

CLAIMS

1. A substrate cleaning device comprising:
a substrate rotating mechanism that rotates a substrate; and
a first nozzle and a second nozzle that eject an ultrasonic cleaning solution toward a predetermined surface of the substrate that is rotated, wherein
the first nozzle and the second nozzle are held in one casing, and
wherein the first nozzle and/or the second nozzle ejects an ultrasonic cleaning solution on a bevel of the substrate that is rotated in a tangential direction of the substrate.
2. The substrate cleaning device according to claim 1, wherein an ultrasonic cleaning solution from the first nozzle and an ultrasonic cleaning solution from the second nozzle reach the predetermined surface after being mixed with each other, or
are mixed with each other after reaching the predetermined surface.
3. The substrate cleaning device according to claim 1, wherein the first nozzle and the second nozzle are attached to a tip end of an arm that turns about a turning shaft and eject an ultrasonic cleaning solution on a first surface of the substrate.

4. The substrate cleaning device according to claim 1, wherein

the first nozzle ejects an ultrasonic cleaning solution on a first surface of the substrate that is rotated, and

the second nozzle ejects an ultrasonic cleaning solution on a second surface opposite to the first surface of the substrate that is rotated.

5. The substrate cleaning device according to claim 1, wherein the first nozzle and/or the second nozzle ejects an ultrasonic cleaning solution on an edge portion of the substrate that is rotated.

6. The substrate cleaning device according to claim 5, wherein the first nozzle and/or the second nozzle that ejects an ultrasonic cleaning solution on the edge portion ejects the ultrasonic cleaning solution such that the ultrasonic cleaning solution lands on the edge portion of the substrate that is rotated without hitting a bevel of the substrate and then moves toward a center from the edge portion.

7. The substrate cleaning device according to claim 5, wherein the first nozzle and/or the second nozzle that ejects an ultrasonic cleaning solution on the edge portion ejects the ultrasonic cleaning solution such that the ultrasonic cleaning solution lands on a center side of the edge portion of the substrate that is rotated and then moves toward the

edge portion.

8. The substrate cleaning device according to claim 1, wherein the first nozzle and the second nozzle eject an ultrasonic cleaning solution to an edge portion of the substrate while swinging in a vicinity of the substrate rotating mechanism.

9. A substrate cleaning device comprising:

a substrate rotating mechanism that rotates a substrate;

a first nozzle and a second nozzle that eject an ultrasonic cleaning solution toward a predetermined surface of the substrate that is rotated;

a flow path that is connected to the casing and supplies a cleaning fluid to the first nozzle and the second nozzle;

a transducer that applies ultrasonic waves to the cleaning fluid supplied from the flow path; and

a microbubble supply mechanism that is connected to the flow path and introduces microbubbles into the cleaning fluid, wherein

the first nozzle and the second nozzle are held in one casing.

10. The substrate cleaning device according to claim 9, further comprising a filter that is installed between the microbubble supply mechanism and the first and second nozzles, and configured to remove microbubbles introduced by the microbubble supply mechanism.

11. A substrate cleaning method comprising
ejecting an ultrasonic cleaning solution from a first nozzle and a second nozzle held in one casing toward a predetermined surface of a substrate while rotating the substrate.

12. The substrate cleaning method according to claim 11, wherein

an ultrasonic cleaning solution ejected from the first nozzle and an ultrasonic cleaning solution ejected from the second nozzle are different from each other in at least one of frequency, electric power, flow rate, temperature, and type of fluid of the ultrasonic cleaning solutions.

13. The substrate cleaning device according to

claim 1, wherein the first nozzle and/or the second nozzle that ejects an ultrasonic cleaning solution on the bevel is supported movably within a range inside a first tangential direction and a second tangential direction of the substrate in a horizontal plane of the substrate, and

the ultrasonic cleaning solution is ejected toward the bevel of the substrate in the first tangential direction and the second tangential direction.

14. A system for cleaning a substrate, comprising:

a casing;

a substrate rotating mechanism housed in the casing, configured to rotate a substrate;

a first nozzle, housed in the casing, configured to eject an ultrasonic cleaning solution toward a predetermined surface of the substrate that is rotated; and

a second nozzle, housed in the casing, configured to eject an ultrasonic cleaning solution toward a predetermined surface of the substrate that is rotated,

wherein at least one of the first nozzle and the second nozzle is coupled to a transducer via a flow path and is held at a position where it is possible to supply an ultrasonic cleaning solution on a bevel of the substrate that is rotated in a tangential direction of the substrate.