UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

GLOBALFOUNDRIES U.S., INC., GLOBALFOUNDRIES DRESDEN MODULE ONE LLC & CO. KG, GLOBALFOUNDRIES DRESDEN MODULE TWO LLC & CO. KG, and THE GILLETTE COMPANY,
Petitioners

v.

ZOND, LLC,
Patent Owner

Case No. IPR2014-01088[1]

Patent 6,806,652 B2

PATENT OWNER'S OBSERVATIONS ON CROSS-EXAMINATION OF PETITIONER'S REPLY WITNESS

37 C.F.R. §42.70

[1] Case IPR2014-01000 has been joined with the instant proceeding.

Pursuant to 37 C.F.R. §42.70(a), Patent Owner, Zond, LLC, hereby submits it observations on cross-examination of Dr. Korthsagen, whose Declaration was submitted by Petitioners with their Reply Brief filed June 26, 2015. Dr. Kortshagen's cross-examination was conducted by deposition on July 2, 2015. Exhibit 2003 is a transcript of that deposition, and is used as the basis for the present observations.

1. Dr. Kortshagen Testified that Mozgrin's Regions 2 and 3 Both Represent Areas of High-Density Plasma.

Claim 1 of the '652 patent requires "super-ionizing [an] initial plasma so as to generate a high-density plasma."[2] According to Petitioner, a person of ordinary skill in the art would have found it obvious to substitute the device of *Fahey* in the preexcitation unit of *Iwamura* to generate such an initial plasma.[3] That is, Petitioner specifies the initial plasma as that which is produced by the preexcitation unit.[4] Dr. Kortshagen testified that region 1 of Mozgrin's Fig. 4 is

[2] *Ex. 1001* at 33:63-64; see also, *Ex. 2003* at 10:5-23.

[3] Pet. at 54-55.

[4] *Id*. at 55; see also, *Ex. 2003* at 46:12 – 51:23 (Dr. Kortshagen specifying that

representative of such an initial plasma created by a preexcitation unit.[5] Dr. Kortshagen further testified that region 2 of Mozgrin's Figure 4 represents an area of high-density plasma,[6] and that region 3 of Mozgrin's Figure 4 also represents an area of high-density plasma.[7] This testimony is relevant because it contradicts Petitioner's argument that Mozgrin teaches "super-ionizing the initial plasma so as to generate a high-density plasma."[8]

In an attempt to show "super-ionization" of the initial plasma, Dr. Kortshagen and Petitioner rely on computations that discuss the plasma densities during a transition from Mozgrin's region 2 to region 3.[9] For example, Dr. Kortshagen states that "'for the discharge transit from regime 2 to regime 3 . . . the

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although it may not be visible, a plasma is produced in *Iwamura's* preexcitation unit.).

[5] *Ex. 2003* at 22:16-24:18 (testifying that region 1 shown in *Mozgrin's* Figure 4 represents a pre-ionization stage, with an initial plasma having a density in the range $10^7 – 10^9$ cm^{-3}).

[6] *Id*. at 26:3-21; 28:7-17.

[7] *Id*. at 28:19 – 29:8.

[8] Reply Brief at 2 *et seq.*

[9] *Ex. 1020* at ¶ 31; Reply Brief at 10-11, 17.

ionization degree **$\alpha = n_e / (n_g + n_i)$ ranges from $\alpha \approx 1$ (p = 0.01 torr)** to $\alpha \approx 0.7$ (p = 1torr).'"[10] However, Dr. Korshagen's deposition testimony reveals that such a transition is ***not*** super-ionizing ***an initial plasma***, as required by claim 1, rather it is further ionizing an already high-density plasma. That is, Dr. Kortshagen's reliance on the densities reported by Mozgrin for a "discharge transit from regime 2 to regime 3" do not support "converting at least 75% of the neutral atoms in the initial plasma into ions,"[11] as the Board has determined is required by the claim. Rather, the "discharge transit from regime 2 to regime 3" represents ionization of an already dense plasma, not ionization of an initial plasma.

2. Dr. Kortshagen Testified that Mozgrin's Region 1 Represents An Area of a Weakly-Ionized Plasma.

Claim 1 of the '652 patent requires "super-ionizing [an] initial plasma so as to generate a high-density plasma,"[12] and claim 4 specifies that the initial plasma

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[10] *Ex. 1020* at ¶ 31 quoting *Mozgrin* at 407, left col. ¶ 2 and right col. ¶ 3 (emphasis in original).

[11] *Globalfoundries U.S., Inc. et al. v. Zond, LLC*, IPR2014-01088, Paper 16, p. 11 (P.T.A.B. Jan. 6, 2015).

[12] *Ex. 1001* at 33:63-64; see also, *Ex. 2003* at 10:5-23.

is a weakly-ionized plasma.[13] Dr. Kortshagen testified that region 1 of Mozgrin's Fig. 4 is representative of such an initial plasma created by a preexcitation unit.[14] Dr. Kortshagen further testified that region 2 of Mozgrin's Figure 4 represents an area of high-density plasma,[15] and that region 3 of Mozgrin's Figure 4 also represents an area of high-density plasma.[16] This testimony is relevant because it contradicts Petitioner's argument that claim 4 is obvious in view of the cited references.[17]

In an attempt to show "super-ionization" of the initial plasma, Dr. Kortshagen and Petitioner rely on computations that discuss the plasma densities during a transition from Mozgrin's region 2 to region 3.[18] For example, Dr. Kortshagen states that "'for the discharge transit from regime 2 to regime 3 . . . the

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[13] *Ex. 1001* at 34:5-6.

[14] *Ex. 2003* at 22:16-24:18 (specified that region 1 shown in Mozgrin's Figure 4 represents a pre-ionization stage, with an initial plasma having a density in the range $10^7 – 10^9$ cm^{-3}).

[15] *Id*. at 26:3-21; 28:7-17.

[16] *Id*. at 28:19 – 29:8.

[17] Pet. at 54 *et seq*.

[18] *Ex. 1020* at ¶ 31; Reply Brief at 10-11, 17.

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