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'652 Patent

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

PATENT: 6,806,652, CLAIMS 18-34

INVENTOR: ROMAN CHISTYAKOV

FILED: MAY 12, 2003

ISSUED: OCTOBER 19, 2004

TITLE: HIGH-DENSITY PLASMA SOURCE USING EXCITED ATOMS

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**DECLARATION OF UWE KORTSHAGEN, PH.D., REGARDING
CLAIMS 18-34 OF U.S. PATENT NO. 6,806,652**

I, Uwe Kortshagen, declare as follows:

1. My name is Uwe Kortshagen.
2. I received my Diploma in Physics from the University of Bochum in Germany in 1988. I received my Ph.D. in Physics from University of Bochum in 1991 and my Habilitation in Experimental Physics from University of Bochum in 1995.
3. I am a Distinguished McKnight University Professor at the University of Minnesota. I have been the Head of the Mechanical Engineering Department at

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the University of Minnesota since July 2008. I have been a Professor at the Mechanical Engineering Department at the University of Minnesota since August 2003. Between August 1999 and August 2003, I was an Associate Professor at the Mechanical Engineering Department at the University of Minnesota. Between July 1996 and August 1999, I was an Assistant Professor at the Mechanical Engineering Department at the University of Minnesota. Between April 1996 and July 1996, I was a Lecturer at the Department of Physics and Astronomy at the University of Bochum, Germany. Between August 2006 and June 2008, I was the Director of Graduate Studies at the Mechanical Engineering Department at the University of Minnesota.

4. I have taught courses on Introduction to Plasma Technology and Advanced Plasma Technology. These courses include significant amounts of material on plasma technology. In addition, I have taught a Special Topics class on Plasma Nanotechnology.

5. Plasma processes for advanced technological applications has been the primary area of my professional research for over 30 years. Most of my Ph.D. students go on to work on plasmas either in academia or the semiconductor industry.

6. A copy of my latest *curriculum vitae* (CV) is attached as Appendix A.

7. I have reviewed the specification, claims, and file history of U.S. Patent No. 6,806,652 (the “652 Patent”) (Ex. 1101). I understand that the ‘652 Patent was filed on May 12, 2003. I understand that, for purposes determining whether a publication will qualify as prior art, the earliest date that the ‘652 Patent could be entitled to is May 12, 2003.

8. I have reviewed the following publications and others listed in the Table of Exhibits:

- D.V. Mozgrin, *et al*, High-Current Low-Pressure Quasi-Stationary Discharge in a Magnetic Field: Experimental Research, Plasma Physics Reports, Vol. 21, No. 5, pp. 400-409, 1995 (“Mozgrin” (Ex. 1103)).
- D. W. Fahey, *et al.*, High flux beam source of thermal rare-gas metastable atoms, J. Phys. E; Sci. Instrum., Vol. 13, 1980 (“Fahey” Ex. 1105)).
- A. A. Kudryavtsev, *et al*, Ionization relaxation in a plasma produced by a pulsed inert-gas discharge, Sov. Phys. Tech. Phys. 28(1), January 1983 (“Kudryavtsev” (Ex. 1106)).
- U.S. Patent No. 5,753,886 (“Iwamura” (Ex. 1108)).
- Campbell, U.S. Pat. No. 5,429,070 (“Campbell” (Ex. 1114)).

Of these, I understand that only Mozgrin was of record during prosecution of the '652 Patent.

9. I have read and understood each of the above publications. The disclosure of each of these publications provides sufficient information for someone to make and use the plasma generation and sputtering processes that are described in the above publications.

10. I have considered certain issues from the perspective of a person of ordinary skill in the art at the time the '652 Patent application was filed. In my opinion, a person of ordinary skill in the art for the '652 Patent would have found the '652 invalid.

11. I have been retained by Intel Corporation ("Intel" or "Petitioner") as an expert in the field of plasma technology. I am being compensated at my normal consulting rate of \$350/hour for my time. My compensation is not dependent on and in no way affects the substance of my statements in this Declaration.

12. I have no financial interest in the Petitioner. I similarly have no financial interest in the '652 Patent, and have had no contact with the named inventor of the '652 Patent.

I. RELEVANT LAW

13. I am not an attorney. For the purposes of this declaration, I have been informed about certain aspects of the law that are relevant to my opinions. My understanding of the law is as follows:

A. Claim Construction

14. I have been informed that claim construction is a matter of law and that the final claim construction will ultimately be determined by the Board. For the purposes of my invalidity analysis in this proceeding and with respect to the prior art, I have applied the broadest reasonable construction of the claim terms as they would be understood by one skilled in the relevant art.

15. I have been informed and understand that a claim in *inter partes* review is given the “broadest reasonable construction in light of the specification.” 37 C.F.R. § 42.100(b). I have also been informed and understand that any claim term that lacks a definition in the specification is therefore also given a broad interpretation.

B. Anticipation

16. I have been informed and understand that a patent claim can be considered to have been anticipated at the time the application was filed. This means that if all of the requirements of a claim are found in a single prior art

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