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**Datasheet for the decision
of 12 October 2022**

Case Number: T 1455/19 - 3.3.03

Application Number: 11756193.6

Publication Number: 2548916

IPC: C08K9/04, A61K6/06, A61K47/04,
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A61K6/027, C09C1/36, C09C1/30,
A61K6/083, B82Y30/00

Language of the proceedings: EN

Title of invention:
ORGANIC/INORGANIC COMPOSITE FILLER AND MANUFACTURING METHOD
THEREFOR

Patent Proprietor:
Tokuyama Dental Corporation

Relevant legal provisions:
EPC Art. 54, 56, 100(b)
RPBA Art. 12(4)

Keyword:
Late-filed fact - admitted (no)
Grounds for opposition - insufficiency of disclosure (no)
Novelty - (yes)
Inventive step - (yes)

Decisions cited:

T 0927/04, T 0666/09, T 1817/15, T 0058/19



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Case Number: T 1455/19 - 3.3.03

D E C I S I O N
of Technical Board of Appeal 3.3.03
of 12 October 2022

Appellant: RPE GmbH
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Decision under appeal: **Interlocutory decision of the Opposition
Division of the European Patent Office posted on
25 April 2019 concerning maintenance of the
European Patent No. 2548916 in amended form.**

Composition of the Board:

Chairman D. Semino
Members: O. Dury
W. Ungler

Summary of Facts and Submissions

I. The appeal of the opponent is against the interlocutory decision of the opposition division concerning maintenance of European patent No. 2 548 916 in amended form according to the claims of the main request filed with letter of 21 February 2018 and a description adapted thereto.

II. The following documents were *inter alia* cited in the decision under appeal:

D1: JP 2003-12 460

D1a: Automated English translation of D1

D3: JP 2008-37 952

D3a: Automated English translation of D3

D4: Synthesis of Poly(methyl methacrylate)/Silica Nanocomposite Through Emulsion Polymerization Using Dimethylaminoethyl Methacrylate; Barari et al., J. Appl. Polym. Sci., Vol. 110, 929-937, 2008

D5: Novel Zwitterionic-Polymer-Coated Silica Nanoparticles; Jia et al.; Langmuir, 25, 3196-3199, 2009

D6: US 4,781,940

D7: Experimental report regarding two samples prepared according to D6, Thermoscientific, Report date: 10 January 2019

III. In that decision the following conclusions were reached:

- The main request met the requirements of Article 123(2) and (3) EPC as well as those of

sufficiency of disclosure;

- Documents D6 and D7 were admitted into the proceedings;
- The main request was novel over D3 and D6;
- The main request involved an inventive step in view of the combinations of either:
 - D3 as the closest prior art with D6;
 - D1 as the closest prior art with D6;
 - D6 as the closest prior art with D7;

For these reasons, the patent amended according to the main request was held to meet the requirements of the EPC.

IV. The opponent (appellant) filed an appeal against the above decision and, together with the statement of grounds of appeal, filed the following document:

D10: Experimental Report relating to Example 1 of D3

V. In their rejoinder to the statement of grounds of appeal, the patent proprietor (respondent) made reference to the following inventor's declaration filed with the rejoinder to the notice of opposition (letter of 21 February 2018):

E0: Declaration by T. Yamazaki dated 16 July 2016

Also, the following documents were filed:

E1: Declaration by T. Yamazaki related to a rework

of example 1 of D3

E1a: Experimental report made by Quantachrome Corporation in relation to sample ID "SD-powder", dated 25 November 2019

E1b: Experimental report made by Quantachrome Corporation in relation to sample ID "D3A", dated 6 December 2019

E1c: Experimental report made by Quantachrome Corporation in relation to sample ID "CF-Patented", dated 17 December 2019

- VI. The parties were summoned to oral proceedings and a communication pursuant to Article 15(1) RPBA 2020 was then issued by the Board.
- VII. With letter of 14 September 2022 the respondent filed nine sets of description, adapted to each of the operative auxiliary requests.
- VIII. With letter of 4 October 2022 the respondent filed an English translation of tables 1 and 2 of D3.
- IX. At the beginning of the oral proceedings which were held on 12 October 2022 in the presence of both parties the respondent withdrew their request that D6 and D7 be not admitted into the proceedings and requested that E1 and E1a to E1c be admitted irrespective of the admittance of D10 into the proceedings.
- X. **The final requests of the parties were as follows:**
- (a) The appellant requested that the decision of the opposition division be set aside and that the patent be revoked.

(b) The respondent requested that the appeal be dismissed or, in the alternative, that the patent be maintained in amended form according to the claims of any of auxiliary requests 1 to 9 filed with the rejoinder to the statement of grounds of appeal and a description adapted thereto as filed with letter of 14 September 2022.

XI. Claims 1, 5 and 8 of the **main request**, which are the sole claims relevant for the present decision, read as follows:

"1. An organic-inorganic composite filler with an average particle size of 3 to 100 μm , comprising:

inorganic agglomerated particles surface-treated with a hydrophobing agent, comprising agglomerates of inorganic primary particles with an average particle size of 10 to 1,000 nm;

an organic resin phase with which a surface of each inorganic primary particle is coated and with which the inorganic primary particles are bonded together; and

intra-agglomerate voids that are formed between parts of the organic resin phase, with which the surface of each inorganic primary particle is coated, and have a pore volume of 0.01 to 0.30 cm^3/g as measured by mercury intrusion porosimetry, wherein the pore volume corresponds to the volume of pores with pore sizes in the range of 1 to 500 nm."

"5. A method of manufacturing the organic-inorganic composite filler according to claim 1, comprising the steps of:

immersing inorganic agglomerated particles surface-treated with a hydrophobing agent, which comprise agglomerates of inorganic primary particles with an average particle size of 10 to 1,000 nm, in a polymerizable monomer solution containing 100 parts by mass of an organic solvent, 3 to 70 parts by mass of a polymerizable monomer, and a polymerization initiator in the amount of 0.01 to 30 parts by mass based on 100 parts by mass of the polymerizable monomer;

removing the organic solvent from the inorganic agglomerated particles after the immersion;

polymerizing and curing the polymerizable monomer with which the inorganic agglomerated particles are impregnated."

"8. A dental curable composition, comprising:

the organic-inorganic composite filler according to any one of claims 1 to 4;

a polymerizable monomer in the amount of 10 to 100 parts by mass based on 100 parts by mass of the organic-inorganic composite filler; and

a polymerization initiator in the amount of 0.01 to 10 parts by mass based on 100 parts by mass of the polymerizable monomer."

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

- (a) Document D10 should be admitted into the proceedings;
- (b) The main request did not meet the requirements of sufficiency of disclosure;
- (c) The subject-matter of claim 1 of the main request was not novel over D3 alone or in view of D10 as well as over D6 as demonstrated by D7;
- (d) The subject-matter of claims 1 and 8 of the main request was not inventive starting from document D3 as the closest prior art;
- (e) The subject-matter of claim 5 of the main request was not inventive starting from document D1 as the closest prior art.

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

- (a) Document D10 should not be admitted into the proceedings;
- (b) Documents E1 and E1a to E1c should be admitted into the proceedings and this, even if D10 were not to be admitted;
- (c) The main request met the requirements of sufficiency of disclosure;
- (d) The subject-matter of claim 1 of the main request was novel over both D3, either alone or in view of D10, and D6, even in the light of D7;

- (e) The subject-matter of claims 1 and 8 of the main request was inventive starting from D3 as the closest prior art;
- (f) Even if D1 were to be considered as a document that could be suitably taken as the closest prior art, which was contested, the subject-matter of claim 5 of the main request was inventive starting from D1.

Reasons for the Decision

Main request

- 1. Admittance of document D10
 - 1.1 Considering that D10 was filed with the statement of grounds of appeal, the (non)admission to the proceedings of that document and of the submissions based thereon is regulated by the provisions of Article 12(4) RPBA 2007 (see Article 25(2) RPBA 2020), according to which the Board has the power to hold inadmissible facts and evidence which could have been presented in the first instance proceedings.
 - 1.2 According to established case law, the primary object of opposition-appeal proceedings is to obtain a judicial review of the opposition decision (Case Law of the Boards of Appeal of the EPO, 10th edition, 2022, V.A.5.11.1). In that respect, it is a matter for each party to submit all facts, evidence, arguments and requests relevant for the enforcement or defence of its rights as early and completely as possible, in particular in *inter partes* proceedings, in order to act fairly towards the other party and, more generally, to

ensure due and swift conduct of the proceedings (Case Law, *supra*, V.A.5.1.2, 5.2.1, 5.4.2.b, 5.11.1 and 5.11.3.a). Therefore, the question has to be answered whether there are objective reasons why the appellant could have been expected to submit D10 already in the first instance proceedings.

- 1.3 D10 is an experimental report regarding the determination of the pore volume concerning a filler prepared as a rework of example 1 of D3 (as described on page 10 of the statement of grounds of appeal). D10 was filed to show that the feature "pore volume of 0.01 to 0.30 cm³/g" specified in operative claim 1, which was not explicitly disclosed in D3/D3a, was nevertheless met in said example 1 of D3/D3a, i.e. said feature was implicitly disclosed.
- 1.4 However, the feature "pore volume of 0.01 to 0.30 cm³/g" was already present in claim 1 as granted. In addition, D3/D3a was already cited in the patent in suit ("Literature 2" mentioned in paragraphs 11 to 15) and was already relied upon in the notice of opposition as a document to be taken as the closest prior art for the assessment of inventive step (page 10: section 2). Under these circumstances, the Board sees no compelling reasons why D10 and the submissions regarding lack of novelty over example 1 of D3/D3a could not have been filed already during the opposition proceedings.
- 1.5 It is further derivable from the file history that the feature "pore volume of 0.01 to 0.30 cm³/g", which was not explicitly disclosed in D3/D3a, was crucial from the very beginning since it was indicated by the opponent themselves as constituting the sole distinguishing feature over D3/D3a (notice of opposition: page 10, last paragraph, whereby reference

is erroneously made to D2). In view of this and also taking into account that it was not contested by the appellant that the novelty objection based on example 1 of D3/D3a was firstly raised at a very late stage of the proceedings, namely during the oral proceedings before the opposition division, it would have been expected that the appellant provided at that moment all the necessary evidence in support of their case, in particular any information related to the missing feature "pore volume of 0.01 to 0.30 cm³/g". However, the appellant decided deliberately at that stage not to provide any experimental evidence but merely to rely on the argument that the process used in D3/D3a to fill the pores was equivalent to the use of a solvent as in the patent in suit, which, in the absence of any supporting evidence, was in the Board's view nothing more than an assumption, as in fact acknowledged by the appellant themselves (letter of 12 August 2022: page 2, sections 1.3 and 1.4).

1.6 Considering that D10 was effectively filed to corroborate an assumption made earlier by the opponent in their objection of lack of novelty based on D3/D3a, the appellant held that D10 was filed in reaction to the decision under appeal, in order to support an argument which did not convince the opposition division (letter of 12 August 2022: sections 1.9 and 1.10).

1.6.1 However, the issue whether or not the filler prepared according to example 1 of D3/D3a met the requirements of operative claim 1 in terms of the pore volume was discussed at the oral proceedings before the opposition division for the first time because the objection of lack of novelty was only raised by the appellant at that stage and this, although they had until then accepted that said feature was not met and effectively

constituted a distinguishing feature. Therefore, it is understandable that there was no need for the patent proprietor or the opposition division to take position in that respect earlier but that the opposition division nevertheless had to take a decision in that respect in the decision under appeal.

1.6.2 In addition, considering that no experimental evidence was filed at the oral proceedings before the opposition division in support of the submission that said feature was implicitly met, it is not surprising that said objection of lack of novelty, which was based on a mere assumption, did not succeed.

1.6.3 Therefore the issue regarding lack of novelty over example 1 of D3/D3a had to be addressed for the first time at the oral proceedings before the opposition division as a consequence of the late submission of that objection by the appellant themselves. Under these circumstances, the Board cannot recognise that the appellant was unexpectedly confronted with a new procedural situation at the oral proceedings before the opposition division, which could have justified the filing of D10 with the statement of grounds of appeal, apart from a situation that they created themselves.

1.6.4 For these reasons, the filing of D10 cannot be seen as a legitimate reaction to the decision under appeal.

1.7 In the circumstances of the present case, the fact that the appellant's objection of lack of novelty based on D3/D3a complemented with D10 which was submitted with the statement of grounds of appeal follows the same line of argumentation as the one already put forward at the oral proceedings before the opposition division is not sufficient to justify the admittance of D10 into

the proceedings, contrary to the appellant's view (letter of 12 August 2022: sections 1.9 to 1.11). Indeed, what is relevant here is that the opponent changed their analysis of document D3/D3a at the very last opportunity (namely, at the oral proceedings before the opposition division) and without providing all the necessary evidence in support of their case. Under these circumstances, admitting D10 into the proceedings at the appeal stage would go against the well admitted principle that in *inter partes* proceedings it is a matter for each party to submit all facts, evidence and arguments relevant for its case as early and completely as possible in order to act fairly towards the other party (see section 1.2 above). In the Board's view, by submitting the objection of lack of novelty over example 1 of D3/D3a only at the oral proceedings before the opposition division and without relying on convincing evidence in support of their case, the opponent did not contribute to a due and swift conduct of the proceedings and did not allow the opposition division to consider all the relevant facts of the case to take position on that issue. In that regard, the argument that it was impossible to provide D10 during the first instance proceedings is rejected (letter of 12 August 2022: end of section 1.11) since D10 could undoubtedly have been filed in due time if the objection had been raised earlier, e.g. in the notice of opposition, or if said objection had at least been announced earlier by the opponent, optionally with a request to postpone the oral proceedings, which was not done.

- 1.8 In the statement of grounds of appeal, the appellant argued that D10 should be admitted because the content of D3/D3a was presented in a misleading manner in the patent in suit.

However, considering that D3/D3a was relied upon by the opponent in their notice of opposition, the Board considers that it would have been the opponent/appellant's responsibility to indicate already at that stage how they read said document themselves, and this, independently of the manner how the patent in suit reflected the content of D3/D3a. In that respect, it is noted that at that stage, the opponent/appellant considered that D3/D3a was not novelty destroying, as pointed out by the respondent (rejoinder: page 5, fifth paragraph). For that reason, the appellant's argument is not persuasive.

- 1.9 In their letter of 12 August 2022, the appellant argued that D10 should be admitted into the proceedings in view of the conclusions reached - among others - in decisions T 927/04, T 666/09, T 1817/15 and/or T 58/19.

However, it was not shown that any of these cases dealt with the issue of the admittance of additional experimental evidence filed with the statement of grounds of appeal in order to complete a new objection, which was raised for the first time by the opponent themselves at the oral proceedings before the opposition division in view of a document which was until then held not to anticipate the subject-matter being claimed. The Board is also satisfied that this is not the case for the following reasons:

- In decision T 927/04, some additional documents filed by the opponent with the statement of grounds of appeal were admitted into the proceedings taking into account that they completed the chain of evidence regarding an objection of an alleged public prior use which had been already raised

previously in writing (points 2.15 to 2.17 of the reasons). In that respect, it is derivable from the file history that the alleged public prior use was already relied upon in the notice of opposition, i.e. at the outset of the opposition proceedings (see arguments related to D5 and D6 in the notice of opposition as well as the comments made in section IX.B of EPO form 2300; see also opponent's letter of 7 March 2003);

- In decision T 666/09, additional experimental evidence filed with the patent proprietor's statement of grounds of appeal were admitted in view of a change of mind of the opposition division at the oral proceedings regarding whether an effect relied upon by the patent proprietor in support of an inventive step was effectively achieved (whereas an inventive step was acknowledged in the preliminary opinion, this was not the case any more at the oral proceedings: see points 3 and 4 of the reasons);

- In decision T 1817/15, the Board admitted documents filed with the statement of grounds of appeal by the appellant/opponent considering that it could not reasonably have been expected that these documents should have been already filed during the opposition proceedings because the operative main request was submitted by the patent proprietor - i.e. the opposite party - only one month before the oral proceedings before the opposition division and was modified on the basis of a feature taken from the description, which feature was crucial for the decision of the opposition division regarding inventive step. In particular, the appellant/opponent could not have predicted that said main

request would be admitted into the proceedings and that the opposition division would reverse its negative provisional opinion on the patentability of claim 1 of said main request (T 1817/15: sections 2.1.2 and 2.1.3 of the reasons). In addition, it was not shown by the appellant that any of the other decisions relied upon in support of the same line of argumentation as the one relying on T 1817/15 (letter of 12 August 2022: section 1.10) was directed to circumstances that were at least similar to the ones of the present case;

- In decision T 58/19, experimental evidence (D11) filed by the patent proprietor with their rejoinder to the statement of grounds of appeal were admitted considering that it was a legitimate reaction to a new issue raised by the opponent, i.e. the opposite party, at the oral proceedings (see point 2 of the reasons).

In view of this, it makes no doubts that the circumstances of the present case differ in a significant manner from the ones of the cases relied upon by the appellant. Therefore, there is no reason to consider that the findings of these decisions must also apply to the present case. For these reasons, the appellant's arguments based on these decisions are rejected.

- 1.10 Admitting D10 into the proceedings would further not be in line with the primary object of the appeal proceedings to review the decision under appeal in a judicial manner.

1.11 In view of the above, the Board found it appropriate to make use of its power to hold document D10 inadmissible pursuant to Article 12(4) RPBA 2007.

2. Admittance of documents E1 and E1a to E1c

2.1 At the oral proceedings before the Board, the respondent requested that E1, E1a, E1b and E1c be admitted into the proceedings irrespective of the admittance of D10 into the proceedings.

2.2 Documents E1 and E1a to E1c are experimental reports directed to reworks of example 1 of D3/D3a and of example 1 of the patent in suit. Considering that these documents were filed with the rejoinder to the statement of grounds of appeal, the (non)admission to the proceedings of these documents and of the submissions based thereon is also regulated by the provisions of Article 12(4) RPBA 2007 (see section 1.2 above), whereby the question has to be answered whether there are objective reasons why the respondent could have been expected to submit these documents already in the first instance proceedings (see section 1.3 above).

2.2.1 Considering that D10 was not admitted into the proceedings, it cannot be argued that E1 and E1a to E1c should be admitted into the proceedings as a matter of fairness to the respondent in order to react to the late submission of D10, as put forward in writing by the respondent (rejoinder: page 2, second paragraph).

2.2.2 However, for the same reasons as the ones indicated in respect of the admittance of D10 (which was also directed to a rework of example 1 of D3/D3a) above, example 1 of D3/D3a was central to the present case from the outset of the opposition proceedings.

Therefore, it would have been the duty of the respondent to submit all the evidence on which they intended to defend their case, in particular regarding the identification of the distinguishing features or the presence of an effect in relation to these distinguishing features, as early as possible. In particular, considering that it was undisputed between the parties that example 1 of D3/D3a could suitably be taken as the closest prior art and that the sole feature possibly distinguishing claim 1 of the main request from said example 1 of D3/D3a was the pore volume of the intra-agglomerates voids, the respondent should have been aware that if they wanted to formulate the problem effectively solved over the closest prior art in terms of an improvement, it was established case law that such an improvement should be made credible over said closest prior art. Therefore, any evidence in support of such an improvement could and should have been filed during the first instance proceedings.

2.2.3 In addition and contrary to the respondent's line of defense submitted at the oral proceedings before the Board, the filing of E1 and E1a to E1c cannot be held to constitute a legitimate reaction of the respondent to the decision under appeal since it was not shown that the conclusions reached therein may have taken the respondent by surprise. In respect of decisions T 666/09 and T 58/19 which were in particular relied upon at the oral proceedings before the Board, it was not shown that there was a change of mind of the opposition division at the oral proceedings regarding whether a feature of an operative claim was met in the prior art (T 666/09). Also, it is derivable from T 58/19 (section 2 of the reasons) that in that case, the Board considered that the issue of the absence of fair comparative tests when determining the problem

solved over the closest prior art first arose at the oral proceedings before the opposition division, which is not the case here: indeed, it was not disputed at the oral proceedings before the Board that it was derivable from the decision under appeal (e.g. section 5.1, third and fourth paragraphs) that the fact that the problem solved could have to be formulated as residing in the provision of a mere alternative to D3/D3a was already at stake during the opposition proceedings. Therefore, in view of the different circumstances of present case, there is no reason to consider that the conclusions reached in T 666/09 and T 58/19 must apply.

- 2.2.4 Also, as already indicated in section 1.10 above, admitting E1 and E1a to E1c into the proceedings would not be in line with the primary object of the appeal proceedings.
- 2.3 At the oral proceedings before the Board, the respondent argued that E1 and E1a to E1c were submitted in appeal in reaction to the Board's communication, in which it was indicated that it would have to be discussed at the oral proceedings how the problem solved over example 1 of D3/D3a may be formulated, whereby it appeared that no fair comparison between the properties of a filler according to claim 1 and the one according to example 1 of D3/D3a was on file.

However, since E1 and E1a to E1c were submitted with the rejoinder to the statement of grounds of appeal, i.e. before the Board's communication was sent to the parties, it cannot be held that these documents were filed in reaction to the Board's communication.

In addition, it was in any case not shown - in

particular at the oral proceedings before the Board - that any new issue was raised for the first time in the Board's communication which went beyond what was already at stake in the proceedings. In that respect, the Board's considerations mentioned by the respondent arose in view of the formulation of the problem solved indicated by the respondent (communication: sections 7.2.2 a) and b)), whereby it was not disputed at the oral proceedings before the Board that that issue was already at stake during the opposition proceedings (see section 2.2.3, last sentence, above).

For these reasons, the respondent's arguments did not convince.

- 2.4 In view of the above, the Board found it appropriate to make use of its power to hold documents E1 and E1a to E1c inadmissible pursuant to Article 12(4) RPBA 2007.
- 3. Operative main request and objections put forward
 - 3.1 The operative main request is the main request dealt with in the decision under appeal, which was held among others to satisfy the requirements of sufficiency of disclosure and to be novel as well as inventive.
 - 3.2 Considering that the objections pursued in appeal in respect of sufficiency of disclosure were said to be based on considerations derived from arguments put forward by the respondent in respect of novelty over D6 and D7, the issues of novelty and inventive step will be addressed hereinafter first (sections 4 and 5 below) while sufficiency of disclosure will be addressed subsequently (section 6). In that respect, considering that neither D10, nor E1, nor E1a to E1c were admitted into the proceedings (sections 1 and 2 above), the

submissions of the parties based on these documents are not taken into account.

4. Article 54 EPC

4.1 The appellant raised objections of lack of novelty against operative claim 1 in view of either example 1 of D3/D3a or in view of D6, complemented by D7.

4.2 Document D3/D3a

4.2.1 In the decision under appeal, novelty over D3/D3a was acknowledged considering that the teaching of document D3/D3a was the complete filling of the pores using a specific method, namely using repeated pressurization and de-pressurization while applying the monomer at reduced pressure and that there was no certainty concerning the final porosity in example 1 of D3/D3a (reasons of the decision: page 6, fifth and sixth paragraphs).

4.2.2 In appeal, it was undisputed between the parties that the sole feature possibly distinguishing operative claim 1 from the filler prepared in example 1 of D3/D3a was the pore volume of 0.01 to 0.30 cm³/g.

4.2.3 The appellant did not dispute that there was no explicit disclosure in D3/D3a of the pore volume defined in operative claim 1 and that no experimental evidence was available to support their view. However, they argued at the oral proceedings before the Board that it was nevertheless derivable from D3/D3a as a whole that the filler prepared in example 1 of D3/D3a implicitly, but directly and unambiguously, met that requirement.

4.2.4 In that respect, according to the Boards' established case law, an alleged disclosure can only be considered "implicit" if it is immediately apparent to the skilled person that nothing other than the alleged implicit feature forms part of the subject matter disclosed (Case Law, *supra*, I.C.4.3). Therefore, in the present case, it has to be assessed if it can be concluded that the filler prepared in example 1 of D3/D3a must have a pore volume of 0.01 to 0.30 cm³/g.

Regarding the higher end of the range

4.2.5 Example 1 of D3/D3a is directed to the preparation of an organic-inorganic composite filler by first preparing by spray drying an agglomerate of inorganic primary particles which have been surface treated with a hydrophobing agent as a starting material (D3a: paragraph 73) followed by a step of deposition of a resin layer using a specific method involving repeated pressurization and de-pressurization while applying the monomer and a subsequent step of polymerisation (D3a: paragraph 74).

The appellant's view that the inorganic agglomerated particles prepared in example 1 of D3/D3a before the treatment with the resin must exhibit a pore volume of 0.25 cm³/g because they were prepared exactly in the same manner as the inorganic agglomerated particles prepared in the patent in suit (paragraphs 116 and 120-122, whereby it is indicated on page 16, line 56 that a pore volume of 0.25 cm³/g was obtained) was not disputed by the respondent. The Board also has no reason to deviate from that view.

Therefore, it is also agreed with the appellant that the resin treatment carried out in D3/D3a (D3a:

paragraph 74) must result in an organic-inorganic filler having a pore volume lower than $0.25 \text{ cm}^3/\text{g}$, i.e. lower than the higher end of the range of pore volume defined in operative claim 1 (statement of grounds of appeal: section 28.3). This was also not contested by the respondent.

Regarding the lower end of the range

- 4.2.6 According to the teaching of D3a, the resin treatment process carried out in example 1 of D3/D3a makes the polymerisable monomers enter the gaps between the primary particles of the inorganic aggregated particles and penetrate into deep portions thereof (paragraph 38; paragraph 39, last sentence; paragraph 41: second sentence; paragraph 42, second sentence; paragraph 43, first sentence; paragraph 45; paragraph 46, first sentence). It was not in dispute between the parties that the volume of resin effectively used in example 1 of D3/D3a was much too low in order to achieve a complete filling of the pore volume (appellant's letter of 4 September 2019, page 1; rejoinder: three bullet points on top of page 9). In view of the limited information available, it cannot, however, be excluded that the respondent's view is correct that the resin treatment method according to D3/D3a does not lead to the monomer mixture deeply penetrating the agglomerate micropores but rather results in said mixture substantially remaining on the outer counter of the aggregates, whereby the internal micropores of the inorganic agglomerated particles are not (completely) filled with the monomer mixture (rejoinder: page 9, lower half, which is also illustrated on top of page 10). As a consequence, since the resin treatment may lead to a blocking of the pores of the filler prepared in example 1 of D3/D3a, it can also not be excluded

that said filler exhibit a very small pore volume determined by mercury intrusion porosimetry as indicated in operative claim 1, in particular a pore volume below the value of $0.01 \text{ cm}^3/\text{g}$ according to operative claim 1. In that respect, the fact that the value of $0.01 \text{ cm}^3/\text{g}$ was held by the appellant to be close to zero is not sufficient to conclude that the filler prepared in example 1 of D3/D3a must have a pore volume which is higher than $0.01 \text{ cm}^3/\text{g}$.

- 4.2.7 The appellant argued that the reading of D3/D3a which was made by the respondent was not in line with the teaching of e.g. paragraphs 9 and 38 of D3a, that the resin penetrated deep in the pores and did not remain at the surface.

However, the reading of D3/D3a proposed by the appellant would mean that D3/D3a teaches that the resin treatment carried out therein leads to successive penetration and filling of the internal pore structure of the agglomerates by the monomer mixture beginning from the deeper parts of the inorganic agglomerated particles followed by successively filling the less deep portions. However, the Board does not share the appellant's view that such a teaching is effectively derivable from D3a and in any case does not consider that this is the sole reading of D3a that can be made. In particular, D3a can be understood as indicating that the resin treatment method used therein leads to a filling of the pores near their surface, which effectively closes the pores, whereby said method allows the resin to penetrate deeper into the pores (from the surface) than if said method was not used, as understood by the respondent.

4.2.8 In the Board's view, the reading of D3a made by the respondent is further supported by the data related to example 7 and comparative example 6 reported in Table 2 of D3/D3a: it can be seen therewith that the bending strength of dental compositions prepared with organic-inorganic fillers only differing in that the specific resin treatment according to D3/D3a was carried out or not are very similar (138 MPa for example 7 according to D3/D3a; 135 MPa for comparative example 6, resin treatment without the specific method according to D3/D3a). To the contrary, it is derivable from the comparison of example 17 and comparative example 6 of the patent in suit (tables 1 to 3) that dental compositions prepared with organic-inorganic fillers having a pore volume according to operative claim 1 (example 17; pore volume of the filler: $0.09 \text{ cm}^3/\text{g}$ as indicated in example 1 in table 1 on page 19) has a significantly higher bending strength than a very similar composition mostly differing therefrom in that the fillers have a pore volume of zero (comparative example 6; pore volume of the filler prepared in comparative example 1 in table 2 on page 25). Although the resin treatment methods carried out in D3/D3a and in the patent in suit are different (D3/D3a: repeated pressurization and de-pressurization; patent in suit: use of a solvent), these results render credible that the resin treatment carried out in example 1 of D3/D3a has a limited impact on the pore volume, which is in the Board's view also compatible with the reading of D3/D3a proposed by the respondent.

In addition, although it is correct that the small increase in bending strength shown in table 2 of D3/D3a for example 7 as compared to comparative example 6 supports an increase in pore volume (as put forward by the appellant at the oral proceedings before the

Board), it is still not sufficient to conclude that the pore volume of the filler prepared in example 1 of D3/D3a must be higher than $0.01 \text{ cm}^3/\text{g}$ as specified in operative claim 1.

- 4.2.9 For these reasons, it is also agreed with the respondent that it cannot be concluded that the filler prepared in example 1 of D3/D3a mandatorily has a pore volume higher than $0.01 \text{ cm}^3/\text{g}$.
- 4.2.10 In view of the above, the appellant's arguments provide no cause for the Board to overturn the decision of the opposition division regarding novelty of the subject-matter of operative claim 1 over example 1 of D3/D3a.
- 4.3 Documents D6 and D7
 - 4.3.1 In the decision under appeal, novelty over D6 was acknowledged considering that it was not unambiguously and directly derivable from the teaching of D6 whether the particles were agglomerated in such a way as to form intra-agglomerate voids between parts of the organic resin phase (decision: section 4.2.2 of the reasons).
 - 4.3.2 As indicated by the respondent (rejoinder: bottom of page 12), D6 discloses an organic-inorganic filler manufactured by immersing primary inorganic particles having a primary particle size of less than $1 \mu\text{m}$ in a polymerizable monomer solution, evaporating the solvent, individualizing the coated particles by sieving, so as to obtain a particle size of $90 \mu\text{m}$ or less, subsequently polymerizing and curing the monomer with which the primary particles are impregnated, and finally again passing the product through the sieve to break up any agglomerates that might have formed (D6:

claim 1; column 2, line 36 to column 3, line 48; example 1). In addition, D6 teaches that the primary organic particles may be first treated with a silane coupling agent before being treated with the polymerisable monomer (column 2, lines 52-53 and example 1, column 4, lines 21-23).

4.3.3 Although it is correct that D6 does not explicitly disclose that aggregates of primary particles are used or formed during the process taught therein, said process comprises two steps of sieving in order to produce particles having sizes of 90 μm or less (claim 1; column 3, lines 26-28 and 44-46). Considering that the primary particles used in D6 have a much smaller size (column 2, lines 37-39), the sieving steps disclosed in D6 can only imply that some aggregation of the primary particles has to take place. This finding is further confirmed by the fact that it is indicated in column 3, lines 44-47 that a sieving is carried out "to break up any agglomerates that might have formed", which can only mean that agglomerates are formed but that, while larger agglomerates are discarded, smaller agglomerates are tolerated. In view of this, it cannot be concluded that D6 does not disclose agglomerates with an average particle size of 3 to 100 μm (as specified in operative claim 1) at all. In addition, it is to be expected that a sieving to obtain particles having sizes of 90 μm or less implicitly leads to an average particle size of the filler of 3 to 100 μm as defined in operative claim 1 and no evidence to the contrary is present on file.

4.3.4 Regarding the (possible) disclosure of agglomerates in D6, it was in dispute between the parties whether or not said wording as used in operative claim 1 encompassed embodiments in which the inorganic

agglomerated particles result from the agglomeration of inorganic primarily particles which already have, prior to agglomeration, an organic resin phase on their surface, as is done in the process of D6.

a) In that respect, the normal rule of claim construction is that the terms used in a claim should be given their broadest technically sensible meaning in the context of the claim in which they appear. In particular, if a term present in a claim has a clear, accepted, generic meaning, it may not be held to have a different meaning in view of the description of the patent specification.

b) In the present case, the Board considers that the wording of operative claim 1 does not exclude embodiments in which the filler comprises an organic-inorganic composite obtained by first coating the surface of inorganic primary particles with an organic resin phase and then, subsequently, aggregating the so-obtained particles. In particular, the wording of claim 1 that the fillers being claimed comprise "inorganic agglomerated particles", whereby "an organic resin phase with which a surface of each inorganic primary particle is coated and with which the inorganic primary particles are bonded together" does not exclude fillers prepared according to D6. It is noted that the present inventors themselves appear to share that view (see E0: second full paragraph on page 3 and figure 2 on page 4). Therefore, the respondent's argument that the subject-matter of claim 1 differed from the fillers according to D6 in that D6 did not prepare or use agglomerated particles (rejoinder: section 2.2.3.ii on page 15) fails to convince.

4.3.5 In view of the above, it remains to be assessed whether the subject-matter of claim 1 may be held to be novel over D6 in view of the specific range of pore volume of 0.01 to 0.30 cm³/g as defined therein (rejoinder: page 15, section 2.2.3.i, last sentence).

a) In that respect, the appellant's objection is based on D7, in which fillers according to the teaching of D6 were prepared (as detailed on pages 7 to 9 of their letter of 11 January 2019). In particular, it was neither disputed by the appellant at the oral proceedings before the Board that D7 was not an exact rework of example 1 of D6, nor that there was no evidence on file regarding the pore volume of the filler prepared in said example 1 of D6. Therefore, it makes no doubt that example 1 of D6 *per se* was not shown to anticipate the subject-matter of operative claim 1.

b) Regarding the fillers prepared by the appellant on the basis of the teaching of D6 for which the pore volume was determined in D7, it was also not disputed by the appellant that these fillers were not obtained by merely reworking example 1 of D6 but that they were prepared using a modification of the process carried out in that example, whereby various features of the process disclosed in said example 1 were modified (as shown by the respondent in their rejoinder: page 13, "Relevance of data of D7" to middle of page 14).

In that respect, the Board agrees with the respondent that at least the following features were modified:

(a) The resin content of the organic-inorganic composite filler, whereby the amount of resin used for the fillers according to D7 is within the range

taught in the description of D6 (column 3, lines 6-9) but different from the one use specifically in example 1 of D6;

- (b) The concentration of the polymerizable monomer dissolved in solvent, whereby the concentration used for the fillers according to D7 is within the range taught in the description of D6 (column 3, lines 9-13) but different from the one use specifically in example 1 of D6;
- (c) The pressure of the vacuum oven (7.5 mmHg in D7 vs. 30 mmHg in example 1 of D6; according to D6, column 3, lines 30-37, the polymerisation should take place under an inert atmosphere such as "under vacuum");
- (d) The sieve mesh size (100 μm in D7 vs. 90 μm in example 1 of D6; according to D6, column 3, lines 25-29, the screening may be carried out using "an appropriately sized sieve").

In view of this, the combination of modifications carried out to prepare the fillers considered in D7 undoubtedly leads to the creation of an embodiment which is not disclosed *per se* in D6. In particular, the Board considers that it is credible that the modifications made may be expected to have an impact on the pore volume of the filler so prepared, as argued by the respondent (rejoinder: page 14, end of first paragraph). While this is particularly true for the different amount of resin used, it cannot be excluded that the different concentration of the polymerisable monomer (which has an impact on the viscosity and therefore on the process of coating the primary particles), the pressure in the oven (where the

polymerisation takes place) and the sieve mesh (which may have an impact on the size of the agglomerates) may also play a role. Under these circumstances, the fillers prepared by the appellant and the pore volume determined in the experiments carried out in D7 cannot be held to constitute a disclosure which is directly and unambiguously derivable from D6.

c) At the oral proceedings before the Board, the appellant argued that above modifications (a) and (b) were interrelated because modifying the resin content automatically implied that the resin concentration was changed. Also, these modifications amounted to modifying example 1 of D6 by making a single choice within a list, which amounted to a direct and unambiguous disclosure according to established case law.

However, by changing the amount of resin while maintaining the same amounts of primary particles and solvent, the appellant effectively modified the disclosure of example 1 of D6 both in regard of the silica to monomer proportion and in regard of the proportion of monomer in the solvent. In addition, the modification of a specific example of a prior art document which constitutes an isolated and complete disclosure in itself of a specific combination of features, as was done by the appellant in D7, cannot be equated to performing a single selection within a list of equivalent alternatives in a disclosure defined in generic terms. For these reasons, the appellant's arguments are rejected.

4.3.6 Considering that the fillers prepared with D7 do not constitute a disclosure which is directly and unambiguously derivable from D6, they do not take away

the novelty of the subject-matter of claim 1 of the main request.

4.3.7 In view of the above, the appellant's arguments provide no reasons for the Board to overturn the decision of the opposition division regarding novelty over D6/D7.

5. Article 56 EPC

5.1 Objections of lack of inventive step were raised by the appellant against operative claims 1 and 8 in view of document D3/D3a taken as the closest prior art, either alone or in combination with common general knowledge, and against operative claim 5 in view of the combination of D1 as the closest prior art document with D5 or D4. These objections are treated separately hereinafter.

5.2 Claims 1 and 8 - D3/D3a and common general knowledge

5.2.1 Closest prior art

It was common grounds that D3/D3a is a document that can suitably be taken as the closest prior art for the subject-matter of claims 1 and 8, whereby example 1 is particularly relevant and can be used as starting point for the assessment of the inventive step.

5.2.2 Distinguishing feature(s)

a) It results from the assessment of novelty carried out in section 4.2 above that the subject-matter of operative claim 1 differs from the fillers prepared in example 1 of D3/D3a in the specific pore volume defined therein, which is not disclosed in D3/D3a and for which no evidence is on file.

b) At the oral proceedings before the Board, the appellant argued that since novelty was only acknowledged because there was some uncertainty whether or not the feature "pore volume" was effectively met in example 1 of D3/D3a, it was not appropriate to consider that said feature constituted a distinguishing feature.

However, the fact that novelty was acknowledged can only mean that there must be a feature distinguishing the subject-matter being claimed from the disclosure of example 1 of D3/D3a. In the present case, since it cannot be concluded that the pore volume feature according to operative claim 1 is directly and unambiguously derivable from D3/D3a, said feature can only be held to constitute a distinguishing feature. Accordingly, the appellant's argument must be rejected.

5.2.3 Technical problem effectively solved over the closest prior art

a) The respondent put forward that the problem solved over D3/D3a resided in the provision of a cured product that exhibited increased mechanical strength, which was shown by the examples and comparative examples of the patent in suit (rejoinder: page 17, first and second full paragraphs).

b) It remained undisputed that no fair comparison between the properties of a filler according to operative claim 1 and the one according to example 1 of D3/D3a is on file. In particular, none of the comparative examples of the patent in suit discloses the preparation of a filler using the specific resin treatment process taught in D3/D3a (which comprises using repeated pressurization and de-pressurization).

c) However, as already indicated in section 4.2.8 above, table 3 of the patent in suit allows to make a fair comparison between an organic-inorganic filler according to claim 1 (example 17, directed to a dental composition comprising a filler according to example 1, illustrative of operative claim 1) and a filler differing therefrom in that it has a pore volume of zero (comparative example 6, directed to a dental composition comprising a filler according to comparative example 1). Accordingly, that comparison shows that fillers having a pore volume in the range defined in operative claim 1 lead to cured dental compositions exhibiting increased bending strength. In view of this, the Board is satisfied that although said comparison is not directly related to the closest prior art, it nevertheless renders credible that the distinguishing feature identified in section 5.2.2 above is effectively related to an improvement in terms of mechanical properties of the cured dental compositions. That conclusion is in line with established case law according to which the nature of the comparison with the closest state of the art must be such that the alleged advantage or effect is convincingly shown to have its origin in the distinguishing feature of the invention compared with the closest state of the art (Case Law, *supra*, I.D.4.3.2).

d) The appellant formulated the problem to be solved as providing a filler having intra-agglomerate voids having a pore volume of at least $0.01 \text{ cm}^3/\text{g}$ as defined in operative claim 1 (statement of grounds of appeal: page 22, last paragraph). However, said problem should be formulated in such a way that it contains no pointer to the solution (Case Law, *supra*, I.D.4.2.1). In the

present case, considering that the pore volume is a feature of operative claim 1, it is part of the solution of the problem and should, therefore, not be taken up in the formulation of the problem to be solved. Therefore, the formulation of the problem solved contemplated by the appellant is not appropriate.

e) In addition, the appellant's objection that it was not credible that any problem was solved over the whole breadth of the claims (statement of grounds of appeal: sections 65-66) is not based on any evidence and therefore is not convincing.

f) In view of the above, the Board is satisfied that the problem effectively solved over example 1 of D3/D3a resides in the provision of organic-inorganic fillers leading to cured products with increased mechanical strength.

5.2.4 Obviousness

a) The question remains to be answered if the skilled person desiring to solve the problem identified as indicated in section 5.2.3.f above, would, in view of the closest prior art, possibly in combination with other prior art or with common general knowledge, have modified the disclosure of the closest prior art in such a way as to arrive at the claimed subject matter.

b) In that respect, there is no evidence on file that it is at all possible to arrive at the subject-matter being claimed, namely an organic-inorganic filler with a specific pore volume within the range of 0.01 to 0.30 cm³/g, by following the teaching of D3/D3a, in particular using a resin treatment method employing

repeated pressurization and de-pressurization while applying the monomer at reduced pressure.

c) In addition, the provision of an organic-inorganic filler with a specific pore volume within the range of 0.01 to 0.30 cm³/g would not be in line with the teaching of D3/D3a that the pores should be filled (paragraphs 38-43 and 45-46). In particular, the use of a solvent which is indeed taught in paragraph 43 of D3/D3a, is understood to be disclosed therein with the aim in mind to fill in the pores. Therefore, even considering that the skilled person knows from the common general knowledge that the amount of solvent may be varied to adjust the viscosity, as argued by the appellant (statement of grounds of appeal: page 23, second full paragraph), it cannot be held that the subject-matter of claim 1 would be obvious starting from example 1 of D3/D3a, in particular not in order to increase the mechanical properties of a cured product.

d) For these reasons, the subject-matter of operative claim 1 is not obvious starting from D3/D3a as the closest prior art document, either alone or in combination with common general knowledge.

5.2.5 In view of the parties' submissions and as agreed by the parties at the oral proceedings before the Board, the same conclusion regarding inventive step starting from D3/D3a as the closest prior art document has to be reached for claim 8 as for claim 1 of the main request.

5.3 Claim 5 - D1/D1a in combination with D5 or D4

5.3.1 Operative claim 5 is related to a method of preparing the organic-inorganic filler according to claim 1. Under these circumstances, it was not contested by the

appellant, in particular at the oral proceedings before the Board that, as put forward by the respondent, since the subject-matter of operative claim 1 is inventive, the same is also valid for operative claim 5 (rejoinder: section 3.2.i bridging pages 17 and 18).

5.3.2 In addition, as pointed out by the respondent (rejoinder: section 3.2.ii), D1 belongs to a different technical field than the patent in suit (cosmetic compositions - D1: paragraphs 1, 4, 23 - vs. dental compositions - patent in suit: paragraphs 1, 17, 18, 22, 23) and aims at solving different problems (lightness and slippery/smoothness when mixed in a composition - D1: paragraph 4 - vs. mechanical strength - patent in suit: paragraphs 17, 18, 22, 23, 131 and table 3). Therefore, the Board agrees with the respondent that the selection of D1 as the document constituting the closest prior art can only be made based on hindsight, which is not allowable.

5.3.3 For these reasons, the appellant's objection of lack of inventive step of operative claim 5 based on document D1 taken as the closest prior art cannot succeed.

5.4 In view of the above, the appellant's arguments provide no reasons for the Board to overturn the decision of the opposition division according to which the main request involves an inventive step.

6. Article 100(b) EPC

6.1 In order to meet the requirements of sufficiency of disclosure, an invention has to be disclosed in a manner sufficiently clear and complete for it to be carried out by the skilled person without undue burden on the basis of the information provided in the patent

specification and, possibly, common general knowledge. This means in particular in the present case that the skilled person should be able to prepare an organic-inorganic composite filler according to claim 1, which is objected to by the appellant.

6.2 The appellant's main objection that the requirements of sufficiency were not met is based on the argument that the mercury intrusion porosimetry technique mentioned in claim 1 of the main request cannot distinguish between the different types of pores measured and in particular does not allow to distinguish between "intra-agglomerate voids" as defined in claim 1 from "cracks or holes in the resin coating" (i.e. voids within the polymeric layer coating of the inorganic primary particles, also referred to as "defect voids" by the respondent, see section I.1.i on page 2 of the rejoinder). In that respect, the appellant's objection is based on considerations derived from arguments put forward by the respondent when interpreting the data of D7.

6.2.1 However, in the Board's view, said arguments do not allow to conclude that a filler according to operative claim 1 cannot be prepared on the basis of the teaching of the patent in suit, if needed complemented by common general knowledge. In particular the data submitted by the appellant regarding the fillers prepared in D7 show that these fillers exhibit a void volume determined by mercury intrusion porosimetry in the range specified in operative claim 1 (letter of the appellant dated 11 January 2019: pages 7 to 10, see in particular page 10, second paragraph). Therefore, D7 in any case cannot allow to conclude that a filler having a void volume according to claim 1 cannot be prepared, i.e. it cannot demonstrate a lack of sufficiency of disclosure

for the subject-matter of claim 1.

6.2.2 Regarding the method of determination of the pore volume specified in claim 1, it was not argued that the skilled person would not be able to carry it out using common general knowledge and the Board sees no reason to deviate from that view. In the Board's view, the question whether or not the mercury intrusion porosimetry can effectively distinguish between the different types of pores measured and in particular between "intra-agglomerate voids" and "defect voids" is not relevant: in view of the appellant's argument regarding the determination method of the pore volume specified in operative claim 1, the question to be answered regarding sufficiency of disclosure is if the skilled person may determine in a reliable manner and without undue burden the "pore volume" as defined in claim 1. In that respect, it is agreed with the respondent that operative claim 1 defines the pore volume in relation to "intra-agglomerate voids that are formed between parts of the organic resin phase, with which the surface of each inorganic primary particle is coated" *and which is measured by mercury intrusion porosity* (emphasis by the Board). In view of that, the pore volume defined in claim 1 is merely the direct result of the mercury intrusion porosimetry measurement carried out on a given filler as indicated in operative claim 1, independently of the types of pores effectively present. In that regard, it is not disputed that the skilled person perfectly knows how to carry out such a measurement.

6.2.3 For these reasons the Board is satisfied that the skilled person would have no difficulties to prepare a filler according to claim 1 on the basis of the information provided in the patent in suit, if needed

complemented by common general knowledge.

- 6.3 The appellant further put forward that the information provided by the patent in suit was not sufficient to carry out the invention over the whole scope of the claims (statement of grounds of appeal: sections 17 and 23-26).

However, according to EPO case law, an objection of insufficiency of disclosure presupposes that there are serious doubts, substantiated by verifiable facts and the burden of proof is primarily on the opponent, here the appellant (Case Law, *supra*, II.C.9). Considering that the appellant's objection is not based on any evidence, it cannot succeed.

- 6.4 In view of the above, the appellant's arguments provide no cause for the Board to overturn the decision of the opposition division regarding sufficiency of disclosure.

7. As none of the objections put forward by the appellant is successful, the appeal is to be dismissed.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:



B. ter Heijden

D. Semino

Decision electronically authenticated