

CLAIMS

[Claim 1] A substrate cleaning method comprising:

rotating the substrate about its central axis;

delivering a two-fluid jet from a two-fluid jet nozzle to a surface of the substrate

5 while moving the two-fluid jet nozzle in a radial direction of the substrate, the two-fluid jet being composed of a mixture of a first liquid and a gas; and

when the two-fluid jet is being delivered to the surface of the substrate, delivering a fan-shaped jet of a second liquid from a spray nozzle to the surface of the substrate to form a flow of the second liquid on the surface of the substrate, the fan-

10 shaped jet being located away from the two-fluid jet.

[Claim 2] The substrate cleaning method according to claim 1, wherein an angle of the spray nozzle with respect to the surface of the substrate is in a range of 15° to 45°.

15 [Claim 3] The substrate cleaning method according to claim 1 or 2, wherein a width of the fan-shaped jet is at least three-quarters of a radius of the substrate.

[Claim 4] The substrate cleaning method according to any one of claims 1 to 3, wherein a direction of the fan-shaped jet is oriented toward an outside of the substrate.

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[Claim 5] The substrate cleaning method according to any one of claims 1 to 4, wherein the spray nozzle is located above the substrate.

[Claim 6] The substrate cleaning method according to any one of claims 1 to 5, wherein delivering the fan-shaped jet comprises delivering the fan-shaped jet from the spray nozzle to the surface of the substrate to form the flow of the second liquid on the

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surface of the substrate while moving the spray nozzle.

[Claim 7] The substrate cleaning method according to claim 6, wherein the two-fluid jet nozzle and the spray nozzle are fixed to a common arm.

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[Claim 8] A substrate cleaning apparatus comprising:

 a substrate holder configured to hold a substrate and rotate the substrate about a central axis of the substrate;

 a two-fluid jet nozzle configured to form a two-fluid jet composed of a mixture
10 of a first liquid and a gas;

 a fan spray nozzle configured to form a fan-shaped jet of a second liquid; and

 a nozzle moving device configured to translate the two-fluid jet nozzle, the two-fluid jet nozzle and the fan spray nozzle being oriented toward a surface of the substrate, and the fan spray nozzle being oriented in a direction in which the fan-shaped jet does not
15 collide with the two-fluid jet.

[Claim 9] The substrate cleaning apparatus according to claim 8, wherein an angle of the fan spray nozzle with respect to the surface of the substrate is in a range of 15° to 45°.

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[Claim 10] The substrate cleaning apparatus according to claim 8 or 9, wherein the fan spray nozzle is configured to form the fan-shaped jet having a width of at least three-quarters of a radius of the substrate.

25 [Claim 11] The substrate cleaning apparatus according to any one of claims 8 to 10, wherein the nozzle moving device includes an arm holding the two-fluid jet nozzle and the fan spray nozzle.