

Appeal Decision

Appeal No. 2019-9046

Appellant Brilliant Light Power, Inc.

Patent Attorney AIKAWA, Toshihiko

The case of appeal against the examiner's decision of refusal of Japanese Patent Application No. 2016-555734, entitled "Photovoltaic Power Generation Systems and Methods Regarding Same" (International publication No. WO2015/134047 published on September 11, 2015, and National Publication of International Patent Application No. 2017-518011 published on June 29, 2017) has resulted in the following appeal decision:

Conclusion

The appeal of the case was groundless.

Reason

No. 1 History of the procedures

The application was originally filed on April 1, 2014 as an International Patent Application (priority claim under the Paris Convention: received on March 3, 2014 in US, March 7, 2014 in US, March 21, 2014 in US, and March 31, 2014 in US) and the history of the procedures is as follows:

March 28, 2017	Written amendment
As of March 20, 2018	Notification of reasons for refusal
September 27, 2018	Written opinion and Written amendment
October 11, 2018	Written statement (seven documents)
As of February 28, 2019	Decision of refusal
July 4, 2019	Written demand for trial and Written amendment
August 26, 2019	Written amendment (Amendment of written demand for trial)
As of March 16, 2020	Notification of reasons for refusal
September 18, 2020	Written opinion and Written amendment

No. 2 The Invention

Inventions according to Claims 1 to 11 of the present application are recognized to be as specified by the matters recited in Claims 1 to 11, which have been amended by the written amendment submitted on September 18, 2020 (hereinafter, the amendment is referred to as "the Amendment"), and the invention recited in Claim 1 (hereinafter referred to as "the Invention") is as follows:

"A power system that generates at least one of direct electrical energy and thermal energy comprising:

at least one vessel;

reactants comprising:

a) a mixture of a metal, a metal halide, and H₂O;

b) a mixture of a metal, a metal oxide, and H₂O;

c) a mixture of a metal, a metal oxyhydroxide, and H₂O; or

d) a mixture of a metal oxide and H₂O;

at least one set of electrodes,

a source of electrical power to deliver a short burst of high-current electrical energy to apply high current to the reactants confined by the electrodes, and

at least one photovoltaic converter or at least one plasma dynamic converter."

The incorrectly spelled term found in "(b)" in Claim 1 can be obviously recognized as "metal oxide". Therefore, after correcting the error, the present invention has been identified.

No. 3 Reasons for refusal notified by the body

The gist of the reasons for refusal dated March 16, 2020 notified by the body includes the following contents:

1 The inventions recited in Claims 1 to 17 before the Amendment include a system that generates a power larger than an input energy. However, such a system is not supported by the Detailed Description of the Invention in the present application. Thus, none of these inventions is described in the Detailed Description of the Invention. Therefore, the present application does not satisfy the requirement under Article 36(6)(i) of the Patent Act.

2 The inventions recited in Claims 1 to 17 before the Amendment are based on the assumption of "Hydrino theory", but "Hydrino theory" is contrary to common general technical knowledge, and besides, even in view of the descriptions in the description or drawings attached to the application (hereinafter, referred to as "the description, etc. of the present application," it is not recognized that the system

according to the Invention has been experimentally proved as a system in which the generated power is larger than the input energy. Since the Detailed Description of the Invention is not clear and sufficient to enable a person skilled in the art to carry out each of the inventions, the present application does not satisfy the requirement under Article 36(4)(i) of the Patent Act.

No. 4 Judgment by the body

The body judges that the present application should be rejected for the reasons described in the above 1 and 2 in No. 3.

1 Findings

(1) Descriptions in the description, etc. of the present application

The description, etc. of the present application includes the following descriptions (the underlines are added by Appellant).

A "[Technical field]"

"The present disclosure relates to the field of power generation and, in particular, to systems, devices, and methods for the generation of power. More specifically, embodiments of the present disclosure are directed to power generation devices and systems, as well as related methods, which produce optical power, plasma, and thermal power, thereby producing electrical power via an optical to electric power converter, a plasma to electric power converter, a photon to electric power converter, or a thermal to electric power converter. In addition, embodiments of the present disclosure describe systems, devices, and methods that use the ignition of a water or water-based fuel source to generate optical power, mechanical power, electrical power, and/or thermal power using photovoltaic power converters. These and other related embodiments are described in detail in the present disclosure." ([0002])

B "[Background Art]"

"Power generation can take many forms, including harnessing power from plasma. Successful commercialization of plasma may depend on power generation systems capable of efficiently forming plasma and then capturing the power of the plasma produced." ([0003])

C "[Means for solving the problem]"

"Plasma may be formed during ignition of certain fuels. These fuels can include water or a water-based fuel source. During ignition, a plasma cloud of electron-stripped atoms is formed, and high optical power may be released. The high optical power of

the plasma can be harnessed by an electric converter of the present disclosure. The ions and excited state atoms can recombine and undergo electronic relaxation to emit optical power. The optical power can be converted to electricity with photovoltaics." ([0004])

D "[Description of Embodiments]"

"Disclosed herein are catalyst systems to release energy from atomic hydrogen to form lower energy states wherein the electron shell is at a closer position relative to the nucleus. The released power is harnessed for power generation and additionally new hydrogen species and compounds are desired products. These energy states are predicted by classical physical laws and require a catalyst to accept energy from the hydrogen in order to undergo the corresponding energy-releasing transition." ([0029])

"Classical physics gives closed- form solutions of the hydrogen atom, the hydride ion, the hydrogen molecular ion, and the hydrogen molecule and predicts corresponding species having fractional principal quantum numbers. Using Maxwell's equations, the structure of the electron was derived as a boundary-value problem wherein the electron comprises the source current of time-varying electromagnetic fields during transitions with the constraint that the bound $n = 1$ state electron cannot radiate energy. A reaction predicted by the solution of the H atom involves a resonant, nonradiative energy transfer from otherwise stable atomic hydrogen to a catalyst capable of accepting the energy to form hydrogen in lower-energy states than previously thought possible. Specifically, classical physics predicts that atomic hydrogen may undergo a catalytic reaction with certain atoms, excimers, ions, and diatomic hydrides which provide a reaction with a net enthalpy of an integer multiple of the potential energy of atomic hydrogen, $E_h = 27.2$ eV where E_h is one Hartree. Specific species (e.g. He^+ , Ar^+ , Sr^+ , K , Li , HCl , NaH , OH , SH , SeH , nascent H_2O , $n\text{H}$ ($n = \text{integer}$)) identifiable on the basis of their known electron energy levels are required to be present with atomic hydrogen to catalyze the process. The reaction involves a nonradiative energy transfer followed by $q \cdot 13.6$ eV continuum emission or $q \cdot 13.6$ eV transfer to H to form extraordinarily hot, excited-state H and a hydrogen atom that is lower in energy than unreacted atomic hydrogen that corresponds to a fractional principal quantum number. That is, in the formula for the principal energy levels of the hydrogen atom:

$$E_n = -(e^2/n^2 8\pi\epsilon_0 a_H) = -(13.598\text{eV}/n^2) \quad (1)$$

$$n = 1, 2, 3, \dots \quad (2)$$

where a_H is the Bohr radius for the hydrogen atom (52.947 pm), e is the magnitude of the charge of the electron, and ϵ_0 is the vacuum permittivity, and the fractional quantum

numbers are as follows:

$$n = 1, 1/2, 1/3, 1/4, \dots, 1/p \quad (3)$$

They replace the well-known parameter $n = \text{integer}$ in the Rydberg equation for hydrogen excited states. Then, similar to an excited state having the analytical solution of Maxwell's equations, a hydrino atom also comprises an electron, a proton, and a photon. However, the electric field of the latter increases the binding corresponding to absorption of energy rather than decreasing the central field with the absorption of energy as in an excited state, and the resultant photon-electron interaction of the hydrino is stable rather than radiative." ([0030]),

"The $n = 1$ state of hydrogen and the $n = 1/\text{integer}$ states of hydrogen are nonradiative, but a transition between two nonradiative states, say $n = 1$ to $n = 1/2$, is possible via a nonradiative energy transfer. Hydrogen is a special case of the stable states given by Equations (1) and (3) wherein the corresponding radius of the hydrogen or hydrino atom is given by (4)

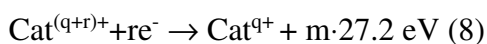
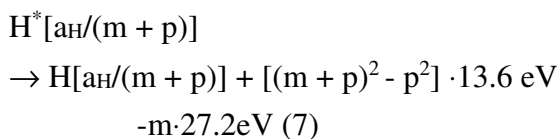
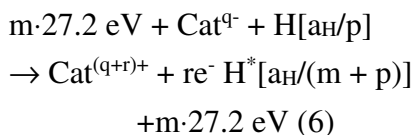
$$r = a_H/p \quad (4)$$

where $p = 1, 2, 3, \dots$. In order to conserve energy, energy must be transferred from the hydrogen atom to the catalyst in units of

$$m \cdot 27.2 \text{ eV}, m = 1, 2, 3, 4, \dots \quad (5)$$

and the radius transitions to $a_H/(m + p)$. The catalyst reactions involve two steps of energy release: a nonradiative energy transfer to the catalyst followed by additional energy release as the radius decreases to the corresponding stable final state. It is believed that the rate of catalysis is increased as the net enthalpy of reaction is more closely matched to $m \cdot 27.2 \text{ eV}$. It has been found that catalysts having a net enthalpy of reaction within $\pm 10\%$, preferably $\pm 5\%$, of $m \cdot 27.2 \text{ eV}$ are suitable for most applications. In the case of the catalysis of hydrino atoms to lower energy states, the enthalpy of reaction of $m \cdot 27.2 \text{ eV}$ (Eq. (5)) is relativistically corrected by the same factor as the potential energy of the hydrino atom." ([0031]),

"Thus, the general reaction is given by



and the overall reaction is

$H[a_H/p]$

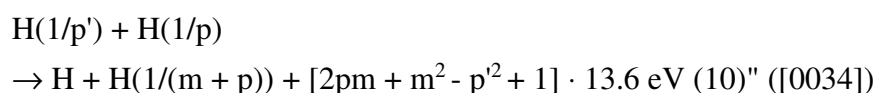
$$\rightarrow H[a_H/(m+p)] + [(m+p)^2 - p^2] \cdot 13.6 \text{ eV} \quad (9)$$

Where q , r , m , and p are integers. $H^*[a_H/(m+p)]$ has the radius of the hydrogen atom (corresponding to 1 in the denominator) and a central field equivalent to $(m+p)$ times that of a proton, and $H[a_H/(m+p)]$ is the corresponding stable state with the radius of $1/(m+p)$ that of H . As the electron undergoes radial acceleration from the radius of the hydrogen atom to a radius of $1/(m+p)$ - this distance, energy is released as characteristic light emission or as third-body kinetic energy. The emission may be in the form of an extreme-ultraviolet continuum radiation having an edge at $[(p+m)^2 - p^2 - 2m] \cdot 13.6 \text{ eV}$ or $91.2/[(m+p)^2 - p^2 - 2m] \text{ nm}$ and extending to longer wavelengths. In addition to radiation, a resonant kinetic energy transfer to form fast H may occur. Subsequent excitation of these fast H ($n=1$) atoms by collisions with the background H_2 involving emission of the corresponding H ($n=3$) fast atoms gives rise to broadened Balmer α emission. Alternatively, fast H is a direct product of H or hydrino serving as the catalyst wherein the acceptance of the resonant energy transfer regards the potential energy rather than the ionization energy. Conservation of energy gives a proton of the kinetic energy corresponding to one-half the potential energy in the former case and a catalyst ion essentially at rest in the latter case. The H recombination radiation of the fast protons gives rise to broadened Balmer α emission that is disproportionate to the inventory of hot hydrogen consistent with the excess power balance." ([0032]),

"In the present disclosure terms such as hydrino reaction, H catalysis, H catalysis reaction, catalysis when referring to hydrogen, the reaction of hydrogen to form hydrinos, and hydrino formation reaction all refer to the reaction such as that of Equations (6-9) of a catalyst defined by Equation (5) with atomic H to form states of hydrogen having energy levels given by Equations (1) and (3). The corresponding terms such as reactants, reactants for hydrino formation, catalyst mixture, hydrino reaction mixture, and hydrino reactants that produce or form lower-energy state hydrogen or hydrinos are also used interchangeably when referring to the reaction mixture that performs the catalysis of H to H states or hydrino states having energy levels given by Equations (1) and (3)." ([0033]),

"The catalytic lower-energy hydrogen transitions of the present disclosure require a catalyst that may be in the form of an endothermic chemical reaction of an integer m of the potential energy of uncatalyzed atomic hydrogen, 27.2 eV, that accepts the energy from atomic H to cause the transition. The endothermic catalyst reaction may be the ionization of one or more electrons from a species such as an atom or ion (e.g. $m=3$ for $Li \rightarrow Li^{2+}$), and may further comprise the concerted reaction of a bond cleavage with

ionization of one or more electrons from one or more of the partners of the initial bond (e.g. $m = 2$ for $\text{NaH} \rightarrow \text{Na}^{2+} + \text{H}$). He^+ , fulfills the catalyst criterion – a chemical or physical process with an enthalpy change equal to an integer multiple of 27.2 eV, since it ionizes at 54.417 eV, which is $2 \cdot 27.2$ eV. An integer number of hydrogen atoms may also serve as the catalyst of an integer multiple of 27.2 eV enthalpy. Hydrogen atoms $\text{H}(1/p)$ $p = 1, 2, 3, \dots, 137$ can undergo further transitions to lower-energy states given by Equations (1) and (3) wherein the transition of one atom is catalyzed by one or more additional H atoms that resonantly and non-radiatively accept $m \cdot 27.2$ eV with a concomitant opposite change in its potential energy. The overall general equation for the transition of $\text{H}(1/p)$ to $\text{H}(1/(p + m))$ induced by a resonance transfer of $m \cdot 27.2$ eV to $\text{H}(1/p)$ is represented by



E "I. Catalysts

He^+ , Ar^+ , Sr^+ , Li , K , NaH , $n\text{H}$ ($n = \text{integer}$), and H_2O are predicted to serve as catalysts, since they meet the catalyst criterion – a chemical or physical process with an enthalpy change equal to an integer multiple of the potential energy of atomic hydrogen, 27.2 eV. Specifically, a catalytic system is provided by the ionization of t electrons from an atom each to a continuum energy level such that the sum of the ionization energies of the t electrons is approximately $m \cdot 27.2$ eV (where m is an integer). Moreover, further catalytic transitions may occur such as in the case wherein $\text{H}(1/2)$ is first formed: $n = 1/2 \rightarrow 1/3, 1/3 \rightarrow 1/4, 1/4 \rightarrow 1/5$, and so on. Once catalysis begins, H or $\text{H}(1/p)$ serves as the catalyst for another H or $\text{H}(1/p')$ (p may equal p'). ([0050]), "The potential energy of H_2O is 81.6 eV (Equation (43)) [Mills GUT]. Then, by the same mechanism, the nascent H_2O molecule (not hydrogen bonded in solid, liquid, or gaseous state) may serve as a catalyst (Equations (44 to 47)). The continuum radiation band at 10.1 nm and going to longer wavelengths for theoretically predicted transitions of H to lower-energy, so called "hydrino" states, was observed only arising from pulsed pinched hydrogen discharges first at Black Light Power, Inc. (BLP) and reproduced at the Harvard Center for Astrophysics (CfA). Continuum radiation in the 10 to 30 nm region that matched predicted transitions of H to hydrino states was observed only arising from pulsed pinched hydrogen discharges with metal oxides that are thermodynamically favorable to undergo H reduction to form HOH catalyst; whereas, those that are unfavorable did not show any continuum even though the low-melting point metals tested are very favorable to forming metal ion plasmas with strong short-

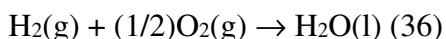
wavelength continua in more powerful plasma sources." ([0056])

F "II. Hydrinos

A hydrogen atom having a binding energy given by $\text{Binding Energy} = 13.6\text{eV}/(1/p)^2$ (34) where p is an integer greater than 1, preferably from 2 to 137, is the product of the H catalysis reaction of the present disclosure. The binding energy of an atom, ion, or molecule, also known as the ionization energy, is the energy required to remove one electron from the atom, ion, or molecule. A hydrogen atom having the binding energy given in Equation (34) is hereafter referred to as a "hydrino atom" or "hydrino." The designation for a hydrino of radius a_H/p (where a_H is the radius of an ordinary hydrogen atom and p is an integer) is $H[a_H/p]$. A hydrogen atom with a radius a_H is hereinafter referred to as "ordinary hydrogen atom" or "normal hydrogen atom." Ordinary atomic hydrogen is characterized by its binding energy of 13.6 eV." ([0058]),

"Hydrinos are formed by reacting an ordinary hydrogen atom with a suitable catalyst having a net enthalpy of reaction of $m \cdot 27.2$ eV (35) where m is an integer. It is believed that the rate of catalysis is increased as the net enthalpy of reaction is more closely matched to $m \cdot 27.2$ eV. It has been found that catalysts having a net enthalpy of reaction within $\pm 10\%$, preferably $\pm 5\%$, of $m \cdot 27.2$ eV are suitable for most applications." ([0059]),

"This catalysis releases energy from the hydrogen atom with a commensurate decrease in size of the hydrogen atom, $r_n = n a_H$. For example, the catalysis of $H(n = 1)$ to $H(n = 1/2)$ releases 40.8 eV, and the hydrogen radius decreases from a_H to $(1/2) a_H$. A catalytic system is provided by the ionization of t electrons from an atom each to a continuum energy level such that the sum of the ionization energies of the t electrons is approximately $m \cdot 27.2$ eV (where m is an integer). As a power source, the energy given off during catalysis is much greater than the energy lost to the catalyst. The energy released is large as compared to conventional chemical reactions. For example, when hydrogen and oxygen gases undergo combustion to form water, the known enthalpy of formation of water is $\Delta H_f = -286$ kJ/mole or 1.48 eV per hydrogen atom.



By contrast, each ($n = 1$) ordinary hydrogen atom undergoing catalysis releases a net of 40.8 eV. Moreover, further catalytic transitions may occur: $n = 1/2 \rightarrow 1/3$, $1/3 \rightarrow 1/4$, $1/4 \rightarrow 1/5$ and so on. Once catalysis begins, hydrinos autocatalyze further in a process called disproportionation. This mechanism is similar to that of an inorganic ion catalysis. But hydrino catalysis should have a higher reaction rate than that of the

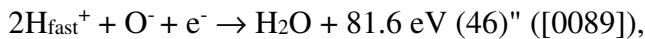
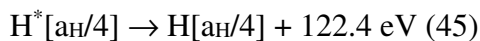
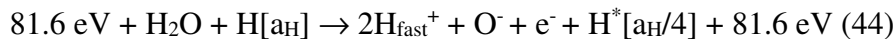
inorganic ion catalyst due to the better match of the enthalpy to $m \cdot 27.2$ eV." ([0060])

"In an embodiment, at least one of a molecule or positively or negatively charged molecular ion serves as a catalyst that accepts about $m \cdot 27.2$ eV from atomic H with a decrease in the magnitude of the potential energy of the molecule or positively or negatively charged molecular ion by about $m \cdot 27.2$ eV. For example, the potential energy of H₂O given in Mills GUTCP is as follows:

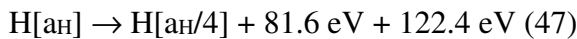
$$V_e = \left(\frac{3}{2}\right) \frac{-2e^2}{8\pi\epsilon_0\sqrt{a^2 - b^2}} \ln \frac{a + \sqrt{a^2 - b^2}}{a - \sqrt{a^2 - b^2}} = -81.8715 \text{ eV} \quad (43)$$

" ([0088]),

" A molecule that accepts $m \cdot 27.2$ eV from atomic H with a decrease in the magnitude of the potential energy of the molecule by the same energy may serve as a catalyst. For example, the catalysis reaction ($m = 3$) regarding the potential energy of H₂O is as follows:



"And the overall reaction is as follows:



wherein $\text{H}^*[\text{a}_\text{H}/4]$ has the radius of the hydrogen atom and a central field equivalent to 4 times that of a proton and $\text{H}[\text{a}_\text{H}/4]$ is the corresponding stable state with the radius of 1/4 that of H. As the electron undergoes radial acceleration from the radius of the hydrogen atom to a radius of 1/4 this distance, energy is released as characteristic light emission or as third-body kinetic energy. Based on the 10% energy change in the heat of vaporization in going from ice at 0°C to water at 100°C, the average number of H bonds per water molecule in boiling water is 3.6. Thus, in an embodiment, H₂O must be formed chemically as isolated molecules with suitable activation energy in order to serve as a catalyst to form hydrinos. In an embodiment, the H₂O catalyst is nascent H₂O." ([0090])

G " VII. Solid Fuel Catalyst Induced Hydrino Transition (SF-CIHT) Cell and Power Converter

In an embodiment, a power system that generates at least one of direct electrical energy and thermal energy comprises at least one vessel, reactants comprising: (a) at least one source of catalyst or a catalyst comprising nascent H₂O; (b) at least one source of atomic hydrogen or atomic hydrogen; and (c) at least one of a conductor and a

conductive matrix, and at least one set of electrodes to confine the hydrino reactants, a source of electrical power to deliver a short burst of high-current electrical energy, a reloading system, at least one system to regenerate the initial reactants from the reaction products, and at least one direct converter of plasma to electricity and at least one power converter of heat to electricity. In a further embodiment, the vessel is capable of a pressure of at least one of atmospheric, above atmospheric, and below atmospheric. In an embodiment, the regeneration system can comprise at least one of a hydration, thermal, chemical, and electrochemical system. In another embodiment, the at least one direct plasma to electricity converter can comprise at least one of the group of a plasmadynamic power converter, an E x B direct converter, a magnetohydrodynamic power converter, a magnetic mirror magnetohydrodynamic power converter, a charge drift converter, a Post or Venetian Blind power converter, a gyrotron, a photon bunching microwave power converter, and a photoelectric converter. In a further embodiment, the at least one thermal to electricity converter can comprise at least one of the group of a heat engine, a steam engine, a steam turbine and generator, a gas turbine and generator, a Rankine-cycle engine, a Brayton-cycle engine, a Stirling engine, a thermionic power converter, and a thermoelectric power converter." ([0171]),

"In an embodiment, H₂O is ignited to form hydrinos with a high release of energy in the form of at least one of thermal, plasma, and electromagnetic (light) power. ('Ignition' in the present disclosure denotes a very high reaction rate of H to hydrinos that may be manifest as a burst, pulse, or other form of high power release.) H₂O may comprise the fuel that may be ignited with the application a high current such as one in the range of about 2000 A to 100,000 A. This may be achieved by the application of a high voltage such as 5,000 to 100,000 V to first form highly at least conductive plasma such as an arc. Alternatively, a high current may be passed through a compound or mixture comprising H₂O wherein the conductivity of the resulting fuel such as a solid fuel is high. (In the present disclosure a solid fuel or energetic material is used to denote a reaction mixture that forms a catalyst such as HOH and H that further reacts to form hydrinos. However, the reaction mixture may comprise other physical states than solid. In embodiments, the reaction mixture may be at least one state of gaseous, liquid, solid, slurry, sol gel, solution, mixture, gaseous suspension, pneumatic flow, and other states known to those skilled in the art.) In an embodiment, the solid fuel having a very low resistance comprises a reaction mixture comprising H₂O. The low resistance may be due to a conductor component of the reaction mixture. In embodiments, the resistance of the solid fuel is at least one of in the range of about 10⁻⁹ Ω to 100 Ω, (Omitted). In another embodiment, the fuel having a high resistance comprises H₂O comprising a

trace or minor mole percentage of an added compound or material. In the latter case, high current may be flowed through the fuel to achieve ignition by causing breakdown to form a highly conducting state such as an arc or arc plasma." ([0172]),

"In embodiments, the solid fuel can comprise carbon or activated carbon and H₂O, wherein the mixture is regenerated by rehydration comprising addition of H₂O. In further embodiments, the reactants can comprise at least one of a slurry, solution, emulsion, composite, and a compound. In embodiments, the current of the source of electrical power to deliver a short burst of high-current electrical energy is sufficient enough to cause the hydrino reactants to undergo the reaction to form hydrinos at a very high rate. In embodiments, the source of electrical power to deliver a short burst of high-current electrical energy comprises at least one of the following: a voltage selected to cause a high AC, DC, or an AC-DC mixture of current that is in the range of at least one of 100 A to 1,000,000 A, 1 kA to 100,000 A, and 10 kA to 50 kA; a DC or peak AC current density in the range of at least one of 100 A/cm² to 1,000,000 A/cm², 1000 A/cm² to 100,000 A/cm², and 2000 A/cm² to 50,000 A/cm²; the voltage is determined by the conductivity of the solid fuel or energetic material wherein the voltage is given by the desired current times the resistance of the solid fuel or energetic material sample; the DC or peak AC voltage may be in at least one range chosen from about 0.1 V to 500 kV, 0.1 V to 100 kV, and 1 V to 50 kV, and the AC frequency may be in the range of about 0.1 Hz to 10 GHz, 1 Hz to 1 MHz, 10 Hz to 100 kHz, and 100 Hz to 10 kHz. In embodiments, the resistance of the solid fuel or energetic material sample is in at least one range chosen from about 0.001 mΩ to 100 MΩ, 0.1 Ω to 1 MΩ, and 10 Ω to 1 kΩ, and the conductivity of a suitable load per electrode area active to form hydrinos is in at least one range chosen from about 10⁻¹⁰ Ω⁻¹cm⁻² to 10⁶ Ω⁻¹cm⁻², (omitted)." ([0177]),

"The solid fuel or energetic material may comprise a conductor or conductive matrix or support such as a metal, carbon, or carbide, and H₂O or a source of H₂O such as a compound or compounds that can react to form H₂O or that can release bound H₂O such as those of the present disclosure. The solid fuel may comprise H₂O, a compound or material that interacts with the H₂O, and a conductor. The H₂O may be present in a state other than bulk H₂O such as absorbed or bound H₂O such as physisorbed H₂O or waters of hydration. Alternatively, the H₂O may be present as bulk H₂O in a mixture state that is highly conductive or made highly conductive by the application of a suitable voltage. The solid fuel may comprise H₂O and a material or compound such as a metal powder or carbon that provides high conductivity and a material or compound such as an oxide such as a metal oxide to facilitate forming H and possibly HOH catalyst. An exemplary solid fuel may comprise R-Ni alone and with additives

such as those of transition metals and Al wherein R-Ni releases H and HOH by the decomposition of hydrated Al_2O_3 and $\text{Al}(\text{OH})_3$. A suitable exemplary solid fuel comprises at least one oxyhydroxide such as TiOOH , GdOOH , CoOOH , InOOH , FeOOH , GaOOH , NiOOH , AlOOH , CrOOH , MoOOH , CuOOH , MnOOH , ZnOOH , or SmOOH and a conductive matrix such as at least one of a metal powder and carbon powder, and optionally H_2O . The solid fuel may comprise at least one hydroxide such as a transition metal hydroxide such as at least one of $\text{Cu}(\text{OH})_2$, $\text{Co}(\text{OH})_2$, $\text{Fe}(\text{OH})_2$, and $\text{Ni}(\text{OH})_2$, an aluminum hydroxide such as $\text{Al}(\text{OH})_3$, a conductor such as at least one of carbon powder and a metal powder, and optionally H_2O . The solid fuel may comprise at least one oxide such as at least one of a transition metal oxide such as at least one of CuO , Cu_2O , NiO , Ni_2O_3 , FeO , and Fe_2O_3 , a conductor such as at least one of carbon powder and a metal powder, and H_2O . The solid fuel may comprise at least one halide such as a metal halide such as an alkaline earth metal halide such as MgCl_2 , a conductor such as at least one of carbon powder and a metal powder such as Co or Fe, and H_2O . The solid fuel may comprise a mixture of solid fuels such as one comprising at least two of a hydroxide, an oxyhydroxide, an oxide, and a halide such as a metal halide, and at least one conductor or conductive matrix, and H_2O . The conductor may comprise at least one of a metal screen coated with one or more of the other components of the reaction mixture that comprises the solid fuel, R-Ni, a metal powder such as a transition metal powder, Ni or Co celmet, carbon, or a carbide or other conductor, or conducting support or conducting matrix known to those skilled in the art. In an embodiment, at least one conductor of the H_2O -based solid fuel comprises a metal such as a metal powder such as at least one of a transition metal such as Cu, Al, and Ag." ([0181]),

H "In an exemplary energetic material, 0.05 ml (50 mg) of H_2O was added to 20 mg or either Co_3O_4 or CuO that was sealed in an aluminum DSC pan (Aluminum crucible 30 μl , D: 6.7 x 3 (Setaram, S08/HBB37408) and Aluminum cover D: 6,7, stamped, non-tight (Setaram, S08/HBB37409)) and ignited with a current of 15,000 to 25,000 A at about 8 V RMS using a Taylor-Winfield model ND-24-75 spot welder. A large energy burst was observed that vaporized the samples, each as an energetic, highly-ionized, expanding plasma. Another exemplary solid fuel ignited in the same manner with a similar result comprises Cu (42.6 mg) + CuO (14.2 mg) + H_2O (16.3 mg) that was sealed in an aluminum DSC pan (71.1 mg) (Aluminum crucible 30 μl , D: 6.7 x 3 (Setaram, S08/HBB37408) and Aluminum cover D: 6, 7, stamped, tight (Setaram, S08/HBB37409))." ([0190])

I "A. Plasmadynamic Converter (PDC)

The mass of a positively charge ion of a plasma is at least 1800 times that of the electron; thus, the cyclotron orbit is 1800 times as large. This result allows electrons to be magnetically trapped on magnetic field lines while electrons may drift. Charge separation may occur to provide a voltage to a plasmadynamic converter." ([0194])

J "B. Calorimetry of Solid Fuel of the SF-CIHT Cell

Calorimetry was performed using a Parr 1341 plain-jacketed calorimeter with a Parr 6774 calorimeter thermometer option on a solid fuel pellet. A Parr 1108 oxygen combustion chamber of the calorimeter was modified to permit initiation of the chemical reaction with high current. Copper rod ignition electrodes that comprised 1/2-inch outer diameter (OD) by 12 inch length copper cylinders were fed through the sealed chamber containing a graphite pellet (~1000 mg, L x W x H = 0.18 inches x 0.6 inches x 0.3 inches) as a control resistive load for calibration of the heat capacity of the calorimeter or a solid fuel pellet wherein the ends had a copper clamp that tightly confined each sample. The calorimeter water bath was loaded with 2,000 g DI water (as per Parr manual). The power source for calibration and ignition of the solid fuel pellet was a Taylor-Winfield model ND-24-75 spot welder that supplied a short burst of electrical energy in the form of a 60 Hz low-voltage of about 8 V RMS and high-current of about 15,000 to 20,000 A. The input energy of the calibration and ignition of the solid fuel was given as the product of the voltage and current integrated over the time of the input. The voltage was measured by a data acquisition system (DAS) comprising a PC with a National Instruments USB-6210 data acquisition module and Labview VI. The current was also measured by the same DAS using a Rogowski coil (Model CWT600LF with a 700 mm cable) that was accurate to 0.3% as the signal source. V and I input data were obtained at 10 KS/s and a voltage attenuator was used to bring analog input voltage to within the plus-minus 10 V range of the USB-6210." ([0374]), "The calibrated heat capacity of the calorimeter and electrode apparatus was determined to be 12,000 J/°C using the graphite pellet with an energy input of 995 J by the spot welder. The sample of solid fuel comprising Cu (45 mg) + CuO (15 mg) + H₂O (15 mg) that was sealed in an aluminum DSC pan (70 mg) (Aluminum crucible 30 µl, D: 6.7 x 3 (Setaram, S08/HBB37408) and Aluminum cover D: 6,7, stamped, tight (Setaram, S08/HBB37409)) was ignited with an applied peak 60 Hz voltage of 3 V and a peak current of about 11,220 A. The input energy measured from the voltage and current over time was 46 J to ignite the sample as indicated by a disruption spike in the waveforms with a total of 899 J input by the power pulse of the spot welder, and the

total output energy calculated for the calorimetry thermal response to the energy released from the ignited solid fuel using the calibrated heat capacity was 3,035.7 J. By subtracting the input energy, the net energy was 2, 136.7 J for the 0.075 g sample. In control experiments with H₂O, the alumina pan did not undergo a reaction other than becoming vaporized in the blast. XRD also showed no aluminum oxide formation. Thus, the theoretical chemical reaction energy was zero, and the solid fuel produced 28,500 J/g of excess energy in the formation of hydrinos." ([0375]),

"C. Photovoltaic Power Conversion

The sample of solid fuel comprising Cu (45 mg) + CuO (15 mg) + H₂O (15 mg) that was sealed in an aluminum DSC pan (70 mg) (Aluminum crucible 30 µl D: 6.7 x 3 (Setaram, S08/HBB37408) and Aluminum cover D: 6,7, stamped, tight (Setaram, S08/HBB37409)) was ignited with an applied peak 60 Hz voltage of 3 to 6 V and a peak current of about 10,000 to 15,000 A. The visible spectrum was recorded with an Ocean Optics visible spectrometer (Ocean Optics Jaz, with ILX511b detector, OFLV-3 filter, L2 lens, 5 µm slit, 350 to 1000 nm). The spectrum fit a blackbody of about 6000K. The blackbody temperature of the sun is 5800 K. Since the sun and the SF-CIHT plasma are both at 5800 K-6000 K (FIGURE 40), and the sun is a standard blackbody of 1000 W/m² at Earth, a solar cell served as a power meter. The optical power density of the plasma at a given distance from the ignition center to a solar cell was calculated based on the relative solar cell power density response to the plasma source relative to that of the sun. The total optical power of the plasma source was then calculated by multiplying the power density and the solid angle area of a spherical shell on which the density was determined." ([0376])

"Taking the power of sunlight of 1000 W/m² as a standard light source, the efficiency of a polycrystal solar panel was determined. Using the energy recorded on a monocrystal solar panel as well as its area, and duration of the ignition event of 20 µs determined by 150,000 frames per second high-speed video, the power density of the plasma was determined to be 6 x 10⁶ W/m². The optical power of the plasma was confirmed with the Ocean Optics visible light spectrometer. The separation distance of the entrance of the fiber optic cable from the plasma center that resulted in the spectral intensity to match that of a standard point-source power light source was determined. Then, the power of the plasma source was given by the correcting the standard power by the separation distance squared. Typical separation distances were large such as 700 cm." ([0377])

"By multiplying the power density by the solid-angle spherical area at the 10-inch radius, the distance between the ignition center and the solar panel, the total optical

power of the plasma was determined to be $0.8 \text{ m}^2 \times 6 \times 10^6 \text{ W/m}^2 = 4.8 \times 10^6 \text{ W}$ optical power. The total energy given by the total power times the blast duration of 20 us was $(4.8 \times 10^6 \text{ W}) (20 \times 10^{-6} \text{ s}) = 96 \text{ J}$. The typical calorimetrically measured energy released by detonation of the solid fuel was about 1000 J. The lesser amount of recorded optical energy was considered due to the slow response of a monocrystalline solar cell that disadvantages the fast ignition emission. GaAs cell may be more suitable." ([0378])

"D. Plasmadynamic Power Conversion

0.05 ml (50 mg) of H₂O was added to 20 mg of either Co₃O₄ or CuO that was sealed in an aluminum DSC pan (Aluminum crucible 30 μl, D: 6.7 x 3 (Setaram, S08/HBB37408) and Aluminum cover D: 6,7, stamped, tight (Setaram, S08/HBB37409)). Using a Taylor-Winfield model ND-24-75 spot welder, each sample was ignited with a current of 15,000 to 25,000 A at about 8 V RMS applied to the ignition electrodes that comprised 5/8-inch outer diameter (OD) by 3-inch length copper cylinders wherein the flat ends confined the sample. A large power burst was observed that vaporized each sample as an energetic, highly-ionized, expanding plasma. PDC electrodes comprised two 1/16-inch OD copper wires. The magnetized PDC electrode was shaped as an open loop with a diameter of 1 inch that was placed circumferentially around the ignition electrodes, in the plane of the fuel sample. Since the current was axial, the magnetic field from the high current was radial, parallel to the contour of the loop PDC electrode. The counter unmagnetized PDC electrode was parallel to the ignition electrodes and the direction of the high current; thus, the radial magnetic field lines were perpendicular to this PDC electrode. The counter PDC electrode extended 2.5 inches above and below the plane of the sample. The PDC voltage was measured across a standard 0.1 Ω resistor. The voltage of the PDC electrodes following ignition corresponding was 25 V." ([0384])

"F. Spectroscopic Identification of Molecular Hydrino

0.05 ml (50 mg) of H₂O was added to 20 mg of either Co₃O₄ or CuO that was sealed in an aluminum DSC pan (Aluminum crucible 30 μl, D: 6, 7 x 3 (Setaram, S08/HBB37408) and Aluminum cover D: 6,7, stamped, non-tight (Setaram, S08/HBB37409)) and ignited with a current of 15,000 to 25,000 A at about 8 V RMS using a Taylor-Winfield model ND-24-75 spot welder. A large power burst was observed that vaporized the samples, each as an energetic, highly-ionized, expanding plasma. A MoCu foil witness plate (50-50 at%, AMETEK, 0.020-inch thickness) was placed 3.5 inches from the center of the ignited sample such that the expanding plasma was incident on the surface to embed H₂(1/4) molecules into the surface." ([0387]),

" Using a Thermo Scientific DXR Smart Raman with a 780 nm diode laser in the macro mode, a 40 cm^{-1} broad absorption peak was observed on the MoCu foil following exposure to the $\text{H}_2(1/4)$ containing plasma. The peak was not observed in the virgin alloy, and the peak intensity increased with increasing plasma intensity and laser intensity. Since no other element or compound is known that can absorb a single 40 cm^{-1} (0.005 eV) near infrared line at 1.33 eV (the energy of the 780 nm laser minus 1950 cm^{-1}), $\text{H}_2(1/4)$ was considered. The absorption peak starting at 1950 cm^{-1} matched the free space rotational energy of $\text{H}_2(1/4)$ to four significant figures, and the width of 40 cm^{-1} matches the orbital-nuclear coupling energy splitting [Mills GUTCP]." ([0388]),

"A Raman spectrum was performed on a 1 g KOH-KCl (1 : 1) getter sample that was held 2 inches away from the center of 15 consecutive initiations of 15 separate solid fuel pellets each comprising CuO (30 mg) + Cu (10 mg) + H_2O (14.5 mg) that was sealed in an aluminum DSC pan (Aluminum crucible 30 μl , D: 6, 7 x 3 (Setaram, S08/HBB37408) and Aluminum cover D: 6,7, stamped, tight (Setaram, S08/HBB37409)). Each sample of solid fuel was ignited with a Taylor-Winfield model ND-24-75 spot welder that supplied a short burst of low- voltage, high-current electrical energy. The applied 60 Hz voltage was about 8 V peak, and the peak current was about 20,000 A. The getter sample was contained in an alumina crucible that was covered with a polymer mesh wire tied around the crucible. The mesh prevented any solid reaction products from entering the sample while allowing gas to pass through. The fifteen separate solid fuel samples were rapidly and successively ignited, and the getter sample that accumulated the 15 exposures was transferred to an Ar glove box where it was homogenously mixed using a mortar and pestle. Using the Horiba Jobin Yvon LabRAM Aramis Raman spectrometer with a HeCd 325 nm laser in microscope mode with a magnification of 40X, a series of 1000 cm^{-1} equal-energy spaced Raman peaks that matched the second order rotational emission of $\text{H}_2(1/4)$ within the $\nu = 1 \rightarrow \nu = 0$ transition was observed. Specifically, the Q, R, and P branch peaks Q(0), R(0), R(1), R(2), P(1), P(2), P(3), P(4), and P(5), were observed at 12,194, 11,239, 10,147, 13,268, 14,189, 15,127, 16,065, 17,020, and $17,907\text{ cm}^{-1}$, respectively, that confirmed molecular hydrino $\text{H}_2(1/4)$ as the source of the energetic blast of the ignited solid fuel." ([0406])

(2) Technical significance of the Invention

According to each description in the above (1), it is acknowledged that the technical significance of the Invention is as follows:

A The Invention relates to the field of power generation to produce optical power, plasma, and thermal power , thereby producing electrical power via an optical to electric power converter, a plasma to electric power converter, a photon to electric power converter, or a thermal to electric power converter. Power generation may depend on power generation systems capable of capturing the power of the plasma produced ([0002], [0003]).

B Plasma may be formed during ignition of certain fuels. These fuels can include water or a water-based fuel source. During ignition, a plasma cloud is formed, and high optical power may be released, and utilized by an electric converter . ([0004])

C In catalyst systems to release energy from atomic hydrogen to form lower energy states, the electron shell of the atomic hydrogen is at a closer position relative to the nucleus. The released power is harnessed for power generation. These energy states are predicted by classical physical laws and require a catalyst to accept energy from the hydrogen in order to undergo the corresponding energy-releasing transition. ([0029])

Specifically, for hydrogen atoms, etc., classical physics predicts species having fractional principal quantum numbers n ($n = 1, 1/2, 1/3, 1/4, \dots, 1/p$). A hydrogen atom having a binding energy of $13.6 \text{ eV}/(1/p)^2$ (p is an integer larger than 1) is referred to as a "hydrino atom" or "hydrino." The diameter of an hydrino atom is a_H/p (a_H is the Bohr radius for the hydrogen atom), and the designation for hydrino with the radius is $H[a_H/p]$. A hydrogen atom with a radius a_H is hereinafter referred to as "ordinary hydrogen atom" or "normal hydrogen atom." Ordinary atomic hydrogen is characterized by its binding energy of 13.6 eV. ([0030], [0031], [0058])

The catalyst reactions involve a nonradiative energy transfer to the catalyst followed by additional energy release as the radius decreases to the corresponding stable final state. As the electron undergoes radial acceleration from the radius of the hydrogen atom to a radius of $1/(m + p)$ this distance, energy is released as characteristic light emission or as third-body kinetic energy. ([0032])

The catalytic lower-energy hydrogen transitions require a catalyst that may be in the form of an endothermic chemical reaction of an integer m of the potential energy of uncatalyzed atomic hydrogen, 27.2 eV, that accepts the energy from atomic H to cause the transition. ([0034])

D The potential energy of H_2O is 81.6 eV. Then, by the same mechanism, the

nascent H₂O molecule may serve as a catalyst. ([0056])

Furthermore, due to the catalysis reaction ($m = 3$) regarding the potential energy of H₂O, the electron undergoes radial acceleration from the radius of the hydrogen atom to a radius of 1/4 this distance. Then, energy is released as characteristic light emission or as third-body kinetic energy. Thus, H₂O must be formed chemically as isolated molecules with suitable activation energy in order to serve as a catalyst to form hydrinos. ([0089], [0090])

E In an embodiment, a power system that generates at least one of direct electrical energy and thermal energy comprises at least one vessel, reactants comprising: (a) at least one source of catalyst or a catalyst comprising nascent H₂O; (b) at least one source of atomic hydrogen or atomic hydrogen; and (c) at least one of a conductor and a conductive matrix, and at least one set of electrodes to confine the hydrino reactants, a source of electrical power to deliver a short burst of high-current electrical energy, a reloading system, at least one system to regenerate the initial reactants from the reaction products, and at least one direct converter of plasma to electricity and at least one power converter of heat to electricity. ([0171])

The current of the source of electrical power to deliver a short burst of high-current electrical energy is sufficient enough to cause the hydrino reactants to undergo the reaction to form hydrinos at a very high rate. ([0177])

F In an example, the reactants can include a mixture of a metal, a metal oxide thereof, and H₂O, and the reactants can include a mixture of a metal, a metal halide, and H₂O. ([0175], [0176])

In addition, a suitable exemplary solid fuel comprises at least one oxyhydroxide and a conductive matrix such as at least one of a metal powder and carbon powder, and optionally H₂O. ([0181])

(3) Examples of "reactants" in the Invention

The "reactants" are specified in the Invention. Examples of the "reactants" can be found in the description, etc. of the present application as follows:

A 0.05 ml (50 mg) of H₂O was added to 20 mg of either Co₃O₄ or CuO that was sealed in an aluminum DSC pan.

It was ignited with a current of 15,000 to 25,000 A at about 8 V RMS.

A large energy burst was observed that vaporized the samples, each as an energetic, highly-ionized, expanding plasma. ([0190])

B Cu (42.6 mg) + CuO (14.2 mg) + H₂O (16.3 mg) sealed in an aluminum DSC pan.

It was ignited in the same way as the above A, and similar results were obtained. ([0190])

C Sample of solid fuel comprising Cu (45 mg) + CuO (15 mg) + H₂O (15 mg) that was sealed in an aluminum DSC pan

It was ignited with an applied peak 60 Hz voltage of 3 V and a peak current of about 11,220 A.

The input energy was 46J out of total 899J input, and the total output energy was 3,035.7 J. The net energy was 2,136.7 J for the 0.075 g sample. In control experiments with H₂O, the alumina pan did not undergo a reaction other than become vaporized in the blast. XRD also showed no aluminum oxide formation. Thus, the theoretical chemical reaction energy was zero, and the solid fuel produced 28,500 J/g of excess energy in the formation of hydrinos. ([0374], [0375])

D Sample of solid fuel comprising Cu (45 mg) + CuO (15 mg) + H₂O (15 mg) that was sealed in an aluminum DSC pan.

It was ignited with an applied peak 60 Hz voltage of 3 to 6 V and a peak current of about 10000 to 15,000 A.

The total optical power of the plasma was determined to be $0.8 \text{ m}^2 \times 6 \times 10^6 \text{ W/m}^2 = 4.8 \times 10^6 \text{ W}$ optical power. The total energy given by the total optical power times the blast duration of 20 us was 96 J. In contrast, the typical calorimetrically measured energy released by detonation of the solid fuel was about 1000 J. The lesser amount of recorded optical energy was considered due to the slow response time of a monocrystalline solar cell that disadvantages the fast ignition emission. ([0376] to [0378])

E 0.05 ml (50 mg) of H₂O was added to 20 mg of either Co₃O₄ or CuO that was sealed in an aluminum DSC pan.

Each sample was ignited with a current of 15,000 to 25,000 A at about 8 V RMS applied to the ignition electrodes.

A large power burst was observed that vaporized the samples, each as an energetic, highly-ionized, expanding plasma. The voltage of the PDC electrodes following the corresponding ignition was 25 V. ([0384], [0194])

F 0.05 ml (50 mg) of H₂O was added to 20 mg of either Co₃O₄ or CuO that was sealed in an aluminum DSC pan.

It was ignited with a current of 15,000 to 25,000 A at about 8 V RMS.

A large power burst was observed that vaporized the samples, each as an energetic, highly-ionized, expanding plasma. In addition, a 40 cm⁻¹ broad absorption peak was observed on the MoCu foil following exposure to the plasma containing H₂(1/4). The peak was not observed in the virgin alloy, and the peak intensity increased with increasing plasma intensity and laser intensity. Since no other element or compound is known that can absorb a single 40 cm⁻¹ (0.005 eV) near infrared line at 1.33 eV, H₂(1/4) was considered. ([0387], [0388])

G Fifteen separate solid fuel pellets each comprising CuO (30 mg) + Cu (10 mg) + H₂O (14.5 mg) that was sealed in an aluminum DSC pan.

Each sample of solid fuel was ignited with an applied 60 Hz voltage of about 8 V peak and a peak current of about 20,000 A.

The solid fuel samples were rapidly successively ignited. Using a Raman spectrometer for the getter sample that accumulated the 15 exposures, the series of 1000 cm⁻¹ equal-energy spaced Raman peaks that matched the second order rotational emission of H₂(1/4) within the $\nu = 1 \rightarrow \nu = 0$ transition was observed. Specifically, the Q, R, and P branch peaks Q(0), R(0), R(1), R(2), P(1), P(2), P(3), P(4), and P(5), were observed at 12,194, 11,239, 10,147, 13,268, 14,189, 15,127, 16,065, 17,020, and 17,907 cm⁻¹, respectively, that confirmed molecular hydrino H₂(1/4) as the source of the energetic blast of the ignited solid fuel. ([0406])

2 Judgment

(1) Regarding the violation of enablement requirement

A Working of an invention of a product means acts of manufacturing, using, etc. the product (Article 2(3)(i) of the Patent Act). Thus, the wording "to enable a person ordinarily skilled in the art of the invention to work the invention" in Article 36(4)(i) of the Patent Act implies that a person ordinarily skilled in the art of the invention is enabled to manufacture and use the product. Thus, for the invention of a product, it is necessary to specifically describe the method of manufacturing and using the product in the description. However, even if there is no such a description, the above enablement requirement can be satisfied as long as a person skilled in the art is enabled to manufacture and use the product based on the descriptions in the description and

drawings and the common general technical knowledge at the time of filing.

Furthermore, for allowing a person skilled in the art to be "enabled to use," it should be said that the product of the Invention must be used at least in some technically significant mode, for example, it must be used in a mode of exhibiting the desired action and effect of the Invention.

B Considering this matter for the Invention, since the Invention relates to a "power system" and is intended to generate electrical energy in the field of power generation as described in the above 1 (2) A, it is difficult to think as technically significant, unless it can be said that the output energy is larger than the input energy, at least in principle.

Then, the "reactants" of the Invention comprise "a) a mixture of a metal, a metal halide, and H₂O," "b) a mixture of a metal, a metal oxide, and H₂O," "c) a mixture of a metal, a metal oxyhydroxide, and H₂O," or "d) a mixture of a metal oxide and H₂O" (hereinafter occasionally referred to as "a-reactant," "b reactant," "c-reactant," and "d-reactant," respectively). For each of these reactants, no specific metal element has been specified, and it can be thus understood that any metal element may be used.

It is understood that it is necessary to enable a person skilled in the art to use the "power system" of the Invention in such a mode that the output energy of each of these reactants is larger than the input energy at least in principle ("a mode in which the output energy is larger than the input energy, at least in principle" is hereinafter referred to as an "excess energy mode"), based on the descriptions in the description, etc. of the present application and the common general technical knowledge.

C Then, whether or not the whole of each reactant included in the "reactants" of the Invention can be used in an excess energy mode by a person skilled in the art, based on the description, etc. of the present application and the common general technical knowledge, will be examined. In view of the case, the examinations are as follows in the order of b-reactant, d-reactant, a-reactant, and c-reactant.

(A) Regarding b-reactant

a In view of the wording of the special technical feature of the b-reactants and descriptions in [0175] such that "the reactants can include a mixture of a metal, a metal oxide thereof, and H₂O," the b-reactant can be understood as being mainly assumed in a mode in which the element of "metal" and the element of "metal" in "metal oxide" is the same (the b-reactant in such a mode is hereinafter referred to as "specific b-reactant"). This understanding is affirmed based on the following fact; Among the examples of the reactants of the Invention certified in the above 1 (3), those relating to "b-reactants"

mainly consist of "Cu", "CuO," and "H₂O."

However, in light of common general technical knowledge, it cannot be said that the "power system" of the Invention for the entire specific b-reactant can be used in the excess energy mode. That is, the energy input to the "power system" of the Invention is "a short burst of high-current electrical energy." It cannot be said that in any mixture corresponding to the specific b-reactant, chemical reaction occurs just by applying a high current, while the special technical feature of the Invention does not limit the specific b-reactant to the mode in which such a chemical reaction occurs.

On the other hand, in the descriptions in the description, etc. of the present application, as recognized in the above 1 (2) C and D, an energy generation principle premised on the existence of hydrino atoms predicted by classical physical laws (hereinafter referred to as "the energy generation principle") is disclosed, and based on the energy generation principle, there is room to think the specific b-reactant can be used in excess energy mode by applying a high current.

Then, if the energy generation principle described in the description, etc. of the present application is valid, there is room to evaluate that the entire specific b-reactant can be used in excess energy mode. However, whether or not the energy generation principle is valid is a problem in the above sense. Even if the energy generation principle is not valid, it does not immediately mean that the entire specific b-reactant cannot be used in excess energy mode. When focusing on the example of the specific b-reactant described in the description, etc. of the present application, if the example can be used in the excess energy mode, there is room to evaluate that the invention can be carried out for the entire specific b-compound based on descriptions in the description, etc. of the present application.

b Then, first, the energy generation principle will be examined.

The energy generation principle presupposes the existence of a hydrino atom, as recognized in the above 1 (2) C. The hydrino atom means the state of the principal quantum number of a fraction for a hydrogen atom or the like.

However, according to the common general technical knowledge established as quantum mechanics, it is clear that the existence of the hydrino atom is contrary to such common general technical knowledge, because the principal quantum number of the hydrogen atom needs to be a positive integer.

In this regard, in the description, etc. of the present application, there is a description that a Raman peak derived from the molecular hydrino H₂(1/4) was observed by igniting fifteen separate solid fuel pellets each comprising CuO (30 mg) +

Cu (10 mg) + H₂O (14.5 mg) that was sealed in an aluminum DSC pan as described in the above 1 (3). However, the description is merely a list of detection results. It is not specifically confirmed that this detection result is not a false positive of noise caused by intrusion from the environment or voltage or temperature fluctuation of a detector. Furthermore, since the existence of the hydrino atom clearly contradicts the common general technical knowledge established as quantum mechanics, it cannot be said that the existence of the hydrino atom was immediately proved by this detection result.

In the description, etc. of the present application, there is a description that peaks derived from hydrino were observed for reactants other than specific b-reactant. However, for the same reason as above, it cannot be said that the existence of the hydrino atom was proved by this. In any case, it does not prove that the hydrino atom formation reaction occurred for the specific b-reactant.

As the existence of the hydrino atom is clearly contrary to the common general technical knowledge established as quantum mechanics, and it cannot be said that the description, etc. of the present application proves that the hydrino atom formation reaction has occurred, the energy generation principle is not valid.

Therefore, it cannot be said that the entire specific b-reactant can be used in the excess energy mode, based on the validity of the energy generation principle.

c Next, it will be examined whether or not the example of the specific b-reactant can be used in the excess energy mode.

In the examples of the specific b-reactant (the above 1 (3) B, C, D, and G), "metal" is exclusively Cu. By applying a high current to such a specific b-reactant, it is unlikely that the output energy can be made larger than the input energy in principle. This is also set forth as the description "the theoretical chemical reaction energy was zero" in [0375].

In this regard, among the examples of the specific b-reactant, the one in the above 1 (3) C describes the generation of excess energy. However, the description merely lists the detection results. Even if the alumina pan exploded, no confirmation was made on what happened to the reactants, the alumina pan, and other residues. Also, the specific method of confirming that XRD did not show the formation of aluminum oxide is not explained. Then, from the embodiment, it cannot be proved that the specific b-reactant can be used in the excess energy mode by applying a high current.

Concerning other examples of specific b-reactant, which state no confirmation

about the generation of excess energy, it can be said that the same point as above holds.

Therefore, no example of the specific b-reactant can be recognized to be used in excess energy mode.

d From the above, it cannot be said that a person skilled in the art could use the entire specific b-reactant in excess energy mode, based on the description, etc. of the present application and the common general technical knowledge. As described in the above a, a specific b-reactant is mainly assumed as the b-reactant. However, even if the b-reactant of the Invention comprises a substance other than the specific b-reactant, it is not clear whether the entire b-reactant can be used in excess energy mode even based on the description, etc. of the present application and the common general technical knowledge, as long as the energy generation principle is not recognized as valid.

Therefore, it cannot be said that a person skilled in the art could use the entire b-reactant in excess energy mode, based on the description, etc. of the present application and the common general technical knowledge.

e Even if the example of the specific b-reactant can be used in excess energy mode, for the b-reactant that does not fall under this example, the energy generation principle is not valid, and it cannot be said that these b-reactants can be used in excess energy mode even in light of the description, etc. of the present application and the common general technical knowledge.

Therefore, it cannot also be said in this aspect that a person skilled in the art could use the entire b-reactant in the excess energy mode the descriptions in the description, etc. of the present application and the common general technical knowledge.

(B) Regarding d-reactant

a Given that the d-reactant only excludes "metals" from the b-reactant, similar to what was instructed in the above (A) a, in light of the common general technical knowledge, it cannot also be said that the "power system" of the Invention for the d-reactant can be used in excess energy mode.

Therefore, regarding d-reactant, the energy generation principle and the example of the d-reactant, which are described in the description, etc. of the present application, should be examined.

b As to whether the energy generation principle is valid for the d-reactant, the

example of fuel in above 1(3)F should be examined, in which 0.05 ml (50 mg) of H₂O was added to either 20 mg of Co₃O₄ or CuO sealed in the aluminum DSC pan. In this example, however, the detection results are merely listed, similar to what was explained in the above (A) b, and it should be said that the detection results did not immediately prove the existence of the hydrino atom.

c Concerning the examples of the d-reactant (the above 1 (3) A, E, and F), which describe no confirmation about the generation of excess energy, the same point as instructed in the above C (A) c holds.

Therefore, no example of the d-reactant can be recognized to be used in excess energy mode.

d Furthermore, the d-reactant does not contain any metal and is considered one in which the input energy required to obtain the same current value would be higher. Thus, it can be more difficult to realize the excess energy mode than the b-reactant.

e Therefore, it cannot be said that a person skilled in the art could use the entire d-reactant in excess energy mode, based on the descriptions in the description, etc. of the present application and the common general technical knowledge.

f Even if the example of the d-reactant can be used in excess energy mode, for the same reason as the above (A) e, it cannot be said that the d-reactant that does not fall under this example can be used in excess energy mode even in light of the descriptions in the description, etc. of the present application and the common general technical knowledge.

Therefore, it cannot also be said in this aspect that a person skilled in the art could use the entire d-reactant in the excess energy mode based on the descriptions in the description, etc. of the present application and the common general technical knowledge.

(C) Regarding a-reactant and c-reactant

There is no evidence of common general technical knowledge that the Invention's "power system" for the whole a-reagent and the whole c-reactant can be used in excess energy mode. Therefore, regarding these reactants, the energy generation principle and examples described in the description, etc. of the present application should be examined.

However, there are no examples of these reactants in the description, etc. of the present application. Even if other examples in the description, etc. of the present application are taken into consideration, it can be said that the same points as instructed in the above C (A) b and c hold.

Therefore, it cannot be said that a person skilled in the art could use the entire a- and c-reactants in excess energy mode, based on the descriptions in the description, etc. of the present application and the common general technical knowledge.

(D) Summary

Based on the above, it cannot be said that a person skilled in the art could use any of the entire a-reactant, b-reactant, c-reactant, or d-reactant in excess energy mode, based on the descriptions in the description, etc. of the present application and the common general technical knowledge.

D As described above, because the Invention cannot be used in a technically significant manner, it cannot be said that a person skilled in the art could use the product according to the Invention, based on the descriptions in the description, etc. of the present application and the common general technical knowledge.

Therefore, it cannot be said that a person skilled in the art could carry out the Invention based on the descriptions in the description, etc. of the present application and the common general technical knowledge.

E The Appellant makes the following allegations, but all of them are unreasonable.

(A) The Appellant alleges that the Invention is feasible without considering the "hydrino theory" which is not recited in the claims, because the "power system," "vessel," "reactants," "electrodes," "a source of electrical power," and "plasma dynamic converter or photovoltaic converter," which constitute the Invention, could be prepared by a person skilled in the art in consideration of the descriptions in the description, etc. of the present application and the common general technical knowledge, and the product of the Invention could be made and used based on the descriptions in the description, etc. of the present application.

However, for allowing a person skilled in the art to be "enabled to use" the product of the Invention, it should be said that the product of the Invention must be used at least in some technically significant mode as instructed in the above A. Thus, the facts alleged by the Appellant do not mean that a person skilled in the art would be

"enabled to use" the product of the Invention.

The Appellant alleges no need of clarifying the rationale for the Invention as long as the purpose and effect of the invention are described in the description to the extent that the Invention can be easily implemented. However, as instructed in the above C (A) a, the body examined it in the sense that in case the rationale is clear, there is room for determining that the Invention of the present application can be practiced. The body has decided that the Invention cannot be implemented, not only because the rationale is unclear. And, as instructed in the above C and D, it cannot be said that a person skilled in the art could carry out the Invention based on the descriptions in the description, etc. of the present application and the common general technical knowledge.

(B) The Appellant submits following reports by third-party on the inventor's theory: the document entitled "Report on the Power Output of a Solid Pellet Water. Bath Calorimeter, Thermal Power Output of a Solid Pellet, and SunCell® Output Power at Brilliant Light Power" (translated) (hereinafter, referred to as "Report 1"); the document entitled "Validation of SF-CIHT Technology" (translated) (hereinafter, referred to as "Report 2"); and the article entitled "A new way to explain the 511 keV signal from the center of the Galaxy and its possible consequences" (translated) (hereinafter, referred to as "Report 3), and alleges that to a person skilled in the art, the absence of hydrogen smaller than the ground state is not always true.

However, Report 1 covers reactants without water and presupposes a specific environment, such as an argon-hydrogen atmosphere (refer to the translated text, page 3, lines 12 to 14, page 10, lines 1 to 3, and page 11 from the bottom to line 5 to line 4, etc.), so it cannot be deemed as an embodiment of the present invention.

Although both Reports 1 and 2 examine the amount of heat and spectrum generated by the reaction, similar to what was described in the above C (A) b and c, these detections were not confirmed in detail and specifically concerning the possibility of being caused by other factors. Taking into consideration that the existence of the hydrino atoms is clearly contrary to the common general technical knowledge established as quantum mechanics, it is hard to say that the existence of the hydrino atom was immediately proved by these detection results in Reports 1 and 2.

Furthermore, Reports 1 and 2 are records by persons who observed the experiments conducted by the Appellant (translation of Report 1, page 3, lines 1 to 10, and translation of Report 2, pages, lines 2 to 4), which cannot be said to be independent verifications by a third party, and have limitations to support the contents of the descriptions in the description, etc. of the present application. On the other hand,

although it is not considered to be so difficult to confirm whether or not the product of the Invention can be used, because it does not require a large-scale device or a special sample, the Appellant does not submit any certificate of experimental results, etc. by an independent third party.

In Report 3, the existence of a small hydrogen atom (it is understood to correspond to hydrino in the description, etc. of the present application) is assumed to explain the signal of 511 keV from the center of the galaxy, but the existence of hydrino is not demonstrated.

Then, it cannot be said that these reports influence the judgments of the above C and D.

F Based on the above, it cannot be said that the Description of the Detailed Description of the Invention of the present application is clear and sufficient to the extent that a person skilled in the art can carry out the Invention. Therefore, it does not meet the requirements stipulated in Article 36(4)(i) of the Patent Act .

(2) Regarding violation of support requirements

A Whether or not the scope of claims meets the support requirements should be determined by comparing the recitations in the scope of claims with the descriptions in the Detailed Description of the Invention to consider whether or not the inventions recited in the scope of claims are the inventions described in the Detailed Description of the Invention and could be recognized by a person skilled in the art as being able to solve the problems of the Invention in view of the descriptions in the Detailed Description of the Invention, as well as to consider whether or not a person skilled in the art could recognize that the problem of the Invention can be solved in light of the common general technical knowledge at the time of filing even if there is no description or suggestion thereof.

B When such an examination is conducted on the Invention, in view of the descriptions in [0002] to [0004], it is recognized that the problem to be solved by the present invention (hereinafter referred to as "the problem") is to realize power generation using the ignition of water or a water-based fuel source.

Then, it will be examined whether or not a person skilled in the art could recognize that the problem would be solved by the special technical feature recited in the Invention.

C Since the problem is related to power generation, it is clear that the Invention for the "power system" assumes at least an excess energy mode.

However, as instructed in the above (1) C (D), it cannot be said that the "reaction product" of the Invention can be used in excess energy mode, for all of the a-reactant, b-reactant, c-reactant, and d-reactant. Further, even if the examples described in the description, etc. of the present application can be used in excess energy mode, for the same reason as instructed in the above (1) C (A) e, for "reactants" that do not fall under the examples, the energy generation principle is not appropriate, and a person skilled in the art could not recognize that they would be used in excess energy mode even in light of the descriptions in the description, etc. of the present application and the common general technical knowledge.

Then, it should not be said that a person skilled in the art could recognize that the problem could be solved by the special technical feature recited in the Invention.

D The Appellant alleges that the description, etc. of the present application describe the shape, structure, and function of each member to the extent that a person skilled in the art could grasp them, but the allegation does not influence the above judgment.

E Therefore, since the Invention cannot be said to be described in the Detailed Description of the Invention, the present application does not comply with the requirements stipulated in Article 36(6)(i) of the Patent Act.

3 Closing

As described above, since the present application does not meet the requirements under Article 36(4)(i) and (6)(i) of the Patent Act, the present application should be rejected.

Therefore, the appeal decision shall be made as described in the conclusion.

April 9, 2021

Chief administrative judge: INOUE, Hiroyuki
Administrative judge: YAMAMURA, Hiroshi
Administrative judge: SEGAWA, Katsuhisa