Claims

1. A method to adsorb a substrate to a top ring comprising a top ring body and an elastic film under the top ring body, the method comprising:

vacuuming at least one area among a plurality of areas formed concentrically between a top face of the elastic film and the top ring body under a state where a bottom face of the substrate is supported by a support member and a top face of the substrate contacts a bottom face of the elastic film;

measuring a flow volume of gas in an area located outside one or more areas to be vacuumed;

determining whether the substrate is adsorbed to the top ring based on the flow volume of the gas; and

after it is determined that the substrate is adsorbed to the top ring, separating the elastic film to which the substrate is adsorbed from the support member.

2. The method to adsorb a substrate according to claim 1, further comprising removing the elastic film to which the substrate is adsorbed from the support member after determining that the substrate is adsorbed to the top ring.

3. The method to adsorb a substrate according to claim 1 or 2 further comprising measuring pressure of at least one area among the one or more areas to be vacuumed after vacuuming at least one area among the plurality of areas,

wherein whether the substrate is absorbed is determined taking into consideration the flow volume of the gas and the pressure of at least one area among the one or more areas to be vacuumed.

4. The method to adsorb a substrate according to one of claims 1-3 further comprising:

pressuring at least one area among the plurality of areas; and

contacting the top face of the substrate with the bottom face of the elastic film,

wherein vacuuming at least one area among the plurality of areas is performed thereafter.

5. The method to adsorb a substrate according to claim 4, wherein upon pressuring at least one area, at least one of the areas to be vacuumed is pressured.

6. The method to adsorb a substrate according to one of claims 1-5, wherein an area located outside the areas to be vacuumed is not pressured when the top face of the substrate contacts the bottom face of the elastic film.

7. The method to adsorb a substrate according to one of claims 1-6, wherein the support member is a transfer mechanism configured to transfer the substrate to the top ring.

8. The method to adsorb a substrate according to one of claims 1-7, wherein the support member is a polishing table configured to polish the substrate holed by the top ring.

9. A top ring comprising:

a top ring body;

an elastic film under the top ring body, a plurality of areas being concentrically formed between a top face of the elastic film and the top ring body;

a pressure controller configured to vacuum at least one area among the plurality of areas under a state where a top face of a substrate whose bottom face is supported by a support member contacts a bottom face of the elastic film;

a flow meter configured to measure a flow volume of gas in an area located outside one or more areas to be vacuumed; and

a determiner configured to determine whether the substrate is adsorbed to the top ring based on the flow volume of the gas.

10. The top ring according to claim 9, wherein a flow path on which the flow meter is provided is connected to the area located outside the one or more areas to be vacuumed, and the flow path is not branched between said area and the flow meter.

11. The top ring according to claim 9 or 10, wherein no holes are formed on the elastic film at a position where the plurality

of areas are formed.

12. A substrate polishing apparatus comprising:

the top ring according to one of claims 9-11;

a transfer mechanism configured to transfer the substrate to the substrate holding apparatus; and

a polishing table configured to polish the substrate held by the substrate holding apparatus.