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Petitioners v. ZOND, LLC Patent Owner

U.S. Patent No. 7,811,421

Cases IPR2014-00800; IPR2014-00802; IPR2014-00805

Patent Owner's Demonstrative Exhibits



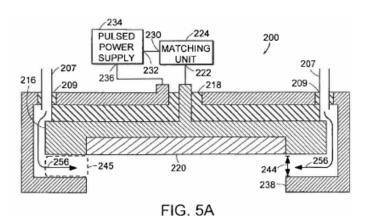
Low Power Pulse to Create A Weakly Ion

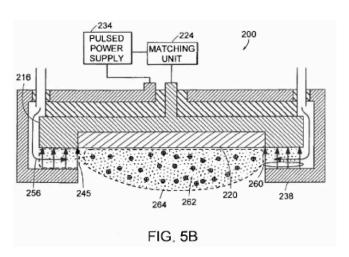
"In operation, the pulsed power supply 102 **voltage pulse** between the cathode assemble the anode 130 that has a **sufficient amplitu the argon feed gas** in the vacuum chamber '421 patent, col. 4, lines 13 - 16.

"In one embodiment, the pulsed power sup a **low power pulse** ... in order **to generate tionized plasma**." Ex. 1001, '421 patent, col. 8, lin also col. 11, lines 21 – 22.

"The characteristics of the voltage pulse are such that an electric field 260 develops between the cathode assembly 216 and the anode 238 the weakly-ionized plasma 262 in the region 24 the anode 238 and the cathode assembly 25 421 patent, col. 11, lines 9 - 25.

"In one embodiment, the pulsed power sup generates the weakly-ionized plasma 262 b a low power pulse having an initial voltage range of 100V to 5 kV with a discharge curre







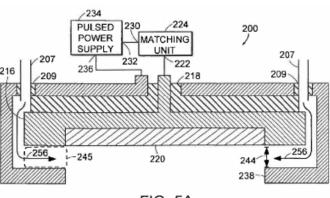
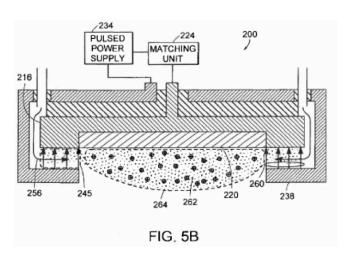


FIG. 5A



Weakly Plasma's Density Has Sufficient Co Suppress Arc When High Power Ap

"Forming a weakly-ionized or pre-ionized pl substantially eliminates the probability of a breakdown condition in the chamber 202 power pulses are applied between the cath assembly 216 and the anode 238. ...

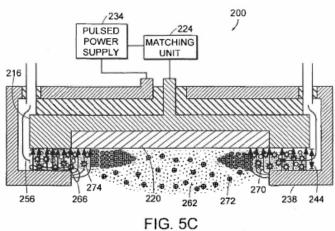
The probability of establishing a breakdown substantially eliminated because the weakly plasma has a low-level of ionization that proelectrical conductivity through the plasma. conductivity greatly reduces or prevents the of a breakdown condition when high power to the plasma." Ex. 1001, '421 patent, Col. 9, line also, col. 15, lines 67 – col. 16, line 3.



High Pulse Power For Transition to Strongly-Ionized Plasma

"Once the weakly-ionized plasma is formed power pulses are then generated between assembly 216 and the anode 238. In one enthe pulsed power supply 234 generates the pulses. The desired power level of the high-depends on several factors including the dedeposition rate, the density of the pre-ionizand the volume of the plasma, for example Ex. 1001, '421 patent, col. 9, lines 29 – 36.

"In one embodiment, the pulsed power sup generates the weakly-ionized plasma 262 I a low power pulse The pulsed power su generates high-power pulses between the assembly 216 and the anode 238 (FIG. 5C) a weakly-ionized plasma 262 is formed." Ex. patent. col. 11. lines 21 – 62.



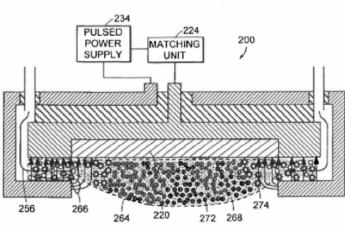


FIG. 5D



Choose Voltage Amplitude, Rise Time and Duration

"The particular **size**, **shape**, **width**, **and frequency of the high-power pulses** depend on various factors The **shape and duration of the leading edge** 356 and the trailing edge 358 of the power pulse 354 is **chosen** so as to sustain the weakly-ionized plasma 262 while controlling the of ionization of the strongly-ionized plasma 268." Ex. 1001, '421 patent, col. 16, lines 61 - 64.

"The **amplitude and shape of the voltage pulse** are such that a weakly-ionized plasma is general in the region 246 between the anode 238 and the cathode assembly 216." Ex. 1001, '421 paten lines 19 - 22.

"Each of the high-power pulses are maintained for a predetermined time .." Ex. 1001, '421 μ col. 9, lines 45 – 46.

"The **level and duration of the high power electrical pulse is limited** by the level and duratio power that the strongly-ionized plasma 268 can absorb before the high power discharge contand terminates." *Ex. 1001, '421 patent, col. 14, lines 26 - 29.*



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