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(54) **Title:** ATOMIC OXYGEN DETECTION IN SEMICONDUCTOR PROCESSING CHAMBERS

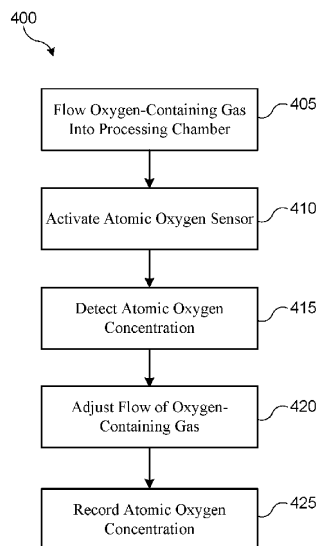


FIG. 4

(57) **Abstract:** Semiconductor processing systems are described to measure levels of atomic oxygen using an atomic oxygen sensor positioned within a substrate processing region of a substrate processing chamber. The processing systems may include a semiconductor chamber that has a chamber body which defines a substrate processing region. The processing chamber may also include a substrate support positioned within the substrate processing region. The atomic oxygen sensor may be positioned proximate to the substrate support in the substrate processing region of the chamber. Also described are semiconductor processing methods that include detecting a concentration of atomic oxygen in the substrate processing region with an atomic oxygen sensor positioned in the semiconductor processing chamber. The atomic oxygen sensor may include at least one electrode comprising a material selectively permeable to atomic oxygen over molecular oxygen, and may further include a solid electrolyte that selectively conducts atomic oxygen ions.

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