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**Datasheet for the decision  
of 27 February 2007**

**Case Number:** T 0307/05 - 3.3.03

**Application Number:** 98113054.5

**Publication Number:** 0874008

**IPC:** C08F 22/02

**Language of the proceedings:** EN

**Title of invention:**

Maleic acid copolymer, process for producing the same and uses thereof

**Patent Proprietor:**

NIPPON SHOKUBAI CO., LTD.

**Opponents:**

BASF Aktiengesellschaft, Ludwigshafen  
Rohm and Haas Company

**Headword:**

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**Relevant legal provisions:**

EPC Art. 123(2), 123(3)

RPBA Art. 10b

**Keyword:**

"Main request and auxiliary request 3: extension of scope of protection (yes)"

"Auxiliary requests 2, 4 and 5: extension of subject-matter (yes)"

**Decisions cited:**

G 0001/93, T 0119/82, T 0113/86, T 0383/88, T 0166/90,  
T 0581/91, T 0553/99, T 0658/02, T 0064/03, T 0335/03,  
T 1449/05



Case Number: T 0307/05 - 3.3.03

**D E C I S I O N**  
of the Technical Board of Appeal 3.3.03  
of 27 February 2007

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**Decision under appeal:**

Decision of the Opposition Division of the European Patent Office dated 21 December 2004 and posted 11 January 2005 revoking European patent No. 0874008 pursuant to Article 102(1) EPC.

**Composition of the Board:**

**Chairman:** R. Young

**Members:** C. Idez

C. Heath

## Summary of Facts and Submissions

I. The grant of the European patent No. 0 874 008 in the name of Nippon Shokubai Co., Ltd., in respect of European patent application No. 98 113 054.5, filed in accordance with Article 76 EPC as a divisional application of the earlier European patent application 94 921 115.5 filed on 18 July 1994 and claiming the priorities of 20 July 1993, 18 March 1994 and 2 June 1994, respectively, of three earlier patent applications in Japan (178946/93, 49375/94 and 121578/94), was announced on 31 October 2001 (Bulletin 2001/44) on the basis of 9 claims. Independent Claims 1 and 6 read as follows:

"1. A maleic acid-based copolymer which has a calcium ion-capturability of 350 mg CaCO<sub>3</sub>/g or higher calculated as calcium carbonate and a clay-dispersibility of 1.4 or higher, wherein said copolymer is a copolymer of maleic acid, maleic acid salt or mixtures thereof and a water-soluble ethylenically unsaturated monomer in a ratio of 95/5 to 5/95 by molar amount, said copolymer having a weight-average molecular weight of 3,000 to 15,000.

6. A detergent composition which comprises:  
a maleic acid-based copolymer having a calcium ion-capturability of 350 mg CaCO<sub>3</sub>/g or higher calculated as calcium carbonate, and a clay-dispersibility of 1.4 or higher wherein said copolymer is a copolymer of maleic acid, maleic acid salt or mixtures thereof and a water-soluble ethylenically unsaturated monomer in a ratio of 95/5 to 5/95 by molar amount, said copolymer having a

weight-average molecular weight of 3,000 to 15,000; and a surfactant."

Claims 2 to 5, and 7 to 9 were dependent claims.

II. Two notices of Opposition were filed against the patent, as follows:

(i) by BASF Aktiengesellschaft (Opponent I), on 29 July 2002, on the grounds of lack of novelty and lack of inventive step (Art. 100(a) EPC, and

(ii) by Rohm & Haas Company (Opponent II), on 30 July 2002 on the grounds of lack of novelty and lack of inventive step (Art. 100(a) EPC), insufficient disclosure (Art. 100(b) EPC) and added subject-matter (Art. 100(c) EPC).

Both Opponents requested revocation of the patent as the whole.

The following document has been *inter alia* considered during the opposition proceedings:

D6: US-A-4 555 557.

III. By a decision announced orally on 21 December 2004 and issued in writing on 11 January 2005, the Opposition Division revoked the patent.

The decision of the Opposition Division was based on a main request and on three auxiliary requests all submitted with letter dated 16 November 2004.

According to the decision, all the requests infringed Article 123(3) EPC, and furthermore the first and the third auxiliary requests did not meet the requirements of Article 123(2) EPC.

IV. A Notice of Appeal was filed on 8 March 2005 by the Appellant (Patent Proprietor) with simultaneous payment of the prescribed fee.

With the Statement of Grounds of Appeal filed on 17 May 2005, the Appellant submitted a new main request consisting of nine claims and auxiliary request consisting of four claims.

Independent Claims 1 and 6 of the main request read as follows:

"1. A maleic acid-based copolymer which has a calcium ion-capturability of 350 mg CaCO<sub>3</sub>/g or higher calculated as calcium carbonate and a clay-dispersibility of 1.4 or higher, wherein said copolymer is a copolymer of maleic acid, maleic acid salt or mixtures thereof and a water-soluble ethylenically unsaturated monomer, said copolymer having a weight-average molecular weight of 3,000 to 15,000.

wherein said maleic acid-based copolymer is obtainable by a process including the steps of:

charging a material (A) into a reaction vessel, in such a manner that the concentration of said material (A) will be 35 % by weight or higher, wherein said material (A) is maleic acid and/or its salt;

adding hydrogen peroxide into said reaction vessel after said charging step, in such a manner that the amount of hydrogen peroxide is within the range of 3 to 20 % by weight of said material (A); and

adding a water-soluble ethylenically unsaturated monomer (B) into said reaction vessel after said charging step and within 30 to 500 minutes after initiation of a reaction, in such a manner that the

ratio (A)/(B) is within the range of 90/10 to 20/80 in mol ratio, wherein the adding of said monomer (B) is completed 10 to 300 minutes later than completion of said step of adding hydrogen peroxide, and wherein 70 % by weight or more of the total used amount of the maleic acid (salt) is charged into the reaction vessel before the reaction.

6. A detergent composition which comprises:  
a maleic acid-based copolymer as claimed in claim 1 and  
a surfactant."

Claims 2 to 5 and 7 to 9 corresponded in substance to granted Claims 2 to 5 and 7 to 9.

Claim 1 of the auxiliary request differed from Claim 6 of the main request in that all the features of Claim 1 of the main request had been incorporated therein.

Claims 2 to 4 corresponded in substance to granted Claims 7 to 9.

The Appellant also submitted arguments concerning Article 123(2) and 123(3) EPC which may be summarized as follows:

(i) Concerning the main request:

(i.1) Claim 1 of the main request was substantially a combination of Claim 1 as granted and the features, as disclosed on page 7, lines 36 to 45 of the patent, of the process by which the copolymer was obtainable in accordance with page 8, line 1 of the patent.

(i.2) The ratio of 95/5 to 5/95 by molar amount, as recited in Claim 1 as granted, had been deleted.

(i.3) In the part describing the process the range of 95/5 to 5/95 had been amended to a range of 90/10 to 20/80 (cf. patent in suit page 7, last three lines)

(i.4) The feature that 70 % by weight or more of the total used amount of the maleic acid (salt) was charged into the reaction vessel before the reaction was disclosed at page 8, lines 6 and 7 of the patent.

(i.5) In the decision T 0658/02 of 27 May 2004 (not published in OJ EPO) concerning the parent application, the Board had decided that there was no basis in the application as filed for the limitation of the copolymer comprising the two types of monomers A and B in a ratio of 95/5 to 5/95.

(i.6) By removing this limitation any contravention to Article 123(2) EPC which existed in Claim 1 as granted had been removed. Consequently Claim 1 of the main request met the requirements of Article 123(2) EPC.

(i.7) Although in Claim 1 of the Main Request the limitation "in a ratio of 95/5 to 5/95 by molar amount" had been removed, extension of protection had been avoided by adding the limiting feature that in the process for obtaining the copolymer the monomer materials A (maleic acid and/or its salt) and B (water-soluble ethylenically unsaturated monomer) were used in a molar ratio in the range 90/10 to 20/80.



(i.8) Consequently Claim 1 included only copolymers which had the ratio A/B in a range which was narrower than the range of 95/5 to 5/95 recited in Claim 1 as granted.

(i.9) In the decision T 0658/02 (points 2.2.2 to 2.3.3) it had been considered that due to the incomplete reaction of monomers, which usually occurred in a polymerization process, the ratio of monomer units in the obtained copolymer would not be the same as the ratio of monomers in the monomer mixture used for the polymerization.

(i.10) However, the degree of incompleteness of the polymerization process was usually small and the amount of residual monomer which did not take part in the reaction was usually not more than few percent of the total amount of monomer.

(i.11) Therefore, the ratio of the monomer components in the obtained copolymer would always be close to the ratio of monomers which were present in the monomer mixture used for the polymerization.

(i.12) Consequently, it would not be possible for a polymerization process which used monomers A and B in the ratio from 90/10 to 20/80, to result in a copolymer in which the ratio of monomer units A and B was as high as 95/5 or more or as low as 5/95 or less.

(i.13) Even if it would be considered that the polymerization reaction was incomplete to such a degree that only 50 % of monomer B participated in the reaction, which was a completely unrealistic

assumption, the result would be that the ratio of monomer units A and B in the copolymer would be 90/5. This was still clearly below the upper range limit of 95/5 of the range claimed in Claim 1 as granted. The same considerations would apply at the lower end of the range. The ratio would be 10/80, which would be still clearly greater than the lower limit 5/95 of the range claimed in Claim 1 as granted.

(i.14) Therefore, Claim 1 of the Main Request did not extend the scope of protection defined by Claim 1 as granted. It did not contravene Article 123(3) EPC.

(ii) Concerning the auxiliary request:

(ii.1) Claim 1 of the Auxiliary Request corresponded to Claim 6 of the Main Request.

(ii.2) Claim 1 of the Auxiliary Request was directed to a detergent composition which comprised a surfactant and a maleic acid-based copolymer which had all the features of Claim 1 of the Main Request. Therefore, Claim 1 of the Auxiliary Request did not contravene Articles 123(2) and (3) EPC.

V. In its letter dated 30 November 2005, Respondent II presented arguments concerning Article 123(3) EPC in respect of the requests submitted by the Appellant with its letter dated 17 May 2005, which may be summarized as follows:

(i.1) Claim 1 of the main request was now directed to "a maleic acid-based copolymer which has a Calcium ion-capturability of 350 mg CaCO<sub>3</sub>/g or higher calculated as

calcium carbonate and a clay-dispersibility of 1.4 or higher, wherein said copolymer is a copolymer of maleic acid, maleic acid salt or mixtures thereof and a water-soluble ethylenically unsaturated monomer, said copolymer having a weight-average molecular weight of 3,000 to 15,000, wherein said maleic acid-based copolymer is obtainable by [... a process in which the monomers are present in a starting ratio of 90/10 to 20/80...] ."

(i.2) The whole of the "obtainable by" insertion to Claim 1 could be ignored, since the claimed product could be obtained by the route described, but, crucially, it needed not to be.

(i.3) Consequently, deleting the previous requirement that the monomer amounts in the product must be between 95/5 and 5/95 meant that the claim was now broader than in its form as granted, i.e. Article 123(3) EPC was violated.

(i.4) The process set out in the claim would not produce a discrete product having a particular molar ratio of monomer units and molecular weight.

(i.5) The terms used to describe polymers were in fact statistical averages of the final mix.

(i.6) A process such as that in the claim would produce a mix of products, from homopolymers of monomer A (e.g. maleic acid) to homopolymers of monomer B (e.g. acrylic acid), and everything in between.

(i.7) The product mix depended on all the process conditions and the relative reactivities of the starting materials.

(i.8) As homopolymers would be produced by the process claimed, the amendment deleting the molar ratio of 95/5 to 5/95 broadened the scope of the claims and thus offended Article 123(3) EPC.

VI. In its letter dated 1 December 2005, Respondent I argued essentially as follows concerning the allowability under Article 123(3) of the requests submitted by the Appellant with its letter dated 17 May 2005:

(i.1) The feature that the claimed product should be obtainable by the process set out in the claim did not result in a limitation of the deleted mole ratio.

(i.2) Furthermore, it had not been established that this possibility of producing the copolymer did not lead to copolymers representing an unallowable extension.

(i.3) The calculation made by the Appellant on the basis of a reactivity of 50% of component B would indeed lead to a copolymer having a mole ratio 94.7/5.3 (rounded to 95/5), i.e. corresponding to an unallowable ratio of 95/5.

VII. In a communication dated 14 December 2006, annexed to the Summons to Oral Proceedings scheduled to take place on 27 February 2007, the Board presented its

provisional view concerning the allowability of the requests then on file under Article 123(3) EPC.

VIII. With its letter dated 25 January 2007, the Appellant submitted 4 additional auxiliary requests. Auxiliary request 2 differed from the main request by the reintroduction of the feature "in a ratio of 95/5 to 5/95 by molar amount" in Claim 1. Auxiliary request 3 differed from the main request by the restriction of range of the ratio (A)/(B) to 70/30 to 40/60, the deletion of granted Claim 2 and the corresponding renumbering of the claims. Auxiliary request 4 differed from auxiliary request 3 in that the feature "in a ratio of 95/5 to 5/95 by molar amount" from Claim 1 as granted had been reintroduced. Auxiliary request 5 corresponded to auxiliary request 2 except for introducing the statement into 1 that "the feature in a ratio of 95/5 to 5/95 is an inadmissible extension from which no rights may be derived".

The Appellant also argued essentially as follows concerning the allowability of these requests:

(i) Concerning the main request, auxiliary request 1 and auxiliary request 3:

(i.1) According to the provisional opinion of the Board, the Main Request and Auxiliary Request 1 were considered to contravene Article 123(3) EPC since the restriction of the starting monomers to a mole ratio of 90/10 to 20/80 did not inevitably result in a molar ratio of 95/5 to 5/95 of maleic acid, maleic acid salt or mixtures thereof to the water-soluble ethylenically unsaturated monomer in the copolymer.

(i.2) The Board held the opinion that according to the principles of decision T 581/91 of 4 August 1993 (not published in OJ EPO) even the slightest doubt that a requested amendment might contravene Article 123 EPC would preclude its allowability. Decision T 581/91 referred to decisions T 113/86 of 28 October 1987 and T 383/88 of 1 December 1992 (neither published in OJ EPO) also relating to the standard of proof which had to be applied when deciding on the allowability of an amendment. Both decisions required a very high standard of proof for allowability of amendments under Article 123(2) EPC.

(i.4) The Appellant believed that the standard of proof required in T 113/86 as well as T 383/88 and T 581/91 was not necessarily the same as in the present case.

(i.5) The interests of the Patentee and third parties had to be balanced so that the standard of proof required for amendments necessary for the Patentee in order to maintain the patent should be less strict.

(i.6) The amount of residual maleic acid which remained unreacted in the Examples as described in the patent specification was not larger than a few percent (Tables 3, 6).

(i.7) There was hence almost no possibility that the molar ratio A/B of the starting-monomers in the range of 90/10 to 20/80 resulted in the molar ratio A/B of the monomers in the obtained copolymer outside the range of 95/5 to 5/95 as recited in Claim 1 as granted.

(i.8) Even if it would not possible to exclude the theoretical possibility that the ratio (A)/(B) of monomers of Claim 1 of the Main Request and Auxiliary Request 1 resulted in a monomer outside the scope of Claim 1 as granted, this possibility would be extremely small. This possibility would be even smaller in Claim 1 of auxiliary request 3.

(i.9) Reference was also made to the decision T 166/90 of 11 August 1992 (not published in OJ EPO) in which it had been held that an inadmissible feature might be replaced by a feature disclosed in the description even if there was no absolute certainty that under extreme conditions results outside the scope of the claim as granted might be achieved.

(ii) Concerning auxiliary requests 2 and 4:

(ii.1) Claim 1 of Auxiliary Requests 2 and 4 still comprised the undisclosed feature "in a ratio of 95/5 to 5/95 by molar amount".

(ii.2) The feature of the restriction of the ratio (A)/(B) of monomers to a range of 90/10 to 20/80 and 70/30 to 40/60, respectively, in the production process rendered the undisclosed feature inessential. Reference was made to decision T 553/99 of 21 February 2001 not published in OJ EPO).

(ii.3) A skilled person would realize that the restriction of the ratio (A)/(B) determined the composition of the resulting copolymer.

(ii.4) Consequently, the ratio of 95/5 to 5/95 of the components in the resulting copolymer did not provide a technical contribution to the subject-matter of the claimed invention and hence it no longer infringed Article 123(2) EPC. Reference was made to decision G 1/93 (OJ EPO 1994, 541) in that respect.

(iii) Concerning auxiliary request 5:

(iii.1) It had been stated in Claim 1 that the ratio 95/5 to 5/95 was an inadmissible extension from which no rights might be derived.

(iii.2) While the allowability of a similarly amended claim had been rejected in G 1/93 (paragraphs 14 and 6 of the Reasons for the Decision), the rejected so-called "footnote solution" was, however, characterized by a statement in the description of the patent.

IX. In its letter dated 13 February 2007, Respondent II, while relying essentially on the arguments presented in its letter dated 30 November 2006, made additional submissions which may be summarized as follows:

(i.1) Claim 1 of auxiliary requests 2, 4 and 5 included the 95/5 to 5/95 molar ratio as a feature of the polymer per se.

(i.2) This incorporation of this feature contravened Article 123(2) EPC.

(i.3) Reference was made in that respect to the decision T 658/02 concerning the parent application in which it had been considered that the claimed molar



ratio range 95/5 to 5/95 in the polymer constituted added matter.

X. Oral proceedings were held before the Board on 27 February 2007.

(i) At the oral proceedings the discussion essentially focussed on the question of the allowability of the main request and of the auxiliary request 1 to 5 of the Appellant under Article 123(3) and 123(2) EPC.

(ii) At the beginning of the oral proceedings, the Appellant submitted that the feature in granted Claim 1 that the copolymer is "a copolymer of maleic acid, maleic acid salt or mixtures thereof and a water-soluble ethylenically unsaturated monomer in a ratio of 95/5 to 5/95 by molar amount" should be interpreted as referring to a copolymer made of the starting monomers used in the molar ratio 95/5 to 5/95 and not to the ratio of monomer units incorporated into the claimed copolymer.

In that respect, the Board made preliminary observations according to which this argument had been brought for the first time at the oral proceedings and would hence represent an amendment of the Appellant's case.

While the Respondents objected to this unexpected change of the Appellant's case, Respondent I further submitted that the language of granted Claim 1 did not support the new interpretation made by the Appellant and Respondent II mentioned that the subject-matter of Claim 1 of the main request represented an unallowable combination of two different inventions disclosed in the parent application (copolymer product according to

Claim 1 to 9 thereof with process claims 18 to 21 thereof).

(iii) The Board having, after deliberation, informed the Parties that the new line of argument of the Appellant would not be admitted in accordance with Article 10(b) of the Rules of Proceedings of the Boards of Appeal (RPBA), the discussion moved to the admissibility of the main request under Article 123(3) EPC. While essentially relying on the arguments presented in the written phase of the appeal, the Parties made additional submissions which may be summarized as follows:

(iii.1) By the Appellant:

(iii.1.1) The calculation made by Respondent I (cf. Point VI.i.3) above) indeed showed that the copolymer would exhibit a ratio of 94.7/5.3 i.e. within the range claimed in the patent as granted, even if the 50% of the comonomer remained unreacted. Such an unreacted amount was in any case unrealistic.

(iii.1.2) It was further clear that the object of the patent in suit was to obtain copolymers with small amounts of unreacted monomers (cf. paragraphs [0011] and [0093] of the patent in suit).

(iii.1.3) The process conditions were also selected in order to obtain low amounts of unreacted maleic acid (paragraphs [0069] and [0072]).

(iii.1.4) The Examples of the patent in suit showed that very low amounts of unreacted maleic acid were obtained.

(iii.1.5) Even if it could not be excluded that copolymers exhibiting a ratio outside the range 95/5 to 5/95 might be obtained, this would correspond to process conditions which the skilled person would not consider. Reference was in particular made to decision T 166/90 , Reasons Point 3.4; second paragraph).

(iii.1.6) Consequently, the criteria for allowing amendments should not be an absolute certainty.

(iii.1.7) Furthermore, the claimed copolymers had to exhibit properties in terms of molecular weight, calcium ion capturability and clay dispersibility. This further limited the possibility of obtaining a copolymer having a ratio outside the ratio set out in granted Claim 1 and exhibiting all the other required properties.

(iii.1.8) In particular the obtaining of a high molecular weight would not be compatible with a high amount of unreacted monomers. Reference was also made to document D6 in that respect (column 3, lines 18 to 24).

(iii.1.9) The process indicated in Claim 1 comprised the essential steps for the obtaining of the claimed copolymer. Even if process conditions such as the temperature or the pressure were not indicated, there were inherently limited by the requirements set out for

the claimed copolymer in terms of its properties (molecular weight, capturability).

(iii.1.10) In that respect, it should be noted that in the case under consideration in T 166/90, several process parameters were also not indicated in the main claim.

(iii.1.11) While it was acknowledged that the Patentee had not submitted further experimental data in order to support its view, that the process indicated would with a very high probability result in a copolymer having a ratio of monomer in the ratio 95/5 to 5/95, it was submitted that it would have been in any case impossible to prove the non-existence of process conditions which might lead to copolymers having a ratio outside this range.

(iii.2) By the Respondents:

(iii.2.1) Article 123(2) and 123(3) EPC had a mandatory character. They must hence be applied very strictly.

(iii.2.2) The Examples of the patent in suit were not sufficient to prove that the process incorporated in Claim 1 would not lead to copolymers being outside the scope of Claim 1 as granted.

(iii.2.3) The burden of proof was on the Appellant to demonstrate that the process incorporated in Claim 1 led always to copolymers within the scope of Claim 1 as granted.

(iii.2.4) The process was very broadly defined. There was no reference to the temperature range to be used or to the use of an aqueous solution.

(iii.2.5) The reference to the decision T 166/90 made by the Appellant was not pertinent, since the case there under consideration was concerned with the scope of a process claim and not with the scope of a product claim as in the case in suit.

(iii.2.6) There were several ways of obtaining the claimed copolymer (cf. also parent application page 6, line 9). Thus, the term "obtainable" used in Claim 1 had no limiting effect.

(iii.2.7) The range of starting monomers of 90/10 to 10/90 was not related in the parent application with the obtaining of the claimed calcium capturability and clay dispersibility.

(iii.2.8) Furthermore, several examples of the patent in suit (e.g. Example 1-12) showed that copolymers produced according to the process disclosed in Claim 1 did not exhibit the claimed calcium capturability.

(iv) The Board, after deliberation, having informed the Parties that the main request could not be allowed, and the Appellant having indicated that it withdrew its first auxiliary request (i.e. the auxiliary request submitted with the Statement of Grounds of Appeal), the discussion moved to the question of the allowability of the auxiliary requests labelled Auxiliary requests 2 to 5 as submitted with the letter dated 25 January 2007 of the Appellant.

(iv.1) The Appellant, while essentially relying on the arguments presented in that respect in the letter dated 25 January 2007, made additional submissions which may be summarized as follows:

(iv.1.1) Concerning Auxiliary requests 2 and 4, reference was made to the decision T 553/99.

(iv.1.2) The skilled person would recognize that the ratio of the starting monomers indicated in Claim 1 of both requests would be the essential factor for the composition of the resulting copolymer and essential for the solution of the technical problem underlying the patent in suit.

(iv.1.3) These ratios hence rendered inessential the ratio 95/5 to 5/95 indicated for the components in the obtained copolymer.

(iv.1.4) While the ratio 95/5 to 5/95 of the components indicated in Claim 1 as granted provided a technical contribution, its technical contribution was removed by the incorporation of the features concerning the ratios of starting monomers in Claim 1 of both requests.

(iv.1.5) Consequently, the feature 95/5 to 5/95 still present in Claim 1 of these requests had a mere limiting function. In accordance with the decision G 1/03 this feature, which had a limiting function but which did not provide any technical contribution would not infringe Article 123(2) EPC.

(iv.1.6) Concerning auxiliary request 3, the probability that the process could lead to copolymers outside the scope of granted Claim 1 had been further reduced in comparison to the main request, since the ratio of the starting monomers had been further restricted.

(iv.1.7) Concerning auxiliary request 5, although it had been considered in the decision T 335/03 of 26 July 2005 (not published in OJ), that a footnote solution could not be allowed, no prohibition of such footnote in the claims could be discerned from the decision G 1/93 which only dealt with the presence of such footnote in the description (cf. Reasons points 6 and 14).

(iv.1.8) The incorporation of this footnote in Claim 1 would amount to a legal disclaimer. The undisclosed feature would be robbed of its legal effect.

(iv.2) Both Respondents submitted that the arguments presented concerning the allowability of the main request would equally apply to the auxiliary request 3. Concerning the auxiliary request 2 and 4 they essentially argued that the ratio 95/5 to 5/95 still retained its technical contribution and that therefore these requests contravened Article 123(2) EPC. Concerning the auxiliary request 5, it was submitted that it was not possible that the undisclosed feature i.e. the ratio 95/5 to 5/95 be robbed of its technical contribution by a declaration of the Appellant, and that the incorporated footnote had no basis in the application as originally filed.

XI. The Appellant requested that the decision under appeal be set aside and that the patent be maintained based on the main request as filed with the grounds of appeal, or in the alternative on one of the auxiliary requests 2-5 as filed with letter of 25 January 2007.

The Respondents requested that the appeal be dismissed.

### **Reasons for the Decision**

1. The appeal is admissible.

2. *Procedural matters*

2.1 According to the Rules of Procedure of the Boards of Appeal, the statement of grounds of appeal and the reply of the other party shall contain a party's complete case and should *inter alia* specify expressly or by specific reference all the facts, arguments and evidence relied on (Article 10a(2) RPBA). 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. The discretion shall be exercised in view of *inter alia* the complexity of the new subject-matter submitted, the current state of the proceedings and the need for procedural economy (Article 10b(1) RPBA). Furthermore, 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 (Article 10b(3) RPBA).



2.2 In the present case, the Board notes that the Appellant in its statement of grounds of appeal has submitted that Claim 1 of its main and first auxiliary request no longer included the limitation of the copolymer comprising the two types of monomers A and B in a molar ratio of 95/5 to 5/95. The Board further notes that, according to the Appellant, this feature had been deleted from Claim 1 of these requests since it was considered as infringing Article 123(2) EPC, and it had been replaced by a limiting feature which had its basis in the application as filed and which effectively limited the scope of the thus amended claims so that they included only copolymers which had the ratio A/B in a range which was narrower than the range 95/5 to 5/95 recited in Claim 1 as granted.

2.3 There could hence be no doubt that the arguments and the requests submitted by the Appellant with its statement of grounds of appeal were unambiguously conceptually based on the interpretation that the ratio 95/5 to 5/95 in granted Claim 1 referred to the ratio of the monomers incorporated in the claimed copolymer.

2.3 This had for its consequence that the counterarguments presented by the Respondents in their letters dated 30 November 2005 and 1 December 2005 concerning the allowability of the main request and the first auxiliary request of the Appellant under Article 123(3) EPC and that the provisional opinion expressed by the Board in its communication dated 14 December 2006 (cf. paragraph I.I.3 thereof) were also based on this interpretation of Claim 1 as granted relied on by the Appellant in its statement of grounds of appeal.

- 2.4 The Board further observes that the Appellant did not deviate from this interpretation in its last submission before the oral proceedings of 27 February 2007 before the Board (cf. letter dated 25 January 2007; page 3, lines 26 to 29; page 4, lines 20 to 23).
- 2.5 Under these circumstances, it is evident that the submission made for the first time by the Appellant at the beginning of the oral proceedings according to which the feature in granted Claim 1 that "the copolymer is a copolymer of maleic acid, maleic acid salt or mixtures thereof and a water-soluble ethylenically unsaturated monomer in a ratio of 95/5 to 5/95 by molar amount" indeed referred to the ratio of the starting monomers used for the manufacture of the copolymer and not to the content of the monomers in the claimed copolymer represents an unexpected and a complete change in the line of argumentation of the Appellant.
- 2.6 The resilement of the Appellant at such a very late stage of the appeal procedure from the interpretation of Claim 1 as granted on which its statement of grounds of appeal was based and which was consistently maintained during the whole written phase of the appeal indisputably raised new issues which the Board and the Respondents could not have reasonably been expected to deal with at the oral proceedings.
- 2.7 Consequently, the Board, making use of its discretionary power to admit amendments to a party's case (Article 10b(1) and (3) RPBA), does not permit the resilement of the Appellant at such a late stage of the proceedings (cf. also T 1449/05 of 26 September 2005; not published in OJ EPO).

*Main request*

3. *Wording of Claim 1*

- 3.1 Claim 1 of this request differs from granted Claim 1, in that (a) the feature that maleic acid, maleic acid salt or mixtures thereof and a water soluble ethylenically unsaturated monomer should be in a ratio 95/5 to 5/95 by molar amount in the claimed maleic acid based copolymer has been deleted, and in that (b) that it has been indicated that the claimed maleic acid based copolymer is obtainable by a process including the steps of:
- charging a material (A) into a reaction vessel, in such a manner that the concentration of the material (A) will be 35 % by weight or higher, wherein the material (A) is maleic acid and/or its salt;
- adding hydrogen peroxide into the reaction vessel after said charging step, in such a manner that the amount of hydrogen peroxide is within the range of 3 to 20 % by weight of the material (A); and
- adding a water-soluble ethylenically unsaturated monomer (B) into the reaction vessel after the said charging step and within 30 to 500 minutes after initiation of a reaction, in such a manner that the ratio (A)/(B) is within the range of 90/10 to 20/80 in mol ratio, wherein the adding of the monomer (B) is completed 10 to 300 minutes later than completion of said step of adding hydrogen peroxide;
- and wherein 70% by weight or more of the total used amount of the maleic acid (salt) is charged into the reaction vessel before the reaction.

3.2 Thus, it must be firstly examined whether the deletion of the feature (a) and its replacement by the feature (b) does not lead to an extension of scope of protection in comparison to the scope of protection conferred by Claim 1 as granted contrary to Article 123(3) EPC.

3.3 This gives rise to the question as to which requirements have to be satisfied by the author of the amendments in order to establish that the requirements of Article 123(3) EPC have been met.

3.3.1 In that respect, as indicated in the decision T 64/03 of 1 February 2005 (not published in OJ EPO; Reasons points 3. and 3.1), it is established Case Law that a very rigorous standard, namely that of "beyond reasonable doubt" is to be applied when checking the allowability of amendments under Article 123(2) and 123(3) EPC. A similar rigorous standard was also expressed in the decision T 581/91 relied on by the Board in its communication dated 14 December 2006 by reference to the decision T 113/86 by stating that the slightest doubt that the unamended patent could be construed differently to the patent as amended would preclude the allowability of the amendment.

3.3.2 While it is be true as argued by the Appellant that the decision T 113/86 referred to voluntary amendments requested by the Patentee and not necessitated by any ground of opposition, the fact that the amendment would be, as in the present case, necessitated by a ground of opposition (i.e. Article 100(c) EPC) could not, in the Board's view, justify the application of a lower standard of proof than the one mentioned in that

decision. On the contrary, a very rigorous standard is even more justified in the present case, since allowing such amendments while using a lower standard of proof might give an unwarranted advantage to the Patentee in the overcoming of a ground of opposition.

3.3.3 Nor can be deduced, in the Board's view, from the decision T 166/90 relied on by the Appellant that a lower standard of proof could be applied when checking the allowability of amendments for the following reasons:

- (a) In the case under consideration in the decision T 166/90, the invention concerned an opaque film made from a composition comprising a polypropylene polymer and calcium carbonate. According to the granted Claim 1 the density of the film was to be less than the density calculated from the type and amounts of the individual components.
- (b) In the course of the appeal opposition proceedings in that case the Patentee claimed a process for manufacturing the opaque film, but without including in the process claim the feature that the density of the obtained film was to be less than the density calculated from the type and amounts of the individual components.
- (c) While examining whether this would lead to a broadening of scope of protection, the board in that case considered, in view of the evidence on file, that the process now claimed would produce an opaque film of a density less than that the one calculated from the type and amounts of its

individual components **with a probability bordering on certainty** (emphasis by the Board) (cf. Reasons Point 3.3).

- (d) While it is true, as submitted by the Appellant, that in the following Point 3.4 of the Reasons, it was held that absolute certainty cannot be required, this was only because under extreme conditions it could not be excluded that films outside the scope of the claims as granted might be obtained.
- (e) It was however considered in same Point 3.4, that these extreme conditions (i.e. a stretching speed close to zero) would correspond to conditions that the skilled person would never apply.
- (f) It thus follows that the apparent gap between the probability bordering on certainty mentioned in Point 3.3 and the absolute certainty mentioned in Point 3.4 of the decision T 166/90 indeed corresponded to possibilities that the skilled person would never consider. There was *de facto* not the slightest doubt that the skilled person carrying out the process claimed in the amended claim would inevitably obtain a film having a density less than that the one calculated from the type and amounts of its individual components.

3.3.4 Consequently, the Board sees no reason to depart from the well established very rigorous standard of proof to be applied when checking the allowability of amendments under Article 123 EPC.

3.4 Thus, the question of the allowability of amended Claim 1 under the provisions of Article 123(3) EPC, boils down to the question as to whether or not there is the slightest doubt that a maleic acid based copolymer obtainable by a process including the process steps defined by the feature (b) would inevitably exhibit a ratio of maleic acid, maleic acid salt or mixtures thereof and a water soluble to ethylenically unsaturated monomer within the range 95/5 to 5/95 by mole.

3.5 In this connection the Board however notes that:

(i) further undefined process steps are not excluded by the wording of Claim 1 ("process including the steps of");

(ii) that the conditions such as the temperature, the pressure, or the reaction medium under which the process should be carried out are not indicated in Claim 1;

(iii) that the comonomers to be copolymerized with the maleic acid or salt are merely defined by the rather broad and vague term "water soluble ethylenically unsaturated monomer" so that drastic differences in reactivity between the maleic acid (or salt) and the "water soluble ethylenically unsaturated monomer" cannot be excluded, with the consequence that

(v) it is hence not clear which degree of incorporation of the comonomers in the copolymer, and which degree of conversion would be achieved.

- 3.6 Under these circumstances, even if one would accept the argument of the Appellant that in view of the ratio of the starting comonomers indicated in Claim 1 (i.e. 90/10 to 20/80) there is a great probability that the obtained copolymer would exhibit a ratio of incorporated monomers between 95/5 to 5/95, although in contrast to the case in decision T 166/90 (cf. Reasons Point 3.3 thereof) no evidence has been submitted in order to support this view, it could not be excluded, as admitted by the Appellant (cf. Point VIII (i.8) above), that the process mentioned in Claim 1 could lead to copolymers having a ratio of incorporated monomers in a ratio outside the range 95/5 to 5/95.
- 3.7 While in the case under consideration in T 166/90, the gap between probability bordering on certainty and absolute certainty corresponded to extreme conditions related to only one process feature (i.e. stretching speed) that the skilled person would never consider, it is evident that here the gap between the presumed high probability and the very rigorous standard of proof mentioned in paragraph 3.4 above corresponds in the present case to a myriad of basic conditions such as number of process steps, temperature, pressure, reaction medium or kind of comonomer which the skilled person is not prevented from considering.
- 3.8 In this connection, the indication of the properties that the final copolymers must achieve in terms of calcium capturability, clay dispersibility or molecular weight ranges could not, in the Board's view, reduce the gap between high probability and the very rigorous standard of proof mentioned above in paragraph 3.4.



- 3.8.1 Independently of the fact that the conditions defined in Claim 1 might not lead to copolymers which exhibit the claimed properties (cf. e.g. Examples 1-3, 1-5, 1-6, 1-7, 1-8, 1-9, 1-12, 1-14, 1-15, 1-16, 1-19 of the patent in suit)), this is primarily because the values which should be obtained for these properties are either open-ended (calcium capturability, clay dispersibility) or broadly defined (molecular weight), so that it is *prima facie* not clear which limitation of the process conditions these properties would inherently imply.
- 3.8.2 This is further because no evidence has been submitted by the Appellant that the obtaining of these properties would so drastically reduce the field of operating conditions that it would be only under extreme conditions which would not be considered by the skilled person that copolymers exhibiting a ratio of incorporated monomers outside the range 95/5 to 5/95 and the claimed properties could be obtained.
- 3.8.3 In that respect, the argument of the Appellant based on the document D6 (column 3, lines 18 to 24) that the obtaining of a high molecular weight copolymer implies a very low level of unreacted maleic acid, is, in the Board's view not pertinent. Independently of the fact as to whether a molecular weight as low as 3000 (cf. Claim 1) could be regarded as a high molecular weight, this is because, while according to D6 in the production of maleic acid (MA)/acrylic acid (AA) copolymers the amount of unreacted maleic acid increases when the molar ratio MA/AA is more than 3 and hence no high molecular weight copolymer could be obtained, the present process is limited neither to

MA/AA copolymers nor to a starting molar ratio of maleic acid to acrylic acid of less than 3.

3.9 Consequently, the Board can only come to the conclusion that the question mentioned in paragraph 3.3 above must be positively answered and that hence Claim 1 of the main request does not meet the requirements of Article 123(3) EPC.

3.10 It thus follows that the main request must be refused.

*Auxiliary request 2*

4. *Wording of Claim 1*

4.1 Claim 1 of Auxiliary request 2 differs from Claim 1 of the main request in that the feature (a) that maleic acid, maleic acid salt or mixtures thereof and a water soluble ethylenically unsaturated monomer should be in a ratio 95/5 to 5/95 by molar amount in the claimed maleic acid based copolymer has been incorporated into Claim 1.

4.2 As indicated in the decision under appeal this feature (a) has no support in the application as originally filed and this has not been challenged by the Appellant. The Board sees also no reason to depart from that view.

4.3 Despite the presence of this undisclosed feature in Claim 1, the Appellant has nevertheless submitted that Claim 1 should be considered as meeting the requirements of Article 123(2) EPC, and has relied on the considerations made in the decision T 553/99 in that respect. According to the Headnote of that

decision, "if a claim as granted contains an undisclosed, limiting feature in contravention of Article 123(2) EPC it can be maintained in the claim without violating Article 123(2) EPC provided that a further limiting feature is added to the claim which further feature (i) is properly disclosed in the application as filed, and (ii) deprives the undisclosed feature of all technical contribution to the subject-matter of the claimed invention (following decision G 1/93 OJ EPO 1994, 541, Point 2 of the order)."

4.4 In that context, the problem the allowability of Claim 1 under Article 123(2) EPC boils down to the questions as to whether the process features (b) (cf paragraph 3.1 above) incorporated in that claim are (i) properly disclosed in the application as filed and (ii) deprive the feature (a) of all technical contribution.

4.4.1 Concerning question (i), it is evident that the process features (b) are supported by lines 16 to 27 and 34 to 47 of page 10 of the application as originally filed (cf. published application EP-A2-0 877 008).

4.4.2 It remains hence to be decided whether question (ii) can be answered positively or not.

4.4.3 In that respect, the Board observes that, in the case under consideration in T 553/99,

(a) Claim 1 as granted was directed to a reflection minimizing apparatus comprising a display unit having a display surface thereon, and a frame arranged in a sunken position in the upper surface of a vehicle dashboard, said display unit being

arranged for use in a substantially vertical position;

(b) that, while it had been considered in the decision that Claim 1 as granted did not meet the requirements of Article 123(2) EPC, since the feature of the display unit being arranged for use in a substantially vertical position was not supported by the application as originally filed, it had been held that Claim 1 of the first auxiliary request which essentially differed from Claim 1 as granted by the further indication that the display surface was downwardly angled with respect to the vertical by a small acute angle  $\beta$  met the requirements of Article 123(2) EPC, and that

(c) this was because, according to the board in charge of the case, it was the position of the active part of the display, i.e. that of its display surface, not that of its housing, which was essential, and that therefore the skilled person would therefore consider the claimed vertical position as completely inessential, and hence as providing no technical contribution to the claimed invention.

4.4.4 It is hence clear that in the case under consideration in T 553/99, the undisclosed technical feature which related to the claimed product as a whole has been considered as deprived of its technical contribution due to the incorporation of a feature directed to the essential and clearly identifiable part of the claimed product.

- 4.4.5 In the present case, however, the Appellant has introduced process features in order to overcome the objection under Article 123(2) EPC concerning the undisclosed feature of the range 95/5 to 5/95 of the molar ratio of the monomer in the obtained copolymer.
- 4.4.6 As indicated in the decision T 119/82 of 12 December 1983 (not published in OJ EPO), the effect of a process manifests itself in the result, i.e. in the product in chemical cases. This implies that the process defined by the process features according to Claim 1 will inevitably result in a product exhibiting a specific ratio of incorporated monomers.
- 4.4.7 Since, as shown in paragraphs 3.4 to 3.8 above, it cannot be excluded that this process may lead to copolymers having a molar ratio of incorporated monomers outside the range 95/5 to 5/95, it can equally not be excluded that the incorporated process features, which are not confined to a clearly identifiable part of the claimed product, could result in a product further exhibiting the undisclosed feature. This implies that the range 95/5 to 5/95 of mole ratio of the monomers in the claimed copolymer cannot be regarded as depriving the undisclosed feature of all technical contribution to the subject-matter of the claimed invention, and hence must inevitably be regarded as part of the technical definition of the claimed copolymer obtainable by the process referred to in Claim 1.
- 4.4.8 Since, furthermore, there can be no doubt that the properties of a copolymer are dependent on its

composition, i.e. on the ratio of the comonomers incorporated therein, it is hence evident that a technical contribution is inevitably associated with the range of molar ratio 95/5 to 5/95 indicated in the claims.

4.4.9 Consequently, the introduction of the process features in Claim 1 cannot deprive this undisclosed feature of its technical contribution. It thus follows that the question (ii) mentioned above in paragraph 4.4 must be answered negatively, and that therefore Claim 1 of the auxiliary request 2 contravenes Article 123(2) EPC.

4.4.10 This request must hence be refused.

#### *Auxiliary request 3*

#### 5. *Wording of Claim 1*

5.1 Claim 1 of auxiliary request 3 differs from Claim 1 of the main request in that the range of the ratio of the starting monomers has been restricted to 70/30 to 40/60 instead of the range 90/10 to 20/80.

5.2 While it might be true as submitted by the Appellant in its letter dated 25 January 2007 (page 4, first paragraph) that the probability of obtaining a polymer outside the scope of granted Claim 1 could be smaller than in the case of the main request, it still remains that this possibility, as admitted by the Appellant (cf. letter of 25 February 2007; page 4, first paragraph), cannot be excluded.

5.3 Consequently, even if the doubts that the unamended patent could be construed differently to the patent as amended might be slighter than in the case of the main request, the Board, for the same reasons as indicated in paragraphs 3.4 to 3.8 above comes to the conclusion that the deletion of the feature that maleic acid, maleic acid salt or mixtures thereof and a water soluble ethylenically unsaturated monomer should be in a ratio 95/5 to 5/95 by molar amount in the claimed maleic acid based copolymer contravenes Article 123(3) EPC.

5.4 It thus follows that auxiliary request 3 must be rejected.

*Auxiliary request 4*

6. *Wording of Claim 1*

6.1 Claim 1 of the auxiliary request 4 differs from Claim 1 of auxiliary request 2 in that the range of the ratio of the starting monomers has been restricted to 70/30 to 40/60 instead of the range 90/10 to 20/80.

6.2 Since the feature (a) that maleic acid, maleic acid salt or mixtures thereof and a water soluble ethylenically unsaturated monomer should be in a ratio 95/5 to 5/95 by molar amount in the claimed maleic acid based copolymer has been maintained in Claim 1, the same considerations as for auxiliary request 2 apply concerning the allowability of Claim 1 under Article 123(2) EPC, since, as for the auxiliary request 2, the process features incorporated in Claim 1

cannot deprive the undisclosed feature (a) of its technical contribution.

6.3 It thus follows that Claim 1 of auxiliary request 4 does not meet the requirements of Article 123(2) EPC.

6.4 Consequently, this request must be refused.

#### *Auxiliary request 5*

#### 7. *Wording of Claim 1*

7.1 Claim 1 of auxiliary request 5 differs from Claim 1 of the auxiliary request 2 only in that the statement that "the feature in a ratio of 95/5 to 5/95 is an inadmissible extension for which no rights may be derived" has been incorporated therein.

7.2 As indicated above, Claim 1 of the auxiliary request 2 does not meet the requirements of Article 123(2) EPC due to the presence of the feature that maleic acid, maleic acid salt or mixtures thereof and a water soluble ethylenically unsaturated monomer should be in a ratio 95/5 to 5/95 by molar amount in the claimed maleic acid based copolymer.

7.3 Nevertheless, in order to support the allowability of Claim 1 of this request under Article 123(2) EPC, the Appellant has presented the statement made in Claim 1 as a legal disclaimer, this statement rendering all possible advantages due to the undisclosed feature void while the restriction of scope would be maintained. According to the Appellant, this legal disclaimer would correspond to the so called "footnote solution"



mentioned in paragraph 6 of the Reasons of the decision G 1/93 with the difference that it had been inserted in the claims instead of in the description as considered in that paragraph of the decision G 1/93. According to the Appellant, although the decision G 1/93 rejected the so called "footnote solution" characterized by a statement in the description, no prohibition of a footnote solution in the claim could, in the Appellant's view, be derived from the decision G 1/93. Thus, according to the Appellant, Claim 1 of the auxiliary request 5 should be allowable under the provisions of Article 123(2) EPC.

- 7.4 In the Board's view, however, the fact that the decision G 1/93 only expressly rejected the footnote solution characterized by a statement in the description, provides no basis for deducing therefrom that a footnote solution characterized by a statement in the claims would be allowable.
- 7.5 On the contrary, while it was stated in the decision G 1/93 that there was no basis under the EPC for a footnote solution of the kind referred in paragraph 6 of the decision (i.e. a statement incorporated in the description), this conclusion was presented as a consequence of the mandatory character and effect of Article 123(2) and (3) EPC as well of the function of the description and claims of a patent granted under the European patent system (cf. paragraph 14 of the decision G 1/93).
- 7.6 In this connection, the decision at paragraph 14 states that "The main function of the description of a European patent is to disclose the invention so that it

may be carried out (Article 83 EPC). The function of the claims is to define the subject-matter which is to be protected in terms of its technical features (Article 84 and Rule 29(1) EPC)". Clearly, if the decision G 1/93 excludes the possibility of a footnote solution in a part of the patent, namely the description, the function of which is mainly to do something else, it must *a fortiori* exclude such possibility from a part of a patent, namely, the claims, the sole function of which is do something else.

7.7 It can hence be derived, in the Board's view, from this paragraph 14 that the footnote solution is compatible neither with the function of the description nor with the function of the claims of a patent granted under the EPC, and that, hence, this incompatibility would in no case be removed by a displacement of the footnote from the description into the claims.

7.8 Consequently, the Board, also in accordance with the considerations made in the decision T 335/03 of 26 July 2005 (not published in OJ EPO) in which the board in charge rejected the incorporation of a footnote in the claims (cf. Reasons Point 3; Headnote) comes to the conclusion that the statement made in Claim 1 of the auxiliary request cannot be allowed and that therefore Claim 1 did not meet the requirements of Article 123(2) EPC.

7.9 The auxiliary request 5 must therefore be refused.

8. Since none of the requests of the Appellant can be allowed, the appeal must be dismissed.

**Order**

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

**The appeal is dismissed.**

The Registrar:

The Chairman:

E. Görgmaier

R. Young