

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

PCT

To:

see form PCT/ISA/220

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY (PCT Rule 43bis.1)

Date of mailing
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION
See paragraph 2 below

International application No.
PCT/IT2008/000532

International filing date (day/month/year)
04.08.2008

Priority date (day/month/year)
09.04.2008

International Patent Classification (IPC) or both national classification and IPC
INV. C01B3/00
ADD. C01B6/02

Applicant
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1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☒ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA:



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Date of completion of
this opinion

see form
PCT/ISA/210

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Box No. I Basis of the opinion

1. With regard to the **language**, this opinion has been established on the basis of:
 - ☒ the international application in the language in which it was filed
 - ☐ a translation of the international application into , which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1 (b)).
2. ☐ This opinion has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43bis.1(a))
3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
 - a. type of material:
 - ☐ a sequence listing
 - ☐ table(s) related to the sequence listing
 - b. format of material:
 - ☐ on paper
 - ☐ in electronic form
 - c. time of filing/furnishing:
 - ☐ contained in the international application as filed.
 - ☐ filed together with the international application in electronic form.
 - ☐ furnished subsequently to this Authority for the purposes of search.
4. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
5. Additional comments:

Box No. II Priority

1. ☒ The validity of the priority claim has not been considered because the International Searching Authority does not have in its possession a copy of the earlier application whose priority has been claimed or, where required, a translation of that earlier application. This opinion has nevertheless been established on the assumption that the relevant date (Rules 43bis.1 and 64.1) is the claimed priority date.
2. ☐ This opinion has been established as if no priority had been claimed due to the fact that the priority claim has been found invalid (Rules 43bis.1 and 64.1). Thus for the purposes of this opinion, the international filing date indicated above is considered to be the relevant date.
3. Additional observations, if necessary:

Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	<u>2,6,9-12,15</u>
	No: Claims	<u>1,3-5,7,8,13,14</u>
Inventive step (IS)	Yes: Claims	
	No: Claims	<u>2,6,9-12,15</u>
Industrial applicability (IA)	Yes: Claims	<u>1-15</u>
	No: Claims	

2. Citations and explanations

see separate sheet

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

Reference is made to the following documents:

- D1: EP-A-1 551 032 (OSAKA IND PROMOTION ORG [JP] ARATA YOSHIKI [JP]) 6 July 2005 (2005-07-06)
- D2: E. CAMPARI, S. FOCARDI, V. GABBANI, V. MONTALBANO, F. PIANTELLI, S. VERONESI: "Overview of H₂/Ni systems: old experiments and new setup" 5TH ASTI WORKSHOP ON ANOMALIES IN HYDROGEN-DEUTERIUM LOADED METALS, ASTI, ITALY, 2004, XP002517911
- D3: S. FOCARDI, V. GABBANI, V. MONTALBANO, F. PIANTELLI, S. VERONESI: "Evidence of Electromagnetic radiation from Ni-H Systems" 11TH INTERNATIONAL CONFERENCE ON CONDENSED MATTER NUCLEAR SCIENCE 2004, MARSEILLE, FRANCE, 2004, XP002517912
- D4: CERRON-ZEBALLOS E ET AL: "INVESTIGATION OF ANOMALOUS HEAT PRODUCTION IN NI-H SYSTEMS" SOCIETA ITALIANA DI FISICA, NUOVO CIMENTO A, EDITRICE COMPOSITORI, BOLOGNA, IT, vol. 109A, no. 12, 1 December 1996 (1996-12-01), pages 1645-1654, XP008103248 ISSN: 0369-3546

Disclosure

1. The application does not meet the requirements of Article 5 PCT as the description does not disclose in a manner sufficiently clear the invention.

In the description it is claimed that the reaction of hydrogen with nickel is generating energy. However, there is no explicit evidence of energy production in the description or Figures, as would be temperature measurements, radiation emission measurements, or any alternative measurements showing production of energy.

According to PCT Guidelines 5.45 and 5.47, the disclosure of the claimed invention is considered sufficiently clear and complete if it provides information which is sufficient to allow the invention to be carried out by a person skilled in the art without undue experimentation. As factors to be considered in determining whether undue experimentation is needed to carry out the claimed invention, which should be considered for the present invention are: the general knowledge of the invention and the level of predictability in the art.

At present cold fusion, which is the basic explanation given in the description for generating energy is not accepted as mainstream science and technology. Relevant for the present invention is D4, which is reporting an independent experiment between Nickel (as a rod) and hydrogen, where no heat generation could be put into evidence, which would result as a fusion process between Nickel atom and a proton.

As the invention seems, at least at first, to offend against the generally accepted laws of physics and established theories, the disclosure should be detailed enough to prove to a skilled person conversant with mainstream science and technology that the invention is indeed feasible. This implies, inter alia, the provision of all the data which the skilled person would need to carry out the claimed invention, since such a person, not being able to derive such data from any generally accepted theory, could not be expected to implement the teaching of the invention by trial and error.

In the present case, the invention does not provide experimental evidence (nor any firm theoretical basis) which would enable the skilled person to assess the viability of the invention. The description is essentially based on general statements and speculations which are not apt to provide a clear and exhaustive technical teaching.

Clarity

2. The application does not meet the requirements of Article 6 PCT, because claims 1, 5, 7, 8 and 15 are not clear.

2.1. Claims 1, 5 and 15 do not meet the requirements of Article 6 PCT in that the matter for which protection is sought is not clearly defined. The claims attempt to define the subject-matter in terms of the result to be achieved, which merely amounts to a statement of the underlying problem, without providing the technical features necessary for achieving this result.

2.2. The term 'isothermal reaction' used in claim 1 is vague and unclear and leaves the reader in doubt as to the meaning of the technical feature to which it refers, thereby rendering the definition of the subject-matter of said claims 1-4 unclear, Article 6 PCT. It is unclear how an isothermal reaction is generating energy.

2.3. Attention is drawn to the applicant that according to PCT Guidelines 5.22, 'an apparatus for carrying out an exothermal reaction' is interpreted as any apparatus suitable for carrying out the process, with the corresponding technical features as

disclosed by the claims. Claims 7 and 8 which disclose a variable pressure and temperature relate to a mode of carrying out the process and are not intrinsic technical features of the apparatus.

Novelty

3. Furthermore, the above-mentioned lack of clarity notwithstanding, the subject-matter of **claims 1, 3-5, 7, 8, 13, 14** is not new in the sense of Article 33(2) PCT, and therefore the criteria of Article 33(1) PCT are not met.

3.1. Document D1 discloses a method of generating heat using a hydrogen condensate, wherein the hydrogen condensate comprises metal nano-ultrafine particles containing a plurality of metal atoms and a plurality of hydrogen isotope atoms solid-dissolved among the plurality of metal atoms. At least two of the plurality of hydrogen isotope atoms are condensed so that an interatomic nuclear distance between the two hydrogen isotope atoms is smaller than or equal to an internuclear spacing of a molecule consisting of the two hydrogen isotope atoms, the heat generation method comprising applying energy to the hydrogen condensate; and generating heat by causing the at least two hydrogen isotope atoms to react with each other due to the energy (claim 1). As metal atoms, nickel and copper are disclosed (claim 2). The pressure of the process is disclosed to be between 10 and 100 atmospheres (§46). By applying an ultrasonic wave (§64), the temperature of the system is raised to very high values, the outer wall temperature being 250°C (Figure 4, §73). It follows that the subject-matter of **claims 1, 3-5, 13 and 14** is not new in the sense of Article 33(2) PCT. D1 discloses that besides microwave heating, the energy might be generated based on high pressure, discharge, etc (§14). It follows that the subject-matter of **claims 7 and 8** is not new in the sense of Article 33(2) PCT.

Inventive step

4. The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of **claims 2, 6, 9-12, 15** does not involve an inventive step in the sense of Article 33(3) PCT.

4.1. The document D1 is regarded as being the closest prior art to the subject-matter of claim 2. The subject-matter of claim 2 therefore differs from this known D1 in that a catalyst is present. The technical effect is that the presence of the catalyst enhances

the reaction between nickel and hydrogen. The problem to be solved may therefore be regarded as enhancing the reaction between nickel and hydrogen.

The solution proposed in **claim 2** of the present application cannot be considered as involving an inventive step (Article 33(3) PCT) as catalysts in general have the purpose of enhancing chemical reactions and a person skilled in the art would always consider using catalysts in enhancing chemical reactions.

The same reasoning applies, mutatis mutandis, to the subject-matter of the corresponding **claim 6**, which therefore is also considered not inventive.

4.2. Dependent **claims 9-12 and 15** do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of inventive step.

The presence of a lead and boron with the function of neutron shielding is known in the art, a neutron shield being disclosed in Figure 2, D3 (relevant for claims 9 and 10 of the application). Water is widely used as cooling agent in various exothermal chemical or nuclear reactions (relevant for claim 11 of the application). Use of a nickel isotope powder instead of nickel powder is merely one of several straightforward possibilities from which the skilled person would select, without the exercise of inventive skill (claim 12 of the application). Existence of various trace elements in little spots or corroded regions of the Ni-H system is disclosed in D2, Figure 9 (relevant for claim 15 of the application).

Further remarks

5. The description page 12, lines 17-20, cites that in 'Figure 2 the locations of the two samples are indicated by arrows'. However, Figure 2 does not show these arrows. Therefore, the position of the samples analysed in Figure 3 and 4 is not disclosed.