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Datasheet for the decision of 25 October 2023

Case Number: T 0531/21 - 3.3.03

Application Number: 13780008.2

Publication Number: 2935377

IPC: C08F265/02, C09D151/00, C08F265/06, C08F285/00

Language of the proceedings: EN

Title of invention:
GRAFTED PIGMENT DISPERSING POLYMERIC ADDITIVE AND PAINT EMPLOYING THE SAME WITH IMPROVED HIDING

Patent Proprietor:
Benjamin Moore&Co.

Opponent:
BASF SE

Relevant legal provisions:
EPC Art. 54, 56
RPBA 2020 Art. 12(4), 12(6), 13(2)

Keyword:

Late-filed evidence - admitted (yes)
Novelty - main request (yes)
Inventive step - main request (no) - auxiliary request 12 (yes)
Late-filed request - should have been submitted in first-instance proceedings (no)
Late-filed objection - taken into account (no)

Decisions cited:

T 0698/10, T 0638/16, T 1407/18, T 2920/18, T 2988/18, T 0247/20

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Case Number: T 0531/21 - 3.3.03

D E C I S I O N
of Technical Board of Appeal 3.3.03
of 25 October 2023

Appellant: (Patent Proprietor)	Benjamin Moore&Co. 101 Paragon Drive Montvale, NJ 07645 (US)
Representative:	Strych, Sebastian Mitscherlich PartmbB Patent- und Rechtsanwälte Karlstraße 7 80333 München (DE)
Respondent: (Opponent)	BASF SE Carl-Bosch-Str. 38 67056 Ludwigshafen (DE)
Representative:	BASF IP Association BASF SE ZRX-C6 67056 Ludwigshafen (DE)
Decision under appeal:	**Decision of the Opposition Division of the European Patent Office posted on 10 March 2021 revoking European patent No. 2935377 pursuant to Article 101(3)(b) EPC.**

Composition of the Board:

Chairman	D. Semino
Members:	M. Barrère
	R. Cramer

Summary of Facts and Submissions

I. The appeal of the patent proprietor lies against the decision of the opposition division revoking European Patent No. 2 935 377.

II. The following documents were *inter alia* cited in the decision of the opposition division:

D1: EP 0597567 A2
D2: US 5340870
D12: US 4894397
D14: EP 2426155 A1
D23: Tsavalas, J.G. *et al.*, Hydroplasticization of Polymers: Model Predictions and Application to Emulsion Polymers, Langmuir, 2010, 26(10), pages 6960 to 6966

III. In that decision the opposition division held, among others, that:

- the subject matter of the claims as granted was novel in view of document D2. However, the subject-matter of granted claim 1 did not involve an inventive step over D2 as the closest prior art;

- claim 1 of auxiliary request 1 did not meet the requirements of Article 123(2) EPC and

- the subject-matter of claim 1 of auxiliary requests 2 to 5 did not involve an inventive step over D2 as the closest prior art.

IV. With the statement of grounds of appeal, the patent proprietor (appellant) filed twelve sets of claims as auxiliary requests 1 to 12 as well as the following evidence:

Decl-Dandreaux: Expert declaration from Dr. Gary Dandreaux dated 25 June 2021

V. With the rejoinder to the statement of grounds of appeal, the opponent (respondent) filed the following documents:

D31: Polymer Science Dictionary, second edition, Mark Alger, page 5, acid value (AV)
D32: Dictionary of Coating Materials and Pigments, standard definitions with translations English - German, first edition 2015, DIN Deutsches Institut fur Normung e.V., page 85, non-volatile matter (NV)

VI. During the oral proceedings on 25 October 2023, the appellant withdrew auxiliary requests 1 and 5 to 11.

VII. The appellant requested that the decision under appeal be set aside and the patent be maintained as granted, or alternatively that the patent be maintained in amended form on the basis of the claims of one of auxiliary requests 2, 12, 3 or 4 filed with the statement of grounds of appeal in this order.

The respondent requested that the appeal be dismissed.

VIII. Claim 1 as granted (main request of the appellant) read as follows:

"1. A paint composition comprising at least a latex binder, an opacifying pigment and a grafted pigment dispersing polymeric additive,

wherein the grafted pigment dispersing additive comprises a polymeric pigment dispersant and a polymeric carrier grafted to each other,

wherein the polymeric pigment dispersant has a weight average molecular weight of 1,000 Daltons to 20,000 Daltons and an acid number from 150 to 250 and

wherein the polymeric pigment dispersant is soluble in an alkali solution, and

wherein the minimum film forming temperature (MFFT) of the polymeric carrier is greater than 10°C and less than 130°C, and

wherein the grafted pigment dispersing polymeric additive is capable of adsorbing to an opacifying pigment."

Claim 1 of auxiliary request 2 was amended with respect to granted claim 1 in that it was specified at the end of the claim that

"the polymeric carrier is produced in an emulsion polymerization process including methyl methacrylate" (emphases here and below added by the Board).

Claim 1 of auxiliary request 12 was amended with respect to granted claim 1 in that it was specified at the end of the claim that

"the monomer in the emulsion polymerization process that produces the polymeric carrier is methyl methacrylate (MMA)".

The other claims of these requests as well as the claims of auxiliary requests 3 and 4 are not relevant to the present decision.

IX. The appellant's submissions, in so far as they are pertinent to the present decision, may be derived from the reasons for the decision below. They were essentially as follows:

(a) Documents D31 and D32

Documents D31 and D32 should not be admitted into the proceedings.

(b) Main request (patent as granted)

(i) Novelty

The subject-matter of granted claim 1 was novel in view of example 5C of D2.

(ii) Inventive step

The subject-matter of granted claim 1 involved an inventive step over example 5C of D2 as the closest prior art.

(c) Auxiliary request 2

(i) Inventive step

The subject-matter of claim 1 of auxiliary request 2 involved an inventive step over example 5C of D2 as the closest prior art.

(d) Auxiliary request 12

(i) Admittance

Auxiliary request 12 should be admitted into the proceedings.

(ii) Inventive step

The subject-matter of claim 1 of auxiliary request 12 involved an inventive step over example 5C of D2 as the closest prior art.

(iii) Article 123(2) EPC

The objection under Article 123(2) EPC against auxiliary request 12 should not be admitted into the proceedings.

X. The respondent's submissions, in so far as they are pertinent to the present decision, may be derived from the reasons for the decision below. They were essentially as follows:

(a) Documents D31 and D32

Documents D31 and D32 should be admitted admitted into the proceedings.

(b) Main request (patent as granted)

(i) Novelty

The subject-matter of granted claim 1 was not novel in view of example 5C of D2.

(ii) Inventive step

The subject-matter of granted claim 1 lacked an inventive step over example 5C of D2 as the closest prior art.

(c) Auxiliary request 2

(i) Inventive step

The subject-matter of claim 1 of auxiliary request 2 lacked an inventive step over example 5C of D2 as the closest prior art.

(d) Auxiliary request 12

(i) Admittance

Auxiliary request 12 should not be admitted into the proceedings.

(ii) Inventive step

The subject-matter of claim 1 of auxiliary request 12 lacked an inventive step over example 5C of D2 as the closest prior art.

(iii) Article 123(2) EPC

The objection under Article 123(2) EPC against auxiliary request 12 should be admitted into the proceedings.

Reasons for the Decision

1. Admittance of late-filed documents

1.1 Documents D31 and D32

1.1.1 D31 and D32 are new items of evidence filed by the respondent with the rejoinder to the statement of grounds of appeal. Their admission to the proceedings, which is contested by the appellant, is subject to the discretionary power of the Board in accordance with Article 12 paragraphs (4) to (6) RPBA.

1.1.2 These documents were cited in the context of novelty and inventive step over D2.

D31 and D32 are directed to establishing that the acronyms AV and NV stand for "acid value" and "non-volatile matter" respectively (rejoinder to the statement of grounds of appeal, page 8, second paragraph). Therefore, according to the respondent, the "AV/NV" value of the binder C given in column 8 of D2 would refer to the acid value of the non-volatile matter of binder C in "mg KOH/g non-volatile matter".

1.1.3 The respondent contended that D31 and D32 should be admitted because they were representative of common general knowledge. In the notice of opposition, it was argued that AV and NV stood for acid value and non volatile matter respectively. By contrast, it was an error to state during the oral proceedings before the opposition division that NV was the neutralisation value. D31 and D32 were filed to correct this error.

1.1.4 The appellant considered that D31 and D32 should have been filed during the opposition proceedings and criticised the fact that the respondent, in its rejoinder to the statement of grounds of appeal, had not provided any justification for the filing of those documents.

1.1.5 The Board acknowledges that it was the initial intention of the respondent as opponent to argue that the AV and NV meant respectively "acid value" and "non volatile" (notice of opposition, page 6, "Berechnung der Säurezahl"). It is therefore recognised that the statement made by the respondent's technical expert that NV was the "neutralisation value" was contrary to the original line of argument (minutes of the oral proceedings before the opposition division, page 3, fourth line). It follows that the filing of D31 and D32 is seen as a legitimate reaction to correct this contradictory statement made during oral proceedings.

1.1.6 In addition, D31 and D32 are extracts from a dictionary of polymer science and therefore evidence of common knowledge. To the extent that the meaning of the acronyms AV and NV was disputed between the parties, the Board considers that these documents should be taken into account.

1.1.7 Under these circumstances, the Board finds it appropriate to exercise its discretion under Article 12(4) RPBA by admitting documents D31 and D32 into the proceedings.

1.2 No objection was raised against the admittance of declaration Decl-Dandreaux and the Board sees no reason to exclude it from the proceedings.

Main request (patent as granted)

2. Novelty over example 5C of D2

2.1 The respondent argued that example 5C of D2 (i.e. the paint composition of example 5 comprising resin C - see column 8, lines 26-60) anticipated the subject-matter of granted claim 1.

For the sake of clarity of the following assessments of novelty and inventive step, it is pointed out that D2 and the opposed patent use different terminologies to address the different polymers of the paint composition. In the opposed patent (claim 1), the paint composition contains a grafted pigment dispersing polymeric additive comprising an acid functional polymeric pigment dispersant grafted to a polymeric carrier. In D2 (column 1, lines 39 to 53), the paint composition contains an emulsion binder comprising an acid functional support resin and an emulsion polymer.

It was the position of the respondent (and a matter of dispute between the parties) that:

the support resin of D2 corresponded to a polymeric pigment dispersant according to the opposed patent;

the emulsion polymer of D2 corresponded to a polymeric carrier according to the opposed patent

and that the two polymers were grafted so that:

the emulsion binder of D2 corresponded to a pigment dispersing polymeric additive according to the opposed patent.

2.2 According to the appellant the subject-matter of granted claim 1 differed from example 5C of D2 in that the paint composition comprised:

(i) a polymeric pigment dispersant having an acid number between 150 to 250;
(ii) a polymeric carrier having a minimum film forming temperature (MFFT) between 10°C and 130°C and
(iii) a latex (in addition to the pigment dispersing additive of D2)

wherein the polymeric pigment dispersant was:

(iv) alkali soluble and capable of adsorbing to an opacifying pigment and
(v) grafted to the polymeric carrier.

2.3 In what follows, the Board addresses each of the alleged distinguishing features (i) to (v) identified by the appellant.

2.4 Acid number (feature (i))

2.4.1 The respondent considered that there were two possibilities to calculate the acid number of the support resin "B.F. Goodrich's XPD-1166" used in example 5C of D2 (in short "XPD-1166"). The first one was based on the monomer composition of the resin. The second one relied on an AN/NV value of 50, which was the ratio of the acid number to the non volatile content of the whole emulsion binder. Both methods would lead to acid numbers between 150 to 250.

2.4.2 The appellant argued that the exact composition of resin XPD-1166 was not known. Furthermore the meaning of the acronym AN/NV was not disclosed in D2. Consequently, the acid number of XPD-1166 could not be calculated.

2.4.3 As noted by the parties, the polymer used as starting material in the resin of example 5C is commercial product XPD-1166 (D2, column 8, lines 4-5). D2 merely specifies that this product is a solution of a "styrene/alpha-methyl styrene/acrylic copolymer in about a 1:1:1 molar ratio" (D2, column 7, lines 67-68). However the nature of the acrylic monomer(s) present is not known. For this reason, the first method proposed by the respondent to calculate the acid number cannot be applied to XPD-1166.

The second method relied on the "AV/NV" value of 50 reported in example 5 of D2 as indirect evidence of the acid number of resin XPD-1166 (D2, column 8, second table). However, D2 does not give any explanation for the acronym "AV/NV". While the opponent's technical expert declared during the oral proceedings before the opposition division that NV stood for "neutralisation value" (minutes of the oral proceedings, page 3, lines 1-4), it is the respondent's position that this declaration was an error and that NV meant "non volatile". Furthermore, the respondent submitted documents D31 and D32 showing that AV was the "acid value" and NV the "non volatile" content. In the Board's view, the declaration of the opponent's technical expert (even if it was unintentional) clearly shows that there was at least another possible meaningful interpretation of the acronym NV in the present technical field (namely the "neutralisation value"). Furthermore, it is pointed out that D2 uses

another acronym for the non volatile content which is NVM thereby casting doubts on the alleged fact that NV would have the same meaning (D2, column 7, lines 19 to 22). In the absence of a clear teaching in D2 as to the signification of "AV/NV", the Board considers that it cannot be used to calculate the acid value of XPD-1166.

2.4.4 Consequently, example 5C of D2 does not directly and unambiguously disclose a polymeric pigment dispersant having an acid number from 150 to 250 (distinguishing feature (i)).

2.5 MFFT of the polymeric carrier (feature (ii))

2.5.1 According to the respondent, the MFFT can be determined by any method known at the time of filing of the patent such as by measurement or by calculation. For example, the glass-transition temperature (Tg), which can be calculated using the Fox equation, could be used to determine the MFFT. In the present case, the calculated Tg of the emulsion polymer of the resin of example 5C would be 23°C.

2.5.2 According to the appellant, the MFFT-value and the Tg-value of a polymer are not the same. Furthermore, the respondent failed to provide any evidence that the Fox equation can be used to calculate the MFFT.

2.5.3 With regard to the MFFT, the Board agrees with the opposition division and the respondent that the Tg of a hydrophobic polymer is normally a suitable approximation of its MFFT (D23, page 6961, left-hand column, end of the second paragraph). Furthermore, as noted by the respondent, the patent does not provide any method to determine the MFFT of the polymeric

carrier. Consequently, the MFFT can be estimated by any known method such as by using the Tg.

It belongs to common general knowledge that the Tg of a random copolymer can be calculated using the Fox equation. This calculation method is therefore suitable to determine the MFFT of the copolymer of the prior art.

In the present case, the emulsion polymer of example 5C is a hydrophobic copolymer derived from methacrylate (MMA) and 2-ethyl-1-hexyl acrylate (EHA) in a weight ratio of 1.59/1 (=22.4/14.05) (D2, column 8, first table). Hence, in agreement with the respondent (rejoinder to the statement of grounds of appeal, page 10, lines 1-7), the calculated Tg should be about 23°C corresponding to a MFFT of at least 10°C (as required by granted claim 1).

2.5.4 Consequently, the MFFT (feature (ii)) is not a distinguishing feature.

2.6 Latex (feature (iii))

2.6.1 The respondent is of the opinion that the emulsion binder of example 5C of D2 is both a latex and a pigment dispersing additive as defined in granted claim 1. Therefore the presence of a latex would not constitute a distinguishing feature between claim 1 as granted and D2.

2.6.2 According to the appellant, the formulation of example 5C does not contain a latex in addition to a pigment dispersing additive. In their opinion, the wording of granted claim 1 makes it clear that the latex and the pigment dispersing additive cannot be the same

component. Furthermore, it is a requirement under the EPC that every feature of a claim should be considered as a distinct feature. Conversely, the respondent's interpretation of granted claim 1 would be artificial and not in line with the case law of the Boards of appeal (decision T 1407/18, point 15 of the Reasons).

2.6.3 Granted claim 1 is directed to a paint composition comprising a latex, an opacifying pigment and a grafted pigment dispersing additive.

In the present case, it was not disputed that the compositions of D2 include an emulsion binder which is a synonym for a "latex binder" (D2, column 1, summary of the invention). Thus independently of the question whether the emulsion binder of example 5C of D2 may be seen as a grafted pigment dispersing polymeric additive according to claim 1, D2 unambiguously discloses a coating composition comprising a latex binder.

It is furthermore clear for the Board that a particular compound may fall under different categories: as a matter of example, an amino acid is both an amine and a carboxylic acid. In the present case, the grafted pigment dispersing polymeric additive can be in the form of a latex. In that case, it cannot be disputed that this compound then fulfils at the same time two features of granted claim 1: i.e. the presence of latex and the presence of a grafted pigment dispersing polymeric additive. Conversely, it would be arbitrary and illogical to consider that this compound ceases to be latex because it is falls under the category of a grafted pigment dispersing polymeric additive (or *vice versa*). Claim 1 also does not exclude that the latex binder and the grafted pigment dispersing polymeric additive be the same. In fact, as pointed out by the

respondent, the opposed patent even specifies that, under certain conditions, the grafted pigment dispersing polymeric additive can perform as the film-forming latex (page 6, lines 10 to 11).

2.6.4 The present Board considers that the situation in decision T 1407/18 (cited by the appellant) is a different one and does not apply to the present case. In that case granted claim 6 was directed to a powder composition comprising 30 to 70 wt% of polyester particles and 70 to 30 wt% of particles comprising a fluorocarbon resin. In that decision, the Board held that a composition consisting of particles which would be both polyester particles and particles comprising a fluorocarbon resin would contain 100 wt% of them, contrary to the limitation that the powder composition should contain only 30 to 70 wt% of each type of particles. Therefore novelty was acknowledged due to the weight percent ranges in claim 6 (point 15 of the Reasons). This situation does not apply to the present case because granted claim 1 does not specify the amounts of latex or pigment dispersing additive.

2.6.5 Therefore, the Board considers that the emulsion binder of example 5C is a latex independently of the question whether it is also a grafted pigment dispersing polymeric additive. Consequently, feature (iii) is not a distinguishing feature.

2.7 Properties of the polymeric pigment dispersant and of the additive derived therefrom (feature (iv))

2.7.1 According to the appellant, it cannot be assumed that the support resin in example 5C of D2 is alkali soluble and that the product derived therefrom is capable of adsorbing to an opacifying pigment.

2.7.2 In that respect the Board agrees with the respondent (rejoinder to the statement of grounds of appeal, page 3, sixth and seventh paragraphs and page 13, fourth paragraph).

(a) According to D2 (column 2, lines 15 to 21 and column 5, lines 40 and 41), the support resin must be soluble in alkaline aqueous media. By applying this general condition to the examples, it is thus implicit for the Board that resin XPD-1166 used in example 5C of D2 also fulfils this property.

(b) With regard to the adsorption capability of the polymeric pigment dispersant additive, the opposed patent teaches that additives carrying an acid group would have the ability to absorb to TiO_2 particles (paragraph [0014] of patent). Although the exact composition of XPD-1166 is not known, it can nevertheless be inferred from the general part of the description that "the support polymer has carboxylic acid functionality" (D2, column 2, lines 13 to 15). Hence, according to the teaching of the opposed patent, it can be assumed that the emulsion binder of example 5C, which is derived from XPD-1166 and therefore includes carboxylic acid groups, is capable of adsorbing to TiO_2 corresponding to an opacifying pigment.

2.7.3 Consequently, feature (iv) is not a distinguishing feature.

2.8 Grafting between the polymeric pigment dispersant and the polymeric carrier (feature (v))

2.8.1 According to the appellant, D2 does not mention that the support resin is grafted to the emulsion polymer (Decl-Dandreaux, page 1, fourth paragraph). In contrast, it was shown that the process disclosed in the opposed patent allowed to obtain grafting between a pigment dispersant and a polymeric carrier (example 3 and specifically paragraphs [0018] and [0050] with reference to figures 1A-1B, 2A-2B, 3 and 4). In view of the different process disclosed in D2 (in particular the absence of an additional surfactant or the one-step polymerisation of the monomers for the emulsion polymer) it could not be expected that a grafting reaction occurred. In any event, the respondent did not provide any experimental proof that the polymerisation process carried out in D2 would result in grafting.

2.8.2 The respondent essentially argued that the emulsion polymerisation process of D2 was not significantly different from the process disclosed in the opposed patent (rejoinder to the statement of grounds of appeal, second half of page 4). It was therefore implicit that some grafting would occur between the support polymer and the emulsion polymer of D2.

2.8.3 While the term "grafted" is not mentioned in D2, the question to be answered by the Board is whether it can be expected from the disclosure of D2 that resin XPD-1166 (support polymer) and the copolymer of MMA and EHA (emulsion polymer) be at least partially grafted to each other in the emulsion binder of example 5C.

2.8.4 It was not disputed by the parties that the opposed patent provides evidence that an emulsion polymerisation process such as the one disclosed in example 3 leads to some grafting between a polymeric pigment dispersant and a polymeric carrier. It was in

particular estimated that the proportion of reacted (i.e. grafted) polymeric dispersant was approximately 27%, while approximately 73% remained unreacted (paragraph [0019] of the opposed patent).

It is further taught in the patent that the grafted pigment dispersing polymeric additive can be prepared by emulsion polymerisation of the monomers of the polymeric carrier in the presence of the polymeric pigment dispersant dissolved in water after neutralisation with ammonia (paragraph [0028] and examples of the patent). Thereby conventional free radical initiators such as ammonium persulfate may be used (paragraph [0029]). As to the monomers of the polymeric carrier, the opposed patent also teaches that MMA is particularly advantageous (paragraph [0026] and page 17, table 1). In particular, it is indicated that the higher water solubility of MMA compared to other monomers such as styrene is expected to lead to "greater interaction (grafting) with water soluble polymeric pigment dispersant" (page 5, lines 27 to 29 of the patent).

2.8.5 The Board agrees with the respondent that the process disclosed in example 5C of D2 is not significantly different from the process of the opposed patent. In the said example, a monomer mixture including MMA (corresponding to a preferred monomer according to the opposed patent) is polymerised in emulsion in the presence of an acid functional resin (XPD-1166) neutralised by ammonia and dissolved in water (D2, example 4). The initiator is furthermore ammonium persulfate corresponding to a conventional free radical initiator.

In view of the similarities between the process of D2 and the teaching of the opposed patent, the Board considers that some grafting must occur between the polymeric pigment dispersant and the polymeric carrier of example 5C of D2.

It is in particular pointed out that the reaction involved in D2 and the opposed patent are the same (radical polymerisation of unsaturated monomers initiated by a conventional free radical initiator in an aqueous environment). It is undisputed that grafting occurs when a polymerising monomer (radical) of the polymeric carrier is in contact/interacts with the water soluble polymeric pigment dispersant (opposed patent, last sentence of paragraph [0026]). In view of the fact that the polymerisation of the monomer mixture including MMA in example 4 of D2 is carried out in the presence of the XPD-1166 as water soluble polymeric pigment dispersant, it is implicit that the monomers must be in contact with the said pigment dispersant (which acts as a surfactant in D2) and that some grafting must take place between the propagating radicals and the pigment dispersant. In that respect, it is noted that the opposed patent does not specify a limit to the level of grafting. As explained previously, in example 3 of the patent the grafting efficiency is estimated to be about 27% (paragraph [0019] of the opposed patent). Likewise, the Board considers that it cannot be denied that some grafting would occur in the reaction conditions of D2, even if the level of grafting is not known.

2.8.6 As mentioned above, the appellant pointed to differences between the process of D2 and the process of the opposed patent, in particular to the absence of an additional surfactant in D2 or the fact that the

emulsion polymerisation is carried out in one stage (instead of in multiple stages in the examples of the patent including the preparation of a seed monomer emulsion).

The Board does not contest these differences. However, the question to be answered is whether it can be assumed that they have any influence on the ability of the polymeric carrier to be grafted on the polymeric pigment dispersant.

While it is true that D2 explicitly mentions that an external surfactant should be avoided (D2, column 3, lines 63 to 67), it is also noted that the support polymer (the resin XPD-1166 in example 5C of D2) acts as a surfactant (D2, column 1, lines 44 to 50). More importantly, for the grafting reaction to take place, the polymerising monomers should be in contact/interact with the support polymer (opposed patent, page 5, lines 27 to 29 of the patent). Hence, in view of the fact that the support resin in D2 is the only surfactant, the Board considers that the monomers and the support resin must be in contact, with the consequence that some grafting reaction should take place (the reaction involved being identical in D2 and in the opposed patent).

Likewise, the Board sees no reason why the emulsion polymerisation of the monomers in one or more steps would make any difference with regard to grafting as long as said monomers are at some point in contact with the support resin XPD-1166.

2.8.7 The Board is therefore satisfied that, even in the absence of experimental evidence provided by the respondent, the process conditions in D2 are suitable

to obtain some grafting between the resin XPD-1166 and the polymeric carrier derived from MMA and EHA in the emulsion binder of example 5C of D2. Consequently, feature (v) is not a distinguishing feature.

2.9 It follows that the only distinguishing feature between granted claim 1 and the composition of example 5C of D2 is the acid number of the polymeric pigment dispersant (feature (i)). The subject-matter of granted claim 1 is thus novel over example 5C of D2.

3. Inventive step

In the contested decision, the opposition division came to the conclusion that the subject-matter of granted claim 1 lacked an inventive step starting from example 5C of D2 as the closest prior art (point 3.4.3 of the Reasons).

3.1 Closest prior art

3.1.1 The respondent agreed with the opposition division that document D2 (and in particular the paint composition of example 5C) could be selected as the closest prior art for the subject-matter of claim 1.

3.1.2 The appellant contested the choice of document D2 as the closest prior art. The problem solved by the opposed patent was to maximise the hiding power of opacifying pigments, thereby reducing the amount of pigments needed in paints. D2 would not relate to the objective of improving the hiding power of opacifying pigments. Instead, the level of opacifying pigments in the paints formulations of D2 would be so low that the problem of agglomeration of said pigments would not occur. Conversely, document D14 was a suitable starting

point for the assessment of inventive step, as this document would aim at providing aqueous paint compositions containing titanium dioxide and having improved spacing between pigment particles, thus increasing the efficiency of titanium dioxide.

The appellant further argued that D2 did not have many features in common with granted claim 1 and was therefore not a promising springboard towards the invention.

3.1.3 Irrespective of whether or not D2 is closer to the subject-matter of claim 1 than D14, the relevant question for the Board is whether D2 represents a realistic starting point for a skilled person aiming at the claimed invention (Case Law of the Boards of Appeal, 10th edition, 2022, in the following "Case Law", I.D.3.4.1). In that respect, a central consideration in selecting the closest prior art is that it must be directed to the same purpose or effect as the invention (Case Law, I.D.3.2).

The opposed patent pertains to paint compositions comprising an opacifying pigment such as titanium dioxide (paragraph [0001]). In view of the fact that D2 and in particular its example 5C concerns a paint formulation comprising titanium dioxide, the Board is of the opinion that this example is not an unreasonable starting point and can therefore be chosen as springboard to analyse inventive step of the subject-matter of granted claim 1.

As to the argument that the content of titanium dioxide was too low in the paint formulations of D2, it is noted that the granted claims do not specify a limit for the content of opacifying pigment. Therefore, in

view of the fact that the scope of the granted claims encompasses paint compositions with any content of opacifying pigment, it is also not unreasonable to select the paint of example 5C independently of its content of titanium dioxide.

3.1.4 While it is true that D2 does not explicitly address the objective of improving the hiding power of opacifying pigments, the Board considers that this fact alone cannot justify to dismiss this document as starting point. In that respect, reference is made to decisions T 0698/10 (points 3.3 and 3.4 of the Reasons) and T 0638/16 (point 1.2.6 of the Reasons) in which the respective Boards considered that the closest prior art did not have to disclose all the problems solved by the claimed invention and not even the objective technical problem which is only identified in the next step of the problem-solution approach.

3.1.5 Eventually, although the above reasons are sufficient to justify the choice of D2 as the closest prior art, it should be noted that the paint formulation of example 5C also has many features in common with granted claim 1 (reference is made to the above assessment of novelty in which a single distinguishing feature was identified). From this point of view, it cannot be argued that the paint formulation of example 5C is not a promising springboard towards the claimed invention.

3.1.6 For these reasons, the Board considers that D2, and in particular its example 5C, is a reasonable starting point for assessing inventive step.

3.2 Distinguishing features

The issue of the distinguishing features between granted claim 1 and example 5C of D2 was addressed under novelty (point 2. above).

In that context, the Board came to the conclusion that the subject-matter of claim 1 differed from example 5C of D2 in that the paint composition comprised:

(i) a polymeric pigment dispersant having an acid number between 150 to 250 (whereas the exact acid number of resin XPD-1166 used in example 5C was not known).

3.3 Objective problem to be solved

3.3.1 The appellant considered that the effect of the acid number in D2 was to make the support polymer water soluble to act as a surfactant. At the same time, the acid number should not be too high to prevent the support polymer from re-solubilising after application of the paint (D2, column 2, lines 18-27). Conversely, the opposed patent would provide evidence that the selection of an acid number between 150 and 250 resulted in good absorption of the grafted pigment dispersing additive onto the surface of an opacifying pigment, thereby improving the hiding power and tinting strength of said pigment.

3.3.2 As regards the objective problem to be solved, the Board agrees with the respondent that the opposed patent does not include any comparative example with an acid number below or above the range defined in claim 1. While the exact acid number of resin XPD-1166 is not known, D2 teaches that the support resin has an acid number between 50 and 250 (D2, column 2, lines 12 to 15). In the absence of suitable comparative examples

and in view of the large overlap between the range defined in granted claim 1 (150 to 250) and that of D2 (50 to 250), the Board is therefore of the opinion that it is not credible that distinguishing feature (i) is associated with any technical effect.

3.3.3 The appellant essentially relied on D2 to argue that distinguishing feature (i) was associated with a technical effect. In the Board's view, D2 merely teaches that the acid number should be neither too low (i.e. not below 50) since the support resin would not be water soluble (which is also a requirement of the pigment dispersant in the opposed patent), nor too high (i.e. not above 250) since the support resin might tend to redissolve after application of the paint (D2, column 2, lines 12 to 27). However, D2 does not allow to draw any conclusion as to the sub-range of 150 to 250.

3.3.4 Consequently, in the absence of a suitable comparative example, the objective problem to be solved is formulated as the provision of an alternative paint composition.

3.4 Obviousness

3.4.1 It remains to be evaluated whether it was obvious for a person skilled in the art wishing to provide an alternative to the paint composition of example 5C of D2, to select a support polymer having an acid number between 150 to 250.

3.4.2 The appellant argued that the skilled person wishing to solve the subjective technical problem of the opposed patent (namely to improve the hiding power of opacifying pigments such as TiO_2) would have turned to

D14 which relates to the same objective (paragraph [0002] of D14). However, this document would teach that the acid value of the support resin should be in the range of 9.1 to 17.2 for polymeric particles to adsorb on TiO_2 (appellant's letter dated 11 October 2023, page 10, first to eighth paragraph). Therefore, having no knowledge of the acid number of the support resin in example 5C of D2, the skilled person would have selected an acid number in the range suggested by D14. Therefore, the subject-matter of granted claim 1 would involve an inventive step over D2 in combination with D14.

3.4.3 The Board cannot follow the appellant's line of argument for the following reasons:

(a) As noted above, the objective problem to be solved is merely the provision of an alternative to the paint of example 5C of D2. Although the exact acid number of resin XPD-1166 is not known, the skilled person is not left without guidance. It is in particular indicated in the description of D2 that the acid number of the support polymer should be between 50 and 250 (D2, column 2, lines 12 to 15). Already for that reason, the Board considers that it was an obvious option for a skilled person wishing to provide an alternative paint composition to arbitrarily select a sub-range (such as 150 to 250) within the broader range disclosed in D2.

In fact, a preferred support polymer of D2 is a terpolymer of styrene, alpha-methyl styrene and acrylic acid in a 1:1:1 molar ratio (D2, column 2, lines 41 to 44). The respondent calculated that the acid number of this preferred polymer should be about 190 (letter of 1 February 2023, page 3, sixth

to tenth paragraph), a result which was not contested by the appellant. Therefore, it was also an obvious option for the skilled person wishing to provide an alternative to the paint composition of example 5C to replace the support resin XPD-1166 by a preferred support resin within the disclosure of D2.

(b) The appellant essentially argued that D14 would not have led the skilled person to select an acid number of 150 to 250. For the respondent as opponent, however, it is sufficient to show that the claimed subject-matter was obvious on the basis of D2 alone. Whether a different combination of documents would have resulted in a different outcome is irrelevant and cannot alter the above conclusion.

3.5 Consequently, the subject-matter of granted claim 1 lacks an inventive step starting from example 5C of document D2 as the closest prior art.

Auxiliary request 2

4. Inventive step

4.1 Claim 1 of auxiliary request 2 differs from granted claim 1 in that the polymeric carrier is produced in an emulsion polymerisation process including methyl methacrylate.

4.2 It was not contested by the parties that the additional limitation of present claim 1 was known from example 5C of D2 so that there was no further distinguishing feature deriving from the amendment. In view of that, the Board comes to the conclusion that the subject-

matter of claim 1 of auxiliary request 2 does not involve an inventive step over D2 for the same reasons as outlined above (point 3. above).

Auxiliary request 12

5. Admittance

5.1 Auxiliary request 12 is a new request filed by the appellant with the statement of grounds of appeal. Its admission to the proceedings, which is contested by the respondent, is subject to the discretionary power of the Board in accordance with Article 12 paragraphs (4) to (6) RPBA.

5.2 The respondent considered that auxiliary request 12 should not be admitted because it did not significantly differ from auxiliary request 2 and was therefore *prima facie* not allowable.

5.3 According to the appellant, auxiliary request 12 was filed to overcome the objection of lack of inventive step as set out in the contested decision. The matter of inventive step had not been addressed by the opposition division in their two preliminary opinions. In view of the fact that the full reasoning of the opposition division was only available in the decision under appeal, the appellant did not have an opportunity to properly react during opposition proceedings and could not be expected to file auxiliary request 12 earlier.

5.4 The Board acknowledges that the issue of inventive step had not been addressed by the opposition division during the written proceedings. Furthermore, while various objections of lack of novelty and inventive

step over D2 had been raised by the opponent, the number of possible distinguishing features (at least 5 based on the above discussion under novelty) made it difficult for the patentee to anticipate which of the possible lines of attack could be successful. The Board therefore agrees with the appellant that a proper response to the successful objection of lack of inventive step was difficult, all the more so as the full reasoning of the opposition division was only known from the decision. The Board has therefore no reason to consider that the appellant should have filed auxiliary request 12 during the opposition proceedings.

5.5 The respondent questioned the *prima facie* suitability of auxiliary request 12 to overcome the previous objections of lack of inventive step. The Board cannot agree with this argument for the following reasons:

5.5.1 Claim 1 of auxiliary request 12 was amended with respect to granted claim 1 in that it was specified that

> "the monomer in the emulsion polymerization process that produces the polymeric carrier is methyl methacrylate (MMA)"

5.5.2 Contrary to claim 1 of the higher ranking requests, the monomer of the polymeric carrier is MMA. In view of the fact that the resin of example 5C of D2 is not based only on MMA, the amendment of auxiliary request 12 could constitute a further distinguishing feature and is therefore suitable to address the above objection of lack of inventive step.

5.6 Under these circumstances, the Board finds it appropriate to exercise its discretion under Article

12(4) RPBA by admitting auxiliary request 12 into the proceedings.

6. Inventive step

According to the respondent, the subject-matter of claim 1 of auxiliary request 12 also lacked an inventive step over example 5C of D2 as the closest prior art.

6.1 Closest prior art

The parties did not submit any additional arguments concerning the choice of the closest prior art. Hence, for the above reasons (point 3.1), the Board considers that example 5C of D2 is a suitable starting point to assess inventive step.

6.2 Distinguishing features

Claim 1 of auxiliary request 12 differs from granted claim 1 in that the monomer in the emulsion polymerization process that produces the polymeric carrier is methyl methacrylate (MMA).

In the context of the main request, the Board already concluded that the acid number of the polymeric pigment dispersant was a distinguishing feature between granted claim 1 and example 5C of D2 (distinguishing feature (i)). It is therefore necessary to assess whether the new limitation of claim 1 can justify the presence of an additional distinguishing feature.

6.2.1 According to the respondent, the additional feature of claim 1

"wherein the monomer in the emulsion polymerization process that produces the polymeric carrier is methyl methacrylate"

should be interpreted as

"wherein the monomer in the emulsion polymerization process that produces the polymeric carrier comprise[s] methyl methacrylate" (rejoinder to the statement of grounds of appeal, page 32, *Novelty*).

As MMA is one of the monomers used in example 5C of D2, said feature cannot further distinguish claim 1 from the closest prior art.

6.2.2 In this respect, the Board agrees with the appellant that the wording of claim 1

"the monomer in the emulsion polymerization process that produces the polymeric carrier is methyl methacrylate" (and in particular the use of the verb "be" instead of "comprise")

makes it clear that solely MMA is used for the preparation of the polymeric carrier.

In view of the fact that the polymeric carrier in example 5C of D2 was derived from a monomer mixture comprising MMA and EHA, the additional feature of present claim 1 (requiring MMA alone) constitutes a further distinguishing feature.

6.2.3 Consequently, the subject-matter of present claim 1 differs from example 5C of D2 in that:

(i) the acid number of the polymeric pigment dispersant is between 150 and 250 and

(ii) the monomer producing the polymeric carrier is MMA (instead of a mixture of MMA and EHA).

Distinguishing feature (i) has already been addressed in the context of the main request and was found to be obvious for the skilled person (reference is made to points 3.3 and 3.4 above). The Board will therefore focus on the additional distinguishing feature (ii) and assess whether it can justify the acknowledgement of an inventive step.

6.3 Problem to be solved

6.3.1 According to the appellant, the opposed patent provides evidence that all paint formulations comprising MMA as the only monomer for the polymeric carrier (examples 14, 17, and 19) show improved tint strength compared to examples 13 and 16 where a mixture of MMA and BA (butyl acrylate) was used (table 1 of the opposed patent).

6.3.2 During the oral proceedings before the Board, the respondent argued that examples 17 and 19 of the opposed patent did not fall within the scope of present claim 1 because of the presence of methacrylic acid as an additional monomer. Thus, the only example representative of the claimed subject-matter was example 14.

Moreover, none of the examples proposed by the appellant for comparison with D2 were based on EHA and MMA as monomers for the polymeric carrier. The respondent therefore concluded that the examples of the

opposed patent were not suitable to provide evidence of an effect over example 5C of D2.

6.3.3 According to established case law, the objective technical problem must be derived from effects directly and causally related to the distinguishing features of the claimed invention. In particular the comparison with the closest prior art has to convincingly show that the effect is attributable to the feature distinguishing the invention. The aim of such a comparison is to demonstrate that the technical effect has its exclusive origin in the feature characterising the invention in the claims (Case Law, I.D.4.3.2).

6.3.4 For the Board, the question to be answered is whether a credible technical effect can be inferred from the available experimental evidence that is related to distinguishing feature (ii), i.e. the use of a polymeric carrier derived from MMA as only monomer (instead of a polymeric carrier derived from a mixture of MMA and EHA).

6.3.5 With regard to the experimental evidence in the opposed patent, it is not disputed that example 14 discloses a paint formulation wherein MMA is the only monomer of the polymeric carrier. This example is therefore according to claim 1 of auxiliary request 12. In contrast, examples 13 and 16 disclose formulations wherein the polymeric carrier is derived from a mixture of MMA and BA. It is furthermore shown that the paint derived from example 14 is characterised by a markedly improved tint strength compared to (comparative) examples 13 and 16 (page 17, table 1 of the opposed patent).

In the Board's view, it can be inferred from these examples that the use of MMA as the sole monomer for the polymeric carrier leads to an improved tint strength (compared to a mixture of MMA and BA).

6.3.6 The respondent did not contest the difference in terms of tint strength but essentially argued that the additional monomer used in examples 5C of D2 was EHA and not BA. Therefore, the comparison made in the patent was not suitable to show an effect compared to example 5C of D2. Instead, a valid comparison would require the use of a comparative paint formulation derived from EHA and MMA.

6.3.7 An additional question to be answered by the Board is therefore whether examples 13 and 16 based on BA and MMA can be considered as representative of example 5C of D2 where the polymeric carrier is derived from EHA and MMA.

6.3.8 In order to provide evidence of an effect over the closest prior art, the parties do not necessarily have to reproduce embodiments of the closest prior art. According to the boards' established case law, what is required is that tests comparing the invention with the prior art be conducted in such a way that any effect can be attributed to the distinguishing feature. However, it is also permitted – and might even be necessary – to modify prior-art embodiments in line with the invention to such a degree that the only remaining difference is the feature distinguishing the claim (Case Law, I.D.4.3.2).

6.3.9 In the present case, it is not disputed that the examples of the opposed patent are not based on a mixture of MMA and EHA. However, the Board agrees with

the appellant that EHA and BA are relatively close in terms of structure and properties of the polymer derived therefrom (statement of grounds of appeal, page 28, first paragraph). Consequently, even if examples 13 and 16 are based on MMA and BA, they are considered to be representative of the polymeric carrier derived from MMA and EHA as set out in example 5C of D2.

It follows that the comparison of example 14 with examples 13 and 16 is considered to be suitable to show an effect linked to distinguishing feature (ii) and more specifically to show that said feature can be associated with an improved tint strength of the paint.

6.3.10 In any case, it is also considered that the appellant has discharged its onus of proof by providing some evidence of an effect linked to distinguishing feature (ii) and that the respondent has raised doubts about the relevance of this evidence only at a very late stage of the proceedings (i.e. at the oral proceedings). The burden of proof was therefore shifted to the respondent to show that the specific nature of the comonomer (EHA instead of BA) would have led, as alleged, to conflicting results. In the absence of concrete evidence to support the respondent's view, the Board cannot be convinced by it.

6.3.11 Consequently, based on the examples of the patent, the objective problem to be solved is formulated as the provision of a paint with improved tint strength.

6.4 Obviousness of the solution

It remains to be evaluated whether it was obvious for a skilled person wishing to improve the tint strength of the paint formulation of example 5C to use MMA as the

sole monomer for the polymeric carrier (distinguishing feature (ii)).

6.4.1 The respondent argued that it was obvious in view of the teaching of D1 or D12 to use MMA as the only monomer of a polymeric carrier.

6.4.2 However, for the Board, the relevant question is not whether the distinguishing feature (ii) was known from the prior art, but whether the skilled person would have considered it in the expectation of solving the underlying technical problem (Case Law, I.D.5, "Could-would approach").

6.4.3 In this respect, the Board agrees with the appellant that there was no suggestion in the prior art to use MMA alone in order to improve the tint strength of a paint. In other words, even if distinguishing feature (ii) were known from the available prior art, there was no incentive to use it in order to solve the underlying technical problem.

6.5 As distinguishing feature (ii) is not obvious, the subject-matter of claim 1 of auxiliary request 12 involves an inventive step over example 5C of document D2 as the closest prior art.

7. Article 123(2) EPC - Admittance of the objection

7.1 During the oral proceedings before the Board, the respondent contended that claim 1 of auxiliary request 12 did not comply with the requirements of Article 123(2) EPC.

7.2 The appellant held that the present objection was raised for the first time during the oral proceedings

and should therefore not be admitted into the appeal proceedings.

7.3 Article 13(2) RPBA provides that amendments to a party's case made after notification of oral proceedings are not to be taken into account unless exceptional circumstances, justified by cogent reasons, exist.

7.4 The Board concurs with the approach taken in several decisions (T 247/20, point 1.3 of the Reasons; T 2988/18, point 1.2 of the Reasons; T 2920/18, point 3.4 of the Reasons), according to which the examination under Article 13(2) RPBA is carried out in two steps. The question to be answered in the first step is whether the submission objected to is an amendment to a party's appeal case. If that question is answered in the negative, then the Board has no discretion not to take the submission into account. If, however, that question is answered in the affirmative, then the Board needs to decide whether there are exceptional circumstances, justified by cogent reasons (second step).

7.5 The first question to be answered by the Board is therefore whether the objection under Article 123(2) EPC against auxiliary request 12 constitutes an amendment to the respondent's case.

7.5.1 The respondent argued that this objection was initially raised in the rejoinder to the statement of grounds of appeal in which it was stated that:

> "*The twelfth auxiliary request corresponds to the main request but contains the additional feature "wherein the monomer in the emulsion polymerization*

process that produces the polymeric carrier is methyl methacrylate".

Amendments

According to the patent proprietor, the basis for this feature can be found in [0021] (page 6) of WO2014/099103 (the application of EP2935377B1 as originally filed) reading "preferred monomers in the emulsion polymerization process that produces the carrier polymers may include methyl methacrylate and styrene".

The word "include" means "comprise"." (rejoinder, pages 31 and 32, point 13., first three paragraphs)

7.5.2 The Board however agrees with the appellant that the cited passage of the rejoinder cannot be understood as an objection under Article 123(2) EPC but merely as an interpretation of the amendments made in claim 1 of auxiliary request 12.

7.5.3 Therefore an objection under Article 123(2) EPC against auxiliary request 12 cannot be derived from the written submissions of the respondent. Nor is there any reason to regard this objection as a mere development of the appeal case since there were also no objections under Article 123(2) EPC against the granted claims or auxiliary request 2. Consequently the present objection under Article 123(2) EPC against auxiliary request 12 is an amendment to the respondent's case within the meaning of Article 13(2) RPBA.

7.6 The second question to be answered is whether there are exceptional circumstances, supported by cogent reasons,

which justify the admittance of the present objection into the appeal proceedings.

7.7 The respondent has not provided any explanation for raising this objection only during the oral proceedings, nor does the Board discern any.

7.8 In the absence of any exceptional circumstances, the objection under Article 123(2) EPC is not taken into account (Article 13(2) RPBA).

8. During the oral proceedings before the Board, the respondent stated that they had no novelty, sufficiency, clarity or additional inventive step objections against auxiliary request 12 (minutes of the oral proceedings, page 3, fourth paragraph). As none of the objections raised against auxiliary request 12 is either successful or admitted into the proceedings, the patent is to be maintained on the basis of this request.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the opposition division with the order to maintain the patent on the basis of the claims of auxiliary request 12 filed with the statement of grounds of appeal, after any necessary amendment of the description.

The Registrar: The Chairman:

D. Hampe D. Semino

Decision electronically authenticated