CLAIMS

~~[Claim 1]~~

1. A power supply apparatus for supplying electric power to an electrostatic chuck which holds by attraction a to-be-processed substrate in a vacuum chamber, the power supply apparatus comprising:

~~——~~a DC power source unit for applying DC voltage to an electrode disposed in the electrostatic chuck;

~~——~~an AC power source unit for causing AC current to flow through an electrostatic capacitance of the electrostatic chuck;

~~——~~provided that a circuit for charging an electrode, from the DC power source unit, with chuck voltage to attract and hold in position the to-be-processed substrate be defined as a first circuit and that a circuit for charge clearing the to-be-processed substrate be defined as a second circuit,

~~——~~a switching means for switching between the first circuit and the second circuit,

~~——~~ the second circuit being provided with the AC power source unit and a measuring device for measuring the AC current or the DC voltage~~.~~

~~[Claim~~ wherein a secondary side of a transformer of the AC power source unit is interposed in the second circuit.

2~~] The~~. A power supply apparatus for supplying electric power to an electrostatic chuck which holds by attraction a to-be-processed substrate in a vacuum chamber, the power supply apparatus comprising:

a DC power source unit for applying DC voltage to an electrode disposed in the electrostatic chuck;

an AC power source unit for causing AC current to flow through an electrostatic capacitance of the electrostatic chuck;

provided that a circuit for charging an electrode, from the DC power source unit, with ~~electric power according to claim 1,~~ chuck voltage to attract and hold in position the to-be-processed substrate be defined as a first circuit and that a circuit for charge clearing the to-be-processed substrate be defined as a second circuit,

~~——~~a switching means for switching between the first circuit and the second circuit, and

the second circuit being provided with the AC power source unit and a measuring device for measuring the AC current or the DC voltage,

wherein the electrode is constituted by a pair of electrodes, the positive and negative outputs of the DC power source unit are respectively connected to each of the electrodes through the switching means, and the second circuits have disposed in series two of the AC power source units,

wherein resistors are disposed in series between both the AC power source units and a voltmeter as the measuring device is connected in parallel with the resistors.

~~[Claim 3]~~

3. A substrate control method for controlling attraction and releasing of a substrate to and from the electrostatic chuck by using ~~the power supply apparatus for the electrostatic chuck according to claim 1 or claim 2, the method comprising:~~a power supply apparatus for supplying electric power to an electrostatic chuck which holds by attraction a to-be-processed substrate in a vacuum chamber, the power supply apparatus having

a DC power source unit for applying DC voltage to an electrode disposed in the electrostatic chuck,

an AC power source unit for causing AC current to flow through an electrostatic capacitance of the electrostatic chuck,

provided that a circuit for charging an electrode, from the DC power source unit, with chuck voltage to attract and hold in position the to-be-processed substrate be defined as a first circuit and that a circuit for charge clearing the to-be-processed substrate be defined as a second circuit,

a switching means for switching between the first circuit and the second circuit, and

the second circuit being provided with the AC power source unit and a measuring device for measuring the AC current or the DC voltage, the method comprising:

the step of: placing in position a to-be-processed substrate on the surface of the electrostatic chuck in a state in which switching has been made by the switching means to the second circuit; causing AC current by the AC power source unit to flow through the electrostatic capacitance, measuring by the measuring device AC current or AC voltage at this time; and, when the

measured value is within a predetermined range, allowing DC voltage to be applied to the electrode;

——the step of: switching by the switching means to the first circuit to apply chuck voltage from the DC power source unit to the electrode, thereby holding by attraction the to-be-processed substrate that is placed on the surface of the electrostatic chuck; after attraction, causing AC current to flow, by the AC power source unit, through the electrostatic capacitance of the electrostatic chuck; measuring by the measuring device AC current or AC voltage at this time to judge whether the measured value is within a predetermined range; and

——the step of: switching by the switching means to the second circuit for charge clearing the to-be-processed substrate and causing AC current to flow, by the AC power source unit, through the electrostatic capacitance of the electrostatic chuck; measuring by the measuring device AC current or AC voltage at this time; and, when this measured value is within a predetermined range, allowing the releasing of the to-be-processed substrate from the electrostatic chuck.

4. The power supply apparatus according to claim 1, the AC power configured to measure a state of the to-be-processed substrate before processing, and configured to judge acceptability of the to-be-processed substrate.