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D E C I S I O N
of 12 June 2003

Case Number: T 1182/00 - 3.3.6

Application Number: 93870154.7

Publication Number: 0635565

IPC: C11D 3/37

Language of the proceedings: EN

Title of invention:
Detergent compositions inhibiting dye transfer

Patentee:
THE PROCTER & GAMBLE COMPANY

Opponent:
Henkel KGaA

Headword:
Vinylimidazole/vinylpyrrolidone copolymer/HENKEL

Relevant legal provisions:
EPC Art. 56

Keyword:
"Inventive step (yes) - alternative not suggested in the prior art"

Decisions cited:
-

Catchword:
-

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Case Number: T 1182/00 - 3.3.6

D E C I S I O N
of the Technical Board of Appeal 3.3.6
of 12 June 2003

Appellant: (Opponent)
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D-40191 Düsseldorf (DE)

Representative:
-

Respondent: (Proprietor of the patent)
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Decision under appeal:
Decision of the Opposition Division of the European Patent Office posted 2 November 2000 rejecting the opposition filed against European patent No. 0635565 pursuant to Article 102(2) EPC.

Composition of the Board:

Chairman: P. Krasa
Members: G. N. C. Raths
M. Tardo-Dino

Summary of Facts and Submissions

I. This appeal is from the Opposition Division's decision to reject the opposition filed against European patent No. 0 635 565 relating to detergent compositions inhibiting dye transfer.

Claim 1 of the patent as granted read:

"A detergent compositions comprising a surfactant system wherein the surfactant can be selected from nonionic and/or anionic and/or cationic and/or ampholytic and/or zwitterionic and/or semi-polar surfactants and 0.01 to 10% by weight of a N-vinylimidazole N-vinylpyrrolidone copolymer having a molar ratio of N-vinylimidazole to N-vinylpyrrolidone from 1 to 0.2 characterized in that said copolymer has an average molecular weight range from 5,000 to 50,000."

II. The opposition had been filed on the grounds of Article 100(a) EPC, in particular for lack of novelty and inventive step; the notice of opposition cited, inter alia, the following documents:

(1) DE-A-3 840 056,
(2) DE-A-4 027 832,
(4) H.U. Jäger, W.Denziger, Ludwigshafen/ Deutschland, "Wirkungsweise von Polymeren mit farbübertragungsinhibierenden Eigenschaften", Tenside Surf. Det. 28 (1991) 6, 428-433.

During the opposition procedure document

(6) V. Bühler, "Kollidon", BASF, 1992, 27-30, 34-35, 194-198

was introduced by the proprietor (now the respondent).

The Opposition Division found that the subject-matter of Claim 1 of the patent in suit was novel and involved an inventive step since a skilled person would not arrive at the subject-matter of Claim 1 of the patent in suit with the expectation of getting improved washing performance when considering the technical teaching of documents (1), (3) and (4). Further, the claimed subject-matter displays improved clay soil removal as a technical surprising effect.

III. The opponent (appellant) filed an appeal against this decision. It submitted, in writing and orally, that the subject-matter of Claim 1 did not involve an inventive step in view of document (2). It argued, in essence,

– that the Opposition Division had not correctly evaluated document (2) which would suggest copolymers of N-vinylimidazole/N-vinylpyrrolidone as dye transfer inhibitors;

– that the partial problem of maintaining a good detergency performance was solved by the compositions according to the patent in suit, but in particular, also by those disclosed in document (2);

– that document (2) disclosed a lot of copolymers containing a proportion of at least 50% of N-vinylpyrrolidone (page 2, lines 35 to 37) which copolymers would be covered by Claim 1 of the patent in suit;

– that clay soil removal was only a bonus effect.

IV. The respondent refuted the arguments of the appellant. In essence, it argued as follows:

The units of the proportions of the polymer constituting the copolymer were not clear in document (2). If, by reference to document (1), "%" meant "weight %", then the molar ratio of N-vinylimidazole to N-vinylpyrrolidone was 1.18, ie outside the claimed range. Further, it was not clear whether document (2) referred to the weight average molecular weight or to the number average molecular weight or to the viscosity average molecular weight. Only if the number average molecular weight was meant in document (2), there would be a small overlap with the molecular weight range in the patent in suit. Anyhow, the molecular weight range in the patent in suit was not an arbitrary but a purposive selection, as demonstrated in the proprietor's submission dated 31 May 1996.

Document (4) taught that the effectiveness of polymers in dye transfer inhibition increased with increasing molecular weight. Therefore, there was no incentive to select a low average molecular weight as stated in the patent in suit.

V. Oral proceedings took place on 12 June 2003.

VI. The appellant (opponent) requested that the decision under appeal be set aside and that the European patent No. 0 635 565 be revoked.

The respondent (proprietor) requested that the appeal be dismissed.

VII. At the end of the oral proceedings the Chairman announced the decision of the Board.

Reasons for the Decision

1. *Novelty*

The Board is satisfied that the subject-matter of Claim 1 is novel. Since during the appeal procedure novelty was no longer contested, no further reasons need to be given.

2. *Inventive step*

2.1 Claim 1 concerns a detergent composition comprising a surfactant system and 0.01 to 10% by weight of a N-vinylimidazole N-vinylpyrrolidone copolymer having a molar ratio of N-vinylimidazole to N-vinylpyrrolidone from 1 to 0.2 said copolymer having an average molecular weight range from 5,000 to 50,000.

2.2 In its written submissions and during oral proceedings before the Board the appellant took document (2) as the starting point for evaluating inventive step. The Board can agree to this approach.

Document (2) disclosed similar compositions comprising as dye transfer inhibiting polymers homo- or copolymers on the basis of N-vinylimidazole and/or N-vinyl-pyrrolidone and/or N-vinyloxazolidone (page 2, lines 31 and 32, and Claims 1 and 2). The objective as stated in document (2) was to provide a liquid, aqueous, dye transfer inhibiting detergent having a zeolite A content which was not inclined to sedimentation on storage but met the requirements of modern liquid detergents (page 2, lines 19 to 21).

According to the patent in suit one of the most persistent and troublesome problems arising around modern fabric laundering operations was the tendency of some coloured fabrics to release dye into the laundering solutions. The dye is then transferred onto other fabrics being washed therewith (page 2, lines 11 to 13). The objective of the patent in suit was to overcome this problem.

2.3 Thus, in the light of document (2), the technical problem underlying the patent in suit may be seen in the provision of an alternative detergent composition which was efficient in eliminating dye transfer while not adversely affecting the overall detergency performance (page 2, lines 35 to 37).

2.4 In the patent in suit it was stated that the compositions of the examples were very good at displaying excellent cleaning and detergency performance with outstanding colour-care performance on coloured fabrics and mixed loads of coloured and white fabrics (page 14, lines 37 to 40). In view of this

statement, uncontested as such, in absence of a proof to the contrary, the Board considers that the subject-matter of Claim 1 of the patent in suit plausibly solves the technical problem as defined under point 2.3.

2.5 The question remains to be decided whether or not the claimed solution involves an inventive step.

2.6 The appellant argued that the Opposition Division had not correctly evaluated document (2). The composition 1 according to document (2) contained a dye transfer inhibitor whereas the composition 4 did not (page 3, table 1). The detergency performance of composition 1 was rated as 72% reflectance, and, thus, higher than that of composition 4 (69% reflectance).

It concluded that, therefore, a skilled person would have expected that by adding such a dye transfer inhibitor a good detergency performance was safeguarded or even improved.

2.7 The Board does not agree with the reasoning of the appellant.

2.7.1 Document (2) disclosed that the dye inhibiting copolymers could be formed of N-vinylpyrrolidone and/or N-vinylimidazole and/or N-vinyloxazolidone. As well homo- as co-polymers of the cited compounds could be used. Copolymers, suitable for detergents, had a proportion of at least 50% of N-vinylpyrrolidone. Suitable comonomers were vinylacetate, acrylnitrile and maleic anhydride. The preferred mol weight of suitable copolymeres was in the range of 20 000 to 200 000.

Detergents containing poly-N-vinylimidazole were preferred (page 2, lines 31 to 39).

2.7.2 In the written submissions (grounds of appeal, 28 February 2001, page 2, paragraph 4 and the respondent's reply of 24 September 2001, paragraph bridging pages 3 and 4) the meaning of a proportion of "at least 50%" of N-vinylpyrrolidone" in the copolymer was controversely discusssed (document (2), page 2, line 36). There was disagreement whether the percentage referred to "mol%" or "weight%". According to the appellant, who took the position that this percentage referred to the molar composition of the copolymer, document (2) suggested a lot of copolymers containing vinylpyrrolidone as suitable candidates for solving the technical problem at stake which copolymers were also within the range of copolymers defined in Claim 1 of the patent in suit.

In the Board's judgment the issue of this discussion is of minor importance. Independently of whether "weight%" or "mol%" were meant, the reference to "at least 50%" is a clear indication that the amount of N-vinylpyrrolidone should predominate over that of the other comonomer in the copolymer.

Of major importance however is the kind of the comonomer to be selected for solving the technical problem.

Having regard to the examples of document (2) only the homopolymer of poly-N-vinylimidazole was used (see table 1). This confirms the preference given to this homopolymer (page 2, line 39). So, in a first approach,

the skilled person would have considered this homopolymer. Only in a further step, he would have taken the copolymers into consideration. Document (2) disclosed as suitable comonomers for N-vinylpyrrolidone "e.g. vinylacetate, acrylnitrile and maleic anhydride", but not vinylimidazole. Therefore, document (2) did not comprise any incentive to select a copolymer of N-vinylimidazole/ N-vinylpyrrolidone as a dye transfer inhibiting agent apt to solve the existing technical problem.

2.7.3 Document (4) deals with the mode of action of polymers with dye transfer inhibiting properties. It discloses that homopolymers of vinylpyrrolidone perform well, but polyvinylimidazoles perform even better as dye transfer inhibitors (page 478, left-hand column, at the end of the summary). The homopolymers of N-vinylimidazole and a copolymer of N-vinylimidazole and N-vinlypyrrolidone are the most efficient agents in this respect (page 432, at the middle of the right-hand column). A particular N-vinylimidazole N vinylpyrrolidone copolymer C3 is disclosed in this connection for which a K-value of 97 is given (page 430, right-hand column, table 1, and page 431, left-hand column, figure 13, in combination with page 431, right-hand column, first complete paragraph). The K-value characterises the degree of polymerisation and, thus, the molar mass of the polymer (page 430, right-hand column, footnote). According to document (6) a K-value of 97 corresponded to a molecular weight of 1 000 000. As said molecular weight was far outside the claimed range of 5 000 to 50 0000, document (4) did not give any guidance for arriving at the claimed subject-matter even when acknowledging that

it discusses already a N-vinylimidazole N-vinylpyrrolidone copolymer.

2.7.4 The question is whether a skilled person would have considered the low molecular range of 5 000 to 50 000 given in Claim 1 of the patent in suit when searching for a solution of the existing technical problem. According to the appellant, the skilled person would have at least tried a copolymer having a molecular weight of 20 000 which figure is the lower limit of the molecular weight range given in document (2)(page 2, lines 38 to 39).

The Board cannot accept this argument. Apart from the fact that it is already to be questioned why a skilled person should have combined information on molecular weight ranges given in document (2) in respect to particular classes of polymers with the information given in document (4) for a different polymer, the latter citation disclosed that the dye inhibiting performance of polymers increased in line with their molar mass (page 428, introduction last sentence and page 433, right-hand column, lines 12 to 13 under point 3). Therefore, the skilled person would rather select a molecular weight being closer to the upper limit of the range disclosed in document (2), i.e. 200 000, than to the lower limit, i.e. 20 000.

2.7.5 The appellant, by referring to the decision of the Opposition Division, further argued that the partial problem of avoiding a loss in cleaning performance of the detergent composition was already solved in all the cited prior art documents, and in particular, in

document (2) (letter of 29 February 2001, page 2, second paragraph, first sentence).

The Board refers to table 1 of document (2) (page 3). The composition of example 6 contained zeolite A and displayed a detergency performance rating of 63% whereas the composition according to example 5 did not contain zeolite A and displayed a detergency performance rating of 51%, which was the lowest rating of all the compositions 1 to 6. The Board concludes therefrom that the skilled person would not have considered to dispense with zeolite A but would have rather considered it to be an absolutely necessary component to safeguard a satisfactory detergency performance of the respective composition.

However, the compositions according to examples I and II of the patent in suit did not contain zeolite A whereas the compositions according to examples III and IV did, and in both cases i.e. with and without zeolite, the overall detergency performance was good (patent in suit, page 14, lines 38 and 39). A skilled person could not foresee this result, which, according to the Board's judgement, is due to the presence of the particular copolymer according to Claim 1 of the patent in suit.

Since the overall detergency performance was obtained independently of the presence of zeolite A, the findings of the Opposition Division that the overall detergency performance was not adversely affected were not objectionable.

2.8 The appellant further argued that the clay soil removal obtained with the compositions according to the patent in suit was only a bonus effect.

While this issue is no longer of importance in view of the above considerations it is appropriate to note that the data submitted by the respondent under cover of the letter dated 31 May 1996 showed that a copolymer having a molecular weight of 10 000 to 15 000 falling thus within the claimed molecular weight range of 5 000 to 50 000 showed a better performance in removing particulate clay stain than a polymer having a molecular weight of 60 000 i.e. outside the claimed range. This proves that the selection of the molecular weight of the respective copolymer was decisive.

2.9 It follows that documents (2) and (4) - alone or in combination - would not have led the skilled person to suggest, with a reasonable expectation of success, the claimed subject-matter as a solution to the existing technical problem.

2.10 As can be seen below, this result remains the same when also considering document (1), e.g. by taking it as the starting point for evaluating inventive step.

Document (1) relates to dye sensitive textile materials. Its objective was the inhibition of dye transfer (column 1, lines 1 to 5).

This problem was solved by using particular mixtures of anionic and nonionic tensides in specified ratios in the presence of water soluble dye inhibiting polymers (the paragraph bridging columns 1 and 3, and column 3,

lines 39 to 46). Whereas the gist of the disclosure in document (1) is the nature and the respective amounts of the tensides, possible classes of dye transfer inhibiting polymers are mentioned in passing as follows:

"The water soluble polymers used as dye transfer inhibiting agents are the ... active substances polyvinylimidazole and polyvinyloxazolidone and copolymers on the basis of N-vinylimidazole, or N-vinyloxazolidone with at least 50 weight % of N-vinylpyrrolidone as well as, in particular, polymers on the basis of N-vinylpyrrolidone. Such a polymer component may have a mol weight of about 10 000 to 1 000 000. Suitable homopolymers have a mol weight of about 15 000 to about 700 000. Copolymers, which are suitable for the washing process ... , have a portion of at least 50 weight % of N-vinylpyrrolidone based on the copolymer. Suitable comonomers are e.g. acrylnitrile and maleic anhydride. The preferred mol weight of suitable comonomers is from about 20 000 to about 200 000. Particularly well performing homopolymers have e.g. a mol weight of from 30 000 to about 600 000, in particular, about 40 000" (column 3, lines 46 to 66).

In the light of document (1), the problem underlying the patent in suit was the provision of an alternative detergent composition efficient in eliminating dye transfer while not affecting the overall detergency performance.

In the Board's judgement, there was no guidance in document (1) neither to the selection of the particular

comonomers nor of the ratio of N-vinylimidazole to N-vinylpyrrolidone nor to the average molecular weight.

2.11 For all these reasons, the subject-matter of Claim 1 involves an inventive step and thus meets the requirements of Article 56 EPC.

The dependent claims 2 to 7 refer to specific embodiments of Claim 1 and derive their patentability from Claim 1.

Order

For these reasons it is decided that:

The appeal is dismissed

The Registrar: The Chairman:

G. Rauh P. Krasa