## DETAILED ACTION

### *Notice of Pre-AIA or AIA Status*

**1.** The present application, filed after 16 March 2013, is being examined under the first inventor to file provisions of the AIA.

### *Response to Amendment*

**2.** A Reply was filed 13 December 2019. Claims 32-39, 41-43, 45-46, and 48-51 are pending. Claims 36-37, 39, 43, and 50-51 are withdrawn.

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

### *Claim Rejections - 35 USC § 112(b)*

**3.** Claims 32-35, 38, 41-42, 45-46, and 48-49 are rejected under 35 U.S.C. 112(b) as being indefinite for failing to particularly point out and distinctly claim the subject matter which the inventor or a joint inventor regards as the invention.

Claim 32

It remains unclear what constitutes a "dusty" compound, especially with respect to a non-dusty compound. The border or dividing line between dusty and non-dusty is undefined.

It remains unclear what constitutes the source of emitted protons.

The wording "at least one transition metal" lacks proper antecedent basis.

Claims 35, 36, and 39

These claims depend on canceled claim 52. It is unclear whether these claims should be canceled. It is unclear how these claims further limit a prior pending claim.

***Claim Rejections - 35 USC § 112a (non-enabling)***

**4.** Claims 32-35, 38, 41-42, 45-46, and 48-49 are rejected under 35 U.S.C. 112(a) as failing to comply with both the written description requirement and 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.

The reasons for rejection set forth in the Office Action dated 2 July 2019 are herein incorporated by reference.

***Claim Rejections - 35 USC § 112a (scope of enablement)***

**5.** Claims 32-35, 38, 40-42, 44-49, and 52 are rejected under 35 U.S.C. 112(a) because the specification, while being enabling for disclosed embodiments, does not reasonably provide enablement for non-disclosed broad embodiments.

The claims allow for an emission of protons of an unknown energy and flux. However, for deactivation of the radioactive material to take place, there will clearly be a minimum proton energy which is required for the reaction. This minimum proton energy (and flux) is unknown.

The claims are therefore not sufficiently supported by the original disclosure as their scope is broader than justified. Thus, the specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention commensurate in scope with these broad claims.

### *Claim Rejections - 35 USC § 101*

**6.** Claims 32-35, 38, 40-42, 44-49, and 52 are rejected under 35 U.S.C. 101 because the disclosed invention is inoperative and therefore lacks utility.

The reasons for rejection set forth in the Office Action dated 2 July 2019 are herein incorporated by reference.

### *Objection to Specification*

**7.** The claimed invention as disclosed is deemed non enabling. For the same reasons discussed above, the specification is objected to as being directed to an inoperable device.

### *Additional Comment*

**8.** Despite their lack of clarity (e.g., the 35 U.S.C. 112 rejections), claims have not been rejected based on prior art. Nevertheless, it should be understood that clarification of the application (e.g., via claim amendment) may necessitate a future prior art rejection thereof.

***Response to Arguments***

**9.** Applicant's arguments have been fully considered but they are not persuasive.

Applicant argues that "the transmutation is a nuclear reaction which transforms two products (a dusty compound and a radioactive material) into two different products. Thus, the transmutation occurs both in the dusty compound and in the radioactive material" (Reply at page 8, lines 6-8).

However, Applicant does not provide the processes (steps) by which these two nuclear transmutations to occur. For example, the source of protons is unclear. For sake of argument, even if protons are emitted from a transition metal, then how do they penetrate the closed container to transmute the radioactive material therein? Also, it remains unclear what it means to deactivate radioactive material (e.g., change its decay rate?). A complete understandable step-by-step process for carrying out transmutation in both the dusty compound and in the radioactive material is absent and unknown.

Regarding the source of emitted protons, Applicant states that "without wishing to be bound by theory, Applicant respectfully notes that, based upon the examples of the present disclosure, the availability of active nucleons is due to the interaction under the claimed conditions between micrometric metal powders and hydrogen. Applicant respectfully points out that the behavior of the process in the presence of heavy radionuclides can easily suggest that the radionuclides, even after a certain time of pushing by the metals drivers, behave like donors of active nucleons" (Reply at page 8, lines 4-10).

As Applicant's argument is best understood, the source of protons (nucleons) is due to interactions between micrometric metal powders and hydrogen. However, Applicant does not provide understandable processes (steps) by which protons are produced by mere interactions between micrometric metal powders and hydrogen, especially protons that are emitted with the capability of passing through a closed container to cause transmutation in a radioactive material.

Applicant's disclosure does not comply with the written description requirement and the enablement requirement. Applicant's disclosure does not enable one skilled in the art to make and/or use the invention. For example, how protons are generated and how the protons transmute radioactive material remains unclear. Applicant's disclosure (invention) is, at best, theoretical. Additionally, the disclosure (and claims), as best understood, appears to be based on the unproven concept of "low energy nuclear reaction" (LENR).

The Reply also states that "Applicant has submitted herewith two articles and three abstracts showing a more recent view of the field (Reply at page 13). However, the submitted IDS only lists three U.S. references. That is, the record is absent a recent filing of two articles and three abstracts.

## ***Conclusion***

**10.** Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. Prosecution on the merits is closed. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

### *RCE Eligibility*

**11.** Since prosecution is closed, this application is now eligible for a request for continued examination (RCE) under 37 CFR 1.114. Filing an RCE helps to ensure entry of an amendment to the claims and/or the specification.

### *Interview Information*

**12.** Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, Applicant is encouraged to use the USPTO Automated Interview Request (AIR) at http://www.uspto.gov/interviewpractice.

## *Contact Information*

**13.** Examiner Daniel Wasil can be reached at (571) 272-4654, on Monday-Thursday from 10:00-4:00 EST. Supervisor Jack Keith (SPE) can be reached at (571) 272-6878.

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