EXHIBIT C.12
U.S. Patent No. 7,811,421

References cited herein:

- U.S. Pat. No. 7,811,421 ("'421 Patent")
- U.S. Pat. No. 6,413,382 ("Wang")
- U.S. Pat. No. 5,958,155 ("Kawamata")

'421 Claims 3-5, 18-20, 36, 40, 41	Wang in view of Kawamata
[1pre]. A sputtering source comprising:	Wang discloses a sputtering source. Wang at Title ("pulsed sputtering with a small rotating magnetron")
[1a] a) a cathode assembly comprising a sputtering target that is positioned adjacent to an anode; and	Wang discloses a cathode assembly comprising a sputtering target that is positioned adjacent to an anode. '421 Patent at 3:39-4:2 ("FIG. 1 illustrates a cross-sectional view of a known magnetron sputtering apparatus 100 having a pulsed power source 102. … The magnetron sputtering apparatus 100 also includes a cathode assembly 114 having a target 116. … An anode 130 is positioned in the vacuum chamber 104 proximate to the cathode assembly 114.") Wang at 3:66-4:1 ("A grounded shield 24 … acts as a grounded anode for the cathode of the negatively biased target 14.")
[1b] b) a power supply that generates a voltage pulse between the anode and the cathode assembly that creates a weakly-ionized plasma and then a strongly-ionized plasma from the weakly-ionized plasma without an occurrence of arcing between the anode and the cathode assembly, an amplitude, a duration and a rise time of the voltage pulse being chosen to increase a density of ions in the strongly-ionized plasma.	Wang discloses a power supply that generates a voltage pulse between the anode and the cathode assembly that creates a weakly-ionized plasma and then a strongly-ionized plasma from the weakly-ionized plasma without an occurrence of arcing between the anode and the cathode assembly, an amplitude, a duration and a rise time of the voltage pulse being chosen to increase a density of ions in the strongly-ionized plasma Wang at Figs. 1, 6 and 7 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

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'421 Claims 3-5, 18-20, 36, 40, 41	Wang in view of Kawamata
	14 corresponding to the background power P_B.") Wang at 7:61-62 ("The pulsed DC power supply 80 produces a train of negative voltage pulses.") Wang at 3:66-4:1 ("A grounded shield 24 … acts as a grounded anode for the cathode of the negatively biased target 14.") 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 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 7:3-6 ("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.") Wang at 7:13-28 ("Accordingly, it is advantageous to use a target power waveform illustrated in FIG. 6… As a result, once the plasma has been ignited

'421 Claims 3-5, 18-20, 36, 40, 41	Wang in view of Kawamata
	at the beginning of sputtering prior to the illustrated waveform…") Wang at 7:47-49 ("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 7:28-30 ("…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 5:23-26 ("The illustrated pulse form is idealized. Its exact shape depends on the design of the pulsed DC power supply 80, and significant rise times and fall times are expected.")
3. The sputtering source of claim 1 wherein the increase of the density of ions in the strongly-ionized plasma is enough to generate sufficient thermal energy in a surface of the sputtering target to cause a sputtering yield to be related to a temperature of the sputtering target.	The combination of Wang and Kawamata discloses the increase of the density of ions in the strongly-ionized plasma is enough to generate sufficient thermal energy in a surface of the sputtering target to cause a sputtering yield to be related to a temperature of the sputtering target. *See* evidence cited in claim 1 '421 Patent at 2:9-10 ("In general, the deposition rate is proportional to the sputtering yield.") Kawamata at 3:18-20 ("[G]enerat[ing] plasma over the film source material to thereby cause the surface of the film source material to have its temperature raised by the plasma.") Kawamata at 7:53 ("When the input power is 400 W or higher, it is seen that the surface temperature of granules 3 rises to about 650ºC or higher… When the input power is 800 W, the surface temperature of the granules 3 rises to about 1100 ºC.") Kawamata at 7:51-53 ("FIG. 2 shows what changes of the surface temperature of granules 3 and the rate of film formation on the substrate 2

'421 Claims 3-5, 18-20, 36, 40, 41	Wang in view of Kawamata
	are brought about by changes of the input power") Kawamata at Fig. 2 One of ordinary skill would have been motivated to incorporate the teachings of Kawamata in Wang, e.g., using input power to control the density of the plasma and thereby control the temperature of the sputtering material so as to control the sputtering yield. Also, one of ordinary skill reading Wang would have looked to Kawamata. Wang teaches increasing the sputtering rate by generating a high-density plasma. Wang at 4:27-29. ("[C]reating a region 42 of a high-density plasma (HDP), which … increases the sputtering rate.") Kawamata similarly notes that "[o]bjects of the present invention are to provide a process for producing a thin film…by sputtering at a high speed and a thin film produced thereby…" Kawamata at 2:6-9 (emphasis added). Both Wang and Kawamata provide ways to enhance the sputtering rate and one of ordinary skill in the art would have been motivated to combine the teachings of Wang with Kawamata. Also, using Kawamata's teachings of temperature control in Wang would have been a combination of old elements in which each element behaved as expected.
4. The sputtering source of claim 3 wherein the sputtering yield is related to a temperature of a surface of the sputtering target.	The combination of Wang and Kawamata discloses the sputtering yield is related to a temperature of a surface of the sputtering target. *See* evidence cited in claim 1 *See* evidence cited in claim 3 Kawamata at Fig. 2
5. The sputtering source of claim 3 wherein the thermal energy generated in the sputtering target does not substantially increase an average	The combination of Wang and Kawamata discloses the thermal energy generated in the sputtering target does not substantially increase an

'421 Claims 3-5, 18-20, 36, 40, 41	**Wang in view of Kawamata**
temperature of the sputtering target.	average temperature of the sputtering target. *See* evidence cited in claim 1 *See* evidence cited in claim 3 '421 Patent at 20:52-56 ("When the temperature of the target 220 reaches a certain level, the target material is evaporated in an avalanche-like manner. In one embodiment, the high-power pulse generates thermal energy 516 into only a shallow depth of the target 220 so as to not substantially increase an average temperature of the target 220.") '421 Patent at 9:57-61 ("the thermal energy in at least one of the cathode assembly… is conducted away or dissipated by liquid or gas cooling…") Kawamata at 7:36-40 ("The [sputtering target was] heated by the plasma with their temperature maintained by a balance between plasma heating and cooling by cooling water 8 flowing on the lower face of the magnetron cathode 5….") Kawamata at Fig. 1
[17pre]. A sputtering source comprising:	Wang discloses a sputtering source. *See* evidence cited in claim 1 preamble
[17a] a) a cathode assembly comprising a sputtering target that is positioned adjacent to an anode;	Wang discloses a cathode assembly comprising a sputtering target that is positioned adjacent to an anode. *See* evidence cited in claim [1a]
[17b] b) a power supply that generates a voltage pulse between the anode and the cathode assembly that creates a weakly-ionized plasma and then a strongly-ionized plasma from the weakly-ionized plasma without an occurrence of arcing between the anode and the cathode assembly, an amplitude and a rise time of the voltage pulse being chosen to	Wang discloses a power supply that generates a voltage pulse between the anode and the cathode assembly that creates a weakly-ionized plasma and then a strongly-ionized plasma from the weakly-ionized plasma without an occurrence of arcing between the anode and the cathode assembly, an amplitude and a rise time of the voltage pulse being chosen to increase a density of ions in the

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