IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE PATENT TRIAL AND APPEAL BOARD

GLOBALFOUNDRIES U.S., INC.,
GLOBALFOUNDRIES U.S., INC.,
DRESDEN MODULE ONE LLC & CO. KG,
GLOBALFOUNDRIES U.S., INC.,
DRESDEN MODULE TWO LLC & CO.
AND TSMC NORTH AMERICA CORP.,

Petitioners,

Case Nos.
IPR2014-01088
IPR2014-01089
IPR2014-00861

-vs-

ZOND, LLC,

Patent Owner.

VIDEOTAPED DEPOSITION of DR. UWE KORTSHAGEN
Minneapolis, Minnesota
March 2nd, 2015

Reported by:
Amy L. Larson, RPR
Job No. 90908

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ALSO PRESENT: Kraig Hildahl, Videographer

INDEX:

DR. UWE KORTSHAGEN

THE VIDEOTAPED DEPOSITION OF DR. UWE KORTSHAGEN, taken on this 2nd day of March, 2015, at The Commons Hotel, 615 Washington Avenue, S.E., Minneapolis, Minnesota, commencing at approximately 8:07 a.m.

P R O C E E D I N G S

THE VIDEOGRAPHER: We are on the record. This is the start of tape labeled number 1 of the videotaped deposition of Dr. Uwe Kortshagen in the matter of Taiwan Semiconductor Manufacturing Company vs. Zond, LLC, in the U.S. Patent & Trademark Office before the Patent Trial & Appeal Board, Patent Number 6,806,652, IPR numbers 2014-01088, also 2014-01-089 [sic], and 2014-00861.

This deposition is being held at The Commons Hotel in Minneapolis, Minnesota, on March 2nd, 2015. The time is approximately 8:07 a.m. My name is Kraig Hildahl, I'm a legal video specialist from TSG Reporting headquartered in New York,

DR. UWE KORTSHAGEN

New York. The court reporter is Amy Larson also in association with TSG Reporting.

Will counsel please identify themselves for the record.

MS. GRANOVSKY: Maria Granovsky from Radulescu, LLP for patentholder Zond.

MR. TENNANT: David Tennant of White & Case for Global Foundries U.S., Inc., Global Foundries Dresden Module One, LLC & Co. KG and Global Foundries Dresden Module Two, LLC, and Co. KG.

MR. RISMILLER: Brett Rismiller, White & Case, also on behalf of Global Foundries.

MR. HUH: Gregory Huh, Haynes & Boone, LLC, on behalf of TSMC and Fujitsu.

MR. TENNANT: Anybody on the phone, please, please announce yourself.

MR. FELDHAUS: John Feldhaus of Foley & Lardner for Renesas.

THE VIDEOGRAPHER: Will the court reporter please swear in the witness and then we can proceed.

DR. UWE KORTSHAGEN

DR. UWE KORTSHAGEN,
a witness in the above-entitled action, after having been first duly sworn, was deposed and says as follows:

MR. TENNANT: Maria, real quick, for the record, any objections I make today will apply to all petitioners in the various proceedings.

MS. GRANOVSKY: That's fine.

EXAMINATION

BY MS. GRANOVSKY:

Q. Good morning, Dr. Kortshagen.

A. Good morning, Dr. Granovsky.

Q. We've been here before, so I know you've been deposed before. But just so we are clear on the rules, you should answer verbally; do you understand that?

A. I do.

Q. Is there any reason why you cannot testify truthfully today?

A. No.

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Q. Okay. Are you taking any medications that might impact your memory?

A. No, I don't.

Q. Okay. What did you do to prepare for today's deposition?

A. I reread to the best of my ability my declarations, the board decisions, the references that were cited. I briefly met with my lawyers yesterday evening. In total, I think I spent maybe 10 to 12 hours preparing myself.

Q. Okay. I'm handing you a document that was formerly marked as TSMC-1101. Do you recognize this, Doctor?

A. I do.

Q. What is it?

A. It is the U.S. Patent 6,806,652.

Q. And you have seen this document before?

A. I have.

Q. And when was the last time you reviewed it?

A. Probably on Friday.

Q. Okay.

A. And I looked at it probably Saturday and Sunday, but, yeah.

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Q. Let's turn to claim 1 of the '652 patent. It's in column 33.

A. (Complies.)

Q. And subpart C of the claim reads, "An excited atom source that generates an initial plasma and excited atoms from a volume of feed gas"; is that correct?

A. That is correct, yes.

Q. Is it your understanding that this claim limitation requires the generation of both a plasma and excited atoms?

MR. TENNANT: Objection to form.

THE WITNESS: Well, I think what you asked me is, I believe, precisely the claim language, an excited atom source that generates an initial plasma and excited atoms, yes.

BY MS. GRANOVSKY:

Q. What is your understanding of the difference between the generation of a plasma and excited atoms?

MR. TENNANT: Objection to form.

THE WITNESS: Yeah, in my opinion there is no difference, because the

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generation of a plasma and the generation of excited atoms go hand in hand. When you're creating a plasma, you will generate excited atoms.

BY MS. GRANOVSKY:

Q. Can you generate excited atoms without generating a plasma?

A. Yeah, I think there are other means of generating excited atoms.

Q. So the two are not synonymous, in your opinion?

MR. TENNANT: Objection to form.

THE WITNESS: I think when you're creating a plasma you will create excited atoms. I think there are other ways of creating excited atoms without using a plasma.

BY MS. GRANOVSKY:

Q. Subpart C also has this term, "From a volume of feed gas"; is that correct?

A. That is correct, yes.

Q. Do you have an understanding of what the term "a volume of gas" means?

MR. TENNANT: Objection to form.

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THE WITNESS: A volume of gas?

MS. GRANOVSKY: Yes.

THE WITNESS: Yes, I would call it a volume of gas atoms or molecules.

BY MS. GRANOVSKY:

Q. So I guess my question is more what -- what does a -- a volume mean?

A. What does a volume mean?

Q. Yes.

A. Well, conventionally, I believe a volume means a -- a region in space. Yeah, I think I need to leave it at that, a region in space.

Q. Is it a measurable quantity?

A. Volume, is a volume a measurable quantity? I think so. Ideally, you would want volume to be measurable, yes.

Q. Okay. And if you look at the limitation D of claim 1, it recites, "A power supply that generates an electric field between the cathode assembly and the anode, the electric field super-ionizing the initial plasma so as to generate a high-density plasma"; is that correct?

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A. Yes, that is correct.

Q. Is it your understanding that this limitation requires the electric field generated by the pour supply to super-ionize the initially plasma to generate a high-density plasma?

MR. TENNANT: Objection to form.

THE WITNESS: Could you please repeat your question just so that I --

MS. GRANOVSKY: Sure.

THE WITNESS: -- can be sure that I accurately understand it?

BY MS. GRANOVSKY:

Q. Is it your understanding that this limitation requires the electric field generated by the power supply to super-ionize the initial plasma to generate a high-density plasma?

MR. TENNANT: Same objection.

THE WITNESS: So claim limitation D uses the term electric field twice. It says, "A power supply that generates an electric field between the cathode and the anode," and then it continues, "The electric field super-ionizing the initial plasma so as to generate."

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So are you asking me whether these two mentions of electric field refer to the same electric field?

BY MS. GRANOVSKY:

Q. Let's start with that, yes. Do they -- do they refer to the same electric field?

A. Aha. Well, I certainly believe this would be one possibility. It's not entirely clear to me that the claim language really suggests that they need to be the same electric field.

Q. Where else would the electric field be generated from?

MR. TENNANT: Objection to form.

THE WITNESS: Yeah, I think -- yeah, so I do believe that these two electric fields or mentions of electric fields are -- likely refer to the same electric field.

BY MS. GRANOVSKY:

Q. And that electric field is generated by the -- by the power supply mentioned in -- in the -- in this claim -- in this claim limitation; is that correct?

A. Yes, I believe that is correct.

Q. Okay. I handed you an exhibit previously

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marked Intel 1002. Do you recognize it?
A. I do.
Q. What is it?
A. It is my declaration concerning claims 1 through 17 of the U.S. Patent Number 6,806,652.
Q. And when did you last review it?
A. Sometime this weekend.
MR. TENNANT: Maria, the copy you gave me is in black and white, but there were color figures throughout the declaration.
MS. GRANOVSKY: I apologize, I just have the black and white.
MR. TENNANT: Okay. Can we just note for the record that the witness wasn't given the true and correct copy.
MS. GRANOVSKY: Right, it's a black and white copy.
BY MS. GRANOVSKY:
Q. I handed you an exhibit previously marked as TSMC-1105; is that correct?
A. That is correct.
Q. What is it?
A. This is the paper the High Flux Beam Source

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of Thermal Rare-Gas Metastable Atoms that we commonly refer to as Fahey.
Q. Have you read it before?
A. I did, yes.
Q. Did you read it in conjunction with forming your opinions about the '652 patent?
A. I did, yes.
Q. Okay. And when was the last time you reviewed it?
A. Again, sometime this weekend.
Q. Okay. If you'd turn to page 23 of your declaration, paragraphs 53 to 58.
A. Which page, please?
Q. Twenty-three.
A. Twenty-three?
Q. Uh-huh.
A. Yes.
Q. I'm sorry, paragraphs 56 to 58.
A. Fifty-six --
Q. No, fifty -- paragraphs 56 to 58. So it's page 23 --
A. Sorry. I have it, yeah, 56, yes.
Q. And these paragraphs discuss limitation of claim 1, limitation claim 1-C, right?

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A. Yes, that's correct.
Q. Okay. And is it your assertion that this reference, Fahey, discloses limitation 1-C?
A. That is my opinion, yes.
Q. Can you please point me to where Fahey discloses the generation of plasma?
A. So in the introduction paragraph of Fahey, which is on page 381, the right column, Fahey noticed, "A novel meta beam" -- "metastable beam source was recently described by Leasure, et al., 1975, whose design employed a weak high-voltage corona discharge between a sharp needle and a cone-shaped anode. The discharge was maintained across a substantial pressure gradient."
And then in the second paragraph of the introduction Fahey continues and says, "We report here modifications to the Leasure, et al., design which result in a further simplification, enhanced beam flux, species-independent energies, and importantly, beam energies only slightly in excess of thermal energies."
So Fahey -- so, first of all, let me back

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up. In the first sentence Fahey talks about the beam source that he is modifying, which is based on weak high-voltage corona discharge, and that means that a plasma is created here, because creating a corona discharge involves the generation of a plasma. And so this is the basis for Fahey's design of the metastable atom source.
Q. So is it your assertion that the corona discharge necessarily leads to the generation of plasma?
A. That is correct, yes.
Q. Are there any conditions under which a corona discharge will not be accompanied by the generation of plasma?
A. In my opinion, I believe every one of ordinary skill would agree that forming a discharge always involves the generation of a plasma. So I cannot think of any circumstance under which operating a corona discharge would not involve the generation of a plasma.
Q. Are there different types of coronas?
A. In principle, there are two types of corona

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