

EXHIBIT 2



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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/736,193	09/16/2010	Andrea Rossi	1724-001	2834

47888	7590	01/11/2016
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EXAMINER	
BURKE, SEAN P	

ART UNIT	PAPER NUMBER
3646	

NOTIFICATION DATE	DELIVERY MODE
01/11/2016	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

PTOmail@hgcpatent.com
 ipdocket@hgcpatent.com

Office Action SummaryApplication No.
12/736,193Applicant(s)
ROSSI, ANDREAExaminer
SEAN P. BURKEArt Unit
3646AIA (First Inventor to File)
Status
No**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --****Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 6/12/2015.
☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on ____; the restriction requirement and election have been incorporated into this action.
- 4) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

- 5) ☒ Claim(s) 1-7,9 and 10 is/are pending in the application.
5a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 6) ☐ Claim(s) ____ is/are allowed.
- 7) ☒ Claim(s) 1-7,9 and 10 is/are rejected.
- 8) ☐ Claim(s) ____ is/are objected to.
- 9) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.

Application Papers

- 10) ☒ The specification is objected to by the Examiner.
- 11) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

- a) ☐ All b) ☐ Some** c) ☐ None of the:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b)
Paper No(s)/Mail Date ____.
- 3) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 4) ☒ Other: Detailed Action.

Application/Control Number: 12/736,193
Art Unit: 3646

Page 2

1. The present application is being examined under the pre-AIA first to invent provisions.

DETAILED ACTION

Status of Claims

2. Claims 1-7, 9 and 10 are under examination.

Affidavit

3. The affidavit filed by the inventor on 12 June 2015 is acknowledged, however the arguments of the affidavit are not persuasive. Applicant avers that the two submitted papers demonstrate independent confirmation of the device operability. Examiner respectfully disagrees.

4. Regarding the Parkhomov papers, as discussed previously, the purported reaction cannot be initiated without substantial energy. Assuming *arguendo* that a nuclear reaction occurs between hydrogen and nickel, it is fundamental that such a reaction produces both β and γ emissions. However, the paper author explicitly states that no such radiation was measured by the attendant dosimeter.¹ The absence of any detected radioactive signature is an indicia of inoperability.

5. The only indicator of operability in the Parkhomov papers is the claim of anomalous heat production. As has been stated previously, there are many potential sources anomalous heat in such a setup. One glaring example might be a chemical reaction between the nickel and lithium hydride. Or a reaction between the aluminum components and one of the fuel constituents. However, if the reaction is indeed

¹ Parkhomov, Exhibit D, § IV; Exhibit E, § V.

Application/Control Number: 12/736,193

Page 3

Art Unit: 3646

chemical and it is coming from elements that have been purified in the production process, it is axiomatic that the reaction cannot be exothermic.

6. As such, the Parkhomov papers are not persuasive.²

Response to Arguments

7. Applicant's arguments filed 12 June 2015 have been fully considered but they are not persuasive. A detailed response follows.

8. Applicant traverses the operability rejections, arguing that the dummy system served as a proper control because the only difference between the control run and the experimental run was that the latter system contained fuel. "Instead of building two identical systems, the operating characteristics of the same reactor was determined, with the same experimental set up before and after the fuel loading was carried out."³ It is hard to believe that Lugano et al. could certify this fact, because by the Applicant's own admission, they were not permitted to inspect the machine internals. How can a person determine if there is fuel in the device if he is not permitted to see within it? This

² Beyond the experimental criticisms, no reasonable person of ordinary skill in the art would accept an article from "The Journal of Unconventional Science" at face value. A selection of articles **from the same issue** reveal: "прибор новой физики. Часть 3. Лабораторные исследования торсинда" (A report on a spinning disk capable of harnessing the torque captured by the syzygy of a lunar eclipse), "13C, онтогенез и парадокс эволюции," (A paper exploring a new fundamental force - beyond the known four forces - as a determinate for the slow pace of evolution), "Могут ли двойной слепой контроль и двойная рандомизация быть критериями достоверности в "психофизических" экспериментах. (Обоснование необходимости введения мета-прибора в психофизические исследования)" (An admittedly laudable call for the use of double-blind criteria in the study of telekinesis), "Нетрадиционные исследования – псевдонаука, техномистицизм или новая область знания?" (Literally: "Unconventional Research: Pseudoscience, Technomysticism or a New Field of Knowledge?" The author advocates the latter.) and "Сверхъестественное. Научно доказанные факты (анонс книги)," (A review of a book entitled "Supernatural: Scientifically Proven Fact").

While the titles and summaries of the articles speak for themselves, given the cyclic nature of this prosecution, the Examiner reiterates that one of ordinary skill in the art would have serious cause to doubt the credibility of any article published in the Journal of Unconventional Science.

³ Remarks, p. 6.

Application/Control Number: 12/736,193

Page 4

Art Unit: 3646

kind of passive acceptance discredits any claim of operability made by the group. As such, the Lugano report still remains unpersuasive.

9. Applicant cites *Newman*⁴ in support of the contention that an applicant is not required to know how a device operates in order to receive a patent for it. While this is a correct statement of the law, it is premature. The Applicant has not proven **if** the device works; much less **how** it works. For the reasons discussed above and below, there is no credible assertion of operability.

10. The Applicant argues that the blog posting cited as Exhibit B, if it is not a credible reference, it should not be used in the rejection. This is a circular argument. The reference is not believable because it not peer reviewed. It demonstrates the precise form of undiscerning "review" that seems peculiar to the cold fusion art. Notwithstanding this observation, the reference was originally cited by the Applicant, not the Examiner.⁵

11. Applicant's remaining arguments reiterate that the inventor is not responsible for a theory of operation. Examiner reiterates the prior arguments as further notes that while Applicant is not bound by theory, the claimed invention is explicitly directed to "A method of carrying out an exothermal reaction of nickel and hydrogen." To date, there is no credible evidence of this reaction. Nor would one of ordinary skill in the art, after

⁴ 783 F.2d 971 (Fed. Cir. 1986).

⁵ Applicant further argues that the subject of blog post, Brian Ahern, "has long been a critic of the present applicant" but neglects to mention that Dr. Ahern also has a long track record in the annals of cold fusion. C.f. Swartz, "Survey of the Observed Excess Energy and Emissions in Lattice Assisted Nuclear Reactions," <http://world.std.com/~mica/Swartz-SurveyJSE2009.pdf> last visited 4 January 2016.

Applicant further states that Brian Ahern is "a distinguished MIT professor." While Dr. Ahern is no doubt distinguished, it appears that he is not a professor at MIT. Currently, the only Brian Ahern in the MIT directory is a Brian W. Ahern, a third year student in the biological engineering department.

Application/Control Number: 12/736,193

Page 5

Art Unit: 3646

reviewing the claimed evidence, consider Applicant's claims dispositive. Accordingly, Applicant's traversal the operability rejection is not persuasive.

12. Applicant's remaining arguments refer to the recent amendments. They are addressed in the rejections below.

Specification

13. The specification is objected to as directed solely to an inoperable device. Specifically, the present invention appears to be derived from the discredited "dry LENR" process embodied by Andrea Rossi's "e-Cat" device. As discussed below, claims directed to this mode of fusion have been rife with fraud and fail to measure up to even cursory examination under the generally accepted laws of physics.

14. Rossi's e-Cat device is a purported nuclear fusion reactor which exposes nickel powder to hydrogen gas at modest pressure (around 2 bar) and temperature (between 150-500°C).⁶ According to Rossi, the nickel nuclei absorb protons from the hydrogen gas and undergo β decay to form various isotopes of copper. Rossi does not propose a theory of operation for the device, but simply reviewing the products and the reactants would cause one of ordinary skill to doubt the operability of the system.

15. First, there is the issue of nickel. Nickel-62, one of the reactant isotopes, has the highest nuclear binding energy of any known isotope.⁷ In laymen's terms, this means that nickel-62 is the most stable and non-reactive nucleus in the known universe.

⁶ See Application. 12/736,193 (US 2011/0005506 A1). Note, the Abstract in this reference states a temperature range of 150-5000°C. This would appear to be a typographical error since the steel containment would melt at 1510°C. Examiner notes that this error is not repeated in elsewhere in the specification or the claims.

⁷ See Fewell, "The Atomic Nuclide With the Highest Mean Binding Energy," <http://adsabs.harvard.edu/abs/1995AmJPh..63..653F> (last visited 17 December 2015).

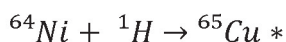
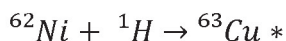
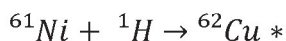
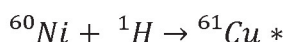
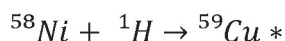
Application/Control Number: 12/736,193

Page 6

Art Unit: 3646

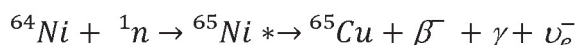
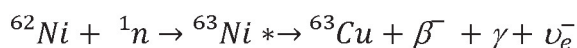
However, the other common isotopes of nickel (^{58}Ni , ^{60}Ni , ^{61}Ni and ^{64}Ni) share similar binding energies. This relative stability explains why the metal accumulates in stars - even under the most extreme fusion conditions imaginable, nickel will not react with other elements. However, for the sake of argument, we will assume that an unknown mechanism is causing nickel to react with hydrogen.

16. If nickel were to react with hydrogen, it would do so according to the following mechanisms:⁸



17. Where the star (*) signifies that copper is unstable and will undergo β -decay back to a nickel isotope of corresponding mass. This mechanism obviously fails because it does not produce the claimed reaction products.

18. One could create copper from nickel with neutrons, but then it is not clear where the present invention would obtain such a source. However, for the sake of argument, we assume that the unknown mechanism *also* has a ready supply of neutrons. If this is the case, then we can convert ^{62}Ni and ^{64}Ni into ^{63}Cu and ^{65}Cu respectively under the following reactions:⁹



⁸ See Thieberger, "The Physics of why the e-Cat's Cold Fusion Claims Collapse," pp. 7-8.

⁹ *Id.* at 10.

Application/Control Number: 12/736,193
Art Unit: 3646

Page 7

19. If one were to build a machine to leverage these reactions, one would expect the proportion of the products to equal the proportion of the reactants. Thus, the ratio of nickel-62 to nickel-64 should equal the ratio of copper-63 to copper-65. However, this is not the case.¹⁰

20. Putting aside the theoretical considerations, there is the additional matter of verifiability. To date, there exists no credible independent, peer-reviewed evaluation of the e-Cat device. Nor has there been a credible attempt at explaining the purported nickel phenomenon. Additionally, attempts to independently verify the Rossi device appear to have been met with resistance.¹¹

21. A person of ordinary skill in the art would have cause to doubt the operability of the claimed invention for three reasons. First, the inventors make the incredible claim of exothermic fusion of hydrogen and nickel in a laboratory environment. For the reasons discussed above, the known and existing laws of nature do not support this reaction. Next, the proponents have only been able to produce an ash that reflects the standard isotopic distribution of copper, not the distribution of copper that would occur if nickel were actually undergoing the fusion process. Finally, the absolute dearth independent confirmation and the carefully crafted "demonstrations" would cause a person of ordinary skill in the art to doubt the operability of the device as claimed.

¹⁰ See Aleklett, "Rossi energy catalyst - a big hoax or new physics?" Aleklett's Energy Mix, pp. 2-3. <https://aleklett.wordpress.com/2011/04/11/rossi-energy-catalyst-a-big-hoax-or-new-physics/> (last accessed 18 December 2015).

¹¹ See "Can Andrea Rossi's Infinite-Energy Black Box Power the World - Or Just Scam It?" Popular Science <http://www.popsci.com/science/article/2012-10/andrea-rossis-black-box> (last accessed 18 December 2015).

Application/Control Number: 12/736,193
Art Unit: 3646

Page 8

Claim Rejections - 35 USC § 101

22. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

21. Claims 1-7, 9 and 10 are rejected under 35 U.S.C. 101 because the disclosed invention is inoperative and therefore lacks utility. The claims are rejected for the reasons disclosed above.

Claim Rejections - 35 USC § 112

22. The following is a quotation of the first paragraph of 35 U.S.C. 112(a):

(a) IN GENERAL.—The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor or joint inventor of carrying out the invention.

The following is a quotation of the first paragraph of pre-AIA 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor of carrying out his invention.

23. Claims 1-7, 9, and 10 rejected under 35 U.S.C. 112(a) or 35 U.S.C. 112 (pre-AIA), first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Specifically, any claim that is inoperable is necessarily non-enabled. *In re Swartz*, 232 F.3d 862 (Fed. Cir. 2000).

Application/Control Number: 12/736,193
Art Unit: 3646

Page 9

Claim Rejections - 35 USC § 103

24. The following is a quotation of pre-AIA 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

25. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under pre-AIA 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

26. Claims 1 and 7 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Butler et al., "Radiative Proton Capture by Ni⁵⁸, Ni⁶⁰, and Co⁵⁹."

27. Notwithstanding the inoperability of the claimed device, the reaction itself is obvious over Butler. Note, the Butler device uses the more traditional method of nucleosynthesis which employs accelerating protons into a stationary target. However, even if the alleged reaction could occur, one of ordinary skill in the art would understand that the reaction would be subject to varying the basic reaction parameters.

Application/Control Number: 12/736,193
Art Unit: 3646

Page 10

28. Applicant traverses the rejection because the Butler device employs nickel-plated silver and not nickel powder. However, if the reaction is to occur as described in the specification, it is not clear why the solid form of the fuel would matter.

29. Accordingly, claims 1 and 7 are rejected as obvious over Butler.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SEAN P. BURKE whose telephone number is (571)270-5493. The examiner can normally be reached on Monday-Friday, 10:00 AM to 6:30 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jack Keith can be reached on (571) 262-6878. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Application/Control Number: 12/736,193
Art Unit: 3646

Page 11

/SEAN P BURKE/

Examiner, Art Unit 3646