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**D E C I S I O N**  
**of 9 March 2000**

**Case Number:** T 0811/96 - 3.3.6

**Application Number:** 89304207.7

**Publication Number:** 0339998

**IPC:** C11D 3/12

**Language of the proceedings:** EN

**Title of invention:**

Liquid cleaning products

**Patentee:**

UNILEVER PLC, et al

**Opponent:**

Henkel Kommanditgesellschaft auf Aktien  
PROCTER & GAMBLE EUROPEAN TECHNICAL CENTER N.V.

**Headword:**

Cleaning products/UNILEVER

**Relevant legal provisions:**

EPC Art. 54, 56

**Keyword:**

"Novelty - yes: specific entity not anticipated by generic definition"

"Novelty - yes: specific combination of two components taken from a known list of components"

"Inventive step - yes: problem not addressed in prior art - solution not rendered obvious by a *posteriori* explanation"

**Decisions cited:**

T 0666/89, T 0181/82, T 0012/81, T 0763/89

**Catchword:**

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Boards of Appeal

Chambres de recours

Case Number: T 0811/96 - 3.3.6

**D E C I S I O N**  
**of the Technical Board of Appeal 3.3.6**  
**of 9 March 2000**

**Appellant:**  
(Opponent I)

Henkel  
Kommanditgesellschaft auf Aktien  
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**Other party:**  
(Opponent II)

PROCTER & GAMBLE EUROPEAN TECHNICAL CENTER N.V.  
Temselaan 100  
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**Respondent:**  
(Proprietor of the patent)

UNILEVER PLC  
Unilever House  
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**Representative:**

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MARKS & CLERK  
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**Decision under appeal:**

**Decision of the Opposition Division of the  
European Patent Office posted 4 July 1996  
rejecting the opposition filed against European  
patent No. 0 339 998 pursuant to Article 102(2)  
EPC.**

**Composition of the Board:**

**Chairman:** P. Krasa  
**Members:** G. Dischinger-Höppler  
J. H. P. Willems

## Summary of Facts and Submissions

I. The appeal is from the decision of the Opposition Division to reject the two oppositions and maintain European patent No. 0 339 998 on the basis of six claims as granted, the only independent claim reading:

"1. A substantially non-aqueous liquid cleaning composition comprising solid particles of aluminosilicate builder dispersed in a liquid phase, said composition also comprising an alkalimetal metasilicate and being substantially free of bleach precursor."

II. In the statement of grounds of appeal and during the oral proceedings held before the appeal Board on 9 March 2000, the Appellant (Opponent I) maintained that the subject-matter of granted Claim 1 lacked novelty and inventive step (Articles 54 and 56 EPC). Opponent II did not take part in the appeal proceedings.

The Appellant relied on the following documents:

- (1) DE-A-3 625 189,
- (2) EP-B-0 120 659,
- (4) Journal of applied chemistry of the USSR, 50(4), 1977, pages 697-702 and
- (5) Römpp, Chemie Lexikon, Georg Thieme Verlag, Stuttgart - New York, 1991, page 2933.

He further relied on comparative tests filed in the opposition proceedings with his letter of 24 May 1996.

III. The Appellant based his novelty objection on documents (1) and (2) and argued in essence that

- the situation in view of document (1) was comparable with that of the case leading to decision T 666/89 where an overlap of ranges was held to be not novel;
- if the addition of metasilicate as claimed were to be considered as a selection out of a list of possible alkali silicates proposed in document (1), this selection was merely an arbitrary one;
- the subject-matter of granted Claim 1 further lacked novelty in view of document (2) which inherently proposed to add sodium metasilicate and zeolite as a combination of two builders to a non-aqueous detergent composition.

Concerning inventive step, the Appellant expressed the opinion that

- the claimed subject-matter did not solve the objective problem of the patent in suit to stabilize perborate bleaching compounds;
- it was common general knowledge to use metasilicate for stabilizing perborate, even in a composition as disclosed in document (1); reference was made to documents (4) and (5).

IV. The Respondent (Proprietor) inter alia adopted the reasoning of the appealed decision of the Opposition Division. His arguments can be summarized as follows:

- The claimed subject-matter was not directly and unambiguously derivable from document (1) or (2) since it constituted a selection from two lists in view of document (1), and because document (2) did not disclose a possible combination of zeolite and alkali metasilicate.
- Contrary to the Appellant's allegation, none of the cited prior art documents related to the existing problem of undesired gassing in non-aqueous suspensions of aluminosilicates or to its solution.

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

The Respondent requested that the appeal be dismissed.

### **Reasons for the Decision**

#### 1. *Novelty (Article 54 EPC)*

Claim 1 of the patent in suit requires that the non-aqueous liquid cleaning composition having solid particles of aluminosilicate builder dispersed in a liquid phase, additionally contains an alkali (metal) metasilicate and is essentially free of bleach precursor.

1.1 Document (1) also discloses a non-aqueous liquid detergent composition comprising crystalline aluminosilicate as an inorganic builder salt dispersed in a liquid phase on the basis of non-ionic surfactants (see Claims 1, 8, 12 and 16 and page 7, line 54 to page 8, line 1). This composition may further contain inorganic builder salts, inter alia silicates (page 8, lines 2 to 6).

1.2 From the definition of the term 'bleach precursor' given in the patent in suit (page 2, lines 16 to 20 and 30), it follows that the bleach precursor is equivalent to the activator mentioned in document (1) (page 9, lines 53 to 56). In this respect, document (1) teaches that silicates undesirably decompose peroxy acids which is why compositions comprising peroxy compounds and a suitable activator for generating such peroxy acids in the washing liquor should not contain silicates (page 10, lines 39 to 43). This means, vice versa, that compositions comprising silicates should not contain compounds generating peroxy acids. Hence, the Board accepts the Appellant's argument that the exclusion of a bleach precursor from a silicate containing cleaning composition was known from document (1).

1.3 Concerning the additional inorganic builder salts suggested in document (1), special emphasis is laid on alkali silicates as being useful builder salts, preferably sodium silicates having a molar  $\text{Na}_2\text{O}:\text{SiO}_2$  of from 1.6:1 to 1:3.2 (page 8, line 10).

1.3.1 The term "sodium silicate" (Natriumsilikat; see page 8, line 8 of document (1)) designates a group of stoichiometrically well-defined chemical compounds

which are distinguished from each other by their respective molar  $\text{Na}_2\text{O}:\text{SiO}_2$  ratios. Consequently, the said preferred range of molar ratios in document (1) is merely a generic definition of a group of stable silicate entities within the system  $\text{Na}_2\text{O}-\text{SiO}_2$ , including doubtlessly sodium metasilicate but also, e.g. sodium disilicate and sodium orthosilicate, and mixtures of said silicates without, however, disclosing any individual sodium silicate.

1.3.2 In deciding novelty it has to be considered that normally a generic disclosure will not anticipate any specific embodiment embraced by that generic disclosure. This principle is confirmed by the jurisdiction of the Boards of Appeal (see e.g. T 763/89, not published in the OJ EPO, Reasons for the Decision Nos. 2.4 and 2.5, and T 181/82, OJ EPO 1984, 401, reasons Nos. 7 to 9). Applying this principle, the Board finds that document (1) does not disclose the addition of (sodium) metasilicate to the respective composition.

1.3.3 This conclusion is not invalidated by the Appellant's argument that the term sodium metasilicate was merely a synonym for a group of compounds defined by a continuous range of molar  $\text{Na}_2\text{O}:\text{SiO}_2$  ratios of 0.9:1 to 1.1:1 which group was embraced by the larger group of compounds defined by the continuous range of molar  $\text{Na}_2\text{O}:\text{SiO}_2$  ratios of 1.6:1 to 1:3.2 as disclosed in document (1).

1.3.4 The parties agreed on the fact that, while sodium metasilicate has the stoichiometric formula  $\text{Na}_2\text{SiO}_3$ , i.e. a theoretical molar  $\text{Na}_2\text{O}:\text{SiO}_2$  ratio of 1:1, this



molar ratio in practise varies between about 0.9:1 and 1.1:1, since commercially available alkali metal silicates normally will not have exactly the theoretical stoichiometry of the respective compounds (see also annex to the minutes of the oral proceedings before the Opposition Division, points 3.1 and 3.2). Likewise, the  $\text{Na}_2\text{O}:\text{SiO}_2$  ratio for commercial sodium disilicate of the formula  $\text{Na}_2\text{Si}_2\text{O}_5$  was merely "around" 1:2. It follows that the term sodium metasilicate designates a particular chemical entity, in spite of the possible minor variations in the  $\text{Na}_2\text{O}:\text{SiO}_2$  ratio resulting from the manufacturing process and due to varying degrees of purity.

1.3.5 Consequently the present case is distinguished from that underlying decision T 666/89 (OJ EPO 1993, 495, reasons No. 4) where the novelty of compositions defined by continuous ranges of amounts of ingredients was at stake. It follows that decision T 666/89 is not applicable to the present case.

1.4 The Appellant's further line of argument was based on the fact that the compositions of document (1) contain alkali perborate as bleaching agent. The Appellant argued that it was the common general technical knowledge in the field of detergent compositions that alkali silicates stabilize perborates. This was, for instance, represented by documents (4) and (5). He further submitted that a person skilled in the art would, in practise, merely consider waterglass, metasilicate and disilicate as suitable for that purpose. He would, therefore, understand the special recommendation of alkali silicates as co-builders in document (1) in this sense. In his view, it followed

from the reasoning given in T 666/89, that in the present case novelty was not given because the information in the prior art document (1), in combination with the skilled person's common general knowledge (e.g. document (5)), was sufficient to enable him to practise the technical teaching and because it could be reasonably assumed that he would do so.

In the present case, however, and as the Appellant conceded, in the group of "alkali silicates" mentioned in documents (1) and (5), there are at least three individual compounds at disposal in practise. This is why the Board considers in accordance with T 181/82 (see reference above) the specific metasilicate as being not disclosed in said prior art. Moreover, no evidence is at hand relating to a common general knowledge in connection with the stabilization of perborate in **substantially non-aqueous** systems. Finally, as far as he relies on decision T 666/89, the Appellant overlooks that, as already explained, this decision is not applicable to the present case (see above under point 1.3.5).

- 1.5 It follows that document (1) does not anticipate the subject-matter of Claim 1.
  
- 1.6 The Appellant further contested novelty of the subject-matter of Claim 1 in view of document (2). This document also discloses a non-aqueous liquid detergent composition comprising a builder suspended in the non-aqueous liquid phase. The builder is preferably inorganic in nature. Several inorganic compounds including sodium metasilicate and zeolites are enumerated in a list (page 2, lines 16 to 22 and

lines 30 to 37) as suitable builders. Exemplified are compositions which contain sodium tripolyphosphate and, in addition, "sodium silicate monohydrate" (Table I on pages 4/5), the latter compound being not mentioned in the above list.

The Appellant argued that the sodium silicate monohydrate mentioned Table I had to be in fact sodium metasilicate since metasilicate was the only silicate listed on page 2, line 36 of document (2), and since the monohydrate was the common hydrate of sodium metasilicate. This was contested by the Respondent. Be this as it may, the composition of Table I cannot be novelty destroying since it does not comprise an aluminosilicate builder.

However, the Board accepts that document (2) suggests to combine several builders in one composition. But to end up with the claimed combination of a zeolite (which is a synonym for aluminosilicate) with sodium metasilicate in a non-aqueous liquid detergent composition, a selection of two compounds from one list, which is equivalent to a twofold selection from two identical lists, would have been required. This twofold selection and the resulting combination not being foreshadowed in document (2), the Board holds the claimed specific combination of components was not disclosed in citation (2) (see T 12/81, OJ EPO, 1982, 296, reasons No. 13).

- 1.7 For these reasons, the claimed composition is held to be novel with respect to the disclosure of documents (1) or (2).

2. *Inventive step (Article 56 EPC)*

It remains, therefore, to be assessed whether or not the claimed composition is based on an inventive step.

2.1 Technical background

According to the patent in suit, profound gassing can result from the incorporation of an aluminosilicate builder into non-aqueous dispersions. It is taken into account that the gassing may be caused by evolution of gas trapped in the pores of the aluminosilicate and/or catalytic decomposition of other components, in particular by decomposition of perborate, catalysed by the zeolite (page 2, lines 5 to 7 and 47 to 50). It is further stated in the patent in suit that the gassing can be substantially mitigated if the composition also contains an alkali metasilicate, provided that then the composition is substantially free of bleach precursor (synonym for bleach activator; see point 1.1 above) which would be rendered unstable otherwise (page 2, lines 8 to 10 and 23).

2.2 Closest prior art

None of the cited prior art addresses the problem of gassing of substantially non-aqueous liquid cleaning compositions. Therefore, the closest prior art document may be represented by that document which discloses a cleaning composition having the most features in common with the claimed composition. Document (1) is suitable for that purpose, because it necessarily implies a zeolite builder dispersed in the non-aqueous liquid phase. The Appellant also used this document for the

assessment of inventive step (letter dated 5 November 1996, page 3).

### 2.3 Technical problem and its solution

According to the Appellant, the technical problem consisted in stabilizing a perborate bleaching agent in a non-aqueous liquid composition, since only this was verified by the examples of the patent in suit and since the amount of gas trapped in the pores of the zeolite could only constitute a minor proportion of the total gas volume evolved according to the examples. Reference in this latter respect was made by the Appellant to his calculations filed on 20 January 2000. Moreover, the patent in suit itself contained no reliable explanation of the gassing, but merely speculations in this respect.

In this context, the Appellant also objected that since an effect had only been shown in the patent in suit for perborate containing compositions, and perborate not being a mandatory component of the claimed composition, it was not plausible that the subject-matter of Claim 1 provided a solution to said problem. Consequently, the subject-matter of Claim 1 could not be patentable.

The Board cannot accept this line of argument for the following reasons: while the Appellant's calculations render plausible that the gas possibly contained in the pores of the zeolite can contribute only to a minor degree to the gassing in the presence of perborate, the Appellant did not provide any evidence showing that in the absence of perborate no beneficial reduction of gassing could be achieved by the incorporation of

alkali metasilicate into the compositions concerned. After all, the Appellant himself speculated that varying amounts of air could be physically entrapped into the composition depending on the different modes of mixing the components of the claimed compositions. In this context, it should be noted, that it is irrelevant to the present case whether perborate containing compositions evolve more gas than perborate-free compositions as was shown by the Respondent in a graph filed on 9 February 2000 since the decisive point is the **reduction** of gassing and not its absolute amount. Nor is it important whether a technical explanation for the gassing and its reduction is given in the patent in suit or can be given a posteriori elsewhere since the EPC does not require that a scientific explanation of a technical effect is given.

The Appellant's redefinition of the problem is based on a hind-sight evaluation of what might be the origin of the gassing, once it has been realized that the gassing became a problem and a solution to this problem was suggested in the patent in suit.

The Board holds, therefore, that neither convincing evidence nor convincing arguments are available which would necessitate a reformulation of the technical problem as it is stated in the patent in suit, i.e. the avoidance of said gassing, no matter what causes it (page 2, lines 5 to 6).

The examples of the patent in suit show that the gassing is reduced where sodium metasilicate has been added to the composition (see Examples 1 and 2). The Appellant questioned these experiments in view of his

own tests filed during the opposition proceedings which, in his opinion, showed that the effect lay within the margin of error given by the Respondent in respect of the examples of the patent in suit. However, as became evident from the Appellant's own diagrams representing his tests and filed during the oral proceedings before the Opposition Division, said tests were carried out with a different non-ionic surfactant as the solvent (see keys to annex 1 and 2 attached to the minutes of the oral proceedings before the Opposition Division). Consequently, in the absence of own error margins, those established for the Respondent's experiments cannot be simply applied to the Appellant's tests from which, thus, no conclusions can be drawn. Therefore, the examples of the patent in suit remain relevant and render plausible that the existing problem actually has been solved by the subject-matter as claimed.

- 2.4 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 technical problem by the means claimed.

Without providing any evidence for this allegations, the Appellant argued that someone skilled in the art would realize that perborate not only decomposes in aqueous media as disclosed in documents (4) and (5), but also in non-aqueous or solid detergent compositions, even in the absence of zeolite, since traces of water which were always present were sufficient to initiate the decomposition reaction.

Therefore, the skilled person would use any commercial alkali silicate, including alkali metasilicate, in a composition as disclosed in document (1), thereby arriving in an obvious manner at the claimed composition.

However, the Appellant also conceded that stabilization of perborate by alkali metal metasilicate in **non-aqueous** solution was not known from the prior art. Moreover, it is stated in document (5) that even in alkaline aqueous solution, decomposition of the perborate is relatively slow. Document (4) further indicates that the effect of stabilizing a bleach liquor is due to the fact that the silicate on the one hand suppresses the catalytic activity of heavy metals by binding free radicals and by chain termination, and on the other hand reacts with the catalyst to make it inactive (page 697, first paragraph). In the absence of any evidence, the Board, therefore, considers the Appellant's allegation that traces of water alone were causative for a **significant** decomposition of perborate as mere speculation. In addition, the Appellant's allegation finds no support in documents (1) and (2), which both use perborates in a zeolite containing non-aqueous composition (see in document (1), Claims 10 and 16 and Example; in document (2), Claim 7 and Table I). If the necessity of stabilising perborate in non-aqueous solutions had been as obvious as the Appellant alleges, then this would have been addressed by the authors of these documents (1) and (2). Certainly, both documents also use a bleach precursor in combination with the perborate, which combination is incompatible with a silicate. However, the reason for that (decomposition of peroxy acid generated from the



perborate of by means of an activator or respectively bleach precursor) has already been realized by the authors of document (1) who, obviously, considered it important to add a bleach activator to the non-aqueous composition while not even addressing any necessity of adding an agent for stabilizing the bleach.

- 2.5 The Board holds, therefore, that none of the cited prior art documents, either individually or in combination, renders obvious the claimed solution of the existing technical problem, and concludes that the composition of Claim 1 as granted is based on an inventive step within the meaning of Articles 52(1) and 56 EPC.

Dependent Claims 2 to 6 which refer to preferred embodiments of Claim 1 are based on the same inventive concept and derive their patentability from that of Claim 1.

## **Order**

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

The appeal is dismissed.

The Registrar:

The Chairman:

G. Rauh

P. Krasa