EXHIBIT D.12
U.S. Patent No. 6,853,142

References cited herein:

- U.S. Pat. No. 6,853,142 ("'142 Patent")
- U.S. Pat. No. 6,413,382 ("Wang")
- U.S. Pat. No. 6,190,512 ("Lantsman")
- D.V. Mozgrin, High-Current Low-Pressure Quasi-Stationary Discharge in a Magnetic Field: Experimental Research, Thesis at Moscow Engineering Physics Institute, 1994 ("Mozgrin Thesis")

'142 Claim 16	Wang in view of Lantsman, and Mozgrin Thesis
[10pre.] A method for generating a strongly-ionized plasma in a chamber, the method comprising:	The combination of Wang and Lantsman discloses an apparatus for generating a strongly-ionized plasma in a chamber. Wang at 7:19-25 ("Preferably, the peak power P_P is at least 10 times the background power P_B, more preferably at least 100 times, and most preferably 1000 times to achieve the greatest effect of the invention. A background power P_B of 1kW will typically be sufficient to support a plasma with the torpedo magnetron and a 200 mm wafer although with little if any actual sputter deposition.") Wang at 7:31-39 ("In one mode of operating the reactor, during the background period, little or no target sputtering is expected. The SIP reactor is advantageous for a low-power, low-pressure background period since the small rotating SIP magnetron can maintain a plasma at lower power and lower pressure than can a larger stationary magnetron. However, it is possible to combine highly ionized sputtering during the pulses with significant neutral sputtering during the background period.") Wang at 7:28-30 (" the application of the high peak power P_P instead quickly causes the already existing plasma to spread and increases the density of the plasma")
[10a.] ionizing a feed gas to form a weakly-ionized plasma that reduces the probability of developing an electrical breakdown condition in the chamber;	The combination of Wang and Lantsman discloses an ionization source that generates a weakly-ionized plasma from a feed gas, the weakly-ionized plasma reducing the probability of developing an electrical breakdown condition in the chamber. Wang at Fig. 7

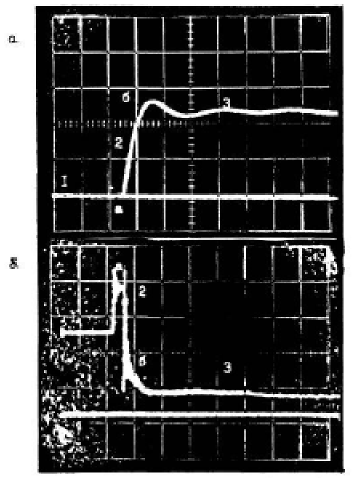
EXHIBIT D.12
U.S. Patent No. 6,853,142

'142 Claim 16	Wang in view of Lantsman, and Mozgrin Thesis
	Wang at 4:5-6 ("A sputter working gas such as argon is supplied from a gas source 32….") Wang at 4:20-21 ("… a reactive gas, for example nitrogen is supplied to the processing space 22….") Wang at 7:17-31 ("The background power level P_B is chosen to exceed the minimum power necessary to support a plasma... [T]he application of the high peak power P_P quickly causes the already existing plasma to spread and increases the density of the plasma.") Wang at 7:19-25 ("Preferably, the peak power P_P is at least 10 times the background power P_B … and most preferably 1000 times to achieve the greatest effect of the invention. A background power P_B of 1 kW [causes] little if any actual sputter deposition." Wang at 4:23-31 (Ex. 1005) ("…thus creating a region 42 of a high-density plasma (HDP)…") Wang at 7:3-49 ("Plasma ignition, particularly in plasma sputter reactors, has a tendency to generate particles during the initial arcing, which may dislodge large particles from the target or chamber… The initial plasma ignition needs be performed only once and at much lower power levels so that particulates produced by arcing are much reduced.") Wang at 7:25-28 ("As a result, once the plasma has been ignited at the beginning of sputtering prior to the illustrated waveform, no more plasma ignition occurs."). Wang at 7:58-61 ("… DC power supply 100 is connected to the target 14 … and supplies an essentially constant negative voltage to the target 14 corresponding to the background power P_B.") Wang at 7:22-23 ("A background power P_B of 1 kW will typically be sufficient to support a plasma…")
[10b.] supplying power to the weakly-ionized plasma by applying an electrical pulse across the weakly-ionized	The combination of Wang and Lantsman discloses a power supply that supplies power to the weakly-ionized plasma though an electrical pulse applied across the weakly-ionized plasma, the electrical pulse having a magnitude

EXHIBIT D.12
U.S. Patent No. 6,853,142

'142 Claim 16	Wang in view of Lantsman, and Mozgrin Thesis
plasma, the electrical pulse having a magnitude and a rise-time that is sufficient to increase the density of the weakly-ionized plasma to generate a strongly-ionized plasma; and	and a rise-time that is sufficient to increase the density of the weakly-ionized plasma to generate a strongly-ionized plasma. Wang at Fig. 7 Wang at 7:61-62 ("The pulsed DC power supply 80 produces a train of negative voltage pulses.") Wang at 7:19-25 ("Preferably, the peak power level P_P is at least 10 times the background power level P_B, … most preferably 1000 times to achieve the greatest effects of the invention. A background power P_B of 1 kW will typically be sufficient…") Wang at 7:28-30 ("… the application of the high peak power P_P instead quickly causes the already existing plasma to spread and increases the density of the plasma."). Wang at 7:36-39 ("However, it is possible to combine highly ionized sputtering during the pulses with significant neutral sputtering during the background period.") Wang at 5:23-27 ("[The pulse's] exact shape depends on the design of the pulsed DC power supply 80, and significant rise times and fall times are expected.") *See* evidence cited in limitation [10pre] of claim 10.
[10c.] diffusing the strongly-ionized plasma with additional feed gas thereby allowing the strongly-ionized plasma to absorb additional energy from the power supply.	The combination of Wang and Lantsman discloses a gas line that supplies feed gas to the strongly-ionized plasma, the feed gas diffusing the strongly-ionized plasma, thereby allowing additional power from the pulsed power supply to be absorbed by the strongly-ionized plasma. Wang at Fig. 1 Wang at 4:5-6 ("A sputter working gas such as argon is supplied from a gas source 32 through a mass flow controller 34 to a region in back of the grounded shield 24.") Wang at 4:8-10 ("The gas flows into the processing region 22 through a gap formed between the pedestal 18, the

'142 Claim 16	**Wang in view of Lantsman, and Mozgrin Thesis**
	grounded shield 24, and a clamp ring or plasma focus ring 36 surrounding the periphery of the wafer 20.") Wang at 4:51-55 ("A computerized controller 58 controls the … mass flow controller 34, as illustrated….") Lantsman at 2:48-51 ("This secondary power supply 'pre-ignites' the plasma so that when the primary power supply is applied, the system smoothly transitions to final plasma development and deposition.") One of ordinary skill would have been motivated to combine Wang and Lantsman. Lantsman is directed to sputtering using a plasma. So is Wang. *See* Wang at Title ("Pulsed sputtering with a small rotating magnetron"); 3:20-21 ("[A] high plasma density is achieved adjacent to the magnetron during the pulse."). Also, Lantsman uses two power supplies, one for pre-ionization and one for deposition. So does Wang. See Wang at Fig. 7 [*showing pulsed supply 80 and constant supply 100*] Lantsman generates a plasma without arcing. So does Wang. Wang at 7:3-49 ("Plasma ignition, particularly in plasma sputter reactors, has a tendency to generate particles during the initial arcing, …. The initial plasma ignition needs be performed only once and at much lower power levels so that particulates produced by arcing are much reduced.") Summarizing, Wang and Lantsman relate to the same application. Further, one of ordinary skill would have been motivated to use Lantsman's continuous gas flow in Wang so as to maintain a desired pressure in the chamber. Also, use of Lantsman's continuous gas flow in Wang would have worked well with Wang's mass flow controller 34 and would have been a combination of old elements in which each element behaved as expected. Finally, such a continuous flow of gas in Wang would diffuse the strongly-ionized plasma and allow additional power to be absorbed by the plasma as required by claim 10.
16. The method of claim 10 wherein the electrical pulse comprises a rise time that is less	The combination of Wang, Lantsman and the Mozgrin Thesis discloses the electrical pulse comprises a rise time that is less than about 100V/µsec.

‘142 Claim 16	Wang in view of Lantsman, and Mozgrin Thesis
than about 100V/µsec.	*See* evidence cited in claim 10. Mozgrin Thesis at Fig. 3.2  Fig. 3.2 Oscillograms of (a) current and (b) voltage of the quasi-stationary discharge. 180 A/div, 50 µs/div; 180 V/div, 50 µs/div. 1 – stationary discharge, 2 – parameters of occurrence of the quasi-stationary voltage (a) and ionization relaxation (b), 3 – diffuse regime. The peak voltage in region 2 is about 720 V (≅ 4 div x 180 V/div) and the voltage in region 1 is about 360 V (≅ 2 div x 180 V/div). This difference is about 360 V. Mozgrin Thesis at 42, ¶ 1 (“…a power supply was selected which produced square current and voltage pulses with a rise time (leading edge of the pulse) of 5 – 60 µs...”) Assuming Mozgrin utilized the fastest rise of the leading edge (i.e., 5 µs) for the pulse shown in Fig 3 of Mozgrin (Fig. 3.2 of Mozgrin Thesis), Mozgrin discloses a rise time of about 72 V/µs (i.e., 360Volts/5µs = 72 V/µs). Even if Mozgrin utilized the slowest rise of the leading edge (i.e., 60 µs, which would exceed a single division on the oscillogram), Mozgrin would have nevertheless achieved a rise time of 1.2 V/µs (i.e., 360 Volts/60µs = 1.2 V/µs). One of ordinary skill have looked from Wang to Mozgrin Thesis to determine operational details, such as plasma density, of Wang’s process. One of ordinary skill would have further looked to the Mozgrin Thesis to determine additional operational details such as the rise time of the

DOCKET ALARM

Explore Litigation Insights

Docket Alarm provides insights to develop a more informed litigation strategy and the peace of mind of knowing you're on top of things.

Real-Time Litigation Alerts

Keep your litigation team up-to-date with **real-time alerts** and advanced team management tools built for the enterprise, all while greatly reducing PACER spend.

Our comprehensive service means we can handle Federal, State, and Administrative courts across the country.

Advanced Docket Research

With over 230 million records, Docket Alarm's cloud-native docket research platform finds what other services can't. Coverage includes Federal, State, plus PTAB, TTAB, ITC and NLRB decisions, all in one place.

Identify arguments that have been successful in the past with full text, pinpoint searching. Link to case law cited within any court document via Fastcase.

Analytics At Your Fingertips

Learn what happened the last time a particular judge, opposing counsel or company faced cases similar to yours.

Advanced out-of-the-box PTAB and TTAB analytics are always at your fingertips.

API

Docket Alarm offers a powerful API (application programming interface) to developers that want to integrate case filings into their apps.

LAW FIRMS

Build custom dashboards for your attorneys and clients with live data direct from the court.

Automate many repetitive legal tasks like conflict checks, document management, and marketing.

FINANCIAL INSTITUTIONS

Litigation and bankruptcy checks for companies and debtors.

E-DISCOVERY AND LEGAL VENDORS

Sync your system to PACER to automate legal marketing.

WHAT WILL YOU BUILD? | **sales@docketalarm.com** | **1-866-77-FASTCASE**