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Paper 15
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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

ASML NETHERLANDS B.V., EXCELITAS TECHNOLOGIES CORP.,
and QIOPTIQ PHOTONICS GMBH & CO. KG,
Petitioner,

v.

ENERGETIQ TECHNOLOGY, INC.,
Patent Owner.

Case IPR2016-00126
Patent 9,048,000 B2

Before SALLY C. MEDLEY, JONI Y. CHANG, and
BARBARA A. PARVIS, *Administrative Patent Judges.*

CHANG, *Administrative Patent Judge.*

DECISION
Institution of *Inter Partes* Review
37 C.F.R. § 42.108

I. INTRODUCTION

ASML Netherlands B.V., Excelitas Technologies Corp., and Qioptiq Photonics GmbH & Co. KG (collectively, "Petitioner") filed a Petition requesting an *inter partes* review of claims 7–10 of U.S. Patent No. 9,048,000 B2 (Ex. 1101, "the '000 patent"). Paper 4 ("Pet."). Energetiq Technology, Inc. ("Patent Owner") did not file a Preliminary Response. We have jurisdiction under 35 U.S.C. § 314(a).

For the reasons set forth below, we institute an *inter partes* review as to claims 7–10 of the '000 patent.

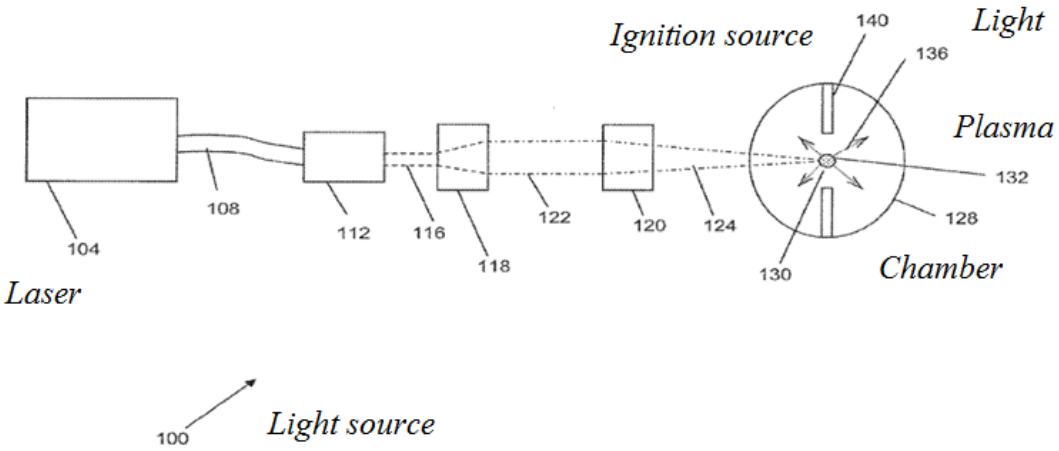
A. Related Matter

The parties indicate that the '000 patent is asserted in *Energetiq Techn., Inc. v. ASML Netherlands B.V.*, No. 1:15-cv-10240-LTS (D. Mass.), and identify related proceedings. Pet. 1; Paper 12, 2–3.

B. The '000 Patent

The '000 patent claims under 35 U.S.C. § 120, through a series of continuation and continuation-in-part applications, the benefit of the filing date of an application filed March 31, 2006. Ex. 1101, at [63]; Ex. 1102. The '000 patent discloses a light source comprising a laser that ionizes a gas within a chamber to produce a plasma-generated light. *Id*. at Abs. According to the '000 patent, such a light source can be used as a source of illumination in a semiconductor photolithographic system. *Id*. at 1:27–37.

Figure 1 of the ’000 patent illustrates a block diagram of a light source, and is reproduced below with annotations added.



As shown in annotated Figure 1, light source 100 includes laser 104, chamber 128, and ignition source 140. *Id*. at 14:40–16:5. Laser 104 outputs laser beam 116 via fiber optic element 108. *Id*. Collimator 112 directs the laser beam to beam expander 118, which produces laser beam 122 and directs it to optical lens 120. *Id*. Optical lens 120 focuses the beam to produce smaller diameter laser beam 124 and directs it to region 130. *Id*. Plasma 132 is generated within the chamber to produce light 136. *Id*.

C. Illustrative Claim

Of the challenged claims, claim 7 is the sole independent claim. Claims 8–10 depend, directly or indirectly, from claim 7, which recites:

> 7. A laser driven light source comprising:
>
> a sealed pressurized plasma chamber having an ignition source for ionizing a gas within the chamber and a sapphire window for maintaining a pressure therein;

> a laser for providing at least *substantially continuous energy* through the sapphire window to the ionized gas within the pressurized plasma chamber to sustain a plasma and produce plasma-generated *light having wavelengths greater than 50 nm, the pressure of the plasma chamber during operation is greater than 10 atmospheres*
>
> wherein the sapphire window allows the plasma-generated light to exit the pressurized chamber.

Ex. 1101, 49:5–17 (emphases added).

D. Prior Art of Record

In support of its Petition, Petitioner proffers the following prior art references[1]:

Gärtner	FR 2554302 A1	May 3, 1985	(Ex. 1104)
Sato	JPS61-193358	Aug. 27, 1986	(Ex. 1105)
Eastlund	US 6,414,436 B1	Jul. 2, 2002	(Ex. 1114)
Guthrie	US 2001/0035720	Nov. 1, 2001	(Ex. 1115)

Zane A. Arp et al., *Feasibility of Generating a Useful Laser-Induced Breakdown Spectroscopy Plasma on Rocks at High Pressure: Preliminary Study for a Venus Mission*, *in* 59B SPECTROCHIMICA ACTA, PART B: ATOMIC SPECTROSCOPY, 987–999 (Elsevier 2004). Ex. 1106 ("Arp").

WILLIAM T. SILFVAST, LASER FUNDAMENTALS 1–6, 199–222, 565–68 (2d ed. 2004). Ex. 1109 ("Silfvast").

PATEL & ZAIDI, THE SUITABILITY OF SAPPHIRE FOR LASER WINDOWS, *in* 10 MEAS. SCI. TECHNOL. 146–151 (1999). Ex. 1116 ("Patel").

[1] The citations to Sato and Gärtner are to their certified English-language translations in Exhibits 1105 and 1104, respectively.

D. KEEFER, LASER SUSTAINED PLASMA, *in* RADZIEMSKI ET AL., LASER-INDUCED PLASMA AND APPLICATIONS (CRC Press 1989). Ex. 1117 ("Keefer").

RONALD WAYNANT ET AL., ELECTRO-OPTICS HANDBOOK, Chapter 10 (2d ed. 2000). Ex. 1122 ("Waynant").

KELIN J. KUHN, LASER ENGINEERING, Chapter 10, at 303–43 (Prentice Hall 1998). Ex. 1127 ("Kuhn").

CHRISTOPHER C. DAVIS, LASER AND ELECTRO-OPTICS: FUNDAMENTALS AND ENGINEERING (reprint 2000) (Cambridge Univ. Press 1996). Ex. 1128 ("Davis").

G.C. WEI, JOURNAL OF PHYSICS D 3057 (2005). Ex. 1129 ("Wei").

E. Asserted Grounds of Unpatentability

Petitioner asserts the following grounds (Pet. 18, 42):

Claims	Basis	References
7–10	§ 103(a)	Sato in view of Gärtner
7–10	§ 103(a)	Gärtner in view of Arp

II. ANALYSIS

A. Claim Construction

In an *inter partes* review, claim terms in an unexpired patent are given their broadest reasonable construction in light of the specification of the patent in which they appear. 37 C.F.R. § 42.100(b). Here, Petitioner proposes construction for "light source" and "ignition source for ionizing

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