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# D E C I S I O N
## of 17 January 2001

**Case Number:** T 0052/97 - 3.3.6

**Application Number:** 89302692.2

**Publication Number:** 0334566

**IPC:** C11D 17/00

**Language of the proceedings:** EN

**Title of invention:**
Liquid detergent composition

**Patentee:**
UNILEVER PLC, et al

**Opponent:**
Henkel Kommanditgesellschaft auf Aktien

**Headword:**
Water soluble abrasive/UNILEVER

**Relevant legal provisions:**
EPC Art. 123(2), 83, 56

**Keyword:**
"Inventive step (no) - use of a known component for its known properties in a known manner"

**Decisions cited:**
T 0130/89

**Catchword:**
-

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**Case Number:** T 0052/97 - 3.3.6

# D E C I S I O N
## of the Technical Board of Appeal 3.3.6
## of 17 January 2001

**Appellant:** (Opponent)
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**Decision under appeal:** **Decision of the Opposition Division of the European Patent Office posted 15 November 1996 rejecting the opposition filed against European patent No. 0 334 566 pursuant to Article 102(2) EPC.**

**Composition of the Board:**

**Chairman:** P. Krasa
**Members:** L. Li Voti
C. Rennie-Smith

## Summary of Facts and Submissions

I. The present appeal is from the decision of the Opposition Division to reject the opposition and to maintain European patent No. 0334566 unamended.

Independent Claim 1 reads as follows:

"1. A pourable, homogenous, abrasive, aqueous detergent composition comprising, in addition to water:

i) detergent active;

ii) water soluble salt, at least part of which is potassium sulphate in an amount from 2% to 65% by weight of the composition and present in both a dissolved and an undissolved state, the undissolved part of the potassium sulphate having a mean particle diameter of from 10 - 500 µm and constituting from 0.5% to 60% by weight of the composition;

the composition having a pH of less than 8, and having an apparent viscosity at 20 °C of at least 6500 Pas at a shear rate of $3 \times 10^{-5}$ $sec^{-1}$, and not more than 10 Pas at a shear rate of 21 $sec^{-1}$."

Claims 2 to 10 refer to specific embodiments of the claimed composition.

II. The notice of opposition as filed, requested revocation of the patent on the grounds of insufficiency of disclosure as well as of lack of an inventive step, based, *inter alia*, on

D1: US-A-3 607 161 and

D3: EP-A-0 193 375.

III. In its decision, the Opposition Division found that the claimed subject-matter as disclosed in the patent in suit fulfilled the patentability requirements of the EPC. In particular it held that the claimed invention was disclosed in a manner sufficiently clear for it to be carried out by a skilled person; and that the claimed subject-matter also involved an inventive step, since it would not be obvious to a person skilled in the art to modify the composition known from D3 which, when used, produces an unpleasant sensation on the skin, by replacing the sodium bicarbonate used therein with potassium sulphate and by reducing the pH of the composition to a value not exceeding 8 in order to overcome that drawback.

IV. In its notice of appeal the Appellant (Opponent) requested that the decision be set aside and the patent be revoked.

V. The Appellant's arguments as regards Article 83 EPC (insufficient disclosure) can be summarized as follows:

- the patent application required a "judicial" choice of anionic and nonionic surfactants in order to meet the rheological conditions of the claimed product. However, the patent in suit did not explain how this choice should be made and thus did not give sufficient information to enable the skilled person to carry out the claimed invention;

- it was not possible to prepare a composition according to claim 1 possessing only 2% of potassium sulphate, since the sulphate would in this case have been completely dissolved by the water present in the composition;

- the description of the patent in suit did not contain any teaching as to the selection of a water soluble salt capable of lowering the solubility of potassium sulphate (a salt which is an essential feature of dependent claim 5) apart from specifically addressing sodium chloride; therefore in this respect also the claimed invention was not sufficiently disclosed.

The Appellant's arguments as regards inventive step can be summarized as follows:

In the light of the combination of D1 and D3, it submitted that,

- D3, which generically disclosed abrasive compositions having a pH as low as 7, had already solved the alleged problem of the patent in suit, namely reducing the slimy feeling of compositions having a pH above 8.5 and bicarbonate as their sole abrasive;

- the objective problem solved by the patent in suit was thus the selection of an alternative suitable abrasive for a composition as in D3 having a pH below 8;

- the skilled person knew from D1 that potassium sulphate was a suitable water-soluble abrasive;

- the skilled person knew from his common general knowledge that the solubility in water of potassium sulphate was similar to that of sodium bicarbonate;

- therefore he would have obviously recognised this salt as a suitable alternative to the bicarbonate used in D3.

VI. The Respondents' (Proprietors) arguments can be summarised as follows:

- the invention was sufficiently disclosed, since the patent in suit contained six illustrative examples of the claimed invention and sufficient information to enable a skilled person to deviate successfully from these examples;

- the skilled person knew from common general knowledge that one way of reducing the solubility of a sparingly water-soluble salt was the addition of a more soluble salt having an ion in common with the sparingly water-soluble one. Moreover a variation of the surfactant and of the water content would have also affected the solubility of the dissolved salt;

- further, the claimed invention was neither rendered obvious by document D3, which did not indicate that the problem of a slimy feeling could be overcome by the use of potassium sulphate, nor by document D1, which related to essentially anhydrous compositions.

In this respect the Respondents argued specifically that:

- D3 suggested preferentially the use of sodium bicarbonate, sodium tripolyphosphate pentahydrate or sodium tetraborate decahydrate as water-soluble abrasive salts, which, because of their instability at a low alkaline pH, require a pH of above 8.5;

- D3 suggested the possible addition of water-soluble potassium salts only in addition to bicarbonate, tripolyphosphate or borate, the preferred additional salts being capable of functioning both as abrasives and builders;

- even though the skilled man could have envisaged replacing the preferred abrasive of D3, he would not have looked to D1 for an alternative since that document related to structurally different compositions, i.e. scouring powders and not a liquid abrasive composition, and he would not have found any incentive for selecting potassium sulphate from the long list of water-soluble abrasives of D1;

- moreover, potassium sulphate was a known strong salting-out electrolyte and thus not a suitable component for a surfactant composition; the skilled person would thus not have selected this salt as an alternative to those preferred in D3.

VII. The Respondents requested that the appeal be dismissed or alternatively that the patent be maintained on the basis of their auxiliary request, filed at the oral proceedings on 17 January 2001.

Claim 1 of this auxiliary request differs from Claim 1 as granted by the insertion of "the other part being optional and chosen from sodium chloride, potassium chloride, magnesium chloride, calcium chloride and sodium citrate;"

at the end of feature ii) after "composition;".

VIII. The Appellant raised the same objections to this auxiliary request as to the main request. However, it additionally argued that the amended claim 1

contravened Article 123(2) EPC insofar as it envisaged combinations of potassium sulphate with specific inorganic salts, which combinations were not specifically addressed in the original specification of the patent in suit.

## Reasons for the Decision

1. *Amendments (Auxiliary request)*

Claim 1 of the auxiliary request differs from claim 1 of the main request (that is, claim 1 as granted) insofar as it requires that the optional water-soluble salts, if present in the claimed composition, are chosen from sodium chloride, potassium chloride, magnesium chloride, calcium chloride and sodium citrate.

The patent application as filed specified on page 10 (lines 13 to 17) that "in addition to potassium sulphate, the composition according to the invention can also optionally comprise other water-soluble salts such as sodium bicarbonate, sodium chloride, potassium chloride, magnesium chloride, calcium chloride, sodium tripolyphosphate pentahydrate, sodium tetraborate decahydrate and sodium citrate...".

The amendment thus amounts to a restriction of claim 1 to compositions comprising as component ii) either solely potassium sulphate or potassium sulphate in combination with particular salts as specified; all these possibilities having been explicitly disclosed in the application as filed.

Therefore, in the Board's judgement, claim 1 as amended in the auxiliary request complies with the requirements of Article 123(2) EPC.

2. *Sufficiency of disclosure (Main and auxiliary request)*

2.1 With regard to the issue of sufficiency of disclosure the Board is satisfied that the patent contains six examples which illustrate the invention and can be easily repeated by a skilled person. This has not been contested by the Appellant which confirmed in its grounds of appeal of 25 March 1997 that it was able to repeat example 5 and even to adjust its pH within the limits of the attacked claim 1.

2.2 The Board agrees that the description of the patent in suit suggests that a "judicial choice of anionic and nonionic detergent surfactants" can be used to provide the requisite suspending properties; other methods, such as the use of structuring agents are, however, also indicated as being suitable. Moreover, the preparation of liquid compositions having suspending properties by the selection of a suitable surfactant system was a technique well known to the skilled person at the priority date of the patent in suit as clearly illustrated by D3, which also calls for a "judicial choice of anionic and nonionic detergent surfactants" to be carried out (page 17, lines 23 to 26 and illustrative examples); liquid abrasive compositions comprising suspended water-insoluble particles were also well known as reported in D3 (page 1, lines 12 to 15) and as acknowledged in the patent in suit (page 2, lines 12 to 17).

Therefore, in the light of this state of the art, a skilled person would not have encountered any difficulty in preparing a composition having the rheological properties required by claim 1 of the patent in suit.

2.3 As agreed by the parties at the oral proceedings, potassium sulphate has a water solubility of about 10g/100g water at room temperature. Example 2 of the patent in suit shows a composition comprising 8% potassium sulphate, 18% surfactants and 71.25% water with 2% undissolved particles of potassium sulphate. As taught in the patent in suit it was, moreover, possible to reduce substantially the amount of water, e.g. to 30%, and to increase the amount of surfactants, e.g. to 40% (page 5, lines 50 to 51 and page 4, lines 50 to 52), an operation which would have negatively affected the water solubility of the potassium sulphate, thus reducing the amount of dissolved salt.

Moreover, as also envisaged by the patent in suit, the claimed invention specifically contemplated the possibility of adding a water soluble salt capable of reducing the solubility of potassium sulphate, such as sodium chloride (page 5, lines 34 to 35).

Further, the skilled person would have known from his common general knowledge that it was possible to reduce the solubility of a sparingly water-soluble salt by adding a more soluble salt having an ion in common with the former.

Therefore, the skilled person knew which salts were able to reduce the solubility of potassium sulphate and would have had no difficulty in carrying out the invention throughout the whole scope of the claims, even at the lowest concentration of potassium sulphate allowed by the patent in suit.

Therefore, in the Board's judgement, the invention as claimed according to both the main and the auxiliary request was sufficiently disclosed in the patent in suit.

3. *The Technical Problem*

3.1 The patent in suit concerns a pourable, homogenous, aqueous abrasive liquid composition for cleaning hard surfaces comprising suspended particles of a water soluble salt. The claimed compositions comprise detergent actives and a water soluble salt which is present in undissolved and dissolved state, the undissolved state having a mean particle diameter of from 10 - 500 µm and constituting from 0.5% to 60% by weight of the composition; the composition having a pH of less than 8, and having an apparent viscosity at 20°C of at least 6500 Pas at a shear rate of $3 \times 10^{-5}$ $sec^{-1}$, and not more than 10 Pas at a shear rate of 21 $sec^{-1}$.

3.2 D3 discloses similar pourable, homogenous, abrasive, aqueous detergent compositions also comprising detergent active compounds; a saturated solution of a water-soluble salt present in an amount of 6 to 45% by weight, at least 5% by weight being in undissolved form as particle size having a diameter of from 10 - 500 µm; the composition having a preferred pH in the range from 7 to 11; and having an apparent viscosity at 20°C of at least 6500 Pas at a shear rate of $3 \times 10^{-5}$ $sec^{-1}$, and not more than 10 Pas at a shear rate of 21 $sec^{-1}$ (see page 4, lines 3 to 33 and page 16, lines 20 to 22).

3.3 Example 1 of D3 discloses in particular a composition consisting of 6.5% by weight of surfactants, 29.3% by weight of sodium bicarbonate and 64.2% of water, this composition displaying a viscosity at 20 °C of 0.15 Pas at a shear rate of 21 $sec^{-1}$ and of more than 6500 Pas at a shear rate of 3 x $10^{-5}$ $sec^{-1}$ (page 19, lines 1 to 14). While no pH-value is given in this example, it is credible that this value would be above 8.5 as submitted by the Respondents.

3.4 The Board thus accepts this Example 1 of D3, which in fact represents the state of the art referred to in the patent in suit (page 2, lines 40 to 46), as the starting point for evaluating inventive step as suggested by the parties.

3.5 According to the patent in suit, the sodium bicarbonate containing compositions of D3 display a slimy feeling to the touch when used in hand washing without the use of gloves (page 2, lines 47 to 51); this problem is due to the alkaline pH of 8.5 or higher, which is necessarily achieved by using bicarbonate as the sole water-soluble abrasive (page 2, lines 52 to 54).

3.6 Thus, the technical problem underlying the claimed invention in respect to the sodium bicarbonate compositions of D3, in particular that of Example 1, amounted to the provision of an aqueous liquid abrasive composition not conferring a slimy feeling to the touch when used in the hand washing of hard surfaces without the use of gloves.

3.7 The Board has no reason to doubt that a composition as specified in claim 1 solved this existing technical problem.

4. *Evaluation of inventive step*

4.1 Main request

4.1.1 As agreed at the oral proceedings it was common general knowledge that a composition would feel slimy to the touch if alkaline.

Therefore, a skilled person, faced with the existing technical problem described in point 3.6 above, would have looked for alternative less alkaline water-soluble abrasives to replace the sodium bicarbonate which imparted alkalinity to the respective abrasive composition used in example 1 of D3.

4.1.2 D3 had already taught generic abrasive compositions with a pH as low as 7 (see point 3.2). Sodium bicarbonate was moreover not a necessary component thereof but only one of the preferred salts to be used in such compositions, other equally preferred salts being sodium borate and sodium tripolyphosphate (page 10, line 25 to page 11, line 13). D3 also specified the properties which a useful abrasive water-soluble salt should have, i.e.

(a) not more than a single hydrated species when present as a crystalline solid in water at a temperature of from 10 to 40 °C in an amount above that required to form a saturated solution, and

(b) a saturation solubility in water at 40 °C which is less than ten times that at 10 °C (see page 4, lines 16 to 23).

Therefore the technical teaching of D3 told a skilled person what properties a salt should have to be used for the intended purpose.

4.1.3 The skilled person knew, for example, from D1 that potassium sulphate, a salt giving no alkaline reaction in aqueous solution, is a water-soluble abrasive (see column 1, lines 59 to 67; column 2, lines 35 to 38; and column 3, line 24).

4.1.4 The Respondents argued that a skilled person would not have combined D3 with D1, since the latter related to structurally different compositions, i.e. to scouring powders and not to aqueous liquid abrasive compositions and further that a skilled person would have had no incentive to select potassium sulphate from the long list of salts of D1 (column 2, line 35 to column 3, line 26).

Moreover a skilled person would not have selected potassium sulphate, since it has only inferior building properties (whilst, according to D3, page 10, lines 25 to 28, the selected water-soluble salt should be preferably both an abrasive and a builder), and was a strong salting-out electrolyte, which rendered it undesirable in a liquid surfactant composition. Furthermore, it could not be expected that upon crystallization potassium sulphate would form particles of the size required by the patent in suit.

4.1.5 The Board cannot agree with these arguments, since, as already indicated, a skilled person would have looked for an alternative among the known water-soluble abrasives, availing himself of the guidance in this respect disclosed in D3 (see point 4.1.2); and since, as already mentioned, the generic teaching of D3 did not require the water-soluble salt to have any specific building capacity and did not exclude the presence of strong salting-out electrolytes (see page 4 of D3).

Moreover, as agreed at the oral proceedings, it was common general knowledge at the priority date of the patent in suit that potassium sulphate has a solubility comparable with that of sodium bicarbonate and also complies with the general requirements for the abrasive water-soluble salt disclosed in D3 (see point 4.1.2)

In respect to the particle size, i.e. the mean particle diameter of from 10 to 500 µm, of the non-dissolved salt, no particular effects were advanced by the Respondents. D3, however, explains that this particle size provides the necessary abrasive properties to the compositions concerned (page 9, lines 24 to 27). The skilled person, being aware from D1 that solid potassium sulphate was a useful water-soluble abrasive, would have reasonably expected solid potassium sulphate to be available with the requisite particle diameter and to crystallize from its saturated solution with a particle size within the broad range of claim 1 of the patent in suit.

Furthermore, even if a skilled person would have had some doubts as to whether or not potassium sulphate, mentioned in D1 as a scouring agent, could be used as the abrasive agent in the pourable, homogenous, abrasive, aqueous detergent compositions known from D3, it would have been obvious for him to try to establish by routine experimentation whether such doubts were justified.

4.1.6 In the absence of any evidence as to an unexpected advantage based on the use of potassium sulphate and taking into account that this known salt was used in a composition for its known properties in a known manner to obtain a known effect, no inventive step can be seen in its selection from the list of water-soluble scouring agents of D1 (see also T 130/89, point 6.2.4 of the reasons for the decision, OJ EPO 1991, 514).

4.2 Auxiliary request

Claim 1 of the auxiliary request differs from claim 1 of the main request only insofar as it specifies the water-soluble salts **optionally** present in addition to potassium sulphate. Therefore, it encompasses, as claim 1 of the main request does, an embodiment in which potassium sulphate is the sole component ii) and consequently the same arguments put forward with respect to the main request apply "mutatis mutandis" to the auxiliary request.

Therefore, claim 1 of the auxiliary request also lacks an inventive step.

**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:

G. Rauh P. Krasa