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**Datasheet for the decision
of 9 October 2019**

Case Number: T 1711/16 - 3.3.03

Application Number: 09806065.0

Publication Number: 2373727

IPC: C08K3/26, C08L63/02, C08K9/04

Language of the proceedings: EN

Title of invention:
NANOCALCITE COMPOSITES

Patent Proprietor:
3M Innovative Properties Company

Opponent:
Solvay SA

Relevant legal provisions:
EPC Art. 100(c), 54, 56
RPBA Art. 12(2), 13(1), 13(3)

Keyword:

Documents admitted - discretionary decision of the opposition division overturned
Document admitted - legitimate and timely reaction
Main request - extension beyond the content of the application as filed (yes)
Auxiliary request - novelty (yes)
Inventive step (no) - comparative examples suitable starting point for assessing inventive step
Admittance second to nineteenth auxiliary requests (no) - absence of / late substantiation

Decisions cited:

G 0003/89, G 0010/91, G 0011/91, G 0007/93, G 0004/95,
G 0001/03, G 0002/10, G 0003/14, T 0332/87, T 0217/10



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Case Number: T 1711/16 - 3.3.03

D E C I S I O N
of Technical Board of Appeal 3.3.03
of 9 October 2019

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Decision under appeal: **Interlocutory decision of the Opposition
Division of the European Patent Office posted on
9 May 2016 concerning maintenance of the
European Patent No. 2373727 in amended form.**

Composition of the Board:

Chairman D. Semino
Members: F. Rousseau
C. Brandt

Summary of Facts and Submissions

I. The appeals are against the interlocutory decision of the opposition division posted on 9 May 2016 according to which European patent No. 2 373 727 as amended according to the documents of the first auxiliary request submitted with letter of 4 March 2016 met the requirements of the EPC. The decision was also based on the patent as granted as the patent proprietor's main request.

II. Claims 1 and 6 of the granted patent read as follows:

"1. A composition comprising surface-modified nanoparticles dispersed in a curable resin, wherein the surface-modified nanoparticles comprise calcite cores and a first surface-modifying agent bonded to the calcite, wherein the first surface-modifying agent comprises a binding group ionically bonded to the calcite and a compatiblizing segment compatible with the curable resin, wherein the binding group comprises a phosphonic acid, a sulfonic acid, a phosphoric acid, or a combination thereof, and further wherein the compatiblizing group comprises at least one of a polyethylene oxide, a polypropylene oxide, and a polyester.

6. The composition according to any one of the preceding claims, wherein the first surface-modifying agent comprises zwitterions."

III. The claims of the first auxiliary request differed from those of the main request solely in that claim 6 had been amended to read (for ease of understanding the Board has indicated the modifications in underlined and strikethrough):

"6. The composition according to any one of the preceding claims, wherein the first surface-modifying agent comprises a zwitterions."

IV. The decision was taken having regard to the following documentary evidence amongst others:

D2: JP 2008-101051 A

D2b: certified translation in English of D2

D3: DE 10 2005 047 807 A1

D5: Paint and Coating Testing Manual, Fourteenth Edition of the Gardner-Sward Handbook, J. Koleske, Editor, 1995, pages 23-25

D6: BYK Additives & Instruments, Product Guide L-G 1, Paint Additives, February 2009

D7: WO 2011/084380 A1.

V. According to the reasons for the contested decision claim 1 of the granted patent did not extend beyond the content of the application as filed, as it was based on the disclosure of its claims 1, 4, 6 and paragraphs [0015], [0016] and [0019]. However, the application as filed did not disclose a surface-modifying agent comprising zwitterions, but only that the surface-modifying agent was a zwitterion (paragraph [0005] and claim 9) or that the surface-modifying agent comprised a zwitterion (paragraph [0025]). Accordingly, granted claim 6 extended beyond the content of the application as filed and as a consequence the main request was not allowable. Taking into account of amended claim 6, claims 1 to 14 of auxiliary request 1 met the requirements of Article 123(2) EPC. The objection that the subject-matter was not sufficiently disclosed, because allegedly the disclosure of the patent in suit did not enable the skilled person to broadly use any

kind of phosphate group containing modifying agent was not found to be convincing. The patent in suit gave sufficient guidance how to select the compatibilising segment and the bonding group, one way to carry out the invention being also indicated. The fact that comparative examples 3 and 4 fell within the ambit of claim 1 was merely a question of clarity. D2b which was a certified translation of D2 had been requested by the opposition division in the summons and therefore admitted into the proceedings. Late filed documents D6 and D7 prima facie did not constitute evidence that "Disperbyk-111" used in D2b was a surface-modifying agent according to the definition of claim 1. D6 and D7 were, therefore, not admitted into the proceedings. The objection that examples 5 and 22 of D2 were novelty destroying was not convincing, since those examples were silent about the crystalline form of the calcium carbonate particles used. It was nevertheless noted that the dispersant used in these examples, namely Disperbyk-111, was according to D3 a first surface-modifying agent within the meaning of claim 1 of the patent in suit and that the norbornene resin used in examples 22 was a curable resin. Novelty over D2b was therefore acknowledged. The subject-matter of claim 1 of auxiliary request 1 differed from the specific disclosure provided in claims 1 and 13, paragraph [0032] and table 1 of D2, constituting the closest prior art, in that it used a specific combination of calcite nanoparticles with a specific surface-modifying agent. The results shown in table 3 of the patent in suit rendered it credible that the problem successfully solved over the closest prior art resided in the provision of resin compositions having a reduced viscosity. Neither D2b nor D3 suggested the use of the specific combination of features defined in claim 1 of

auxiliary request 1 in order to solve that problem, so that an inventive step was acknowledged.

VI. Appeals against that decision were lodged by the patent proprietor and by the opponent, their statements setting out the grounds of appeal being submitted with letters of 16 September 2016 and 19 September 2016, respectively.

VII. The statement of grounds of appeal of the patent proprietor included first to nineteenth auxiliary requests, which were indicated to correspond to those already filed before the opposition division. Whereas claim 1 of the first auxiliary request was identical to claim 1 of the granted patent, claims 1 of the second to tenth auxiliary requests differed from claim 1 of the granted patent in the following manner:

Second auxiliary request

- the feature "; and wherein the curable resin comprises an epoxy resin, polyester resin, bismalimide resin, cyanate ester resin, vinyl ester resin, acrylic resin, urethane resin or urethane acrylate resin" was inserted at the end of the claim.

Third auxiliary request

- the feature "; and wherein the curable resin comprises a thermosetting resin" was inserted at the end of the claim.

Fourth auxiliary request

- the feature "; and wherein the first surface-modifying agent further comprises a reactive group

capable of reacting with the curable resin" was inserted at the end of the claim.

Fifth auxiliary request

- the features added to claims 1 of the second and fourth auxiliary requests were inserted in combination.

Sixth auxiliary request

- in addition to the features incorporated in claim 1 of the second auxiliary request, the feature "and wherein the first surface-modifying agent comprises zwitterions" was inserted at the end of the claim.

Seventh auxiliary request

- in addition to the features incorporated in claim 1 of the second auxiliary request, the feature "and wherein the first surface-modifying agent comprises a polyetheramine" was inserted at the end of the claim.

Eighth auxiliary request

- "polyester" was deleted in the list defining the compatibilizing group and the feature "; and wherein the curable resin comprises an epoxy resin" was inserted at the end of the claim.

Ninth auxiliary request

- the feature "; and wherein the composition further comprises core shell rubber particles" was inserted at the end of the claim.

Tenth auxiliary request

- claim 1 contained a combination of the amendments made in claims 1 of the seventh and nine auxiliary requests.

Eleventh to nineteenth auxiliary requests

Claims 1 of those requests were identical to claims 1 of the second to tenth auxiliary requests, as the eleventh to nineteenth auxiliary requests were based on the second to tenth auxiliary requests in which claim 6 (respectively claim 5 in the twelfth to fourteenth auxiliary requests and claim 1 in the fifteenth auxiliary request) had been amended in the same manner as claim 6 in the first auxiliary request.

- VIII. The patent proprietor submitted with its rejoinder to the appeal of the opponent (letter of 6 February 2017) the following document:
- D8: ARTON G Datasheet (<https://plastics.ulprospector.com/datasheet/e19027/arton-g>, 3 February 2017)
- IX. A communication of the Board dated 12 July 2019 sent in preparation for oral proceedings was issued.
- X. Additional submissions were made by the patent proprietor and the opponent with letters of 9 September 2019 and 4 October 2019, respectively.
- XI. Oral proceedings before the Board took place on 9 October 2019.

XII. The patent proprietor's submissions, in so far as they are pertinent, may be derived from the reasons for the decision below. They are essentially as follows:

- (a) Claims 1, 2 and 6 of the main request did not extend beyond the content of the application as filed.
- (b) The subject-matter of the first auxiliary request met the requirements of Articles 123(2) EPC and was sufficiently disclosed. Its novelty over each of examples 5 and 22 of D2 should be acknowledged, in particular as D6 and D7 could not establish the nature of the additive Disperbyrk-111 at the relevant date of D2. An inventive step was also to be recognized, *inter alia* because examples 5 and 22 of D2 as comparative examples of that document did not constitute an appropriate starting point for assessing inventive step.

XIII. The opponent's submissions, in so far as they are pertinent, may be derived from the reasons for the decision below. They are essentially as follows:

- (a) The subject-matter of claims 1, 2 and 6 of the main request extended beyond the content of the application as filed (Article 100 (c) EPC). The same was valid for claims 1 and 2 of the first auxiliary request.
- (b) The subject-matter of claim 1 of the first auxiliary request lacked sufficiency of disclosure and novelty over each of examples 5 and 22 of D2. Stating from any of examples 5 and 22 of D2 as the closest prior art, an inventive step was to be denied taking into account the teaching of D3.

XIV. The patent proprietor requested that the decision under appeal be set aside and the patent be maintained as granted, i.e. to reject the opposition, or, alternatively, that the patent be maintained in amended form according to the first auxiliary request, filed with letter dated 16 September 2016 (statement setting out the grounds of appeal).

Should the Board find the main request and first auxiliary request not to be allowable, it was further requested to remit the case to the opposition division for further prosecution on the basis of the second to nineteenth auxiliary requests, all submitted with letter of 16 September 2016, or alternatively that the patent be maintained on the basis of any of those second to nineteenth auxiliary requests.

It was also requested that documents D6 and D7 not be admitted into the proceedings.

XV. The opponent requested that the decision under appeal be set aside and that the patent be revoked and that the second to nineteenth auxiliary requests, filed with letter dated 16 September 2016 be not admitted into the proceedings.

It was also requested that documents D6 and D7 be admitted into the proceedings and that document D8 be not admitted into the proceedings.

Reasons for the Decision

Admittance of D6 and D7

1. The admission to the proceedings of D6 and D7 which were not admitted into the proceedings by the

opposition division is left to the power of the Board (Article 12(4) RPBA). According to the established case law, in particular decision G 7/93 (OJ EPO 1994, 775), point 2.6 of the reasons, Boards of Appeal should only overturn discretionary decisions of the department of first instance if it is concluded that the department of first instance exercised its discretion according to the wrong principles, or without taking into account the right principles or in an unreasonable way.

- 1.1 D6 and D7 were submitted by the opponent in order to demonstrate that the additive Disperbyk-111 mentioned in D2 and in its translation into English D2b corresponded to additive Disperbyk D-111 described in the patent in suit to be a surface modifying agent within the meaning of operative claim 1. Concerns that the additive Disperbyk-111 might not correspond to Disperbyk D-111 were expressed for the first time by the opposition division in the communication of 29 July 2015 sent out in preparation for oral proceedings. D6 and D7 were submitted by the opponent with a facsimile letter received on 4 March 2016, i.e. within the final date for making submissions set in this communication in accordance with Rule 116(1) EPC. Page 2 of this letter, as well as point 2.4 of the statement of grounds of appeal of the opponent, contain submissions explaining the relevance of D6 and D7, whose passages highlighted by the opponent in its written submissions indeed contain information about additives named Disperbyk-111 and/or Disperbyk D-111. Accordingly, D6 and D7 were therefore timely submitted by the opponent in a fair attempt to dispel doubts about the meaning of Disperbyk-111 expressed by the opposition division.

- 1.2 The point that D6 and D7 were not prima facie relevant in the sense that they could not in the patent proprietor's opinion provide convincing evidence of the identity of products named Disperbyk-111 and/or Disperbyk D-111 is irrelevant to the issue of admittance. The decisive point is rather whether these documents and the submissions made in their respect deal with that issue and were timely submitted, i.e. whether they represent a fair answer to the above mentioned concerns raised by the opposition division.
- 1.3 Accordingly, the Board decides that the discretionary decision of the first instance not to admit D6 and D7 into the proceedings should be overturned (Article 12(4) RPBA).

Admittance of D8

2. D8 is a data sheet concerning the product Arton G submitted by the patent proprietor in its rejoinder to the grounds of appeal of the opponent in order to show that this material, also mentioned in example 22 of D2, is not a curable resin. D8 was submitted in response to the objection raised by the opponent that claim 1 of the patent in suit was anticipated by example 22 of D2. Hence, submissions based on document D8, made with the rejoinder of the patent proprietor, relate to the case under appeal and meet the requirements of Article 12(2) RPBA. In application of Article 12(4) RPBA these submissions shall therefore be taken into account by the Board, unless the Board is of the opinion that the situation is such that they should have been presented already before the opposition division. Considering that the objection for lack of novelty of claim 1 over example 22 of D2 was raised for the first time during the oral proceedings before the opposition division

(point 5.2 of the reasons for the decision, second paragraph) and maintained in the statement of grounds of appeal of the opponent, the filing of D8 by the patent proprietor constitutes not only a legitimate, but a timely response to this objection of the opponent. Therefore, the Board sees no justification to hold inadmissible that document. The question of the probative value of D8, which was doubted by the opponent, is under the present circumstances irrelevant to the admissibility of that document whose admittance as shown above is already justified by the lateness of the attack based on example 22 of D2.

Main request

Article 100 (c) EPC

3. The opponent objected inter alia that the subject-matter of granted claim 6 extended beyond the content of the application as filed. In accordance with the established Case Law of the Boards of Appeal of the EPO, the relevant question to be decided in assessing whether the subject-matter of an amended claim extends beyond the content of the application as filed, is whether after the amendment the skilled person is presented with new technical information (see G 2/10, OJ 2012, 376, point 4.5.1 of the Reasons and Case Law of the Boards of Appeal, 9th Edition, 2019, II.E.1). The amended claims are only allowable if the skilled person would derive their subject-matter directly and unambiguously, using common general knowledge from the whole of the application as filed.
- 3.1 Independently of the question whether claim 6 is open to a clarity objection, said claim is in any event like any part of the patent concerning the disclosure of the

invention open pursuant to Article 100 (c) EPC to the distinct objection that its subject-matter extends beyond the content of the application as filed, in so far as in the present case Article 100 (c) EPC does not constitute a fresh ground for opposition within the meaning of the decision of the Enlarged Board of Appeal G 10/91 (OJ EPO 1993, 420). The patent proprietor's argument that the opponent's objection that the term "the first surface-modifying agent comprises zwitterions" in granted claim 6 extends beyond the content of the application as filed is at best an objection under Article 84 EPC, which objection could not be raised in accordance with the ruling of G 3/14 (OJ EPO 2015, A102), therefore, fails to convince.

3.2 Whereas in the application as filed the first surface modifying agent is defined in claim 9 and in paragraph [0005] on page 2 to be a zwitterion, or is defined in [0025] on page 6 to comprise a zwitterion, granted claim 6, which is objected to by the opponent to extend beyond the content of the application as filed, defines that the first surface modifying agent comprises zwitterions.

3.3 The patent proprietor's argument that the use of the plural form for "zwitterions" stems from the use of the plural form for "calcite cores" in claim 1 is not convincing, since claim 6 as granted uses the singular form for defining the first surface-modifying agent. The patent proprietor was also of the opinion that the term "agent" could be considered as a composition or mixture of a multiplicity of the same molecules, in which case the surface-modifying agent would comprise "zwitterions". This does not change the fact that the term "the first surface-modifying agent comprises

zwitterions" undisputedly covers the use of a surface-modifying agent having a plurality of zwitterions, i.e. at least two or more of different kinds thereof, which in the Board's opinion represents a technical sensible meaning of claim 6. The additional argument of the patent proprietor that this term would be based on paragraph [0006] of the application as filed according to which "In some embodiments, the composition further comprises a second surface modifying agent bonded to the calcite" is also not convincing, since the application as filed has not been shown to describe the combined use of a first and a second surface-modifying agent, each selected within the class of zwitterions. Another basis for the use of a plurality of zwitterions, i.e. at least two or more of different kinds thereof, was not provided by the patent proprietor.

- 3.4 Consequently, the subject-matter of granted claim 6 when read according to its broadest technical sensible meaning results in the skilled person being presented with technical information which was absent from the application as filed. On that basis, the main request is not allowable.

First auxiliary request

4. Auxiliary request 1 differs from the main request in that the wording of claim 6 was reverted to that of claim 9 as filed, thereby overcoming the objection that claim 6 as granted extended beyond the content of the application as filed. This amendment was not objected to by the opponent. Moreover, the Board is not convinced by the opponent's additional objections that claims 1 and 2 of the first auxiliary request (corresponding to claims 1 and 2 as granted) extend

beyond the content of the application as filed or that that the subject-matter of claim 1 is insufficiently disclosed. In view of the negative conclusion in respect of inventive step as set out in points 7 to 9 below, a decision of the Board on these issues is unnecessary.

Novelty

5. Novelty of the subject-matter of claim 1 has been objected in view of each of example 5 ("Preparation of sample No. 5") and example 22 ("Preparation of sample No. 22") of D2 disclosed in its paragraphs [0079] (page 45) and [0090] (page 49), respectively. The passages of D2 indicated refer to the translation of this document D2b. Examples 5 and 22 of D2 concern compositions comprising a resin and carbonate fine particles obtained after a surface treatment with the dispersing additive "Disperbyk-111" of BYK-Chemie GmbH. The parties were in dispute concerning the nature of said dispersing additive, the nature of resins and the crystalline form of the calcium carbonate fine particles used in these examples.

Nature of the dispersing additive

- 5.1 Disperbyk 111 has as described on page 45, paragraph [0079] of D2, a phosphoric acid group, in line with the information provided in Table 1 on page 53 of D2 that this additive is of the type having a "*phosphoric acid system absorptive group*". Having regard to the teaching of D2 relating the dispersing additives (claims 6 and 7; paragraphs [0012] and [0013] and [0033]), it can be understood that the phosphoric acid group of Disperbyk 111 allows adsorption of the additive to the carbonate particles. In view of the information given in

paragraph [0035] of D2 concerning the dispersing additives, Disperbyk 111 must also comprise a polymer chain in order to achieve sufficient affinity of the dispersing additive with the resin in which it is dispersed. D2, however, is silent on the nature of said polymer chain.

5.2 D3, D6 and D7 were cited by the appellant as evidence of the nature of Disperbyk 111 at the relevant date of D2, which was filed on 17 October 2006 and published on 1 May 2008.

5.2.1 D3 is a patent application filed on 7 December 2006. It describes in paragraph [0030] and [0031] that the dispersant Disperbyk®111 of BYK Chemie is a phosphoric acid ester with polyether/polyester side chains, confirming the structural information provided in D2, but specifying in addition the nature of the polymer chains of said product, which as covered by operative claim 1, comprises a polyester.

5.2.2 D7 is a patent application of the present patent proprietor filed on 13 December 2010 whose paragraph [0059] mentions that "*Disperbyk D-111 (Ligand D)*" is a phosphoric acid polyester ligand commercially available from BYK-Chemie GmbH. A compound Ligand D is mentioned in Example 5 of D7, as shown in paragraph [0066] of that document in which it is designated in bracket to be "*Disperbyk-111, phosphoric acid polyester*". It appears therefore that the insertion of a capital D between "Disperbyk" and "-111" in paragraph [0059] of D7 was in error, obviously due to the designation in that document of this dispersing agent as Ligand D. The patent proprietor neither disputed that the designation D-111 was in error, nor indicated as the author of

document D7 what should be the difference between Disperbyk-111 and Disperbyk D-111.

- 5.2.3 The error in the designation of Disperbyk-111 in D7 when using Disperbyk D-111 is also supported by D6 which is a brochure of BYK Additives & Instrument dated February 2009 containing a list of wetting and dispersing additives, including a long list of products designated by the prefix Disperbyk and in addition a numerical code immediately following said prefix. Said list of products designated by the prefix Disperbyk whose codes are arranged by numerical order shows that Disperbyk-111 existed. However, it does not show the existence of a Disperbyk product with a D-111 code, or the existence of Disperbyk products designated with an additional letter.
- 5.2.4 According to the information provided in D7 in paragraph [0050] and Table 2 on page 12, in paragraphs [0015] and [0016] on page 4 and in claim 1, the phosphoric acid and the polyester of Ligand D are a binding group allowing ionic association with the calcite and a compatibilizing group within the meaning of operative claim 1, respectively. Accordingly, D7 confirms that Disperbyk-111 is a dispersing agent within the meaning of operative claim 1.
- 5.3 Moreover, the patent in suit, filed on 17 December 2009, describes in paragraphs [0033] and [0076], Tables 1 and 5, respectively, that Disperbyk D-111 of BYK-Chemie GmbH is a surface modifying agent, also named "phosphoric acid polyester", within the meaning of claim 1 of the patent in suit, which corresponds to operative claim 1. However, as shown above in relation to D6, Disperbyk D-111 of BYK-Chemie

GmbH does not exist and would be understood by the skilled person to read Disperbyk-111.

- 5.4 It follows from the above that D2, D3, D6, D7 and the patent in suit show consistent and converging information concerning the nature of the product Disperbyk 111 of BYK-Chemie over a time span stretching from one year before the filing date of D2 to four years after that date. This is in line with the assumption that in the interest of customers any substantial change of a commercially available product would be likely accompanied by a corresponding change in its designation. On that basis and the analysis provided in above points 5.1 to 5.3 the Board is convinced that Disperbyk 111 of BYK-Chemie as used in D2 comprised both a binding group and a compatibilising group within the meaning of operative claim 1. The respondent's opinion that documents D6 and D7 published after the priority date of the patent in suit could not demonstrate as such the nature of Disperbyk-111 at the relevant date of D2 is not decisive, since neither D6, nor D7 were cited in isolation as a direct evidence of the nature of Disperbyk 111, but alongside additional evidence, i.e. D2, D3 and the patent in suit itself, as part of a body of evidence meant to establish in an indirect manner the nature of that compound at the relevant date of D2.

Crystalline form of the calcium carbonate fine particles

- 5.5 According to the disclosure of D2 the crystalline form of the carbonate fine particles is not restricted, as it can be for example any of a calcite type, an aragonite type, and a vaterite type (page 29, paragraph [0047]). The preparation of the carbonate fine particles used in the examples is described in

paragraphs [0069] to [0072] (pages 40-42) and these specific particles are used both in example 5 and in example 22. D2 does not contain any explicit disclosure of the crystalline form of the carbonate fine particles. The argument by the opponent that the calcite form is the most thermodynamically stable form of calcium carbonate was not disputed. However, the opponent did not provide any evidence demonstrating that the specific conditions used for the preparation of the carbonate fine particles used in the examples of D2 would correspond to kinetic conditions leading to the formation of the calcite form. The arguments of the appellant that the temperature or stirring conditions used in D2 would lead to the most stable form of the calcium carbonate must in the absence of corroborating evidence be considered as an unsubstantiated allegation which therefore must be disregarded. Accordingly, based on the appellant's submissions, the Board cannot conclude that the crystalline calcite form obtained in examples 5 and 22 of D2 is necessarily calcite.

- 5.6 The opponent also argued that the skilled person would read examples 5 and 22 of D2 in the light of the disclosure on page 29, paragraph [0047] of that document according to which any crystalline form for the calcium carbonate can be used, including calcite. However, nothing more appears to be derivable from the bare disclosure of the specific characteristics of the compositions described in examples 5 and 22. In this respect, D2 does not contain any indication even implicit that the preparation of these examples 5 and 22 should be repeated using any other crystalline form of carbonate calcium described in paragraph [0047]. Decision T 0332/87 referred to by the opponent is anterior to the opinion and decision of the Enlarged Board of Appeal defining the concept of disclosure

(opinion G 3/89 and decision G 11/91, OJ EPO 1993, 117 and 125), reaffirmed in G 2/10 (OJ EPO 2012, 376), which concept of disclosure, namely what a skilled person would derive directly and unambiguously, using common general knowledge, and seen objectively and relative to the relevant date, from the whole document, is also employed for the purposes of Article 54 EPC (decisions of the Enlarged Board of Appeal G 1/03, OJ EPO 2004, 413, point 2.2.2 of the Reasons and G 2/10, supra, point 4.6 of the Reasons).

Nature of the resin

- 5.7 It is undisputed that examples 5 and 22 do not explicitly disclose the use of a curable resin.
- 5.7.1 The resin used in example 5 of D2 is described to be a cellulose acetate propionate resin (paragraph [0075], page 43). Even if, as alleged by the opponent on the basis of D5 (page 23, left-hand column, first paragraph), a cellulose acetate propionate resin necessarily contained hydroxyl groups, this does not imply that the amount of hydroxyl groups of the resin used in example 5 of D2, which is unknown, would be sufficient to allow this resin to be curable, i.e. to cross-link, harden or lose its solubility, i.e. to undergo significant structural transformation if a curing step were performed. This, as outlined by the patent proprietor, is indirectly shown in D5 which specifies on the same page in the paragraph "Factors affecting performance of cellulose esters in coatings" that for cellulose acetate butyrate resins a level of hydroxyl higher than 5% is accompanied with a reactivity increase providing crosslinking capability with amino and isocyanate resins. This constitutes for the Board sufficient evidence that similar resins such

as cellulose acetate propionate resins will become curable, only if they contain a sufficient level of hydroxyl groups, which level however is unknown for the resin used in example 5 of D22.

- 5.7.2 The resin used in Example 22 of D2 is described to be a binder comprising a norbornene resin (Arton G by JSR Corporation) (paragraph [0090] on pages 48 and 49). The opponent did not provide any evidence that this specific resin is curable. D8 is a data sheet concerning a product having this trade name which is mentioned to be a thermoplastic material. Even if D8 alone cannot prove the meaning of Arton G at the relevant date of D2, because it has not been shown to concern the product sold at that time, D8 already indicates the possibility that norbornene resins are not necessarily curable. This also is in any event well known in the art, as the polymerisation process used might include a subsequent hydrogenation step. Therefore, even if the initial polymerisation leads to repeating units containing unsaturations, norbornene resins may, but do not necessarily contain double bonds.
- 5.7.3 Accordingly, no evidence was submitted demonstrating that the resin used in example 5 or 22 of D2 are implicitly understood by the skilled person to be curable.
6. On that basis, the Board concludes that the subject-matter of claim 1 has not been shown to be anticipated by the compositions described in either example 5 ("Preparation of sample No. 5") or example 22 ("Preparation of sample No. 22") of D2, since it was not shown that these compositions comprise calcium carbonate particles in the calcite form and a resin

which is curable. Novelty of the claimed subject-matter is therefore acknowledged.

Inventive step

Closest state of the art

7. The opponent substantiated its objection for lack of inventive step starting from examples 5 and 22 of D2 as the closest prior art, whereas the patent proprietor argued that those examples could not constitute the closest prior art for the purpose of assessing inventive step as they are presented as comparative examples.

7.1 According to established case law the closest prior art for the purpose of assessing inventive step is that which corresponds to a purpose or effect similar to that of the invention and requiring the minimum of structural and functional modifications (Case Law, *supra*, I.D.3.1). As shown in paragraph [0001], [0003], [0014], [0063], [0064], [0070] to [0079] of the specification, the patent in suit aims at providing curable resin compositions comprising dispersed nanocalcite particles, i.e. highly dispersed calcite particles in a curable resin.

7.2 D2 whose examples 5 and 22 are comparative examples and have been analysed above in relation to novelty concerns a surface treatment method of fine carbonate particles used for resin compositions and a resin film in which said carbonate fine particles are highly dispersed (claims 1, 13 and 14; page 7, paragraph [0001]; page 10, lines 1-9; paragraph [0102] on pages 53 and 54, Table 1). According to the invention of D2 the carbonate particles are treated both with a surface

modifier including a carboxylic acid group and a dispersing additive (claims 1, Table 1) in order to achieve a suitable state of dispersion of the fine carbonate particles. In the experimental part of D2, the dispersibility of the treated or non treated carbonate particles is measured in ethanol, in a binder liquid comprising a resin and in a resin film obtained after casting and drying (paragraphs [0074] to [0076], [0080] and [0098] to [0101]). An assessment of the dispersibility of the treated and non treated carbonate particles is indicated in Table 1. This assessment was made by a measure of the sedimentation velocity for ethanol dispersions, by a turbidity measurement for the resin binder liquids and by haze measurements for the resin films (paragraphs [0098] to [0101]).

7.3 One of the dispersing additives taught in D2 is Disperbyk-111 which as shown above point 5.4 is a surface modifying agent in accordance with operative claim 1. As indicated in above point 5.1 paragraph [0035] of D2 teaches that the polymer chain of Disperbyk-111 allows affinity of the dispersing additive with the resin, while its phosphoric acid group provides adsorption to the carbonate particles. A comparison in Table 1 of sample 1 using untreated fine calcium carbonate particles and of sample 5 using the same calcium carbonate particles treated only with Disperbyk-111 as dispersing additive, i.e. with no surface modifier including a carboxylic acid group rendering this example comparative, shows that a treatment of the fine calcium carbonate particles with the sole Disperbyk-111 already provides a significant improvement of their dispersibility in resins and in haze values measured on a film based on the same resin. The results obtained with the sole Disperbyk-111 are even close to those obtained for sample 6 representing

an example of the invention according to D2. On that basis the skilled person understands that Disperbyk-111 is a useful additive for obtaining highly dispersed fine calcium carbonate particles in resins.

- 7.4 Under these circumstances, the Board agrees with the the view of the opponent that the disclosure relating to examples 5 and 22 of D2 represents a realistic starting point for the skilled person concerned with the goal of the present invention.
- 7.5 Contrary to the patent proprietor's opinion the mere existence of several distinguishing features of the claimed subject-matter over examples 5 and 22 of D2, namely the use of curable resin and of calcium carbonate in the calcite form, or the mere fact that examples 5 and 22 are comparative examples of D2 do not disqualify them as a starting point for the claimed invention. What counts is that the technical teaching relating to those comparative examples is promising in the sense that the skilled person would have had good reason to take it as the starting point for further development in order to achieve the objectives set out in the patent in suit.
- 7.6 In the case of D2, samples 5 and 22 are marked comparative despite the use of Disperbyk-111 leading to highly dispersed fine calcium carbonate particles in a resin, because claim 1 of D2 requires the additional use of a surface modifier including a carboxylic acid group in order to achieve even lower haze values making the obtained resin films suitable for optical films (paragraph [0063] bridging pages 36 and 37 and paragraph [0067] on page 39). When as in the present case the skilled person does not seek to provide resin compositions suitable for optical films, it is

sufficient and therefore reasonable for him to start from compositions on the basis of which a suitable degree of dispersions of the calcium carbonate particles in a curable resin can be expected, namely from compositions such as those disclosed with samples 5 and 22 of D2.

- 7.7 Consequently, the disclosure relating to samples 5 and 22 of D2 is taken as the closest prior art and as the starting point for assessing inventive step. As indicated above in relation to novelty, the subject-matter of claim 1 differs from the closest prior art in that the resin used is curable and the calcium carbonate is in the calcite form.

Problem successfully solved

8. Having regard to the disclosure of the closest prior art, the patent proprietor and the opponent were divided as to which problem could be considered to be successfully solved by the subject-matter of operative claim 1. Relying on the experimental results described in the patent in suit, the patent proprietor argued that the technical problem solved by the subject-matter of claim 1 over the closest prior art was the provision of curable resin compositions comprising nanoparticles of calcium carbonate and having low viscosity, whereas the opponent submitted that the problem solved by the claimed subject-matter was to provide an alternative to the resin compositions of the closest prior art based on the argument that the comparisons offered with the experimental part of the patent in suit lacked pertinence.

- 8.1 The problem to be determined is that solved over or in comparison with the closest prior art, namely the resin

compositions of samples 5 or 22 of D2 which comprise Disperbyk-111 as dispersing additive. The formulation of a problem defining in absolute terms a level of viscosity without any comparison with the closest prior art cannot be accepted. It is unknown whether the level of viscosity obtained with the claimed compositions is higher, similar or lower than in the closest prior art, since the sole experimental evidence relied upon by the patent proprietor, namely those summarized in Table 3 on page 9 of the specification, only demonstrate the influence of the dispersing additive on the viscosity of the resin composition, which dispersing additive however does not constitute a distinguishing feature over the closest prior art. In other words, those experimental data do not provide a comparison of viscosity values between the claimed resin compositions and those of the closest prior art, nor do they demonstrate that the specific form of calcium carbonate defined in operative claim 1 or a curable resin would in comparison to a different calcium carbonate form or in comparison to the resin of the closest prior art have an impact on the viscosity of the composition. Therefore, the formulation of the problem by the patent proprietor cannot be accepted.

- 8.2 Accordingly, the problem solved by the subject-matter of claim 1 over the closest prior art can only be formulated, in line with the arguments presented by the opponent, as the provision of further resin compositions comprising dispersed calcium nanoparticles.

Obviousness

9. It remains to be decided whether or not the proposed solution to the above problem, i.e. the use of a

curable resin and of calcium carbonate in the calcite form, was obvious to the skilled person in view of the state of the art. The opponent referred to D2 and D3. In case of the existence of more than one distinguishing feature over the prior art and in the absence of any synergistic effect arising from their combination, it has to be examined whether each of these features, taken singly, would be derivable from the prior art in an obvious way when starting from the closest prior art (Case Law, *supra*, I.D.9.2.2).

- 9.1 As indicated by the opponent the use of a calcite type calcium carbonate to provide resin compositions comprising dispersed calcium nanoparticles is known from D2 (page 29, paragraph [0047]).
- 9.2 Furthermore, the skilled person faced with the above problem would consult D3 which concerns plastic and adhesive compositions comprising nanoparticles coated with a dispersant, especially Disperbyk®111 whose phosphoric groups are described to interact with the surface of the nanoparticles (claim 29, paragraphs [0029] to [0031] and claim 6). As outlined by the opponent, D3 describes in this context the use of curable resins, for example epoxy resins, or the use of calcium carbonate for the nanoparticles (paragraphs [0051], [0055], [0056]).
- 9.3 In view of the above, the skilled person merely aiming at providing further resin compositions comprising dispersed calcium nanoparticles would have found obvious in the light of D2 and D3 to use calcite nanoparticles and to replace the resins used in the closest prior art by an epoxy resin, thereby arriving in an obvious manner at a composition falling within the ambit of claim 1 of first auxiliary request.

- 9.4 It is therefore concluded that the subject-matter of claim 1 of the first auxiliary request which encompasses obvious embodiments does not meet the requirements of Article 56 EPC.

Second to nineteenth auxiliary requests

10. The second to nineteenth auxiliary requests were submitted with the statement setting out the grounds of appeal of the patent proprietor. They had already been submitted before the opposition division with letter of 4 March 2016, i.e. one month before the oral proceedings. There is nothing in the contested decision or the minutes of the oral proceedings showing that the admittance of those auxiliary requests was discussed, let alone decided upon. There was in fact no need to take this decision, once it had been decided that the first auxiliary request met the requirements of the EPC. Accordingly, the admittance of the second to nineteenth auxiliary requests needs to be decided upon.

- 10.1 It is the established case law of the boards of appeal that the appeal procedure is designed to ensure that the proceedings are as brief and concentrated as possible and ready for decision at the conclusion of oral proceedings, if scheduled. As indicated in the Case Law (*supra*, IV.E.4.2.4), the RPBA taken as a whole make it clear that appeal proceedings are primarily written in nature, an important aim of Article 12 and Article 13 RPBA being that the parties' submissions are concentrated at as early a stage as possible so that the case is as complete as possible when it comes to examining it, oral proceedings being in principle appointed at a point in time when the written

submissions of all parties are complete (see decision G 4/95, point 4 of the reasons).

- 10.2 Under Article 12(2) RPBA, it must be set out in the statement of grounds or the reply thereto why it is requested that the decision under appeal be reversed, amended or upheld. If auxiliary requests are submitted, reasons usually have to be given to explain how they overcome the relevant objections, at least if this is not obvious from the amendments made (Case Law, *supra*, IV.E.4.2.4, citing T 0217/10).
- 10.3 The statement of grounds of appeal of the patent proprietor and its rejoinder to the statement of grounds of the opponent contain in respect of the second to nineteenth auxiliary requests a mere identification of the amendments incorporated and their basis in the application as filed. However, the merits of these auxiliary requests with respect to inventive step could only be considered in a meaningful manner if reasons in support of those auxiliary requests had been stated. This in the present case would have required not only arguments concerning whether those amendments represented further distinguishing features over the closest prior art, but also an indication why those amendments would lead to a different formulation of the problem successfully solved and to a different assessment of the obviousness of the claimed solution. This also would have required an indication of the pertinent passages of the relevant prior art, i.e. of the closest prior art and the other documents relied on by the opponent in combination thereof, in order to allow for the Board and the opponent to take position in respect of those auxiliary requests. Hence, the submissions made in respect of the second to nineteenth auxiliary requests by highlighting the amendments

inserted constituted at most an invitation to the Board and the opponent to explore the various approaches proposed by the patent proprietor leaving up to them to guess the assessment made by the patent proprietor of the prior art and its significance on the analysis of inventiveness of the claimed compositions.

10.4 Accordingly, the arguments provided in support of the second to nineteenth auxiliary requests either in the statement of grounds of appeal of the patent proprietor or in its reply to the statement of grounds of the opponent did not constitute a proper substantiation within the meaning of Article 12(2) RPBA.

10.5 The patent proprietor submitted that in the absence of any objection, let alone arguments or comments, by the opponent in relation to those auxiliary request, it was legitimate in the interest of procedural economy to avoid unnecessary work and wait for the position of the opponent, especially as the opponent might file new objections, new prior art documents, possibly leading to a change of the starting point for assessing inventive step. The patent proprietor's view is in conflict with the necessity to provide a proper substantiation supporting new claim requests, specified in Article 12(2) RPBA, reflecting the principle that once the legal presumption of validity of a granted patent has been successfully rebutted, it is up to the patent proprietor to persuade the Board that a modified version of it overcomes the objection(s) leading to the conclusion that the granted patent or a previous modified version of it lacked validity. Accepting that the behaviour of the patent proprietor was legitimate, would force as explained above the Board and the opponent to guess the various approaches proposed by the patent proprietor, which contrary to the patent

proprietor's opinion cannot serve the economy of the procedure.

10.6 A proper substantiation for the second to eight and eleventh to seventeenth auxiliary requests was neither submitted in the additional letter of 9 September 2019, nor during the oral proceedings before the Board. The substantiation submitted in respect of these auxiliary requests did not go beyond identifying the features inserted in their claims 1, which concerned the nature of the resin and/or the nature of the surface-modifying agent and the argument that they represented further distinguishing features over examples 5 and 22 of D2, indication being made that the arguments in favor of patentability provided in respect of granted claim 1 equally applied to those auxiliary requests. Accordingly, the Board finds it appropriate to make use of the power pursuant to Article 12(4) RPBA by holding the second to eight and eleventh to seventeenth auxiliary requests inadmissible.

10.7 Concerning the ninth, tenth, eighteenth and nineteenth auxiliary requests, the substantiation of those requests was based on an analysis of inventive step provided only with the patent proprietor's letter of 9 September 2019. Such auxiliary requests which were not self-explanatory are therefore considered by the Board to have been formally submitted only on the date of their substantiation, i.e. with letter of 9 September 2019 (Case Law, supra, IV.E.4.2.4). This constitutes an amendment to the patent proprietor's case, the admissibility of which has to be judged on the basis of Article 13(1) RPBA. The analysis of the patent proprietor, however, was based on a reformulation of the problem solved by the claimed subject-matter having regard to the mandatory use of

core shell rubber particles and on an indication as to why the solution to this problem was not obvious in the light of the prior art cited. Admitting into the proceedings such submissions and therefore these auxiliary requests, deemed to be filed only one month before before the oral proceedings, would however have necessitated adjournment of the oral proceedings in order to safeguard the opponent's rights to fair proceedings. On that basis the ninth, tenth, eighteenth and nineteenth auxiliary requests are not admitted into the proceedings under Article 13(3) RPBA.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The patent is revoked.

The Registrar:

The Chairman:



B. ter Heijden

D. Semino

Decision electronically authenticated