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Datasheet for the decision of 20 May 2011

Case Number: T 0885/09 - 3.3.06

Application Number: 99932388.4

Publication Number: 1123376

IPC: C11D 3/50

Language of the proceedings: EN

Title of invention:
Laundry and cleaning compositions

Patentee:
THE PROCTER & GAMBLE COMPANY

Opponent:
Henkel AG & Co. KGaA

Headword:
Laundry and cleaning composition/P&G

Relevant legal provisions:
RPBA Art. 13(1)

Relevant legal provisions (EPC 1973):
EPC Art. 56

Keyword:
"Inventive step (yes): prior art not suggesting claimed solution to the underlying technical problem"
"Admissibility of a new argument raised by the Respondent during oral proceedings (yes)"

Decisions cited:
-

Catchword:
-

Case Number: T 0885/09 **-** 3.3.06

D E C I S I O N
of the Technical Board of Appeal 3.3.06
of 20 May 2011

Appellant: (Patent Proprietor)
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Representative:
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Respondent: (Opponent)
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Representative:
-

Decision under appeal:
Decision of the Opposition Division of the European Patent Office posted 20 February 2009 revoking European patent No. 1123376 pursuant to Article 102(1) EPC 1973.

Composition of the Board:

Chairman: P.-P. Bracke
Members: L. Li Voti
U. Tronser

Summary of Facts and Submissions

I. The present appeal is from the decision of the Opposition Division to revoke the European patent no. 1 123 376 concerning laundry and cleaning compositions.

II. In its notice of opposition the Opponent sought revocation of the patent on the grounds of Articles 100(a) and (b) EPC 1973.

The Opponent referred during the opposition proceedings to the following documents:

(1): Advanced Organic Chemistry, 3rd edition (1985) by J. March, page 784;
(2): EP-A-392619;
(3): DE-B-1133847;
(4): EP-A-841391;
(5): EP-A-11499;
(6): Journal of Polymer Science: Polymer Chemistry Edition, vol. 20, pages 3121 to 3129 (1982), "Chemical Release Control-Schiff Bases of Perfume Aldehydes and Aminostyrene" by H.Kamogawa et al.;
(7): US-A-5008437.

III. The Opposition Division found in its decision that the invention was sufficiently disclosed and that the subject-matter of the claims according to the then pending main and auxiliary requests were novel but lacked an inventive step in the light of the teaching of the prior art.

IV. An appeal was filed against this decision by the Patent Proprietor (Appellant).

The Appellant submitted with the letter of 19 June 2009 experimental reports (8), (9) and (10). Furthermore, it submitted with the letter of 1 April 2011 a further experimental report und with that of 10 May 2011 four sets of claims according to the main request and first to third auxiliary requests.

Oral proceedings were held before the Board on 20 May 2011.

V. The set of claims according to the **main request** consists of 15 claims, the independent claim 1 of which reads as follows:

"1. A laundry and/or cleaning composition comprising a detersive ingredient and a product of reaction between an amino functional polymer comprising at least one primary and/or secondary amine group and a perfume component selected from perfume ketone, aldehyde, and mixtures thereof, characterised in that said amino functional polymer has an Odour Intensity Index of less than that of a 1% solution of methylanthranilate, in dipropylene glycol, and is selected from polyvinylamines, derivatives thereof, and copolymers

thereof, alkylene polyamines, polyaminoacids and copolymers thereof, cross-linked polyaminoacids, amino substituted polyvinylalcohol, polyoxyethylene bis amine or bis aminoalkyl, aminoalkyl piperazine and derivatives thereof, N,N'-bis-(3-aminopropyl)-1,3-propanediamine linear or branched, and mixtures thereof, and the product of reaction has a Dry Surface Odour Index of more than 5, said composition being further characterized in that the product of reaction is preformed before incorporation into the laundry and/or cleaning composition."

Independent claim 11 relates to a method of delivering residual fragrance to a surface by contacting said surface with a composition as defined in any one of claims 1 to 10, and thereafter contacting the treated surface with a material so that the perfume is released.

Independent claim 13 relates to the use of a product of reaction as defined in any one of claims 1-10 for the manufacture of a laundry and cleaning composition for delivering residual fragrance on a surface on which it is applied.

The remaining dependent claims relate to particular embodiments of the claimed composition, method or use.

VI. The Appellant submitted in writing and orally that

- the experimental evidences submitted as documents (8) to (10) and that submitted with letter of 1 April 2011 showed that the claimed invention had convincingly solved the technical problem indicated in the patent in suit of providing further laundry and cleaning compositions capable of delivering in a substantive way a fresh fragrance to the treated surface and of providing delayed release of the perfume component from the treated surface, herewith providing a longer lasting fresh fragrance;
- the closest prior art was represented by document (4);

- even if the skilled person could have envisaged to use a not fully modified amino functional polymer of document (4) in combination with an aldehyde or ketone perfume, neither this document nor the remaining prior art contained a suggestion that the reaction product of these components would be stable in the wash liquid, substantive to fabrics and able to provide a delayed release of the perfume component after washing;

- furthermore, the skilled person would not have had any incentive to replace the condensation product of aldehyde perfume and amine suggested as suitable perfume component in document (4) with one of the condensation products known from document (2) with the expectation of providing a product stable in the wash liquid, substantive to fabrics and able to deliver the perfume component at a later stage after washing;

- as regards the other cited documents, document (3), (6) and (7) concerned condensation products which were not part of claim 1 according to the main request and document (5) related to rinsing agents and not laundry or cleaning compositions;

- therefore, in the light of the teaching of the prior art, the skilled person would not have had any incentive to modify the compositions of document (4) by using a condensation product as required in claim 1 with the expectation of solving the technical problem underlying the invention;

- the claimed subject-matter thus involved an inventive step.

The Appellant contested also the admissibility of the new arguments based on documents (4) and (2), raised against the inventiveness of the claimed subject-matter by the Respondent for the first time during oral proceedings.

VII. The Respondent (Opponent) submitted in writing and orally that

- any of documents (2), (3), (4) or (5) could be used as starting point for the evaluation of inventive step;

- document (2) disclosed the same technical concept of the invention since it related to the use of a Schiff base formed from amines less odorous than methylanthranilate, such as alkylene polyamines, and perfume aldehydes for trapping malodorous aldehydes present, for example, in soaps and releasing the aldehyde fragrance over time;

- document (3) also disclosed the same technical concept of the invention since it taught the use of a condensation product of oxyamines, such as ethanolamine, and a perfume aldehyde or ketone ingredient in washing powders in order to provide to the washed textile a substantive perfuming note of the ketone or aldehyde which was released over time;

- moreover, it was already known that Schiff bases, condensation products of amines and aldehydes or ketones, were substantive to the treated fabric and, once on the fabric, released gradually the aldehyde or ketone; therefore, it was obvious for the skilled person to solve the technical problem underlying the invention by using any known Schiff base;

- for these reasons, it was obvious to use other known Schiff bases like those of document (2) within the teaching of document (4) instead of the one specifically disclosed in that document;

- furthermore, document (5) disclosed liquid compositions containing an alkylene polyamine and perfume aldehydes and

ketones able of depositing the perfume on the treated fabrics; moreover, the skilled person would have recognised that a Schiff base is necessarily formed in the preparation of the composition; therefore, it would have been obvious to use such compositions containing a Schiff base in washing or cleaning compositions with the aim of delivering the perfume substantively on the treated surface;

- the claimed subject-matter thus lacked an inventive step.

VIII. The Appellant requests that the decision under appeal be set aside and the patent be maintained on the basis of the claims according to the main request or one of the auxiliary requests 1 to 3, all requests submitted with letter dated 10 May 2011.

IX. The Respondent requests that the appeal be dismissed.

Reasons for the Decision

1. Main request

1.1 Articles 54(1) and (2), 83 EPC 1973 and 123(2) and (3) EPC

The Board is satisfied that the claims according to the main request comply with the requirements of Articles 54(1) and (2), 83 EPC 1973 and 123(2) and (3) EPC.

Since the Respondent did not raise any objection in this respect no further details are necessary.

1.2 Inventive step

1.2.1 The invention of claim 1 relates to a washing or cleaning composition comprising a detersive ingredient and the product of reaction between a selected amino functional polymer which is less odorous than methylanthranilate and a perfume component selected from ketone, aldehyde and mixtures thereof.

It is undisputed that the selected so-called amino functional polymer encompasses both real polymers like polyvinylamine and not polymeric compounds like aminoalkyl piperazine (see point V above). Moreover, since claim 1 does not contain any limitation as to the molecular weight of the so-called amino functional polymer, the term "amino functional polymer" encompasses for the purpose of the invention of the patent in suit any compound belonging to the chemical classes listed in claim 1, for example any alkylene polyamine, provided that said product of reaction complies with the "Dry Surface Odour Index" requirement of the claim. As shown by the methods for measuring the Dry Surface Odour Index reported in paragraphs 77 to 93 of the patent in suit, a Dry Surface Odour Index of more than 5

requires in essence that said product of reaction provides a long-lasting more intense perfume odour than the free aldehyde or ketone perfume after the washing and drying steps or the cleaning step indicated in the methods of measurement.

1.2.2 As explained in the description of the patent in suit, it was well known that consumer acceptance of perfumed washing and cleaning compositions is determined not only by their performance but also by their capacity of maintaining a pleasing fragrance on the treated surface over time. However, as regards especially perfume ingredients which are characteristic of the fresh notes, namely the aldehydes and ketones perfume ingredients, the amount of perfume carried over from an aqueous laundry bath onto fabrics is low and the fresh fragrance does not last long on the fabric. Therefore, it is desirable to provide means for improving the delivery and the endurance of these types of fragrance from laundry and cleaning products onto the surface treated (see paragraphs 2, 3 and 8 of the patent in suit).

It was known in the art to render such volatile perfume ingredients substantive to the fabrics by using a carrier or an encapsulating material or by formulating compounds able to provide a delayed release of the perfume over a longer period of time (see paragraphs 4, 5 and 12). Moreover, it was also known that a condensation product of an aldehyde perfume ingredient with an anthranilate is also substantive to fabrics; however, it was found that methyl anthranilate exhibits a strong scent itself and produces as a result a mixture of fragrances, thereby reducing or even inhibiting the aldehyde fragrance perception (paragraph 11).

The technical problem underlying the invention thus is formulated in the patent in suit as the provision of a laundry or cleaning composition able to deliver an aldehyde and/or ketone perfume component in a substantive way onto the surface treated and to provide a delayed release of the perfume component and longer endurance of the fresh fragrance (paragraph 9).

1.2.3 The most suitable starting point for assessing inventive step is, according to the jurisprudence of the Boards of Appeal of the EPO, a document (if available) conceived for the same purpose or aiming at the same objectives as the claimed invention and having the most relevant technical features in common (see Case Law of the Boards of Appeal of the EPO, 6th edition, 2010, point I.D.3.1).

Document (2) relates to a method of removing or reducing unpleasant malodours or off-flavours arising from the presence of aldehydic materials in fats, oils and related products, which are used for example in the production of surfactants for use as detergents or cleansers, by means of a condensation product of an amine and an aldehyde perfume ingredient, which product is capable of trapping the

malodorous aldehyde with concomitant release of desirable aldehyde flavour over time (page 2, lines 3 to 4 and 22 to 23; page 3, lines 12 to 15). Therefore, this document does not concern the delivery of an aldehyde and/or ketone perfume component in a substantive way onto the surface treated but the improvement of the odour of a washing or cleaning product.

Document (3) concerns a method for incorporating aldehyde and ketone perfume ingredients into compositions such as washing powders and soaps, which contain alkaline reacting components, which method avoids oxidation of the perfume components with formation of malodorous reaction products and improves the endurance of the perfume in the washing powder or soap by releasing the fragrance over time (column 1, lines 1 to 20 and 41 to 47). However, this document does not concern explicitly the delivery of the aldehyde or ketone perfume ingredient in a substantive way onto the surface treated.

Document (5) concerns the provision of liquid formulations for use in the rinse cycle of a fabric cleaning operation, which formulations are capable of depositing perfumes on fabric surfaces (see page 1, lines 2 to 8). Therefore, this document does not concern laundry and cleaning compositions containing a detersive ingredient and the technical problem of providing a laundry or cleaning composition able to deliver an aldehyde and/or ketone perfume component in a substantive way onto the surface treated.

Therefore, none of documents (2), (3) and (5) concern explicitly a technical problem similar to that addressed to in the patent in suit.

Document (4) concerns the technical problem of providing a fabric treatment composition such as a pre-treatment or wash additive composition, which is able to release onto the fabrics in a substantive way a long-lasting hydrophilic perfume, such as a perfume aldehyde or ketone, capable of providing a fresh impression on the surface treated which is greater than that provided by the hydrophilic perfume without the amino functional polymer (see page 2, lines 9 to 13, 25 to 33 and page 27, lines 29 to 30).

Therefore, the Board finds that document (4) deals with a similar technical problem as the patent in suit.

The Board thus takes document (4) as the most suitable starting point for the evaluation of inventive step.

1.2.4 Since document (4) had already solved a technical problem similar to that addressed to in the patent in suit, the technical problem underlying the invention was formulated by the Appellant during oral proceedings as the provision of a further laundry washing or cleaning composition which is capable of delivering to the treated surface in a

substantive way a perfume aldehyde or ketone and to provide a delayed release of the perfume component and longer endurance of the fresh fragrance.

The Appellant has shown by means of the experimental reports of documents (8) and (9) that a condensation product of Lupasol G35, a polyethylenimine (hereinafter PEI), i.e. a polymeric alkylene polyamine in accordance with claim 1, and •-Damascone, a ketone perfume ingredient, is substantive to the fabric, stable during washing and releases the •-Damascone perfume ingredient in a subsequent tumble drying step after 1 to 7 days. Moreover, document (10) shows a similar effect for the condensation product of •-Damascone with BNPP, an aminoalkyl piperazine according to claim 1 (see also page 7, line 23 of the patent in suit).

Finally, the experimental report submitted with letter of 1 April 2011 shows that the •-damascone (a ketone perfume ingredient) condensed with Lupasol WF (a PEI) has a greater substantivity to the fabric treated than an uncondensed •-damascone in admixture with the same Lupasol WF.

1.2.5 Therefore the Board, in the light of the above experimental data and in the absence of contrary evidence, has no reason to doubt that the condensation products tested are deposited substantively onto the surface treated, are stable during washing or cleaning and provide delayed release of the perfume component and longer endurance of the fresh fragrance.
The Board has also no reason to doubt that the other products encompassed by claim 1 behave in a similar way.

Therefore, the Board is convinced that the subject-matter of claim 1 solves in its whole extent the above mentioned technical problem.

1.2.6 Document (4) discloses the use of an amino-functional polymer, such as a modified PEI, in a fabric treatment composition which can comprise a detersive surfactant and contains a hydrophilic perfume, which can be an aldehyde, a ketone or a condensation product of an aldehyde and an amine having a molecular weight of from 180 to 320 (page 2, lines 51 to 52; page 12, lines 40 to 44; page 22, lines 54 to 55). The amino functional polymer of document (4) has a backbone wherein all or a part of the primary and secondary nitrogen moieties are substituted, quaternized or oxidized; preferably, the amino functional polymer is fully modified so that the resulting polymer does not contain any of the primary or secondary amino groups required according to claim 1 of the patent in suit; all examples relate in fact to fully modified amino-functional polymers (see document (4), page 2, line 57 to page 3, line 54 and page 10, line 36 to page 12, line 28). However, it was admitted by the Appellant during oral proceedings that the broadest scope of document (4) encompasses also, at least theoretically, a

polymeric polyalkylenamine belonging to the chemical class listed in claim 1 of the patent in suit.

Therefore, the disclosure of document (4) differs from the claimed subject-matter insofar as the claimed composition does not contain a preformed condensation product of the selected amino functional polymer of claim 1 and an aldehyde or ketone perfume ingredient.

1.2.7 The Respondent submitted in writing that the skilled person would have expected that a PEI polymer of document (4) would react *in situ* with an aldehyde or ketone perfume ingredient, if present, and that it would be obvious to use as alternative, a preformed condensation product of these two compounds instead of the mixture of PEI and perfume.

The Board remarks that the fully modified PEI polymers of document (4) would be unable to react with an aldehyde or ketone to form a condensation product.
Moreover, no evidence was submitted by the Respondent that a not fully modified PEI of document (4) would react in a washing solution, i.e. in a much diluted state and in presence of detersive ingredients and possibly of further detergent components, with aldehyde or ketone perfumes to form a condensation product.
In fact, even though the condensation of amines and aldehydes and ketones is a known reaction leading to formation of the so-called Schiff bases, no information was available in the cited prior art that a polymeric amine such as PEI would easily form such a condensation product with aldehyde or ketone perfume under the conditions of document (4) and no evidence was submitted by the Respondent that this alleged fact belonged to common general knowledge of the skilled person.

The Board thus concludes that the skilled person would not have expected that a PEI polymer of document (4) reacted in the washing liquid with an aldehyde or ketone perfume. Therefore, the above Respondent's argument has to be rejected.

1.2.8 As submitted by the Respondent during oral proceedings, document (4) suggests also to use as hydrophilic perfume a condensation product of aldehyde and amine (a Schiff base) having a molecular weight of from 180 to 320; therefore, the skilled person, faced with the technical problem of providing a further laundry washing or cleaning composition which is capable of conferring to the treated fabric a long-lasting fresh fragrance of perfume aldehyde or ketone, would try known condensation products of perfume aldehyde and amines and would expect a similar substantivity to the fabric. The delayed release of the aldehyde perfume and a longer lasting fresh fragrance would then be necessarily achieved by using such a condensation product and would have been expected by the skilled person because of the known hydrolytic capacity of Schiff bases.

The Board remarks that it was generically known that Schiff bases can hydrolyse easily in the presence of water (see document (1)). However, this knowledge would have rather led the skilled person away from using a Schiff base in a laundry washing or cleaning composition for solving the technical problem of providing a substantive delivery of an aldehyde or perfume component onto the surface treated since in the washing or cleaning step considerable amounts of water are used. In fact, he would have expected to the contrary that the Schiff base hydrolyses already during washing or cleaning in the presence of water, thus releasing the aldehydes and ketone at an early stage without any improvement in the substantivity to the surface treated and in the long-lasting of the fragrance with respect to the use of uncondensed aldehydes and ketones.

Therefore, in the light of the teaching of document (4) and of his technical knowledge of the behaviour of Schiff bases, the skilled person, faced with the technical problem mentioned above, would have looked only for Schiff bases which were known to be hydrophilic perfumes and which would have not been expected to hydrolyse easily in water.

Document (4) discloses explicitly only one of these Schiff bases as hydrophilic perfume, namely aurantiol, which is the condensation product of methylanthranylate (an amine not in accordance with claim 1 of the patent in suit) and hydroxycitronellal (page 13, line 10), whilst the prior art discloses other similar condensation products based on an anthranilate not in accordance with claim 1, which products have their own perfume characteristics and can be substantive to fabrics (see document (7), column 2, line 11 to column 5, line 17).

Document (2) discloses *inter alia* condensation products of polyalkylenamines, i.e. one of the selected amino functional polymers of claim 1 according to the main request, and aldehyde perfumes (see page 4, lines 20 to 22 in combination with page 5, lines 9 to 51). However, this document, as explained above, concerns the use of such condensation products for trapping the malodorous aldehydes which can be present, for example, in soaps with concomitant release of a desirable aldehyde flavour over time. Moreover, this document does not contain any indication that such condensation products could be useful as hydrophilic perfumes within the teaching of document (4) and, in fact, it appears to suggest to the contrary that at least some of the disclosed condensation products are odourless (see page 6, lines 18 to 19). Furthermore, it does not teach if these condensation products, which must be already capable of exchanging the aldehyde moiety with another one in the product wherein they are contained, would be stable and not hydrolyse during washing or cleaning and would be effective for solving the technical problem underlying the invention of the patent in suit.

Document (3) discloses **odourless** Schiff bases based on oxyamines, which do not belong to the selected group of amino functional polymers of claim 1 according to the main request; these Schiff bases release aldehyde or ketone perfumes in the presence of humidity and provide a long-lasting odour (column 1, lines 41 to 47). However, these condensation products, being **odourless,** would have not been selected by the skilled person as a suitable hydrophilic perfume for the purpose of document (4).

As regards document (5), this document does not disclose explicitly any condensation product. Moreover, as explained above, it regards only rinsing compositions. Therefore, even though the skilled person would have recognised that a condensation product can be formed during the preparation of the composition, it would not have found in this document any suggestion that such an alleged condensation product would be useful as hydrophilic perfume within the teaching of document (4), would be stable and not hydrolyse during washing or cleaning and would be effective for solving the technical problem underlying the invention.

Finally, document (6), which was no longer discussed in detail by the Respondent during appeal, concerns the hydrolytic capability of some condensation products of amino functional polymers not falling within the groups selected in claim 1 according to the main request (see page 3121, synopsis). Moreover, this document only teaches that the hydrolysis of the tested Schiff bases takes place under mild conditions and depends on the specific chemical structure; therefore, the release of the perfume can be controlled (page 3125, lines 9 to 11). However, this document does not suggest the application that these Schiff bases are hydrophilic perfumes themselves or that could be used in washing or cleaning compositions. Therefore, this document would not be considered by the skilled person to contain any suggestion for solving the above mentioned technical problem.

1.2.9 The Board thus finds that the prior art did not contain any hint that would have led the skilled person to try one of the selected product of reactions of claim 1 in a washing or cleaning composition as disclosed in document (4) with an expectation of success.

The Board concludes that the subject-matter of claim 1 involves an inventive step.

Since the laundry and cleaning compositions of claim 1 involve an inventive step, the other independent claims, which involve a method of delivering residual fragrance to a surface by using such compositions and the use of the product of reaction as defined in any of claims 1 to 10 for the manufacture of such compositions, as well as all dependent claims involve necessarily an inventive step.

1.3 Procedural matter

One of the Respondent's argument discussed in point 1.2.8 above, in particular the specific combinations of the partial teachings of documents (4) and (2), was submitted for the first time during oral proceedings.

However, this argument is based on the contents of documents (2) and (4), which had already been discussed in writing and before the department of first instance in the evaluation of the inventiveness of the claimed subject-matter. Therefore, this new argument based on the already discussed prior art is not one which could not have been expected by the Appellant. In fact, it was also dealt with easily by the Appellant during oral proceedings.

Therefore, the Board found that the introduction of this new argument into the proceedings could not be considered to disadvantage the Appellant; thus the argument was admitted under Article 13(1) RPBA.

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 according to the main request submitted with the letter dated 10 May 2011 and the description to be adapted.

The Registrar: The Chairman:

D. Magliano P.-P. Bracke