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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/183,463	07/18/2005	Roman Chistyakov	ZON-003CN2	9688

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RAUSCHENBACH PATENT LAW GROUP, LLP
P.O. BOX 387
BEDFORD, MA 01730

EXAMINER	
MCDONALD, RODNEY GLENN	

ART UNIT	PAPER NUMBER
1795	

NOTIFICATION DATE	DELIVERY MODE
04/21/2010	ELECTRONIC

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

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

kurt@rauschenbach.com
fax@rauschenbach.com
pto@rauschenbach.com

Office Action Summary	Application No.	Applicant(s)	
	11/183,463	CHISTYAKOV, ROMAN	
	Examiner	Art Unit	
	Rodney G. McDonald	1795	

-- 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) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, 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 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 *14 April 2010*.

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) *31-75* 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4a) Of the above claim(s) _____ is/are withdrawn from consideration.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) *31-75* is/are rejected.

7)☐ Claim(s) _____ 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 _____ 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/SB/08) Paper No(s)/Mail Date *4-14-2010*
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____ .

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on April 14, 2010 has been entered.

Claim Rejections - 35 USC § 102

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.

Claims 31-46, 64-71 and 73-75 are rejected under 35 U.S.C. 102(e) as being anticipated by Kouznetsov (WO 02/103078 A1).

Regarding claim 31, Kouznetsov teach a sputtering source comprising a cathode assembly comprising a sputtering target that is positioned adjacent to an anode; and a power supply that generates a voltage pulse between the anode and the cathode assembly that creates a weakly ionized plasma and then a strongly ionized plasma from the weakly ionized plasma without an occurrence of arcing between the anode and the

cathode assembly, an amplitude a duration and a rise time of the voltage pulse being chosen to increase a density of ions in the strongly ionized plasma. (See Abstract; Page 9 lines 18-33; Page 11 lines 27-30; Page 12 lines 3-7; Page 13 lines 23-29; Page 15 lines 2-13; Page 21 lines 25-27; Page 22 lines 11-17; Figs. 8b; Fig. 10)

Regarding claim 32, Kouznetsov teach that the strongly ionized plasma at least partially converts neutral sputtered atoms into positive ions in order to enhance the sputtering process with ionized physical vapor deposition. (Page 18 lines 16-20)

Regarding claims 33, 34, Kouznetsov teach inherently based on the voltage pulse an increase in the density of ions which inherently generates sufficient thermal energy to cause a sputtering yield to be related to a temperature of the target.

Regarding claim 35, Kouznetsov teach the thermal energy generated in the sputtering target does not increase an average temperature of the sputtering target due to cooling. (See Fig. 12a)

Regarding claim 36, Kouznetsov teach a gas inlet to control the flow of the feed gas so that the feed gas diffuses the strongly ionized plasma. (Page 23 lines 10-11)

Regarding claim 37, Kouznetsov teach a gas inlet to control the flow of feed gas to allow additional power to be absorbed by the strongly ionized plasma, thereby generating additional thermal energy in the sputtering target. (Page 23 lines 10-11)

Regarding claim 38, Kouznetsov teach a magnet that is positioned to generate a magnetic field proximate to the weakly ionized plasma, the magnetic field substantially trapping electrons in the weakly-ionized plasma proximate to the sputtering target. (Page 11 lines 27-30)

Regarding claim 39, Kouznetsov teach the voltage pulse generated between the anode and the cathode assembly excites atoms in the weakly ionized plasma and generates secondary electrons from the cathode assembly, the secondary electrons ionizing a portion of the excited atoms, thereby creating the strongly ionized plasma. (Page 15 lines 2-13)

Regarding claim 40, Kouznetsov teach the power supply generates a constant power. (Page 5 lines 23-25)

Regarding claim 41, Kouznetsov teach the power supply generates a constant voltage. (Page 5 lines 23-25)

Regarding claim 42, Kouznetsov teach a rise time. (See Figs. 9, 10)

Regarding claim 43, Kouznetsov teach a distance between the anode and the cathode for generating the plasma. (See Fig. 12a)

Regarding claim 44, Kouznetsov teach the rise time to be approximately within Applicant's range. (Page 23 lines 12-17)

Regarding claim 45, Kouznetsov teach the amplitude of the voltage pulse in the range of .4 to 4 kV. (Page 23 lines 13-14)

Regarding claim 46, Kouznetsov teach the pulse width of the voltage pulse in the range of approximately 0.1 microsecond to 100 seconds. (Page 23 lines 12-17)

Regarding claim 64, Kouznetsov teach a method for high deposition rate sputtering, the method comprising generating a voltage pulse between the anode and the cathode assembly comprising a sputtering target, the voltage pulse creating a weakly ionized plasma and then a strongly ionized plasma from the weakly ionized

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