

By: Christopher Frerking (chris@ntknet.com)
Reg. No. 42,557

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

MICRON TECHNOLOGY, INC., INTEL CORPORATION
AND GLOBALFOUNDRIES U.S., INC.

Petitioners

v.

DANIEL L. FLAMM,

Patent Owner

CASE IPR2017-00391
U.S. Patent No. 6,017,221

**SECOND DECLARATION OF DANIEL L. FLAMM IN
SUPPORT OF PATENT OWNER'S RESPONSE**

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P.O. Box 1450
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I, Daniel L. Flamm, Sc.D., hereby declare as follows:

1. I worked in academia, research, and industry in various roles for more than 50 years. My curriculum vitae, which includes a more detailed summary of my background, experience, and publication, is attached as Appendix A.
2. I have been a leading researcher and educator in the fields of semiconductor processing technology, air pollution control, materials science, and other areas of chemical engineering. My research has been funded by NASA, National Science Foundation, Environmental Protection Agency, and AT&T Bell Laboratories. While a Distinguished Member of Technical Staff at Bell Laboratories, I led a semiconductor processing research group comprised of research colleagues, visiting university scientists, post-doctoral associates, and summer students. I have also served as a technical consultant to various semiconductor device and processing equipment manufacturers.
3. I have published over one hundred and fifty (150) technical journal articles and books, and dozens of articles in conference proceedings, most of them in highly competitive referred conferences and rigorously reviewed journals. I am an inventor listed in more than 20 U.S. patents, a number of which have been licensed through the industry, and most being in the general field of semiconductor processing technology.
4. I had experience studying and analyzing patents and patent claims from the

perspective of a person having ordinary skill in the art (“PHOSTIA”) starting at least at the time of my employment at AT&T Bell laboratories in 1977. At AT&T Bell Laboratories, I served as a member of the patent licensing review committee where I was responsible for reviewing hundreds of patents for potential utility and licensing potential. I have also served as a technical expert in patent disputes and litigation.

5. I was admitted to the patent bar as an Agent in 2003 and have been registered as a Patent Attorney since 2006. I am also a member of the California State Bar.

6. I am the inventor of U.S. Patent No. 6,017,221, in the name of Daniel L Flamm and titled “(“the ‘221 Patent”).

7. I have read the Petitioners Petition for *Inter Partes* Review in this matter and the various art cited therein, including, among others,

8. Petitioner inflates the significance of three sentences in a brief four sentence paragraph in Lieberman that amounts to suggesting use of a radiofrequency isolation transformer to apply voltage to a coil used to induce inductive current in a plasma source. This teaches nothing about the ‘221’s inductive coupling structure being adjusted using a wave adjustment circuit.

9. Lieberman’s article as a whole makes it very clear that the “balanced transformer” means an isolation transformer that isolates the output side from ground -- on page 42 (Ex. 1006) in the second paragraph he teaches powering a

helicon antenna “driven through a balanced transformer so that the coil is isolated from ground.” As a matter of fact, the main teaching of the Qian reference is to use an isolation transformer, the same type of transformer identified in Lieberman. Qian teaches the transformer is to isolate a “coil antenna” from the RF power source”. Qian further teaches the result of the isolation is that “the potential of the coil antenna is floating” to reduce capacitive coupling from the antenna to the plasma.

10. None of this has anything do with any balancing, adjusting, or wave adjustment circuits. Qian correctly teaches an isolation transformer can eliminate *any* DC potential between the generator and the inductive coil antenna so that the electric potential of the coil antenna is floating with respect to the wafer pedestal (aka “chuck”). Qian’s focus on the chuck relates to another critical distinction between the subject matter of the ‘221 patent and the subject matter of Qian, and Lieberman.

11. The capacitive currents referenced in Lieberman are not the same thing as the capacitive currents referenced in the ‘221 patent. The “capacitive current” Lieberman refers to is only the magnitude of that portion of capacitive current which flows from the coil to the plasma and returns to the coil. In Lieberman, this is the entire capacitive current emanating (or returning) to the coil, because Lieberman’s coil has been isolated. This is not the subject of Claim 1, and

Lieberman does not teach a phase and anti-phase portion of capacitive currents in the manner claimed.

12. In this regard, the main point is that claim 1 concerns selectively balancing the vector sum of phase and anti-phase currents flowing from the coil as a whole to the plasma—to obtain a selected difference current, if any, flowing through the plasma to grounded chamber bodies, the wafer chuck, etc. The magnitude of current flowing from and returning to an isolated coil from the plasma and the vector sum of differently phased currents flowing to chamber bodies are quite different things. The magnitude current taught by Lieberman is not susceptible to selective balancing. And the voltage of an isolated coil relative to ground is uncontrolled, as explained by Qian (“the electrical potential of the coil antenna 50 is floating with respect to the wafer pedestal 20”, e.g. it has no value without making a connection (in which case it would no longer be isolated or floating). Lieberman merely suggests lowering the magnitude of a current that flows in a closed path within the plasma source by itself (e.g., coil to plasma and return). However, the meaning of “lowering” is never defined (lowering relative to what?). One can only guess that Lieberman may be thinking of comparison to a coil that is grounded at one end, rather than being isolated, and having an equal magnitude of voltage applied to it. But this would be a misguided comparison, and in any case it is not the teaching of the ‘221 patent. The comparison is

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