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Datasheet for the decision of 23 June 2022

Case Number: T 0053/20 - 3.3.05

Application Number: 16020278.4

Publication Number: 3276719

IPC: H01M6/04, H01M6/14

Language of the proceedings: EN

Title of invention:
GRAVITATIONAL/DIFFUSIONAL ELECTROLYTIC BATTERY CELL

Applicant:
CERAGOS Electronics & Nature

Headword:
Gravitation-diffusion-cell/Ceragos

Relevant legal provisions:
EPC Art. 123(2)
RPBA 2020 Art. 13(2), 12(2)

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

Decisions cited:

Catchword:

Europäisches Patentamt
European Patent Office
Office européen des brevets

Beschwerdekammern

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Case Number: T 0053/20 - 3.3.05

D E C I S I O N
of Technical Board of Appeal 3.3.05
of 23 June 2022

Appellant: (Applicant)	CERAGOS Electronics & Nature 23, Chemin Alphonse Daudet 06800 Cagnes-sur-Mer (FR)
Decision under appeal:	**Decision of the Examining Division of the European Patent Office posted on 24 June 2019 refusing European patent application No. 16020278.4 pursuant to Article 97(2) EPC.**

Composition of the Board:

Chairman	E. Bendl
Members:	S. Besselmann
	O. Loizou

Summary of Facts and Submissions

I. The appeal in this case is against the examining division's decision to refuse European patent application No. 16020278.4. The patent application concerns a gravitational/diffusional electrolytic battery cell.

II. The examining division found that the claims of 2 December 2018 extended beyond the content of the application as originally filed (Article 123(2) EPC), that the invention was insufficiently disclosed (Article 83 EPC) and that novelty was lacking (Article 54(1) and (2) EPC).

III. With their grounds of appeal, the applicant (appellant) defended the claims underlying the impugned decision (main request).

IV. The board informed the appellant of its provisional opinion that the appeal was likely to be dismissed (communication dated 4 March 2022).

V. The appellant filed further submissions on 8 June 2022 and 21 June 2022. These included a request to be allowed to submit a divisional application, to which the board replied by notifying the appellant of the relevant provisions (communication dated 17 June 2022 sent by advance email).

VI. During oral proceedings before the board, held on 23 June 2022, the appellant reintroduced the originally-filed claim as an auxiliary request.

VII. Independent claim 1 of the main request reads as follows:

"*1. A battery including:*
- an insulating case,
- two electrodes made of metal, possibly made of the same metal, positioned in contact with the electrolyte, configured to be placed at two different height positions, and characterized in that the generated electrostatic potential is proportional to the height difference between the two electrodes and to the gravitational acceleration
- an electrolyte solution positioned between the electrodes and comprising anions and cations, and characterized in that it should maximize the difference of weight and coefficient of diffusion between anions and cations
Said battery is further characterized in that it does not require an electric current to be recharged."

VIII. The claim according to the auxiliary request, which is the claim as originally filed, reads as follows:

"*1. This battery cell is based on the Gravitational and counter Diffusional forces appearing in an Electrolyte dissolved in a solvent (typically in water but not exclusively).*
It uses one electrolyte and do not involve any Redox reaction but requires the separation of the electrolyte into anions and cathions. It does not need to be charged and does not imply exhaustion of Electrolyte or anode and cathode materials.
Several electrolytes can be used such as Potassium Sulfide: K_2S, Calcium Chloride: $CaCL_2$, Potassium Carbonate: K_2CO_3 , Potassium Chlorure: KCI, Sodium Ferrocyanide: $Na_4\ Fe(CN)_6$, Potassium FerriCyanide

$K_3Fe(CN)_6$, Lead Nitrate: $Pb(NO_3)_2$, and even Sodium Chloride (with much less efficiency): NaCl can be used. Acids are also efficient electrolytes but require manufacturing and handling safety procedures. Organical electrolytes could be advantageously used due their ions weight but their conductivity needs to be high. This type of cells offer the following advantages compared to the current ones:
- They do not need to charged or replaced (lifetime superior to several years)
- They are simple enough to be cost effective
- The electrolyte and other materials used can be environment friendly
However they cannot be transported (at least easily) due to variation of ions concentration."

IX. The appellant's arguments, as far as they are relevant to the present decision, may be summarised as follows:

The invention related to a battery which used different mechanisms compared to known electrochemical batteries, namely a combination of gravitation and diffusion forces. It did not involve any chemical reaction, i.e. there was no redox reaction. It also differed from a concentration cell and the Nernst equation did not apply. The production of electricity was not due to the concentration of different types of ions but to the different characteristics of anions and cations (for a given electrolyte).

In light of these principles underlying the invention, a person skilled in the art could have deduced all of the added information from the physical laws involved.

X. The appellant requested that the decision under appeal be set aside and that a patent be granted on the basis

of the set of claims filed on 2 December 2018 (main request) or, alternatively, on the basis of the claim as originally filed (auxiliary request).

Reasons for the Decision

Main request

1. Article 123(2) EPC

1.1 Claim 1 of the main request differs from claim 1 as originally filed *inter alia* in that the feature according to which the "*electrostatic potential is proportional to the height difference between the two electrodes*" and the feature "*characterized in that it should maximize the difference of weight and coefficient of diffusion between anions and cations*" have been inserted. These features were objected to in the impugned decision.

1.2 The application documents as originally filed do not contain any information associating the electrostatic potential with the height difference between the electrodes. The drawings indicate the height difference H but provide no further teaching. The application as a whole is silent as to the technical significance of this height difference.

The documents of the application as originally filed do not mention any difference of weight or coefficient of diffusion between anions and cations either; nor do they mention or imply *maximising* this difference.

1.3 The appellant argued that a person skilled in the art could have deduced all of the added information from the physical laws involved.

This argument is not convincing and no supporting evidence is available. Furthermore, the physical principles underlying the invention are only very generally indicated in the application as originally filed (namely that gravitational and diffusional forces act on the cations and anions in the electrolyte and equilibrate; see section "2. Presentation"). However, it is not specified which concrete relationship between the electrostatic potential and the parameters of the claimed cell, for instance the height difference between the electrodes, results. This relationship cannot be assumed to be implicit to the skilled person, because utilising the indicated principles constitutes the main idea of the invention; they differ from those occurring in known cells which involve redox reactions (claim 1 as originally filed).

1.4 The requirements of Article 123(2) EPC are therefore not met.

Auxiliary request

2. Article 13(2) RPBA 2020

2.1 During the oral proceedings before the board, the appellant reintroduced the originally-filed claim as the auxiliary request. This claim had been withdrawn and replaced by amended claim sets several times before the examining division (on 23 March 2017, on 5 July 2018, on 22 July 2018 and finally on

2 December 2018); reintroducing it constitutes an amendment to the party's appeal case.

2.2 In light of the above, the provisions of Article 13(2) RPBA 2020 apply. According to these provisions, the auxiliary request shall, in principle, not be taken into account unless there are exceptional circumstances, which have been justified with cogent reasons by the party concerned.

2.3 The appellant did not indicate any exceptional circumstances, nor did they present any cogent reasons to justify the reintroduction of this request. The board cannot see any such circumstances or reasons either. The board's conclusion regarding the main request merely confirmed the examining division's finding in this regard in the impugned decision (see point 2.2), so the appellant should have presented any amendments addressing this finding at the latest with the statement of grounds of appeal.

2.4 Furthermore, by withdrawing the claim as originally filed, the appellant prevented the examining division from dealing with this claim in the impugned decision. In this case, reintroducing this claim at the appeal stage is contrary to the primary object of the appeal proceedings, namely to review the decision under appeal in a judicial manner (Article 12(2) RPBA 2020). Moreover, reverting to the claim as originally filed would require starting the examination proceedings anew and would be detrimental to procedural economy (Article 13(1) RPBA 2020).

2.5 The auxiliary request is therefore not taken into account.

Procedural request

3. Notwithstanding the fact that a board of appeal is not the right addressee for filing divisional applications, the appellant's request that they be allowed to submit a divisional application to "unambiguously distinguish the claimed device" from a prior-art citation is irrelevant and so cannot be granted, because the question of novelty was not decisive for the outcome of these appeal proceedings.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

C. Vodz E. Bendl

Decision electronically authenticated