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**Datasheet for the decision  
of 8 November 2024**

**Case Number:** T 0697/23 - 3.3.07

**Application Number:** 16810382.8

**Publication Number:** 3389618

**IPC:** A61K8/58, A61K8/73, A61K8/81,  
A61Q5/06, A61Q5/12

**Language of the proceedings:** EN

**Title of invention:**

PROCESS FOR TREATING KERATIN FIBRES USING AN AQUEOUS  
COMPOSITION COMPRISING A COMBINATION OF PARTICULAR  
ALKOXYLSILANES

**Patent Proprietor:**

L'OREAL

**Opponent:**

Henkel AG & Co. KGaA

**Headword:**

PROCESS FOR TREATING KERATIN FIBRES USING AN AQUEOUS  
COMPOSITION COMPRISING A COMBINATION OF PARTICULAR  
ALKOXYLSILANES/L'Oréal

**Relevant legal provisions:**

RPBA 2020 Art. 12(4), 12(6)  
EPC Art. 56

**Keyword:**

Admission of new documents

Main request and auxiliary requests 1-8 - Inventive step (No)

Auxiliary request 9 - Inventive step (Yes)



**Beschwerdekammern**  
**Boards of Appeal**  
**Chambres de recours**

Boards of Appeal of the  
European Patent Office  
Richard-Reitzner-Allee 8  
85540 Haar  
GERMANY  
Tel. +49 (0)89 2399-0

Case Number: T 0697/23 - 3.3.07

**D E C I S I O N**  
**of Technical Board of Appeal 3.3.07**  
**of 8 November 2024**

**Appellant:** Henkel AG & Co. KGaA  
(Opponent) Henkelstrasse 57  
40589 Düsseldorf (DE)

**Representative:** Henkel AG & Co. KGaA  
CLI / Patente  
40191 Düsseldorf (DE)

**Respondent:** L'OREAL  
(Patent Proprietor) 14 rue Royale  
75008 Paris (FR)

**Representative:** Casalonga  
Casalonga & Partners  
Bayerstraße 71/73  
80335 München (DE)

**Decision under appeal:** **Decision of the Opposition Division of the  
European Patent Office posted on 28 February  
2023 rejecting the opposition filed against  
European patent No. 3389618 pursuant to Article  
101(2) EPC.**

**Composition of the Board:**

**Chairman** A. Uselli  
**Members:** D. Boulois  
L. Basterreix

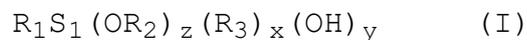
## Summary of Facts and Submissions

I. European patent No. 3 389 618 B1 was granted on the basis of a set of 12 claims.

Independent claim 1 as granted read as follows:

"1. Process for treating keratin fibres, especially the hair, preferably for shaping and/or conditioning the hair, which comprises the application of a composition (A) comprising:

(a) one or more alkoxy silanes bearing solubilizing function(s) of formula (I) below, and/or hydrolysis products thereof and/or oligomers thereof:



in which:

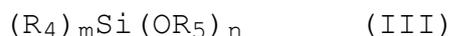
R<sub>1</sub> is a linear or branched, saturated or unsaturated C<sub>1</sub>-C<sub>6</sub> hydrocarbon-based chain, substituted with an amine group NH<sub>2</sub> or NHR, R being:

- a C<sub>1</sub>-C<sub>20</sub> and preferably C<sub>1</sub>-C<sub>6</sub> alkyl group optionally substituted with a group comprising a silicon atom, better still a group (R<sub>2</sub>O)<sub>3</sub>Si-,
- a C<sub>3</sub>-C<sub>40</sub> cycloalkyl or
- a C<sub>6</sub>-C<sub>30</sub> aromatic group,

R<sub>2</sub> and R<sub>3</sub>, which may be identical or different, represent a linear or branched alkyl group comprising from 1 to 6 carbon atoms,

y denotes an integer ranging from 0 to 3,  
z denotes an integer ranging from 0 to 3, and  
x denotes an integer ranging from 0 to 2,  
with  $z + x + y = 3$ ,

(b) one or more alkylalkoxysilanes of formula (III)  
below, and/or hydrolysis products thereof and/or  
oligomers thereof:



in which:

$R_4$  and  $R_5$  each represent, independently of each other,  
a  $C_{1-6}$ , better still  $C_{1-4}$ , alkyl group such as methyl,  
ethyl, n-propyl, isopropyl, n-butyl, isobutyl and tert-  
butyl,

n ranges from 1 to 3,

m ranges from 1 to 3,

on condition that  $m+n=4$ ,

and

(c) water in an amount of greater than 30% by weight  
relative to the total weight of the composition."

**Independent claim 11** relates to a cosmetic composition  
comprising the same elements (a)-(c) as in claim 1 with  
furthermore "**(d) one or more thickeners**", while  
**independent claim 12** relates to the "use for shaping  
and/or conditioning the hair, of the composition  
comprising" all elements (a)-**(d)** also claimed in claim  
11.

II. The patent 3 389 618 B1 had been opposed under Article  
100 (a) EPC on the grounds that its subject-matter  
lacked novelty and inventive step.

III. The appeal lies from the decision of the opposition division to reject the opposition.

IV. The documents cited during the opposition proceedings included the following:

D1: WO 2011/073280 A2

D2: US 2013/0225698 A1

D3: FR 2964869 A1

D4: EP 1736139 A1

D5: EP 2111848 A2

D6: EP 2343039 A2

D7: WO 2012/038880 A2

D8: comparative data from 15-11-2022

V. According to the decision under appeal, the claimed subject-matter was novel over D1 and D2, in particular since the treatment of the skin disclosed in the prior art could not be seen as treating keratin fibres as required by claim 1, or shaping and/or conditioning the hair as required by claim 12, and the compositions of the prior art lacked the thickener required by claim 11.

With regard to inventive step, D6 was considered to represent the closest prior art. The problem was defined as the provision of compositions with improved stability, i.e. with an improved ability to remain homogenous upon storage, to be used in hair treatments, especially hair styling and hair conditioning. The claimed solution was inventive in view of D6 and D7.

VI. The opponent (hereinafter the appellant) filed an appeal against said decision. With the statement

setting out the grounds of appeal the appellant submitted the following items of evidence:

D9: Auszug aus Wikipedia zum Stichwort Vellushaar, <https://de.wikipedia.org/wiki/Vellushaar>

D10: Vergleichsversuche der Einsprechenden

VII. With a letter dated 6 November 2023, the patent proprietor, (hereinafter the respondent), filed auxiliary requests 1 to 16.

Independent claim 1 of the auxiliary requests 1-9 read as follows, the differences, unless otherwise indicated, relating to a comparison with the main request and shown in bold:

Auxiliary request 1

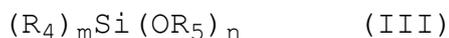
"1. Process for treating keratin fibres, especially the hair, preferably for shaping and/or conditioning the hair, which comprises the application of a composition (A) comprising:

(a) one or more alkoxy silanes bearing solubilizing function(s) of **formula (II)** below, and/or hydrolysis products thereof and/or oligomers thereof:



**in which the groups R', which may be identical or different, are chosen from linear or branched C<sub>1</sub>-C<sub>6</sub> alkyl groups and n' is an integer ranging from 1 to 6 and preferably from 2 to 4**

(b) one or more alkylalkoxysilanes of formula (III) below, and/or hydrolysis products thereof and/or oligomers thereof:



in which:

~~R<sub>4</sub> and R<sub>5</sub> each~~ represents, ~~independently of each other,~~ a C<sub>1-6</sub>, better still C<sub>1-4</sub>, alkyl group such as methyl, ethyl, n-propyl, isopropyl, n-butyl, isobutyl and tert-butyl,

**R<sub>5</sub> represents a methyl, ethyl or n-propyl group,  
n=3 and  
m=1**

and

(c) water in an amount of greater than 30% by weight relative to the total weight of the composition."

#### Auxiliary request 2

Claim 1 of auxiliary request 2 corresponded to claim 1 of the main request with a restriction regarding the process, namely:

"1. Process ~~for treating keratin fibres, especially the hair, preferably~~ for shaping and/or conditioning the hair, which comprises the application of a composition (A) comprising..."

#### Auxiliary request 3

Claim 1 of auxiliary request 3 had been restricted to the process as in claim 2 with the composition as in claim 1 of auxiliary request 1.

Auxiliary request 4

Claim 1 of auxiliary request 4 corresponded to claim 1 of the main request with a restriction regarding the process, namely:

1. Process ~~for treating keratin fibres, especially the hair, preferably~~ for shaping ~~and/or conditioning~~ the hair, which comprises the application of a composition (A) comprising...".

Auxiliary request 5

Claim 1 of auxiliary request 5 had been restricted to the process as in claim 4 with the composition as in claim 1 of auxiliary request 1.

Auxiliary request 6

The subject-matter of claim 1 of auxiliary request 6 corresponded to claim 1 of the main request with the further amendment:

**"wherein compounds (a) and (b) are present in an (a)/(b) weight ratio ranging from 1 to 10".**

Auxiliary request 7

The subject-matter of claim 1 of auxiliary request 7 corresponded to claim 1 of the main request with the further amendments:

**"1. Process ~~for treating keratin fibres, especially the hair, preferably~~ for shaping and/or conditioning the**

hair, which comprises the application of a composition  
(A) comprising...

**...wherein compounds (a) and (b) are present in an (a)/  
(b) weight ratio ranging from 1 to 10".**

Auxiliary request 8

The subject-matter of claim 1 of auxiliary request 8  
corresponded to claim 1 the main request with the  
further amendments:

"1. Process ~~for treating keratin fibres, especially the  
hair, preferably~~ for shaping ~~and/or conditioning~~ the  
hair, which comprises the application of a composition  
(A) comprising...

**...wherein compounds (a) and (b) are present in an (a)/  
(b) weight ratio ranging from 1 to 10".**

Auxiliary request 9

The subject-matter of claim 1 of auxiliary request 9  
corresponded to claim 1 of the main request with the  
further amendment:

**"wherein:**

**the alkoxy silane(s) bearing solubilizing function(s)  
(a) are present in an amount ranging from 2% to 25% by  
weight, relative to the total weight of the  
composition,**

**the alkylalkoxy silane(s) (b) are present in an amount  
ranging from 0.1% to 10% by weight, relative to the  
total weight of the composition, and**

**compounds (a) and (b) are present in an (a)/(b) weight  
ratio ranging from 1 to 10".**

Claim 10 corresponded to the composition claim 11 as granted with the following further amendments:

**"comprising 2% to 25% by weight, relative to the total weight of the composition, of one or more alkoxy silanes bearing solubilizing function(s) of formula (I) below,..."**, and

- **"wherein:**

**the alkylalkoxy silane(s) (b) are present in an amount ranging from 0.1% to 10% by weight, relative to the total weight of the composition, and compounds (a) and (b) are present in an (a)/(b) weight ratio ranging from 1 to 10."**

Claim 11 corresponded to the use claim 12 of the main request with the following further amendment:

**"wherein:**

**the alkoxy silane(s) bearing solubilizing function(s) (a) are present in an amount ranging from 2% to 25% by weight, relative to the total weight of the composition,**

**the alkylalkoxy silane(s) (b) are present in an amount ranging from 0.1% to 10% by weight, relative to the total weight of the composition, and compounds (a) and (b) are present in an (a)/(b) weight ratio ranging from 1 to 10."**

- VIII. The opponent (hereinafter the appellant) filed an appeal against said decision.
- IX. A communication from the Board, dated 11 July 2024, was sent to the parties.
- X. Oral proceedings took place on 8 November 2024.

XI. The arguments of the appellant may be summarised as follows:

Admission of D9

D9 was filed in response to the decision of the opposition division which did not consider example 8 of D1 to be detrimental to novelty and did not consider the application of the formulation to the skin disclosed in D1 to fulfil the requirement of "treatment of keratin fibres" (see point 7.3.2. of the grounds for the decision). The opposition division justified this by stating that the opponent had not shown that human skin was covered with hair.

Admission of D10

The tests D10 were a response to the patent proprietor's tests D8 and related to the unexpected use of D6 as closest state of the art by the opposition division in its decision. Since some raw materials had to be ordered for these tests and since the method for measuring mechanical stability is not a standard method, the test results were not yet available at the time of the oral hearing.

Main request - Inventive step

D6 addressed the same problem of stability and mechanical stress than the patent. D10 showed that there was no improvement over D6 and that the problem had to be defined as the provision of an alternative process or composition. The claimed solution was obvious in view of D7.

Auxiliary requests 1-5 - Inventive step

The same arguments than for the main request applied.

Auxiliary requests 6-8 - Inventive step

The problem was still the provision of an alternative, and the solution, in particular the claimed ratio, was obvious as such, and also in view of the disclosure of claim 6 of D3.

Auxiliary request 9 - Inventive step

With the subject-matter of auxiliary request 9, the problem over D6 was still the provision of an alternative process or composition and the solution was obvious in view of D3, D4 or D5.

If D3 was taken as closest prior art, it was the same situation and the claimed solution was obvious in view of D3, D4 or D5.

XII. The arguments of the respondent may be summarised as follows:

Admission of D9

This document could have been filed earlier because the opposition division addressed the specific point of novelty over D1 in its preliminary opinion.

Admission of D10

The experiments D10 could and should have been filed during the opposition proceedings. Moreover, the mechanic stability is a property that had not been

studied in D8 and the method used in D10 is not the method disclosed in paragraph [0241] of the patent, in particular the step of "crushing [of] the lock in flat tongs, which are drawn over the entire length". D10 was not relevant for this reason.

Main request - Inventive step

D8 showed that an improvement existed for the claimed process and composition over D6, in particular in view of a better moisture resistance when styling the hair. There was no incentive in D3 or D7 to add a silane (b) to the composition.

Auxiliary requests 1-5 - Inventive step

The patent proprietor had no arguments in respect of auxiliary requests 1 to 5 other than those submitted in respect of the main request.

Auxiliary requests 6-8 - Inventive step

The skilled person would not have envisaged the claimed ratio, even if the problem had to be defined as the provision of an alternative process or composition.

Auxiliary request 9 - Inventive step

D6 or D3 could be the closest prior art, and the problem was the provision of an improved process or composition in view of D10. The solution was not obvious.

XIII. Requests

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

The respondent requested that the appeal be dismissed, alternatively that the decision under appeal be set aside and the patent be maintained according to one of the sets of claims filed as auxiliary requests 1-16 with letter of 6 November 2023.

The respondent further requested that documents D9 and D10 not be admitted into the appeal proceedings.

**Reasons for the Decision**

1. Admission of documents D9 and D10 into the appeal proceedings

- 1.1 Both documents have been filed by the appellant with its statement of grounds of appeal.

The filing of these documents constitutes evidence that was not part of the facts on which the decision under appeal was based. For this reason, its filing amounts to an amendment of the appellant's case and the Board has discretion to admit them pursuant to Article 12(4) RPBA.

Relevant criteria for the exercise of the Board's discretion are the complexity of the amendment, the suitability of the amendment to address the issues which led to the decision under appeal and the need for procedural economy.

Moreover, the Board shall not admit evidence which should have been submitted in the proceedings leading to the decision under appeal (Article 12(6) RPBA).

1.2 Admission of D9

1.2.1 D9 has been cited by the appellant in support of its objection of lack of novelty over D1, to show that a skin treatment as disclosed in D1 would also treat keratin fibres present on the skin. D9 is the Wikipedia excerpt on "Vellushaar" ("vellus hair"), i.e. the fine hair that covers the entire human body: "Vellus hair grows on the entire surface of the body with the exception of the groin skin, palms of the hands and feet, and the lips and nipples" (cf. D9, paragraph 1, lines 6 - 9).

1.2.2 The Board notes that the preliminary opinion of the opposition division dated 10 June 2022 considered that D1 was not relevant for novelty. It mentioned that the application to the skin, which is the only application disclosed in D1, could not be considered as a treatment of the keratin fibres. It had not been shown that the skin is composed of keratin fibres, and even if the composition of D1 was applied to the skin on which some hair grows, the application of a topical composition was not seen as treatment of such hair.

The opponent did not provide any response to the preliminary opinion and the oral proceedings were held by videoconference on 15 February 2023.

**1.2.3 In the Board's view, document D9 could and should have been filed earlier during the opposition proceedings, since the preliminary opinion of the opposition**

**division already addressed the specific point of novelty over D1.**

1.2.4 Moreover, the relevance of D9's content and of the discussion related thereto appears to be questionable; it is indeed known that the skin comprises on its surface some hair, and this point did not necessitate the filing of a document. The discussion on novelty over D1 does furthermore not relate to the possible treatment of such vellus hair, but rather on the interpretation of the claimed subject-matter as granted. The filing of D9 does therefore not address the issues which led to the decision under appeal.

1.2.5 Consequently, D9 is not admitted into the appeal proceedings (Article 12(4) and 12(6) RPBA).

### 1.3 Admission of D10

1.3.1 According to the appellant, the tests D10 are a response to the patent proprietor's tests D8. The experiments D10 are based on the examples of D6.

1.3.2 The opposition division considered in its preliminary opinion dated 10 June 2022 that the claimed subject-matter **was not inventive over D3 as closest prior art, but inventive when starting from D6 as closest prior art.**

The proprietor filed the experiments D8 on 15 November 2022, the limit date as set out by Rule 116 EPC, in reaction to the preliminary opinion of the opposition division.

During oral proceedings, the parties discussed inventive step in the light of documents D3 or D6 as

closest prior art. The data of D8 have also been discussed by both parties apparently in relation to both documents D3 and D6 (see page 1 of the minutes). The opposition division came to the conclusion that claim 1 of the main request was inventive.

**In its decision, the opposition division finally took D6 as closest prior art and did not assess inventive step over D3.** The opposition division did not take into account the comparative data of D8 stating that they were relevant only for comparison with D3 (see point 7.8 of the decision).

1.3.3 **Thus, the opposition division reverted its preliminary opinion with regard to inventive step, in particular with regard to the choice of the closest prior art.** In its decision, the opposition division considered D6 as the closest prior art, while D3 was not considered. It also considered that the comparative data D8 were relevant only for a comparison with D3 and did not need to be taken into account when assessing inventive step over D6.

**The decision of the opposition division to consider that only D6 could be regarded as the closest prior art, thereby avoiding the assessment from D3, is presented for the first time with the decision.** In the Board's view, this decision of the opposition division could not have been expected by the parties. The filing of the experiments D10 based on the examples of D6 is therefore a legitimate reaction to the decision of the opposition division with regard to inventive step. In view of the circumstances of the case, the Board considers that it was not possible to expect from the appellant to file the experiments D10 during the opposition proceedings.

**In this regard the Board notes that the experiments D8 were filed on the last day set according to Rule 116 EPC, giving no chance to the opponent to file experiments in response to them.** The Board notes that the data of D8 are relevant for the assessment of inventive step over both D3 and D6. This is confirmed by the fact that the respondent in its reply to the statement of grounds of appeal relies on the experiments disclosed in D8 both when starting from D3 or when starting from D6 as closest prior art. **The tests D10 appear therefore clearly to be a response to the patent proprietor's tests D8 and are also relevant for the assessment of inventive step over D6.**

1.3.4 Consequently, D10 is admitted into the appeal proceedings (Article 12(4) and 12(6) RPBA).

2. Main request (patent as granted) - Inventive step

2.1 The claimed invention relates to a process for treating keratin fibres using a composition comprising a combination of particular alkoxy silanes. The invention aims to obtain stable alkoxy silanes-based systems, which are sufficiently concentrated to be effective both for shaping the hair and for caring the hair (cf. par. [0014] and [0016] of the specification). The compositions are also stable over time, with regard to the visual appearance and viscosity (cf. par. [0019]).

2.2 The opposition division considered that D6 was the closest prior art, rather than D3, which is the choice of the respondent. The appellant maintains in the appeal proceedings that both D6 and D3 might be considered as closest state of the art.

In view of the decision of the opposition division, the inventive step will first be assessed over D6.

- 2.3 D6 relates to hair treating and conditioning compositions comprising 3-aminopropyltriethoxysilane (APTES), a silane (a) falling under the claimed formula (I) (see par. [0008], [0009], [0022]). Said compositions may also comprise a thickener (cf. page 17, lines 9-17). Said compositions are said to be stable with regard to the visual appearance and viscosity (see par. [0015] and [0016]).

**This document does not disclose the presence of a further alkoxy silane of formula (III).**

- 2.4 The opposition division defined the problem over D6 as the provision of compositions with improved stability, i.e. with an improved ability to remain homogenous upon storage, to be used in hair treatments, especially hair styling and hair conditioning.

The respondent defines the problem as the provision of a process conferring better performance of fixation and improved resistance to humidity when styling hair.

The appellant defines the problem as the provision of an alternative process for treating keratin fibres and the provision of an alternative composition.

- 2.5 The respondent relies on the data provided by the examples of the contested patent, i.e. the data for formulations 12-14, 17 and 20 of example 1, by comparative examples 3-4, examples 2-3, as well by D8 in support of a technical effect. The appellant relies on D10 to show the absence of any effect.

- 2.5.1 Formulations 12-14, 17 and 20 of example 1 relate to compositions comprising aminopropyltriethoxysilane and methyltriethoxysilane, i.e. the alcoxysilanes of the claimed Formula (I) and (III). The experiments concern the effect of the formulations on the resistance to mechanical stress, feel and absence of residue formation on hair, as well as hairstyles moisture resistance (cf. par. [0241]-[0245] of the specification). These formulations are however not compared to a formulation without methyltriethoxysilane, or any alternative silane of Formula (III), so that it is not possible to draw any conclusion with regard to the comparison with the formulations disclosed in D6. The same conclusion applies to the remaining formulations of example 1 which were not cited by the respondent.
- 2.5.2 Example 1 discloses furthermore comparative examples 1-4, wherein comparative examples 3 and 4 relate specifically to formulations without the silane of formula (III). The compositions of comparative examples 3 and 4 are found to be tacky and do not deliver sufficient fixing performance (cf. the Table on page 26 and par. [0247] of the specification). **The results of comparative examples 3 and 4 show therefore an effect over compositions as disclosed in D6, and an improvement in the performance of fixation.**
- 2.5.3 Example 2 shows the effect of a pretreatment by the compositions A1-A5 according to the claimed invention, i.e. comprising aminopropyltriethoxysilane (silane of formula (I)) and methyltriethoxysilane (silane of formula (III)), followed by post-treatment by surfactant compositions B2-B5 applied to hair locks. With the compositions B2 to B4, the locks obtained are very easy to disentangle and remain supple during the

subsequent application of a shampoo. The hair locks treated with one of formulations A1-A5 and then treated with composition B5 showed much better resistance to UV than the untreated hair locks.

These formulations and treatments are not compared to the treatment with a formulation without methyltriethoxysilane, or any alternative silane of formula (III) as disclosed in D6, so that also in this case it is not possible to draw any conclusion with regard to the existence of any effect over the formulation disclosed in D6.

2.5.4 Example 3 shows a comparison between a composition 38 as claimed comprising 5% by weight of an alkoxy silane (a) (aminopropyltriethoxysilane) and 5% by weight of an alkoxy silane (b) (methyltriethoxysilane), and composition 39 comprising only aminopropyltriethoxysilane, a silane of formula (I) and octyltriethoxysilane. **Formulation 38 according to the invention had an improved stability when compared to that of comparative formulation 39.**

2.5.5 The data of D8 provides a comparison between a composition A according to the invention, comprising 10% by weight of alkoxy silane (a) (aminopropyltriethoxysilane or APTES) and 3% by weight of alkoxy silane (b) (methyltriethoxysilane or MTES), and a comparative composition C, without MTES, or an alkoxy silane of formula (III); said comparison corresponds to the distinguishing feature between D6 and the claimed subject-matter. It shows that the surface area of the frizz is lower before or after switching to humidity for locks treated with composition A according to the invention compared to those treated with comparative composition C. **This**

**shows that a composition according to the claimed invention helps to improve frizz control after the drying stage and after 24 hours in humid conditions over a composition as disclosed in D6.**

2.5.6 D10 provides a comparison between a composition according to D6 without alcoxysilane of Formula (III) and compositions V1-V5 comprising respectively only an alcoxysilane of formula (I) in V1, or a combination of alcoxysilanes of formula (I) and (III) as claimed in compositions V2-V5, namely aminopropyltriethoxysilane (APTES) and methyltriethoxysilane (MTES). D10 reports in detail the test protocol and the apparatus used, so that the tests and the results are technically relevant, contrary to the arguments of the respondent. The fact that the protocol of the experiments D10 is not exactly the same as in the patent is not relevant, since what matters is the possibility to make a comparison between compositions according to the invention and compositions according to D6.

**D10 shows that all tested compositions were equally stable. Moreover, the hair strand treated with a formulation as in D6 showed the greatest mechanical stability.** The stability of all other strands was poorer, i.e. both the strand treated only with MTES (V1) and the strands treated with mixtures of MTES and APTES (V2 - V5) showed poorer mechanical stability.

**Finally, the hair strand treated with formulation D6 had the best humidity resistance;** the hair strands treated with formulations V1 to V4 had more "frizz". The results for V5 were the same when compared to D6.

2.5.7 The Board notes that the results of experiments D10 contradict the results shown in examples 1 and 3, as

well as in the experiments D8. As the Board does not see any reason to technically question the results of all these experiments, it has to be concluded that an effect on improved stability, on better performance of fixation and improved resistance to humidity when styling hair may depend on specific characteristics of the processes and of the compositions such as the amounts and concentrations of the silanes (a) and (b) which are different in the experiments D8 and D10. Thus, the Board is not convinced that the effects shown in D8 and examples 1 and 3 of the patent can be generalized to the whole scope of the claim.

- 2.6 Hence, the problem over D6 is as defined by the appellant, namely the provision of an alternative process for treating keratin fibres and the provision of an alternative composition.
- 2.7 The solution to this problem is a process involving the application of a composition comprising a silane of formula (III), as well as a composition comprising said silane of formula (III) and its use for shaping and/or conditioning the hair.
- 2.8 Considering that the problem to be solved has been defined as the provision of an alternative, if the claimed solution is known from the remaining prior art or simply resulting from the knowledge and competence a skilled person must be assumed to have, the invention as claimed cannot involve an inventive step.

With regard to obviousness, the appellant cited document D7, the PCT publication of D3, which relates *inter alia* to compositions for making up and caring keratin materials and comprising at least one alkylalcoxysilane, more preferably a combination of two

alkylalcoxysilanes (see D7 page 1, first and second par.; see page 3, third par.; see claims 1, 2, 4). The products of D7 can be in the form of a hair care product or a hair styling product (D7, claim 12 and p. 16, lines 24 - 29).

D7 discloses in particular compositions comprising APTES (3-aminopropyltriethoxysilane) and MTES (triethoxymethylsilane), which are silanes of respectively the claimed formulas (I) and (III) (see claims 1 and 12, and example 1 for instance).

Consequently, a combination of a silane of formula (I) with in particular a silane of formula (III) is known from D7, or from its equivalent D3.

It results that the claimed solution is obvious and the main request does not meet the requirements of Article 56 EPC.

3. Auxiliary requests 1-5 - Inventive step

The subject-matter of the process claim 1 of these requests has been restricted to a combination of the alcoxysilanes of formula (II) with alcoxysilanes of a more restricted formula (III) and/or to a different type of process (see point VII above). These amendments do not constitute further technical distinguishing features over D6, since the alcoxysilane disclosed in D6, i.e. 3-aminopropyltriethoxysilane (APTES), falls also under formula (II) and since this document relates also to a process for shaping and/or conditioning the hair. Hence, the conclusions reached for the main request apply *mutatis mutandis* to at least independent claim 1 of auxiliary requests 1-5.

Consequently, auxiliary requests 1 to 5 do not comply with the requirement of inventive step (Article 56 EPC).

4. Auxiliary requests 6-8 - Inventive step

4.1 Auxiliary request 6

In comparison to claim 1 of the main request, claim 1 of auxiliary request 6 comprises the further amendment:

**"wherein compounds (a) and (b) are present in an (a)/(b) weight ratio ranging from 1 to 10".**

There is no particular effect linked with this technical feature and none of the examples of the patent or of D8 show a comparison with a process or composition involving a combination of silanes (a) and (b) in a different ratio.

D10 shows furthermore that the tested compositions V2 and V5 which provide a combination of alkoxysilanes (a) and (b) with a ratio of respectively 1 and 2 do not provide a better stability, mechanical stability and moisture resistance than the composition according to D6.

There is therefore no evidence that the claimed weight ratio has a more favourable effect than another possible weight ratio.

Consequently, the problem remains the provision of an alternative process for treating keratin fibres and the provision of an alternative composition.

The claimed solution, i.e. a process involving the application of a composition comprising in particular a silane of formula (III) and ratio of alkoxysilane of formula (I) to alkoxysilane of formula (III) of 1 to 10, as well as such composition and its use for shaping and/or conditioning the hair amount to an arbitrary measure within the ordinary routine of a skilled practitioner and cannot contribute to an inventive step. For this reason alone, the claimed solution is obvious.

Moreover, although D3 (or D7) teaches a preferred combination of alkoxysilane of formula (I) with an alkoxysilane of formula (III) with a ratio of 0.01 to 0.1 (cf. claim 7 of D3), this document also envisages that both alkoxysilanes may be present in the same amounts in claim 6.

Consequently, the subject-matter of claims 1, 11 and 12 of auxiliary request 6 is not inventive (Article 56 EPC).

#### 4.2 Auxiliary requests 7-8

In comparison to claim 1 of auxiliary request 6, the subject-matter of claim 1 of these requests has been restricted respectively to a "process for shaping and/or conditioning the hair" and a "process for shaping the hair", while the composition claim and the use claim were unchanged. These amendments do not constitute further technical distinguishing features over D6, so that the conclusions reached for auxiliary request 6 apply *mutatis mutandis* to auxiliary requests 7 and 8.

Consequently, auxiliary requests 7 and 8 do not meet the requirement of Article 56 EPC.

5. Auxiliary request 9 - Inventive step

In comparison to claim 1 of the main request, the subject-matter of independent claims 1, 10 and 11 of auxiliary request 9 has been amended in respect to the amounts of the alkoxy silane (a) of formula (I), which is now comprised between 2% to 25% by weight and to the amounts of the alkoxy silane (b) of formula (III), now comprised between 0.1% and 10% by weight, while the ratio of compounds (a)/(b) ranges from 1 to 10.

5.1 D6 as closest prior art

5.1.1 The respondent defines the problem over D6 as the provision of a process conferring better performance of fixation and improved resistance to humidity when styling hair.

The appellant maintains the problem over D6 as the provision of an alternative process for treating keratin fibres and the provision of an alternative composition.

5.1.2 In view of the amendments brought to the independent claims of auxiliary request 9, it appears that the experiments D10 are no longer representative of the claimed process, composition or use. In D10 the composition V2-V5 according to the claimed invention comprise indeed between 0.35 and 1% by weight of the alkoxy silane (a) of formula (I) and between 0.75 and 1% by weight of the alkoxy silane (b) of formula (III). The used amounts of the alkoxy silane (a) of formula (I) in D10 excludes *de facto* all the results obtained in D10

as representative of an effect of the claimed subject-matter; in addition, only examples V2 and V5 respect a ratio of (a)/(b) between 1 and 10. Consequently, the results of these experiments are no longer relevant.

On the other hand, the comparative examples 3 and 4 of example 1, example 3 of the contested patent, and the experiments shown in D8, are all based on compositions with the claimed amounts of alkoxysilanes (a) and (b) and ratio (a)/(b) (cf. point 2.5.5 above). The results of these experiments are still valid and are not negatively counterbalanced by the results of experiments D10, and show clearly that compositions according to the claimed subject-matter of auxiliary request 9 have **an improved stability and an improved frizz control after the drying stage and after 24 hours in humid conditions over a composition as disclosed in D6.**

5.1.3 In view of the experiments of the patent and of D8, the problem over D6 is as defined by the respondent, namely the provision of a process conferring better performance of fixation and improved resistance to humidity when styling hair.

5.1.4 The combination of the quantities of compounds (a) and (b) and the weight ratio (a)/(b) is not suggested in any of documents D6 and D3, nor in documents D4 and D5 cited by the appellant in the context of the inventive step.

There is no incentive in D6 to add a second silane (b), to adjust the concentrations and ratio in order to improve the stability and the frizz control after.

The amount of the silane (b) is comprised between 20 and 90% in D3 (or D7), as disclosed on page 7, lines 7-11 and as reflected by all the examples of D3, and there is no suggestion or incentive to change the amount in the frame of the problem as posed by the present patent.

D4 discloses hair processing compositions comprising methyltriethoxysilane in more than 30% of water (see examples 14-23 and Table 7 on page 15) while D5 discloses hair compositions comprising 3-aminopropyltriethoxysilane in more than 30% by weight of water. Both documents disclose methods and compositions comprising either the silane (a) or the silane (b), but not the combination, and there is no suggestion in any of these documents to add the second silane, even less for solving the problem over D6.

5.1.5 Thus, the claimed solution is not obvious since none of the cited documents mentions the particular combination of silanes in the context of the technical problem.

Consequently, auxiliary request 9 is inventive over D6 (Article 56 EPC).

## 5.2 D3 as closest prior art

5.2.1 D3 relates to cosmetic or dermatological compositions comprising an association of two alkoxysilanes of the same types of those claimed in claim 1 of the main request, such as in particular APTES (silane (a)) with MTES (silane (b)), which aims to form rapidly a film on keratin materials (see D1, claims 1-4; page 2, lines 18-21; examples 1, 2, 4 and 5); in examples 1 and 2, the composition comprise a high amount of ethanol and a maximum amount of 23.6% by weight of water. Such

composition can be applied to keratin fibres as mascara, hair styling lotions or foams, styling sprays or styling sticks, but is preferably a nail varnish (see D1, claim 12 or page, 2, lines 18-19 and page 5, lines 18-19).

The compositions disclosed in D3 do not contain **water in an amount of greater than 30% by weight** or a thickener and **the amount of the silane (b) is comprised between 20 and 90%** (see D3 page 7, lines 7-11 and the examples).

- 5.2.2 The appellant defined the problem over D3 as the provision of an alternative process or composition.

The problem as defined by the respondent over D3 is the provision of a process providing improved moisture resistance when styling hair.

- 5.2.3 According to the respondent, the problem of providing an improved process, composition or use has been solved, as shown in document D8.

D8 provides a comparison between a composition A according to the invention comprising 35.6% by weight of water and a similar composition B comprising 25.6% by weight of water and a pH of  $6 \pm 0,2$ , i.e. in line with the pH of the compositions of D3 (see page 3, line 15). The surface area of the frizz is lower before or after switching to humidity for locks treated with composition A according to the invention compared to those treated with comparative composition B. Said experiments show therefore an improvement with regard to moisture resistance when styling hair.

The comparative tests of D8 remain valid for independent claims 11 and 12, because compositions A and C include a thickener (hydroxyethylcellulose).

In view of D8 alone it can be concluded that the problem is as defined by the respondent.

5.2.4 The appellant relies on D3, D4 or D5 with regard to the obviousness of the solution.

(a) D3 does not mention the problem of improving the moisture resistance when styling hair and relates to compositions forming a film on drying presenting essentially a good stability and scratch resistance (see D3 page 2). D3 does neither disclose or suggest a composition with a water amount higher than 30% by weight, even less in the context of the definition of the problem.

(b) D4 discloses hair processing compositions comprising methyltriethoxysilane alone and in high amounts and more than 30% of water (see examples 14-23 and Table 7 on page 15).

D5 discloses hair compositions comprising 3-aminopropyltriethoxysilane alone in more than 30% by weight of water.

D4 and D5 are in the field of cosmetic hair treatment, D4 rather focusing on hair care while D5 relates to styling and conditioning keratin fibres. In view of the properties sought in D3, particularly linked to nail polishes, the skilled person is not encouraged to combine D3 with D4 or D5 to solve the technical problem, since they are not technically related. Moreover, the moisture

resistance of styling demonstrated in D8 and linked to the quantity of water is not mentioned in D4 and D5.

Accordingly, the claimed solution is not obvious, and the process, composition or use of auxiliary request 9 presents an inventive step with regard to D3 alone or in combination with D4 or D5 (Article 56 EPC).

5.3 Consequently, auxiliary request 9 meets the requirement of Article 56 EPC.

## Order

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

1. The decision under appeal is set aside.
2. The case is remitted to the opposition division with the order to maintain the patent on the basis of the claims of auxiliary request 9 filed on 6 November 2023 and a description to be adapted if necessary.

The Registrar:

The Chairman:



B. Atienza Vivancos

A. Uselli

Decision electronically authenticated