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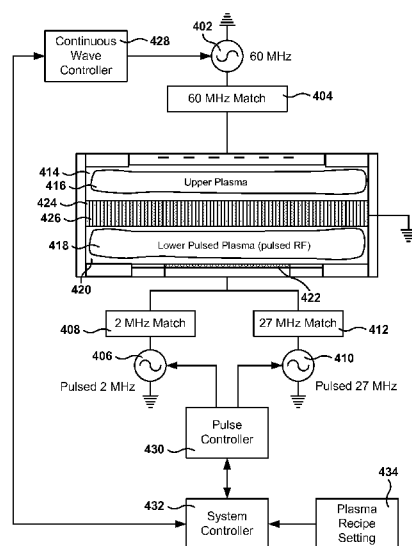
(54) **Title:** PULSED PLASMA CHAMBER IN DUAL CHAMBER CONFIGURATION

Fig. 4

(57) **Abstract:** Systems, methods, and computer programs for processing a semiconductor substrate in a pulsed plasma chamber in a dual chamber configuration are provided. A wafer processing apparatus with a top chamber and a bottom chamber separated by a plate that fluidly connects the top chamber to the bottom chamber includes a continuous wave (CW) controller, a pulse controller, and a system controller. The CW controller is operable to set the voltage and the frequency for a first radio frequency (RF) power source coupled to a top electrode in the top chamber. The pulse controller is operable to set voltage, frequency, ON-period duration, and OFF-period duration for a pulsed RF signal generated by a second RF power source coupled to the bottom electrode in the bottom chamber. Further, the system controller is operable to set parameters for the CW controller and the pulse controller to regulate the flow of species from the top chamber to the bottom chamber through the plate during operation of the chamber. The flow of species assists in the negative-ion etching and in neutralizing excessive positive charge on the wafer surface during afterglow in the OFF period, and assists in the re-striking of the plasma in the bottom chamber during the ON period.



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