

What is claimed is:

1. A substrate washing device for washing a substrate comprising:
an arm;

a two-fluid jet nozzle configured to generate a jet flow in which liquid is mixed with gas and to supply the jet flow to a first surface of the substrate, which is supported on a leading end of the arm and moved toward an outer circumference of the first surface of the substrate from the center of the first surface of the substrate by a rotation of the arm;

an on-arm washing liquid supply nozzle which is provided in the arm to supply a washing liquid, which has conductivity, to the first surface of the substrate in a vicinity of the two-fluid jet nozzle;

a single tube nozzle configured to supply a rinse liquid to the center of the first surface of the substrate; and

a control unit configured to control the substrate washing device so that the rinse liquid from the single tube nozzle is supplied in front of the center of the first surface of the substrate to form a liquid flow toward the center of the first surface of the substrate at the same time that the jet flow from the two-fluid jet nozzle and the washing liquid, which has conductivity, are simultaneously discharged while the arm rotates,

wherein the on-arm washing liquid supply nozzle is provided at a position (a) which is proximate the two dimensional center of the first surface with respect to the two-fluid jet nozzle and on an upstream side in a rotational direction of a first portion of the first surface of the substrate when a jet flow is discharged from the two-fluid jet nozzle onto the substrate while the arm rotates from the center to the outer circumference of the substrate and (b) at which the washing liquid, which has conductivity, can be supplied to a vicinity of a washing location at which the jet flow discharged from the two-fluid jet nozzle collides with the first surface of the substrate.

2. A substrate washing device for washing a substrate comprising:
an arm;

a two-fluid jet nozzle configured to generate a jet flow in which liquid is mixed with gas and to supply the jet flow to a first surface of the substrate, which is supported on a leading end of the arm and moved toward an outer circumference of the substrate from the center of the first surface of the substrate by a rotation of the arm;

an on-arm spray nozzle which is provided in the arm to supply a chemical liquid, which has conductivity, to the first surface of the substrate in a vicinity of the two-fluid jet nozzle;

a single tube nozzle configured to supply a rinse liquid to the center of the first surface of the substrate; and

a control unit configured to control the substrate washing device so that the rinse liquid from the single tube nozzle is supplied in front of the center of the first surface of the substrate to form a liquid flow toward the center of the first surface of the substrate at the same time that the jet flow from the two-fluid jet nozzle and the chemical liquid, which has conductivity, are simultaneously discharged while the arm rotates,

wherein the on-arm spray nozzle is provided at a position (a) which is proximate the two dimensional center of the first surface with respect to the two-fluid jet nozzle and on an upstream side in a rotational direction of a first portion of the first surface of the substrate when a jet flow is discharged from the two-fluid jet nozzle onto the substrate while the arm rotates from the center to the outer circumference of the substrate and (b) the on-arm spray nozzle is provided so as to be inclined with respect to the vertical direction in a direction toward a washing location by the two-fluid jet nozzle, at which the jet flow discharged from the two-fluid jet nozzle collides with the first surface of the substrate.

3. The substrate washing device according to claim 1, wherein the substrate to be washed by the washing device is a polished substrate by a polishing unit.

4. The substrate washing device according to claim 1, wherein the control unit is disposed inside a housing of a substrate processing apparatus which also houses the substrate washing device.