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**Datasheet for the decision  
of 18 March 2015**

**Case Number:** T 0471/12 - 3.3.06

**Application Number:** 03701299.4

**Publication Number:** 1463794

**IPC:** C11D1/645, A61K8/49, A61Q5/02,  
A61Q5/12

**Language of the proceedings:** EN

**Title of invention:**  
IMMIDAZOLINE QUATS

**Patent Proprietor:**  
Croda, Inc.

**Opponent:**  
Evonik Degussa GmbH

**Headword:**  
Imidazoline quats/CRODA

**Relevant legal provisions:**  
EPC Art. 52(1), 56, 123(3)

**Keyword:**  
Inventive step - reformulation of the technical problem -  
obvious solution (Main Request)  
Amendments -  
extension of the protection conferred (Auxiliary Requests)

**Decisions cited:**

**Catchword:**



**Beschwerdekammern  
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Case Number: T 0471/12 - 3.3.06

**D E C I S I O N  
of Technical Board of Appeal 3.3.06  
of 18 March 2015**

**Appellant:**  
(Patent Proprietor)

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**Decision under appeal:**

**Decision of the Opposition Division of the  
European Patent Office posted on 9 December 2011  
revoking European patent No. 1463794 pursuant to  
Article 101(3)(b) EPC.**

**Composition of the Board:**

**Chairman** B. Czech  
**Members:** G. Santavicca  
S. Fernández de Córdoba

## Summary of Facts and Submissions

- I. The appeal lies from the decision of the Opposition division to revoke European patent 1 463 794.
- II. The patent in suit had been opposed on the grounds of *inter alia* lack of inventive step (Article 100(a) EPC). The prior art documents referred to include
- D3/D3a: JP 58 144 174 A / English translation thereof,
- and
- D5: DE 100 58 328 A1.
- III. Claim 1 according to Auxiliary Request 1 considered by the Opposition Division in the decision under appeal reads as follows:

*"1. A cosmetic or personal care composition comprising :*

*(a) a mixture of dialkyl imidazoline [sic] quats wherein at least a portion of the mixture includes at least one dialkyl imidazoline [sic] quat having at least one C<sub>16</sub>-C<sub>30</sub> alkyl group; the C<sub>16</sub>-30 substitution content of the mixture being from about 10% to about 95% with respect to C<sub>10+</sub> reference substitution range, and*

*(b) at least one active ingredient selected from the group consisting of a surfactant, emollient, sunscreen compound, emulsifier, anti-dandruff agent, hair oxidizer/reducer, thickener, hair conditioning agent, hair setting agent, hair styling agent, cleansing agent, skin conditioning agent, hair growth promoter, perfume, pigment, moisturizer, film former, hair color, make-up agent, deodorant active, and pharmaceutical*

*useful for topical purposes for transdermal delivery, wherein said personal care composition is selected from the group consisting of a shampoo, hair conditioner, sunscreen formulation, suntan oil, bath composition, hand cleaner, anti-perspirant composition, perfume, cologne, cold cream, pre-shave, deodorant, topical pharmaceutical ointment, skin moisturizer, facial cleanser, cleansing cream, skin gel, make-up product, lipstick product, mascara and hair coloring product."*

- IV. In the decision under appeal, the Opposition Division came *inter alia* to the following conclusion as regards the subject-matter of said Claim 1:

Taking D3/D3a as the closest prior art, and considering the examples comprised in the patent in suit and the comparative evidence submitted during substantive examination, the technical problem to be solved could, absent any demonstrated effect attributable to the use of a mixture of two different quats as defined in Claim 1, only be seen in providing further cosmetic or personal care compositions. However, the use of a dialkyl imidazoline quat as defined in Claim 1 was already known from D3/D3a and D5. Since the first priority date of the patent in suit was not validly claimed, D5, published between first and second priority dates of the patent in suit, was prior art under Article 54(2) EPC. D5 (Claim 1) explicitly suggested that there might be more quats in the composition. Consequently, the claimed composition was an obvious solution to the technical problem posed.

- V. With its statement setting out the grounds of appeal filed on 19 April 2012, Appellant I (hereinafter **Proprietor**) re-submitted as its new Main Request the

set of claims that had been pending as Auxiliary Request 1 before the opposition division (see wording of Claim 1 under III, *supra*), together with three further amended sets of claims as Auxiliary Requests A1, A2 and A3.

Claim 1 according to Auxiliary Request A1 differs from Claim 1 of the new Main Request in that its part (a) is amended and reads (amendments made apparent by the Board)

"... (a) a mixture of dialkyl imidazoline [sic] quats wherein at least a portion of the mixture includes  
**(i)** at least one dialkyl imidazoline [sic] quat having at least one C<sub>16</sub>-C<sub>30</sub> alkyl group; the C<sub>16-30</sub> substitution content of the mixture being from about 15% to about 80% with respect to C<sub>10+</sub> reference substitution range, or  
**(ii)** at least a portion of the mixture includes at least one dialkyl imidazoline [sic] quat having at least one C<sub>20</sub>-C<sub>30</sub> alkyl group; the C<sub>20-30</sub> substitution content of the mixture being from about 15% to about 80% with respect to C<sub>10+</sub> reference substitution range, and  
(b) ..."

Claim 1 according to Auxiliary Request A2 differs from Claim 1 according to the new Main Request in that its part (a) is further amended, and reads as follows (amendments made apparent by the Board):

"... (a) a mixture .... at least one dialkyl imidazoline [sic] quat having at least one **C<sub>20</sub>-C<sub>30</sub>** alkyl group; the C<sub>20-30</sub> substitution content of the mixture being from about 15% to about 80% with respect

to C<sub>10+</sub> reference substitution range, and  
(b)..."

Claim 1 according to Auxiliary Requests A3 differs from Claim 1 according to Auxiliary Request A2 in that its part (a) is further amended, and reads as follows (amendments made apparent by the Board):

"...(a) a mixture ... the C<sub>20-30</sub> substitution content of the mixture being from about **35%** to about **60%** ..."

In arguing that the claimed subject-matter was not obvious, the Appellant also relied on the examples of the patent in suit as well as on comparative experimental data included in the following documents filed during the substantive examination of the case:

AP1: First declaration by Mr A. Pereira dated  
2 March 2005, and

AP2: Second declaration by Mr A. Pereira dated  
14 December 2006.

- VI. In its reply of 11 October 2012, the Respondent (Opponent) maintained objections regarding *inter alia* inventive step. In this respect it argued *inter alia* that the subject-matter of Claim 1 of the new Main Request was obvious in the light of document D3/D3a. Regarding the claims of Auxiliary Requests A1 to A3 it raised objections under Article 123(3) EPC.
- VII. Oral proceedings were held on 18 March 2015. As regards the Main Request, the debate focused on the issue of inventive step in the light of D3/D3a taken as the closest prior art. As regards Auxiliary Requests A1 to A3, the parties

were heard regarding the objections under Article 123(3) EPC.

- VIII. The Appellant (Patent Proprietor) requested that the decision under appeal be set aside and that the patent be maintained on the basis of the claims according to the Main Request filed with the statement setting out the grounds of appeal or, in the alternative, on the basis of the claims according to one of Auxiliary Requests A1 to A3 filed with the statement setting out the grounds of appeal.

The Respondent (Opponent) requested that the appeal be dismissed.

- IX. The arguments of the Appellant of relevance for the present decision can be summarised as follows:

*Main Request - Inventive step*

The closest prior art document D3/D3a, disclosed a hair rinse agent, but the hair to be rinsed could also be animal hair, i.e. not necessarily human hair.

Imidazoline quats were mentioned in D3a, and it was not disputed that these quats were known as such before the priority date of the patent in suit. The invention concerned, however, mixtures of imidazoline quats having the specific substitution content profile as prescribed by the claims of the patent. D3/D3a did not disclose a composition containing mixtures of dialkyl imidazoline quats, let alone one having the particular substitution content profile prescribed by the claims at issue.

The problem solved in the light of D3/D3a was the provision of compositions with improved properties including viscosity and substantivity of hydrophobic



ingredients on hair.

This was apparent from the examples of the patent in suit. The labelling "reference examples" was the result of an error made during the examination proceedings. In fact, the examples showed mixtures of dialkyl imidazoline quats. In this respect, the references to "*di-behenyl*" and "*di-erucic*" in the examples of the patent in suit might be not entirely clear as regards the presence of a mixture. However, in the light of the examples, the description (e.g. Paragraph [0078]) and the claims read in combination, there was no doubt that mixtures of quats were meant in the examples. "*Di-erucic*" was to be understood as "derived from rapeseed oil". Natural dermal oils such as rapeseed oils were mixtures of oils, i.e. of esters of different fatty acids. For instance, Example 2 of the patent in suit concerned a mixture, which remained a mixture also after hydrogenation. Also Examples 6 to 12 concerned mixtures, the profile of which was to be calculated as done e.g. in Paragraph [0023] of the patent in suit. Thus, the examples of the patent in suit were not to be read on their own, and concerned mixtures of imidazoline quats. The table on page 22 of the patent in suit listed natural oils having the claimed profile, from which the mixtures of quats to be used in the claimed compositions could be derived (paragraph [0078]).

Regarding the improvement obtainable by using mixtures of quats having a substitution content according to Claim 1, the comparative data provided with documents AP1 and AP2 had also to be considered. These experiments clearly showed improvements in terms of reduced combing force and viscosity, compared to compositions according to D3/D3a. Thus, the objection that none of the submitted examples showed the effects of the invention was unjustified. D3/D3a neither

addressed the problem solved by the patent in suit, i.e. an improvement in desired properties of hair care composition, nor suggested how to improve its viscosity and/or substantivity. In particular, D3/D3a did not indicate any reason for choosing two imidazoline quats according to D3/D3a and using them in admixture, hence it contained no suggestion to do so. Moreover, D3/D3a did not hint at selecting the specific substitution content profile prescribed by Claim 1 at issue, nor even at trying any particular substitution content profile in the expectation of success. Since D3/D3a gave no value to the mixing of imidazoline quats, no motivation to do so was derivable from this document.

*Auxiliary Requests A1 to A3*

At the oral proceedings, the Appellant conceded that it could follow the calculations made by the Respondent, and stated that it had nothing to add.

- X. The counter-arguments of the Respondent of relevance for the present decision can be summarised as follows:

*Main request - Inventive step*

D3/D3a described the closest prior art because it dealt not only with reduction of hair friction, i.e. a conditioning effect, but also with viscosity stability, as apparent from e.g. page 13, 2nd paragraph, so that there was a similarity of the problems addressed in D3/D3a and the patent in suit, respectively, also in respect of viscosity improvement.

As regards the closest embodiment of D3/D3a, attention was drawn to D3a, Page 12, lines 10-15, disclosing a hair rinse agent comprising, in addition to a

"softening agent", a dye or pigment. According to D3a, page 4, second paragraph, the softening agent for said hair rinse composition comprised a 4<sup>th</sup> class ammonium salt having two alkyl or alkenyl groups each having 12-24 carbons in its molecule (Component (A)), which was to be used in aqueous compositions for reducing hair friction. Thus, D3a disclosed, *inter alia*, conditioning hair care compositions containing a dye or pigment. In particular, the softening agent of D3/D3a could be an imidazoline quat of general Formula (IV), containing two alkyl, hydroxyalkyl or alkenyl groups having 12 - 24 carbons. Most importantly, D3/D3a mentioned that mixtures of salts of formula (IV) could be used, whereby practical examples thereof, in the paragraph bridging its Pages 7 and 8, listed two specific dialkyl imidazoline quats. Thus, the only difference between the claimed subject-matter and the closest embodiment disclosed by D3/D3a was that the former required the use of a mixture of dialkyl imidazoline quats having the specified substitution content profile.

However, in this respect, an improvement over compositions according to D3/D3a, as invoked by the Appellant, had not been shown, neither in the examples of the patent in suit nor by the further comparative examples submitted. The table on page 22 of the patent in suit was no clear indication of a criticality of the claimed substitution content profile. Examples 6 to 8 of the patent in suit concerned individual dialkyl imidazoline quats, not mixtures thereof, as there were no references to specific examples concerning mixtures, such as Example 2. The further examples of the patent in suit mostly concerned individual quats. Examples 9 to 12, for instance, could not be read with reference to Paragraph [0023] of the patent in suit, since they

contained no back-reference to said paragraph. However, even considering that mixtures were exemplified in the patent in suit, the respective examples would not be comparative, let alone indicative of some effect obtained across the whole breadth of the claims. Thus, if mixtures were indeed exemplified, the claims of the patent in suit would nevertheless also encompass combinations of quats which did not provide the desired improvements.

Declaration AP1 did not compare the claimed invention with compositions according to D3/D3a, as apparent from the first line of Table 1 of AP1, which did not refer to a dialkyl imidazoline quat.

Declaration AP2 was intended to be a comparison between a composition (AP2: points 9 and 10, Table 2) according to the invention (namely, Example 10 of the patent in suit) and Example 1 of D3/D3a (AP2: Table 1; component c, third row). However, there were too many differences between the compositions compared in terms of their ingredients and relative amounts, so that the comparative results provided in Tables 3 and 4 of AP2 did not permit acknowledging an improvement, e.g. in terms of viscosity or combing force, attributable to the particular quats mixture used in the composition according to the invention.

Hence, the comparisons made in AP1 and AP2 were unsuitable to demonstrate any effect allegedly achieved by using a mixture of dialkyl imidazoline quats instead of a single dialkyl imidazoline quat compound. Nor had any effect allegedly provided by the "substitution content profile" ever been shown.

In the absence of any proven effect, the problem solved could only be seen in providing a further personal care composition, in particular a dye- or pigment-containing hair conditioning composition.

The claimed solution to this problem was obvious for the skilled person starting from D3/D3a, a document pertaining to the same technical field as the patent in suit. For the skilled person implementing the teaching of D3, a mixture of the two imidazoline quats specifically mentioned (D3a: paragraph bridging pages 7 and 8) at a 1:1 ratio would be the first, obvious choice to try. The claimed profile would thus automatically be obtained. The same would happen also with many mixtures having ratios different from 1:1, in view of the breadth of the profile defined in the claims.

#### *Auxiliary Requests A1 to A3*

As apparent from the compositions indicated as examples provided in its letter of 11 October 2012, the respective amended Claims 1 according to each of Auxiliary Requests A1 to A3, extended the protection conferred by Claim 1 as granted, and thus did not meet the requirements of Article 123(3) EPC. Therefore, none of the three auxiliary claims was allowable.

### **Reasons for the Decision**

#### *Main Request - Claim 1 - Inventive step*

##### *The invention*

1. The present invention concerns *inter alia* a "personal care composition" being a conditioning hair care composition, containing dialkyl imidazoline quats and a pigment (see Claim 1 and Paragraph [0086], last sentence).

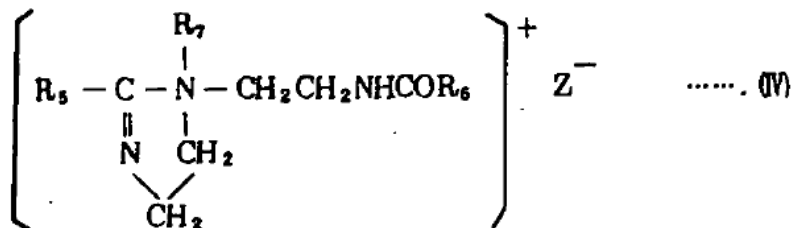
*The closest prior art*

2. At the oral proceedings before the Board, it was common ground between the parties that the closest prior art is represented by document D3/D3a. Considering the similarities between the patent in suit and D3/D3a in terms of problems addressed and features of the compositions disclosed, the Board has no reason to take a different stance.

2.1 The relevant disclosure of D3/D3a

2.1.1 D3/D3a relates to a "softening base agent" used as a softening liquid agent for fibre and clothes and as effective substance in a hair rinse agent (D3a: page 3, last full sentence).

2.1.2 More particularly D3 discloses a "hair rinse agent" containing said softening base agent and, additionally, a pigment or dye (D3a: page 12, lines 10-15). According to Claim 1 of D3/D3a, the softening base agent contains two components (A) and (B), component (A) being a "4<sup>th</sup> class ammonium salt having two alkyl or alkenyl groups, each having 12 - 24 carbon atoms in its molecule". According to Claim 2 of D3/D3a, component (A) comprises, in one preferred alternative, an imidazoline compound of Formula IV:



where "R<sub>5</sub> and R<sub>6</sub> respectively denote an alkyl group having 12 - 24 carbon atoms, β-hydroxy alkyl group or alkenyl group; R<sub>7</sub> ... denotes an alkyl group or hydroxy

alkyl group having 1 - 3 carbon atoms, benzyl group, group expressed as  $-(C_2H_4O)_nH$  ( $n=1-5$ ), ... and Z denotes a halogen or monoalkyl sulfuric acid group having 1 - 3 carbon atoms".

2.1.3 The softening agents disclosed in D3 are supposed to impart excellent softness and reduced friction to hair, i.e. a conditioning effect, and to be capable of improving *inter alia* the viscosity stability (D3a: sentence bridging pages 3 and 4, page 4, first full paragraph, first sentence; page 5, first full paragraph, first sentence).

2.2 Moreover, the Board infers from the distinction made on page 4 (line 6) of D3a between a "softening agent for clothes" and "a hair rinse agent", respectively, as well as from the reference to smooth combability in Example 3 of D3 (D3a: page 18, last paragraph), concerning a "hair rinse agent", that within the context of D3/D3a a hair rinse agent is a (personal) hair care composition for treating human hair.

2.3 The Board thus accepts that D3/D3a discloses personal care compositions, which are conditioning hair care compositions containing a softening agent and a pigment (D3a: Page 12 of D3a), the softening agent comprising a dialkyl imidazoline quat having two alkyl groups each containing containing 12-24 carbons as expressed by Formula (IV) (D3a: claim 2).

That such quat is suitable for conditioning the hair is apparent from e.g. the reference to good combability in Example 3 of D3 (D3a: page 18, last paragraph). This was not in dispute.

These compositions disclosed on page 12 of D3a thus

represent the closest prior art embodiment for assessing inventive step.

*The technical problem solved according to the Appellant*

3. During the oral proceedings before the Board, the Appellant maintained that, in the light of the closest prior art D3/D3a (point 2.3, *supra*), the technical problem solved consisted in providing compositions with improved properties such as viscosity and substantivity of the ingredients on hair, and leading to less combing force being required.

*The solution*

4. The patent in suit as amended proposes to solve this problem by providing a composition as defined in Claim 1 at issue, which is characterized in particular in that it comprises

*"a mixture of dialkyl imidazoline quats wherein at least a portion of the mixture includes at least one dialkyl imidazoline quat having at least one C<sub>16</sub>-C<sub>30</sub> alkyl group; the C<sub>16-30</sub> substitution content of the mixture being from about 10% to about 95% with respect to C<sub>10+</sub> reference substitution range".*

*The alleged success of the solution*

5. In attempting to show improved properties allegedly attributable to the claimed compositions, as compared to the hair care composition disclosed by D3/D3a, the Appellant relied on the following evidence:
  - on the one hand, the examples comprised in the patent in suit; and,



- on the other hand, the comparative examples reported in the two declarations AP1 and AP2.
6. For the following reasons, the Board holds that this evidence does not convincingly show any improvement achieved over the closest prior art:
- 6.1 The examples in the patent in suit:
- 6.1.1 In this respect, the Board notes that prior art document D3 is not mentioned in the application as filed, let alone the problem of improving compositions according to D3. An acknowledgement of D3 was only inserted into the description during substantive examination of the patent in suit. Hence, the disclosure of D3 had apparently not been considered in drafting the application as filed and was not taken into account in the examples now also contained in the patent as granted, and supposed to show some improvement over the prior art.
- i) In fact, Examples 1 to 3 of the patent in suit merely concern the preparation of dialkyl imidazoline quats. Among them, only Example 2 clearly appears to concern the preparation of a mixture of such quats, resulting from the use of "*rapeseed oil*", i.e. a mixture of esters from different fatty acids, see "*HEAR oil*" row in Table 11 on page 22 of the patent in suit).
- ii) Examples 4 and 5 describe quat raw materials which are solutions of mixtures of dialkyl imidazoline quats (see Tables 3 and 7 of the patent in suit), however they only report the "*cationic activity*" of these materials.
- iii) Examples 6 and 7 concern the preparation of

sunscreen lotions containing (in their Phase A) di-erucic imidazoline quat. Since these examples do not specify whether the di-erucic imidazoline quat was obtained from erucic acid (as in Example 1) or from e.g. rapeseed oil (as in Example 2), it is not clear whether these compositions actually comprise a mixture of dialkyl imidazoline quats.

iv) Example 8 concerns the preparation of a hair conditioner comprising (in its Phase A) "*di-C<sub>20-24</sub> imidazoline quat*", which may be a mixture of quats. The example contains no assessment of any effect whatsoever attributable to this particular conditioner.

v) Examples 9 and 10 illustrate the preparation of, respectively, a "*soft and shine*" conditioner and a "*vitamin E containing*" conditioner containing (in their Phase A) a mixture of di-behenyl imidazolinium methosulfate and cetrimonium Methosulfate (7/3 w/w) in cetearyl alcohol (70% actives). At the oral proceedings before the Board, the Appellant invoked paragraph [0078] (last sentence) of the patent in suit in support of its view that the di-behenyl imidazolinium methosulfate component used in these examples had to be a mixture of dialkyl imidazoline quats. However, irrespective of whether or not this is the case, these examples do not mention or quantify any particular effect attributable to the so-prepared compositions.

vi) Examples 11 and 12 both concern the deposition of Vitamin E on hair and are comparative. Example 11 compares the deposition of Vitamin E from two simple conditioning compositions containing 0.5% of the vitamin and 1.5% of either a mixture of di-behenyl imidazolinium methosulfate and cetrimonium methosulfate (7/3 w/w) or behentrimonium chloride (not an

imidazoline quat) only.

Example 12 compares three formulations: Two of them comprise 1% of a mixture of di-behenyl imidazolinium methosulfate and cetrimonium methosulfate (7/3 w/w) in cetearyl alcohol (70% actives), one having a 1% cationic activity, the other having a 0.5% cationic activity. The di-behenyl imidazolinium methosulfate was derived from HEAR oil, hence was a mixture of dialkyl imidazoline quats. The third (comparative) formulation comprises 1% of Polyquaternium-10 (a well known polymeric conditioner), having 0.3% cationic activity. The composition containing di-behenyl imidazolinium methosulfate derived from hear oil (i.e. a quat mix) performed better in terms of vitamin E substantivity, and the performance was proportional to the cationic activity.

6.1.2 As apparent from the above analysis, none of the examples of the patent in suit concerns a comparison with the compositions disclosed by D3. Hence, these examples are not suitable to demonstrate the achievement of any improvement whatsoever over the compositions according to the closest prior art embodiment of D3, which also contain a dialkyl imidazoline quat as expressed by Formula (IV).

6.2 Declaration AP1

i) In AP1 a comparison is made between a composition allegedly replicating Example 3 of D3, then considered as the closest prior art, and a composition falling within the ambit of Claim 1 then at issue, i.e. comprising a mixture of dialkyl imidazoline quats. According to declaration AP1, the composition of Example 3 of D3 (D3a, page 18) was replicated with the same ingredients, except for the replacement of

dihydrogenated beef tallow alkyl dimethyl ammonium chloride with dihydrogenated beef tallow imidazolinium chloride, stated to contain about 4.4% C<sub>14</sub>, 31.9% C<sub>16</sub>, 2.1% C<sub>17</sub> and 60.8% C<sub>18</sub> fatty acid substituents and to thus fall within the ambit of Claim 1 then at issue. Table 1 of AP1 summarises the ingredients of the compositions compared. Tables 2 and 3 are supposed to show that the composition comprising beef tallow derived dialkyl imidazoline quats had a higher viscosity, which was more appropriate for a cosmetic composition hair conditioning, and was more effective at reducing the combing force.

ii) However, Example 3 of D3 contains, as quarternary ammonium components, 1% of di-palmityl methyl polyoxyethylene (P=5) ammonium chloride and 0.005% of the ammonium salt also mentioned as preferred in D3 (D3a: page 9, Formula VI; page 10, penultimate formula), namely of octadecyl-dimethyl-2-hexadecyl-eicosanyl-ammonium chloride.

Since the composition illustrated by Example 3 of D3 neither contains dihydrogenated beef tallow alkyl dimethyl ammonium chloride nor dihydrogenated beef tallow imidazolinium chloride, declaration AP1 does not concern a replication of Example 3 of D3.

iii) D3 indeed mentions dihydrogenated cow grease alkyl dimethyl ammonium chloride as one of the materials preferably used as component A (D3a: page 7, text lines 11 to 13), as an alternative to distearyl methyl polyoxy ethylene (average polymerization ratio = 5) ammonium chloride as used in Example 3 of D3. However, the list of preferred quaternary ammonium compounds disclosed in D3 (D3a: paragraph bridging pages 7 and 8) also includes two dialkyl imidazoline quats that were,

not tested according to the data reported in declaration AP1.

6.2.1 Hence, the comparative experiments described in declaration AP1 are neither based on a reproduction of Example 3 of D3, nor do they shed any light on effects possibly achieved (or not achieved) using the dialkyl imidazoline quats also disclosed in D3.

6.3 Declaration AP2

6.3.1 In declaration AP2 a comparison is made between a "claimed composition" (AP2: point 9, Table 2), supposed to correspond to a composition according to Example 10 of the patent in suit, and a "prior art" formulation (AP2: points 3, 8: Table 1) supposed to be illustrated by example 1 of D3 (D3a: Table 1, component c: 2-hexadecyl-1-methyl-1-[(2-hexadecanoyl amino) ethyl] imidazolinium chloride).

6.3.2 According to the results shown in Tables 3 and 4 of declaration AP2, the "claimed" composition had a much higher viscosity than the "prior art" composition. The higher viscosity was appropriate for a cosmetic composition, such as hair care products, whilst the lower viscosity of the composition according to D3 was more appropriate for a fabric softening composition. Also, the "claimed" composition was more effective at reducing the combing force.

6.3.3 However, apart from water, the compared compositions differ in all other ingredients and relative amounts (compare Tables 1 and 2), i.e. are so different that it is not apparent how they could show which effect is attributable to which ingredient and amount. Also, as acknowledged in declaration AP2 itself (see Point 14),

the "prior art" composition illustrated in Example 1 of D3 (D3a: Table 1, third row), reproduced is intended to be used as fabric softener, not as hair care composition (as in Example 3 of D3).

- 6.3.4 Already for these reasons, the comparative data presented in declaration AP2 are not suitable for demonstrating that, compared to the conditioning hair care composition generally disclosed in D3 (point 2.3, *supra*), an improvement is achieved by the combination of features recited in Claim 1 at issue.
- 6.4 In summary, for the Board, none of the evidence on file convincingly shows that compositions as defined are improved compared to the compositions according to the closest prior art (point 2.3, *supra*), let alone across the whole breadth of Claim 1 at issue. In particular, there is no evidence on file convincingly demonstrating any advantages attributable to the substitution profile of the mixture of dialkyl imidazoline quats comprised in the claimed compositions.
- 6.5 Furthermore, the Board notes that the Appellant has not discharged the onus of proof resting on it in respect of any alleged improvements, in particular in respect of a viscosity, which is not even mentioned as such in the application as filed. Also, the question arises whether the fact that a composition is more viscous, e.g. more apt for being hold in the hand, might represent an improvement in the context of hair conditioners. In view of the conclusions reached, the Board need not, however, deal with that question.

*Reformulation of the technical problem*

7. Since the problem solved cannot be formulated in terms

of an improvement over the closest prior art disclosed by D3 (point 2.3, *supra*), it has to be reformulated in a less ambitious way.

It can be seen in the providing of further personal care compositions, in particular conditioning hair care compositions with comparable properties, including providing good substantivity on hair of the hydrophobic ingredients of the composition and good combability.

*The success of the solution*

8. Paragraph [0092] and Examples 11 and 12 of the patent in suit disclose an improvement over compositions not containing (an) imidazoline quat(s) in terms of substantivity to hair of hydrophobic ingredients of cosmetic compositions, such as Vitamin E. The achievement of good combability, due to the dialkyl imidazoline quat, is plausible at least in view of AP1.

The Board is thus satisfied that the reformulated less ambitious technical problem (*supra*) is effectively solved by the claimed compositions.

*Obviousness*

9. It remains to be decided whether, having regard to the state of the art, the claimed subject-matter was obvious for the skilled person seeking to solve the less ambitious technical problem posed (*supra*).
- 9.1 In the present case, a key question to be answered is whether the skilled person would envisage using a mixture of dialkyl quats as defined in Claim 1 at issue in a conditioning hair care composition as disclosed in

- D3, comprising an imidazoline quat, and a pigment as further active ingredient.
- 9.1.1 D3 not only discloses (D3a: page 6, last paragraph) that the 4<sup>th</sup> class ammonium salt (i.e. Component (A)) of the softening agent **is** a "mixture of one or more kinds of the 4<sup>th</sup> class ammonium salt, imidazolinium salt, as expressed by Formula (IV)", but even gives specific examples of salts that may be admixed. More particularly, the paragraph bridging pages 7 and 8 of D3a discloses mixtures of one or more materials selected from " ..., 2-**heptadecyl**-1-methyl-1-[(2-**octadecanoyl** amino) ethyl] imidazolinium ethyl sulfate, 2-**hexadecyl**-1-methyl-1-[(2-**hexadecanoyl** amino) ethyl] imidazolinium chloride, etc." (emphasis added by the Board).
- 9.1.2 Hence, D3 generally teaches that component (A) may be a mixture of compounds, *inter alia* imidazoline quats of Formula (IV), including, more specifically, the two mentioned quat compounds which are "*dialkyl imidazoline quats*" within the meaning of the patent in suit (see paragraph [0016] "*having at least one C<sub>16-30</sub> alkyl group*" as required by Claim 1 at issue.
- 9.1.3 The Board is thus convinced that by virtue of these indications in D3/D3a the skilled person is expressly oriented towards the possibility of using a mixture of said two dialkyl imidazoline quats as component (A) of the hair rinse compositions disclosed, as one amongst many other readily available formulation options.
- 9.2 However, since D3/D3a does not mention or point to any particular "*C<sub>16-30</sub> substitution content*" of such a mixture of dialkyl imidazoline quats, it must be



assessed whether providing a mixture also meeting this additional requirement was obvious too.

- 9.2.1 With regard to this particular aspect, the Board is convinced that the skilled person, in implementing a quat mixture following the teaching of D3 (D3a: page 6, last paragraph, in combination with the paragraph bridging pages 7 and 8) would, considering the absence of any indications concerning possible mixing ratios, in the first place adopt the most natural approach, namely using an about 1:1 mixture of the two only quats specifically mentioned in D3/D3a.
- 9.2.2 The first imidazoline quat mentioned in D3a has two C<sub>17</sub> alkyl groups (applying the definitions given in paragraphs [0012] to [0014] of the patent in suit), and the second imidazoline quat mentioned in D3a has a C<sub>16</sub> and a C<sub>15</sub> alkyl group.
- 9.2.3 Applying the calculation criteria given in paragraphs [0017] to [0028] of the patent in suit to an equimolar mix of the two dialkyl quats exemplified in D3a would result in a "*C<sub>16-30</sub> substitution*" content of the mixture of about 75%, since four C<sub>10+</sub> groups are present on the two different molecules, of which only three are in the C<sub>16-30</sub> range.
- 9.2.4 Incorporating such a mixture of the two quats specifically disclosed in D3a into a hair rinsing composition comprising a dye or pigment thus results in a hair care composition falling within the ambit of Claim 1 at issue.
- 9.2.5 The Board is also convinced that the skilled person would envisage variations of the molar ratio of said

two quats. Considering the breadth of the definition of the substitution profile, he will still, in most of the cases, arrive without ingeniousness at a composition falling within the ambit of Claim 1 at issue.

9.3 Considering that there is no evidence on file convincingly showing that some particular effect or improvement over the closest prior art compositions (point 2.3, *supra*) of D3 is achieved when working within the ambit of Claim 1 at issue, the Board concludes that in view of the total disclosure of document D3 taken alone, providing a hair rinsing composition comprising a mixture of dialkyl quats as defined in Claim 1, meeting also the "*C<sub>16-30</sub> substitution content*" criterion is merely one amongst equally obvious formulation options readily available to the skilled person seeking to solve the technical problem posed.

9.4 Hence, in the Board's judgement, the subject-matter of Claim 1 at issue does not involve an inventive step (Articles 52(1) and 56 EPC).

9.5 The Main Request is thus not allowable.

*Auxiliary Requests A1 to A3 - Non-compliance with Article 123(3) EPC*

10. In support of its objections raised under Article 123(3) EPC with respect to Auxiliary Requests A1 to A3, the Respondent submitted examples of compositions that  
- do not fall under the scope of Claim 1 as granted but  
- do fall under the respective Claims 1 according to said Auxiliary Requests:

- 10.1 A composition comprising a quat mixture wherein the alkyl group distribution is 4% C<sub>12</sub> / 17% C<sub>16</sub> / 79% C<sub>24</sub> - is not encompassed by Claim 1 as granted since it contains 96%, i.e. more than 95%, of C<sub>16-30</sub> alkyl groups,  
- but is encompassed by the respective Claims 1 according to Auxiliary Requests A1 (alternative ii) and A2, which merely require a C<sub>20-30</sub> substitution content in the range from of 15 to 80% (here: 79%).
- 10.2 A composition consisting of quat mixture wherein the alkyl group distribution is 4% C<sub>12</sub> / 48% C<sub>16</sub> / 48% C<sub>24</sub> - is not encompassed by Claim 1 as granted since the relative amount of C<sub>16-30</sub> alkyl groups is greater than 95%,  
- but is encompassed by Claim 1 according to Auxiliary Request A3 which merely requires the relative amount of C<sub>20-30</sub> to be in the range of of 35 to 60% (here: 48%).
- 10.3 Compared to Claim 1 as granted, the respective Claims 1 according to each of Auxiliary Requests A1 to A3, all extend the protection conferred. The Appellant did not provide any counter-arguments in this respect.
- 10.4 Hence, in the Board's judgement, none of the auxiliary claims requests A1 to A3 meets the requirements of Article 123(3) EPC.
- 10.5 Auxiliary Requests 1 to 3 are thus not allowable either.

**Order**

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

The appeal is dismissed.

The Registrar:

The Chairman:



D. Magliano

B. Czech

Decision electronically authenticated