

Publication in the Official Journal ~~Yes~~ / No

File Number: T 73/91 - 3.3.1  
Application No.: 84 308 271.0  
Publication No.: 0 146 289  
Title of invention: Laundry compositions

Classification: C11D 1/62

DECISION  
of 1 September 1992

Applicants: 01) The Procter & Gamble Company  
02) Procter & Gamble European Technical Center

Headword: Laundry composition/PROCTER

EPC Article 56

Keyword: "Inventive step (confirmed) - closest prior art"



Case Number : T 73/91 - 3.3.1

**D E C I S I O N**  
of the Technical Board of Appeal 3.3.1  
of 1 September 1992

Appellant 01 : The Procter & Gamble Company  
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Appellant 02 : Procter & Gamble European Technical Center  
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Decision under appeal : Decision of Examining Division 023 of the  
European Patent Office dated 5 September 1990  
refusing European patent application  
No. 84 308 271.0 pursuant to Article 97(1) EPC.

**Composition of the Board :**

Chairman : K.J.A. Jahn  
Members : R.W. Andrews  
J.-C. Saisset

## Summary of Facts and Submissions

I. The appeal lies from the decision of the Examining Division of 5 September 1990 rejecting European patent application No. 84 308 271.0 (publication No. 0 146 289). The decision was based on Claims 1 to 9 as filed. The only independent claim reads as follows:

"A detergent composition comprising deterative surfactant, builders and other conventional deterative ingredients, and clay fabric softener, characterised in that it contains at least 0.1% of a water-soluble di-C<sub>6</sub>-C<sub>10</sub> alkyl quaternary ammonium salt and not more than 3% by weight of alkoxyated nonionic deterative surfactant."

II. The ground for the refusal was that the claimed subject-matter did not involve an inventive step in the light of the disclosure of the following documents:

- (1) Seifen-Öle-Fette-Wachse, No. 10-2, pages 273 to 277, 19 June 1975, and
- (3) GB-A-2 104 540.

The Examining Division considered that the only difference between the present compositions and those of document (3) lay in the replacement of distearyldimethylammonium chloride by the quaternary ammonium salts defined in Claim 1. However, document (1) disclosed the use of these latter compounds in detergent compositions in combination with distearyldimethylammonium chloride or other softeners. In the absence of any prejudice against combining these quaternary ammonium salts with a clay fabric softener or any surprising advantage resulting from their presence in this combination, the Examining Division held that the skilled person would have chosen the

selected quaternary ammonium salts without exercising any inventive skill.

III. An appeal was lodged against this decision on 29 October 1990 with payment of the prescribed fee. In their Statement of Grounds of Appeal filed on 9 January 1991, the Appellants contended that, in the light of the closest prior art as represented by document (3), the technical problem was to formulate a softening through the wash (STW) composition comprising different quaternary ammonium salts which provides superior softening through the wash and which also overcomes the compatibility problem between the clay and quaternary ammonium salts associated with the prior art compositions.

The Appellants also argued that document (1) disclosed the present quaternary ammonium salts as biocides and that they may be used in rinse added softeners in which the softening effect is achieved by another compound. Furthermore, since clays are not present in rinse added softeners, the reference to other softeners in this document has to be construed as referring to other softeners of the quat type.

In the Appellants' opinion, document (3) teaches away from the present invention since it specifies that it is essential that the quaternary ammonium compounds be water-insoluble to overcome the compatibility problem with clays.

Finally, the Appellants maintained that, although in the tests submitted on 23 February 1990 a prior art composition was not compared with one of the invention, nevertheless the results demonstrated, in a single variable test, that the present quaternary ammonium salts provided a superior softening effect. In the Appellants'

view this comparison was valid since there was no reason to consider that a different result would have been obtained if the test was performed using the detergent matrix of the prior art and one of the claimed invention.

- IV. In a communication dated 31 January 1992, the Rapporteur expressed the opinion that EP-A-0 026 529 (4), which was cited in the search report, represented the closest state of the art and that a combination of the teaching of this document with that of EP-A-0 000 225 (5) rendered the claimed subject-matter obvious.

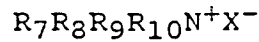
In response to this communication the Appellants emphasised that the cited prior art did not disclose that the quaternary ammonium salts used according to the present invention possessed softening properties.

- V. The Appellant requests that the decision under appeal be set aside and that a patent be granted on Claims 1 to 9 as filed.

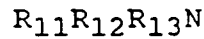
#### Reasons for the Decision

1. The appeal is admissible.
2. The application in suit relates to laundry detergent compositions by means of which fabrics can be washed and softened simultaneously; i.e. compositions providing cleaning and softening through the wash (cf. page 2, lines 8 to 12). In the Board's opinion, document (4) represents the closest state of art. This document discloses a laundry detergent composition which provides cleaning and softening of fabrics during conventional laundry operations comprising 3 to 40% of an anionic

surfactant; 0.5 to 15% a water-soluble quaternary salt of the formula



wherein R<sub>7</sub> is a C<sub>6-16</sub> alkyl radical atoms, each of R<sub>8</sub>, R<sub>9</sub> and R<sub>10</sub> is C<sub>1-4</sub> alkyl, C<sub>1-4</sub> hydroxyalkyl, benzyl or -(C<sub>2</sub>H<sub>4</sub>O)<sub>n</sub>H, wherein n is 2 to 5, not more than one of R<sub>8</sub>, R<sub>9</sub> or R<sub>10</sub> being benzyl and X is an anion or an aliphatic amine of the formula:



wherein R<sub>11</sub> is C<sub>8-18</sub> alkyl, R<sub>12</sub> and R<sub>13</sub> are independently hydrogen, C<sub>1-4</sub> alkyl or hydroxyalkyl, benzyl or -(C<sub>2</sub>H<sub>4</sub>)<sub>x</sub>H where x is 2 to 5 or water-soluble acid addition salts thereof; and from 1.5 to 45% by weight of the composition of an impalpable smectite-type clay having an ion exchange capacity of at least 50meq per 100g (cf. Claim 1 in combination with page 3, lines 1 to 6 and pages 6 and 7).

2.1 In the light of this closest prior art, the technical problem underlying the disputed application is to provide additional laundry detergent compositions of the STW type.

According to the application this technical problem is solved by a composition comprising deterative surfactants, builders, other conventional deterative ingredients, clay fabric softener, at least 0.1% of a water-soluble di-C<sub>6-10</sub> alkyl quaternary ammonium salt and not more than 3% by weight of alkoxyated nonionic deterative surfactant.

In the light of the statements that the compositions of examples provided excellent cleaning and through-the-wash fabric softening (cf. page 9, lines 1 to 3 and 28 to 30),

the Board considers it credible that this technical problem has been solved.

- 2.2 In defining the technical problem the Board has not considered the experimental evidence filed on 23 February 1990 since neither of the tested compositions contained a smectite-type clay and therefore, fell outside the scope of the present claims and those of document (4). It may be true that smectite-type clays have a positive effect on fabric softening, however it cannot be ruled out that this positive effect may be more or even less pronounced when they are used in combination with the quaternary ammonium salts of document (4). With respect to the results of the second test submitted on 23 February 1990, it is pointed out that the statement that significantly more DODMAC (dioctyldimethylammonium chloride) was deposited onto the fabric if a fabric softening clay is present is not supported by the reported figures (DODMAC + clay 0.350mg DODMAC per g fabric; DODMAC 0.400mg DODMAC per g fabric).

Therefore, in the Board's judgment, it cannot be safely concluded that the present compositions provide better softening performance than those in accordance with document (4).

3. After examination of the cited prior art, the Board has concluded that the claimed subject-matter is novel. Since in the decision under appeal the Examining Division held that the subject-matter was novel it is not necessary to give detailed reasons for this finding.
4. It still remains to be decided whether the subject-matter of the application in suit involves an inventive step.
- 4.1 As previously mentioned document (4) discloses a detergent composition, which cleans and acts as a textile softener,

comprising an anionic surfactant, a smectite clay and a water-soluble mono C<sub>8-16</sub> alkyl quaternary ammonium salt (cf. Claim 1 in combination with page 1, lines 2 to 3). However, this document does not provide the skilled person with any indication that further detergent compositions of this type may be obtained by replacing the water-soluble C<sub>8-16</sub> alkyl quaternary ammonium salt by a water-soluble di-C<sub>6-10</sub> alkyl quaternary ammonium salt.

4.2 Document (1) discloses that didecyldimethylammonium chloride, decyloctyldimethylammonium chloride and dioctyldimethylammonium chloride are water-soluble cationic surface active agents with biocidal properties (cf. page 273, right-hand column and Summary in the right-hand column of page 277). In the paragraph headed "Textilweichmacher" in the left-hand column of page 277 (in combination with the reference to "Wäschweichspülmittel, biozid" in the left-hand column of page 276) it recommends adding the three compounds mentioned above to rinse-added softeners containing, for example, distearyldimethylammonium chloride or quaternary ammonium compounds of imidazolium type, in order to obtain a biocidal rinse-added fabric softener. However, this document contains no information from which the skilled person could deduce that the three compounds mentioned therein have softening properties, let alone that they would have through the wash softening properties. Therefore, this document would be of no assistance to the skilled person seeking to solve the above-defined technical problem.

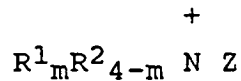
4.3 Document (3) discloses a detergent composition comprising a surface active detergent, metakaolin and optionally a quaternary ammonium fabric softener or antistatic agent such as distearyldimethylammonium chloride or sulphate, di(hydrogenated tallow) dimethylammonium chloride or

methyl sulphate and allyltrimethylammonium chloride (cf. Claims 1 and 6 in combination with Examples 2, 3A(2), 3B(2) and 6A to 6D). Additionally, this document discloses that the quaternary ammonium compound is preferably of the type described in US-A-3 959 155 and US-A-3 886 075 (incorrectly cited as US-A-3 886 975) or that the quaternary ammonium compounds disclosed in US-A-3 997 453 may also be used (cf. page 6, lines 35 to 39).

In the first mentioned patent specification the quaternary ammonium compounds are substantially water-insoluble and form part of the antistatic component of the fabric softener and anti-static compositions (cf. column 2, lines 17 to 45 and column 4, lines 51 to 54). In US-A-3 886 075 the quaternary compounds are water-insoluble di ( $C_{10-22}$  hydrocarbyl) ammonium compounds which are used as anti-static agents (cf. Claim 1 in combination with column 6, line 23 to column 7, line 45). The last-mentioned patent specification discloses fabric softening agents such as quaternary ammonium compounds wherein typically at least one of the groups linked to the nitrogen atom is an alkyl group containing at least 12 carbon atoms and two or three of the groups linked to the nitrogen atom are  $C_{1-6}$  optionally substituted alkyl groups (cf. column 2, lines 14 to 58).

Therefore, document (3), read in connection with the three patent specifications mentioned above, provides no indication that the present di  $C_{6-10}$  alkyl quaternary ammonium salts possess softening through wash properties and that they could be used to replaced the mono  $C_{10-14}$  alkyl quaternary ammonium compounds of document (4) with a view to solving the technical problem underlying the application in suit.

4.4 Document (5) discloses a built laundry detergent composition comprising a surfactant system containing a water-soluble or water-dispersible combination of anionic, alkoxyated, nonionic and water-soluble quaternary ammonium cationic surfactants and at least 10% of a detergency builder (cf. Claim 1). Preferred water-soluble quaternary ammonium cationic surfactants have the general formula



wherein R<sup>1</sup> is C<sub>8-20</sub> alkyl, alkenyl or aralkyl, R<sup>2</sup> is C<sub>1-4</sub> alkyl or benzyl, Z is an anion in number to give electrical neutrality and m is 1, 2 or 3, provided that when m is 2, R<sup>1</sup> has less than 15 carbon atoms and when m is 3, R<sup>1</sup> has less than 9 carbon atoms (cf. page 7, lines 21 to 29). Compounds falling within this formula include lauryltrimethylammonium chloride, dimethyldioctylammonium bromide and didecyldimethylammonium salts (cf. Examples 1 to 10, page 8, lines 7 to 10; page 28, line 13 and page 31, line 8) i.e. quaternary ammonium compounds falling within the scope of document (3) and the present application. Although the skilled person may deduce from this document that these two types of quaternary ammonium compounds are equivalent to one another (cf. for example, page 28, lines 10 to 13 and page 31, lines 5 to 8), this equivalency can only be considered to extend to their function as cationic surfactants in the ternary surfactant system described therein.

This document is wholly silent with respect to the softening through wash properties of either type of quaternary ammonium compound. Therefore, the teaching of this document would not provide any indication pointing in the direction of the proposed solution to the technical

problem of providing alternative detergent compositions providing both cleaning and softening of textiles.

5. Therefore, in the Board's judgment, the proposed solution to the technical problem underlying the disputed application is inventive. Hence, Claim 1 and the dependent Claims 2 to 9, which relate to preferred embodiments of the composition according to Claim 1, are allowable.

Order

For these reasons, it is decided that:

1. The decision under appeal is set aside.
2. The case is remitted to the Examining Division with the order to grant a patent on the basis of Claims 1 to 9 as originally filed.

The Registrar:



P. Martorana

The Chairman:



K.J.A. Jahn