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(54) **METHOD AND APPARATUS FOR CARRYING OUT NICKEL AND HYDROGEN EXOTHERMAL REACTION**

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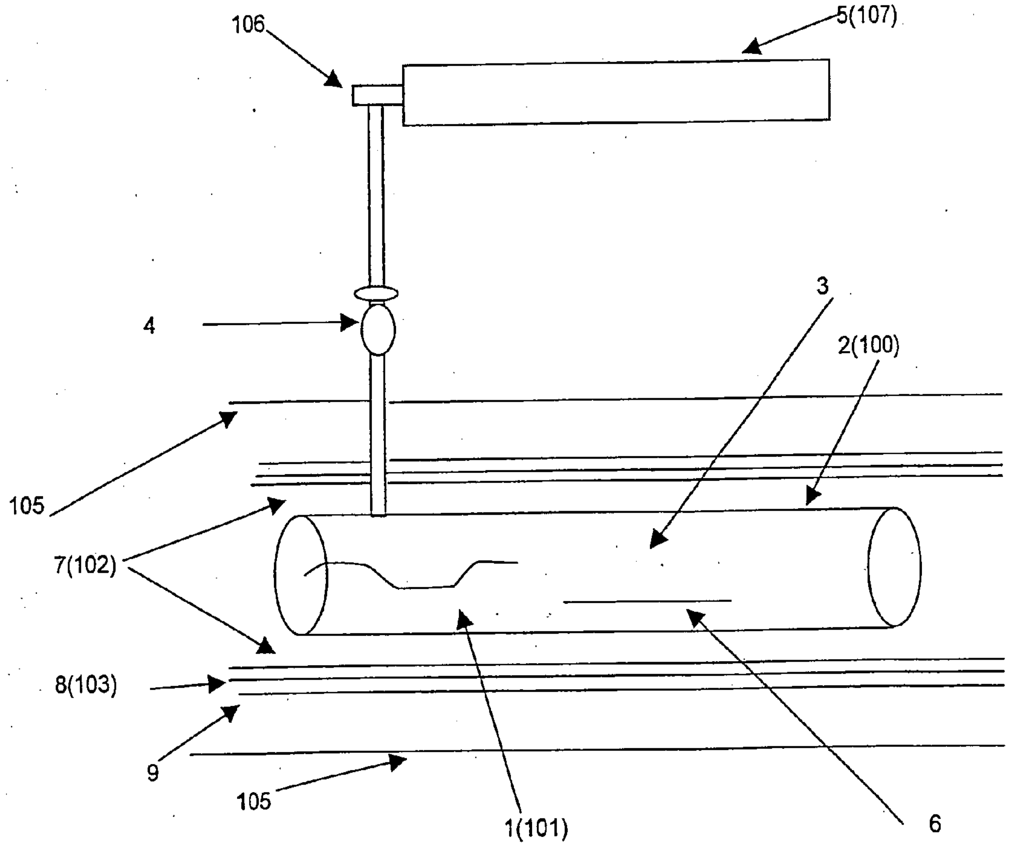
(57) **ABSTRACT**

A method and apparatus for carrying out highly efficient exothermal reaction between nickel and hydrogen atoms in a tube, preferably, though not necessary, a metal tube filled by a nickel powder and heated to a high temperature, preferably, though not necessary, from 150 to 5000 C are herein disclosed. In the inventive apparatus, hydrogen is injected into the metal tube containing a highly pressurized nickel powder having a pressure, preferably though not necessarily, from 2 to 20 bars.



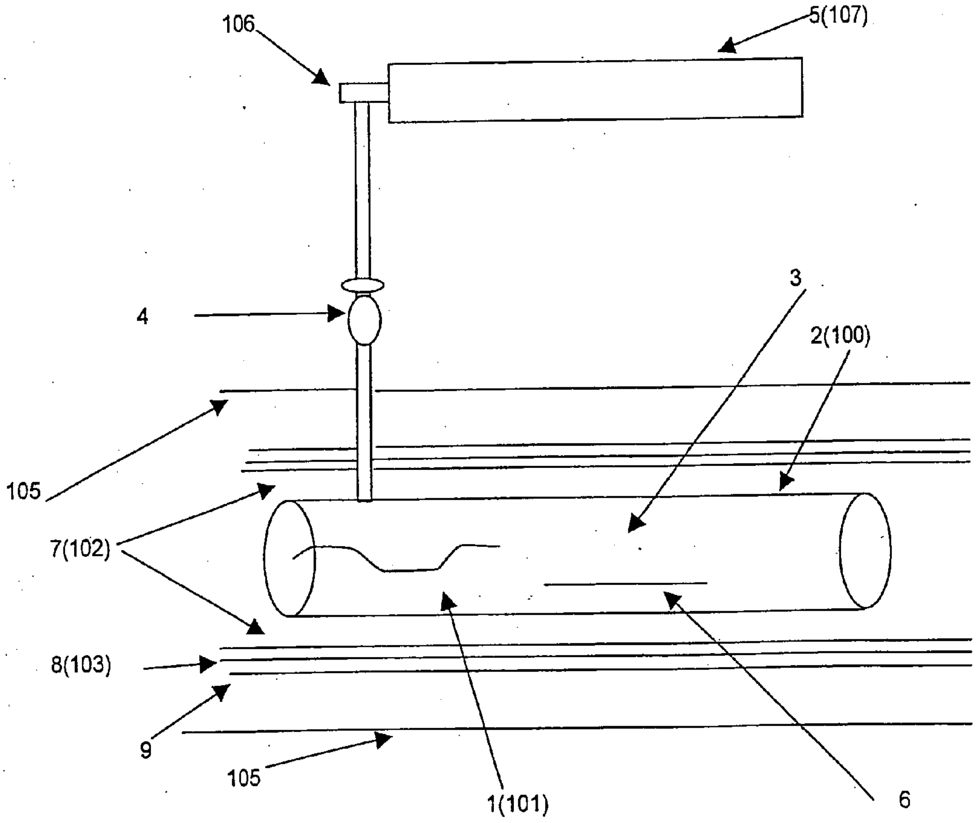


FIG. 1

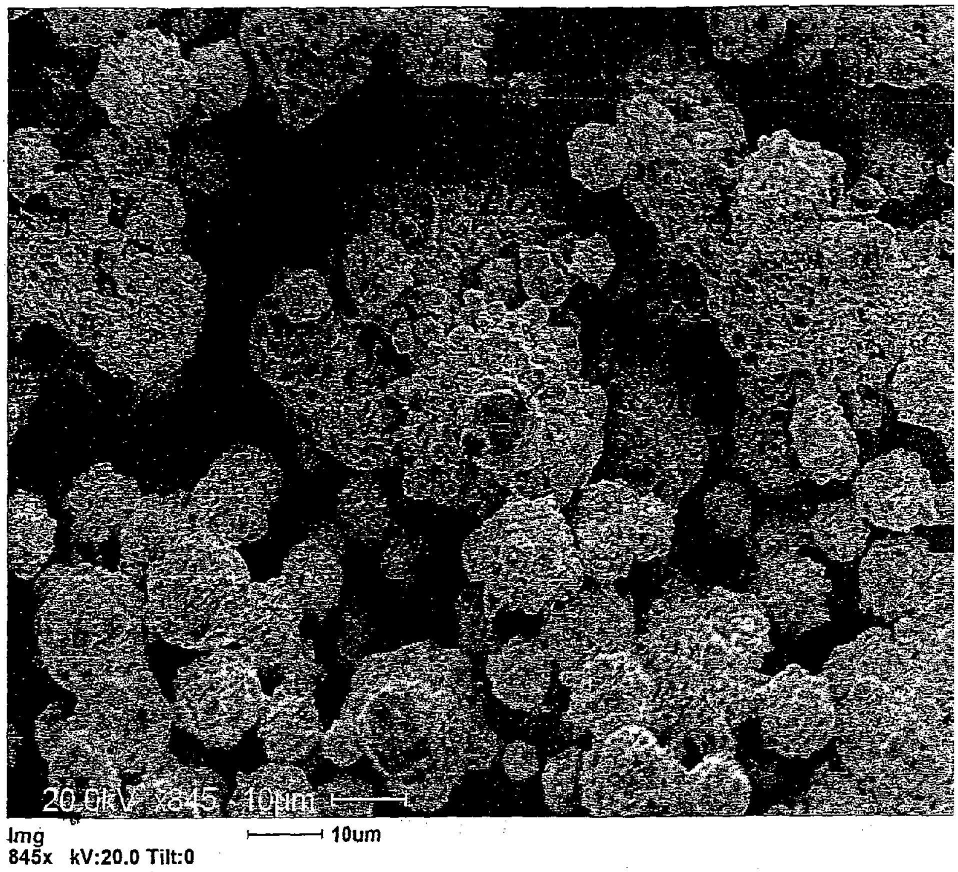
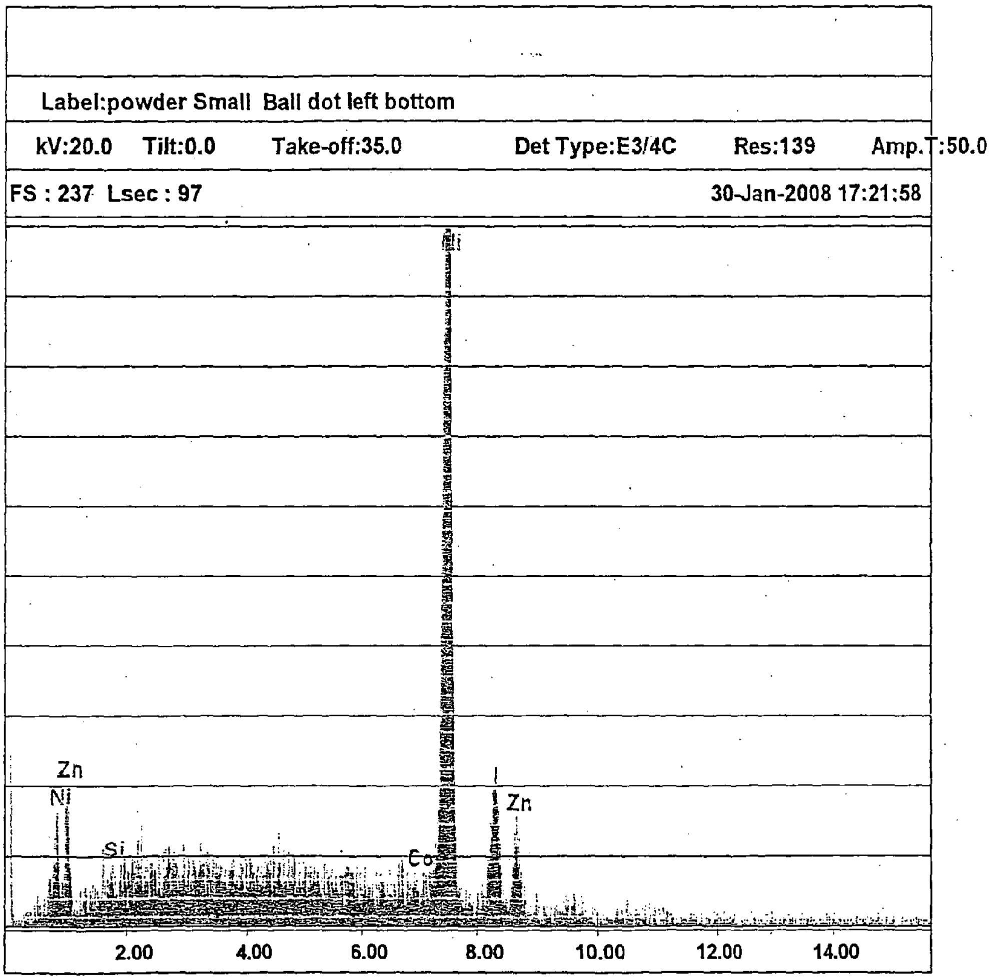


FIG. 2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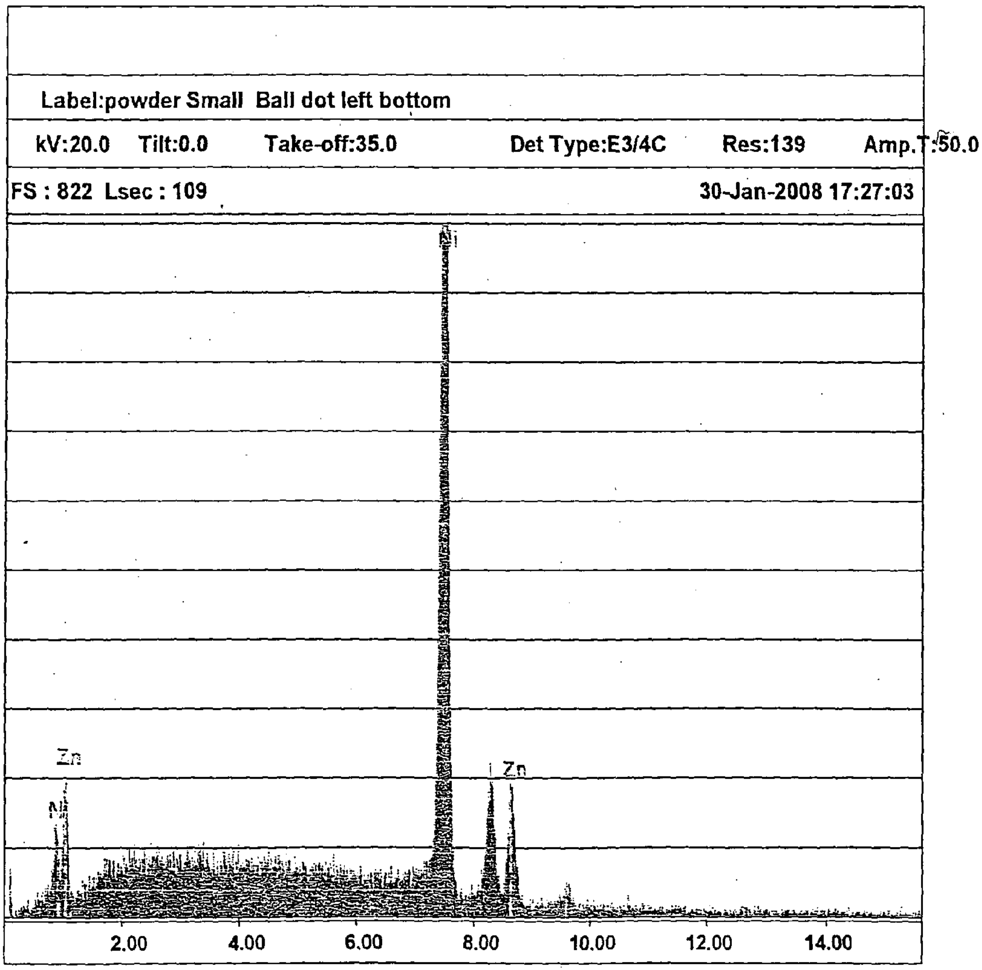
FS : 237 Lsec : 97 30-Jan-2008 17:21:58
Zn
Ni
Si
Co
Ni
Zn
2.00
4.00
6.00
8.00
10.00
12.00
14.00

FIG. 3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kV:20.0 Tilt:0.0 Take-off:35.0 Det Type:E3/4C Res:139 Amp.T:50.0
FS : 822 Lsec : 109
30-Jan-2008 17:27:03
Ni
Zn
Ni
Ni
Zn
2.00
4.00
6.00
8.00
10.00
12.00
14.00

FIG. 4

METHOD AND APPARATUS FOR CARRYING OUT NICKEL AND HYDROGEN EXOTHERMAL REACTION

BACKGROUND OF THE INVENTION

[0001] The present invention relates to a method and apparatus for carrying out nickel and hydrogen exothermal reactions, and has been stimulated by the well known requirement of finding energy sources alternative to fossil sources, to prevent atmospheric carbon dioxide contents from being unnecessarily increased.

[0002] For meeting the above need non polluting energy sources should be found which do not involve health risks, are economically competitive with respect to oil sources susceptible to be easily discovered and exploited and naturally abundant.

[0003] Many of the above alternative energy sources have already been explored and operatively tested even on an industrial scale, and comprise biomasses, solar energy used both for heating and photovoltaic electric generation purposes, aeolian energy, fuel materials of vegetable or agricultural nature, geothermal and sea wave energy and so on.

[0004] A possible alternative to natural oil, is the uranium-fission nuclear energy. However, yet unresolved problems affect nuclear energy such as great safety and waste material processing problems, since, as is well known, radioactive waste materials remain dangerously active for thousands or millions of years, with consequent great risks for persons living near radioactive waste disposal-off places.

[0005] To the above the fact should also be added that, at present, a nuclear fusion based on a laser actuated inertial confining method does not allow to make efficient power systems.

[0006] The above drawbacks are also true for deuterium-tritium fusion processes, as shown by the operating times estimated for the ITER project, which should within the year 2025 should allow to construct power systems according to the so-called DEMO project to make, within the year 2035, the first fusion power station.

[0007] In fact, up to now, the so-called “cold” fusion, after an early announcement by Fleischmann and Pons in 1989 (M. Fleischmann, M. Hawkins, S. Pons: Journal Electroanal. Chem., 261,301-1989), notwithstanding several exploiting attempts on a world-wise scale, has not provided useful and reliable systems capable of generating energy for normal, industrial or domestic applications.

[0008] The most intelligent work performed in the fusion field, which work has been accurately studied by the present inventor for practicing his invention, is a study of Prof. Sergio Focardi, (Dipartimento di Fisica dell’Univerità di Bologna), and Prof. Francesco Piantelli, (Dipartimento di Fisica dell’Università di Siena) as disclosed in the following bibliographic documents:

[0009] S. Focardi, F. Piantelli: Produzione di energia e reazioni nucleari in sistemi Ni—H a 400° C., Atti della Conferenza Nazionale sulla politica energetica in Italia, Università di Bologna, 18-19 aprile 2005.

[0010] S. Focardi, R. Habel, F. Piantelli: Anomalous heat production in Ni-H systems, Nuovo Cimento Vol. 107, pp 163-167, 1994

[0011] S. Focardi, V. Gabbiani, V. Montalbano, F. Piantelli, S. Veronesi: Large excess in heat production in Ni-H systems, Nuovo Cimento Vol. 111 A pp. 1233-1241, 1998

[0012] A. Battaglia, L. Daddi, S. Focardi, V. Gabbiani, V. Montalbano, F. Piantelli, P. G. Sona, S. Veronesi: Neutron emission in Ni—H systems, Nuovo Cimento Vol. 112 A pp 921-931, 1999

[0013] S. Focardi, V. Gabbiani, V. Montalbano. F. Piantelli, S. Veronesi: On the Ni-H systems, Asti Workshop in Hydrogeldeuterium loaded metals, pp 35-47, 1997

[0014] E. G. Campari, S. Focardi, V. Gabbiani, V. Montalbano. F. Piantelli, E. Porcu, E. Tosti, S. Veronesi: Ni—H systems, Proceedings of the 8th Conference on Cold Fusion, pp 69-74, 2000.

[0015] The present inventor, moreover, has also accurately studies the following related patents: U.S. Pat. No. 6,236,225, U.S. Pat. No. 5,122,054, US-H466, U.S. Pat. No. 4,014,168, U.S. Pat. No. 5,552,155, U.S. Pat. No. 5,195,157, U.S. Pat. No. 4,782,303, U.S. Pat. No. 4,341,730, US-A-20010024789.

[0016] An analysis of the above mentioned references shows that:

[0017] 1—all experiments performed based on cold fusion have not permitted to generate power in such an amount to be reliably and constantly exploited in industrial applications;

[0018] 2—all the uranium based methods and systems have not up to now solved the problem of safely disposing of nuclear waste materials;

[0019] 3—all the nuclear fusion based methods and systems have not been shown as capable of generating significative amounts of energy while allowing the fusion process to be safely monitored;

[0020] 4—all the magnetic and inertial confining based methods and systems, such as the plasma fusion method, cannot be properly economically managed; and

[0021] 5—the catalyzed fusion of negative muons based methods and systems cannot be used because of the muon short life.

SUMMARY OF THE INVENTION

[0022] Accordingly, the aim of the present invention is to provide a method allowing to produce energy in an economic, convenient, reliable and repetitive manner, without generating radiations and radioactive waste materials.

[0023] Within the scope of the above mentioned aim, a main object of the invention is to provide such a method which can be carried out in small size systems, adapted to be easily controlled and allowing to heat individual places at an operating cost less than that of commercially available heating systems.

[0024] According to one aspect of the present invention, the above mentioned aim and objects, as well as yet other objects, which will become more apparent hereinafter, are achieved by a method and apparatus for carrying out a highly efficient exothermal reaction between nickel atoms and hydrogen atoms, in a tube, preferably, though not exclusively made of a metal, filled by a nickel powder and heated to a high temperature preferably, though not necessarily, from 150 to 500° C., by injecting hydrogen into said metal tube said nickel powder being pressurized, preferably, though not necessarily, to a pressure from 2 to 20 bars.

[0025] In applicant exothermal reaction the hydrogen nuclei, due to a high absorbing capability of nickel therefor, are compressed about the metal atom nuclei, while said high temperature generates internuclear percussions which are made stronger by the catalytic action of optional elements, thereby triggering a capture of a proton by the nickel powder,