CLAIMS

Claim 1. A plasma processing apparatus comprising:

a plasma processing chamber;

a base disposed in the plasma processing chamber;

an electrostatic chuck disposed over the base and including a substrate support surface and a ring support surface;

a first electrode disposed under the substrate support surface in the electrostatic chuck and for adsorbing a substrate using an electrostatic force;

a second electrode disposed in the electrostatic chuck and surrounding periphery of the first electrode;

a power source electrically connected to the second electrode; and

a controller configured to execute a process including:

a step of acquiring a voltage of a ring assembly disposed on the ring support surface and

a step of controlling an output voltage of the power source according to a value of the acquired voltage.

Claim 2. The plasma processing apparatus according to Claim 1, wherein

in the controlling step, the output voltage of the power source is controlled within a predetermined potential difference from the value of the voltage.

Claim 3. The plasma processing apparatus according to Claim 1, wherein

in the controlling step, the output voltage of the power source is controlled within 1000 V from the value of the acquired voltage.

Claim 4. The plasma processing apparatus according to any one of claims 1 to 3, wherein

the first electrode and the second electrode are disposed in the substrate support surface and have a ring-shape.

Claim 5. The plasma processing apparatus according to any one of claims 1 to 3, wherein

a plurality of the second electrodes are provided in the electrostatic chuck and each of the second electrodes is disposed at different positions in a thickness direction of the electrostatic chuck.

Claim 6. The plasma processing apparatus according to Claim 5, wherein

each of the second electrodes is disposed parallel to the substrate support surface.

Claim 7. The plasma processing apparatus according to Claim 5 or 6, wherein

the second electrodes are disposed at a position closer to the substrate support surface than the first electrode and at a position farther from the substrate support surface than the first electrode, respectively, in the thickness direction of the electrostatic chuck.

Claim 8. The plasma processing apparatus according to any one of claims 1 to 3, wherein

the second electrode is disposed in a direction intersecting an extending direction of the first electrode.

Claim 9. The plasma processing apparatus according to any one of claims 1 to 8, wherein

the second electrode has a ring shape and surrounds the periphery of the first electrode.

Claim 10. The plasma processing apparatus according to any one of claims 1 to 8, wherein

the second electrode is divided in a peripheral direction of the first electrode.

Claim 11. The plasma processing apparatus according to any one of claims 1 to 10, wherein

the ring support surface is lower than the substrate support surface.

Claim 12. The plasma processing apparatus according to any one of claims 1 to 11, wherein

the power source is electrically connected to the second electrode through a wire where a variable resistor is provided.

13. An adsorption control method for a plasma processing apparatus including

a plasma processing chamber,

a base disposed in the plasma processing chamber,

an electrostatic chuck disposed over the base and including a substrate support surface and a ring support surface,

a first electrode disposed under the substrate support surface in the electrostatic chuck,

a second electrode disposed in the electrostatic chuck to surround periphery of the first electrode, and

a power source electrically connected to the second electrode, the adsorption control method comprising:

a step of acquiring a voltage of a ring assembly

disposed on the ring support surface; and

a step of controlling an output voltage of the power source according to a value of the acquired voltage.