

EXHIBIT A.02
U.S. Patent No. 7,147,759

Ex. A.02.PDFReferences cited herein:

- U.S. Patent No. 7,147,759 (“759 Patent”)
- 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, 1995 (“Mozgrin”)
- 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”)
- Li et al, Low-temperature magnetron sputter-deposition, hardness, and electrical resistivity of amorphous and crystalline alumina thin films, J. Vac. Sci. Technol. A 18(5), 2000 (“Li”)
- U.S. Pat. No. 6,413,382 (“Wang”)

Claims 10-12, 34-36	Mozgrin in view of Kudryavtsev and Li
<p>[1pre.] A magnetically enhanced sputtering source comprising:</p>	<p>The combination of Mozgrin with Kudryavtsev discloses a magnetically enhanced sputtering source.</p> <p>Mozgrin 403, right col, ¶4 (“Regime 2 was characterized by intense cathode <i>sputtering</i>...”) (emphasis added).</p> <p>Mozgrin at Fig. 1</p> <p>Figure 1 consists of two diagrams, (a) and (b), illustrating a magnetically enhanced sputtering source. Diagram (a) shows a cross-section with a horizontal cathode (2) and an anode (3) below it. The cathode has a central region with a magnetic field (B) and an electric field (E) pointing downwards. The anode has a central region with a magnetic field (B) and an electric field (E) pointing upwards. Diagram (b) shows a cross-section with a central cathode (2) and two side anodes (3). The cathode has a magnetic field (B) and an electric field (E) pointing downwards. The side anodes have magnetic fields (B) and electric fields (E) pointing outwards.</p>

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<p style="text-align: center;">Claims 10-12, 34-36</p>	<p style="text-align: center;">Mozgrin in view of Kudryavtsev and Li</p>
	<p>Fig. 1. Discharge device configurations: (a) planar magnetron; (b) shaped-electrode configuration. (1) Cathode; (2) anode; (3) magnetic system.</p>
<p>[1a.] an anode;</p>	<p>The combination of Mozgrin with Kudryavtsev discloses an anode. ‘759 Patent at Fig. 1</p> <p style="text-align: center;">PRIOR ART FIG. 1</p> <p>‘759 Patent at Fig. 1 (“FIG. 1 illustrates a cross-sectional view of a known magnetron sputtering apparatus having a pulsed power source.”) ‘759 Patent at 3:40-41 (“an anode 130 is positioned in the vacuum chamber 104 proximate to the cathode assembly.”) Mozgrin at Fig. 1</p>

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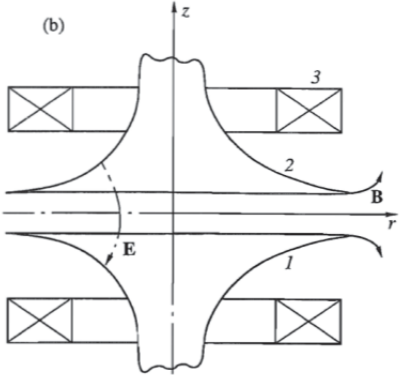
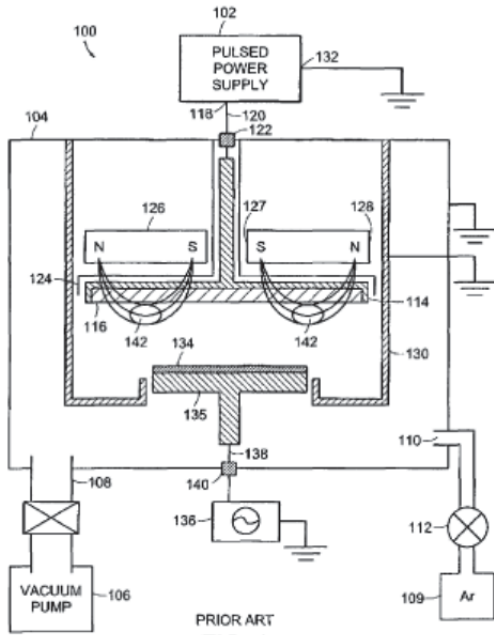
<p style="text-align: center;">Claims 10-12, 34-36</p>	<p style="text-align: center;">Mozgrin in view of Kudryavtsev and Li</p>
	<div style="text-align: center;">  <p>(b)</p> </div> <p>Fig. 1. Discharge device configurations: (a) planar magnetron; (b) shaped-electrode configuration. (1) Cathode; (2) anode; (3) magnetic system.</p>
<p>[1b.] a cathode assembly that is positioned adjacent to the anode, the cathode assembly including a sputtering target;</p>	<p>The combination of Mozgrin with Kudryavtsev discloses a cathode assembly that is positioned adjacent to the anode, the cathode assembly including a sputtering target.</p> <p>‘759 Patent at Fig. 1</p> <div style="text-align: center;">  <p>PRIOR ART FIG. 1</p> </div> <p>‘759 Patent at 3:10-12 (“FIG. 1 illustrates a cross-sectional view of a known magnetron sputtering apparatus having a pulsed power source.”)</p> <p>‘759 Patent at 3:23-24 (“magnetron sputtering apparatus 100 also includes a cathode assembly 114 having a target material 116.”)</p>

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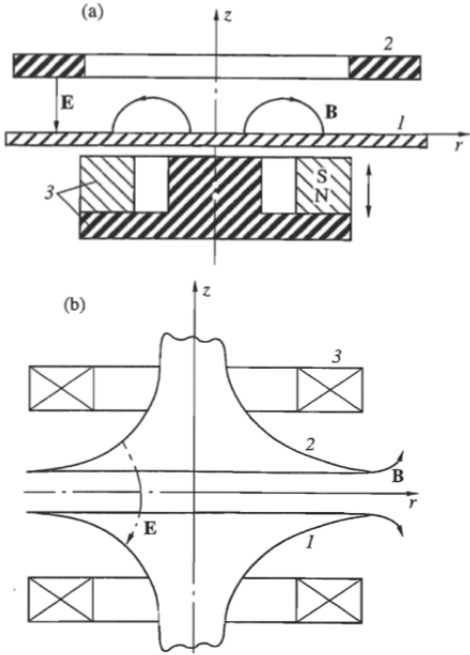
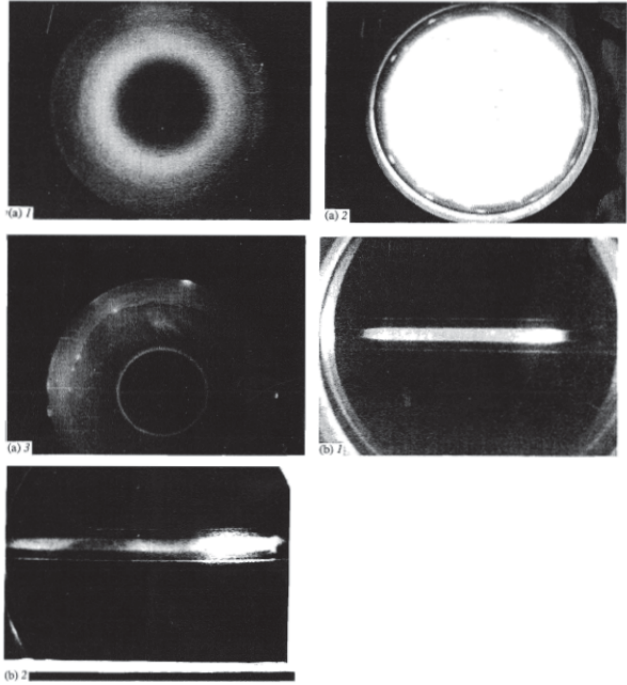
<p style="text-align: center;">Claims 10-12, 34-36</p>	<p style="text-align: center;">Mozgrin in view of Kudryavtsev and Li</p>
	<p>Mozgrin at 403, right col, ¶ 4 (“Regime 2 was characterized by intense cathode sputtering...”).</p> <p>Mozgrin at 403, right col, ¶ 4 (“...The pulsed deposition rate of the cathode material...”).</p> <p>Mozgrin at Fig. 1</p>  <p>Fig. 1. Discharge device configurations: (a) planar magnetron; (b) shaped-electrode configuration. (1) Cathode; (2) anode; (3) magnetic system.</p>
<p>[1c.] an ionization source that generates a weakly-ionized plasma proximate to the anode and the cathode assembly;</p>	<p>The combination of Mozgrin with Kudryavtsev discloses an ionization source that generates a weakly-ionized plasma proximate to the anode and the cathode assembly.</p> <p>‘759 Patent at 6:30-32 (“The weakly-ionized plasma is also referred to as a pre-ionized plasma.”)</p> <p>‘759 Patent at claim 32 (“wherein the peak plasma density of the weakly-ionized plasma is less than about 10^{12} cm⁻³”).</p> <p>Mozgrin at 401, right col, ¶2 (“For pre-ionization, we used a stationary magnetron discharge; the discharge current ranged up to 300 mA.... We found out that only the regimes with magnetic field strength not lower than 400 G provided the initial plasma density in the $10^9 - 10^{11}$ cm⁻³ range.”). (emphasis added).</p>

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Claims 10-12, 34-36	Mozgrin in view of Kudryavtsev and Li
	<p>Mozgrin at 401, left col, ¶ 1 (“The [plasma] discharge had an annular shape and was adjacent to the cathode.”). (emphasis added)</p> <p>Mozgrin at 402, right col, ¶2 (“Figure 3 shows typical voltage and current oscillograms.... Part I in the voltage oscillogram represents the voltage of the stationary discharge (pre-ionization stage).”).</p> <p>Mozgrin at Fig. 6</p>  <p>Fig. 6. High-current quasi-stationary discharge regimes. (a) planar magnetron: (1) high-current magnetron regime ($p = 10^{-1}$ torr, Ar, $I_d = 70$ A, $U_d = 900$ V); (2) high-current diffuse regime ($p = 10^{-1}$ torr, Ar, $I_d = 700$ A, $U_d = 80$ V); (3) arc regime ($p = 10^{-1}$ torr, Ar, $I_d = 1000$ A, $U_d = 45$ V). (b) Shaped-electrode system: (1) high-current diffuse regime ($p = 10^{-1}$ torr, Ar, $I_d = 1000$ A, $U_d = 45$ V); (2) contracted arc regime ($p = 10^{-1}$ torr, Ar, $I_d = 1500$ A, $U_d = 50$ V).</p>
<p>[1d.] a magnet that is positioned to generate a magnetic field proximate to the weakly-ionized plasma, the magnetic field substantially trapping electrons in the weakly-ionized plasma proximate to</p>	<p>The combination of Mozgrin with Kudryavtsev discloses a magnet that is positioned to generate a magnetic field proximate to the weakly-ionized plasma, the magnetic field substantially trapping electrons in the weakly-ionized plasma proximate to the sputtering target.</p> <p>‘759 Patent at 3:10-12 (“FIG. 1 shows a cross-sectional view of a known magnetron sputtering apparatus 100...” that has a magnet 126.”)</p> <p>‘759 Patent at 4:4-10 [<i>describing the prior art Fig. 1</i>] (“The electrons, which cause ionization, are generally confined by the magnetic fields produced by the magnet 126. The magnetic confinement is strongest in a confinement region 142....”)</p>

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