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D E C I S I O N
of 10 August 2000

Case Number: T 0170/96 - 3.3.6

Application Number: 88304186.5

Publication Number: 0291261

IPC: C11D 3/12

Language of the proceedings: EN

Title of invention:
Detergent liquid

Patentee:
UNILEVER PLC, et al

Opponent:
PROCTER & GAMBLE EUROPEAN TECHNICAL CENTER N.V.
Colgate-Palmolive Company

Headword:
Detergent/UNILEVER

Relevant legal provisions:
EPC Art. 54, 56

Keyword:
"Novelty - yes: multiple selection"
"Inventive step - yes: inadmisible combination with non-relevant document"

Decisions cited:
T 0198/84, T 0026/85, T 0453/87, T 0666/89, T 0245/91

Catchword:
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Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number: T 0170/96 - 3.3.6

D E C I S I O N
of the Technical Board of Appeal 3.3.6
of 10 August 2000

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Decision under appeal: **Decision of the Opposition Division of the European Patent Office posted 27 December 1995 rejecting the opposition filed against European patent No. 0 291 261 pursuant to Article 102(2) EPC.**

Composition of the Board:

Chairman: P. Krasa
Members: G. Dischinger-Höppler
P. H. Mühlens

Summary of Facts and Submissions

I. This appeal is from the decision of the Opposition Division to reject the two oppositions and to maintain European patent No. 0 291 261 on the basis of 10 claims as granted, the independent claims reading:

"1. A liquid detergent composition comprising

(i) an aqueous base;
(ii) detergent active material; and
(iii) electrolyte;

in proportions sufficient to create a structuring system with solid-suspending properties; and further comprising from 1-10% by weight of a fabric softening clay material, characterized in that the composition comprises from 0.5 to 10% by weight of a non-peptising/non building electrolyte selected from alkali metal formates, acetates, chlorides and sulphates, said composition at 25°C having a viscosity of no greater than 2.5 Pas at a shear rate of $21s^{-1}$ and yielding no more than 2 % by volume phase separation upon storage at 25°C for 21 days from the time of preparation.

7. A process for preparing a composition according to any of claims 1-6, characterized in that it comprises the steps of:

(i) admixture with an aqueous base, of at least some of the non-peptising/non-building electrolyte, and optionally, any builder salt which is non-peptising;

(ii) then admixing therewith, the fabric softening

clay material;

(iii) admixing with the product of step (ii), the remainder (if any) of the non-peptising/non-building electrolyte, and optionally, some or all of the remainder (if any) of any builder salt which is non-peptising;

(iv) admixing with the product of step (iii), the detergent active material; and

(v) admixing with the product of step (iv), any peptising builder salt and the remainder (if any) of any builder salt which is non-peptising."

II. In its decision, the Opposition Division held that none of the cited prior art disclosed the combination of 1 to 10 % of fabric softening clay and 0.5 to 10% of a non-peptising/non-building electrolyte selected from alkali metal formates, acetates, chlorides and sulphates (hereinafter referred to as "NPNB electrolyte") in a liquid detergent composition. Concerning inventive step, the cited prior art was considered to suggest that the addition of NaCl in amounts of 0.5% and higher increased the viscosity of a clay-containing liquid detergent composition rather than decreased it as aimed at in the patent in suit.

III. In the statement of grounds of appeal and during the oral proceedings held before the Board on 10 August 2000, the Appellant (Opponent II) maintained that the subject-matter of granted Claim 1 lacked novelty and inventive step (Articles 54 and 56 EPC). By letter of 26 June 2000, the Appellant filed a Russian document

including its English translation (hereinafter referred to as document (17)).

Opponent I initially also filed an appeal, which was withdrawn by letter dated 25 April 1996 without filing any statement of grounds of appeal.

By letter of 10 July 2000, the Respondent filed two sets of amended claims and amended pages of the description adapted thereto as auxiliary requests.

IV. During the oral proceedings, the parties relied upon the following documents only:

(1) GB-A-2 132 654;

(7) GB-A-2 178 055;

(8) EP-A-0 225 142; and

(17) E. G. Agibalyan, V.A.Yaremenko; "The Swelling of Clay Minerals and the Firmness of their Three-dimensional Coagulated Structures in Electrolyte-containing Dispersions"; English translation from Dispersnye Sist. Buren 1977, pages 30 to 32.

V. The Appellant's arguments submitted in writing and orally can be summarised as follows:

The claimed subject-matter lacked novelty in view of either document (1) or (7), both disclosing the presence of sodium sulphate or chloride in a proportion of up to 10% in a stable liquid detergent composition containing 10% by weight of a fabric softening clay material, having a viscosity of not greater than 2.5

Pas and comprising an aqueous base, a detergent active material and a builder salt (electrolyte) in amounts so as to result in a structured liquid system with solid suspending properties.

Concerning inventive step, he essentially argued that

- starting from document (1) as the most relevant prior art for assessing inventive step, a skilled person confronted with any viscosity problems arising from clay swelling would learn from document (17) how to inhibit said swelling;

- document (1) already suggested the addition of sodium chloride or sulphate into a liquid detergent composition containing a swelling clay; and

- the optimum amount of salt to be added to a given composition for obtaining a desired viscosity could be found by simple experiments, and

concluded that, therefore, the claimed subject-matter was obvious for a person skilled in the art.

VI. The Respondent supported the opinion set out in the contested decision. His arguments concentrated on the following submissions:

- Neither document (1) nor document (7) disclosed clearly and unambiguously a detergent composition having solid suspending properties, a viscosity and a stability as defined in Claim 1 of the patent in suit. These documents did further not describe the claimed combination of 1 to 10% wt of

clay and 0.5 to 10 % wt of the NPNB electrolyte.

- The invention intended to avoid both excessive viscosity increase and stability problems in clay-containing liquid detergent systems. This problem was solved by maintaining the amount of clay in the range of 1 to 10% and by adding 0.5 to 10% of NPNB electrolyte.

- The closest prior art was represented by either of documents (1) and (7), but neither of them addressed this problem nor its solution.

- Document (17) concerned stability problems of the walls of oil and gas bore holes in the presence of swelling clay rock. It did not relate to structured detergent liquid containing builder electrolytes. Since electrolytes were known to possibly promote clay swelling in a detergent system, it could not have been expected that in such liquid detergent systems further addition of electrolytes would inhibit viscosity increase.

VII. The Appellant requested that the decision under appeal be set aside and that European patent No. 0 291 161 be revoked.

The Respondent requested that the appeal be dismissed and that the patent be maintained as granted (main request) or, alternatively, on the basis of auxiliary requests 1 and 2 submitted by letter of 10 July 2000.

Reasons for the Decision

1. *Novelty (Main Request)*

1.1 Claim 1

1.1.1 In its preamble, Claim 1 of the patent in suit relates to a liquid detergent composition comprising (i) an aqueous base, (ii) a detergent active material and (iii) electrolyte in proportions sufficient to create a structuring system with solid-suspending properties.

According to the description of the patent in suit, a skilled person would readily obtain such structuring systems with solid suspending properties containing (i) an aqueous base, (ii) a detergent active material and (iii) electrolytes (page 2, lines 37 to 41). This was reiterated by the Respondent during oral proceedings and not contested by the Appellant.

The detergent active material (ii) is anionic, non-ionic or amphoteric (page 4, line 50 and page 5, line 19) and is used in amounts of preferably 6 to 15% by weight (page 5, line 31). The aqueous base (i) is water used in amounts of about 50% by weight (page 6, line 25 and Examples 1 and 2). As to the electrolytes (iii), it is generally known in the art that detergent compositions comprise a variety of different ingredients which are electrolytes, including the anionic detergents and other adjuvants such as sequestering agents or soil suspending agents which are not excluded in the claimed composition (page 5, lines 43 to 55). Of particular interest with respect to the major ingredients in the particularly preferred compositions of the patent in suit are of course the detergency builder salts such as sodium tripolyphosphates (STP), the preferred amounts of said

builder ranging generally from 15 to 35% by weight (page 5, lines 32 to 42).

Systems comprising the components (i), (ii) and (iii) are known in the art, e.g. from documents (1) and (7). The compositions of document (1) comprise 40 to 70% by weight of water, 5 to 20% by weight of an anionic, nonionic or amphoteric detergent and 5 to 35% by weight of STP (see Claims 1 and 11). The example is given of a composition having 59% by weight of water, about 11% by weight of detergent active material and 11% by weight of STP (Example 1). The respective figures disclosed for the liquid detergent compositions of document (7) are: 5 to 20% by weight of an anionic, nonionic or amphoteric detergent active material and 5 to 30% by weight of STP (Claim 1), the balance to 100% being water and other components. Again, the example is given of about 11% by weight of detergent active material and of STP and about 50% of water.

Since systems known from documents (1) and (7) are covered - in respect to the amounts of the components (i), (ii) and (iii) - the Board concludes that they must also display the structuring and solid suspending properties of the systems of the patent in suit.

1.1.2 Claim 1 of the patent in suit further requires that said structured detergent composition comprises from 1 to 10% by weight of a fabric softening clay and from 0.5 to 10% by weight of a non-peptising/non-building electrolyte selected from alkali metal formates, acetates, chlorides and sulphates (NPNB electrolyte).

The compositions of documents (1) and (7) also comprise a fabric softening clay, the amount thereof ranging

from 8 to 20, or 5 to 20% by weight, respectively, preferably from 10 to 15% (see in document (1) Claim 1 and page 4, lines 5 to 6; in document (7), Claims 1 and 2). Exemplified are compositions containing 12 and 15% by weight of clay.

Documents (1) and (7) do not explicitly mention the combination of 1 to 10% of clay and 0.5 to 10% of NPNB electrolyte. However, both documents suggest in a paragraph of identical wording that sodium sulphate or sodium chloride may be additionally included as an inorganic filler salt. These salts are mentioned in a list of various possible, i.e. optional, adjuvants of the liquid detergent compositions, including besides the filler salts fluorescent brighteners, perfumes and colorants, antiredeposition agents, dispersing agents, bleaches, bactericides etc., also auxiliary solvents and additional detergents and fillers. It is stated that "normally the individual proportions of such adjuvants will be less than 3%, often less than 1% and sometimes even less than 0.5%, except for any fillers and solvents, and additional detergents and builders for which the proportions may sometimes be as high as 10%". The total proportion of adjuvants should not, however, be more than 20%, desirably less than 10% and still more desirably less than 5% (document (1), page 3, lines 45 to 64; document (7), page 4, line 55 to page 5, line 6, and Claim 1).

1.1.3 As a further requirement, the composition of Claim 1 of the patent in suit is restricted by its viscosity of no greater than 2.5 Pas at a shear rate of 21 s^{-1} and a temperature of 25°C and by a stability expressed as yielding no more than 2% by volume phase separation upon storage at 25°C for 21 days from the time of

preparation. As is evident from the description of the patent in suit, in liquid compositions containing undissolved material in suspension, such as a swelling clay, viscosity and stability are interrelated insofar as "too low a viscosity can result in long term instability" (page 2, lines 9 to 10 and Example 1).

According to document (1), the liquid detergent compositions have viscosities of between 5 and 100 cP, preferably 10 to 70 cP, e.g. 40 cP (page 4, lines 24 to 25), which corresponds to 0.005 to 0.1 Pas, preferably 0.01 to 0.07 Pas, e.g. 0.04 Pas, whereas those of document (7) range from 1000 to 10 000 cP, preferably 2000 to 5000 cP (page 5, lines 18 to 19) corresponding to 1 to 10 Pas, preferably 2 to 5 Pas. It is to be noted that no shear rates are given in document (1) or (7) in respect to these viscosity values.

As to the stability requirement, both documents mention that the compositions are pourable, stable, non-separating and uniform at said viscosities (document (1), page 4, lines 28 to 29; document (7), page 5, lines 20 to 21).

1.1.4 According to the established jurisdiction of the Boards of Appeal, anticipation only occurs where a prior document contains for a skilled person a clear and unambiguous disclosure of the subject-matter of the later invention. In the present case, the claimed subject-matter could be anticipated by the teaching of documents (1) and (7) merely if these documents disclosed directly and unambiguously compositions containing not only sodium sulphate or chloride in an amount falling into the claimed range of 0.5 to 10% by weight, but also 1 to 10% by weight of fabric softening

(swelling) clay and, simultaneously displaying the particular viscosity and stability values given in Claim 1 of the patent in suit.

1.1.5 It follows from the above cited disclosure of documents (1) and (7) concerning the possible adjuvants that the clay-containing detergent compositions may either contain no sodium sulphate or chloride as inorganic filler salts or amounts thereof which may be "sometimes as high as 10%". This means in fact a range of 0 to 10% by weight.

With respect to the parameter viscosity, the following has to be noted: as mentioned by the Respondent and not contradicted by the Appellant, structured liquid detergents are non-Newtonian liquids wherein, by contrast to Newtonian liquids, the viscosity is dependent on the shear rate applied. The absence of any indication of a reference shear rate in connection with the viscosity values of documents (1) and (7) (see above under 1.1.3), therefore, renders these values vague whenever the liquids concerned are structured. It has not been overlooked by the Board that document (1) realizes this problem by indicating that the viscosity figures have to be interpreted in accordance with the thixotropic behaviour of the detergent composition (page 4, lines 25 to 29) which unquestionably is another indication for the non-Newtonian behaviour of a liquid composition. However, no evidence is on file suggesting that the viscosity figures disclosed in documents (1) and (7) corresponded to those at a shear rate of 21 s^{-1} or that they could automatically be transformed into particular figures under said shear rate. This was also not alleged by the Appellant.

Finally, the Board is not aware of any common general knowledge nor did the Appellant provide any evidence from which it could be concluded that the mere mention in documents (1) and (7) that the compositions are stable and non-separating would imply the specific stability as defined in Claim 1 of the patent in suit by a limited percentage of phase separation over a limited period of time and at a particular temperature.

1.1.6 The Board therefore concludes that, in the case of either document (1) or document (7), a multiple selection would be required in order to result in the subject-matter of Claim 1, the selections consisting in the amount of 1 to 10% by weight of swelling clay, the amount of 0.5 to 10% by weight of a NPNB electrolyte, a viscosity of less than 2.5 Pas at a particular shear rate and temperature and a phase separation of less than 2% by volume over a particular period of time.

The teaching of documents (1) or (7) does not, therefore, anticipate the subject-matter of Claim 1.

This finding is not at variance with decisions T 0198/84 (OJ EPO 1985, 209) and T 0026/85 (OJ EPO 1990, 22), which were both concerned with so-called "selections" from a numerical range of only one single parameter and, in the Board's judgement, are therefore not applicable in the present case of a "multiple selection" (see T 0453/87, No. 6 of the reasons for the decision, not published in the OJ EPO; T 0245/91, No. 2.8 of the reasons for the decision, not published in the OJ EPO). Nor is it in conflict with decision T 0666/89, where a composition of matter resulting from a twofold selection was found to be anticipated because of a clear teaching in the prior art regarding the

claimed particular combination of features (T 0666/89, No. 5 of the reasons for the decision, OJ EPO 1993, 495).

1.1.7 Also, none of the other cited documents anticipates the subject-matter of Claim 1. This is in particular evident for document (8), a prior art document under Article 54(3) EPC, which does not disclose the presence of a NPNB electrolyte, and document (17), which does not even relate to detergents at all.

1.2 Claim 7

None of the cited prior art discloses the combination of features as claimed in accordance with Claim 7 which relates to a process for preparing a composition according to Claim 1, which combination of features consists of a particular sequential order of admixing the individual components of the composition, including the initial admixture of the aqueous base with at least some of the NPNB electrolyte. Since this was not contested by the Appellant, a detailed reasoning is not required here.

1.3 For these reasons, the Board concludes that the subject-matter of Claims 1 and 7 is novel in accordance with Article 54 EPC. Dependent Claims 2 to 6 and 8 to 10 are directed to specific embodiments of the subject-matter of the respective independent claims and are, therefore also considered to be novel.

2. *Inventive step*

It therefore remains 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, use of a swelling clay as a fabric softening material in a liquid detergent composition often causes the problem of undesired viscosity increase of the product due to clay swelling, whereas too low viscosities can result in long-term product instability. In this respect, the patent in suit refers to post-published document (8) wherein this same problem has also been recognized and solved by using only particular low-swelling clay materials (patent in suit, page 2, lines 5 to 11; document (8), page 2, lines 5 to 21).

2.2 Closest prior art

The Board accepts the Appellant's suggestion that document (1), which undoubtedly relates to liquid detergent compositions comprising a swelling clay as a softening agent (Claim 1 and page 3, first line), can be used as a starting point for assessing inventive step.

2.3 Technical problem and its solution

The viscosity problem associated with clay swelling mentioned under point 2.1 has not been addressed in the prior art cited under Article 54(2) EPC. The patent in suit now proposes to solve this problem by influencing the clay swelling independently from the swelling behaviour of the clay itself by modifying the electrolytes contained in the composition (page 2, lines 12 to 17), thereby reducing the viscosity of the composition (page 3, lines 49 to 50). The solution consists of adding 0.5 to 10% by weight of a so-called NPNB electrolyte selected from alkali metal formates, acetates, chlorides and sulphates and maintaining the amount of clay within the given range of 1 to 10 % by weight. From the examples it can be seen that, independently of the swelling behaviour of the clay itself, i.e. regardless of whether the fabric-softening clay is of high- or low-swelling type, the addition of the NPNB electrolyte and clay in said amounts gives the desired moderate viscosity. This makes it plausible that the existing problem of reducing the viscosity has actually 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.

2.4.1 Claim 1

Being silent about the existing problem of the patent in suit, documents (1) and (7) do not in the Board's judgment provide a solution to this problem, even if it is suggested in both documents that NPNB electrolytes

(filler salts) may be added to the detergent composition. On the contrary, from the fact that documents (1) and (7) do not hint at any influence of the filler salts on the viscosity of the composition or on the swelling behaviour of the clay, it must be concluded that the ability of such salts to provide a solution to the existing problem under specific circumstances has not been recognized by the authors of documents (1) and (7) and hence not imparted to a skilled reader.

Document (17) is a Russian article discussing the swelling of clay in aqueous dispersions in relation to the amount of NaCl added (page 2, fourth and fifth paragraph of the English translation). It is particularly concerned with the problem of maintaining the stability of the walls of oil and gas bore holes during drilling processes (page 1, first paragraph of the article, English translation). As admitted by the Appellant, it does not relate to conditions prevailing in a detergent composition which by nature is composed of a variety of different electrolytic components. This is a fact which remains unchanged even in the light of the possibly misleading title of the article, "The Swelling of Clay Minerals and the Firmness of their Three-dimensional Coagulated Structures in Electrolyte-containing Dispersions".

As is stated in the patent in suit any electrolyte present in the composition may have an influence, either inhibiting or promoting, on the swelling of the clay (page 2, lines 12 to 14). Hence, the Board is of the opinion that a person skilled in the art, if attracted by the title to consider document (17) at all, cannot draw any conclusion from the observations

made therein on simple systems comprising only aqueous clay dispersions and sodium chloride with respect to the behaviour of the clay in such complex systems as detergent compositions. On the contrary, from the fact that documents (1) and (7) mention sodium chloride and sulphate as possible ingredients in liquid detergent compositions but not in relation to any other effect than that of an inorganic filler, the Board is convinced that the skilled person would not pay much attention to the disclosure of document (17) and would be even less likely to try to combine it with that of documents (1) or (7).

2.4.2 Claim 7

In principle the same reasoning applies to the subject-matter of Claim 7, which concerns the preparation of the composition of Claim 1, and hence implies the admixture of the components in the corresponding proportions. Moreover, the process of Claim 7 is further distinguished by a particular sequential order of admixing the components, especially the NPNB electrolyte, which is not suggested in the prior art and which is shown in the Examples of the patent in suit to impart the desired effect of reduced viscosity while maintaining its stability.

The Board is satisfied that the other documents on file do not provide any incentive for the claimed solution either. Since during the oral proceedings before the Board, the Appellant did not rely on any of these documents, there is no need to discuss these other documents.

3. The Board holds, therefore, that none of the cited

prior art documents, either individually or in combination, renders obvious the claimed solution to the existing technical problem, and concludes that the composition of Claim 1 as granted as well as the process for its preparation according to granted Claim 7 are based on an inventive step within the meaning of Article 56 EPC.

Dependent Claims 2 to 6 and 8 to 10, which refer to preferred embodiments of Claims 1 and 7, are based on the same inventive concept and derive their patentability from that of independent Claims 1 and 7.

4. Since the above findings correspond to the grant of the Appellant's main request, the auxiliary requests need not be considered.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

G. Rauh P. Krasa