PATENT COOPERATION TREATY

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THIRD PARTY OBSERVATION

(PCT Administrative Instructions Part 8)

Applicant's or agent's file reference 1663.0002PCT	
International application number PCT/US2016/021423	International filing date (day/month/year) 09 Mar 2016 (09/03/2016)
Applicant PINESCI CONSULTING (+4)	

Third party observation submitted by Anonymous	Observation submitted on behalf of
Date of submission(day/month/year) 12 Mar 2018 (12/03/2018)	Language of observation English

Basis and contents of observation

1. The observation is made on the basis of the claims in the international application as filed.
2. The observation comprises:
   References to documents: 3
   Uploaded copies of documents: 1
3. Further explanations:
   Uploaded copies of documents: 0

Citation # 1 (Patent/utility model) (# uploaded documents: 0):

Country code:	Publication number:	Document kind code:
US	2008/0160359	A1

Patent Applicant/Patent Owner:	Title of invention:
Mofakhami	System for cation-electron intrusion and collision in a non-conductive material

Link to document:

Publication Date:	Filing Date:	Priority Date:
03 Jul 2008 (03/07/2008)		

Source of Abstract:	Accession number:	Publication Date of Abstract:	Retrieval Date of Abstract:

Most relevant passages or drawings:	Relevant to Claims:
[0010]-[0015] and [0041]-[0047]	

Brief explanation of relevance:

US 2008/0160359 discloses (see in particular [0010]-[0015] and [0041]-[0047]) low energy collision of at least one H+ ion with an electron. US 2008/0160359 provides a device for colliding at least one H+ ion and at least one electron starting from a hydrogen-containing compound and at least one cathode. The device comprises at least one electromagnetic field generator for extracting said H+ ion from said hydrogen-containing compound and transferring said H+ ion towards said cathode; and at least one non-conductive material positioned between at least a portion of said hydrogen-containing compound and said cathode; said collision occurring within said non-conductive material.

In US 2008/0160359 , the disclosed device comprises an electric field generator 1 optionally associated with a magnetic field generator, a solid, liquid, or gas type element 3 containing all or part of the hydrogen in ionic, plasma, gaseous, liquid, or solid form, and a cathode plate 4 such that the non-conductive material 2 is positioned between the cathode plate 4 and the element 3 containing hydrogen in at least one of the forms cited above. Optionally, the cathode plate 4 and the electromagnetic field generators may be integrated into a single element. (see in particular [0041]-[0047])

Claim 2 In US 2008/0160359, the disclosed range of energy is from a few electron volts to a few hundred electron volts (see [0010]).

Claim 7 US 2008/0160359 discloses a material capable of donating electrons.
Claim 9 US 2008/0160359 discloses the use of a plasma with the electron temperature is hotter than the ion temperature. In an embodiment shown in FIG. 2, the device of the invention comprises an electric field generator 1 optionally associated with a magnetic field generator, a solid, liquid, or gas type element 3 containing all or part of the hydrogen in ionic, plasma, gaseous, liquid, or solid form, and a cathode plate 4 such that the non-conductive material 2 is positioned between the cathode plate 4 and the element 3 containing hydrogen in at least one of the forms cited above. Optionally, the cathode plate 4 and the electromagnetic field generators may be integrated into a single element. (See [0041])
Claim 12 US 2008/0160359 discloses a source of deuterons. See [0042], where H+ ions are presented as being protons or ions of isotopes of hydrogen such as deuteron or triton.
Claim 13 In US 2008/0160359, the disclosed range of energy is from a few electron volts to a few hundred electron volts (see [0010]).
Claim 14 US 2008/0160359 discloses (see in particular [0010]-[0015] and [0041]-[0047]) low energy collision of at least one H+ ion with an electron. US 2008/0160359 provides a device for colliding at least one H+ ion and at least one electron starting from a hydrogen-containing compound and at least one cathode. The device comprises at least one electromagnetic field generator for extracting said H+ ion from said hydrogen-containing compound and transferring said H+ ion towards said cathode; and at least one non-conductive material positioned between at least a portion of said hydrogen-containing compound and said cathode; said collision occurring within said non-conductive material.
In US 2008/0160359 , the disclosed device comprises an electric field generator 1 optionally associated with a magnetic field generator, a solid, liquid, or gas type element 3 containing all or part of the hydrogen in ionic, plasma, gaseous, liquid, or solid form, and a cathode plate 4 such that the non-conductive material 2 is positioned between the cathode plate 4 and the element 3 containing hydrogen in at least one of the forms cited above. Optionally, the cathode plate 4 and the electromagnetic field generators may be integrated into a single element. (see in particular [0041]-[0047])
US 2008/0160359 also discloses a source of deuterons. See [0042], where H+ ions are presented as being protons or ions of isotopes of hydrogen such as deuteron or triton.
Claim 15 In US 2008/0160359 (see [0019]), said hydrogen-containing compound is a liquid, solid, or gaseous compound, or a plasma. See also [0041] In the embodiment shown in FIG. 2, the device of the invention comprises an electric field generator 1 optionally associated with a magnetic field generator, a solid, liquid, or gas type element 3 containing all or part of the hydrogen in ionic, plasma, gaseous, liquid, or solid form, and a cathode plate 4 such that the non-conductive material 2 is positioned between the cathode plate 4 and the element 3 containing hydrogen in at least one of the forms cited above.
Claim 16 In US 2008/0160359 (see [0010]), the low energy collision of at least one H+ ion with an electron enables to create a neutron to obtain a low energy neutron source, for example.
Claim 19 In US 2008/0160359 (see [0010]), the collision is performed with predetermined selected electric and magnetic field conditions and the choice of non-conductive material.

Citation # 2 (Patent/utility model) (# uploaded documents: 0):

Country code:	Publication number:	Document kind code:
US	2013/0148770	A1

Patent Applicant/Patent Owner:	Title of invention:
Mofakhami et al.	Method for generating neutrons

Link to document:

Publication Date:	Filing Date:	Priority Date:
13 Jun 2013 (13/06/2013)		

Source of Abstract:	Accession number:	Publication Date of Abstract:	Retrieval Date of Abstract:

Most relevant passages or drawings:	Relevant to Claims:
[0014]-[0026]	

Brief explanation of relevance:

US 2013/0148770 discloses (see in particular [0014]-[0026] a method for generating neutrons, for example a beam of neutrons, comprising at least the successive steps consisting in:
a) placing at least one beam of nuclei chosen from protons (hydrogen nuclei), deuterons (deuterium nuclei) and tritons (tritium nuclei) and at least one beam of electrons in a defined spin state and/or in an interference state, and
b) causing said at least one beam of nuclei and at least one beam of electrons to collide.
Claim 2 US 2013/0148770 discloses (see in particular [0178]) that at least 50%, for example at least 75%, for example substantially all of the electrons forming the beam of electrons may have an energy of between 1 and 10e7 eV, for example between 1 and 10e6 eV, for example between 1 and 10e4 eV.
Claim 7 US 2013/0148770 discloses (see in particular [0167]) that generating a beam of electrons from a thermoionic source includes a step for heating, for example by Joule's effect, a conductive material. As such, US 2013/0148770 discloses a material capable of donating electrons.
Claim 12 US 2013/0148770 discloses a source of deuterons. See [0015].
Claim 13 In US 2013/0148770, the disclosed range of energy is from a few electron volts to a few million electron volts (10 MeV) (see [00178]).
Claim 14 US 2013/0148770 discloses (see in particular [0014]-[0026] a method for generating neutrons , for example a beam of neutrons, comprising at least the successive steps consisting in:
a) placing at least one beam of nuclei chosen from protons (hydrogen nuclei), deuterons (deuterium nuclei) and tritons (tritium nuclei) and at least one beam of electrons in a defined spin state and/or in an interference state (which are precisely the specifics quantum states of those particles), and
b) causing said at least one beam of nuclei and at least one beam of electrons to collide.
Claim 16 US 2013/0148770 discloses (see in particular [0014]-[0026]) a beam of nuclei chosen from protons (hydrogen nuclei), deuterons (deuterium nuclei) and tritons (tritium nuclei) and a beam of electrons. US 2013/0148770 (see [0002]) also relates to nuclear fusion and/or fission methods and to particle colliders for generating nuclei. US 2013/0148770 (see [0012]) proposes novel methods for generating nuclei by nuclear fusion or fission. US 2013/0148770 (see [0140]) uses, in the context of the methods for generating nuclei according to the invention, the neutrons obtained, for example in fission reactions, in nuclear power plant reactors.
Claim 19 US 2013/0148770 discloses (see in particular [0027] to generate one or more magnetic fields configured to place said at least one beam of nuclei and at least one beam of electrons in a defined spin state before the collision.

Citation # 3 (Patent/utility model) (# uploaded documents: 1):

Country code:	Publication number:	Document kind code:
WO	2017/021174	A1

Patent Applicant/Patent Owner:	Title of invention:
NEUSCA SAS	Device and method for producing neutrons

Link to document:			
Publication Date: 09 Feb 2017 (09/02/2017)	Filing Date:	Priority Date: 31 Jul 2015 (31/07/2015)	
Source of Abstract:	Accession number:	Publication Date of Abstract:	Retrieval Date of Abstract:
Most relevant passages or drawings: page 2, lines 4-13 of the English translation		Relevant to Claims:	

Brief explanation of relevance:

WO 2017/021174 discloses (see in particular page 2, lines 4-13 of the English translation) a method for producing and/or capturing neutrons, comprising the following steps:
a) subjecting nuclei chosen from among protons (hydrogen nuclei), deuterons (deuterium nuclei) and/ or tritons (tritium nuclei) to an electrical field in order to extract said nuclei and direct the duly extracted nuclei toward a target containing free electrons,
b) subjecting said nuclei to a spatial and/or temporal gradient of a first magnetic field so as to give a predefined orientation to the magnetic moments of the nuclei, in particular during their acceleration toward the target, (meaning also determined quantum state)
c) subjecting the target to a second magnetic field so as to give a predefined orientation to the magnetic moments of the free electrons of the target.

Claim 7 WO 2017/021174 discloses (see in particular page2, lines 4-13 of the English translation) the use of a target containing free electrons. Such target materials may be heated beyond their Curie temperatures, can participate in boosting the gradient of the magnetic field locally under the combined effect of their own magnetism and of the external magnetic field imposed. (see page 3, lines 4-10). The target may be solid, liquid or gaseous. It may for example comprise at least one of the nano particles, in particular in the case of superparamagnetic materials, powder, foam, porous materials, composite materials and / or materials in the form of sol-gel. It may also contain metallic and electrical conductors or submitted to the magnetic field gradient or not, this list is not exhaustive.
Claim 12 WO 2017/021174 discloses a source of deuterons. (see in particular page2, lines 4-13 of the English translation)
Claim 14 WO 2017/021174 discloses (see in particular page2, lines 4-13 of the English translation) a method for producing and/or capturing neutrons, comprising the following steps:
a) subjecting nuclei chosen from among protons (hydrogen nuclei), deuterons (deuterium nuclei) and/ or tritons (tritium nuclei) to an electrical field in order to extract said nuclei and direct the duly extracted nuclei toward a target containing free electrons,
b) subjecting said nuclei to a spatial and/or temporal gradient of a first magnetic field so as to give a predefined orientation to the magnetic moments of the nuclei, in particular during their acceleration toward the target,
c) subjecting the target to a second magnetic field so as to give a predefined orientation to the magnetic moments of the free electrons of the target.
The neutrons produced can enable low cost of designing nuclear fission subcritical operation, which eliminates the risk of nuclear runaway and the need for uranium enrichment. The nuclear risk may be significantly reduced with a production cost of lower energy.
Claim 16 WO 2017/021174 discloses ((see in particular page2, lines 4-13 of the English translation) the use of a target containing free electrons. Such target materials may be heated beyond their Curie temperatures, can participate in boosting the gradient of the magnetic field locally under the combined effect of their own magnetism and of the external magnetic field imposed. (see page 3, lines 4-10).
The neutrons produced can enable low cost of designing nuclear fission subcritical operation, which eliminates the risk of nuclear runaway and the need for uranium enrichment. The nuclear risk may be significantly reduced with a production cost of lower energy.
Alternatively, the target can be non-metal, which can be the case when the method is used in an objective of transmutation for example. In this case it may include a ferromagnetic or superparamagnetic metal casing. It may for example comprise at least one of Fe, Ni, Mo, Co, FeOFe 2 0 3, MnBi, Ni, MnSb, MnOFe 2 0 3, Cr02, MnAs, Gd, Dy, EuO, U, W, this list is not exhaustive. In this

case, the target or its metal casing can be connected to the cathode or to ground, as explained above.
Applications can be: production of radioelements, transmutation of actinides and radioactive materials, thermal energy production by neutron capture.
Being slow and high performance products neutrons can afford to produce energy by neutron capture. Indeed, it is established that the transmutation of atomic nuclei by neutron capture generates energy. This energy source can reach an outstanding economic performance and gradually replace other energy sources
In yet another aspect, the invention relates to the use of neutrons generated by the methods and / or devices as described above for the nuclear transmutation or generally obtaining cores in experimental physics, production radioisotopes by neutron capture.
Claim 19 WO 2017/021174 discloses (see in particular page2, lines 4-13 of the English translation) subjecting nuclei to a spatial and/or temporal gradient of a first magnetic field.