

I. Summary of Facts and Submissions

- 1 European patent application No. 15 749 782.7 having the title "EXOTHERMIC TRANSMUTATION METHOD" was filed on 07-08-2015.

It claims priority of CA 2860128 filed on 20-08-2014.

The applicant is

Applicant 1:
Ad Maiora LLC
27741 Crown Valley Parkway
Suite 200
Mission Viejo, California 92691, US

Applicant 2:
Gapmed Limited
Chrysorogiatissis & Kolokotroni
Limassol 3040, CY

- 2 The International Search opinion cited the documents:

- D1 WO 2010/058288 A1 (PIANTELLI SILVIA; BERGOMI LUIGI [IT]; GHIDINI TIZIANO [IT]) 27 May 2010 (2010-05-27)
- D2 US 2009/274257 A1 (TAHAN A CHRISTIAN [US]) 5 November 2009 (2009-11-05)
- D3 US 5 076 971 A (BARKER WILLIAM A [US]) 31 December 1991 (1991-12-31)
- D4 WO 2013/108159 A1 (CLEAN NUCLEAR POWER LLC [CH]) 25 July 2013 (2013-07-25)
- D5 WO 01/29844 A1 (ST MICROELECTRONICS SRL [IT]; MASTROMATTEO UBALDO [IT]) 26 April 2001 (2001-04-26)
- D6 FOCARDI S ET AL: "ANOMALOUS HEAT PRODUCTION IN HI-H SYSTEMS", NUOVO CIMENTO, EDITRICE COMPOSITORI, BOLOGNA, IT, vol. 107A, no. 1, 1 January 1994 (1994-01-01), pages 163-167, XP000519191, ISSN: 0029-6341

and raised objections under **Articles 5 and 6 PCT** against **claims 1 and 3**.

- 3 The same objections were raised, against **claims 1 and 2**, in the first communication under **Article 94(3) EPC** issued by the examining division on 07-02-2018 in the European phase under **Articles 83 and 84 EPC**.
- 4 In the response received on 24-07-2018 the applicant requested further examination and provided arguments in support of the patentability of the claims.
- 5 On 07-07-2021 the examining division issued a summons to attend oral proceedings on 16-11-2021. In the annex to the summons, objections under **Articles 83 and 84 EPC** were raised against the whole application in general, and in particular against claim 1.
- 6 In a response to the summons received on 24-07-2018 the applicant submitted one main request and five auxiliary requests, and provided arguments in support of the patentability of the claims.
- 7 On 16-11-2021, oral proceedings were held.
- 8 The decision is based on the following requests:

Main Request

Description, Pages

1-34 filed in electronic form on 15-10-2021

Claims, Numbers

1-15 filed in electronic form on 15-10-2021

Drawings, Sheets

1/7-7/7 as published

Auxiliary Request 1

Description, Pages

1-34 filed in electronic form on 15-10-2021

Claims, Numbers

1-15 filed in electronic form on 15-10-2021

Drawings, Sheets

1/7-7/7 as published

Auxiliary Request 2

Description, Pages

1-34 filed in electronic form on 15-10-2021

Claims, Numbers

1-14 filed in electronic form on 15-10-2021

Drawings, Sheets

1/7-7/7 as published

Auxiliary Request 3

Description, Pages

1-34 filed in electronic form on 15-10-2021

Claims, Numbers

1-15 filed in electronic form on 15-10-2021

Drawings, Sheets

1/7-7/7 as published

Auxiliary Request 4

Description, Pages

1-34 filed in electronic form on 15-10-2021

Claims, Numbers

1-14 filed in electronic form on 15-10-2021

Drawings, Sheets

1/7-7/7 as published

Auxiliary Request 5

Description, Pages

1-34 filed in electronic form on 15-10-2021

Claims, Numbers

1-14 filed in electronic form on 15-10-2021

Drawings, Sheets

1/7-7/7 as published

II. Reasons for the Decision

9 **Article 83 EPC:** Claim 1 of all requests refers to an exothermic transmutation, proton emission and deactivation of a radioactive material:

10 Exothermic Transmutation

According to the description (WO publication, page 15, first full paragraph) when carrying out the claimed method, after some time the heat input is stopped and is no longer required, as there is an excess of heat from the system. Although this appears to be in line with heat being produced, there is not sufficient experimental evidence to support the claim that a transmutation of the dusty driver is exothermic and that this is the source of the heat.

Similar experiments in the past (e.g. "INVESTIGATION OF ANOMALOUS HEAT PRODUCTION IN NI-H SYSTEMS", Cerron-Zeballos et al. in 1996) found no evidence that any heat generation could be attributed to the result of an alleged nuclear reaction (in that case between a nickel nucleus and a proton with the generation of copper). The paper, however, gives an explanation for a certain amount of energy, created as being the standard absorption heat which is generated when hydrogen is absorbed by a metal/metal alloy.

During oral proceedings, the applicant explained however that the heat was generated by the deactivation of the radioactive material, rather than the transmutation of the dusty driver; the examining division do not share this opinion.

The application as filed fails to disclose sufficient basis for a transmutation of the driver taking place. Spectral analysis of the treated material after the experiment was made, but not of the dusty driver compound before of after the experiments (preventing a comparison). No chemical analysis was made before or after; and no detection of photons was made. An emission of X-ray or gamma would be expected from a transmutation reaction of nickel into copper (as suggested on page 3, last sentence, of the description).

The applicant's argumentation that detection of photons during experiment is difficult cannot be accepted as a reason to allow insufficient disclosure.

Claim 1 of all requests on file does not fulfil the requirements of **Article 83 EPC** because evidence of exothermic transmutation is not sufficiently disclosed in the application.

11 Proton emission

The emission of protons would not be expected by a skilled person attempting to carry out the claimed method using the equipment described. Any proton production would be contrary to currently accepted physics: Within the scientific community, there is no currently accepted mechanism whereby hydrogen and a transition metal having an electric field applied would result in the emission of protons.

Furthermore, the application as filed fails to provide any evidence of protons being emitted during the experiments performed.

The applicant's argumentation that detection of protons during experiment is impossible due to field disturbances cannot be accepted as a reason to allow insufficient disclosure.

12 Deactivation of radioactive material

Claim 1 of all requests have as their result the deactivation of radioactive material (the radioactive material not being limited to any particular kind of material). As an experimental basis figure 9 is used to show how the spectrum of a sample of uranyl acetate has reduced in amplitude. This is insufficient to

support the hypothesis made. Although repeatability of this result is confirmed by the applicant, a deactivation of the radioactive material may not be the only possible explanation for the result obtained, and therefore not conclusive beyond all reasonable doubt; especially as such a deactivation would not be expected by a person skilled in the art.

None of the 4 experiments made by the applicant provided chemical or SEM EDAX analysis both before and after the treatment – only gamma spectra. None of the four experiments show any time dependent information – to show how the process develops (except the energy production, which itself appears to contravene the first law of thermodynamics, given the amount of energy that is released by the decay of uranium and its daughter nuclei until stable isotopes are reached); now accelerated to a few hours. The lack of radiation (gamma lines) in figure 9 of the application does not support the applicant's claim that daughter isotopes of uranium are present in the container after treatment.

For example: For the Uranium series (Experiment 3), the decay from U-238, via Th-234, Pa-234m, U-234, Th-230, Ra-226, Rn-222, Po-218, Pb-214, Bi-214, Po-214, Pb-210, Bi-210, Po-210 to Pb-206 (normally having a sum of the half-lives of around 10^9) years would have to release a total of about 70 MeV (10^{-11} J) per atom, see for example Wikipedia: https://en.wikipedia.org/wiki/Decay_chain

In a sample of 0.846 g Uranyl Acetate ($A = 388\text{g/mol}$) there is about 1.3×10^{21} U atoms, i.e. 13 GJ

To release this during a 3 hour experiment would result in an average heat production of about 1,2 MW. This is in contradiction with the results obtained by the applicant.

The applicant's argumentation that safety precautions did not allow the treated material to be analysed to find out what remained in the container cannot be accepted as a reason to allow insufficient disclosure.

- 13 The more an invention departs from, or contradicts, accepted technical and scientific knowledge, the greater the amount of technical information and explanation is required in the application to enable the invention to be carried out by a skilled person. Therefore, in agreement with the case law (see for example **T 0541/96**), an application for a patent on an alleged invention which seems, at least at first, incompatible with the generally accepted laws of physics

does not meet the requirements of **Article 83 EPC** (note: possibly as well as **Article 57 EPC**). At present, such a deactivation of a radioactive material is not established as generally accepted science and technology.

A disclosure of a claimed invention is considered sufficiently clear and complete if it provides information which is sufficient to allow the invention to be carried out by a person skilled in the art without undue experimentation.

- 14 The examining division does not consider the application disclosed in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art, **Article 83** and **Rule 42(1)(e) EPC**.

Therefore, the application is refused under **Article 97(2) EPC**.

- 15 **Remark:** Although **Article 84 EPC** was not discussed during oral proceedings, the objections raised during the written procedure do still remain.

Article 106
Decisions subject to appeal

- (1) An appeal shall lie from decisions of the Receiving Section, Examining Divisions, Opposition Divisions and the Legal Division. It shall have suspensive effect.
- (2) A decision which does not terminate proceedings as regards one of the parties can only be appealed together with the final decision, unless the decision allows a separate appeal.
- (3) The right to file an appeal against decisions relating to the apportionment or fixing of costs in opposition proceedings may be restricted in the Implementing Regulations.

Rule 97
Appeal against apportionment and fixing of costs

- (1) The apportionment of costs of opposition proceedings cannot be the sole subject of an appeal.
- (2) A decision fixing the amount of costs of opposition proceedings cannot be appealed unless the amount exceeds that of the fee for appeal.

Rule 98
Surrender or lapse of the patent

The decision of an Opposition Division may be appealed even if the European patent has been surrendered in all the designated Contracting States or has lapsed in all those States.

Article 107
Persons entitled to appeal and to be parties to appeal proceedings

Any party to proceedings adversely affected by a decision may appeal. Any other parties to the proceedings shall be parties to the appeal proceedings as of right.

Article 108
Time limit and form

Notice of appeal shall be filed, in accordance with the Implementing Regulations, at the European Patent Office within **two months** of notification of the decision. Notice of appeal shall not be deemed to have been filed until the fee for appeal has been paid. Within **four months** of notification of the decision, a statement setting out the grounds of appeal shall be filed in accordance with the Implementing Regulations.

Further information concerning the filing of an appeal

- (a) Notice of appeal can be filed in accordance with Rule 1 and Rule 2(1) EPC, by delivery by hand, by post, or by technical means of communication. The filing has to comply with the details and conditions and, where appropriate, any special formal or technical requirements laid down by the President of the European Patent Office (R. 99(3) EPC).
- (b) The addresses of the filing offices of the European Patent Office are as follows:

(i) European Patent Office D-80298 Munich Germany	(ii) European Patent Office Postbus 5818 NL-2280 HV Rijswijk (ZH) The Netherlands	(iii) European Patent Office D-10958 Berlin Germany
Fax: +49 89 2399-4465	Fax: +31 70 340-3016	Fax: +49 30 259 01-840

- (c) The notice of appeal must contain the name and address of the appellant in accordance with the provisions of Rule 41(2)(c) EPC, an indication of the decision impugned, and a request defining the subject of the appeal. In the statement of grounds of appeal the appellant shall indicate the reasons for setting aside the decision impugned, or the extent to which it is to be amended, and the facts and evidence on which the appeal is based (R. 99(1) and (2) EPC). The notice of appeal and any subsequent submissions stating the grounds for appeal must be signed (R. 50(3) EPC).
- (d) The fee for appeal is laid down in the Rules relating to Fees. The schedule of fees and expenses of the EPO or a reference to the current version is regularly published in the Official Journal of the European Patent Office under the heading "Guidance for the payment of fees, expenses and prices". Fee information is also published on the EPO website under www.epo.org/fees.

Before opening the oral proceedings the identities of applicant/inventor **Prof. Giuseppe de Bellis** ("dB"), representative **Gabriel de Kernier** ("dK"), and interpreter **Francesco Turchi** ("FT") were checked via video/screen comparison of identity cards and the respective persons.

At 9:04 the **Chairman, Godehard Angeloher** ("GA"), declared the oral proceedings in examination of Application No. EP15749782 of 'Ad Maiora' with the title "EXOTHERMIC TRANSMUTATION METHOD" open, announced that the oral proceedings were not public, reminded that any recording was not allowed, and asked for any mobile devices to be switched off.

After introducing the members of the examining division, the Chairman declared that the main objections against the present application related to Articles 83 and 84 EPC, which would be discussed in the following.

GA mentioned that there were one main and five auxiliary requests on file and asked if applicant intended to file further requests - which was answered by dK, that possibly three further requests might be filed during the oral proceedings.

GA explained that the document, very lately filed in the evening before the proceedings, appeared to be - *prima facie* - of no relevance to the current proceedings and would probably not be admitted to the oral proceedings.

In answering dK's question of what the objections were, GA stated that the sufficiency of disclosure according to Article 83 EPC with regard to the first claim of all requests and of the description would be the main focus, which would be explained in the following by the **First Examiner, Chris Smith** ("CS").

In his introduction, CS stated that the Article 83 EPC objections against all first claims of all requests were all the same and could be grouped into three main topics as follows:

1. Exothermic, Transmutation

CS pointed out that the excess heat measured may have come from somewhere else, and there was no sufficient disclosure of an exothermic reaction or process. In the application documents as filed, there was also no sufficient disclosure for a transmutation process, and any proof is missing for transmutation, in particular for transmutation of a transition metal.

2. Proton emission

CS explained that there was no evidence at all, neither in the experiments nor in the remaining description, for proton emission, which, therefore, lacked disclosure.

3. Deactivation of radioactive material

CS stated that according to the application documents the term "radioactive material" was not limited to any particular material and that figure 9 showed two gamma spectra of which one shows less counts. No chemical and time dependent analysis of the materials in the experiments had been carried out. An alleged deactivation of radioactive material could only be regarded as one possible interpretation of the spectra shown. The application documents do not provide sufficient disclosure for this claimed process.

In his reply, dK addressed the point of hydrogen-adsorption, which is to be seen as a different technology that would still be novel and thus suffering from errors. Further, dK stated, that "exothermic is a consequence of deactivation" and that the respective experiments were hard, difficult and dangerous, in particular at the beginning. This is also the reason, why no time dependent measurements had been performed. dK added that the spectrum of Figure 5 showed two isotopes of nickel, namely ^{60}Ni and ^{59}Ni .

The chairman asked whether figure 5 wasn't rather an X-ray spectrum, showing $K\alpha$ and $K\beta$ lines of nickel? Where should be the evidence of two isotopes of Ni in such a spectrum?

dB and FT answered that figure 5 showed two Ni isotopes and traces of cobalt "Co".

CS admitted that Ni may be seen in the spectrum of figure 5. Yet, none of the radioactive cobalt, Co, could be seen.

dB/FT answered, that, for security reasons, it was not possible to measure spectra still showing cobalt.

dK expressed again, that Co was introduced to the experiment as radioactive material to be deactivated.

CS stated, that there was not sufficient proof of the existence of Co-60 material and of the process claimed.

In a further attempt to understand the disclosure of the application and the explanation provided, GA asked, what the X-axis of figure 5 represented?

dB/FT answered, that the X-axis is (coming) from the SEM.

CS summarised, that the application contained no convincing information specifying what was introduced in the experiment. Trying to find out more about the experiments, CS asked, if gamma radiation was measured during the experiment? Were photons measured during the experiment?

In their answer, dK and dB/FT stated that for security reasons no other measurements had been performed except measuring the temperature rise of the cooling water.

CS stressed that measurements of gammas, photons, protons, spectra before and after the claimed process are missing - which might have provided a more convincing proof.

At 9:36, dK cited a passage of the case law. He stated that data have been provided, and some hypotheses have been made which are deemed not to offend the laws of physics. dK stated that there were data taken from before and after the process, but that large laboratories refused to confirm these measurements for security reasons.

The First Examiner expressed that the disclosure of the application as filed was relevant and that its teaching appeared to contravene standard physics. The skilled person does not expect the alleged effects and results of the claimed process. In this context, CS referred to T0541/96. With regard to this decision, CS stressed, that the higher the revelation of the claimed invention, the higher the evidence required.

dK answered to this hint by citing words of Laplace: "*What we know is not much. What we do not know is immense.*"

CS affirmed that the examining division did follow this interpretation, but stressed, that law would not be interpreted in the examining procedure, but rather Articles and Rules would be followed. CS expressed that a decision of how an examining division should interpret new physics has to be taken by a higher ranking board.

dB/FT mentioned again, that the applicants had evidence for transmutation by capturing one nucleon by β -decay where a neutron is changed into a proton. β -decay is a known process. To accelerate the conversion, natural decay has to be accelerated.

"Transmutation" is brought in relation to quark theory and string theory by dB, all of which are known scientific theories - of which "quark" theory must be discussed.

At 9:55, the First Examiner doubted again that protons and proton emission were sufficiently disclosed, and concluded that, in the application as filed, no hard evidence for protons being emitted could be found.

dB/FT replied that Geiger counter measurements showed gamma emission and the gammas should come from β -decay.

At 10:00 dK, again, pointed to figures 6-9 which show measured spectra and which should disclose a decay.

CS stated that a decay could be seen, but the decrease in the counts shown in the spectra in the figures did not unambiguously prove proton emission or deactivation or decrease of radioactivity.

In the following, a discussion of the activity and the danger of handling the used uranyl compound used was triggered by dK.

The Chairman stated that natural uranium can be handled easily, which was acknowledged by dB/FT who said that standard industrial uranyl was used in the experiments.

In this context, First Examiner CS reminded that uranium decays over millions of years. In the experiments under question a power release of 30 kW had been observed which is in contrast to the expectations of a person skilled in the art, who would expect a release of several MW when the material used would be deactivated. CS concluded that there is a problem of thermodynamics and a violation of the 1st law of thermodynamics which leads to the open question, where the missing energy is.

dB/FT just answered that in an experiment lasting 40 hours a big surplus of energy was measured.

To the question of Representative dK, what the level of uranium radioactivity is at the end of the experiment, applicant dB answered, that 94% of uranium would have decayed.

CS tried to find out more by asking, what was left at the end of the experiment with uranium?

dB and FT added that no SEM analysis had been carried out at the end of the experiment, only calculations had been made.

Again, Representative dK asked where the uranium peaks could be seen? dB answered that different species would be inside of experiment.

CS remarked, that in this case, this should give rise to a lot of spectra for identification.

dB/FT replied that the spectra would show only the "solid part", and started talking about radium production.

CS wanted to know, if the container was opened after the experiment in order to measure or look what was inside after.

dB/FT answered that no radium measurements have been carried out.

Coming back to the figures, CS mentioned that figures 8 and 9 looked like natural background.

dB and FT added some explanation of the dusty driver.

CS concluded that still no sufficient disclosure would have to be objected to.

At 10:15, oral proceedings were interrupted for deliberation.

The oral proceedings were resumed at 10:32.

The Chairman GA explained that the examining division was still of the opinion that the requirements Article 83 EPC were not met by each claim 1 of each request on file. He asked if applicants wanted to file further requests.

Representative dK answered that no further request would be filed. He further stated that dB was of the opinion that no detector would allow to measure protons as requested. dB further explained that calculations provided a surplus of protons and that in his opinion the only chance would be to measure the potential (inside the chamber). This, however, would be hampered by two problems: first, how to measure the voltages inside the machine, and second, how to calibrate the machine to the same level and to calculate the effect of electrostatic on the machine, which is filled with hydrogen.

Chairman GA mentioned, that he understood the point and mentioned, from his own experience, measurements by scintillator under consideration of the quenching factor as a possible solution to this problem. Further, if no proof would be possible then the emission of protons was only a hypothesis – yet nevertheless it was present in any independent claim 1.

First Examiner CS reminded, that the questioned proton emission is only one of the problems of the present application.

Chairman GA asked again if further request would be filed.

Representative dK finally answered, that there were no further requests.

Chairman GA declared that the present application was refused for reasons of lack of sufficient disclosure (Article 83 EPC) and lack of clarity (Article 84 EPC).

The oral proceedings were concluded at 10:42.

* * * *

Application No.:

15 749 782.7

Minutes of the oral proceedings before the EXAMINING DIVISION

The proceedings were not public.

Proceedings opened on 16.11.2021 at 09:00 hours

Examining Division:

Chairperson: Angloher, Godehard
1st member: Smith, Christopher
2nd member: Opitz-Coutureau, Jörg

Minute writer: Opitz-Coutureau, J

Present as/for the applicant/s:

Prof. Guiseppe de Bellis as/for Ad Maiora

accompanied by: Gabriel de Kernier, Francesco Turchi

The identity of the person/s present and, where necessary, the authorisation to represent/authority to act were checked.

Essentials of the oral proceedings and relevant statements of the applicant/s:

After deliberation of the examining division, chairperson announced following **decision**:

"The European patent application is refused."

Regarding the reasons for the decision, the chairperson referred to:

Article 97(2) EPC: the application does not meet the requirements of Article/s 83, 84 EPC.

The party/parties was/were informed that the minutes of the oral proceedings and a written decision (including an indication of the possibility of appeal) will be notified to him/them as soon as possible.

The chairperson **closed the proceedings** on 16.11.2021 at 10:42 hours.



signed:

Angloher, Godehard

.....

Chairperson

signed:

Opitz-Coutureau, J

.....

Minute writer