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DECISION
of 16 July 2003

Case Number: T 0817/99 - 3.3.7

Application Number: 92901690.5

Publication Number: 0560896

IPC: A61K 7/075

Language of the proceedings: EN

Title of invention:

Shampoo compositions with silicone and cationic surfactant conditioning agents

Patentee:

THE PROCTER & GAMBLE COMPANY

Opponent:

KPSS-Kao Professional Salon Services GmbH

Headword:

-

Relevant legal provisions:

EPC Art. 54, 56, 83

Keyword:

"Sufficiency of disclosure - yes"

"Inventive step - problem and solution - main request - no"

"Remittal to the first instance - auxiliary request - yes"

Decisions cited:

T 0219/83

Catchword:

-



Case Number: T 0817/99 - 3.3.7

D E C I S I O N
of the Technical Board of Appeal 3.3.7
of 16 July 2003

Appellant:
(Opponent)

KPSS-Kao Professional Salon
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Respondent:
(Proprietor of the patent)

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Representative:

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Decision under appeal:

Decision of the Opposition Division of the
European Patent Office posted 6 July 1999
rejecting the opposition filed against European
patent No. 0560896 pursuant to Article 102(2)
EPC.

Composition of the Board:

Chairman: R. E. Teschemacher
Members: B. J. M. Struif
B. L. ter Laan

Summary of Facts and Submissions

I. European patent No. 0 560 896 was granted with eleven claims in respect of European patent application No. 92 901 690.5 resulting from international patent application PCT/US91/08925, filed on 29 November 1991 and published as WO 92/10163. The mention of the grant of the patent was published on 20 March 1996.

Independent claim 1 read as follows:

"A liquid hair conditioning shampoo composition characterized in that it comprises:

- (a) from 5% to 50%, by weight, of an anionic surfactant component;
- (b) from 0.1% to 10%, preferably from 0.5 to 8%, by weight, of a dispersed, insoluble, nonionic silicone hair conditioning agent, said silicone hair conditioning agent comprising a non-volatile, insoluble, nonionic silicone fluid component;
- (c) from 0.2% to 10%, by weight, of a soluble cationic, amino or quaternary ammonium conditioning surfactant having a single cationic nitrogen atom and at least one N-radical containing one or more hydrophilic moieties that are within 4 carbon atoms, inclusive, of the cationic nitrogen, said hydrophilic moieties being selected from the group consisting of alkoxy, polyoxyalkylene, alkylamido, hydroxyalkyl, and alkylester moieties, and combinations thereof; preferably from 0.5% to 8% by weight of a cationic conditioning surfactant containing from 2 to 10 of said hydrophilic moieties within 3 carbon atoms, inclusive, of a cationic nitrogen; and
- (d) an aqueous carrier."

Claims 2 to 10 were directed to preferred embodiments of the shampoo composition according to claim 1.

Claim 11 read as follows:

"A method for cleaning and conditioning the hair comprising applying from 1 g to 20 g of the composition of Claim 1, 2, 3, 4, 5, 6, 7, 8, 9, or 10, to the hair and then rinsing said composition from the hair."

II. A notice of opposition was filed against the granted patent requesting that the patent be revoked in its entirety on the grounds of lack of novelty, lack of inventive step and insufficient disclosure pursuant to Articles 100(a) and 100(b) EPC, respectively. The opposition was supported *inter alia* by the following documents:

D1: US-A-4 710 314

D2: US-A-4 919 846

D5: GB-A-2 196 980

III. In a decision announced at the oral proceedings held on 8 June 1999 and issued in writing on 6 July 1999, the opposition division rejected the opposition.

That decision can be summarized as follows:

(i) As regards sufficiency of disclosure, the claimed hydrophilic moieties included alkoxy and alkylester groups, which were intended to render

the quaternary ammonium surfactants soluble in the shampoo composition. The skilled person had no difficulty in determining which specific moieties were suitable for that purpose. No evidence was on file showing that specific embodiments within the definition of the claimed subject-matter could not be carried out.

- (ii) The subject-matter of claim 1 was held to be novel over D2. The novelty attack based on D5 represented late filed facts, since D5 had, until the oral proceedings, only been used in the context of inventive step. D5 did not unambiguously disclose the subject-matter of claim 1, therefore the novelty attack was not admitted.
- (iii) Regarding inventive step, either D1 or D2 could represent the closest state of the art. The object of the invention was to provide a conditioning shampoo which had an excellent conditioning performance for both damaged and undamaged hair. Since such a problem was not addressed in the cited documents there was no suggestion that the cationic silicone agent of D1 should be replaced by a non-ionic silicone agent known from D3. In D2 silicone was only used as an optional component and there was no hint that the specific quaternary ammonium surfactants in combination with silicones should be selected in order to solve the problem posed. Thus, the presence of an inventive step was accepted.

IV. On 14 August 1999, the opponent (appellant) filed a notice of appeal against the above decision with simultaneous payment of the prescribed fee. The statement setting out the grounds of appeal was filed on 6 October 1999.

V. By letters of 7 May 1999 and 25 April 2000, the proprietor (respondent) submitted two sets of claims as auxiliary requests, which, by letter dated 16 June 2003, were replaced by two sets of claims as an amended main request and a new first auxiliary request. With the same letter a test report was also submitted.

Claims 1 and 9 of the main request differ from the version as granted in that in feature (c) the term "amino or" is cancelled.

VI. During the oral proceedings held on 16 July 2003, the respondent submitted a new set of claims 1 to 10 as the sole auxiliary request and withdrew the previous auxiliary requests on file.

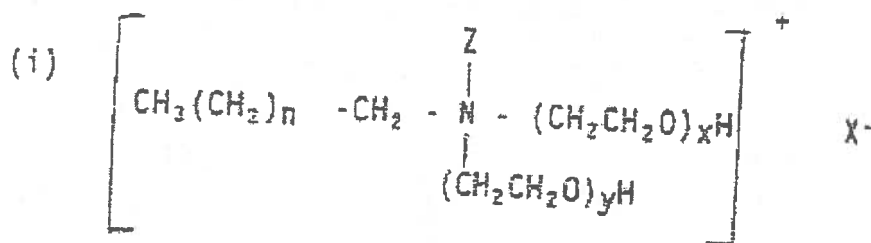
Claim 1 of that auxiliary request reads as follows:

"A liquid hair conditioning shampoo composition characterized in that it comprises:

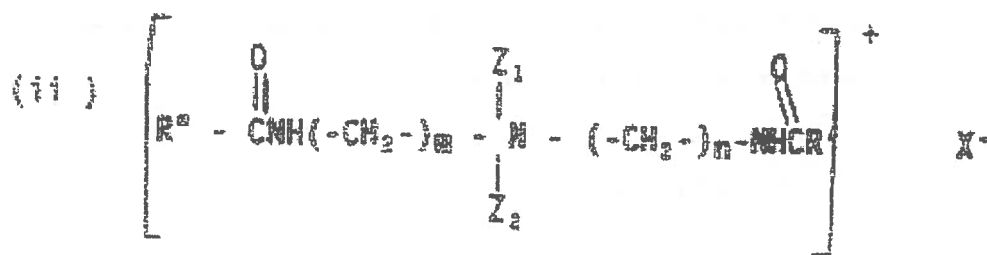
(a) from 5% to 50%, by weight, of an anionic surfactant component;

(b) from 0.1% to 10%, preferably from 0.5 to 8%, by weight, of a dispersed, insoluble, nonionic silicone hair conditioning agent, said silicone hair conditioning agent comprising a non-volatile, insoluble, nonionic silicone fluid component;

(c) from 0.2% to 10%, by weight, of a soluble cationic quaternary ammonium conditioning surfactant selected from the group consisting of:

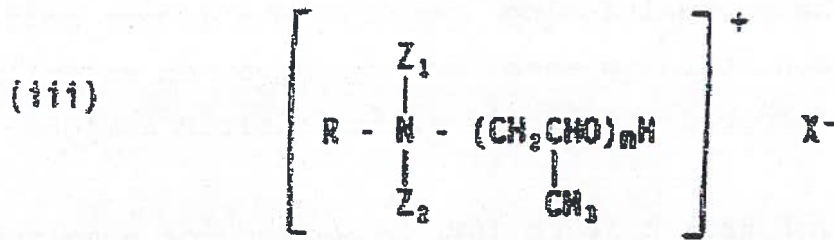


wherein n is from 8-28, x+y = 2 to 15, Z is a C₁-C₂ alkyl, and X is a water soluble salt forming anion;

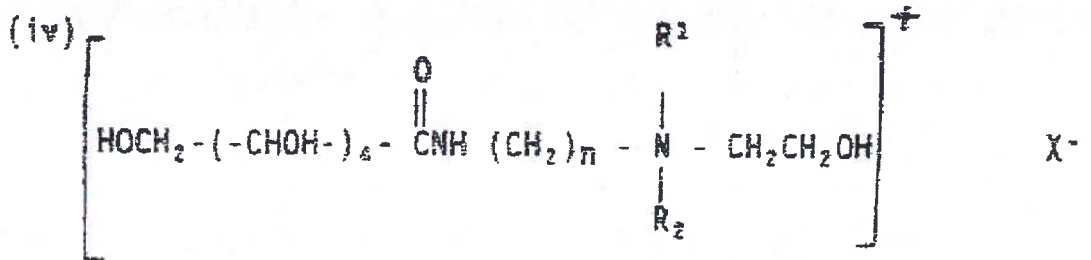


wherein Z₁ is a C₁-C₃ alkyl, Z₂ is a C₁-C₃, hydroxyalkyl, n and m independently are integers from 2 to 4, inclusive, R' and R'', independently, are substituted or unsubstituted hydrocarbyls, and

X is a soluble salt-forming anion;



wherein R is a C₁-C₃ alkyl, Z₁ and Z₂ are, independently, C₂-C₄ alkyl or alkenyl, n is from 7 to 30, and X is a soluble-salt forming anion; and



wherein n is 2 or 3, R₁ and R₂ independently are C₁ - C₃ hydrocarbyls and X is a soluble salt-forming anion; and mixtures thereof; and

(d) an aqueous carrier."

Claim 8, which corresponds to claim 9 as granted, is amended in accordance with claim 1. Amended claims 2 to 7, 9 and 10 correspond to granted claims 2, 4 to 7, 10 and 11, respectively.

VII. The arguments of the appellant, given in writing and during the oral proceedings can be summarized as follows:

- (i) As to insufficiency of disclosure, the claimed alkoxy, alkylester and alkylamido groups were not hydrophilic but hydrophobic groups in accordance with the knowledge of the skilled person. Although the examples could be carried out, the terminology in the claims was contradictory. The description would not be used to clarify the inconsistency. Hence, the patent did not provide sufficient teaching as to which kind of quaternary ammonium groups exhibited sufficient hydrophilicity for maintaining solubility in the shampoo composition, so that the patent could not be reproduced within the whole ambit of the claims. Thus, the requirements of Article 83 EPC were not met.
- (ii) As to novelty, D5 disclosed all the components of the shampoo composition within the claimed amounts without a specific selection being necessary. D2 was novelty destroying as well, because the amount of silicone, though not explicitly specified in D2, was within the general knowledge of the skilled person.
- (iii) Regarding inventive step, D5 was an appropriate starting point since it disclosed conditioning shampoos containing anionic and cationic detergents and a conditioning, non-volatile, nonionic silicone. The respondent's test report did not include a comparison with the closest state of the art and was carried out with non-comparable amounts of the cationic surfactants. Since no improved technical effect had been demonstrated, the problem to be solved over D5 was to provide an alternative shampoo composition.

Since D2 disclosed quaternary ammonium compounds that were similar to compounds disclosed in D5, and since the compounds of both documents exhibited excellent conditioning effects, it was obvious to use the compounds of D2 as alternatives to those of D5.

Starting from D2, the compositions of the patent in suit differed only in that they contained a specific amount of silicone. Since D2 also provided shampoos having an excellent conditioning effect and since no improvement had been shown over D2, it was obvious to use the usual amounts of silicone as known from D5.

Thus, the claimed subject-matter of the main request did not involve an inventive step.

- (iv) Having regard to the auxiliary request, this was filed at a very late stage of the proceedings and should not be allowed. The claimed subject-matter was not novel and inventive for the same reasons as set out for the main request.

VIII. The arguments of the respondent given in writing and during the oral proceedings can be summarized as follows:

- (i) As to insufficiency of disclosure, the objection merely amounted to an alleged lack of clarity. The term "hydrophilic" had to be interpreted according to the patent specification. The skilled person would not ignore the technical information given in the patent in suit and would have no difficulty

in performing the invention. The opponent had not shown that the invention could not be reproduced within the entire scope of the claims.

(ii) As to novelty, D5 did not directly and unambiguously disclose the claimed combination of all the ingredients, even if it did mention the type of quaternary ammonium surfactant now being claimed. Novelty over D2 was established since the skilled person had to make a multiple selection within its disclosure. In this respect, D2 referred to different classes of cationic conditioning agents, to different amounts of anionic surfactants and to silicone as an optional component only.

(iii) As regards inventive step, either of D1 and D2 represented the closest state of the art since they related to shampoos giving a satisfactory conditioning effect, as did the patent in suit, whilst D5 referred to a process for purifying cationic surfactants. However, none of those documents addressed the treatment of different types of hair. The use of specific quaternary ammonium surfactants in combination with an anionic surfactant and a nonionic silicone provided improved compatibility and conditioning properties. This was demonstrated in the test report comparing compositions according to the invention with those containing the best cationic surfactant of D5. There was no motivation in D5 which would lead the skilled person to modify the compositions according to D2 or D1 in the direction now being claimed.

Even if D5 were considered to be the closest state of the art, there was no incentive in the cited prior art to use the present specific quaternary ammonium compounds in order to arrive at improved compatibility and conditioning properties.

(iv) As regards the auxiliary request, the restriction to specific quaternary ammonium compounds provided a further distinction over the cited prior art, which strengthened the arguments on novelty and inventive step.

IX. 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 and that the patent be maintained on the basis of the main request filed on 16 June 2003, or, alternatively, on the basis of the only auxiliary request filed during the oral proceedings, or, as an alternative, that the case be remitted to the Opposition Division for further prosecution.

Reasons for the Decision

1. The appeal is admissible.

Main request

Amendments

2. By the amendments to the main request the alternative feature "amino or" has been cancelled. The appellant did not raise any objections in that respect and the Board sees no reason to take a different position. The amendments are allowable pursuant to Article 123(2) and (3) EPC.

Sufficiency of disclosure

3. The appellant's arguments mainly concern the question whether or not the "alkoxy, alkylester or alkylamido groups" are covered by the term "hydrophilic moieties". This argument relates to a possible inconsistency in the definition of the term "hydrophilic moieties" in claim 1, and is an objection pursuant to Article 84 EPC rather than Article 83 EPC. Since those terms are already present in the version as granted and objections under Article 84 are not a ground for opposition, those features cannot be objected to (Case Law of the Boards of Appeal of the EPO, 4th edition 2001, VII.C.10.2).
- 3.1 Even if the appellant's arguments were considered in the light of Article 83 EPC, they would not be convincing.

- 3.1.1 The question in that case would be whether the skilled person is able to produce the claimed shampoo compositions on the basis of the information in the patent in suit.
- 3.1.2 This assessment has to start from the terms used in the claims, since they define the claimed subject-matter. In the present case, the claims, according to the appellant, contain a discrepancy since some of the groups specified as "hydrophilic moieties" are not normally considered as hydrophilic. However, there is no unclarity in the meaning of the term "alkoxy, alkylester or alkylamido groups" as such, nor did the appellant argue any such unclarity. Therefore, even if the skilled person had any doubts whether these groups fell under their definition "hydrophilic moieties", that would not form a hindrance to the use of the specific groups as defined in the claims.
- 3.1.3 In case the skilled person had any reservations regarding the suitability of any groups, he would turn to the description for more detailed information. The Board cannot accept the appellant's allegation that someone would disregard the description where claims are alleged to be unclear. On the contrary, the application as a whole is relevant for the question of sufficiency of disclosure (Article 83 EPC) and the description is the place of choice to be used for interpreting the claims, as illustrated by Article 69(1), second sentence, EPC for determining the extent of protection. Therefore, the contents of the description are to be taken into account when determining whether the invention can be carried out by a skilled person (Case Law, *supra*, II.A.1)

3.1.4 According to the description, the cationic conditioning surfactant containing the groups under dispute should be soluble in the shampoo composition and sufficient hydrophilic moieties should be present to maintain the solubility subsequent to any ionic complexation that may occur between the cationic conditioning surfactants and the anionic detergent surfactants (page 9, lines 21 to 26). The surfactant contains at least one hydrophilic moiety within 4 (inclusive) carbon atoms of the quaternary nitrogen. The closest non-carbon atom in the hydrophilic moiety to the cationic nitrogen should be within the stated number of carbon atoms relative to said nitrogen (page 9, lines 30 to 33). Furthermore, preferred compounds are defined by formulae II to VI (pages 10 and 11), which illustrate in detail the hydrophilic moieties in the claimed context.

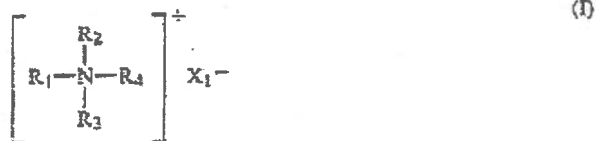
Consequently, the hydrophilic moieties of the cationic surfactant are defined by clear structural features and illustrated by complete chemical formulae so that the skilled person obtains a good idea of the cationic surfactant to be used in the shampoo compositions.

3.1.5 Moreover, it is apparent that the term "hydrophilic moieties" is used in a relative rather than an absolute sense. Since the specified groups alkoxy, polyoxyalkylene, alkylamido, hydroxyalkyl, and alkylester include polar groups, it is apparent that these moieties are more hydrophilic in nature than mere alkyl groups not containing such groups.

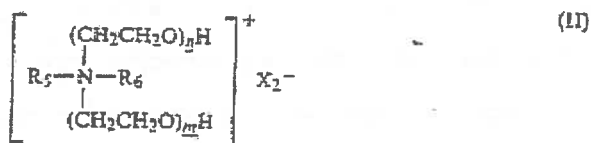
- 3.1.6 Furthermore, the cationic surfactants used in the shampoo compositions according to claim 1 are commercial products. This is illustrated in the examples of the patent in suit (footnote * under the tables of examples I to V). Thus, the skilled person who intends to reproduce the shampoo compositions given as examples will have no problem in obtaining cationic surfactants. Even the appellant himself saw no difficulty in carrying out the examples of the patent in suit.
- 3.2 The appellant has not shown by any experiments or otherwise that he was unable to produce shampoo compositions within the claimed definition which are suitable for the intended purpose. The onus of proof in this respect lies with the appellant (opponent), which he has failed to discharge (T 219/83, OJ EPO 1986, 211).
- 3.3 Consequently, the board is satisfied that the invention is clearly and sufficiently disclosed for it to be carried out by the skilled person within the whole ambit of the claims, so that the requirements of Article 83 EPC are met.

Novelty

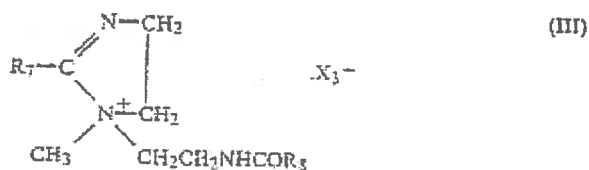
4. The appellant's novelty objections were based on D2 and D5.
- 4.1 D2 discloses a detergent composition comprising, in an aqueous medium, (i) at least one quaternary ammonium cationic surfactant selected from the group consisting of (a) monoalkyl quaternary ammonium salt cationic surfactants having the formula (I):



wherein R₁ represents an alkyl or alkenyl having 12 to 22 carbon atoms, R₂, R₃, and R₄ independently represent methyl or ethyl, and X₁ represents a halogen atom or a methylsulfate residue, (b) ethylene oxide addition quaternary ammonium salt cationic surfactants having the formula (II):



wherein R₅ represents an alkyl having 16 to 22 carbon atoms, R₆ represents methyl, ethyl, or an alkyl having 16 to 22 carbon atoms, X₂ represents a halogen atom or a methylsulfate or ethylsulfate residue, m and n are independently an integer of at least 1, provided that the sum of m and n is 2 to 30, and (c) imidazoline quaternary ammonium salt cationic surfactants having the formula (III):



wherein R₇ and R₈ independently represent an alkyl or alkenyl having 12 to 22 carbon atoms, and X₃ represents a halogen atom or a methylsulfate or ethylsulfate residue;

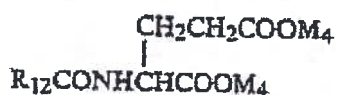
(ii) at least one carboxylate anionic surfactant selected from the group consisting of:

N-acylsarcosinate anionic surfactants having the formula:



wherein R₁₁ represents an alkyl or alkenyl group having 8 to 18 carbon atoms and M₃ represents one or more of alkali metals, organic amines, and basic amino acids;

N-acylglutamates having the formula:



wherein R₁₂ represents an alkyl or alkenyl group having 8 to 18 carbon atoms and M₄ independently represents one or more of alkali metals, organic amines, and basic amino acids;

N-acyl-N-methyl-beta-alanine salt anionic surfactants having the formula:



wherein R₁₃ represents an alkyl or alkenyl group having 8 to 18 carbon atoms and M₅ represents one or more of alkali metals, organic amines, and basic amino acids;

and N-acyl alanine salt anionic surfactants having the formula:



wherein R₁₄ represents an alkyl or alkenyl group having 8 to 18 carbon atoms and M₆ represents one or more of alkali metals, organic amines, and basic amino acids; and

(iii) at least one amphoteric surfactant, the mole ratio of the components (i)/(ii) being within the range of from 4/6 to 8/2 (claim 1). The total amount of components (i) and (ii) may be 0.5 to 20% by weight, based on the total amount of the detergent composition (claim 10).

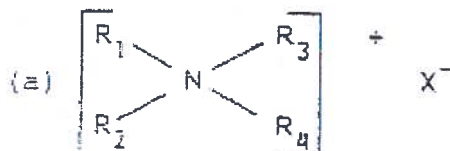
D2 includes 66 examples and 42 comparative examples and specifies altogether more than a hundred shampoo compositions. Examples 1 to 18 and comparative examples 1 to 14 are outside the present claim 1 since the cationic quaternary ammonium salt surfactants do not have the specified hydrophilic moiety. The amount of anionic surfactant falls within the defined range in only five examples (3, 14, 23, 44 and 57) and in eleven

comparative examples (3, 4, 10, 11, 17, 18, 24, 31, 32, 38 and 39) (compare tables 1 to 6).

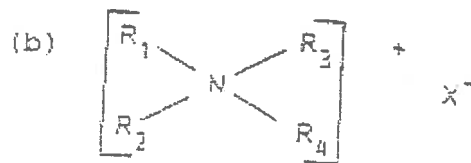
The detergent composition of D2 may also contain further components which include, within a list of 22 chemically quite different components, silicone oils (e.g., dimethyl phenyl siloxane; column 6, lines 13 to 36, in particular lines 14 and 15). However, in none of the examples is a silicone oil actually used, nor are any amounts indicated.

4.2 From the above it follows that a composition falling within the scope of the present claims can only be arrived at by a multiple selection within the disclosure of D2, including the numerous examples, the long list of optional components and the amounts of the components. There is no pointer in D2 to the particular combination of features now being claimed. To destroy novelty it is not sufficient to associate, with knowledge of the invention, the ingredients selected from many possibilities offered by a prior art document so as to create a composition of the patent in suit. On the contrary, it is necessary that the claimed combination should be derived directly and unambiguously from that document. Hence, D2 is not novelty-destroying for the claimed subject-matter.

4.3 D5 discloses a purified cationic surfactant material selected from the group consisting of



wherein R_1 is an aliphatic group having from about 8 to about 22 carbon atoms, R_2 , R_3 and R_4 are hydrogen or short chain alkyl groups having from about 1 to about 4 carbon atoms, and X is an anion selected from the group consisting of acetate, halogen, phosphate, nitrate, and alkyl sulfate radicals;



wherein R_1 , R_2 and R_3 are aliphatic groups having from about 8 to about 22 carbon atoms, R_4 is hydrogen or an alkyl group containing from about 1 to about 4 carbon atoms and X is as defined above;

- (c) salts of primary amines;
- (d) salts of secondary amines;
- (e) salts of tertiary amines;
- (f) and mixtures thereof, wherein said material is substantially free of solvents and water (claim 1).

Furthermore, D5 discloses a shampoo composition comprising:

- (a) from about 0.1% to about 5% of that purified cationic surfactant material;

- (b) from about 0.5% to about 5% of a siloxane conditioning compound;
- (c) from about 5% to about 50% of a synthetic anionic surfactant;
- (d) from about 0.4% to about 5% of a suspending agent; and
- (e) water (claims 6 to 12).

Claim 11 relates to a hair care composition comprising a purified cationic surfactant according to claim 1 wherein the material is purified by a process comprising the steps of:

- (a) washing an impure cationic surfactant material with an organic solvent;
- (b) apply suction to remove the filtrate; and
- (c) drying the solid.

The amines include stearamido propyl dimethyl amine, diethyl amino ethyl stearamide, dimethyl stearamine, dimethyl soyamine, soyamine, myristyl amine, tridecyl amine, ethyl stearylamine, N-tallowpropane diamine, ethoxylated (5 moles E.O.) stearylamine, dihydroxy ethyl stearylamine, and arachidylbehenylamine. Suitable amine salts include the halogen, acetate, phosphate, nitrate, citrate, lactate and alkyl sulfate salts. Such salts include stearylamine hydrochloride, soyamine chloride, stearylamine formate and N-tallowpropane diamine dichloride and stearamidopropyl dimethylamine

citrate. Preferred cationic surfactant materials include lauryl trimethyl ammonium chloride, stearyl trimethyl ammonium chloride, tri C₈₋₁₀ methyl ammonium chloride, tricetyl methyl ammonium chloride, tri C₁₃ amine and stearamido propyl dimethyl amine. Tricetyl methyl ammonium chloride is most preferred (page 2, lines 18 to 28).

Hair care compositions according to D5 may further comprise a silicone conditioning agent which imparts conditioning benefits to human hair. Non-volatile silicones are preferred. Specific silicone conditioning agents include polydimethylsiloxanes which may be unsubstituted or amino or alkoxy substituted (page 2, lines 42 to 54).

Examples II to VII of D5 describe conditioning shampoos containing an anionic surfactant (ammonium lauryl sulfate, ammonium laureth (3) sulfate, ammonium xylene sulfonate) in a total amount of 16 to 22 wt.-%, dimethicone fluid having a viscosity of 350 centistokes in an amount of 1.8 wt.-%, silicone gum in an amount of 1 wt.-%, a cationic surfactant (lauryl trimethyl ammonium chloride, tricetyl methyl ammonium chloride, tri C₈₋₁₀ methyl ammonium chloride, tri C₁₃ amine) in a total amount of 0.50 to 2.00 wt.-%. Dimethicone fluid is a dimethylpolysiloxane which is an insoluble, nonionic silicone fluid. The silicone gum can be SE-76 Silicone Gum sold by General Electric, which is specified in example VIII (page 9, line 27, footnote 1)).

The same types of silicone conditioning agents are used in the patent in suit, wherein a 40/60 weight ratio

blend of polydimethylsiloxane gum (GE SE76 of General Electric Co.) and a polydimethylsiloxane fluid having a viscosity of 350 centistokes are used as siloxane conditioning agents (all examples, footnote ** under the tables).

- 4.4 During the oral proceedings the question was discussed whether D5 disclosed directly and unambiguously all components of the claimed subject-matter, including the specified quaternary ammonium surfactants, in combination. To answer that question not only the chemical structures of the amine surfactants and quaternary ammonium surfactants should be considered, but also their possible combination. This question can however be left unanswered because in view of the information provided by D5, the presence of an inventive step cannot be accepted, as will be seen below.

Inventive step

Closest state of the art

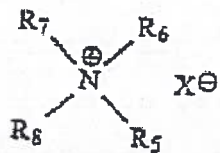
5. The patent in suit concerns shampoo compositions with silicone and cationic surfactant conditioning agents. Such compositions are known from D5, which the appellant regarded as the closest prior art document and from D2 and D1, which formed the starting point for the respondent and the opposition division.
- 5.1 According to D2, the applicability of then known shampoo compositions was unsatisfactory, since a "squeak phenomenon" in the hair was noticeable. The shampoo compositions of D2 thus aim at avoiding the so-

called "squeak phenomenon". According to D2, when anionic surfactants and cationic surfactants are present together in an aqueous solution, complexes are formed which precipitate and make the solution turbid. However, when mono alkyl quaternary ammonium salt surfactants and carboxylic acid salt anionic surfactants are combined, transparent complexes are formed which provide an excellent conditioning effect (column 2, lines 46 to 68). The shampoo compositions exemplified in D2 are said to provide excellent conditioning and rinsing and to be very good as regards irritation of the skin (examples 1 to 8, 10, 11, 21 to 28, 39).

5.2 D1 discloses a detergent cosmetic composition stable on storage comprising in a cosmetically acceptable aqueous medium:

- (a) a certain, specific soap,
- (b) a silicone cationic polymer consisting of a certain specific polysiloxane in which one or more of the silicon atoms are substituted with an aliphatic amino group,
- (c) a cationic surfactant, and
- (d) a cationic polymer chosen from a certain specific quaternary derivative of cellulose ethers, a copolymer of cellulose or cellulose derivative grafted with a certain specific water-soluble quaternary ammonium monomer and a certain specific cationic cyclopolymer (claim 1).

The cationic surfactants may be compounds of the formula:



in which:

- (1) R_5 and R_6 denote methyl, R_7 and R_8 being able, in this case, to have the following meanings:
 - (i) R_7 and R_8 denote a linear aliphatic radical, preferably an alkyl radical having from 12 to 22 carbon atoms, an aliphatic radical derived from tallow fatty acids, containing from 14 to 22 carbon atoms,
 - (ii) or alternatively R_7 denotes a linear aliphatic radical and preferably an alkyl radical having 14 to 22 carbon atoms, and R_8 denotes methyl or benzyl,
 - (iii) or alternatively R_7 denotes a (C_{14} - C_{22} alkyl)alkylaminopropyl radical and R_8 denotes a (C_{12} - C_{16} alkyl)alkyl acetate group,
 - (iv) or alternatively R_7 denotes a γ -gluconamidopropyl or C_{16} - C_{18} alkyl radical and R_8 denotes hydroxyethyl,

X^- denotes an anion such as a halide or methosulphate ion.

- (2) R_5 denotes an alkylamidoethyl and/or alkenylamidoethyl group in which the alkyl radical containing from 14 to 22 carbon atoms is derived from tallow fatty acids, and R_6 and R_7 form with the nitrogen atom a 2-alkyl (derived from tallow fatty acids)-4,5-dihydroimidazole heterocyclic system,

R_8 denotes methyl

X^- denotes a methosulphate ion.

- (3) R_5 , R_6 and R_7 form with the nitrogen atom an aromatic heterocyclic system, R_8 denotes a C_{14} - C_{18} alkyl radical and X^- denotes a halide ion (column 3, lines 39 to column 4, line 8).

Thus, these cationic surfactants are quaternary ammonium compounds which may include hydrophilic groups such as alkylamidopropyl, γ -gluconamidopropyl, alkylamidoethyl or alkenylamidoethyl or hydroxyethyl groups. One preferred compound in D1, which contains a hydrophilic group, is dimethyl-(γ -gluconamidopropyl) hydroxyethylammonium chloride (column 4, lines 14 to 16), used in example 17 of D1. According to D1, the combination of anionic surfactants with cationic compounds gives rise to products which are insoluble in water or unstable as a result of the incompatibility of the anionic surfactants with

the cationic compounds. The problem D1 seeks to solve is to provide a detergent cosmetic composition stable in this respect (column 1, lines 28 to 44). From example 1 of D1 it can be gathered that hair washed with the shampoo compositions and then rinsed, is very easy to disentangle. The dried hair is supple, shiny, soft and easy to style (column 8, lines 64 to 68).

- 5.3 Hair care compositions according to D5 comprise a non-volatile silicone which imparts conditioning benefits to human hair (see point 4.5 above). D5 aims at conditioning shampoos containing an anionic surfactant, a non-volatile silicone and a cationic quaternary ammonium surfactant in order to provide good hair conditioning and good cleaning properties (see point 4.5 above; examples II to VII and page 8, line 48).
- 5.4 According to the established jurisprudence, the closest prior art for the purpose of assessing inventive step is generally that which corresponds to a purpose or technical effect similar to the invention requiring the minimum of structural and functional modifications (Case Law, supra, I.D.3.1).
- 5.5 The patent in suit aims at shampoo compositions that provide excellent cleaning performance and excellent overall hair conditioning for hair damaged by permanent treatments, colour treatments and bleach treatments as well as for hair not subjected to such treatments (undamaged), so that the shampooed hair will have desirable levels of manageability, combability, softness and low or reduced levels of dryness (page 2,

lines 45 to 51), which effects are associated with the combination of cationic surfactants and nonionic silicone conditioning agents (page 3, lines 9 to 11).

5.6 D1, D2 and D5 all concern shampoo compositions providing a good conditioning effect to the hair without any restriction to the type of hair, i.e. these compositions are of general applicability and are therefore suitable for damaged hair as well as for undamaged hair. In D1 and D2 the compatibility between anionic and cationic surfactants is addressed as a main aspect, which problem is solved by using specific anionic surfactants. In D5 the purification of the cationic surfactants is of importance (page 1, lines 29 to 31), which purified cationic surfactants can be used in the patent in suit as well. Whilst D1 describes a silicone cationic polymer and D2 only mentions silicones as optional components, in D5 cationic and anionic surfactants and non-ionic, non-volatile silicones are used as conditioning agents within the claimed amounts in exemplified hair conditioning shampoos (D5, page 8, table). Thus, D5 discloses the combination of cationic surfactants and nonionic silicone conditioning agents as well as the conditioning effect of that combination on hair. Therefore, D5 is more closely related to the present problem and requires fewer modifications to the claimed composition than D1 and D2. For these reasons, D5 is regarded as the most suitable starting point for evaluating inventive step.

Problem and solution

6. During the oral proceedings the respondent stated that the problem vis-à-vis D5 was to improve the compatibility of the components of the shampoo as well as the conditioning performance.

According to the patent in suit, the cationic organic surfactants, when combined with the nonionic, non-volatile silicone conditioning agents as defined in claim 1 provide surprisingly good hair conditioning benefits for permed or other damaged hair having an increased anionic character, such as bleached or colour treated hair. These performance benefits are said to be especially important, because merely increasing the level of silicone conditioning agent in a particular shampoo to improve the conditioning of damaged hair can result in an undesirable level of silicone deposition. On the other hand, the cationic organic polymer by itself does not provide efficient conditioning of undamaged hair (page 3, lines 9 to 27).

- 6.1 In examples I to V, formulations of shampoo compositions are disclosed which provide excellent in-use cleaning and conditioning for both damaged and undamaged hair types (e.g. page 13, lines 32 and 33). However, there is no evidence in the patent in suit that the claimed compositions have a different effect on damaged or on undamaged hair as mentioned above (see point 6 above).
- 6.2 In the test report of 16 June 2003, the commercial two-in-one conditioning shampoo Pert Plus, which (unless otherwise indicated) contains 0.5 wt.-% tricetyl methyl

ammonium chloride (TCMAC) and 3 wt.-% silicone, was modified with 1,5 wt.-% methyl bis-hydrogenated tallow amide ethyl 2-hydroxyethyl ammonium methyl sulfate (Varisoft) or with 1.5 wt.-% Varisoft only (no TCMAC present). Since the amount of Varisoft is considerably higher than for the comparison surfactant TCMAC, no proper comparison can be made and no conclusions can be drawn from the results. The same considerations apply to the compatibility tests of that test report.

From the above it follows that even if the comparative tests properly represented the compositions of D5, which is questionable, there is no evidence on file that an improved technical effect of the claimed compositions vis-à-vis the shampoo compositions of D5 was achieved.

- 6.3 In view of the above, the technical effects shown in the patent in suit only justify the formulation of the problem to be solved as providing an alternative shampoo composition having good cleaning performance and overall hair conditioning for damaged as well as undamaged hair.
- 6.4 In order to solve that problem, the use of an insoluble, nonionic, non-volatile silicone fluid is proposed in combination with 0.2 to 10% by weight of a soluble, cationic quaternary ammonium conditioning surfactant as defined in claim 1 of the main request. From the examples it can be seen that the problem defined above is effectively solved by the claimed measures.

Obviousness

7. It remains to be decided whether the claimed subject-matter is obvious having regard to the documents on file.
- 7.1 From D5 the combination of a cationic surfactant and a nonionic non-volatile silicone in shampoos to provide a good conditioning effect is known. D5 also mentions cationic amino conditioning surfactants having a single cationic nitrogen atom and a hydrophilic moiety such as steramidopropyldimethyl amine citrate and salts of ethoxylated (5 moles E.O.) stearylamine and dihydroxy ethyl stearylamine (page 2, lines 18 to 24). Furthermore, in D5 amino salts and quaternary ammonium compounds are used as alternatives. However, that document does not mention quaternary ammonium compounds having the hydrophilic moieties now being specified.
- 7.1.1 D2 discloses shampoo compositions containing quaternary ammonium salt cationic surfactants according to formula I to III, which may or may not contain hydrophilic groups, as alternative options. The surfactant of D2 not containing hydrophilic groups (formula I) falls within the definition of the quaternary ammonium compounds of component (a) of claim 1 in D5. Lauryl trimethyl ammonium chloride is mentioned as a preferred compound (D5, page 2, line 25) and actually used in examples IV and V. Since D2 mentions cationic surfactants with or without hydrophilic groups as alternative possibilities for use in shampoo compositions, the skilled person, looking for alternative shampoo compositions to those of D5, would expect that the use, in the shampoo of D5, of cationic

conditioning agents containing hydrophilic groups as described in D2 would result in a shampoo having the desired conditioning properties. Thus, in order to provide an alternative shampoo composition, it was obvious to replace the quaternary cationic surfactant according to D5 by a quaternary cationic surfactant having hydrophilic moieties as represented by formulae II and III in D2.

7.1.2 Moreover, in D5 amino salts having hydrophilic moieties are used as alternatives to the quaternary ammonium compounds (point 4.5 above), so that it is also obvious to use the corresponding quaternary ammonium compounds of D2 instead.

7.1.3 For the above reasons, the claimed subject-matter of the main request lacks an inventive step (Article 56 EPC).

7.2 Since according to established case law it is sufficient to show that the claimed subject-matter is obvious when starting from the most appropriate starting point, it is neither necessary nor adequate to evaluate inventive step for a further less appropriate starting point, which the respondent considers should be taken into account (Case Law, *supra*, I.D.3.4).

Auxiliary request

8. The auxiliary request, which was filed during the oral proceedings, combines the features of claim 1 of the main request with those of claim 3 as granted. Thus, at this very late stage of the proceedings, the appellant and the board were confronted with claims that had not

been the subject of the decision of the opposition division. In addition, the issue of the compatibility of the components of the shampoo composition was raised at a very late stage of the appeal proceedings and it remained open as to how far this property might contribute to the presence of an inventive step in the auxiliary request.

Although the appellant suggested that the board should take a final decision on the substantive issues, the board, considering the new request and the fact that new considerations (compatibility) had arisen, and in order to give the parties the opportunity to have the case judged by two instances, considers it appropriate that this case be remitted to the opposition division and abstains from assessing formal and substantive issues related to the auxiliary request.

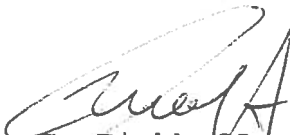
Order

For these reasons it is decided that:


1. The decision under appeal is set aside.
2. The case is remitted to the department of first instance for further prosecution on the basis of the set of claims according to the auxiliary request submitted during the oral proceedings.

The Registrar:

The Chairman:


C. Eickhoff




R. Teschemacher

