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D E C I S I O N
of 8 February 1996

Case Number: T 1028/93 - 3.3.2

Application Number: 86300447.9

Publication Number: 0190010

IPC: A61K 7/075

Language of the proceedings: EN

Title of invention:
Shampoo compositions and method

Patentee:
THE PROCTER & GAMBLE COMPANY

Opponent:
Henkel Kommanditgesellschaft auf Aktien
L'OREAL

Headword:
Shampoo/PROCTER & GAMBLE

Relevant legal provisions:
EPC Art. 54, 56, 123(2)

Keyword:
"Novelty (no individualisation in the state of the art)"
"Inventive step (denied); obvious alternative; obvious new use"
"Not disclosed selection"

Decisions cited:
T 0401/94; T 0112/92; G 0002/88

Catchword:
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Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number: T 1028/93 - 3.3.2

D E C I S I O N
of the Technical Board of Appeal 3.3.2
of 8 February 1996

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Decision under appeal: **Decision of the Opposition Division of the European Patent Office posted 19 November 1993 concerning maintenance of European patent No. 0 190 010 in amended form.**

Composition of the Board:

Chairman: P. A. M. Lançon
Members: C. Germinario
J. Van Moer

Summary of Facts and Submissions

I. European patent No. 0 190 010 was granted in response to European patent application No. 86 300 447.9.

II. Notice of opposition was filed by the Appellants (Opponent I and Opponent II). Revocation of the patent in its entirety was requested on the grounds of lack of novelty and lack of inventive step (Articles 100(a), 52, 54 and 56 EPC).

Among the documents cited, the following are relevant for the present decision:

(1) FR-A-2 542 997;
(3) EP-A-0 079 641;
(4) EP-A-0 074 264, later replaced by the corresponding US Patent 4 364 837;
(7) COSNDG, 35, 117-123, April 1984, (A. Crivello);
(9) "Handbuch der Kosmetika und Riechstoffe", I. Band: Die kosmetische Grundstoffe, 3rd edn Dr. Alfred Hüthig Verlag, Heidelberg, 1978, 515, 1008;
(10) Kelco "Gomme xanthan /Keltron/Kelzan/un biopolysaccharide naturel pour le contrôle scientifique de l'eau" 2nd edn

A. Bakker's declaration and R.E. Bolich's declaration submitted by the Proprietor on 12 October 1992 were also considered.

III. In its interlocutory decision the Opposition Division held that the patent could be maintained in amended form.

Having rejected the main request under Article 123(2) EPC and the first auxiliary request under Article 84 EPC, the Opposition Division acknowledged the subject-matter of claim 1 of the second auxiliary request as novel vis-à-vis the content of documents (1), (3) and (4).

In fact, it was accepted that the cationic silicone of document (1) was not comprised within the definition of silicone given in claim 1 and that the silicone oil cited as a suds depressant in document (3) did not necessarily exhibit the characterising features of the claimed silicones.

Claim 1 was also recognised as involving an inventive step vis-à-vis the closest prior art: document (4 US) [hereinafter simply designated as (4)].

The Opposition Division recognised that the difference between composition 16 of document (4) and the claimed one lay in the lower amount of xanthan gum: namely 0.3% against 0.4% to 5%.

This difference, though slight, was not regarded as trivial since xanthan gum performs its thickening activity at very low concentration and an apparently irrelevant modification in amount may significantly and unpredictably affect the viscosity of the medium, as also stated in T. Bakker's declaration.

With reference to the other cited documents highlighting the excellent properties of xanthan gum as a stabilizer for dispersions, the Opposition Division conceded that the aim of manufacturing a shampoo composition which exhibited both good stability and conditioning properties may already have been achieved. Nevertheless the alternative solution now proposed by the opposed

patent was not derivable in an obvious way from any piece of said prior art.

IV. Appeals against this decision were lodged by both Opponents. Oral proceedings took place on 8 February 1996.

V. In their statement of grounds and further submissions Appellants I reiterated that the subject-matter of claim 1 according to the second auxiliary request lacked novelty vis-à-vis the detergent composition of document (3).

Appellants II contended that the subject-matter of claim 1 also lacked novelty vis-à-vis the compositions disclosed in document (1) and, independently, in document (4).

The Appellants noted that the shampoo compositions of document (4) contained xanthan gum as thickener, the amounts of which being functionally defined by way of the final viscosity to be achieved. This would result in a concentration of gum falling within the claimed range.

Having regard to the inventive step of claim 1, both Appellants cited document (4) as the closest prior art. They maintained that the modification of the slightly lower concentration of xanthan gum comprised in composition 16 of the above cited prior art lay within the competence of the skilled person faced with the task of optimising the performance of the shampoo (Appellants I) or adapting the viscosity of the composition to the need (Appellants II).

In addition, Appellants II developed a new sequence of arguments, based on documents (7) and (10). By relying on the graph illustrating the relationship between the

concentration of xanthan gum and the resulting viscosity of the solution, the Appellants emphasised the variability inherent in commercially available xanthan gum products. This variability, which was due to the microbiological nature of the gum, slightly affected the exact repeatability of the obtained viscosity by a given concentration of thickener and forced the skilled practitioner to find the correct concentration of the gum in any different situations. Therefore, in the Appellants' opinion, the minor difference between the composition 16 of (4) and the claimed composition lacked any significance.

VI. The Respondents (Proprietors) filed a new main request, which was the form of the patent upheld by the Opposition Division in its interlocutory decision and eight auxiliary requests.

The Respondents argued that no cited document disclosed compositions comprising silicones as claimed, namely dispersed, insoluble and non-volatile.

The Respondents contested, by relying on Bakken's declaration, the Appellants' opinion that the difference in xanthan gum concentration in document (4) and in the opposed patent was obvious and noted that a lot of other polymeric suspending agents had failed when submitted to the phase separation stability test.

They also stressed that the teaching of document (4), in its entirety, pointed to a decrease in the amount of thickener agent and thus that the skilled reader would find no technical motivation in the document to raise this amount. On the contrary, while realising that xanthan gum interfered with some cationic polymers present in the compositions of (4), as stated in Bolich's declaration, the skilled practitioner would

have contemplated the opportunity of completely eliminating xanthan gum from the formula rather than increasing it.

With reference to documents (1) and (3), the Respondents maintained that none of the two documents addressed the particular problem to which the patent related.

Having regard to the use of xanthan gum as a suspending agent for the dispersed, insoluble, non-volatile silicone(s), they further maintained that the claimed silicone, being liquid, gives rise to specific problems of suspension.

VII. During oral proceedings both Appellants requested that the decision of the Opposition Division be set aside and that the patent be revoked.

The Respondents withdrew the second and the fifth auxiliary requests as a reaction to the concern of the Board on the admissibility of said claims in respect of Article 123(2) EPC.

They requested that the appeals be dismissed and that the patent be maintained in the form of the main request or of one of the auxiliary requests 1 to 6, as submitted at the oral proceedings.

VIII. The independent claims on file read as follows:

Main request:

A shampoo composition comprising:

(a) from 5% to 50% by weight of synthetic anionic surfactant or a mixture of synthetic anionic surfactants;

(b) from 0.1% to 10% by weight of a dispersed, insoluble, non-volatile silicone or a mixture of dispersed, insoluble, non-volatile silicones, the said silicone or silicones being selected from polyalkyl siloxanes, polyaryl siloxanes, polyalkylaryl siloxanes and polyether siloxane copolymers; and

(c) water;

characterized in that the composition additionally comprises from 0.4% to 5% by weight of xanthan gum.

First auxiliary request:

As the main request, wherein item (b) reads "the silicone or mixture of silicones being selected from unsubstituted polyalkyl siloxanes, unsubstituted polyaryl siloxanes, unsubstituted polyalkylaryl siloxanes and unsubstituted polyether siloxane copolymers"

Second auxiliary request:

The use, in a shampoo composition comprising:

(a) from 5% to 50% by weight of synthetic anionic surfactant or a mixture of synthetic anionic surfactants;

(b) from 0.1% to 10% by weight of a dispersed, insoluble non-volatile silicone or a mixture of dispersed, insoluble non-volatile silicones, the said silicone or silicones being selected from polyalkyl siloxanes, polyaryl siloxanes, polyalkylaryl siloxanes and polyether siloxane copolymers; and

(c) water;

of (d) 0.4% to 5% by weight of xanthan gum as a suspending agent for the said dispersed, insoluble non-volatile silicone(s).

Third auxiliary request:

As the second auxiliary request, wherein item (b) reads "the silicone or mixture of silicones being selected from unsubstituted polyalkyl siloxanes, unsubstituted polyaryl siloxanes, unsubstituted polyalkylaryl siloxanes and unsubstituted polyether siloxane copolymers"

Fourth auxiliary request:

As the first auxiliary request, wherein the range in item (b) is from 0.5% to 10%.

Fifth auxiliary request:

As the main request, wherein item (b) reads "from 0.5% to 10% by weight of a dispersed, insoluble, non-volatile silicone or a mixture of dispersed, insoluble, non-volatile silicones, the said silicone or silicones being selected from polydimethyl siloxanes, polymethylphenyl siloxanes, and alkylene oxide-modified polydimethyl siloxanes, wherein the alkylene oxide is polyethylene oxide, polypropylene oxide or a mixture thereof.

Sixth auxiliary request:

As the fifth auxiliary request, wherein the amount of xanthan gum is "from 0.6% to 5%".

Reasons for the Decision

1. The appeal is admissible.

2. *Main request*

2.1 Admissibility

2.1.1 In the present claim 1 the silicone or silicones are defined as being selected from polyalkyl siloxanes, polyaryl siloxanes, polyalkylaryl siloxanes and polyether siloxane copolymers.

The different chemical groups of silicones are disclosed in the application as filed under the heading "Non-Volatile Silicone Fluid" and more precisely on page 6, lines 33 to 35. Therefore, the amendment does not contravene the requirements of Article 123(2) EPC.

The amendment leads to a more precise definition of one constituent of the claimed composition and accordingly it results in a limitation of the extent of the protection conferred.

Therefore, amended claim 1 complies with the requirements of Article 123(3) EPC.

2.1.2 The formal admissibility of the main request has not been objected to by any of the Appellants.

2.2 Novelty

Documents (3), (1) and (4) are regarded by the Appellants as prejudicial to the novelty of the subject-matter of claim 1.

The Board does not see any other document, among those cited during the procedure, which may be considered as relevant for the purpose of Article 54 EPC.

2.2.1 Document (3) describes built liquid detergent compositions comprising:

(a) a mixture of an anionic and a nonionic synthetic detergent active material,
(b) a polysaccharide hydrocolloid and
(c) a builder salt.

As recognized in the appealed decision, the amount of the anionic detergent in the composition is comprised between 0.5% and 34%.

The polysaccharide hydrocolloid is selected from xanthan gum, guar gum, locus bean gum and tragacanth gum; xanthan gum (eg Kelzan) being the most suitable hydrocolloid.

The hydrocolloid is present in an amount of 0.05% to 1.5% by weight in the final composition

Other conventional materials may also be present in the composition. Among eighteen independent optional agents cited in the fourth paragraph of page 4, suds depressants such as silicones are contemplated.

It is undisputable that none of the compositions of the examples 1 to 3 comprises xanthan gum in an amount of at least 0.4%, as required by claim 1, and therefore that none of them is prejudicial to the novelty of the claim.

On the other hand, nothing prejudicial to the novelty of the claimed composition could be found in the general teaching of document (3).

Admittedly, the third paragraph of page 4 indicates that the polysaccharide hydrocolloid is generally present in an amount of 0.05% to 1.5% by weight, which partially overlaps the range indicated in claim 1 under consideration.

However, by relying on (3), the skilled person would be obliged to select specific values and specific agents from ranges and groups of independent options and then to combine the results of this selection in order to produce a shampoo composition as claimed in the main request.

Hence document (3) does not individualise any composition comprised in the scope of claim 1. As such, the question of the novelty of the claim can be answered in the affirmative.

Document (1) describes a hair conditioning composition and, in a secondary embodiment, a shampoo-conditioning composition, comprising:
(a) a cationic polymer, (b) an anionic polymer, (c) a xanthan gum, optionally (d) a tensio-active agent (ie surfactant).

The cationic polymer may be any one of 13 equivalent classes extensively illustrated over nine pages of the document, namely from page 3 to page 12. As a last possibility (page 12, item 13°), cationic silicone polymers are also contemplated. An example of such silicones is amodimethicone, commercially available as "Dow Corning 929".

Like the cationic, the anionic polymer may also be selected from a broad number of different classes.

Xanthan gum, which may be any one of the commercially available products, is present in an amount of 0.05% to 5% (page 3, lines 17 to 19).

The optional surfactant agent may be selected from cationic, anionic, non-ionic or amphoteric surfactants and mixtures thereof. All the suitable classes of surfactants are extensively illustrated from page 16 to page 19 of the document.

Among 24 examples which practically illustrate the invention of (1), examples 17 and 18 relate to compositions comprising a silicone (Dow Corning 929) as cationic polymer at a concentration of 1.4% and 0.8% respectively. Both compositions also comprise xanthan gum (Rhodopol 23 C) at 0.25% and 0.4% and dialkyldimethyl ammonium chloride or a mixture of dialkyldimethyl ammonium chloride and Triton CG 110 as surfactant.

It is undisputable that the two compositions cited as examples are not prejudicial to the novelty of claim 1 under consideration, since in both cases the surfactant is cationic and not anionic as requested by claim 1.

On the other hand, by relying upon the general part of (1), and in order to design a shampoo composition comprised within the scope of claim 1, the skilled reader would be obliged to perform an act of selection: firstly, for the desired cationic silicone polymer among an extremely broad range of equivalent polymers, secondly, for the desired anionic surfactant from at least four classes of equivalent surfactants, and finally for the desired concentration of xanthan gum. The results of this multiple selection should then be combined to arrive at a claimed composition which is not otherwise individualised in any part of (1).

Thus, the novelty of the subject-matter of claim 1 vis-à-vis (1) is recognised on the same basis as in respect to (3).

2.2.3 Finally document (4) was considered.

Document (4) describes a shampoo-conditioning composition comprising:

(a) from about 15 to about 70% by weight of a water-miscible saccharide,
(b) from about 0.1 to about 30% by weight of at least one nonionic or cationic hair grooming (conditioning) agent,
(c) from about 3 to about 60% by weight of an anionic or anphoteric detergent and
(d) water,

the composition having a viscosity of about 400 to 6000 cps at 25°C.

Suitable cationic grooming agents are illustrated in columns 7 to 9, the preferred member of this category being the "Polymer JR". Suitable non-ionic grooming agents are insoluble waxy or oily silicones such as polyalkyl or polyaryl siloxanes, one of the preferred silicones being the commercially available product "Viscasil", which is a polydimethylsiloxane. Volatile cyclic silicones or mixtures thereof are also contemplated.

As pointed out by both Appellants and as admitted by the Respondent, the most relevant part of (4) is the composition 16 illustrated in table II (example XI).

This composition comprises **inter alia**:

(a) a synthetic anionic surfactant, ie triethanolamine lauryl sulphate and Miranol 2MCS at 20%,
(b) a silicone, ie silicone 60.000 csk at 1.0%,
(c) water and
(d) xanthan gum at 0.3%.

Table II does not explicitly define the chemical nature of the silicone, which may however be derived from the text of the document.

Silicone 60.000 csk is also cited in example II where it is defined, in the footnote, as the commercially available product "Viscasil".

Viscasil is a linear insoluble polydimethylsiloxane also indicated in the opposed patent as one of the most preferred dispersed, insoluble, non-volatile silicones. The Board thus accepts that the silicone of composition 16 shares all the characterising features of the silicone of claim 1.

A further important point is that composition 16 additionally comprises 35% of a 70% sorbitol solution, while the presence of a saccharide is not an essential feature of the invention of the opposed patent. It should however be noted that the wording of claim 1 according to the main request does not exclude the presence of other optional components in addition to the characterising elements of the claimed composition. Said components are expressly reported in the description and, among others, thickeners and viscosity modifiers are also cited.

Thus the recognized difference between composition 16 of (4) and the composition of claim 1 lies in the lower amount of xanthan gum: namely 0.3% against 0.4% to 5%.

Therefore this composition, taken alone, is not prejudicial to the novelty of claim 1. On the other hand, the other compositions of table I or II, which comprise a thickener in higher amount (0.5% or 0.75%), do not contain xanthan gum.

The Appellants suggest that all the compositions of example XI should be construed in the context of the document as a whole and that the amount of the thickener agent disclosed in the document is not limited to the few exact values derivable from the compositions cited as examples, but is rather functionally defined by way of the final viscosity to be achieved, which is indeed between 400 and 6000 cps. Thus the document discloses all the concentrations of thickener which would set the viscosity between 400 and 6000 cps.

The Board does not accept these arguments. Firstly, the existence of a clear, univocal relationship between a defined concentration of thickener and a defined viscosity was not proved by the Appellants. The viscosity is indeed influenced by many factors.

Secondly, the defined range of xanthan gum concentration according to claim 1 cannot be derived from a range of viscosity as broad as 400 to 6000 cps or any other broad range cited in (4). In fact, according to the experimental results submitted by the Appellants (essay II), the value 0.3%, which is outside the range defined in claim 1 (0.4% to 5%), nonetheless results in a viscosity well within the range 400-6000 cps, and even within the most preferred range of 1000 to 4000 cps.

Finally, according to (4), a considerably large number of equivalent thickeners may be used to set the viscosity. Thus the choice of xanthan gum would in itself already be a selection.

The Board does not see any additional valid reason that could substantiate the relevance, for the purpose of novelty, of document (4), which like the previously discussed (1) and (3), fails to individualise a composition falling within the scope of claim 1.

In conclusion the Board recognises the subject-matter of the main request as novel.

2.3 Inventive step

2.3.1 All the parties cite document (4) as the closest prior art: specifically composition 16 illustrated in table II (example XI).

2.3.2 The technical problem

The general framework in which the present invention and the invention of (4) are to be considered is that of providing compositions which are, at one and the same time, satisfactory shampoo and conditioning compositions. The desired composition should exhibit good foaming properties in spite of the presence of conditioning agents, which normally are suds depressants and should be stable against phase separation while remaining pourable.

From different passages of (4) the skilled reader can conclude that all the aforementioned requirements are already met by this prior composition (column 5, lines 30 to 63, column 15, lines 10 to 25). This interpretation of (4) is not disputed by the Respondents.

On the other hand, the text of the opposed patent contains no experimental results, comparative tests or indications which would envisage improvements of

whatever nature in the claimed compositions over said prior art.

Thus the technical problem underlying the present invention is to provide an alternative to the composition of document (4) having at least qualitatively comparable properties.

As a solution for the technical problem, an alternative composition is produced in which the amount of xanthan gum is increased from 0.3% to at least 0.4%.

Since the text of the patent highlights the stability and good conditioning activity exhibited by the compositions cited as examples, the Board has no reason to doubt that the technical problem has actually been solved.

2.3.3 The question to be answered is thus whether the proposed solution, namely the increase in the amount of xanthan gum, is obvious for the skilled person in the light of either the closest prior art in itself or any other prior document, taken alone or in combination.

More exactly, the following two points are to be considered:

(a) whether an increase in concentration, rather than a decrease, would have been contemplated and
(b) whether a modification of 0.1% compared with the amount in the closest prior art could involve an inventive step in itself.

(a) With regard to the first question, the Board notes that the general part of (4) offers no guidance as to the suitable amount of thickener to be used. On the other hand, the punctual concentrations of the

thickener in the examples identify a range from 0.2% to 1.05% of composition 11, which comprises two thickeners: Carbopol 941 and hydroxypropyl methyl cellulose. Yet the skilled person, confronted with the problem of modifying the amount of the thickener without dramatically affecting the desired properties of the compositions, would introduce modifications which nevertheless maintain the amount within this range. In fact, it is predictable that outside the range the slight, but necessary effect of the thickener agent might be either completely lost or inconveniently increased. As a matter of fact, xanthan gum is present in the composition 16 in an amount of 0.3%, which is very close to the lowest limit of the aforementioned range. This fact strongly indicates that the first reasonable modification contemplated by the skilled person would be to increase this amount rather than to decrease it since this could undesirably modify the final properties of the shampoo.

In conclusion, the first question must be answered in the affirmative.

(b) Independently of the previous question, it remains to be decided whether the difference, in either direction, of 0.1% in xanthan gum amount between the composition 16 of (4) and the lowest value contemplated by the invention is to be considered as significant and to involve an inventive step in itself.

In its interlocutory decision, the Opposition Division mainly relied on the experimental results reported in Bakken's declaration, results which prove that a shampoo composition within the scope of claim 1 comprising xanthan gum at 0.5% is stable after one month at 80°F or

even 100°F, whereas the similar composition comprising only 0.2% xanthan gum produces phase separation after two weeks.

The Opposition Division pointed out that thickeners evolve their properties within a range of only a few percent and that a "minimal" lowering of xanthan gum concentration leads to an unsatisfactory product. Thus, the effect of a minimal change cannot be predicted.

On the one hand, the Board concedes that thickeners act at very low concentration. On the other hand, and purely as a theoretical speculation, the difference between 0.2% to 0.5%, though slight in absolute terms, cannot be regarded as "minimal", but rather as critical, since it corresponds to a 150% increase. Thus the skilled person, faced with the results illustrated by Bakken, would reasonably expect some modifications in the properties of the composition and probably would not be surprised to observe some increase in viscosity and stability.

However, regardless of any possible interpretation of the results illustrated by Bakken, the decisive point is that the real amount of xanthan gum in (4) is 0.3%, and hence higher than the concentration designated by Bakken as unsatisfactory, while in claim 1 it is 0.4%, lower than the concentration regarded by Bakken as satisfactory. In conclusion, these experimental results cannot be recognised as valid support for the Opposition Division's assumption that a minimum change in thickener amount may bring about an unpredictable critical modification in the properties of the composition.

On the other hand, the Board does recognise as particularly relevant document (7), document (10) and the test "Essay II" submitted by Appellants II on 5 January 1996.

Document (7) (April 1984) reports a general analysis of the properties of xanthan gum as a thickener in the cosmetic industry. Since the document is written in Italian, reference is made to the corresponding French document (10), which comprises all the relevant parts of (7), but which was probably published after the priority date of the opposed patent.

Figure 7 of (10), which is identical to figure 3 of (7), discloses the relationship between the viscosity of a solution of Keltrol (a classic, commercially available xanthan gum used in the invention of the opposed patent) and its concentration. The relationship is represented in the graph by the area between two curved lines, and not by one single line as theory would lead one to expect. As explained by the Appellants, this phenomenon is due, in the practical situation, to the inherent variability among products sold under the same trade mark. As it is evident from figure 7 relied upon by Appellants II, the effect of this variability is that a given value of viscosity may be achieved with a range of slightly differing concentrations of thickener rather than with an exact, unique amount of it. For example, different amounts of xanthan gum - say 0.3% and 0.4% - can produce the same viscosity of the solution, or the same percent of thickener, under slightly different operating conditions, can result in different viscosity values.

This is consistent with the experimental results submitted as "Essays II" by Appellants II, which indicate a certain degree of independence of the viscosity from the concentration of the thickener.

As a matter of fact, the test proves that an increase of xanthan gum from 0.3% to 0.75%, ie of 150%, is accompanied by a fluctuation of the viscosity, which

moves from 2400 cps to 2760 cps with a final increase of no more than some 15%.

This is also consistent with the results reported in the declaration of Bakken, who observed a moderate improvement in stability (more than one month rather two weeks) when the amount of xanthan gum was increased by 150%.

Thus, while the Board concedes that there is a certain degree of inherent variability in commercial xanthan gum products, it also agrees that this variability is unambiguously recognised and highlighted in document (7), so that the skilled person would be well familiar with this problem of commercial xanthan gum. It is therefore evident that, when attempting to reproduce a composition of the prior art having a determined viscosity, but without having access to exactly the same commercially available products, the skilled practitioner would, without engaging in any inventive activity and as a matter of pure routine, contemplate the possibility of adapting the thickener concentration to the need by modifying its amount by some 0.1% in either direction.

Accordingly, the difference in absolute terms between the amount of xanthan gum in composition 16 of document (4) and the lowest amount contemplated by claim 1, a difference equal to 0.1%, cannot in itself involve an inventive step.

2.3.4 During proceeding, the Respondents expressed the opinion that the skilled reader of (4) cannot find any suggestion or technical motivation to contemplate the thickener agent of composition 16 as a proper candidate to modify, let alone to increase the concentration of an

agent that is said to be "neither necessary nor desirable".

Additionally, they underlined the experimental results reported in Bakken's declaration stressing the higher level of stabilisation achieved with xanthan gum compared to other, commonly used thickeners.

Concerning the first argument, it should be noted that the very nature of the underlying technical problem implies the task of identifying modifications which do not affect the satisfactory properties already provided by the composition of (4), rather than the task of identifying modifications which somewhere improve said properties.

Thus the skilled person, challenged by the technical problem, would first of all investigate, those components which are said to be less important, with the understandable purpose of maintaining unmodified the properties of the composition of the prior art.

The invention disclosed in (4) resides in the partial or total replacement of traditional thickeners by a high amount of saccharide, which brings about a stabilizing effect on the composition. Since, additionally, the saccharide increases, to some extent, the viscosity of the shampoo, conventional thickening agents can be used in lower amounts, and their contribution to the final properties of the composition would appear to be limited.

The relative lack of importance attached to the thickeners in the context of the document is also derivable from the limited description given to said agents, this description being confined to a short

paragraph in column 15, lines 27 to 34, which does not even cite xanthan gum as such.

In view of the above considerations, the opinion of the Board is that the person skilled in the art would have contemplated the thickener, namely the xanthan gum in the specific case of composition 16, as one of the most preferred candidates for modification.

Moreover, the Board acknowledges that the teaching in (4) addresses the use of saccharides as viscosity modifiers and stabilising agents and the consequent decrease in the amount of thickener. Nevertheless, and without wishing to overrate the importance of said agents, it is also acknowledged that thickeners are present, albeit in low concentration, in all the compositions cited as examples and that, when present, they are never below a given level.

Thus, the skilled reader would not interpret the teaching of (4) as advocating the complete elimination of the thickeners, but rather in the sense of keeping the amount of said agents within a range of low concentrations and, when necessary, adapting this amount in order to achieve the desired viscosity of the composition.

A further argument presented by the Respondents in support of the inventive step involved in the claimed shampoo composition is based on the content of R.E. Bolich's declaration.

Since composition 16 of (4) comprises **inter alia** 0.3% of Polymer JR and 0.3% of xanthan gum, Bolich prepared an aqueous composition of the two agents in the cited percent and observed that they appear to form an insoluble complex which settles to the bottom. This

complexation would not allow xanthan gum to be available for suspending the silicone fluid. In the light of this interference of xanthan gum and one of the most preferred cationic polymers of (4), the Respondents contend that the obvious thing to do by the skilled reader of (4) would be to reduce or even eliminate xanthan gum rather than to increase it.

The Board acknowledges the reliability of Bolich's experimentation, but does not share the respondents opinion concerning the conclusions drawn from the results.

In fact, composition 16 of (4) comprises, in addition to the single agents considered by Bolich, many other agents, such as anionic surfactant, sorbitol and lauric isopropanolamide, all of which contribute to stabilising the composition and, probably, to preventing the formation and the precipitation of insoluble complexes. Therefore, the construct prepared by Bolich does not represent a suitable model for analysing the stability of composition 16.

In view of the above it is concluded that the subject-matter of claim 1 according to the main request does not involve an inventive step.

3. *Auxiliary requests*

3.1 Admissibility

3.1.1 The first, third and fourth auxiliary requests qualify the siloxane under item (b) as being **unsubstituted**.

The word "unsubstituted" is not disclosed literally in the original application.

The Respondents maintain that the feature is implicitly disclosed in the original application.

Under the header "Non-Volatile Silicone Fluid" the silicones are chemically defined as polyalkyl, polyaryl, polyalkylaryl and polyether siloxane copolymers. In the Board's opinion the aforementioned definitions are intended to roughly identify broad groups of compounds in order to include all the possibilities without focusing on more specific subgroups. Thus, both unsubstituted and substituted compounds are inherently disclosed, the unsubstituted siloxanes being intended among all the other possible siloxanes. This interpretation applies specifically to the designation "polyether siloxane copolymers", which indisputably indicates any type of siloxane copolymer having ether bonds, regardless of any finer definition of the siloxane monomer.

On the other hand, the added feature "unsubstituted" cannot be regarded as a disclaimer intended to exclude from the scope of the claim a prior disclosure prejudicial to novelty; novelty not being an issue in the present case. Therefore, the introduction of the novel feature in the text of claim 1 would amount to a selection within the disclosure originally filed. However a selection of this type identifies in itself a novel invention (selection invention) which, unless originally disclosed, runs counter to the requirements of Article 123(2) EPC.

Therefore the first, third and fourth auxiliary requests are not allowable.

3.1.2 The fifth and sixth auxiliary requests define the silicone under item (b) as being selected from polydimethyl siloxanes, polymethylphenyl siloxanes, and

alkylene oxide-modified polydimethyl siloxanes, wherein the alkylene oxide is polyethylene oxide, polypropylene oxide or a mixture thereof.

The polydimethylsiloxanes, as general group, are disclosed in the original claim 5.

The case of polymethylphenylsiloxanes is different. This group is referred to, in the original application, not in general terms, but limited to those compounds having viscosity of about 15 to 65 centistokes at 25°. Thus, to cite in claim 1 the group without viscosity-limitation represents a non-supported extension of the content of the original disclosure to embrace all known polymethyl phenylsiloxanes.

The fifth and sixth auxiliary requests are therefore not allowable since the amendment contravenes the requirements of Article 123(2) EPC.

3.1.3 The second auxiliary request addresses the use of 0.4% to 5% xanthan gum as suspending agent for the dispersed, insoluble, non-volatile silicone within the shampoo composition at issue.

The claimed use is disclosed in the original application on page 2, lines 18 to 21, 30 and 31 and on page 8, lines 5 and 6.

The request is therefore formally allowable.

3.2 Novelty

All documents (1), (3) and (4), quoted by the Appellants as prejudicial to the novelty of the main request, describe compositions in which xanthan gum is employed as a conventional thickening agent to increase the

viscosity of the composition or/and to stabilise it against phase separation. The shampoo and conditioning compositions disclosed in the quoted prior art comprise, among other components, silicone, which in the case of document (4) is the same silicone as in the present claim 1. Nevertheless the use of xanthan gum as a **suspending** agent for silicone in the specific conditions as defined in the claim, though inherent in the prior disclosures, remains hidden behind the known described use.

According to decision G 2/88 of the Enlarged Board of Appeal (OJ EPO, 1990, 93) a claim to the use of a known compound for a particular purpose, which is based on a technical effect which is described in the patent, should be interpreted as including that technical effect as a functional technical feature and is accordingly not open to objection under Article 54(1) EPC provided that such technical feature has not previously been made available to the public.

The subject-matter of claim 1 according to the second auxiliary request is therefore regarded as novel.

3.3 Inventive step

3.3.1 Claim 1 under consideration addresses the use of xanthan gum (0.4% to 5%) ... as a suspending agent for ... silicone.

By "suspending agent" the Board understands the ability to bring and maintain particles of solid or oily material in state of homogeneous distribution within a dispersing phase in which said material is insoluble.

The result of the suspending activity is therefore to preserve the homogeneity of the system and to prevent phase separation.

It is thus evident that the suspending activity of xanthan gum cited in claim 1 is strictly connected, or even identifies with, the stabilising activity of the system against the separation of the dispersed phase.

3.3.2 As for the main request, document (4) represents the closest prior art, more exactly composition 16 of example XI (table II).

Beyond the detailed analysis of the content of (4) already made under item 2.2.3 of the present decision, the Board still needs to stress that this prior-art document discloses the use of xanthan gum or equivalent agents as a **thickening** agent, hence as a substance used to increase the viscosity of the final composition up to a defined value or range of values.

The first feature distinguishing the subject-matter of claim 1 from the composition of (4) is thus the intended use of xanthan gum: suspending as opposed to thickening purpose.

The second point of difference, already discussed, is that xanthan gum in composition 16 of (4) is employed in an amount of 0.3%, while in claim 1 the amount is between 0.4% and 5%.

3.3.3 Thus, starting from (4), the technical problem to be solved lies in providing a novel application for xanthan gum.

This problem is solved by its use, in a shampoo composition as defined, as a suspending agent for

dispersed, insoluble, non-volatile silicones, in an amount of 0.4% to 5%.

Since the composition of the patent at issue is said to be stable (page 2, line 36 and page 6, line 56), which is interpreted in the sense that no phase separation is observed overtime, the Board is satisfied that the problem is plausibly solved.

3.3.4 The description of the background of the invention disclosed in (4) offers an explicit representation of the general knowledge in the specific field before the relevant date of the opposed patent.

It is reported in (4), column 1, line 65, to column 2, line 3, that "hair grooming (conditioning) agents or other ingredients may be present in form of colloidal dispersion or emulsion. If particles dispersed in a shampoo are larger, the shampoo may be in the form of a suspension of particles homogeneously dispersed in a liquid". This happens when silicones, which are the preferred insoluble grooming agent (column 9, lines 44 and 45) are employed. It is further mentioned in the same paragraph that "suspensions are normally not stable ... **unless the liquid is sufficiently viscous**".

Instability of shampoo solutions, dispersions, emulsions or suspensions containing detergents and grooming agents is further pointed out in column 4, lines 1 to 20, where it is unambiguously stated that "**the classical method for stabilizing such shampoos is by addition of thickening agents**".

As already seen, the invention disclosed in (4) is based on the partial replacement of traditional thickeners by saccharides, which affect viscosity to a lesser extent. Nevertheless, it is noted (column 5,lines 37 to 41)

that saccharides also thicken the shampoo and stabilize it by **keeping in suspension those hair grooming agents which are insoluble.**

The Board appreciates that the above-cited passages of (4) first of all identify the general problem of the instability of compositions comprising dispersed insoluble grooming agents, such as silicones, and secondly, highlight an undisputable link between the activity of increasing the viscosity, which is the function of a thickening agent, and that of stabilising the system against separation of a dispersed phase, which is the function of a suspending agent.

As a matter of fact, document (4) describes compositions comprising, as a compulsory component, a grooming agent which may be an insoluble nonionic silicone as described in column 9, line 40 to column 10, line 68, and as represented, as preferred embodiment, by the polydimethylsiloxane 60.000 centistokes of claim 55.

It is therefore immediately evident from the context of the document as a whole that any reference to suspensions of insoluble grooming agents which are said to be instable and which are traditionally stabilised by increasing the viscosity of the composition by way of thickeners, mainly refer to the cited insoluble silicones.

In the light of the above, the Board is convinced that the skilled reader of document (4) would immediately recognise a link between the viscosity-increasing effect of the thickeners comprised in the compositions cited as examples (tables I and II), and the suspending effect for the dispersed insoluble grooming agents. Bringing the problem back to the actual case of composition 16, it would have been obvious, knowing the thickening

effect of xanthan gum, to foresee the suspending effect of the same for the silicone grooming agent comprised in the composition.

The relationship between thickening and suspending properties of xanthan gum are furthermore corroborated by other pieces of prior art quoted by the Appellants, namely document (9), which emphasises the good thickening, stabilising and suspending properties of Kelzan, and document (7), which indicates, on page 119, third paragraph, the excellent suspending effects of xanthan gum.

Therefore the claimed suspending activity of xanthan gum is obviously derivable from the cited prior-art documents. This conclusion is consistent with, and follows, decision T 0112/92 (OJ EPO 1994, 192), where the Board decided that the new use of glucomannan as a stabiliser did not involve an inventive step vis-à-vis its prior known use as a thickening agent for emulsion because a well-established link between the earlier and later uses was indicated in the prior art.

The last point to consider is the lower amount of xanthan gum in composition 16.

The focus of the invention according to (4) is, as seen, the stabilisation of shampoo/conditioning compositions with saccharides, which replace completely or in part traditional thickeners. It is thus implicit in the invention that the thickening agents, when present, are comprised at low concentration.

However, the system "saccharide" plus "low amount of thickener" represents an more advanced solution as compared to conventional, simpler situations illustrated

as background art in (4) and where the stabilisation is achieved by way of thickeners only.

The Board is therefore of the opinion that the skilled person, faced by the problem of suspending a silicone, would first of all contemplate the easiest way to achieve the result, that is simply to use a thickener. In this case the skilled person would be led to increase the amount of this agent over the concentrations indicated in (4), since said agent is not assisted by the additional activity of the saccharide.

Thus the use of xanthan gum in an amount slightly higher than 0.3% cannot in itself endow the claim with an inventive merit.

3.3.5 The Respondents maintain that the task of suspending silicone oil, as claimed, involves specific difficulties with regard to other substances due to the liquid nature of the oil and that the presence of said difficulties confers inventiveness on the proposed solution.

However, the Respondents have completely failed to plausibly substantiate with valid arguments, facts or results said alleged unusual difficulties.

The Board thus accepts the opinion expressed by Appellants II, who contend that xanthan gum is an excellent suspending agent, as indicated by (9) and (7) not only for solid substance, but also for liquid substances. This statement is also confirmed by the late published document (10), where it is reported that "the xanthan gum solutions have wide application for stabilising dispersions of solids, liquids and gas" (first three lines of page 5).

In view of the above, the Board concludes that the subject-matter of claim 1 of the second auxiliary request does not involve an inventive step within the meaning of Article 56 EPC.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The patent is revoked.

The Registrar: The Chairman:

P. Martorana P. A. M. Lançon