Claims

1. An apparatus for cleaning a semiconductor wafer, comprising:

a chuck for holding a semiconductor wafer;

an ultra or mega sonic device;

an actuator for driving the ultra or mega sonic device to a position above the surface of the semiconductor wafer and a gap formed between the ultra or mega sonic device and the surface of the semiconductor wafer;

a center dispenser or a side dispenser disposed at a side of the ultra or mega sonic device, wherein the center dispenser or the side dispenser is used for spraying cleaning liquid on the surface of the semiconductor wafer; and

a rotating driving mechanism for driving the chuck to rotate at a spin speed lower than a set spin speed for ensuring that the gap between the ultra or mega sonic device and the surface of the semiconductor wafer is fully and continuously filled with the cleaning liquid, making the ultra or mega sonic energy be stably transferred to the entire surface of the semiconductor wafer through the cleaning liquid, wherein when the center dispenser is used, the rotating driving mechanism drives the chuck to rotate at a spin speed lower than 30rpm, when the side dispenser is used, the rotating driving mechanism drives the chuck to rotate at a spin speed lower than 45rpm.

2. The apparatus according to claim 1, wherein the surface of the semiconductor wafer is hydrophilic.

3. The apparatus according to claim 1, wherein the rotating driving mechanism drives the chuck to rotate at a spin speed which is in the range of 10-30rpm.

4. The apparatus according to claim 1, further comprising a suspension arm, the ultra or mega sonic device is positioned at the bottom of the suspension arm, the center dispenser is positioned at the tip end of the suspension arm.

5. The apparatus according to claim 1, wherein the center dispenser is opposite the center of the semiconductor wafer or slightly over the center of the semiconductor wafer.

6. The apparatus according to claim 1, wherein the rotating driving mechanism drives the chuck to rotate at a spin speed which is in the range of 10-45rpm.

7. The apparatus according to claim 1, wherein the side dispenser has a plurality of jetting holes which are arranged in a line disposed along the side of the ultra or mega sonic device.

8. The apparatus according to claim 1, further comprising a vertical actuator for driving the ultra or mega sonic device to move vertically for changing the gap between the ultra or mega sonic device and the surface of the semiconductor wafer.

9. The apparatus according to claim 1, further comprising a plurality of locating pins disposed on the chuck for fixing the semiconductor wafer.

10. A method for cleaning a semiconductor wafer, comprising:

holding a semiconductor wafer by a chuck;

spraying cleaning liquid on the surface of the semiconductor wafer by a center dispenser or a side dispenser disposed at a side of the ultra or mega sonic device;

driving an ultra or mega sonic device to a position above the surface of the semiconductor wafer and a gap formed between the ultra or mega sonic device and the surface of the semiconductor wafer; and

driving the chuck to rotate at a spin speed lower than a set spin speed for ensuring that the gap between the ultra or mega sonic device and the surface of the semiconductor wafer is fully and continuously filled with the cleaning liquid, making the ultra or mega sonic energy be stably transferred to the entire surface of the semiconductor wafer through the cleaning liquid, wherein when the center dispenser is

used, the chuck is driven to rotate at a spin speed lower than 30rpm, when the side dispenser is used, the chuck is driven to rotate at a spin speed lower than 45rpm.

11. The method according to claim 10, wherein the surface of the semiconductor wafer is hydrophilic.

12. The method according to claim 10, wherein driving the chuck to rotate at a spin speed which is in the range of 10-30rpm.

13. The method according to claim 10, wherein the center dispenser is opposite the center of the semiconductor wafer or slightly over the center of the semiconductor wafer.

14. The method according to claim 10, wherein driving the chuck to rotate at a spin speed which is in the range of 10-45rpm.

15. The method according to claim 10, wherein the side dispenser is disposed at a side of the ultra or mega sonic device.

16. The method according to claim 15, wherein the side dispenser has a plurality of jetting holes which are arranged in a line disposed along the side of the ultra or mega sonic device.