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**Datasheet for the decision
of 15 September 2016**

Case Number: T 1107/13 - 3.3.07

Application Number: 03741869.6

Publication Number: 1509198

IPC: A61Q5/02, A61K8/34

Language of the proceedings: EN

Title of invention:
SHAMPOO CONTAINING A GEL NETWORK

Patent Proprietor:
THE PROCTER & GAMBLE COMPANY

Opponents:
Henkel AG & Co. KGaA
Beiersdorf AG

Relevant legal provisions:
EPC Art. 56

Keyword:
Inventive step - (yes)



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Case Number: T 1107/13 - 3.3.07

D E C I S I O N
of Technical Board of Appeal 3.3.07
of 15 September 2016

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Decision under appeal: **Decision of the Opposition Division of the European Patent Office posted on 1 March 2013 rejecting the opposition filed against European patent No. 1509198 pursuant to Article 101(2) EPC.**

Composition of the Board:

Chairman	D. Semino
Members:	A. Usuelli
	P. Schmitz

Summary of Facts and Submissions

- I. European patent No. 1 509 198 was granted with 10 claims.

Claim 1 of the patent read as follows:

"1. A shampoo composition comprising:

- a) from 5 to 50 weight percent of a deterative surfactant,
- b) at least 0.05% by weight of a fatty alcohol gel network, said network comprising fatty alcohols and surfactant at a weight ratio of 2:1 to 40:1; wherein said network is a solid crystalline gel network and
- c) at least 20.0 weight percent of an aqueous carrier."

The further independent claims 8 and 9 of the patent related respectively to a method of treating hair by administering the composition according to claim 1 and a process for preparing said composition.

- II. Two oppositions were filed against the patent. The following documents were among those cited during the opposition proceedings:

D1: WO01/17490

D2: WO01/17492

D3: US 5,034,218

D4: WO02/22091

D6: DE 698 05 528

D8: WO01/39735

D10: Data report filed by the patent proprietor with letter of 10 January 2013 as D9.

- III. By decision posted on 1 March 2013 the opposition division rejected the oppositions.

The opposition division came to the conclusion that the patent met the requirements of Article 54 EPC.

Document D8 was considered to represent the closest prior art for the assessment of inventive step. The shampoo defined in claim 1 of the patent in suit differed from the compositions of document D8 on account of the feature concerning the ratio fatty alcohol/surfactant and due to the presence of a solid crystalline gel network. The technical problem was defined as "how to provide an alternative shampoo composition". Lamellar gels comprising a fatty alcohol and a surfactant in a weight ratio of ca. 1:1 to 20:1 were disclosed in D1. However, the skilled person seeking to solve the technical problem would have had no reason to consider document D1, which concerned hair-conditioning products. The subject-matter of claim 1 of the patent was therefore inventive.

The opposition division came to the same conclusion also on the basis of an alternative approach starting from document D4 as the closest prior art.

- IV. Opponent I (hereinafter appellant-opponent) lodged an appeal against that decision. With the statement setting out the grounds of appeal filed on 11 July 2013, it submitted the following document:

D12: Journal of the Society of Cosmetic Chemists, 41, 1-22, 1990.

- V. By letter dated 27 September 2013 the patent proprietor (hereinafter respondent) requested that the appeal be dismissed or that the patent be maintained on the basis

of one of eight auxiliary requests submitted with the same letter.

With letter of 12 August 2016 the respondent filed six new auxiliary requests replacing the auxiliary requests on file and submitted the following document:

D13: Experimental report

- VI. Oral proceedings were held on 15 September 2016.
- VII. The appellant presented several alternative approaches for the assessment of inventive step considering documents D1 to D4, D6 and D8 as possible closest prior art. At the oral proceedings it eventually focused its objection on arguments starting from document D8 as the closest prior art.

It argued that D8 disclosed a shampoo containing *inter alia* an anionic surfactant, a silicone emulsion and a high melting point component such as a fatty alcohol. The shampoo provided conditioning benefits such as ease to comb and fly-away control. On page 20, it was mentioned that the fatty alcohol formed a gel with the cationic agent included in the silicone emulsion. The experimental data disclosed in D13, showing that the composition of example 4 of D8 did not contain a gel, were not relevant since this composition had a cationic surfactant concentration that was too low to form a gel network. In the composition of example 2 of D8, the amount of anionic surfactant and the ratio of the fatty alcohol to cationic surfactant were included in the ranges defined in claim 1 of the patent. There was no indication as to whether the composition of this example contained a solid crystalline gel network. This was the sole distinguishing feature of claim 1 of the

patent over the composition of example 2 of D8. There were no data comparing the composition of the patent with the composition of D8. The technical problem was to be seen in the provision of an alternative shampoo composition. Document D1 related to hair-care compositions, such as shampoos, containing a gel matrix. The skilled person would have considered this document in combination with D8 because it addressed the same problem, namely providing hair-care compositions with conditioning properties. The skilled person would have modified the shampoo of D8 by including a gel matrix as disclosed in D1. The subject-matter of the patent was therefore obvious.

VIII. The respondent's arguments on inventive step, starting from document D8 as the closest prior art can be summarised as follows:

D8 related to the provision of a shampoo providing improved hair volume while not compromising conditioning benefits. This document mentioned on page 20 the presence of a gel network. However no other passages of D8 referred to the presence of said gel network, and there was no indication about how to prepare it. The experiment disclosed in document D13 demonstrated that the shampoos of D8, contrary to the statement on page 8, did not contain any solid crystalline gel network. The fact that in the composition tested in D13 the amount of alcohol was very high compared to the amount of cationic surfactant did not affect the validity of this conclusion, since a high alcohol concentration should have helped to form a gel network. The composition of the patent in suit differed from the shampoo of D8 on account of the presence of a solid crystalline gel network. The experimental report D10 showed that a composition

according to the patent in suit exhibited both lower wet friction and dry friction than the composition of example 1 of D4. This composition was very similar to that of example 11 of D8. Thus, the experiments of D10 were indirect evidence that the shampoo of the patent was an improvement over the shampoo of D8. The technical problem was therefore to be seen in the provision of a conditioning shampoo resulting in a reduction of the wet and dry friction. The most relevant documents disclosing hair-care compositions containing a solid crystalline gel network were documents D1 and D2. However, these documents disclosed only conditioning compositions, so the skilled person seeking to prepare a new shampoo had no reason to consider them. Moreover, he would not have known whether a solid crystalline gel network would have been stable also with the components of a shampoo. The subject-matter of the patent therefore met the requirements of inventive step.

- IX. The appellant requested that the decision under appeal be set aside and that the patent be revoked.

- X. The respondent requested that the appeal be dismissed or, alternatively, that the decision under appeal be set aside and that the patent be maintained on the basis of one of auxiliary requests 1 to 6 filed with letter of 12 August 2016.

Reasons for the Decision

Main request (patent as granted)

1. Novelty

During the appeal proceedings the appellant did not dispute the conclusion of the opposition division as to the novelty of the patent and the Board sees no reason to reopen the issue.

2. Inventive step

2.1 The invention addresses the problem of providing a conditioning shampoo which can provide improved conditioning benefit for dry hair, while not interfering with the cleansing efficacy (see paragraph [0007] of the patent in suit). As a solution to this problem, the patent proposes a shampoo characterised *inter alia* by containing a fatty alcohol solid crystalline gel network.

2.2 Closest prior art

2.2.1 Problems similar to those considered in the patent in suit are addressed in documents D8 and D4, which were regarded in the appealed decision as suitable starting points for the assessment of inventive step. D8 refers on page 2 (lines 13 to 16) to the problem of providing a shampoo having good conditioning properties such as manageability, ease to comb and fly-away control. D4 indicates on page 3 (first complete paragraph) that it remains desirable to provide further hair-conditioning shampoo compositions.

The Board considers document D8 as the closest prior art, because it is the sole document disclosing shampoos and mentioning the presence of a gel network in the compositions (page 20, line 24 to 26).

- 2.2.2 During the oral proceedings the parties agreed to present their arguments starting from document D8 as the closest prior art. The appellant maintained however also the alternative approaches to inventive step submitted in writing and starting from D1 to D4 or D6 as the closest prior art.

In the Board's view, none of these documents is as promising as D8 as a springboard for the assessment of inventive step.

Documents D1 and D2 relate to hair-care compositions providing conditioning properties such as reduced fly-away volume, lubricity and smoothness (D1, page 3, lines 8 to 12; D2, page 1, lines 27 to 30). The products described in examples 1 and 2 of D1 and in examples 1 to 3 of D2 are hair-conditioning compositions. D1 furthermore describes in example 3 six compositions defined as "hair care compositions". These products too appear to be conditioning compositions in that they do not contain sufficient amounts of the detergent surfactants that characterise shampoos. Thus, D1 and D2 do not qualify as a suitable starting point for the assessment of inventive step because they do not disclose any shampoo composition.

Document D3 relates to the provision of conditioning shampoos (column 1, lines 9 to 16). However, this document is mainly focused on issues of stability of the composition (column 2, lines 49 to 58). Moreover,

it makes no mention of the presence of a gel phase in the composition.

Document D6 is also primarily concerned with problems of stability of compositions containing anionic and cationic surfactants (page 2, fourth paragraph). It furthermore addresses the problem of providing shampoos containing a biodegradable conditioning agent at minimal cost. In this case too, there is no mention of the presence of a gel phase in the composition.

As discussed above, the disclosure of D4 is considered less close to the subject-matter of the patent than the disclosure of D8.

2.2.3 The shampoo compositions of examples 1 to 12 of D8 contain *inter alia* anionic surfactants (ammonium laureth sulfate and ammonium lauryl sulfate) and water, which correspond respectively to features a) and c) of claim 1 of the patent in suit. It was not disputed that also the quantities fall in the ranges of claim 1 as granted.

In relation to feature b) of claim 1, it is observed that all the shampoos exemplified in D8 contain a fatty alcohol component, which is a mixture of cetyl and stearyl alcohol (examples 1 to 6) or cetyl alcohol alone (examples 7 to 12). They additionally include a silicone emulsion which contains a cationic surfactant, namely stearyltrimonium chloride (see page 41 "Definition of components"). The experimental part of D8 fails to indicate whether the fatty alcohol and the surfactant form a solid crystalline gel network as required by feature b) of claim 1. However, on page 20 (lines 23 to 26) of D8 it is explained that the fatty compounds, which include the fatty alcohols, together

with the cationic conditioning agent, provide a gel network suitable for providing conditioning benefits. It was agreed by the parties that the cationic conditioning agent referred to in this passage of D8 is the cationic surfactant included in the emulsion.

2.2.4 Despite this reference on page 20 to the presence of a gel network, the Board, for the reasons provided in the following paragraphs, concurs with the respondent that document D8 fails to disclose a composition which actually contains such a gel network.

2.2.5 It is firstly noted that throughout the entire disclosure of document D8, the sole reference to the presence in the shampoo of a gel network phase is in the passage of page 20 discussed above. This quite short passage (only four lines) does not provide any detail about the process conditions that lead to the formation of the gel network. The only information about the methods for preparing the shampoos is disclosed on page 42 under the heading "Method of preparation". In this section it is reported that the compositions exemplified in D8 are prepared by dispersing surfactants and polymers in water above 70°C to form a homogenous mixture. Other ingredients are added to the hot mixture, with the exception of the silicone emulsion, perfume and salt which are added only at the end of the preparation, after a cooling step which brings the temperature of the mixture down to about 30°C. Thus, the silicone emulsion which contains the cationic surfactant necessary for the formation of the gel network phase, according to the information on page 20 of D8, is added to the mixture when this has already been cooled.

Such a process is however unsuitable to form a gel network. Indeed it follows from document D12 (pages 10 to 12, "Formation of a gel network phase") that the preparation of a crystalline gel phase requires mixing the molten components at high temperature and then cooling the mixture. During the cooling process liquid crystals are formed which convert to the gel network phase when the temperature falls below the transition temperature, which is between 40°C and 50°C for most fatty alcohol/surfactant systems. The same mechanism for the formation of a gel network phase is described in paragraph [0036] of the patent in suit. In line with this teaching, documents D1 and D2 describe processes for preparing hair-conditioning compositions containing a gel matrix which comprise heating water to at least 70°C and then adding a cationic surfactant and a solid fatty compound. The mixture is then gradually cooled (D1, page 34, lines 14 to 29; D2, page 32, lines 21 to 32).

Hence, documents D12, D1 and D2, in line with the teaching of the patent in suit, indicate that for the formation of a gel network it is important that the cationic surfactant is mixed with the other components at high temperature in order to be incorporated into the composition during the cooling process. In contrast to this, in the process disclosed in D8, the cationic surfactant is added to the mixture only after a cooling step.

2.2.6 The conclusion that the process disclosed in D8 is not suitable for the preparation of a composition containing a gel network is furthermore supported by the results of the experimental report D13. In the experiment described in this document the respondent prepared a composition substantially similar to the

composition of example 4 of D8, following the procedure disclosed in that document. The composition was then analysed using differential scanning calorimetry and X-ray diffraction to verify the presence of a solid crystalline gel network. The conclusion drawn in document D13 is that the composition tested does not contain any solid crystalline fatty gel network.

The appellant pointed out that in the composition tested by the respondent, as well as in the composition of example 4 of D8, the ratio between fatty alcohol and surfactant was outside the range defined in claim 1 of the patent in suit. However, in the Board's view, what matters here is the fact that the composition tested in D13 is very similar to a composition exemplified in D8 and was prepared according to the procedure disclosed in that document. Thus, the fact that the composition tested in D13 does not contain a solid crystalline fatty gel network is an element that corroborates the doubts expressed above in relation to the correctness of the statement of page 20 (lines 23 to 26) of D8.

2.2.7 In addition, it is noted that an essential component of the shampoos disclosed in document D8 is the cationic silicone emulsion (see claim 1). On page 7 (lines 21 to 31) it is explained that when the shampoo is diluted, the cationic silicone emulsion and the anionic surfactant form characteristic colloidal and discrete coacervates which deposit on hair, providing beneficial effects.

As explained above, the cationic silicone emulsion incorporates the cationic surfactant which together with the fatty alcohol is one of the components of the gel network according to the passage of page 20 of D8, lines 23 to 26. Thus, in order to interact with the

fatty alcohol to form the gel network, the cationic surfactant should somehow separate from the other components of the silicone emulsion. Document D8 does not provide any information in this respect.

In the Board's view, the fact that the formation of the gel network may involve a partial breaking down of the silicon emulsion appears at odds with the teaching of D8 that the silicone emulsion is an essential component of the shampoo which is necessary for the formation of the coacervates.

- 2.2.8 Based on the considerations set out above, the Board considers that D8 does not disclose compositions containing a solid crystalline gel network.

Thus, the shampoo composition defined in claim 1 of the patent in suit, differs from the compositions disclosed in D8 in that it contains a solid crystalline gel network.

2.3 Technical problem

- 2.3.1 In the course of the first-instance proceedings, the respondent submitted document D10 which is a report of an experiment comparing the conditioning performance of a composition according to the patent in suit and of the composition of example 1 of D4. The results reported in D10 show that the composition of the patent in suit exhibits lower wet and dry friction than the composition of D4, which is indicative of a superior conditioning performance.

During the appeal proceedings the respondent argued that the comparative composition tested in D10 was very similar to the composition of example 11 of D8, and

therefore D10 could be taken as evidence of an improvement of the shampoo of the patent in suit over the shampoo of D8. In the respondent's opinion, this was to be taken into account in the formulation of the technical problem.

This conclusion was disputed by the appellant, who expressed the view that there were no data on file that could make it possible to compare the shampoo of the patent in suit with the shampoo of D8.

- 2.3.2 As, even assuming in the appellant's favour that D10 does not constitute evidence of an improvement over the composition of D8, the conclusion is reached that an inventive step is present (see point 2.4 below), the Board does not need to decide on this point.

The Board therefore examines inventive step based on the assumption that the technical problem is the provision of an alternative conditioning shampoo composition.

2.4 Obviousness

- 2.4.1 The issue as regards the obviousness of the solution is whether the skilled person, faced with the problem defined above, would transform the shampoos of D8 into shampoos containing a solid crystalline gel network.

- 2.4.2 Document D8 itself refers on page 20 to the presence of a gel network phase. However, as emphasised in points 2.2.5 to 2.2.7 above, this passage contains no technical details and has no apparent conceptual link with the rest of the disclosure of D8.

In the Board's view, the skilled person would not embark on a research project aimed at changing the shampoos disclosed in D8 into shampoos containing a solid crystalline gel network, solely on the basis of the rather speculative statement made on page 20.

2.4.3 Hair-care compositions containing a solid gel network are disclosed in D1 and D2. However, although the general disclosure of these documents covers also shampoos, these documents are mainly focused on the provision of hair-conditioning formulations. Indeed, all the products exemplified in these documents are hair-conditioning compositions. Hence, the skilled person would not turn to D1 or D2 to find a solution to the problem of providing an alternative shampoo composition. In this respect it is also noted that shampoos and hair conditioners differ in terms of the type and amount of surfactants they contain. In particular, a conditioning composition does not contain the same amounts of detergent surfactants as are included in a shampoo. Hence, the Board agrees with the respondent that based on the teaching of D1 and D2 a skilled person would not know whether a solid crystalline gel network would be stable also with the components of a shampoo.

2.4.4 The cited prior-art documents concerning shampoo compositions, in particular documents D3, D4 and D6, do not contain any indication that the compositions disclosed therein may include a solid crystalline gel network. Hence, these documents too do not suggest solving the technical problem by the provision of a shampoo containing a solid crystalline gel network as defined in claim 1 of the patent in suit.

For the above reasons the Board concludes that claim 1 meets the requirement of inventive step.

- 2.5 The above conclusion still holds good if document D4 is selected as the closest prior art. The shampoo of the patent in suit differs from the shampoos disclosed in D4 (e.g. examples 1 to 3) mainly on account of the presence of a solid crystalline gel network. None of the cited documents discloses a shampoo containing a gel network. Hence, the skilled person faced with the problem of providing an alternative conditioning shampoo would have no reason to transform the compositions of D4 into compositions containing a crystalline gel network for the same reasons as outlined starting from D8 as the closest prior art.

The same considerations apply when starting from D3 or D6 as the closest prior art.

As discussed in point 2.2.2 above, D1 and D2 are no reasonable starting points for the problem solution approach as they relate to different products for different purposes.

- 2.6 Independent claims 8 and 9 are likewise inventive since they refer to the composition of claim 1.

It follows that the patent meets the requirements of Article 56 EPC.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:



S. Fabiani

D. Semino

Decision electronically authenticated