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**Datasheet for the decision  
of 26 October 2022**

**Case Number:** T 2345/19 - 3.3.05

**Application Number:** 12715500.0

**Publication Number:** 2702623

**IPC:** H01M4/86, H01M4/94, H01M4/96,  
H01M8/18, H01M8/22, H01M14/00,  
H01M8/06

**Language of the proceedings:** EN

**Title of invention:**  
H2O - BASED ELECTROCHEMICAL HYDROGEN - CATALYST POWER SYSTEM

**Applicant:**  
Brilliant Light Power, Inc.

**Headword:**  
Power system/Brilliant Light Power

**Relevant legal provisions:**  
EPC Art. 83

**Keyword:**  
Sufficiency of disclosure - (no)

**Decisions cited:**  
T 0541/96, T 0018/09, T 1785/06, T 1842/06, T 1620/12

**Catchword:**



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Case Number: T 2345/19 - 3.3.05

**D E C I S I O N**  
**of Technical Board of Appeal 3.3.05**  
**of 26 October 2022**

**Appellant:** Brilliant Light Power, Inc.  
(Applicant) 493 Old Trenton Road  
Cranbury, NJ 08512 (US)

**Representative:** Uexküll & Stolberg  
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**Decision under appeal:** **Decision of the Examining Division of the  
European Patent Office posted on 28 March 2019  
refusing European patent application No.  
12715500.0 pursuant to Article 97(2) EPC.**

**Composition of the Board:**

**Chairman** E. Bendl  
**Members:** S. Besselmann  
S. Fernández de Córdoba

## Summary of Facts and Submissions

- I. This appeal is against the examining division's decision to refuse European patent application No. 12 715 500. The patent application concerns an H<sub>2</sub>O-based electrochemical hydrogen-catalyst power system.
- II. The independent claims underlying the impugned decision relate to an electrochemical power system and to a power system that generates thermal energy, respectively. They read as follows:

Claim 1:

*"An electrochemical power system that generates at least one of electricity and thermal energy comprising a vessel closed to atmosphere, the vessel comprising*  
*at least one cathode;*  
*at least one anode,*  
*at least one bipolar plate, and*  
*reactants that constitute hydrino reactants during cell operation with separate electron flow and ion mass transport, the reactants comprising at least two components chosen from:*

- a) at least one source of H<sub>2</sub>O;*  
*b) at least one source of catalyst or a catalyst comprising at least one of the group chosen from nH, OH, OH<sup>-</sup>, nascent H<sub>2</sub>O, H<sub>2</sub>S, or MNH<sub>2</sub>, wherein n is an integer and M is alkali metal; and*  
*c) at least one source of atomic hydrogen or atomic hydrogen,*  
*one or more reactants to form at least one of the source of catalyst, the catalyst, the source of atomic hydrogen, and the atomic hydrogen;*  
*one or more reactants to initiate the catalysis of*

*atomic hydrogen to form hydrinos; and a support, wherein the combination of the cathode, anode, reactants, and bipolar plate maintains a chemical potential between each cathode and corresponding anode to permit the catalysis of atomic hydrogen to form hydrinos to propagate, and the system further comprising an electrolysis system."*

Claim 24:

*"A power system that generates thermal energy comprising:  
at least one vessel capable of a pressure of at least one of atmospheric, above atmospheric, and below atmospheric; at least one heater,  
reactants that constitute hydrino reactants comprising:  
a) a source of catalyst or a catalyst comprising nascent H<sub>2</sub>O;  
b) a source of atomic hydrogen or atomic hydrogen;  
c) reactants to form at least one of the source of catalyst, the catalyst, the source of atomic hydrogen, and the atomic hydrogen; and  
one or more reactants to initiate the catalysis of atomic hydrogen to form hydrinos  
wherein the reaction occurs upon at least one of mixing and heating the reactants."*

III. The examining division found that the requirements of Articles 57, 83 and 84 EPC were not met. This conclusion was based *inter alia* on the following considerations:

No group of scientists had clearly and unambiguously confirmed the existence of hydrinos, and most of the scientific world dismissed the underlying theory.

Even supposing that hydrinos did exist, it was not known how to separate the process of their formation from the process of their regeneration into the hydrogen ground state to achieve a net power and/or heat benefit.

Claims 1 and 24 were very broad and defined features of common power systems; the skilled person could not derive from the application whether or not hydrinos would be formed in a conventional system of this kind; the feature "catalysis of atomic hydrogen to form hydrinos" was so ill-defined that the skilled person was unable, on the basis of the disclosure as a whole and using common general knowledge, to identify without undue burden the technical measures necessary for generating net power or heat by means of formed hydrinos, i.e. the skilled person did not learn how to modify a conventional power system accordingly.

IV. The decision under appeal referred, *inter alia*, to the following documents:

- D3 A. Rathke: "A critical analysis of the hydrino model", New Journal of Physics, vol. 7, 19 May 2005, 127
- D4 A.K. Vijh: "Hydrino atom: novel chemistry or invalid physics?", International Journal of Hydrogen Energy, vol. 26, no. 3, 2001, 281
- D5 Antonio S. de Castro: "Orthogonality criterion for banishing hydrino states from standard quantum mechanics", ARXIV.ORG, 2007, DOI: 10.1016/J.PHYSLETA.2007.05.006
- D6 Norman Dombey: "The hydrino and other unlikely states", ARXIV.ORG, 2006 DOI: 10.1016/J.PHYSLETA.2006.07.069

D7 "BlackLight Power - Wikipedia, the free encyclopedia", internet citation, 22 October 2015, retrieved from the internet:  
URL: [https://en.wikipedia.org/wiki/BlackLight\\_Power](https://en.wikipedia.org/wiki/BlackLight_Power) [retrieved on 2015-12-04]

V. With their grounds of appeal, the applicant (appellant) re-submitted the claims dealt with in the impugned decision and additionally submitted the following documents:

- A1 R. Mills: "Response to a comment to Catalyst-Induced Hydrino Transition (CIHT) electrochemical cell of D. Sundholm," Int. J. of Energy Res. 2014
- A2 R.L. Mills and Y. Lu: "Time-resolved hydrino continuum transitions with cutoffs at 22.8 nm and 10.1 nm", Eur. Phys. J. D 64, 2011, 65-72
- A3 R.L. Mills: "The grand unified theory of classical physics" (GUTCP), Vol. 1, "Atomic Physics", December 10, 2018 Edition
- A4 W. Xie et al.: "MILLSIAN 2.0: A molecular modeling software for structures, charge distributions, and energetics of biomolecules", Physics Essays 24, 2011, 200-12
- A5 R.L. Mills et al.: "Total bond energies of exact classical solutions of molecules generated by MILLSIAN 1.0 compared to those computed using modern 3-21 G and 6-31 G\* basis sets", Physics Essays 23, 2010, 153-99
- A6 R.A. Booker: "Report on the evaluation of Chapter 10 in 'The Grand Unified Theory of Classical Physics' by Dr. Randell L. Mills", June/December 2018
- A7 US 9,994,450 B2

A8 J. Va'vra: "A new way to explain the 511 keV signal from the center of the Galaxy and its possible consequences", SLAC, Stanford University, September 2018

VI. In reply to the board's communication pursuant to Article 15(1) RPBA 2020, the appellant submitted the following further document:

A9 W.R. Hagen, R.L. Mills: "Electron paramagnetic resonance proof for the existence of molecular hydrino", International Journal of Hydrogen Energy, 47(56), 2022, 23751-61

VII. The appellant's arguments, where relevant to the present decision, can be summarised as follows:

The examining division, when basing its objection on D3-D7, had ignored the measured data in the application.

The application (on pages 222-258) provided sufficient details and experiments to prove the utility of the invention, including the details of the charging and discharging cycles. For example, in cell 121311GZC1-904 it had a "run schedule of charging to 0.8V, discharging for 4s if  $V > 0.6V$ " (page 239). The application provided analytical techniques for measuring certain spectroscopic signals, for example FTIR (page 265). A person of ordinary skill could perform FTIR measurements. Signatures of hydrinos had been detected.

The documents cited in the impugned decision had been published several years before the application was filed. They relied only on mathematical calculations, and did not attempt to reproduce the appellant's



experiments. By contrast, there was mounting evidence for the existence of hydrinos in the 22 years since the documents had been published. Documents A1-A8 as well as the very recent document A9 (from 2022) showed that hydrino signatures could be detected. A1-A5 had passed independent peer review. These documents showed that the appellant's theory had been validated by physicists.

The claims did not relate to hydrinos as such. The claims merely cited a set of reactants undergoing a reaction which produced energy. Even if the examining division took issue with alleged conflicts between hydrino theory and quantum mechanics, there was no basis for rejecting the claims.

- VIII. The appellant requested that the decision under appeal be set aside and that a patent be granted on the basis of the claims underlying the appealed decision, re-submitted with the statement of grounds of appeal.

### **Reasons for the Decision**

1. Articles 83 and 57 EPC relate closely to the applicant's obligation to give a sufficient description of the invention (T 541/96, Reasons 6.1; T18/09, Reasons 16.). An alleged invention which did not comply with the generally accepted laws of physics would be incompatible with the requirements of Articles 57 and 83 EPC, because it cannot be used and therefore lacks industrial application; also the description would be insufficient to the extent that the applicant would not be able to describe how it could be made to work (T 541/96, Reasons 6.1).

In the case at issue, the board focuses on whether the requirements of Article 83 EPC are met.

2. Article 83 EPC

2.1 As stated in the above-mentioned decision T 541/96, if the invention seems, at least at first, to offend against the generally accepted laws of physics and established theories, the disclosure should be detailed enough to prove to a skilled person conversant with mainstream science and technology that the invention is indeed feasible (T 541/96, Reasons 6.2; see also the later decisions T 1785/06, Reasons 3.4.3; T 1842/06, Reasons 2; T 1620/12, Reasons 1.4). The more a new invention contradicts previously accepted technical wisdom, the greater the amount of technical information and explanation is required in the application to enable the invention to be carried out by the average skilled person to whom only that conventional knowledge is available (T 1785/06, Reasons 3.4.3).

2.2 These general considerations also apply to this case, in which the invention relies on a theory that remains highly controversial among scientists.

The theory postulates the existence of "hydrinos", which are described as hydrogen atoms in lower-energy states than previously thought possible, being lower in energy than unreacted atomic hydrogen and corresponding to a fractional principal quantum number (application as originally filed, see paragraph bridging pages 17-18 concerning Equations (1)-(3)).

As outlined in the impugned decision with reference to D3-D7, a number of scientific articles reject the existence of hydrinos because of their incompatibility with standard quantum mechanics, and dismiss the hydrino theory as being unphysical (point 3 of the impugned decision).

The appellant did not contest that there were scientific articles rejecting the hydrino theory. However, the appellant made the criticism that these articles had been published several years before the application under consideration had been filed and relied only on mathematical calculations. The appellant stressed that there had been no attempt to repeat the appellant's experiments. By contrast, according to the appellant, documents A1-A8, including peer-reviewed articles, as well as the very recent document A9 showed that hydrino signatures could be detected.

However, documents A1-A9 do not change the assessment of the hydrino theory as being highly controversial. A1-A5 were authored or co-authored by the inventor himself and thus do not demonstrate independent repetition or general acceptance of the hydrino theory, even if some of these were published in peer-reviewed journals. The author of the report A6, according to his profile (<https://www.unca.edu/programs/physics/faculty-staff/>), is an energy consultant working with Brilliant Light Power since 2005 and thus also affiliated to the appellant. A7 is a patent document, not a peer-reviewed scientific journal. A8 mentions a model of small hydrogen but acknowledges that it had not yet been observed (Table 1, "Strange atomic states"); it does not reference the hydrino theory. Document A9 was also co-authored by the inventor: rather than proving independent verification of the hydrino theory, it

shows that the authors of A9 were still seeking recognition and confirmation of their experiments even at the time when A9 was published, long after the filing of the application under consideration (A9, second page, left-hand column, second paragraph, *"Mill's GUTCP theory has been evaluated - both positively and negatively - by others, however, thus far only on the basis of theoretical arguments"* [the GUTCP theory being the appellant's underlying theory termed "Grand Unified Theory of Classical Physics", see A3] and page 23758, Conclusions section: *"..it is also offered as an urgent invitation to academia at large to repeat and extend the described experiments in lieu of refutation on quantum mechanical theory grounds"*).

2.3 In the light of the above, there is no convincing proof of wider recognition or independent validation of the hydrino theory, let alone any indication that a generally recognised approach as to how this theory could be implemented practically was available at the filing date of the application, to allow for instance the generation and in particular the detection of hydrinos.

2.4 At the same time, carrying out the claimed invention requires, as essential features, that "reactants that constitute hydrino reactants" are present and that the "catalysis of atomic hydrogen to form hydrinos" is initiated (claims 1, 24). These features amount to specifying the desired result to be achieved. The claims do not specify what these reactants are and how the intended formation of hydrinos can be achieved.

Irrespective of whether hydrinos exist at all, there is in any case no common general knowledge that would allow the skilled person to predict, in particular in

view of the broad scope of the independent claims, whether a(ny) given combination of reactants would result in the formation of hydrinos, and using what precise experimental conditions their formation would be initiated.

The skilled person wishing to carry out the claimed invention would thus need to find all the necessary information in a high level of detail in the present application, in line with the general considerations set out under point 2.1 above.

- 2.5 While the application provides a section on "A. Exemplary CIHT Cell Test Results" (starting on page 222 of the application), it is not very detailed regarding the indicated essential features requiring the presence of hydrino reactants and the catalysis of atomic hydrogen to form hydrinos. In particular, this section does not set out how exactly the step according to which "*[d]uring discharge, the reactions and the current were reversed to form nascent H<sub>2</sub>O catalyst and hydrinos to give rise to excess current and energy such that a net excess electrical energy balance was achieved*" (page 222) was carried out; this step too merely reflects the desired result.

The application provides lists of data and parameters of cells, including the mention of a cell "121311GZC1-904" with a "run schedule of charging to 0.8V, discharging for 4s if V>0.6V" (page 239). Irrespective of whether these cells can be reproduced based on the data provided, in any case there is no explanation of how the desired result, namely the formation of hydrinos, was verified; hydrinos are not even mentioned in this context.

2.6 An essential step in any attempt to reproduce the invention in this case is verifying the desired functioning of the claimed system, which involves verifying whether the desired result is achieved and thus whether hydrinos are formed. The skilled person is not provided with a suitable test method for this purpose. The section on "A. Exemplary CIHT Cell Test Results" (starting on page 222 of the application) is silent as to how the formation of hydrinos was verified, as indicated. The application contains a separate section on "C. Spectroscopic Identification of Molecular Hydrino" (starting on page 258). It describes that CIHT cells served as electrode and electrolyte samples for an analytical analysis for the production of the theoretically predicted molecular hydrino product (page 260). However, the CIHT cells were closed cells sealed in a vacuum chamber (page 260, first full paragraph), which thus do not reflect the conditions during the normal operation of the cell encompassed by the claims (claim 14: H<sub>2</sub>O vapor pressure from 0.001 to 100 atm; balance inert gas to achieve at least atmospheric pressure). Furthermore, this application section C describes phenomena observed using various spectroscopic techniques and provides explanations based on the hydrino theory, but fails to specify the concrete experimental steps performed. That certain spectroscopic signals were described and assigned to hydrino - whether in the present application or elsewhere by the inventor - cannot be seen as an instruction on how to carry out the measurement to verify the functioning of the claimed system. Even though for example FTIR is a widely known spectroscopy method, applying FTIR to verify the formation of hydrinos in (electrochemical) power systems is not. In this case, merely specifying the FTIR instrument used cannot be regarded as a practical measuring protocol

enabling the skilled person to repeat the measurement, because this would, for instance, include the concrete steps taken to obtain and prepare a hydrino-containing sample for the analysis, and details of how the analysis was performed.

- 2.7 The skilled person - who, as indicated, cannot rely on any common general knowledge about the analytical verification of hydrinos (see point 2.3) - is not provided with a practical measuring protocol for the purpose of conclusively verifying, in a routine manner, whether hydrinos are formed during operation of a chosen (electrochemical) power system.
- 2.8 In summary, irrespective of whether hydrinos exist, the skilled person would in any case not have known how their formation can be achieved and verified in the claimed systems.
- 2.9 In the light of the above, the requirements of Article 83 EPC are not met, and the board can see no fault in the impugned decision.

**Order**

**For these reasons it is decided that:**

The appeal is dismissed.

The Registrar:

The Chairman:



C. Vodz

E. Bendl

Decision electronically authenticated