

(19) United States

(12) Patent Application Publication (10) Pub. No.: US 2023/0230812 A1 **SAWACHI**

Jul. 20, 2023 (43) **Pub. Date:**

(54) GAS SUPPLY SYSTEM, PLASMA PROCESSING APPARATUS, AND GAS SUPPLY METHOD

(71) Applicant: Tokyo Electron Limited, Tokyo (JP)

Inventor: Atsushi SAWACHI, Miyagi (JP)

(21) Appl. No.: 18/098,313

(22)Filed: Jan. 18, 2023

(30)Foreign Application Priority Data

Jan. 19, 2022 (JP) 2022-006593

Publication Classification

(51) **Int. Cl.** H01J 37/32 (2006.01)

(52) U.S. Cl. CPC .. H01J 37/32449 (2013.01); H01J 37/32623 (2013.01); H01J 37/32816 (2013.01)

(57)ABSTRACT

A system includes: gas supply flow paths for supplying independently a main gas to a processing chamber; a flow rate control valve disposed in each gas supply flow path; an additive-gas flow path connected to the flow rate control valve; a valve for addition disposed in the additive-gas flow path; and a controller for controlling the flow rate control valve and the valve for addition to execute controls of: calculating flow rates of the main gas and an additive gas to be mixed with the main gas; calculating a total of the flow rates; calculating an internal pressure of each gas supply flow path with the total flow rate, and first and second relationships between previously acquired gas flow rates and gas pressures of the main gas and the additive gas, respectively; calculating an internal pressure ratio; and proportionally controlling openings of flow rate control valves based on the ratio.

