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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 10/249,202 | 03/21/2003 | Roman Chistyakov | ZON-009 | 7335 |

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EXAMINER

VO, TUYET THI

ART UNIT PAPER NUMBER

2821

DATE MAILED: 02/11/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

GlobalFoundries 1108

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|------------------------------|--------------------------------------|--|--|
| Office Action Summary | Application No. 10/249,202 | Applicant(s) CHISTYAKOV, ROMAN | |
| | Examiner Tuyet Vo | Art Unit 2821 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 21 March 2003.
- 2a) This action is **FINAL**.
- 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-42 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1-5,7,10-15,17-20,24-27,29-32,34-37 and 39-42 is/are rejected.
- 7) Claim(s) 6,8,9,16,21-23,28,33 and 38 is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 21 March 2003 is/are: a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) All b) Some * c) None of:
1. Certified copies of the priority documents have been received.
2. Certified copies of the priority documents have been received in Application No. _____.
3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
- 4) Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) Notice of Informal Patent Application (PTO-152)

DETAIL ACTION

Drawings

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the electron gun must be shown or the feature(s) canceled from the claims 7 and 20. No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Objections

2. Claim 42 is objected to because of the following informalities:

Claim 42, line 1, replace “elections” with –electrons—for correcting a typographical error or any appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1- 5, 7, 11-15, 17-20, 25-27, 29-32, 34, 35, 37, 39 and 40-42 are rejected under 35 U.S.C. 102(e) as being anticipated by Bertrand et al. (US Pat. 6,661,178), hereinafter Bertrand.

Art Unit: 2821

Regarding claims 30-32, 34, 35, 37, 39 and 40-42, Bertrand discloses an apparatus as well as a method for generating plasma with a multiple step ionization process comprising:

means (120, 122) for generating a volume of metastable atoms from a volume of ground state atoms (rare gas 115) and means (125, 150) for raising an energy of the metastable atoms so that at least a portion of the volume of metastable atoms is ionized, thereby generating a plasma with multiple step ionization process (col. 5, lines 31-67 and col. 6, lines 1-7), wherein means (160, 170) for trapping electrons and ions in the volume of metastable atoms.

Regarding claims 1- 5, 7, 11, 18-20 and 25, Bertrand disclose a plasma generator that generates plasma with a multi-step ionization process, comprising:

a feed argon gas source (115) comprising ground state atoms;
an excited/metastable atoms source (120, 122) that is coupled to the feed gas source, the excited/metastable atoms source generating excited atoms from the ground state atoms;
a plasma chamber (170) that is coupled to the excited/metastable atoms source, the chamber confining a volume of excited/metastable atoms generated from the excited/metastable atoms source and
an energy source (125, 150) that coupled to the volume of excited/metastable atoms source for raising an energy of excited/metastable atoms in the volume of excited/metastable atoms is ionized, thereby generating a plasma with a multi-step ionization process, wherein the excited/metastable atoms source comprises a first electrode (125) and a second electrode (150) for generating a discharge that excited the ground state atoms. The excited/metastable atoms source is position outside of the plasma chamber.

Regarding claims 12-15,17, 26, 27 and 29, Bertrand further discloses the excited/metastable atoms generated by the excited/metastable atoms source have a lower ionization energy compared with an ionization energy of the ground state atoms (col. 4); wherein the energy source is chosen from the AC discharge source (Fig. 5). The plasma generated with the multi-step process inherently has a higher plasma density than the plasma that is generated by direct ionization of the ground state atoms.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 10, 24 and 36 are rejected under 35 U.S.C. 03(a) as being unpatentable over Bertrand.

Bertrand discloses substantially the claim language except for followings:

the excited atoms source is position inside the plasma chamber and raising the energy of the metastable atoms through X-ray radiation.

It would have been an obvious matter of design choice to assembly the excited atoms source inside of the plasma for spacing benefit, wherein the excited atoms can be exposed under any power source such as X-ray radiation for raising higher energy as long as it suited. Such implementation is considered as a routine skill in the art.

Allowable Subject Matter

7. Claims 6, 8, 9, 16, 21-23, 28, 33, 38 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims including any correction for overcome the 112 rejection as noted above.

15. The following is a statement of reasons for the indication of allowable subject matter: the prior fails to disclose a magnet that generates a magnetic field for trapping electrons proximate to the ground state atoms, so as to increase the rate to generate the excited atoms from the ground state as required in claims 6, 22, 33 or increase the rate to generate the higher density of excited atoms from the different pressure of the plasma chamber and the excited atoms source as

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