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D E C I S I O N
of 9 November 1999

Case Number: T 0503/97 - 3.3.4

Application Number: 89312070.9

Publication Number: 0372746

IPC: C14C 9/00

Language of the proceedings: EN

Title of invention:
The use of selected amphiphilic copolymers in the treatment of leather

Patentee:
ROHM AND HAAS COMPANY

Opponent:
(01) Henkel Kommanditgesellschaft auf Aktien
(02) Clariant GmbH
(03) Stockhausen GmbH & Co. KG
(04) Münzing Chemie GmbH

Headword:
Leather treatment/ROHM AND HAAS

Relevant legal provisions:
EPC Art. 54, 56, 123(2)(3)

Keyword:
"Novelty (yes)"
"Inventive step (yes)"
"Added subject-matter (no)"

Decisions cited:
-

Catchword:

Europäisches Patentamt | European Patent Office | Office européen des brevets

Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number: T 0503/97 - 3.3.4

D E C I S I O N
of the Technical Board of Appeal 3.3.4
of 9 November 1999

Appellant: (Proprietor of the patent)
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Decision under appeal: **Decision of the Opposition Division of the European Patent Office posted 13 March 1997 revoking European patent No. 0 372 746 pursuant to Article 102(1) EPC.**

Composition of the Board:

Chairwoman: U. M. Kinkeldey
Members: D. D. Harkness
W. Moser

Summary of Facts and Submissions

I. European patent 0 372 746 having the title "The use of selected amphiphilic copolymers in the treatment of leather" was granted with six claims of which claim 1 to which the further claims were appendant read as follows:

"Use of an aqueous dispersion of a copolymer formed from greater than 10% by weight and less than 50% by weight of at least one hydrophilic monomer and greater than 50% by weight and less than 90% by weight of at least one hydrophobic monomer to impart water resistance to tanned leather or for making leather water proof."

II. The patent was opposed and two new requests submitted by the appellant (proprietor of the patent) as main and auxiliary requests were refused by the opposition division for lack of novelty and inventive step, respectively, and the patent consequently revoked.

III. The appellant filed a notice of appeal, paid the appeal fee and submitted a statement of grounds for the appeal.

IV. In a letter dated 27 February 1998 respondent IV (opponent 04) raised a prior use objection based on the use of hydrophobic fatliquoring agents Provol HF and Provol HFN previously sold by Zschimmer and Schwarz GmbH.

V. In a letter received 7 October 1999 the appellant stated that he would not challenge the validity of this prior use objection and filed a new main request having

one use claim which reads as follows:

"Use, in a process for treating tanned leather, of an aqueous dispersion of a copolymer, having a molecular weight of from 2,000 to 100,000, formed from greater than 10% by wt to less than 50% by weight acrylic acid and from more than 50% by wt and less than 90% by wt (C_8-C_{22})alkyl (meth)acrylate to improve the water resistance of said tanned leather."

VI. The prior art documents which are cited in this decision are:

(1) DE-A-10 300

(3) DE-A-33 04 120

(5) PL-A-118 706

(9) DE-A-26 29 748

VII. Oral proceedings took place on 9 November 1999. Respondent I (opponent (01) did not attend.

VIII. The appellant's arguments are summarised as follows:

The originally filed application had not been amended in such a way that it did not now meet the requirements of Article 123(2) and (3) EPC because the present claim was based on the application as filed and as granted. The description of the application and of the granted patent disclosed both water resistance and waterproofing which were measured in terms of Maeser flexes in the dynamic water resistance test. The term "waterproof" required the leather to withstand 15 000

flex cycles without penetration of water into the leather, see footnote to table 1 of the patent in suit. Whatever the respondents' objection was, there existed no reason to allege that this provision of the EPC has not been complied with.

Even though document (5) did not directly relate to the problem of improving water resistance of tanned leather, there was a reference to retaining a low water absorptivity at the foot of page 2. In example 2 a copolymer of approximately MW 65 900 prepared from 2-ethylhexyl acrylate (498 parts by weight) and methacrylic acid (102 parts by weight) was said in aqueous dispersion to increase "hydrophilicity" of retanned leathers. This copolymer differed from those of the patent in suit only in that methacrylic acid was employed instead of acrylic acid. The copolymers prepared in the absence of a chain transfer agent in examples 1 and 3 of this citation were of very high MW, ie, over one million, and therefore ten times the top limit given in the patent in suit, and the respondents I to IV (opponents 01 to 04) had not filed any practical evidence that they could be employed for the required purpose. This view was supported by written evidence filed on 10 July 1997 in which these examples had been carried out, and in technical references which explained the effect on MW of chain transfer agents and the concentration of polymerisation initiators. Lower MW values were obtained using chain transfer agents and higher concentrations of initiator, whilst emulsion polymerisation tended to increase MW values in comparison with bulk polymerisation. Thus it was possible to control the MW of the copolymer to within the required range.

There was no incentive provided in document (5) to replace the methacrylic acid by acrylic acid in example 2 in order to obtain the effect required by the patent in suit and indeed the hydrophilicity reference was an indication in a totally different direction. Inventive step for the new use claim was supported by the completely unexpected result in respect of water resistance demonstrated by examples 1 and 2 of table 6 of the patent in suit in which the methacrylic acid copolymer (example 2) had a dynamic water resistance of 1 900 Maeser flex cycles and the acrylic acid copolymer (example 1) a flex cycle value of 94 800, thus vastly superior in this respect. Also there was an improvement in the static water resistance by 6 wt% ie, from an uptake of 31 wt% to 25 wt%.

With regard to the other prior art, document (1) was concerned with water absorption and did not disclose any MW values, nor were any C(8-22) esters mentioned. Document (3) related to the waterproofing of leather, but had employed the reverse copolymer mole percentages from those of the patent in suit, thus a combination of documents (1) and (3) led away from the patent in suit. Since documents (3) and (5) referred to different mole percentages of the acidic and ester copolymers, these two documents were incompatible and could not be combined and also a combination of documents (1) and (5) could only be done with the benefit of hindsight.

IX. The respondents' submissions first concerned Article 123(2) and (3) EPC and were essentially that the application as filed related to a use of copolymers for "improving" the water resistance of leather, whereas the granted patent specified a use of copolymers to "impart" water resistance to leather and

the claim now under consideration again related to "improving" said property of leather. Assuming that "improving" and "imparting" have a different meaning then the patent in suit in the form as granted contravened Article 123(2) EPC, and the claim of the latest request contravened Article 123(3) EPC. It was stated that the form of claim 1 as granted was clear and specified "to impart water resistance to tanned leather or for making leather waterproof", whereas the sole claim under consideration specified "to improve the water resistance of said tanned leather" and was therefore broader than claim 1 of the patent in suit in the form as granted.

With regard to inventive step, document (5) was regarded as the nearest prior art because example 3 related to reducing the absorptiveness of leather, and the only difference between this example and the subject-matter of the claim under consideration was that methacrylic acid was employed instead of acrylic acid. It was well known in the leather treating art that these two acids were alternatives and equivalents for various uses, and therefore, it was obvious to use one where the other had already been employed, and the loss of the methyl group when using acrylic acid would have no effect in comparison with methacrylic acid. It was important to note that, according to page 2, paragraph 1 of document (5), solutions and emulsions of the copolymers easily penetrate the substrates to which they are applied, thus the MW of the copolymer was not too high. The water absorption values of the prior art were as good as those of the patent in suit which relied upon the chroming step in combination with the treatment proposed to give an acceptable value.

Document (1) disclosed a process in which leather was treated in example 1 with a copolymer of 20 wt% acrylic acid and 80 wt% of acrylic-acid-ethylester in order to reduce water absorption and on page 2, paragraph 2 it was stated that acrylic acid and methacrylic acid were alternatives as the carboxylic acid group containing component, and, therefore, a combination of document (5) with document (1) was possible because the latter document related to the same problem as that of the former, and it would then be obvious to combine the acrylic acid monomer with the 2-ethylhexylacrylate monomer, thus giving a copolymer according to the claim at issue. Also polyacrylic-acid-ester which had been hydrolysed to give 10 to 50% free carboxyl groups, ie acrylic acid carboxyl groups, was specified as a component of the copolymer of document (1).

X. The appellant requested that the decision under appeal be set aside and that the patent be maintained on the basis of the sole claim filed on 7 October 1999.

The respondents requested that the appeal be dismissed.

Reasons for the Decision

1. The appeal is admissible.

2. *Allowability of the amendments, Article 123(2) and (3) EPC*

2.1 The objection raised by respondent III under this provision appears to rely upon the meanings given on the one hand to "impart" and "improve" and on the other to "water resistant" and "waterproof".

2.2 In the context of treating a substrate with a copolymer to "impart" or to "improve" a certain property of the substrate, the technical effect of the treatment is to increase the level of that property. There is no difference between using a copolymer to treat a substrate which has zero water resistance thereby "imparting" water resistance to it, and treating in the same way a substrate which may have some water resistance thereby "improving" the level of said property. These uses of the copolymer are the same and are carried out in the same way, and no different technical effects are realised by doing so. The interpretation of these terms as implied by respondent III means that the appellant would be restricted to the treatment including other pre-treatment steps of only one leather in exactly the same way, and to the smallest detail in order to get the same result, but this is not consistent with the disclosure of the patent in suit. Accordingly the words "improve" and "imparting" are considered to be coterminous.

2.3 There is no difference in substance between a treatment with the purpose of enhancing "water resistance" and a treatment relating to "waterproofing". From the European patent application as filed, on page 19, first complete paragraph, last six lines, it can be derived that waterproofing implies a higher degree of water resistance; hence, "water resistance" and "waterproofing" relate to the same effect, namely water resistance. The use of the copolymers to provide water resistance may result in a waterproof product, depending on whether or not the product withstands 15 000 Maeser flex cycles (see footnote to table 1 of the patent in suit). It is only a matter of the degree

of water resistance as to whether the treated leather product is regarded as being waterproof or not.

2.4 Given the above understanding of the terms in discussion, there is no violation of Article 123(3) EPC because the sole claim of the request is, in comparison with claim 1 as granted, limited in respect of the copolymers employed and their MW and a specific reference to the alternative of waterproofing has been deleted. Therefore the sole claim of the request does not represent an extension of the protection conferred by the granted claim.

2.5 Claim 1 as granted refers to the use of aqueous dispersions of certain copolymers to impart water resistance to tanned leather or for making the leather waterproof. A basis for this is to be found in the European patent application at page 9, paragraph 4 to page 10 paragraph 2, page 11, last paragraph, page 19, paragraphs 2 and 3, also tables 2 and 6 in the description. The patent in suit accordingly complies with Article 123(2) EPC.

3. *Novelty, Article 54 EPC*

The respondents II to IV were asked during oral proceedings whether there were any objections to the novelty of the subject-matter of the claim. They replied that they had no comment to make, and no objection was raised in this respect. Having reviewed the cited prior art, the Board is also of the opinion that the subject-matter of the claim of the patent in suit is novel.

The prior use objection raised in the written

proceedings was met by the amended claims and was not discussed during the oral proceedings.

4. *Inventive step, Article 56 EPC*

Closest prior art

4.1 The board agrees to the analysis of the disclosures of documents (1) and (5) given by the parties (see sections VIII and IX above). However, document (3) also has to be considered in the assessment of the prior art. This document represents a true development of the prior art document (1) as it relates to the same problem to be solved as that of said document and specifically refers to it. This problem, ie to render leather water resistant, was solved in document (1) by using a copolymer comprising 10 to 50 wt% of hydrophilic monomer and 50 to 90 wt% of hydrophobic comonomer, and in complete contrast to the teaching of document (1), the solution proposed by document (3) was to employ 60 to 95 wt% of hydrophilic comonomer with 5 to 40 wt% of hydrophobic comonomer. This represents a totally different technical development and solution to the problem and shows the line of thought of the skilled person with document (1) at his disposal.

4.2 Because document (5) referred to leather "retaining low water absorptivity" and because example 2 thereof differed from the subject-matter of the patent in suit only in that methacrylic acid comonomer was employed instead of acrylic acid comonomer, the respondents agreed that the disclosure of document (5) represented the closest prior art, whilst the appellant thought it did not directly relate to the problem of treating leather to increase water resistance, however, also the

appellant was prepared to consider this document as the closest prior art, (see also letter of 6 October 1999).

4.3 Having regard to document (5) which the board considers to be the closest prior art the problem to be solved by the patent in suit was to find an alternative process for treating leather to give it the property of low water absorptivity this being considered as having the same technical significance as water resistance. This problem was solved by the use claim (see section V above).

4.4 Chronologically, the documents were published in the order (1), (5) and (3), and assuming that they all may be regarded as relating to the same problem to be solved as that of the patent in suit, then the technical advances were as follows:

(a) the disclosure of document (1) did not specify a use of a copolymer MW of 2 000 to 100 000 or a C(8-22)alkyl ester comonomer;

(b) the authors of document (5) having had knowledge of document (1) prepared in example 2 a copolymer of measured MW 65900 using 2-ethyl hexylacrylate (C8 alkylester) and methacrylic acid which increased the hydrophilic properties of the treated leather;

(c) the technical teaching of document (3) was developed after document (1) had specifically been considered. It related to the use of 60 to 95 Mol% of acrylic acid with 5 to 40 Mol% of methyl-, ethyl-, propyl- or butyl-esters of acrylic acid or methacrylic acid. As a result the authors of this

document reversed the mole-percentages of the hydrophilic and hydrophobic comonomers used in both documents (1) and (5) and did not continue with the C8 ethylhexyl esters.

4.5 From the above it is seen that the trend of thought and technical development in document (3) is, in two aspects, away from the solution proposed in the claim at issue. None of these three documents alone renders the solution to the problem obvious. The teaching of document (3) with regard to the hydrophilic-hydrophobic characteristics of the copolymer is contrary to that of the patent in suit, and the technical development, starting from document (1) and combining with document (5), led to the use of methacrylic acid comonomer and the wrong technical effect.

4.6 When asked by the board during oral proceedings to comment on the relevance of document (3) none of the respondents II to IV did so. Its disclosure indicates the technical direction taken by a skilled person who had considered the disclosure of document (1) and, therefore, the problem to be solved by the patent in suit.

4.7 The appellant demonstrated that by using acrylic acid instead of methacrylic acid (compare examples 1 and 2 of table 6 of the patent in suit) the dynamic water resistance measured in terms of Maeser Flexes rose from 1 900 to 94 800, a remarkable increase of over forty nine times which totally contradicts the respondents' view that acrylic acid and methacrylic acid can be viewed essentially as equivalents. Again, none of the respondents II to IV credibly challenged this result during oral proceedings. Such a result was not

anticipated by document (5); nor was it to be expected by using acrylic acid rather than methacrylic acid in example 2 of said document.

4.8 Respondent III objected that equally good results were obtained by the prior art and referred also to the 4 000 Maeser flex cycle result in table 1, example 1 of the patent in suit. However, this result was obtained before tanning, whereas the sole claim of the request under consideration is limited to the use of copolymers on "tanned" leather. Therefore, that result does not form part of the claimed invention.

4.9 Thus, the claim of the request under consideration fulfills the requirement of Article 56 EPC.

Order

For these reasons it is decided that:

1. The decision of the opposition division is set aside.

2. The case is remitted to the first instance with the order to maintain the patent on the basis of the following documents:

(a) claim 1 filed on 7 October 1999 and

(b) description: pages 2, 4, 5, 6, 15, 16, 17 and 19 filed on 7 October 1999, and pages 3, 7 to 14, 18, 20 to 22, and 23, lines 1 to 46, as granted.

The Registrar: The Chairwoman:

M. Kiehl U. Kinkeldey