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DECISION
of 15 January 2004

Case Number: T 0952/01 - 3.3.3

Application Number: 90312066.5

Publication Number: 0429207

IPC: C08F 265/06

Language of the proceedings: EN

Title of invention:

Method of treating or coating a substrate with an aqueous composition and the use of such compositions

Patentee:

ROHM AND HAAS COMPANY

Opponent:

Clariant GmbH
BASF Aktiengesellschaft, Ludwigshafen

Headword:

-

Relevant legal provisions:

EPC Art. 54, 56, 100(b)

Keyword:

"Novelty (yes) - burden of proof not discharged"
"Obviousness (no) - prior art teaches away"
"New ground of opposition (no)"

Decisions cited:

G 0010/91

Catchword:

-



Case Number: T 0952/01 - 3.3.3

D E C I S I O N
of the Technical Board of Appeal 3.3.3
of 15 January 2004

Appellant:
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Decision under appeal:

Decision of the Opposition Division of the
European Patent Office issued 4 April 2001 and
posted 6 June 2001 rejecting the opposition
filed against European patent No. 0429207
pursuant to Article 102(2) EPC.

Composition of the Board:

Chairman: R. Young
Members: P. Kitzmantel
E. Dufresne

Summary of Facts and Submissions

- I. Mention of the grant of European patent No. 0 429 207 in respect of European patent application No. 90 312 066.5 in the name of Rohm and Haas Company, which had been filed on 2 November 1990 claiming a US priority of 13 November 1989, was announced on 28 February 1996 on the basis of two sets of claims, set A for the Contracting States AT, BE, CH, DE, DK, ES, FR, GB, IT, LI, NL and SE comprising five claims, and set B for the Contracting States GR and LU comprising 10 claims.

Claim 1 of set A reads as follows:

"1. A method for treating or coating wood with an aqueous composition characterised in that said method comprises applying said composition on to said wood and wherein said composition is an aqueous composition comprising an aqueous dispersion of copolymer particles wherein said particles comprise at least two mutually incompatible copolymers, which copolymers form at least one outer phase and at least one inner phase, and wherein said particles have an average particle size from 20 - 70 nanometers, wherein said outer phase copolymer has a Tg lower than 35 °C and said inner phase copolymer has a Tg higher than 45 °C."

Claims 2 to 4 of set A are dependent on Claim 1 and Claim 5 relates to the use of an aqueous composition comprising an aqueous dispersion as defined in Claim 1 for treating a wooden substrate.

Claim 1 of set B differs from the same claim of set A by substitution of the word "substrate" for "wood" and furthermore comprises method claims 2 to 6 dependent on Claim 1, an independent use Claim 7, a Claim 8 dependent thereon, a further independent method Claim 9, and a further independent use Claim 10.

II. Notice of Opposition requesting revocation of the patent in its entirety on the grounds of Article 100(a) EPC was filed by

Opponent I: Hoechst AG Werk Kalle-Albert (later Clariant GmbH) on 7 November 1996, and

Opponent II: BASF AG on 25 November 1996.

The oppositions were *inter alia* based on documents

D1: US-A-3 296 175,

D2: EP-A-0 379 892,

D3: EP-A-0 332 011,

D4: EP-A-0 242 235,

D5: EP-A-0 184 091,

D6: Progress in Organic Coatings, 6 (1978), pages 1 to 30,

D6a: J. Wood and P.J. Frey, Paint Manufacture 1961, pages 199 to 205,

D8: Chemie und Technologie makromolekularer Stoffe,
15. Kolloquium, 25 November 1994, and

D10: DE-B-1 220 613.

III. By its decision orally announced on 4 April 2001 and issued in writing on 6 June 2001, the Opposition Division rejected the oppositions.

It was held in that decision that the subject-matter of the patent in suit was novel and inventive over the cited prior art.

In particular the Opposition Division found that D1 failed to disclose the required size of the copolymer particles and that this deficiency could not be mended by the opponent I's reworking of Example 1, part D of D1 which used experimental conditions deviating from those set out for this example and, moreover, used an emulsifier (i.e. Triton® 770 conc) which had not been established to be identical with Triton® X-770 of this example.

The novelty over the further documents was recognised because

(a) the size of the copolymer particles used according to present Claim 1 was a novel selection providing superior optical properties over the broader particle size range of D2, a document only relevant under Article 54(3) EPC, and because

(b) it was not established that the copolymers of the core/shell particles disclosed, respectively, in D3, D4, D5 and D10 had the Tg's (glass transition temperatures) required by present Claim 1, a deficiency also applying to the hard core/soft shell morphology specified in this claim.

Nor was the Opposition Division convinced by the opponents' obviousness objections because neither D6 nor D6A, though pointing at an improvement of the gloss of coatings from polymer emulsions by using particles of smaller size, would suggest to solve the existing technical problem (including a gloss improvement) by bringing the particle size of the copolymer particles of D1 or D5 into the range of 20 to 70 nm according to present Claim 1. The same conclusion applied to the further citations.

IV. On 16 August 2001 Opponent I (Appellant) lodged an appeal against the decision of the Opposition Division and paid the appeal fee on the same day. The Statement of Grounds of Appeal was submitted on 16 October 2001.

V. The arguments presented by the Appellant in its written submissions (Statement of Grounds of Appeal, submission dated 9 December 2003) and during the oral proceedings held on 15 January 2004 may be summarized as follows:

(a) The subject-matter of Claim 1, set A of the granted patent was anticipated by D1, D13 (US-A-3 401 134; D1 and D13 being continuation-in-part applications of US Ser. No. 161 301 from 21 December 1961), D3 and D4.

- (i) It was established by the new experimental report submitted with the Appellant's letter of 9 December 2003 comprising the results of its reworking of Example I, parts C and D of D1 that the copolymer particles obtained according to these experiments had a size within the claimed range. Since it could be calculated (on the basis of the Fox equation: cf. D8) that the Tg's of the hard cores and the soft shells of these particles were within the claimed ranges, these compositions fulfilled all compositional requirements of Claim 1. In view of their possible use for the coating of wood (column 7, lines 6 to 9) the disclosure of D1 thus anticipated the subject-matter of Claim 1 of set A.

The correctness of the Appellant's reworking conditions with regard to the identity of the emulsifiers Triton® 770 conc used in these reworking experiments and Triton® X-770 used according to D1 was established by documents

D14: Union Carbide data sheet of "TRITON® Surfactants" (undated),

which identified Triton® 770 conc among the group of sulfates and disclosed that it was "30% active",

D15: Union Carbide Material Safety Data Sheet of "TRITON (TM) 770 CONCENTRATE"

identifying it as "Alkoxyate Sulfate" (page 1) and as a composition comprising 47 % by weight of water, 30 % by weight of sodium alkyl aryl ether sulfate and 23 % by weight of isopropanol (page 2),

and

D16: American Paint Journal Convention Daily, 5 October 1955, pages 24 to 34, "The Preparation Of Vinyl Acetate-Vinyl Stearate Emulsion Copolymers"

identifying Triton X-770 *inter alia* as "Na Salt of Alkyl Aryl Polyether-Isopropanol", "Clear Amber Liquid", having a concentration of 30% (Table I, page 24) and setting out that Rohm and Haas Company was its supplier (page 34).

- (ii) Since D13 contained essentially the same disclosure as D1 (its Example II was identical with D1's Example I, part D), the same conclusions applied. In addition, D13 comprised further details of the core/shell structure of the particles and disclosed that their size was from 10 to 1000 nm (0.01 to 1.0 micron), i.e. including the particle size range of the compositions according to Claim 1 of set A of the patent in suit.

- (iii) D3 was also novelty destroying for the subject-matter of Claim 1 because it disclosed emulsion polymerised acrylate compositions suitable for wood lacquers comprising hard core/soft shell particles of a size in the range of 30 to 150 nm having copolymer Tg's within the claimed ranges.
 - (iv) The novelty destroying character of D4 resulted from the coating compositions of its Example 6 which comprised particles of a mean diameter of 70 nm having inner and outer phases with Tg's matching those of present Claim 1.
- (b) The subject-matter of Claim 1 of set A was also obvious over the closest prior art as represented by D1, D13 or D5.
- (i) In that respect it had to be borne in mind that the information in Tables 9.1 and 9.2 of the patent specification, the only evidence relating to the subject-matter of Claim 1, i.e. to the coating of wood, could not prove that the "invention" led to improved properties. This resulted from the vastly different viscosities of the "inventive" composition (Sample 2) and that of Comparative Example C which made it impossible to identify the different particle sizes of the respective compositions as the source of the evidenced different gloss and "Distinctness of Image" (DOI).

- (ii) But even if this was assumed and if it was accepted that the particle sizes of the compositions of D1, Example 1, parts C and D were unknown, it could be inferred, by reference to D13, that they were in the range of 10 to 1000 nm. Since it was known from D6 and D6A that smaller particles favoured better gloss and since it was furthermore known from D6A that this could be achieved with a higher emulsifier content during the polymerisation, the solution of the existing technical problem was obvious for the skilled person starting from D1 and/or D13.

- (iii) Concerning D5, it must be assumed in view of the far-reaching identity of the emulsion polymerisation procedures described therein with those of the patent in suit that the resulting particles had the same hard core/soft shell morphology. The application of the afore-mentioned teachings of D6 and D6A on the disclosure of D5 led therefore in an obvious way to copolymer dispersions according to Claim 1, set A of the patent in suit which were also appropriate for the coating of wood.

- (c) Alternatively, the disclosure of the patent in suit was insufficient insofar as the claimed hard core/soft shell morphology was inconsistent with the patent specification's reference to the polymerisation conditions of the US-A-4 654 397,

the US-parallel patent to D5, according to which the worked examples of the patent should result in a soft core/hard shell morphology.

VI. The Respondent (Proprietor of the patent) presented its counterstatements in written submissions dated 3 January 2002, 10 November 2003 and 4 January 2004 as well as at the oral proceedings. Its arguments may be summarised as follows:

(a) The claimed subject-matter was novel over the cited prior art:

(i) The evidence provided by the Appellant intended to establish that the particle size of the copolymers of documents D1 and D13 met the requirements of the patent in suit was not convincing. The use, in the Appellant's reworking experiments, of Triton® 770 conc in lieu of Triton® X-770 obviated their authenticity because the identity of these two emulsifiers was at least doubtful. The suspicion that in all likelihood different trade names related to different products was furthermore heightened by documents D14, D15 and D16 newly adduced by the Appellant because

- the Triton information leaflet D14 distinguished between tradenames comprising an "X" and "770-conc" not having an "X",

- the Triton 770 conc data sheet D15 described its detergent component as "Sodium alkyl aryl ether sulfate", whereas
- D16 specified the detergent component of Triton X-770 as "Na salt of Alkyl Aryl Polyether" (emphasis added) and failed to identify the nature its salt-forming group.

- (ii) With regard to D3, the Respondent argued that it was apparent for a skilled person from the high minimum film forming temperatures of 65 to 110°C that the compositions of this document were different from those of the "invention" because such film forming temperatures required a Tg of the outer shell far beyond the maximum Tg of 35°C of the patent in suit.
 - (iii) The claimed subject-matter was also novel over D4 because the Tg of the first stage copolymer of Example 6 could be calculated to be 29.7°C, i.e. below the minimum of >45°C of present Claim 1. D4, moreover, used a totally different technology and failed to disclose the coating of wood.
- (b) The claimed subject-matter also involved an inventive step because the prior art would not suggest the claimed solution of the existing technical problem, i.e. the development of a method for coating wood providing a rapid

development of the film properties including a high level of gloss and clarity. The achievement of this goal was established by the evidence contained in Examples 7 to 9 of the patent specification. The Appellant's criticism of Example 9 with regard to the different viscosities of the compared compositions amounted to a mere allegation which was insufficient to discharge its burden of proof.

- (i) None of the citations D1, D13 or D5, alone or in combination with D6 or D6A, suggested to solve the existing technical problem by the claimed combination of features including the provision of a coating composition comprising hard core/soft shell particles having a size of from 20 to 70 nm.
- (ii) Irrespective of further arguments, this conclusion resulted from the failure of all these documents to connect the achievement of high gloss coating compositions with this narrow and exceptionally small particle size.
- (iii) D1 and D5 contained no information as to the particle size, and D13 referred to a preferred particle size of 100 to 500 nm and thus rather taught away from the claimed smaller particle sizes. Even if the skilled person had endeavoured, on the basis of these unpromising disclosures, to look for a gloss improvement of the coating compositions of these documents, it would not have found any incentive in D6 and/or

D6A to turn to such small particle sizes. While both these documents stated that gloss increased with decreasing particle size, they did not disclose particle sizes as small as those according to the patent in suit. Furthermore these general statements were in both cases accompanied by warnings that decreasing particle size affected the flow and that therefore a compromise between high gloss and good paint flow must be sought.

- (iv) Concerning the relevance of D5 the Respondent furthermore stated that it had not been established by the Appellant that the core/shell particles of this document had the hard core/soft shell morphology required by present Claim 1 which was achieved by the less polar character of the second monomer feed which, although predominantly containing hard monomers, constituted the particle core by penetrating into the previously formed soft polymer particles.

VII. The Opponent II has not taken part in the written appeal proceedings, nor did it attend the oral proceedings before the Board.

VIII. The Appellant requested that the decision under appeal be set aside and that the European patent No. 0 429 207 be revoked.

The Respondent requested that the appeal be dismissed and that the patent be maintained as granted or, subsidiarily, according to the first or second auxiliary requests as submitted with their letter of 5 February 2001 (letter of 10 November 2003).

Reasons for the Decision

1. The appeal is admissible.
2. Documents D13 to D16 which have for the first time been cited at the appeal stage are considered in these appeal proceedings because they address the thrust of the Opposition Division's rejection of the Opponents' novelty objection, i.e. the issue of the size of the copolymer particles of the compositions according to Example 1, part D of D1. Their introduction was not objected to by the Respondent.

Main request

3. *Novelty, Claim 1 (sets A and B)*

- 3.1 Document D1

Claim 1 of this document relates to a process for preparing a polymer latex by emulsion polymerisation of a monomer composition comprising an α, β -ethylenically unsaturated carboxylic acid and at least one vinylidene monomer.

D1 seeks to provide polymer latices which have high viscosities and are suitable for the preparation of water-based coating compositions which do not require

the addition of thickening agents. Films from such compositions are clear and glossy (column 1, lines 43 to 50 and 62 to 64).

Example I, Part A describes the preparation of a 45% solids Latex A by stepwise polymerisation in the presence of an emulsifier mix comprising Triton X-770, a sodium salt of an alkyl aryl polyether sulphate (column 2, lines 5 to 20, footnote 2 of the "kettle charge"), of a first monomer charge comprising acrylonitrile and styrene, a second monomer charge comprising styrene and 2-ethylhexyl acrylate, and a third monomer charge comprising 2-ethylhexyl acrylate and methacrylic acid.

Example I, Part C repeats this process with different amounts of monomers in the three monomer charges and results in the preparation of Latex A-1.

Example I, Part D repeats Part C except for different amounts of monomers in the third monomer charge and results in a Control Latex A-1.

There is no information in D1 concerning the size of the polymer particles, whether in the general description or with regard to the exemplified latices.

- 3.1.1 This missing information cannot be made up by the Appellant's reworking experiments of Example I, part D, attached to the opposition statement of Opponent I and the same parties appeal submission dated 9 December 2003, the latter also including a reworking of part C of Example I.

The reason is that the emulsifier Triton® 770 conc used in these reworking experiments has not been established to be identical with Triton® X-770 used according to Example 1 of D1, and that, consequently, there is no certainty as to the identity of the particle sizes obtained according to these reworking experiments with those actually obtained according to D1's "original" Examples.

3.1.2 The above conclusion results from the standard practice in the chemical industry according to which chemical products which are commercialised under different trade names have a different constitution, with the consequential requirement that a deviation from this standard practice has to be supported by convincing, unambiguous evidence, the burden of proof lying with the party making the respective allegation, here the Appellant Opponent.

3.1.3 The Appellant's evidence, however, does not meet this standard of proof.

D16, Table I (page 24), in accordance with D1, identifies Triton® X-770 as "Na Salt of Alkyl Aryl Polyether-Isopropanol" but does not indicate which type of anionic species corresponds to the sodium cation; however, according to page 27 second paragraph, the anionic surface active agents of Table I should be "sulfonated" or "sulfate"; according to Table on page 34 (foot of centre column) Triton® X-770 was supplied by Rohm and Haas Company. This evidence thus conforms with the identification of Triton® X-770 in D1.

The Union Carbide data sheet D15 sets out that Triton® 770 conc is an alkoxyate sulfate (page 1, paragraph 1.1 "Identification") and more specifically a sodium alkyl aryl ether sulfate (page 2, paragraph 2 "Composition Information").

- 3.1.4 While the chemical designations of the emulsifiers Triton® X-770 in D1 and D16 and Triton® 770 conc in D15 may therefore be considered to be identical with regard to their identification as "sodium salt of an alkyl aryl ether sulfate", their designations are nevertheless different in that Triton® X-770 is a "polyether" while Triton® 770 conc is just an "ether".

This different language appears to relate to a structure of Triton® X-770 having polyoxyalkylene groups which are missing in the "simple" ether structure of Triton® 770 conc. This structural difference might cause quite different surface active properties and different emulsifying capacities leading to different particle sizes of the polymerisation compositions.

- 3.1.5 It follows that the Appellant has failed to establish the novelty destroying character of Example I, parts C and D up to the high standard required for this exercise, i.e. that of a direct and unambiguous disclosure of the claimed subject-matter.

- 3.1.6 The gap in the Appellant's argumentative chain cannot be closed by its auxiliary arguments that

- the change of the trade name from Triton® X-770 to Triton® 770 conc was merely due, without change of the chemical constitution of the product, to the transfer of the emulsifier business from Rohm and Haas to Union Carbide, which latter fact was admitted by the Respondent (i.e. Rohm and Haas),
- that the identity of these two compounds should therefore be assumed in view of the close similarity of their designations and in view of their effectively emanating from the same source, and
- that the formulation of Triton® X-770 as well as that of Triton® 770 conc in a concentration of 30% (cf. D16, Table I; D14, entry "sulfates"; D15 page 2, paragraph 2) was proof of their identity.

All these arguments resort to unproved assumptions and provide no objectively convincing logical chain for the alleged identity of Triton® 770 conc with Triton® X-770.

3.1.7 It has therefore not been established by the Appellant's reworking experiments that the subject-matter of Claim 1, set A is anticipated by the disclosure of D1.

3.2 Document D13

The disclosure of this document which, as D1 itself, is derived from a continuation in part application of the US application Ser.No. 161301, is to a large extent identical with that of D1. For example, its Examples I,

II and III correspond to parts A, D and C of Example I of D1.

All arguments presented with respect to D1 are equally applicable to D13 even if this document, in addition to D1, discloses that the size of the copolymer particles was in the range of 10 to 1000 nm (0.01 to 1.0 μm), preferably 100 to 500 nm (0.1 to 0.5 μm) (Claim 1; column 4, lines 37 to 40) and that the multi-step emulsion polymerisation was carried out with a first charge of monomer having a high Tg, followed by a second charge with a low Tg and finally followed by acid monomer (column 6, lines 17 to 21).

Since the particle size range of 10 to 1000 nm disclosed in D13 is extremely broad in comparison with the "inventive" size range of 20 to 70 nm which latter is moreover outside D13's preferred size range of 100 to 500 nm, this document cannot be considered to disclose the narrow particle size range of the claimed invention.

3.3 Document D3

Claim 1 of this document relates to a two-step process for the manufacture of aqueous dispersions of copolymers of alkyl methacrylates with mono- and/or dicarboxylic acids having a minimum film forming temperature of 65 to 110 °C, the monomer mixture of the first step comprising a major amount of methylmethacrylate and the monomer mixture of the second step comprising a major amount of butylmethacrylates.

On page 3, lines 43 to 44 the mean particle size of the dispersed copolymer particles is set out as being from "0,03 to 0,15 nm". In view of the fact these dimensions are in the order of magnitude of atomic diameters (diameter of H-atom: 0,046 nm) they are evidently erroneous and it is highly likely that "nm" should read "µm". On the balance of probabilities it is therefore decided that this information has to be interpreted to mean 30 to 150 nm.

The Tg's of the copolymers of the core/shell particles resulting from the polymerisation process are not explicitly disclosed in D3 and the calculations in the Appellant's submission of 9 December 2003 cannot shed light on this issue because they are based on arbitrary combinations of amounts of monomers which moreover do not add up to 100 % by weight.

The Board is furthermore inclined to accept the Respondent's argument that, in view of the lower limit of the minimum film forming temperature of 65°C - and because of the uncontested close correspondence between Tg and film forming temperature - the Tg of the particles' shell must be beyond the upper limit of 35°C.

The Appellant has not, therefore, discharged the burden of proof for its contention that D3 disclosed core/shell particles of the required size and Tg characterisation.

3.4 Document D4

3.5 Claim 1 of this document relates to acrylic resin particles comprising a particulate crosslinked acrylic polymer to which a number of substantially linear acrylic polymer chains are chemically bonded and which is prepared by a combination of emulsion polymerisation steps.

Example 6 discloses a dispersion comprising core/shell particles having a mean diameter of 70 nm (pages 9 and 11, Tables 3 and 4) but is silent about the Tg's of the copolymers of the particle constituents.

In its submission dated 3 January 2002 the Respondent calculated Tg values for the two phases of 29.7°C and 6.0°C which are both below the lower limit of >45°C of the Tg required for the inner phase copolymer of Claim 1 of set A. These Tg values are different from the values of ">45°C" and "about 10°C" reported by the Appellant in the Statement of Grounds of Appeal (relying on the respective information in its opposition statement of 4 November 1996).

Since the Board (i) is not in a position to *prima facie* decide which one of the contentions is more reliable, since (ii) the Appellant in its response of 10 November 2003 to the Respondent's afore-mentioned submission of 3 January 2002 has not provided a substantial argumentation for the correctness of its own Tg-assessment, and since (iii) all these calculations are anyway incomplete in that they admittedly do not take account of the presence of crosslinking monomers, the Board cannot but conclude that the Appellant has not discharged its burden of proof unambiguously to

establish that the copolymer dispersions of Example 6 of 4 meet the Tg requirements of present Claim 1, set A.

3.6 The subject-matter of Claim 1 of set A is therefore novel over the citations D1, D13, D3 and D4.

3.7 The same conclusion applies *a fortiori* to Claims 2 to 4 which are dependent on Claim 1 and to independent Claim 5 of set A which relates to the use of the compositions as defined in Claim 1. No other conclusion can be arrived at for the independent Claims 1, 7 and 9 of set B whose scope is broader than that of the claims of set A in that they relate to the treating or coating of a (i.e. any) substrate but which - having regard to the Tg and particle size characteristics of the aqueous treating/coating composition - comprise the same combination of features. The subject-matter of Claims 2 to 6, 8 and 10 of set B derives its novelty from their dependence on, respectively, Claim 1, Claim 7 and Claim 9.

4. *Problem and solution, claim sets A and B*

4.1 According to page 2, lines 7 to 8 and 13 to 14 of the patent in suit the problem underlying the claimed invention is the provision of a method for the treating of preferably wooden (page 3, line 15) substrates so that the treated substrates attain their final properties rapidly and can be handled and used without undue delay and resulting in coatings with excellent transparency and clarity.

4.2 According to Claim 1 (sets A and B) this problem may be solved by the use of aqueous coating compositions comprising hard core/soft shell particles having a particle size from 20 to 70 nm, the core (inner phase) and the shell (outer phase) having the Tg's of, respectively, $>45^{\circ}\text{C}$ and $<35^{\circ}\text{C}$.

4.3 The experimental evidence reported in the patent specification (Examples 7, 8 and 9) establishes that the use of such coating compositions may lead to the solution of the afore-mentioned problem.

Despite the use of different substrates (Example 7: glass plates; Example 8: vinyl panels; Example 9: oak panels) the results of these experiments are applicable to the subject-matter of both sets of claims A (relating to the coating of wood) and B (relating to the coating of substrates in general) because the film-forming properties of the coating compositions and the optical properties of the resulting coating films are essentially not dependent on the type of (inert) substrate.

Table 7.2 (page 8) shows that the rate of hardness development of films according to the claimed invention (samples 7.1 and 7.3 comprising core/shell particles having a particle size of 68 nm) was much greater than that of two comparative formulations (samples 7.2 and 7.4 comprising homogeneous particles having a size of 49 nm).

Table 8.2 (page 10) shows that films according to claimed invention (samples 8.1 to 8.4; 8.9 to 8.12 comprising core/shell particles having a particle size

of 63 nm), depending on the amount of silica filler, exhibit on average better gloss and clarity than the comparative films of samples 8.5 to 8.8 comprising core/shell particles having a particle size of 90 nm.

Table 9.2 (page 11) shows that the "inventive" coating of sample 9.1 exhibits better gloss and DOI (distinctiveness of image) values than the comparative coating of sample 9.2 using core/shell particles having a size of 94 nm.

The Board is thus satisfied that the use of the claimed core/shell structure and of the claimed particle size range contributes to the solution of the existing technical problem.

4.4 In the absence of a plausible substantiation the Appellant's argument must be disregarded that - in its view - the different viscosities of the compositions (of sample 2) used according to sample 9.1 and of the compositions (of comparative sample C) used according to sample 9.2 prohibited any reasonable conclusions on the significance of the different particle sizes of the respective compositions for the exhibited gloss and DOI results. While it cannot be ruled out that these viscosity differences have some impact on the spray-gun applied coatings, it is not apparent that this possible impact obviates the afore-mentioned conclusions of improved gloss and DOI, and the respective argument of the Appellant is thus nothing more than an unproved assertion.

5. *Obviousness, Claim 1 (sets A and B)*

5.1 In the Board's judgment, the closest prior art is represented by D13.

Considering the existing technical problem the issue of obviousness primarily turns on the question whether the selection of a particle size of 20 to 70 nm for the coating compositions of Claim 1 (both sets) was suggested by D13 alone or in combination with the further citations.

5.2 D13 is concerned with polymer latices of high viscosity which may lead to clear and glossy films which may additionally be characterised by quick drying (cf. title; column 1, lines 47 to 49, 66 to 69; column 4, lines 44 to 52; column 6, lines 22 to 25).

Even if - disregarding the fact that the primary object of D13, the achievement of high viscosity is not an object of the present invention ("inventive" sample 9.1 using a latex having much lower viscosity latex than "comparative" sample 9.2 leads to better optical properties) - this set of properties was considered an incentive for the further development of D13's coating compositions, D13 does not suggest the use of particles in the claimed size range of 20 to 70 nm because it recommends a preferred size range of 100 to 500 nm and thus clearly teaches away from the use of particle sizes below 100 nm.

Moreover Examples 8 and 9 of the patent in suit establish that the use of a particle size within the claimed range (63 nm) is superior even to the use of a particle size between 70 and 100 nm (90 nm/94 nm).

5.3 Neither can the information in documents D6 and D6A which, in general terms, recommends the use of smaller particles for the achievement of higher gloss films (D6: page 21, last paragraph to page 22 last paragraph; D6A: sentence bridging pages 199 and 200; page 200, Table 1; page 200, left hand column first sentence of third paragraph) suggest the solution of the existing technical problem by the use of coating compositions comprising particles having a size in the range of 20 to 70 nm.

This conclusion results from the fact that D6 is altogether silent about the envisaged size of the emulsion polymer particles, and D6A in essence militates against the use of particle sizes below 100 nm. The latter judgment is based on the statement in D6A (right hand column, first sentence of section "Emulsion viscosity"): "The gloss paint based in emulsion B ... strikes a compromise between very high gloss and good paint flow properties" in combination with the information in Table 1 which indicates for emulsion B a particle size of from 250 to 600 nm (0.25 to 0.60 μm) and a flow qualification of "Fairly good" whereas the flow qualification of emulsion E having a particle size of <100 nm ("All below 0.1 μm ") is "Poor".

In view of the disclosure of D6 and D6A the skilled person looking for a solution of the existing technical problem had therefore no reason to assume that

particles in the "inventive" size range of 20 to 70 nm would be able to provide the benefits evidenced in the patent in suit.

5.4 Since, especially with regard to the particle size of the coating compositions, D1 adds nothing to the disclosure of D13 no other conclusion could be arrived when starting from D1 as "closest state of the art".

5.5 The same applies to the possible choice of D5 as "closest state of the art" because also this document is silent about the size of the particles of the disclosed polymer dispersions.

The issue that was discussed in the opposition and appeal proceedings whether or not the copolymer particles disclosed in D5 must, in view of the very similar polymerisation methods and monomer compositions exemplified in D5 (cf. particularly Example 1 of D5 and the reference to the suitability of the polymerisation methods disclosed in D5's US-parallel US-A-4 654 397), have the same hard core/soft shell morphology as according to the patent in suit is therefore of no relevance for the assessment of obviousness of the claimed subject-matter over this document.

5.6 In the Board's judgment, the subject-matter of Claim 1 (sets A and B) is therefore non-obvious over the cited prior art. No other conclusion can be arrived at with regard to the further claims of both sets which either relate to preferred embodiments of Claim 1 or to the use of the coating compositions according to Claim 1 and to which therefore the same arguments of non-obviousness apply.

6. The Appellant's tentative contention that the disclosure of the patent in suit was insufficient (cf. section V(c) above) is disregarded because it relates to the opposition ground of Article 100(b) EPC which had not been raised within the opposition period and whose consideration in the appeal proceedings was not consented to by the Respondent (G 10/91, OJ EPO 1993, 420).

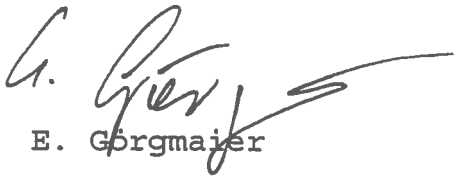
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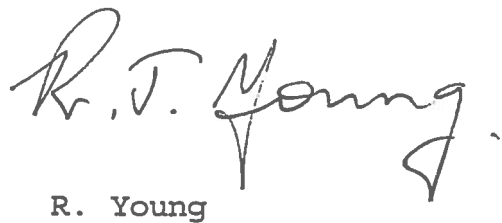
For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:


E. Gorgmaier


R. Young

