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**Datasheet for the decision  
of 21 February 2017**

**Case Number:** T 1260/15 - 3.3.07

**Application Number:** 05853907.3

**Publication Number:** 1924237

**IPC:** A61K8/02, A61K8/34, A61K8/37,  
A61K8/41, A61K8/46, A61Q5/02

**Language of the proceedings:** EN

**Title of invention:**  
SHAMPOO CONTAINING A GEL NETWORK

**Applicant:**  
The Procter & Gamble Company

**Relevant legal provisions:**  
EPC Art. 56

**Keyword:**  
Inventive step - (no)



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Case Number: T 1260/15 - 3.3.07

**D E C I S I O N**  
**of Technical Board of Appeal 3.3.07**  
**of 21 February 2017**

**Appellant:** The Procter & Gamble Company  
(Applicant) One Procter & Gamble Plaza  
Cincinnati, OH 45202 (US)

**Representative:** Briatore, Andrea  
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**Decision under appeal:** **Decision of the Examining Division of the European Patent Office posted on 23 December 2014 refusing European patent application No. 05853907.3 pursuant to Article 97(2) EPC.**

**Composition of the Board:**

**Chairman** A. Uselli  
**Members:** R. Hauss  
Y. Podbielski

## **Summary of Facts and Submissions**

I. The appeal lies from the decision of the examining division, announced on 12 November 2014 and posted on 23 December 2014, refusing European patent application No. 05 853 907.3.

II. The documents cited in the course of the examination and appeal proceedings include the following:

D1: WO 03/101 418 A1

D4: WO 01/78657 A1

D6: Experimental Data Report (April 2015)

III. The decision under appeal was based on a main request and eight auxiliary requests.

The examining division found that the subject-matter of claim 1 of the main request and of claim 1 of the first auxiliary request lacked novelty over the disclosure of document D1 (Article 54 EPC).

The subject-matter of claim 1 of the second auxiliary request lacked inventive step (Article 56 EPC).

Document D1, like the application itself, related to conditioning shampoos comprising a gel network phase and was therefore regarded as the closest prior art. The shampoo composition according to claim 1 of the second auxiliary request differed from the compositions of D1 in the mandatory presence of a specific fatty amphiphile selected from fatty amides and fatty alkoxyated amides. The objective technical problem was the provision of an alternative shampoo composition. The option of including a fatty amide or fatty alkoxyated amide in the gel network phase in order to solve that technical problem would have been obvious to the person skilled in the art from the teaching of document D1 alone or in combination with document D4.

Claim 1 of each of the third to eighth auxiliary requests contained subject-matter going beyond the content of the application as filed (Article 123(2) EPC).

IV. The applicant (appellant) lodged an appeal against that decision.

With the statement setting out the grounds of appeal the appellant submitted a main request (identical to the former second auxiliary request considered in the decision under appeal), an auxiliary request and a test report presenting experimental data (D6).

Claim 1 of the auxiliary request reads as follows:

*"1. A shampoo composition comprising:*

*a) from about 5 % to about 50 % of one or more deterative surfactants, by weight of said shampoo composition;*

*b) a dispersed gel network phase comprising:*

*i) at least about 0.05 % of one or more fatty amphiphiles, by weight of said shampoo composition, wherein said fatty amphiphile, or a mixture of two or more of said fatty amphiphiles, has a melting point of at least 27°C;*

*ii) at least about 0.01 % of one or more secondary surfactants, by weight of said shampoo composition; and*

*iii) water; and*

*c) at least about 20 % of an aqueous carrier, by weight of said shampoo composition;*

*wherein said dispersed gel network phase is pre-formed; wherein the fatty amphiphiles are selected from fatty amides."*

- V. In a communication issued in preparation for oral proceedings and advising the appellant of the board's preliminary opinion, i.a. the following points were mentioned: Since it had not been conclusively shown that the claimed composition provided any improvement or advantage in comparison with the compositions of document D1, the objective technical problem could be seen in the provision of alternative conditioning shampoo compositions. In order to solve that technical problem, the person skilled in the art aware of the teaching of documents D1 and D4 would consider adding fatty amide to the fatty alcohol, or replacing some or all of the fatty alcohol in the gel network according to document D1 with a fatty amide.
- VI. Oral proceedings before the board took place on 21 February 2017. The appellant withdrew its main request and relied on the former auxiliary request as its sole request.
- VII. The appellant's arguments may be summarised as follows:
- Document D1 could be regarded as the closest prior art. That document taught the use of fatty-alcohol-based gel networks in shampoo compositions as the essential component for providing conditioning benefits for wet and dry hair while not interfering with cleansing efficacy. The shampoo composition claimed differed from those disclosed in the examples of D1 in there being a fatty amide in the gel network.
- The samples tested according to test report D6 were sufficiently representative of the invention and the closest prior art D1 to provide a meaningful comparison of the effect of different gel networks in highly similar detergent bases for shampoos. The data obtained showed that formulations containing a fatty amide gel

network provided a performance space which was different compared to both non-gel-network formulations and formulations containing a fatty alcohol gel network. The gel networks with fatty amides provided better wet and dry conditioning than a system without a gel network component, but less heavy conditioning than the gel networks with fatty alcohols. Hence, the shampoos according to the invention had conditioning properties which were suitable for a different consumer target group.

Thus the objective technical problem to be solved was the provision of conditioning shampoos with a different range or scope of conditioning properties, rather than the provision of alternative conditioning shampoos.

Document D1 itself did not teach the use of fatty amides as components of the gel network. Nor would the person skilled in the art have consulted document D4, which concerned skin moisturisers, in order to solve the technical problem of varying the conditioning properties of a shampoo formulation (or, for that matter, the technical problem of providing alternative shampoos). It should, moreover, be kept in mind that it was generally difficult to formulate multi-component systems. Even if D4 were consulted, it contained no teaching about the behaviour and suitable components of gel networks when dispersed in a deterative shampoo composition, or about the hair-conditioning benefits of gel networks.

VIII. The appellant requested that the decision under appeal be set aside and that a patent be granted on the basis of the first auxiliary request filed with the statement of grounds of appeal, which thereby became the appellant's main request (the sole pending request).

## Reasons for the Decision

1. Inventive step (Articles 52(1) and 56 EPC)

### *Present application*

1.1 The present application concerns conditioning shampoo compositions. It states that prior-art shampoos, typically containing cationic polymers as conditioning agents, are good for delivering wet-hair conditioning, but are not regarded as satisfactory in respect of dry hair feel. On that basis, the application aims to provide a conditioning shampoo which offers improved conditioning for dry hair while not interfering with cleansing efficacy and also providing good wet-hair conditioning (see the application as published: WO 2007/040571 A1, page 1, paragraph 1 and page 1, paragraph 6 to page 2, line 3).

1.2 Besides a deterative surfactant and an aqueous carrier, the shampoo compositions according to the present application also contain a dispersed "gel network" phase which mandatorily comprises a "fatty amphiphile", a secondary surfactant and water. The dispersed gel network phase is included to provide conditioning benefits.

The term "gel network" refers to a lamellar or vesicular solid crystalline phase (see the application as published, page 9, paragraph 4).

The term "fatty amphiphile" refers to a compound having a hydrophobic tail group which is an alkyl, alkenyl (containing up to 3 double bonds), alkyl aromatic, or branched alkyl group of C<sub>12</sub>-C<sub>70</sub> length, and a hydrophilic head group which does not make the compound water-soluble, wherein the compound also has a net

neutral charge at the pH of the shampoo composition (see the paragraph bridging pages 11 and 12, and page 12, bottom paragraph, of the application as published).

According to present claim 1, the gel network phase must contain at least one fatty amphiphile selected from fatty amides.

*Starting point in the prior art*

- 1.3 Document D1 was considered to be the closest prior art by both the examining division and the appellant. Inventive step was assessed starting from the working examples of document D1 (pages 29 to 32). The board sees no reason to select a different starting point.
- 1.4 Document D1 seeks to solve the same technical problem as the present application, viz. to provide a conditioning shampoo with improved conditioning benefit for dry hair (compared to compositions relying on cationic conditioning polymers), while also providing good conditioning when the hair is wet, and not interfering with cleansing efficacy (see D1: page 1, paragraphs 6 and 7; essentially identical to page 1, paragraph 6 to page 2, line 3 of the present application).
- 1.5 According to D1, the solution to that problem consists in a shampoo composition comprising a) from about 5 to about 50% by weight of a deterative surfactant, b) at least about 0.05% by weight of a gel network based on fatty alcohol, and c) at least about 20.0% by weight of an aqueous carrier (see D1: claim 1; page 2, paragraph 2; page 6, third full paragraph).

The gel network is intended to be deposited on the hair fibres and is essential for achieving the desired



hair-conditioning benefits (see D1: page 2, paragraph 5; page 11, lines 1 to 4).

D1 also mentions that fatty alcohol gel networks were well known, as they had been used for years in cosmetic creams and hair conditioners (see D1: page 6, third full paragraph).

According to the "examples" section of document D1 (see pages 29 to 32), conditioning shampoo compositions were prepared in the following manner:

i) A surfactant solution pre-mix comprising a deterative surfactant (ammonium laureth-3 sulphate) and further components was formed (see D1: page 29, bottom paragraph to page 30, line 3).

ii) Separately, a gel network was formed from fatty alcohols (cetyl and stearyl alcohol), a cationic surfactant and water (see D1: page 30, lines 4 to 8).

iii) The pre-formed gel network phase was combined with the surfactant pre-mix (see D1: page 30, line 9).

iv) The mixture thus obtained was combined with further components and the remainder of the water, with ample agitation to provide a homogeneous mixture (see D1: page 30, second full paragraph).

The example shampoo formulations of document D1 were thus prepared in basically the same manner as those according to the present application, in a process involving the formation of a surfactant solution pre-mix and a gel network pre-mix, the combination of those pre-mixes and the addition of further components including water, with ample agitation (see the application as filed, page 54, paragraphs 1 and 2 and page 50, second full paragraph).

*Distinguishing technical feature*

- 1.6 The shampoo compositions according to the examples of D1 (see table on page 31) all contain 16% by weight of deterative surfactants (10% or 11.7% being ammonium laureth-3 sulphate) and more than 20% by weight of an aqueous carrier. This corresponds to features a) and c) of present claim 1. Thus, any technical feature distinguishing the claimed subject-matter from the example compositions of D1 must result from a difference in respect of the dispersed gel network phase.
- 1.7 In the decision under appeal, the examining division discussed two separate approaches for comparing the claimed subject-matter to the shampoo compositions disclosed in the working examples of D1.
- 1.7.1 According to one approach, favoured by the appellant, the only gel network in the example compositions of D1 is the component which is explicitly identified in that document as a gel network. Thus the technical features of the gel network phase b) defined in claim 1 are to be compared only to those of the gel network pre-mix prepared according to page 30, lines 4 to 8 of D1 (see above: point 1.5, step ii).
- 1.7.2 According to a second approach, favoured by the examining division, it is implicit in D1 that the surfactant solution pre-mix, due to its components and manner of preparation, must likewise be a gel network (see above: point 1.5, step i). Thus, the technical features of the gel network phase b) defined in claim 1 must also be compared to those of the surfactant solution pre-mix of document D1.

- 1.8 The appellant objected to the second approach and disputed that the surfactant solution pre-mix of D1 was a gel network.
- 1.9 In the following assessment, the board uses the first approach. In view of the outcome (see point 1.24 below), there is no need to examine the merit of the second approach.
- 1.10 It will thus be assumed that the gel network prepared according to page 30, lines 4 to 8 of document D1, which consists exclusively of fatty amphiphiles in the form of fatty alcohols (cetyl and stearyl alcohol), a secondary surfactant which is cationic and water, is the only dispersed gel network phase present in the shampoo compositions described in the examples of document D1.
- 1.11 Accordingly, the mandatory presence of at least one fatty amphiphile selected from fatty amides in the dispersed gel network phase distinguishes the shampoo composition of present claim 1 from the example compositions of document D1.
- 1.12 The appellant did not rely on any other technical feature in support of inventive step.

*Technical problem and solution*

- 1.13 The technical problem stated in the present application is identical to that addressed in D1 (see point 1.4 above). Since it has not been shown that compositions according to present claim 1 provide any improvement or advantage over the compositions described in document D1, the board considers that the objective technical problem starting from the teaching of D1 is

the provision of alternative conditioning-shampoo compositions.

1.14 The comparative tests submitted by the appellant do not provide a basis for the formulation of a more ambitious technical problem, since the information presented in test report D6 is not conclusive, for the following reasons:

1.14.1 If comparative tests are chosen to demonstrate inventive step on the basis of an improved effect, the nature of the comparison must be such that the alleged advantage or effect is convincingly shown to have its origin in the distinguishing feature of the claimed subject-matter compared with the closest prior art (see Case Law of the Boards of Appeal of the European Patent Office, 8th edition 2016, I.D.10.9). The following criteria are relevant in this context:

- (a) The comparative sample must be adequately representative of the closest prior art, and the "inventive" sample must be adequately representative of the claimed subject-matter.
- (b) Since a technical effect cannot be convincingly linked to a particular feature if several features are varied in the comparison, only one technical feature should be varied.
- (c) Furthermore, it must be credible that the effect is obtained over the entire scope claimed for it to be taken into account in determining the objective technical problem.

1.14.2 With regard to criterion (a), the comparative compositions of test report D6 (compositions No. 1, 2, 3, 9 and 10) do not, in fact, reproduce the example compositions according to document D1, in which a

cationic secondary surfactant was used in a fatty-alcohol-based gel network phase. Compositions 9 and 10 lack a gel network component, while compositions 1 to 3 contain a fatty-alcohol-based gel network with an anionic secondary surfactant (sodium laureth-3 sulphate) instead of a cationic one. It cannot be excluded that cationic and anionic secondary surfactants, due to their different charge, may give rise to different properties of the gel network.

As far as criterion (b) is concerned, more than one technical feature was varied in the comparison, affecting both the qualitative and the quantitative composition of the gel network component. The fatty-alcohol-based gel networks of comparative samples 1 to 3 contained only fatty alcohols as the fatty amphiphiles, combined with 1.10% or 1.30% of secondary surfactant, while the gel networks containing a fatty amide component as required in present claim 1 (samples 4 to 8 of D6) each contained 3.3% of secondary surfactant. Thus it is not certain that any technical effect observed was actually caused by there being a fatty amide component in the gel network phase.

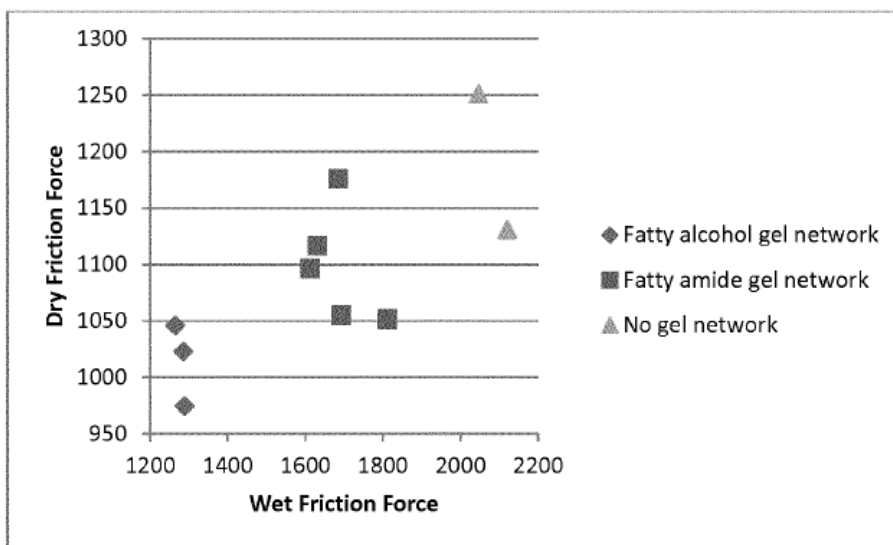
As to criterion (c), the tests described in D6 do not cover variations across the scope claimed, with regard to the choice of secondary surfactant and to possible variations in the composition of fatty amphiphiles. The definition of present claim 1 encompasses a large variety of secondary surfactants. This is illustrated by claim 5 (dependent on claim 1), according to which the secondary surfactant may be selected from the group consisting of cationic, anionic or nonionic surfactants and mixtures thereof. Furthermore, it was not contested by the appellant that claim 1 also covers embodiments in which the gel network phase is predominantly based on fatty alcohol but additionally comprises a low

proportion of fatty amide (as little as 0.05% by weight of the shampoo). These relevant variations are not covered by the comparative tests.

Since the comparative tests presented in D6 do not meet criteria (a), (b) and (c) mentioned in point 1.14.1 above, the test results cannot be regarded as conclusively showing any improvement in comparison with the example shampoo compositions of D1.

1.15 Moreover, the conditioning effects on wet and dry hair switches obtained with the shampoo samples containing fatty amides in the gel network phase were, in any case, not better than the conditioning effects obtained with the samples containing a fatty-alcohol-based gel network phase (see D6: pages 4 and 5):

Technical Performance:



Note: Lower scores = better conditioning

1.16 The appellant contended that these results showed at least that formulations incorporating a fatty amide gel network provided a performance space which was different from that provided by formulations containing a fatty alcohol gel network or by formulations not

including a gel network, and which would be preferred by certain consumer groups for whom the conditioning effect of fatty alcohols might be too strong.

- 1.16.1 This argument must fail, if only because the comparison cannot provide conclusive results for the reasons already given in point 1.14.2 above.
- 1.16.2 Furthermore, according to the graph reproduced above from D6, treatment with a shampoo containing a fatty amide gel network may well provide the same conditioning benefit to dry hair as treatment with a shampoo containing a fatty alcohol gel network (see the three compositions providing a dry hair friction value of 1050 gram force). Thus the appellant's argument appears to be based on an alleged difference in the conditioning benefit for wet hair attainable with fatty amides versus fatty alcohols.

Irrespective of whether it has indeed been shown that there is no significant overlap of the wet-conditioning properties achievable with fatty amides versus fatty alcohols, such a technical effect is in any case not mentioned in the original application. According to the application as published, fatty amphiphiles belonging to a variety of different chemical classes, including fatty alcohols, are all suitable for use in the gel network phase (see claim 1 and page 11, bottom paragraph to page 24, second full paragraph). Fatty amides are not presented as particularly preferred, or as providing any specific advantage over fatty alcohols. A subsequent finding of a difference in wet-conditioning performance for different types of fatty amphiphiles cannot therefore serve as the basis for an invention allegedly made at the filing date of the application.

- 1.17 The board accepts that the technical problem identified in point 1.13 above is solved by the composition defined in present claim 1, which, due to its mandatory components, may be expected to provide both deterative and conditioning benefits.

*Obviousness of the solution*

- 1.18 It remains to be established whether the incorporation of a fatty amide into the dispersed gel network phase would provide an obvious alternative to the example shampoo compositions described in document D1, given the cited prior art.
- 1.19 The person skilled in the art looking for an alternative shampoo formulation would investigate components which can be used in the conditioning shampoo, either in the aqueous deterative phase or as components of the dispersed gel network. To that end, the person skilled in the art would also consult documents relating to physiologically acceptable gel networks.
- 1.20 This includes document D4, which concerns moisturising skin care compositions based on gel networks (see D4: claim 1). The gel networks (termed "liquid crystal gel networks" in D4) comprise water, a cationic surfactant (termed "cationic emulsifier" in D4) and a "low HLB non-ionic emulsifier" which is preferably a fatty alcohol, fatty acid or glyceryl ester (see D4: page 11, lines 32 to 33). The "low HLB non-ionic emulsifiers" mentioned in document D4 thus correspond to the fatty amphiphiles of the present application. According to document D4, these compounds not only have a surface-active function, but also impart emolliency to the skin (see D4: page 5, lines 6 to 10).



Document D4 teaches furthermore that fatty alcohols can be replaced by other low-HLB non-ionic emulsifiers capable of forming gel networks, in particular fatty acid amides and ethoxylated fatty acid amides (see D4: page 9, line 20 to page 10, line 29, more specifically page 10, line 24), and that mixtures of different low-HLB emulsifiers can be employed to form the gel network (see D4: page 12, lines 29 to 30).

- 1.21 It can thus be derived from D4 that the fatty-alcohol-based gel network component of D1 may be modified by employing known equivalents of fatty alcohols as disclosed in D4. Without exercising inventive skill, the person skilled in the art would accordingly consider adding fatty amide to the fatty alcohol, or replacing part or all of the fatty alcohol in the gel network of D1 with a fatty amide, in order to provide alternative shampoo formulations.
- 1.22 As to the appellant's argument that the person skilled in the art would not have consulted document D4 because it concerned skin creams rather than deterative shampoo compositions, the board observes that it was a known fact that gel networks had previously been used in both skin care and hair care products, as also mentioned in document D1 (page 6, third full paragraph). The person skilled in the art could therefore be expected to look for general information on gel networks and their components in all documents describing gel networks and their application to keratinic materials (skin and hair).
- 1.23 The appellant also argued that document D4 would not have been consulted because it described compositions having a gel network structure throughout (see the examples of D4), rather than teaching the incorporation of dispersed gel networks into aqueous shampoo

formulations containing deterative surfactants. If document D4 had nevertheless been consulted, the person skilled in the art would still not have tried replacing the fatty alcohol in the gel network component of D1 with the equivalents mentioned in D4, for lack of a reasonable expectation of success in view of the difficulties typically encountered in the formulation of multi-component systems.

The board does not find these arguments convincing, for the following reasons:

Document D1, which is the starting point of the invention, already provides the information that gel networks can be dispersed successfully in aqueous deterative shampoo formulations and will be deposited on hair. Since document D1 is exclusively concerned with conventional fatty alcohol-based gel networks, it remains silent about the feasibility of replacing all or part of the fatty alcohol with similar or equivalent components.

On the other hand, document D4 teaches that fatty amides are equivalent to fatty alcohols in that they are equally capable of forming gel networks or being incorporated into gel networks.

Based on that teaching, and the close structural similarity of fatty alcohols and fatty amides, the person skilled in the art would expect the same or similar behaviour from those components and would thus have sufficient incentive to try modifying the gel network component of document D1 by incorporating fatty amides. The prior art does not contain any specific piece of information which could constitute a disincentive or technical prejudice discouraging the skilled person from trying that approach. In particular, there is no information in D1 suggesting

that a shampoo composition containing a dispersed gel network would only be stable or fulfil its intended function (dispersal in the aqueous deterative phase and hair conditioning) if the gel network was based on fatty alcohol.

The following observations may be added with regard to expected hair conditioning benefit:

As conceded by the appellant, the wording of present claim 1 does not exclude embodiments in which the gel network is predominantly based on fatty alcohols but contains at least 0.05% fatty amide. In such cases the fatty amide would not necessarily be required to provide hair-conditioning properties.

Moreover, due to the similar structure of fatty alcohols and fatty amides and in the absence of evidence to the contrary, the person skilled in the art would in any case have expected the fatty amide to contribute to the hair-conditioning properties if some or all of the fatty alcohol were replaced with fatty amide. This expectation is further supported by the statement in D4 that the low-HLB non-ionic emulsifiers "provide emolliency to the skin", i.e. they are deposited on a keratinic substrate to provide a conditioning benefit.

- 1.24 For these reasons, the board considers that the subject-matter of claim 1 of the present request does not involve an inventive step within the meaning of Article 56 EPC.

**Order**

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

The appeal is dismissed.

The Registrar:

The Chairman:



S. Fabiani

A. Usuelli

Decision electronically authenticated