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Datasheet for the decision of 3 June 2025

Case Number: T 2520/22 - 3.3.10

Application Number: 12775624.5

Publication Number: 2744529

IPC: A61L27/06, A61L27/30, A61L27/50, A61C8/00

Language of the proceedings: EN

Title of invention:
PROCESS FOR PROVIDING STRUCTURES FOR IMPROVED PROTEIN ADHERENCE ON THE SURFACE OF A BODY

Patent Proprietor:
Straumann Holding AG

Opponent:
Nobel Biocare Services AG

Headword:

Relevant legal provisions:
EPC Art. 56, 84
EPC R. 103(1)(a)
RPBA 2020 Art. 13(2)

Keyword:

Substantial procedural violation - (no)
Reimbursement of appeal fee - (no)
Main request - Inventive step - (no)
Auxiliary requests 1 to 3 - Claims - clarity (no)
Amendment after Rule 15(1) RPBA communication - exceptional circumstances (no)

Decisions cited:

Catchword:

Europäisches Patentamt
European Patent Office
Office européen des brevets

Beschwerdekammern

Boards of Appeal

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Case Number: T 2520/22 - 3.3.10

D E C I S I O N
of Technical Board of Appeal 3.3.10
of 3 June 2025

Appellant: (Opponent)	Nobel Biocare Services AG Balz-Zimmermann-Str. 7 8302 Kloten (CH)
Representative:	Hoffmann Eitle Patent- und Rechtsanwälte PartmbB Arabellastraße 30 81925 München (DE)
Respondent: (Patent Proprietor)	Straumann Holding AG Peter Merian-Weg 12 4002 Basel (CH)
Representative:	Schaad, Balass, Menzl & Partner AG Bellerivestrasse 20 Postfach 8034 Zürich (CH)
Decision under appeal:	**Decision of the Opposition Division of the European Patent Office posted on 4 October 2022 rejecting the opposition filed against European patent No. 2744529 pursuant to Article 101(2) EPC.**

Composition of the Board:

Chairwoman	R. Pérez Carlón
Members:	A. Zellner
	L. Basterreix

Summary of Facts and Submissions

I. The opponent lodged an appeal against the decision of the opposition division to reject the opposition against the European patent No. 2 744 529 (Article 101(2) EPC).

II. A notice of opposition has been filed on the basis of Article 100(a) EPC for lack of inventive step (Article 56 EPC), and Article 100(b) EPC for insufficient disclosure.

III. In the appealed decision, the opposition division held that:

(a) A skilled person would find no difficulty to perform the claimed invention over the whole scope of claim 1, the claimed invention was thus sufficiently disclosed.

(b) Documents D5 and D6 did not address the issue of protein absorption or integration in the surrounding tissue and were for this reason a less promising starting point for examining inventive step than D4 or D8.

(c) Starting from the disclosure of document D4, the problem underlying the claimed invention was to provide a process leading to structures on a body surface which leads to good osseointegrative properties while allowing dry storage of the product (see point 2.14.9 of the appealed decision). The claimed solution was the process of claim 1, characterised by drying and storing steps d) and e) in claim 1, and was not obvious in view

of the prior art.

(d) Starting from the disclosure of document D8, the problem was to provide an alternative process for achieving structures for an improved protein adherence on the surface of a body. The claimed solution was characterised by step c) of storing the acid-etched basic body in an aqueous solution for at least two days, and was not obvious in view of the prior art.

IV. The opponent appealed this decision. According to the appellant, the opposition division erred in their decision when acknowledging that the claimed invention was sufficiently disclosed and that the claimed subject-matter was based on an inventive step. The appellant furthermore submitted that the opposition division's decision was based on a substantial procedural violation due to the violation of the appellant's right to be heard, in particular in the opposition division's evaluation of inventive step.

V. The following documents are referred to:

D1: Straumann: "SLActive the surface with success built in" Scientific overview. (www.straumman.com/SLActive), pages 1-24, (2006).

D2: Wennerberg A, Albrektsson T: "On implant surfaces: a review of current knowledge and opinions". Int. J. Oral Maxillofac. Implants (24), 63-74, (2009).

D3: Wennerberg A et al.: "Current knowledge about the hydrophilic and nanostructured SLActive surface". Clinical, Cosmetic and Investigational Dentistry 2011 (3) 59-67, (2011).

D4: WO 00/44305 A1

D5: US 2009/0132048 A1

D6: Rupp F et al.: "Enhancing surface free energy and hydrophilicity through chemical modification of microstructured titanium implant surfaces". J. Biomed. Mater. Res. 76A, pages 323-334, 2006.

D8: WO 2008/098976 A2

VI. Claim 1 is the only independent claim of the patent as granted, which is the main request in appeal. It has the following wording:

"1. Process for providing structures for an improved protein adherence on the surface of the body, said process comprising the steps of

(a) *providing a basic body made of titanium or a titanium alloy,*
(b) *acid-etching the basic body,*
(c) *storing the acid-etched basic body in an aqueous solution for at least two days, whereby nanostructures are formed on the surface of the basic body,*
(d) *drying the basic body with the nanostructures formed on its surface, and*
(e) *storing the basic body in a dry environment for at least one day after the drying according to d)."*

VII. Claim 1 of auxiliary requests 1 to 3 has at least the following additional feature at the end of step c):

"... said nanostructures extending in at least two dimensions to 200 nm at most, ..."

VIII. Claim 1 of auxiliary request 4 differs from claim 1 of the main request in that it comprises the following feature at the end of the claim:

"... wherein prior to the drying according to step d), the basic body with the nanostructures formed on its surface is rinsed by using water or ethanol."

The claim does not contain the feature *"... said nanostructures extending in at least two dimensions to 200 nm at most, ..."*.

IX. The board issued a communication with their preliminary opinion on the legal and factual issues of the case.

X. Oral proceedings were held on 3 June 2025. At the end of the proceedings, the decision was announced.

XI. The appellant's arguments can be summarised as follows:

The process according to claim 1 of the main request is not based on an inventive step, regardless which of documents D4, D5, D6, or D8 is considered to be closest prior art (Article 56 EPC). The claimed process is furthermore not disclosed in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art (Article 83 EPC). Claim 1 of auxiliary requests 1 to 3 is not clear at least due to the feature *"... said nanostructures extending in at least two dimensions to 200 nm at most, ..."*. The requests do thus not meet the requirements of Article 84 EPC. Furthermore, auxiliary requests 3 and 4 should not be admitted into the appeal proceedings. Both requests were late filed, the issues they were meant to solve should have been addressed earlier in the proceedings. Since the opposition division did not consider the appellant's arguments based on any of documents D5 or D6 as closest prior art, they committed a substantial procedural violation and the appeal fee

should thus be reimbursed (Article 103(1)(a) EPC.

XII. The respondent's arguments can be summarised as follows:

The appellant's request for reimbursement of the appeal fee should not be granted, because the opposition division did not commit a substantial procedural violation. Claim 1 of all requests meets the requirements of Article 56 EPC. Document D4 is the closest prior art to the claimed process. This process is also based on an inventive step, if either of documents D5, D6 or D8 was considered to be the closest prior art. Auxiliary requests 1 to 3 meet the requirements of Article 84 EPC, the feature referred to by the appellant is clear, since the skilled person knows how to measure the respective dimensions of the nanostructures. Although auxiliary request 4 was only filed during the oral proceedings before the board, the request should still be admitted into the appeal proceedings, because the discussion on clarity during the oral proceedings extended beyond what had been submitted by the appellant with their statement setting out the grounds of appeal. The request is also allowable since it meets all of the requirements of the EPC.

XIII. The appellant (opponent) requests that the decision under appeal be set aside and that the patent be revoked. The appellant furthermore requests that auxiliary requests 3 and 4 not be admitted into the appeal proceedings, and that the appeal fee be reimbursed.

XIV. The respondent (patent proprietor) requests that the appeal be dismissed and that the patent be maintained

as granted (main request). As an auxiliary measure, the respondent requests that the patent be maintained on the basis of auxiliary requests 1 to 4. Auxiliary requests 1 to 3 were filed with the reply to the appellant's statement setting out the grounds of appeal, auxiliary request 4 was filed during the oral proceedings before the board. The respondent further requests that the appeal fee not be reimbursed.

Reasons for the Decision

1. The appeal is admissible.

Alleged procedural violation

2. The appellant argued that the opposition division's decision was based on several fundamental procedural violations.

3. According to the appellant, the opposition division did not allow any discussion on the suitability of documents D5 and D6 as closest prior art at the oral proceedings and no discussion was reflected in the minutes. Also, the objections starting from the disclosure of documents D5 and D6 as closest prior art had never been withdrawn and the appellant had been prevented from discussing them.

4. The board comes to the conclusion that there was no procedural violation in the proceedings before the opposition division, and that a reimbursement of the appeal fee is not justified. According to the minutes in accordance with Rule 124(4) EPC, the opposition division asked the parties which documents should be considered as closest prior art and the opponent indicated that documents D4 and D8 would qualify as

closest prior art (see the paragraphs 2 and 3 on page 3). The minutes do not mention that the appellant relied on any of documents D5 and D6 for that purpose, and no request for correction of the minutes is apparent from the file.

5. The appellant argued that the division did not address the arguments with respect to documents D5 and D6 as closest prior art as brought forward in writing, and that the appealed decision thus lacked any substantive reasoning considering the disclosure of these documents as closest prior art. The appellant concluded that the opposition division had thus disregarded arguments.

6. However, the opposition division did put forward in the appealed decision why documents D5 and D6 were considered to be less promising starting points than either of documents D4 or D8. By the very logic of the problem-and-solution approach, if the opposition division concluded that the claimed subject-matter was inventive starting from documents D4 or D8, the conclusion should not change with respect to a less suitable, albeit feasible, starting point. It is thus not correct that the appellant's written arguments had not been addressed in the impugned decision.

7. The board concludes that the opposition division did not commit a substantial procedural violation. A reimbursement of the appeal fee according to Rule 103(1)(a) EPC is thus not justified.

Main request (patent as granted)

Inventive step (Articles 100(a) and 56 EPC)

8. The opposition division held that either of documents D4 or D8 could be considered closest prior art. Starting from document D8, the opposition division saw the technical problem in the provision of an alternative process for achieving structures for an improved protein adherence on the surface of a body. According to the opposition division, the claimed solution was characterised by step c) of claim 1 of the main request, *i.e.* by storing the acid-etched basic body in an aqueous solution for at least two days. This solution to the technical problem was not considered to be obvious in view of the prior art.

9. The appellant argued that the only feature differentiating the claimed method from the disclosure of document D8, in particular pages 7 to 10, Figure 2 and claim 3, was the storage duration of at least two days according to step c), which led to the formation of nanostructures. The appellant submitted, by reference to page 14 of document D8, that nanostructures were already formed during the acid treatment of the disclosed process. According to the appellant, an improvement in protein adherence could not be included in the formulation of the objective technical problem, which consequently could only be seen in the mere provision of an alternative method for preparing an implant. The solution to this problem according to claim 1 of the main request was obvious, already in view of claims 1 and 3 of D8, or by taking into consideration the disclosure of documents D4 as well as D1, D3 or D6.

10. According to the respondent, inventive step should be evaluated starting from document D4 only, rather than additionally from any of documents D5, D6 or D8. With respect to the disclosure of document D8, the

respondent argued that the claimed method differed from the process disclosed therein in that it comprised steps c) and d). The technical problem with respect to D8 was the provision of a body with a surface that remained sufficiently hydrophilic even after extended storage under dry conditions, and without the need of a protective layer, as shown by comparison of samples 1 and 5 of the contested patent. The modification of the method disclosed in document D8 was not obvious, even when taking into account the additional teaching of the documents referred to by the appellant.

11. The Board comes to the following conclusions:

The patent in dispute

11.1 The contested patent relates to a process for providing structures for an improved protein adherence on the surface of a body, in particular a dental implant, in order to provide good osseointegration (see paragraphs [0001] and [0002]). According to paragraph [0006], the hydrophilicity of an edged surface contributes to improved osseointegration. The patent refers to the desire to provide protein retention structures on the implant's surface, which allowed an improved adherence of proteins and which were stable also when the body was stored in a dry environment, and which would thus allow to simplify packaging of the implant (see paragraph [0013]). Further, according to paragraph [0014] of the description, the roughness and hydrophilicity of conventional implants, such as the known SLActive implants, should be maintained at least for a certain time after the preparation of the implant.

11.2 In order to solve these general problems, a process according to claim 1 is provided, which relates to a process for providing structures for an improved protein adherence on the surface of a body made of titanium or a titanium alloy and which comprises
b) acid-etching the body,
c) storing the acid-etched body in an aqueous solution for at least two days (this step should lead to the formation of nanostructures on the surface of the body - see paragraph [0020] of the contested patent),
d) drying,
e) storing for at least one day after drying.

11.3 According to paragraph [0020] of the description, the storage in aqueous solution c) is crucial for the formation of hydrophilic nanostructures. The hydrophilicity achieved in that way is said to remain even if the body was dried in step d). The contested patent also discloses that the initial adherence of proteins to an implant's surface seemed to be of importance for later cell responses, and thus for a better osseointegration (see paragraphs [0012] and [0045]).

The closest prior art

11.4 Document D8 relates to a method for producing storable implants with an ultrahydrophilic surface, in particular for dental implants (see page 1, lines 4 to 15). The document discloses treating an implant with chromosulfuric acid to provide hydrophilicity (page 19, lines 9 to 12), thereby providing an ultrahydrophilic surface of an oxide layer with a characteristic nanostructure (see page 5, lines 5 to 14, page 6, lines 5 to 7, page 14, line 32 to page 15, line 6, page 13, lines 28 to 31 and Fig. 2). The implant is subsequently

treated with a salt solution to stabilise the hydrophilic surface (page 19, lines 14 to 16, page 19, line 35 to page 20, line 2 and page 20, lines 23 to 29). The document does not disclose that the implant is stored in the salt solution. The stabilisation can be increased by complete evaporation of the stabilising solution to form a protecting layer (see page 20, lines 8 to 12 and page 20, lines 29 to 33). The document also mentions the problem of storing the surface activated implants under dry conditions (see page 9, lines 11 to 29), and discloses a storage time of up to 24 weeks (see page 29, lines 4 to 10). Document D8 thus provides a suitable starting point for the evaluation of inventive step, and can be considered to be the closest prior art.

The differing feature

11.5 Document D8 does not disclose a step c) of *"... storing the acid-etched basic body in an aqueous solution for at least two days, whereby nanostructures are formed on the surface of the basic body, ..."*. According to D8, nanostructures are formed during the acid-etching treatment (see page 14, lines 32 to 34), and conserved by the stabilising solution, even after evaporation of the solvent (see page 19, lines 14 to 16 and 8 to 12).

11.6 According to the respondent, the claimed process did lead to a product without the necessity of a protective layer such as the layer formed in the process disclosed in document D8. The respondent argued that such a layer might introduce unnecessary and undesired particles on the nanostructure. The board notes, however, that the process according to claim 1 of the main request does not exclude the formation of a protective layer, such as the layer formed according to the process disclosed

in D8 by evaporation of the protective salt solution (see page 20, lines 29 to 32). The absence of a protective layer is thus not a differing feature.

11.7 The respondent also argued that the claimed process differed in that it comprised a step d) of *"... storing the basic body with the nanostructures formed on its surface, ..."*. Document D8 discloses, however, drying of the acid-etched body, *i.e.* a body comprising nanostructures on its surface (see page 29, lines 4 to 10). Drying step d) is thus not a differing feature.

The technical problem

11.8 The respondent argued, by reference to table 8 (sample 5) of the patent in dispute, that hydrophilicity obtained during the storing step c) of the claimed method was maintained even after the body has been dried and stored for a certain time. The method thus led to an improvement in terms of easier storage for a body having a nanostructured, active surface.

11.9 The board notes, however, that the patent in dispute does not show any comparative data of a body prepared according to the process of claim 1 which includes step c) of storing in an aqueous solution for at least two days, and a body prepared according to D8 by a process including the formation of nanostructures by acid-etching only.

11.10 The objective technical problem is thus the provision of an alternative process for providing structures for protein adhesion on the surface of a body.

The claimed solution

11.11 According to claim 1 of the main request, this problem is solved by a process which comprises the step c) of *"... storing the acid-etched basic body in an aqueous solution for at least two days, whereby nanostructures are formed on the surface of the basic body, ..."*. The board is satisfied that the claimed process solves the technical problem.

The obviousness of the claimed solution

11.12 Document D4 relates to Ti implants having hydrophilic surfaces to enhance bone adherence (see page 3, lines 12 to 21; the definition of hydrophilicity can be found on page 2, lines 35 and 36). The document mentions the problem of loss of biological activity when drying the hydroxylated surface (see page 3, lines 21 to 25). In example 1, hydrophilicity on the surface is achieved by hydroxylation of the metal surface by treatment with an acid, corresponding to step b) in claim 1 of the main request (page 14, lines 8 to 12), followed by either storing the implant in water or in an aqueous solution for 4 weeks, or by air drying (see page 14, lines 19 and 26). According to table 1 of D4, storing in an aqueous salt solution for 4 weeks leads to the strongest bond of the implants to the bone material after implantation (see *"Versuch b)"* in table 1). The skilled person was thus aware that storing an acid-etched body in an aqueous salt solution for four weeks, which is more than two days, leads to an improvement in osseointegration. Similar teaching can be found in documents D2 and D3, which disclose that storing an acid-etched surface (SLA implant) in isotonic NaCl solution increases hydrophilicity, nanostructures formation and stronger bone response (see document D3, "Introduction" and lines 1 to 7 on the right-hand column on page 64, and document D2, page 66, passage

between the left- and right-hand columns and lower part of the right-hand column of page 71, figures 16c and 16d). The skilled person was thus aware before the filing date of the patent in dispute that storing a body with an acid-etched surface in a salt solution for a period of more than two days leads to the formation of nanostructures. This knowledge would have led the skilled person to add a step of storing the acid-etched basic body obtained in the process disclosed in document D8 in an aqueous solution for at least two days, whereby nanostructures are formed on the surface of the basic body, in order to solve the technical problem stated above (see point 11.10 above).

11.13 As a result, the skilled person was motivated by the technical teaching of document D4, D2 or D3, to include the differing feature into the process disclosed in document D8 in order to solve the objective technical problem of providing an alternative to the process for providing structures for protein adhesion on the surface of a body. The proposed solution is thus not based on an inventive step.

12. Since the process according to claim 1 of the main request is not based on an inventive step considering the disclosure of document D8 as closest prior art, the request is not allowable (Article 56 EPC). It is therefore not necessary to consider other documents as closest prior art. It is also not necessary to elaborate on the objection on lack of sufficient disclosure raised by the appellant.

Auxiliary request 1 - clarity (Article 84 EPC)

13. In claim 1 of auxiliary request 1 nanostructures on the surface of the basic body are characterised by the

additional feature *"... said nanostructures extending in at least two dimensions to 200 nm at most, ..."*

14. The appellant argued, by reference to figures 2 and 16 of document D2, that the claim was not clear due to the presence of this feature, because the claim did not contain a reference point for the measurement. Document D2 disclosed in figure 2 a structure without any reference point, which made it impossible for the skilled person to know where to start measuring the nanostructure. The skilled person was thus not in a position to distinguish bodies with a structure extending in at least two dimensions to 200 nm at most from bodies which did not have such structures. It was also not clear how many of the nanostructures on the body had to have dimensions according to this feature.

15. According to the respondent, the skilled person was able to measure the length of the nanostructures on the surface of the body in different directions, and - irrespective of the reference system - could determine whether the dimension in at least two of three dimensions were within the claimed range, or not. The respondent also argued, by reference to figure 2B of document D8, that the skilled person was able to differentiate between nano- and macrostructures. Further, it was enough that some of the structures met the length requirements according to the claim.

16. The board comes to the conclusion that claim 1 of auxiliary request 1 is not clear. It was undisputed that a skilled person can find means to measure a length in the magnitude of up to 200 nm. It was also undisputed that the claim allows that two dimensions can be selected at random. However, the surface of a body which had undergone acid-etching and storage

treatment according to steps b) and c) of the claim has an irregular surface, comprising macro- and nanostructures. Bodies comprising such structures are disclosed in figure 2B of document D8. It is apparent from the sequence of the process steps that nanostructures are formed on already pre-existing macrostructures. It is not clear, however, where the reference point for measuring a certain structure lies. A skilled person examining a surface containing macro- and nanostructures is thus left with no guidance where to start measuring the length of a given structure. It is thus not possible to decide whether a given structure belongs to a nanostructure which meets the requirements according to claim 1.

17. Claim 1 of auxiliary request 1 is thus not clear (Article 84 EPC), and the request is not allowable.

Auxiliary requests 2 and 3 - clarity

18. Claim 1 of auxiliary requests 2 and 3 also contain the feature *"... said nanostructures extending in at least two dimensions to 200 nm at most, ..."* in the same context as claim 1 of auxiliary request 1. Auxiliary requests 2 and 3 are thus not allowable for the same reason as auxiliary request 1 (Article 84 EPC), regardless of the question whether auxiliary request 3 can be admitted into the proceedings.

Auxiliary request 4 - non-admission

19. Auxiliary request 4 was filed during the oral proceedings before the board, and after the notification of the board's communication under Article 15(1) RPBA. It is an amendment to the respondent's appeal case. According to Article 13(2) RPBA, such an

amendment to a party's case shall, in principle, not be taken into account unless there are exceptional circumstances, which have been justified with cogent reasons by the party concerned.

20. In the present case, there are no exceptional circumstances for admitting auxiliary request 4 into the appeal proceedings. The reasons are as follows:

20.1 Claim 1 of auxiliary request 4 does not contain the feature *"... said nanostructures extending in at least two dimensions to 200 nm at most, ..."* of claim 1 of auxiliary requests 1 to 3. The respondent argued that the request has been filed in order to overcome the clarity objection raised against claim 1 of auxiliary requests 1 to 3. This was undisputed.

20.2 According to the respondent, the request could not have been filed earlier, since the clarity objection, in particular with reference to document D2, was only substantiated during the oral proceedings before the board. The respondent submitted that before the oral proceedings, the appellant only argued that the patent did not contain a method for measuring the extension of the nanostructures on the surface of the body. The respondent concluded that this constituted exceptional circumstances.

20.3 The board is not persuaded by this argumentation. An objection concerning the feature relating to the feature *"... said nanostructures extending in at least two dimensions to 200 nm at most, ..."* of claim 1 has been raised in the appellant's statement setting out the grounds of appeal on 2 February 2023 (see paragraph [155]), and reiterated in the appellant's submission on 5 September 2023 (see paragraph [69]). This objection

was supported by the argument that the skilled person was not in a position to determine the dimensions of the structures on the surface of the body, due to the absence of any test method. Although it is correct that the objection has been discussed in more detail during the oral proceedings, including determining the starting point for measuring the dimensions of the nanostructures on the surface of the body, this cannot be seen as exceptional circumstances justifying the admission of further requests during the oral proceedings. The discussions concerning the objection of lack of clarity during the oral proceedings before the board did not differ in substance from those raised by the appellant in their written submissions, and they do not go beyond the framework of these previous submissions. They were all directed at the issue of how to measure the dimensions of the nanostructures on the surface of the implant, and thus on the same underlying claim deficiency raised in the appellant's statement setting out its grounds of appeal.

20.4 As a result, there were no exceptional circumstances justifying taking into account auxiliary request 4. The request is thus not admitted into the appeal proceedings (Article 13(2) RPBA).

Conclusions

21. Since the main request does not meet the requirements of Article 56 EPC, since auxiliary requests 1 to 3 do not meet the requirements of Article 84 EPC, and since auxiliary request 4 is not admitted into the proceedings, the contested patent cannot be maintained on the basis of any of these requests. The patent in dispute has to be revoked.

22. Since the appellant's arguments concerning a reimbursement of the appeal fee are not convincing, the board cannot accede to this request.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The patent is revoked.

3. The request for reimbursement of the appeal fee is rejected.

The Registrar: The Chair:

A. Chavinier R. Pérez Carlón

Decision electronically authenticated