PATENT
Attorney Docket No. EGQ-005CP3

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANTS:	Smith, Donald et al.	CONFIRMATION NO.:	9849
APPLICATION NO.:	13/024,027	GROUP NO.:	2881
FILING DATE:	February 9, 2011	EXAMINER :	McCormack, Jason
TITLE:	LASER-DRIVEN LIGHT SOURCE		

Commissioner for Patents
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RESPONSE TO NON-FINAL OFFICE ACTION

This paper is submitted in response to the Non-Final Office Action mailed from the Patent Office on July 10, 2012 ("Office Action"). Applicants hereby request a one-month extension of time, extending the due date for response to Monday, November 12, 2012. The Commissioner is hereby authorized to charge the fee for the extension of time to Attorney's Deposit Account No. 50-3081. In the event any additional fees are due, the Commissioner is hereby authorized to charge them to Attorney's Deposit Account No. 50-3081.

Applicant respectfully requests entry of this Response, in which:

Applicants' **Remarks** begin on page 2.

REMARKS

Claims 1-55 are currently pending. Claims 1-8 are elected and presented for consideration. Claims 9-55 were previously withdrawn from consideration in response to the Restriction Requirement of April 26, 2012.

In view of the following remarks, Applicants respectfully request reconsideration and withdrawal of all grounds of objection and rejection.

1. Rejections under 35 U.S.C. § 112

The Office Action objects to claim 1 under 35 U.S.C. § 112 as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention. The Office Action states that the term "high" in the phrase "high brightness light source" is a relative term which renders the claim indefinite. Applicants respectfully disagree.

Applicants submit that one of ordinary skill in the art would reasonably understand the term "high" in the phrase "high brightness light source" in view of Applicants' specification. For example, paragraphs [0003] – [0005] of Applicants' published application no. 2011/0181191 (the "Present Application") state "xenon or mercury arc lamps" are examples of "high brightness" light sources and that the present application improves upon these lamps in creating "high brightness light sources." *See* Present Application at ¶¶ [0003] – [0005]. Moreover, Applicants further submit that one of ordinary skill in the art would reasonably understand the term "high" in the phrase "high brightness light source" by virtue of Applicants' recited uses, for example, the light sources can be "used for inspection, testing or measuring properties associated with semiconductor wafers or materials used in the fabrication of wafers (e.g., reticles and

photomasks)." *See* Present Application at ¶ [0003]. The high brightness light sources of the Present Application can also be used in, for example, absorption cells, ultra-violet light detectors, diode array detectors, and fluorescence detectors. *See* Present Application at ¶¶ [0131]-[0134]; Figures 35-38. The specific parameters of the light "(e.g., wavelength, power level, and brightness)" vary depending upon the specific application. These application-dependent parameters are known to those of skill in the art. Applicants also describe high brightness light as "light in the ultraviolet range" and "light in the visible range" used in arc lamps with solid material bulbs ". . . capable of sustaining high pressures and temperatures." *See* Present Application at ¶¶ [0011], [0089], [0181], [0143], and [00148].

Applicants' descriptions of the phrase "high brightness light" throughout the Present Application provide context for one skilled in the art to be reasonably apprised on the scope of the invention. Based on the Present Application, Applicants respectfully submit that the term "high" in the phrase "high brightness light" is not indefinite. Accordingly, Applicants respectfully request reconsideration and withdrawal of the objection to claim 1.

2. Rejections under 35 U.S.C. § 102

The Office Action rejects claims 1-8 under 35 U.S.C. § 102 as allegedly being anticipated by U.S. Publication No. 2006/039435 to Cheymol ("Cheymol") and separately rejects claims 1-8 under 35 U.S.C. § 102 as allegedly being anticipated by U.S. Publication No. 2002/0080834 to Kusunose ("Kusunose"). Of these, claim 1 is independent. For a rejection under 35 U.S.C. §102 to be proper, each reference by itself must disclose each and every element in the claim.

Applicants respectfully submit that neither Cheymol nor Kusunose disclose each and every element of Applicants' claims.

a. Rejections under 35 U.S.C. § 102 – Cheymol

Applicants respectfully submit that Cheymol does not disclose each and every element of Applicants' claims, at least because Cheymol fails to disclose each of the following elements of Applicants' independent claim 1:

(1) "a chamber having a gas disposed therein . . . to produce a high brightness light;" and

(2) an "ignition source for exciting the gas, the excited gas having at least one strong absorption line at an infrared wavelength."

Applicants' invention features a "light source for generating a high brightness light." Present Application at ¶ [0008]. The light source is started by making the "absorption of the laser light by the gas within the chamber … strong enough to provide sufficient energy to the gas to form a dense plasma. Id. at ¶ [0232]. "However, during operation, the same absorption that was used to start the [laser-driven light source] LDLS can be too strong to maintain the brightness of the light." Id. This can create an imbalance between the "absorption needed to start a LDLS and the absorption needed to maintain or operate the LDLS." Id.

To correct the imbalance, the light source of the present invention has a "laser [that] is first tuned to a wavelength nearer the absorption line and then tuned to another wavelength further away from the strong absorption line for optimum operation." Present Application at ¶ [0232]. "The light source can use an excited gas that has at least one strong absorption line at an infrared wavelength to produce a high brightness light," for example, xenon. Id. at ¶ [0233]. "An ignition source 140 can be used to excite the gas within the chamber." Id. "The excited gas

has electrons at an energy level that is higher than the energy of the gas at its ground state." Id. "The excited gas has at least one strong absorption line at an infrared wavelength, for example at about 980 nm, 895 nm, 882 nm, or 823 nm." Id. A laser can then provide energy "to the excited gas within the chamber 128 to produce a high brightness light." Id.

(1) "a chamber having a gas disposed therein . . . to produce a high brightness light"

Cheymol fails to disclose "a chamber having a gas disposed therein . . . to produce a high brightness light" as recited in Applicants' independent claim 1. In contrast to the high brightness light (e.g., light in the ultraviolet and visible ranges) of Applicants' invention, Cheymol describes light sources of extreme ultraviolet, i.e. EUV, which are very short wavelengths at high energy radiation. Specifically, Cheymol describes a device for ". . . generating light in the *extreme ultraviolet*, and to its application to a source for lithography using *radiation in the extreme ultraviolet* . . . . also referred to more simply as *'EUV' radiation*." *See* Cheymol at ¶ [0001]-[0002] (italics added); *see also* id. at [0013]. Cheymol's light source seeks to ". . . enable a plurality of laser beams to be used simultaneously to increase strongly the incident laser power while conserving a device that is effective *in collecting EUV radiation* . . . . Id. at ¶ [0014] (italics added.; The EUV wavelength typically covers the ". . . radiation in the extreme ultraviolet domain . . . wavelengths lying in the range 1 nanometer (nm) to 15 nm . . . .". Id. at ¶ [0002]. The EUV light of Cheymol is not the high brightness light of Applicants' invention.

In view of the foregoing, Applicants respectfully submit that Cheymol fails to disclose each and every element of Applicants' independent claim 1, at least because Cheymol fails to disclose "a chamber having a gas disposed therein . . . to produce a high brightness light."

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