

**Internal distribution code:**

- (A) [ - ] Publication in OJ  
(B) [ - ] To Chairmen and Members  
(C) [ - ] To Chairmen  
(D) [ X ] No distribution

**Datasheet for the decision  
of 7 February 2013**

**Case Number:** T 0213/10 - 3.3.07

**Application Number:** 00960485.1

**Publication Number:** 1207841

**IPC:** A61K8/85, A61Q5/06

**Language of the proceedings:** EN

**Title of invention:**

HYDROXYL-FUNCTIONALISED DENDRITIC MACROMOLECULES IN TOPICAL  
COSMETIC AND PERSONAL CARE COMPOSITIONS

**Patent Proprietors:**

Unilever PLC  
Unilever N.V.

**Opponent:**

DSM NUTRITIONAL PRODUCTS AG

**Relevant legal provisions:**

EPC Art. 56, 114(2)  
RPBA Art. 13(1), 13(3)

**Keyword:**

Late-filed evidence - admitted (no)  
Inventive step - (no)



**Beschwerdekammern  
Boards of Appeal  
Chambres de recours**

European Patent Office  
D-80298 MUNICH  
GERMANY  
Tel. +49 (0) 89 2399-0  
Fax +49 (0) 89 2399-4465

Case Number: T 0213/10 - 3.3.07

**D E C I S I O N  
of Technical Board of Appeal 3.3.07  
of 7 February 2013**

**Appellant:** DSM NUTRITIONAL PRODUCTS AG  
(Opponent) Wurmisweg 576  
4303 Kaiseraugst (CH)

**Representative:** Pressner, Dietmar  
DSM Nutritional Products Ltd  
Patent Department VMD  
Bau 241/637  
PO Box 3255  
4002 Basel (CH)

**Respondent:** Unilever PLC  
(Patent Proprietor 1) Unilever House  
Blackfriars  
London  
Greater London EC4P 4BQ (GB)

**Respondent:** Unilever N.V.  
(Patent Proprietor 2) Weena 455  
3013 AL Rotterdam (NL)

**Representative:** Tansley, Sally Elizabeth  
Unilever Patent Group  
Colworth House  
Sharnbrook  
Bedford  
MK44 1LQ (GB)

**Decision under appeal:** Interlocutory decision of the Opposition  
Division of the European Patent Office posted on  
29 October 2009 concerning maintenance of the  
European Patent No. 1207841 in amended form.

**Composition of the Board:**

**Chairman:** J. Riolo  
**Members:** R. Hauss  
P. Schmitz

## Summary of Facts and Submissions

- I. European patent No. 1 207 841 was granted on the basis of four claims.
- II. A notice of opposition was filed in which the revocation of the patent in its entirety was requested on the grounds of lack of novelty and lack of inventive step under Article 100(a) EPC.
- III. The appeal by the opponent lies from the interlocutory decision of the opposition division, pronounced on 24 September 2009 and posted on 29 October 2009, finding that the patent as amended in the form of auxiliary request 2 met the requirements of the EPC.

Said request has three claims, independent claim 1 reading as follows:

"1. A method of styling hair comprising the step of applying to the hair a composition formulated as a hairspray, gel or mousse comprising a hydroxyl-functionalised dendritic macromolecule, in which the hydroxyl-functionalised dendritic macromolecule is built up from polyester units."

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

D1: EP 0 987 017 A1

D2: SE 468 771 B (corresponding to Swedish patent application No. SE 9200564-4)

D2a: WO 93/17060 A1 (international application in English, claiming priority from SE 9200564-4)

D3: EP 0 815 827 A2

D4: WO 96/12754 A1

D6: Test report submitted by the appellant on 21 August 2009

D10: Test report filed with the respondents' submission dated 24 June 2010

D11: Test report filed with the appellant's submission of 20 December 2012

V. In the impugned decision the opposition division decided that the method defined in claim 1 of auxiliary request 2 was novel over the content of intermediate document D1, which did not disclose a method of hair styling.

The opposition division also found the claimed method to be inventive with respect to the closest prior-art document D3. The hair care formulations of the opposed patent differed from the formulations disclosed in D3 in the type of dendritic macromolecule (dendrimer) used, which was built up from polyester units and functionalised with hydroxyl groups. The dendrimers defined in the opposed patent were capable of forming films and of providing hold to hair, as confirmed by examples 3 and 4 of the opposed patent and also by the data on film formation presented in document D6. The opposition division defined the objective technical problem as the provision of alternative dendrimers for hair styling which had good hair holding ability. Since it was not known from any of the cited prior-art documents that dendritic macromolecules as defined in claim 1 of auxiliary request 2 provided hair styling properties, the claimed subject-matter involved an inventive step.

VI. The appellant (opponent) lodged an appeal against that decision, invoking lack of novelty of the claimed method over the disclosure of document D1 and lack of inventive step over the disclosure of document D3.

- VII. With their reply to the appellant's statement setting out the grounds of appeal, the respondents (patent proprietors) contested the appellant's views on the issues of novelty and inventive step and filed a test report (document D10).
- VIII. With a letter dated 20 December 2012 the appellant submitted new evidence in the form of a test report (document D11).
- IX. Oral proceedings before the board took place on 7 February 2013.
- X. The appellant argued as follows:

*Admission of D11*

Test report D11 did not introduce any new elements, but merely served to illustrate the appellant's previously submitted arguments, so that late filing could not be an issue. Since the tests described in D11 had been carried out in reaction to the respondents' tests described in D10, no need could arise for the respondents to repeat again, in their turn, the tests of D11. The appellant had moreover transmitted D11 to the respondents by telefax at the earliest possible date, in order to give them sufficient time for evaluation.

The delay in filing the data presented in D11 was due *inter alia* to difficulties in sourcing the polymeric material HYBRANE® D2800, which was not commercially available. Even though said material was produced in a different department of the appellant's company, it could not be easily procured via internal channels. Further obstacles which had been encountered were delays in obtaining laboratory capacity for carrying

out the experiments, and intervening priorities in connection with other cases.

*Inventive step*

The appellant pointed out that the wording of claim 1 did not imply that the hydroxyl-functionalised dendritic macromolecule acted as a styling agent. It also stated that conventional hair styling polymers could be present in the compositions of the patent in suit.

It had furthermore not been shown that the entire scope of dendrimers as defined in claim 1 was capable of providing hold or other alleged hair care benefits:

- In this context, the appellant argued that the number of hydroxyl functions and consequently the properties of the dendrimers could vary widely. BOLTORN® H40, used exclusively in the examples of the patent in suit, had sixty-four hydroxyl groups, whereas one hydroxyl group was sufficient to meet the requirement in claim 1 of hydroxyl functionalisation.

- The test results presented in document D6 showed that not all hydroxyl-functionalised dendritic macromolecules built up from polyester units were suitable for application in hair styling, since some did not form films, were tacky or left a residue difficult to wash off.

Document D3 concerned the application of dendrimers in hair care compositions, explicitly including styling compositions which could be mousses, gels or sprays. In example composition 28, document D3 disclosed a hairspray composition comprising a dendrimer and a styling polymer. That composition corresponded to example compositions 1 to 3 of the patent in suit, except for the chemical nature of the dendrimer.

While the dendrimers employed in the specific embodiments of D3 were different from those of the patent in suit, D3 also contained a reference to document D2, which described hydroxyl-functionalised dendritic macromolecules built up from polyester units. It was furthermore known from documents D2 and D4 that dendrimers of that type could form films. Thus film formation, mentioned in support of inventive step by the respondents, was actually known from the prior art and could not be regarded as an unexpected technical effect. Moreover, not all film formers were suitable for hair styling.

Starting from the hair styling compositions described in D3, and based on the reference in D3 to document D2, the person skilled in the art would have considered using the hydroxyl-functionalised dendritic macromolecules built up from polyester units, described in D2, in order to solve the technical problem of providing further hair styling compositions.

Aware of the teaching of D3 (see page 2, line 26), the skilled person would moreover have expected any dendrimer to provide volume and bounce to hair, which corresponded to a styling effect.

XI. The respondents argued as follows:

*Admission of document D11*

The appellant's test report D11 should not be admitted into the proceedings, since it had been filed too late for the respondents to be able to react adequately. The respondents' representative had only received document D11 on 28 December 2012, and a translation of D11 from German into English could not be obtained until 7 January 2013, i.e. one month before the scheduled date of the oral proceedings.



The respondents also pointed out that the tested material HYBRANE D2800 was produced by the appellant's company and had been used for previous tests both by the respondents and by the appellant, as reported in documents D10 and D6.

*Inventive step*

The wording of claim 1 clearly implied that the claimed method of styling hair involved the use of the hydroxyl-functionalised dendritic macromolecule as a styling agent, without requiring the presence of other hair styling polymers.

The respondents defined the technical problem as the preparation of a composition which provided style retention without feeling sticky or giving a harsh brittle feeling to hair, and which could be washed off. The solution to that problem consisted in the use of the specific dendrimers defined in claim 1.

The examples described in the patent in suit as well as the data provided in test report D10 showed that hydroxyl-functionalised dendritic macromolecules built up from polyester units were film formers and capable of providing hold and other hair care benefits.

The photographs of hair switches in document D10 also showed that samples A to D treated with dendrimers falling under the definition of claim 1 were more styled and presented less flyaway than sample E treated with HYBRANE D2800, a hydroxyl-functionalised polyester(amide) dendrimer which according to the respondents' interpretation did not meet the requirement "built up from polyester units".

The test results shown in D6 were not pertinent, since the test conditions used did not adequately mimic the intended application on hair.

Document D3 was not focused on hair styling but disclosed the use of dendrimers in all kinds of hair care applications, for imparting softness to the hair. It could thus not be derived from the teaching of D3 that any type of dendrimer could act as a fixative hair styling agent.

While document D2 disclosed hydroxyl-functionalised dendritic macromolecules built up from polyester units, it did not mention the use of dendrimers in hair care applications and was cited in D3 as part of the background prior art only.

Thus, neither D3 nor D2 provided any incentive for the skilled person to use the dendrimers of D2 for the purpose of styling hair.

The respondents further argued that not all film forming polymers were suitable for styling hair. Documents D2 and D4 taught away from the invention by describing film formation in the context of film hardness (D2: page 3, line 28; D2a: page 3, lines 32 to 33; D4: page 3, lines 30 to 34). The skilled person would therefore have expected the dendrimers disclosed in documents D2 and D4 to form hard, brittle films unsuitable for styling hair.

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

XIII. The respondents requested that the appeal be dismissed.

## Reasons for the Decision

1. The appeal is admissible.
2. Admission of document D11
  - 2.1 According to Article 13(1) of the Rules of Procedure of the Boards of Appeal (RPBA), any amendment to a party's case after it has filed its grounds of appeal or reply may be admitted and considered at the Board's discretion, which shall be exercised in view of *inter alia* the complexity of the new subject-matter, the current state of the proceedings and the need for procedural economy. According to Article 13(3) RPBA, amendments sought to be made after oral proceedings have been arranged shall not be admitted if they raise issues which the Board or the other party or parties cannot reasonably be expected to deal with without adjournment of the oral proceedings.
  - 2.2 If oral proceedings have been arranged in *inter partes* proceedings, experimental results should be submitted sufficiently well in advance for the other party to have the opportunity to perform counter-experiments, very late submission of experimental results being contrary to the requirement of a fair and expedient conduct of the proceedings (see also the Case Law of the Boards of Appeal of the European Patent Office, 7th edition 2013, IV.C.1.4.6 c)).
  - 2.3 Test report D11 was filed by the appellant at a late stage in the appeal proceedings, viz. seven weeks before the scheduled oral proceedings and more than two years after the respondents' test report D10 had been filed.

2.4 The tests described in D11 are not merely a repetition of tests previously carried out by the respondents. At least the test for holding ability as described in D11, paragraph 4.2 and figure 1, is found neither in the patent in suit nor in the respondents' earlier test report D10. Furthermore, the evaluation of tack as described in D11 was carried out under conditions different from those in D10 with regard to the applied quantity of product per weight of hair sample.

Hence, the respondents had a justifiable interest in repeating the experiments described in D11 in order to assess the reported results.

2.5 The appellant gave the following reasons for the late filing of D11: The polymeric material required for the tests (HYBRANE D2800) was difficult to obtain, it was necessary to make arrangements for laboratory capacity to carry out the experiments, and other intervening priorities had to be dealt with.

However, it was equally possible that the respondents could encounter the same difficulties.

In view of this, the time available to the respondents after the filing of D11 was disproportionately short in comparison with more than two years available to the appellant.

This would be the case even if the respondents did indeed have seven full weeks available. However, since D11 was sent out by the appellant on 20 December, it was to be expected that there would be further delays due to the Christmas break.

2.6 As a consequence, the board finds it appropriate to exercise its discretion under Article 114(2) EPC and Articles 13(1) and 13(3) RPBA by not admitting document D11 into the proceedings.

3. Inventive step

*Patent in suit*

- 3.1 Present claim 1 relates to a method of styling hair which involves the application of a composition formulated as a hairspray, gel or mousse, comprising a hydroxyl-functionalised dendritic macromolecule built up from polyester units. This implies that the composition as a whole is capable of providing hold to hair.
- 3.2 It is moreover envisaged in the patent in suit that hair styling polymers may be included in the composition (see paragraphs [0030] to [0032] of the patent specification).
- 3.3 According to page 2, paragraphs [0003] to [0004] of the patent specification, hydroxyl-functionalised dendritic macromolecules are a class of material which provides compositions with good hold and curl retention, without stickiness or flaking and without giving a brittle, harsh feeling to the hair, and capable of being removed by washing the hair.

*Closest prior art*

- 3.4 It was common ground between the parties that document D3 represented the closest prior art. The board sees no reason to differ.
- 3.5 Document D3 discloses the use of dendrimers in general, in any type of hair treatment composition including styling products (see claims 1, 9; page 3, lines 1 to 2, 32 to 36; examples 19 to 37). According to the teaching of D3 (see page 2, lines 25-28), dendrimers improve the touch and combability of wet hair and

impart volume and bounce to the treated hair after drying.

- 3.6 Formulation examples 19 to 37 of D3 disclose hair styling compositions each containing a styling polymer in combination with the preferred dendrimer of D3, designated "Cascade", which is based on 1,4-diamino butane and acrylonitrile and is nitrilo- or amino-functionalised (see claim 3; page 2, lines 50-56; examples). The formulations are designated as hair fixing compositions, hair gels or hairsprays, which implies their use in a method of styling hair. At least example compositions 22 to 26 and 28 to 37 are formulated as a hairspray, gel or mousse.

*Technical problem and solution*

- 3.7 The hair styling composition to be used in the method of claim 1 differs from the hair styling compositions disclosed in document D3 in the presence of a hydroxyl-functionalised dendritic macromolecule built up from polyester units.
- 3.8 That type of dendrimer was known (see documents D2/D2a: claims, figures; D4: claims, examples; D3: page 2, lines 38 to 40 referring to D2). The patent in suit acknowledges in paragraphs [0019] to [0020] of the patent specification that suitable materials are described in document D2.
- 3.9 In order to determine the technical problem to be solved by the claimed method, it has to be established what technical effect is achieved by incorporating a hydroxyl-functionalised dendritic macromolecule built up from polyester units into a hair styling composition such as known from the closest prior art D3.

3.10 According to the respondents, said hydroxyl-functionalised dendritic macromolecules possess hair styling (i.e. hair shaping) properties combined with reduced tack and reduced formation of deposits. The respondents referred in that context to the examples described in the patent in suit and to test report D10.

3.10.1 Examples 1 to 3

In paragraphs [0032] to [0035] of the patent specification, the patent in suit describes comparative tests in which example hairspray formulations 1 to 3 containing a dendritic macromolecule as defined in claim 1 (commercially available as "BOLTORN H40") were tested against a control formulation. Hair samples treated with the formulations were assessed by twelve panellists for the strength of hold and softness of feel imparted to the hair, and for stickiness and formation of deposits.

According to the established jurisprudence of the boards of appeal, a surprising technical effect demonstrated in a comparative test can be taken as an indication of inventive step. If comparative tests are chosen to demonstrate an inventive step on the basis of an improved effect, the nature of the comparison must be such that the alleged advantage or effect is convincingly shown to have its origin in the distinguishing feature of the claimed subject-matter compared with the closest prior art.

The compositions according to examples 1 to 3 of the patent in suit are the following, the concentrations being indicated as percent by weight:

	<b>Ex. 1</b>	<b>Ex. 2</b>	<b>Ex. 3</b>
BOLTORN ® H40 ex Perstorp AB <sup>(1)</sup>	0.02	0.2	1.0
AMPHOMER ® ex National Starch <sup>(2)</sup>	1.98	1.8	1.0
2-Amino-2-methyl-1-propanol	0.297	0.27	0.15
SILWET ® L-602 <sup>(3)</sup>	0.10	0.10	0.10
DC200/10 cst ex Dow Corning <sup>(4)</sup>	0.10	0.10	0.10
Perfume	0.15	0.15	0.15
Water	2.0	2.0	2.0
Ethanol	60.353	60.38	60.15
CAP 40 <sup>(5)</sup>	35.0	35.0	35.0

- (1) Hydroxyl-functionalised dendritic polyester
- (2) Octylacrylamide/acrylates/butylaminoethyl methacrylate
- (3) Dimethicone copolyol, ex OSi Specialities
- (4) Dimethicone fluid, viscosity 10 cst
- (5) Hydrocarbon propellant

According to the patent in suit (see paragraph [0033]) the formulations of examples 1 to 3 were tested against a control formulation in which the BOLTORN H40 component was omitted.

In view of the above-mentioned requirements for comparative tests, it must be determined whether the control formulations adequately represent the closest prior art as disclosed in D3.

Of the formulation examples described in document D3, formulation example 28 is the embodiment which comes closest to the "control formulation" of the patent in suit.

Its composition, indicated in percent by weight, is as follows:



<b>Example 28 of D3: Hairspray with strong fixing effect</b>	
4-Cascade: 1,4-Diaminobutan[4]:propylamine	0.30
t-octylacrylamide/acrylic acid/ t-butylaminoethyl methacrylate terpolymer	5.00
2-Amino-2-methyl-1-propanol	0.58
Perfume	0.15
Ethanol	53.97
1,1-difluoroethane propellant	40.00

The control formulations of the patent in suit differ in several aspects from example formulation 28 of D3, particularly relevant modifications being the absence of the "Cascade" dendrimer of D3 and the introduction of silicone compounds (dimethicone, dimethicone copolyol).

Based on the available information, the possibility that those modifications may have an influence on the tested properties (strength of hold, softness, tack and formation of deposits) cannot be ruled out. In fact, the components in question are known to show an affinity to hair and to modify its surface properties: Silicone compounds are known in the field of hair care as hair conditioning agents, and, according to the teaching of D3, dendrimers including "Cascade" type molecules affect softness, volume and bounce of the treated hair.

Since the control formulations of the patent in suit do not reproduce the composition of the closest prior art and since the modifications have not been shown to be irrelevant to the outcome of the tests, the board comes to the conclusion that the tests described in paragraphs [0032] to [0035] of the patent in suit are

not suitable to demonstrate an improvement over the closest prior art.

Nor can those tests credibly show that hydroxyl-functionalised dendritic macromolecules built up from polyester units have, in themselves, the capability of providing hold to hair, as alleged by the respondents:

- The patent in suit briefly states that the test panel "clearly preferred" the formulations according to examples 1 to 3 over the control in terms of strength of hold. The board observes however that information on test conditions, evaluation criteria, the composition of the test panel and the detailed quantitative outcome of the tests is not included in the patent specification, so that the reader is not in a position to verify and assess the actual test results.

- Furthermore, the tests were carried out with a formulation containing a specific styling polymer ("AMPHOMER"). It was however not examined whether strength of hold could be improved by adding a dendrimer according to claim 1 to formulations containing no styling polymer, or to formulations containing styling polymers structurally different from AMPHOMER (such as those disclosed in the various formulation examples of document D3).

- Moreover, only one specific dendrimer ("BOLTORN H40") was tested. That is not sufficiently representative of the scope of claim 1, which covers a great variety of dendrimers with different surface affinities, due to the fact that the degree of hydroxyl functionalisation, which determines the properties of the dendrimers in particular in terms of polarity, is not restricted in the claim.

In summary, the comparative tests presented in examples 1 to 3 of the patent in suit do not constitute

a comparison with the closest prior art D3 and cannot credibly show an unexpected technical effect to be achieved over the entire scope of claim 1 (which scope relates to a method of styling hair by applying compositions with or without known hair styling polymers, containing dendrimers of varying degrees of hydroxyl functionalisation).

#### 3.10.2 Example 4

Example 4 of the patent in suit (see paragraphs [0036] to [0039] of the patent specification) shows that BOLTORN H40, when applied as a solution in ethanol, bonds to hair and can be washed off without noticeable residue. However, those results do not permit any definite conclusions to be drawn with regard to hair shaping properties or other hair care benefits. Again, only one specific dendrimer ("BOLTORN H40") was tested.

#### 3.10.3 Test report D10

The respondents submitted that the tests reported in document D10 showed that a variety of hydroxyl-functionalised polymers as defined in claim 1 of the patent formed films on polystyrene, which was regarded as a suitable model for the hair surface. They indicated that the treated hair samples did not feel sticky and that no residue was observed.

However, it was not contested among the parties that not all film forming polymers are necessarily suitable for styling hair, since the films obtained in a particular instance might be too soft, tacky, hard or brittle for that purpose. In view of this, and independently of the question whether polystyrene is a good model for the hair surface, the board concludes that the mere property of film formation is not

sufficient as an indicator of hair styling properties, or of other hair care benefits.

The respondents also submitted that the photographs of hair switches in document D10 showed that samples A to D treated with dendrimers falling under the definition of claim 1 were more styled and presented less flyaway than sample E treated with HYBRANE D2800, a dendrimer which according to the respondents did not meet the definition "built up from polyester units".

Independently of the question whether HYBRANE D2800 meets the definition "built up from polyester units", the board is unable to identify sufficient detail in the photographs of D10 to distinguish between the appearance of sample E and of the other hair samples. The inadequate quality of the photographs as reproduced in document D10 was mentioned in a communication issued by the board in preparation for the oral proceedings; however, the respondents did not provide better ones. In these circumstances, their argument cannot be taken into account.

As a consequence, the board considers that test report D10 does not provide proof of an unexpected hair care benefit produced by the dendrimers in question.

3.11 Test report D6

Like D10, test report D6 is mainly concerned with film formation obtainable with a variety of dendrimers but does not examine styling properties or other hair care benefits. Hence, no conclusive information about the alleged hair styling effect can be obtained from document D6.

3.12 In the absence of any evidence of an unexpected technical effect obtained across the entire claimed scope, the technical problem when starting from the

known application of hair styling compositions disclosed in D3 (see examples 22 to 26, 28-37) can only be defined as providing a further method of styling hair, whereby this "further" method is not an alternative required to provide the same level of styling as the closest prior art but merely a novel method which provides styling to hair.

- 3.13 That problem has been solved by the method of styling hair as defined in claim 1.

*Obviousness of the solution*

- 3.14 Document D3 teaches the use of dendrimers in general in hair treatment compositions, *inter alia* in styling products. According to that teaching, any dendrimer is suitable for use in hair care products. Referring in that context to known dendrimers, D3 mentions several prior publications, *inter alia* document D2 which discloses hydroxyl-functionalised dendritic polyesters.
- 3.15 In the knowledge of the teaching of D3, it would have been obvious to the skilled person to employ any known dendrimer, including dendritic hydroxyl-functionalised polyesters as described in D2, in hair styling compositions as described in D3, in order to solve the technical problem of providing a further method of styling hair.
- 3.16 Contrary to the respondents' argumentation, documents D2 and D4 cannot be said to teach away from that solution or to provide a technical prejudice against it, because those documents are not concerned with hair care applications, and the references to film hardness in D2 and in D4 are too unspecific for the reader to predict the effect of any particular dendrimer on hair, or to conclude that a film formed on hair would be unacceptably brittle.

3.17 As a consequence, the subject-matter of claim 1 of the present request does not involve an inventive step within the meaning of Article 56 EPC.

4. In view of this finding, a decision on the novelty of the claimed method over the disclosure of D1 is not necessary.

## 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:



G. Nachtigall

J. Riolo

Decision electronically authenticated