered representative of the lipases which are more easily inhibited by the anionic surfactants.

It is self-evident that the measurable contribution to the liquid fat soil removal demonstrated to derive from the enzyme activity in the invention examples based on such lipases **very easily** inhibited by anionic surfactants is even more likely to occur in the other claimed compositions in which the lipase enzyme is **more resistant** to inhibition by the anionic surfactant.

Accordingly, the Board concludes that the available evidence is sufficient to demonstrate that all claimed compositions in which the "further" surfactant (b) is



nonionic, independently of the kind of lipases (c), credibly solved the technical problem addressed in the patent in suit.

2.3 Inventive step assessment for the claimed compositions based on nonionic tensides as a "further surfactant" (b).

2.3.1 The anionic PAS surfactants mentioned in present claim 1 are not explicitly mentioned in Document (5), which discloses instead either anionic surfactants in general or a specific example of a surfactant of the LAS-type.

On the other hand, the composition now claimed may contain a non-ionic tenside as a "further" surfactant (b) and are not limited with respect to the kind of lipase enzyme. The Appellant explicitly admitted that the lipases which are shown to be resistant to inhibition by LAS / nonionic surfactant systems in Document (5) are included among the possible lipases for the claimed compositions.

Therefore, the claimed matter includes compositions in which the surfactant mixture comprises a nonionic surfactant (b) and a lipase of the groups defined in claim 1 of Document (5).

Moreover, the requirements of claim 1 of the patent in suit as to the relative amounts of the components overlap with the corresponding amounts disclosed for the compositions of Document (5) (see in Document (5) column 4, lines 5 to 10 and 34 to 41, as well as example XIII).

Accordingly, the claimed detergent compositions in which the surfactant (b) is a nonionic tenside and the lipase belongs to the groups defined in claim 1 of

Document (5) are distinguished from the detergent compositions disclosed in Document (5) **only** in that the anionic surfactant must be of the PAS-type.

Therefore, these claimed compositions represent a selection within the general disclosure of Document (5) with respect to the kind of anionic detergent.

2.3.2 It is undisputed that the existing technical problem (see above 2.2.7) has already been solved in Document (5) (see above 2.1.4) by combining certain kinds of lipase enzymes with conventional surfactant mixtures based on anionic/nonionic surfactant systems.

2.3.3 The Appellant underlined that the problem posed was solved by the compositions of Document (5) by selecting a specific class of lipases.

Instead in the patent in suit the same problem was solved by selecting a specific surfactant system of general applicability in combination with any kind of lipase.

2.3.4 The Board considers this argument irrelevant for assessing inventive step for the claimed compositions in which the lipase is the same as those used in the compositions of Document (5). For these claimed compositions the question to be investigated is whether the person skilled in the art would have considered it obvious or not to use PAS surfactants instead of the LAS surfactants in the examples of Document (5).

2.3.5 The Appellant stressed that Document (5) did not mention PAS surfactants and further maintained that certain PAS were known to inhibit certain lipases (see e.g. Documents (8), all examples with lipase; Document (9), page 11, the examples containing only PAS surfactants; Document (10)). For both reasons the

skilled reader would have not considered PAS surfactants as a suitable anionic surfactant for the compositions disclosed in Document (5).

2.3.6 These arguments are not convincing.

First of all the Board observes that Document (5) mentions at column 4, lines 28 to 33, as source of information as to the suitable anionic surfactants, the basic Document (13) which extensively indicates that PAS surfactants are among the most successful anionic detergents.

As to the second argument it is noted that the examples of the compositions in the examples of Document (5) comprise as an anionic surfactant a LAS tenside.

Even in the patent in suit it is acknowledged at page 3, lines 5 to 7, that LAS are "highly inhibitory" for lipases. Therefore Document (5) implicitly teaches to the skilled reader that even anionic surfactants which are known to inhibit lipases may be used in the compositions disclosed in such document.

2.3.7 Therefore, the Board comes to the conclusion that PAS are conventional anionic surfactants and represent one of the alternatives encompassed in the general definition of "anionic detergent-active compound" used in claim 1 of Document (5).

Therefore, it is obvious for the person skilled in the art to use PAS as the anionic surfactants in the compositions defined in Document (5) for the purpose of providing an alternative to the compositions already disclosed therein.

Accordingly, the compositions defined in present claim 1 and differing from those of Document (5) only in that PAS are used as anionic detergent-active compounds provide an obvious solution to the existing technical problem.

- 2.4 Under these circumstances it is not necessary to investigate whether or not all embodiments of claim 1 solve the existing technical problem.
- 2.5 For the above reasons the subject-matter of claim 1 does not involve an inventive step and, therefore, does not comply with the requirements of Article 56 EPC.
3. *Inventive step concerning the subject-matter of claims 2 to 6*

Claims 2 to 6 refer to specific embodiments of claim 1. Since the subject-matter of either of them encompasses the portion of subject-matter of claim 1 which has been established to be obvious in view of Document (5), they fail for the same reasons as mentioned above for claim 1.

## **Order**

**For these reasons it is decided that:**

The appeal is dismissed.

The Registrar:

The Chairman:

G. Rauh

P. Krasa