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**Datasheet for the decision
of 30 September 2025**

Case Number: T 1878/23 - 3.4.01

Application Number: 16173433.0

Publication Number: 3108927

IPC: A61N1/05, B23K26/00, H01L21/04,
H01L31/0224

Language of the proceedings: EN

Title of invention:
BIOMEDICAL ELECTRODE HAVING LOW OXYGEN CONTENT

Applicant:
Pulse IP, LLC

Headword:
Biomedical electrode / Pulse IP

Relevant legal provisions:
EPC Art. 114(2)
RPBA 2020 Art. 13(2)

Keyword:
Amendments after summons - taken into account (no)



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Case Number: T 1878/23 - 3.4.01

D E C I S I O N
of Technical Board of Appeal 3.4.01
of 30 September 2025

Appellant: Pulse IP, LLC
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Decision under appeal: **Decision of the Examining Division of the
European Patent Office posted on 24 May 2023
refusing European patent application No.
16173433.0 pursuant to Article 97(2) EPC.**

Composition of the Board:

Chairman T. Petelski
Members: A. Medeiros Gaspar
R. Winkelhofer

Summary of Facts and Submissions

I. The European application 16173433, entitled "Biomedical electrode having low oxygen content", was filed with a set of claims comprising an independent claim 1, defining an "electrode", and an independent claim 12, defining a "method for producing an electrode".

II. During examination proceedings, all claims of the application were objected to, for lack novelty, in view of at least one of the following documents:

D1	EP 1857138 A1
D2	US 2012/0328905 A1
D3	US 2013/0296678 A1
D4	EP 2886 155 A1

Claims 1 and 2 as filed were objected to, for lack novelty, in view of each of D1, D3, and D4; claim 12 was objected to, for lack of novelty, in view of D2.

Clarity objections were also raised, against the independent claims.

III. In their last substantive communication, which was sent with a summons for oral proceedings, the Examining Division expressed the opinion that claim 1 of the request then on file lacked novelty in view of D3 and of D4.

- IV. In reaction to that communication the applicant made no substantive submission, but instead withdrew their request for oral proceedings and requested a "decision based on the facts and arguments on file".
- V. Subsequently, the Examining Division issued a decision refusing the application, referring to their last substantive communication.
- VI. The applicant appealed this decision, requesting that it be set aside and a patent granted on the basis of a new main request or an auxiliary request, both filed with the statement of grounds of appeal. Oral proceedings were also requested.
- VII. In a communication that accompanied a summons for oral proceedings, the Board gave a preliminary opinion on the case, noting that the new requests constituted amendments in the sense of Article 12(4) RPBA, first sentence, the admission of which was subject to the Board's discretion under Article 12(4) RPBA, second sentence, and that it was not apparent why they had not been submitted before the Examining Division. Additionally, the Board noted that the appellant's arguments as to why the Examining Division's assessment of lack novelty was deemed incorrect were not persuasive, and that the modifications introduced into claim 1 of each of the new requests did not seem suitable to address those issues. Concretely with regards to the condition, that the "metal substrate" of the electrode defined comprised a maximum of 20, or 10, atomic percent of oxygen "in the form of an oxide of the metal", present in claim 1 of each of the then main

request and auxiliary request, respectively, the Board noted that such atomic percentages merely required that no more than one out of five, or one out of ten atoms of the entire metal substrate be an oxygen atom. Such a condition was easily met by any of the solid substrates of D3 or D4, because some of metals and alloys disclosed therein were well known for their anti-corrosive properties, and because, even if an oxidation process would take place, it would, typically, affect only the outer peripheral surface.

VIII. After notification of this communication, the appellant submitted, ahead of the oral proceedings, a new main request, explicitly replacing all requests on file

IX. During the oral proceedings before the Board, the appellant further submitted a new auxiliary request.

X. Claim 1 of the main request defines:

Electrode comprising a solid, monolithic substrate having an outer peripheral surface; the outer peripheral surface having a topography defined by a plurality of discrete macro protrusions distributed about and extending outwardly from the outer peripheral surface, the macro protrusions having a width in the range from 0.15 μm to 50 μm ; a plurality of discrete micro protrusions distributed on and extending outwardly from the macro protrusions, the micro protrusions having a width ranging from ~~about~~ 0.15 μm to 5 μm ; and a plurality of discrete nano protrusions distributed on and extending outwardly from the micro

protrusions, the nano protrusions having a width ranging from 0.01 μm to 1 μm , which substrate comprises a biocompatible metal comprising at least one of titanium, nickel, zirconium, chromium, niobium, molybdenum, tantalum, hafnium, iridium, cobalt, platinum, steel, or alloys or combinations thereof, or an alloy of titanium, aluminum and vanadium, an alloy of platinum and iridium, an alloy of nickel and cobalt, titanium, an alloy of titanium, tantalum; a nickel, cobalt, chromium, molybdenum alloy or combinations thereof which metal substrate has a maximum of 10 atomic percent of oxygen content in the form of an oxide of the metal.

XI. Claim 1 of the auxiliary request defines:

Method for producing an electrode comprising providing a solid, monolithic substrate having an outer peripheral surface, which substrate comprises a biocompatible metal comprising at least one of titanium, nickel, zirconium, chromium, niobium, molybdenum, tantalum, hafnium, iridium, cobalt, platinum, steel, or alloys or combinations thereof, or an alloy of titanium, aluminum and vanadium, an alloy of platinum and iridium, an alloy of nickel and cobalt, titanium, an alloy of titanium, tantalum; a nickel, cobalt, chromium, molybdenum alloy or combinations thereof, and then exposing the outer peripheral surface to pulses of laser irradiation having a laser spot diameter ranging from about 1 μm to about 1000 μm , wherein the number of pulses of laser irradiation per spot, ranges from about 10 to about 1500 pulses, the pulse wavelength ranges from about 200 nm to about 1500

nm, the pulse width ranges from about 1 femtosecond to about 5 picoseconds; at a irradiance of from about 200 watts/cm² to about 5000 watts/cm²;
wherein the exposing of the outer peripheral surface is conducted in an gaseous atmosphere comprising at least 80% by weight of at least one of nitrogen, hydrogen, xenon, argon, helium, neon, krypton, xenon, radon, fluorine, chlorine, bromine, iodine, a hydrocarbon, or combinations thereof,
to thereby provide the outer peripheral surface with a topography having a plurality of discrete macro protrusions distributed about and extending outwardly from the outer peripheral surface, the macro protrusions having a width in the range of from about 0.15 μm to about 50 μm;
a plurality of discrete micro protrusions distributed on and extending outwardly from the macro protrusions, the micro protrusions having a width ranging from about 0.15 μm to about 5 μm;
and a plurality of discrete nano protrusions distributed on and extending outwardly from the micro protrusions, the nano protrusions having a width ranging from about 0.01 μm to about 1 μm,
which metal substrate has a maximum of 20 atomic percent of oxygen content in the form of an oxide of the metal.

Reasons for the Decision

Main request - consideration

1. The main request was submitted after notification of a communication under Article 15(1) RPBA.
2. The appellant argued, by reference to Articles 12(2) and (4) RPBA, that the subject-matter of claim 1 of the new main request was "substantially equal" to that of claim 2 as filed. It had been object of the search and examination procedure, as demonstrated by specific sections of the preliminary search opinion, of a communication under Article 94(3) EPC, issued by the Examining Division, and of the reply thereto. Consequently, the main request could not be regarded as an amendment. Rather, the appeal case was directed to the requests and arguments on which the decision under appeal was based.
3. The Board agrees that claim 1 of the current main request does not differ significantly from claim 2 as filed. Indeed, its subject-matter differs from the subject-matter of claim 2 as filed only in that the numerical ranges are defined as extending "from" a certain number, instead of "from about" that same number.
4. However, a request defining, in its independent claim, such subject-matter was neither submitted nor maintained in the proceedings leading to the decision under appeal.
5. Claim 1 of the main request furthermore differs not only from claim 1 on which the decision was based,

which is the reference point for the purpose of Articles 12(2) and (4) RPBA, but also from claim 1 of each of the requests filed with the statement of grounds of appeal, which is the reference point for the purpose of Article 13 RPBA, in several regards.

6. A common difference, with regards to claim 1 of each of those requests, is that claim 1 of the current main request no longer comprises the limitations defining the "micro protrusions" as having a width "smaller than the width of the macro protrusions", and the "nano protrusions" as having a "width smaller than the width of the micro protrusions", that had been introduced during examination.
7. Therefore, the current main request is not only an amendment with regards to the request on which the decision under appeal was based (see Article 12(2) and (4) RPBA), but also an amendment to the appellant's appeal case as framed by their appeal (see Article 13 RPBA).
8. Given that it was submitted after notification of a communication under Article 15(1) RPBA, its consideration is subject to the Board's discretion under the strict conditions of Article 13(2) RPBA, according to which any amendment to a party's appeal case, shall, in principle, not be taken into account unless there are exceptional circumstances, justified by cogent reasons.
9. No such exceptional circumstances can be recognised here, nor did the appellant argue that any existed.
10. When exercising its discretion at this late stage of the proceedings, the Board may also rely on the

criteria of Article 13(1) RPBA, requiring, among other things, that the amendment *prima facie* overcomes the issues raised in appeal and does not give rise to new objections.

11. The appellant's main request does not meet these conditions, either, as explained below.
12. The definition, in claim 2 as filed, of a maximum of 10 atomic percent of oxygen "in the form of an oxide of the metal" was already present in claim 1 of the auxiliary request, on which the Board's preliminary opinion was negative. As indicated therein, this feature is not suitable to address, let alone *prima facie* solve, the novelty issues, identified in the contested decision.
13. The element *platinum* had been removed from the list of possibilities, for the metal of the substrate, defined in claim 1 of each of the requests filed on appeal. Its reintroduction, into claim 1 of the main request, rather than limiting, broadens the scope of the claim. Also this amendment does not address, let alone *prima facie* solve, the novelty issues.
14. The same applies to the removal, from the claim 1 of the main request, of the limitations concerning the relative sizes of the "macro", "micro" and "nano" protrusions that had been added during examination.
15. The latter amendment, furthermore, raises anew the clarity issues that had been raised during examination proceedings, namely, the problem that the terms "macro", "micro", and "nano" protrusions were defined as having widths within significantly overlapping ranges, meaning that they could all have the same

sizes, or that the "nano" protrusions could be wider than the "macro" protrusions.

16. Additionally, a return to the subject-matter of claim 2 as filed raises anew the question of lack of novelty of this claim in view of D1.
17. For all these reasons, the main request is not admitted into appeal proceedings (Article 13 RPBA).

Auxiliary request - consideration

18. The auxiliary request was filed only during the oral proceedings before the Board.
19. While it is true that claim 1 of the auxiliary request is identical to claim 12 as filed, a request comprising only method claims was neither submitted in the proceedings leading to the decision under appeal, nor in appeal proceedings up to the filing of this request.
20. Claim 1 also differs from claim 12 of the request on which the decision was based, as well as from claim 11 of the main request and claim 10 of the auxiliary request on which the Board's preliminary opinion were based, in that it no longer defines the "micro protrusions" as having a "width smaller than the width of the macro protrusions", and the "nano protrusions" as having a "width smaller than the micro protrusions".
21. Hence, similarly to the main request, consideration of this request is also subject to the Board's discretion under the strict conditions of Article 13(2) RPBA.

22. Apart from the fact that no exceptional circumstances can be identified that could possibly justify its consideration, this request:
- (a) reintroduces a claim that, though present at the outset of the examination proceedings, was later replaced by an amended version and, thus, withdrawn;
 - (b) suffers from at least the same clarity issues as indicated under point 15., with regards to claim 1 of the main request;
 - (c) raises anew the question of the lack of novelty of this claim in view of D2; and
 - (d) shifts the focus to the method claims, thereby changing the legal and factual framework of the appeal at a very late stage of the appeal proceedings. The contested decision only dealt with claim 1. It did not deal with claim 12, nor was this necessary to conclude that the request was not allowable.
23. For all these reasons also this request is not admitted into proceedings (Article 13 RPBA).

Conclusion

24. Since neither the main request nor the auxiliary request are admitted into proceedings, the appeal must be dismissed.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chair:



D. Meyfarth

T. Petelski

Decision electronically authenticated