CLAIMS

[Claim 1] A substrate cleaning apparatus for cleaning a substrate, comprising:

a roll holder configured to support a horizontally elongated roll cleaning member and rotate the roll cleaning member;

a vertical movement mechanism, having a vertically movable unit vertically movable by actuation of an actuator having a regulating device, configured to vertically move the roll holder coupled to the vertically movable unit so that the roll cleaning member applies a predetermined roll load to the substrate at the time of cleaning the substrate;

a load cell provided between the vertically movable unit of the vertical movement mechanism and the roll holder and configured to measure the roll load; and

a controller configured to perform feedback control of the roll load through the regulating device of the actuator based on a measured value of the load cell.

[Claim 2] The substrate cleaning apparatus according to claim 1, wherein the vertically movable unit of the vertical movement mechanism comprises a vertically movable shaft vertically movable by actuation of the actuator, or a vertically movable arm extending in a horizontal direction and having a base end coupled to the vertically movable shaft.

[Claim 3] The substrate cleaning apparatus according to claim 1, further comprising:

a tilting mechanism provided between the vertically movable unit of the vertical movement mechanism and the roll holder and configured to tilt the roll holder.

[Claim 4] The substrate cleaning apparatus according to claim 1, wherein the load cell is provided at a substantially central area along a longitudinal direction of the roll holder and is coupled to the vertically movable unit of the vertical movement mechanism.

[Claim 5] The substrate cleaning apparatus according to claim 1, wherein the controller is configured to start the feedback control of the roll load from when the roll load is applied to the substrate.

[Claim 6] The substrate cleaning apparatus according to claim 1, wherein the controller arbitrarily sets, for each preset roll load, timing to start the feedback control of the roll load applied to the substrate.

[Claim 7] The substrate cleaning apparatus according to claim 5, wherein an electropneumatic regulator is used as the regulating device, and the controller arbitrarily sets, for each preset roll load, an operation amount of the electropneumatic regulator before starting the feedback control of the roll load applied to the substrate.

[Claim 8] A substrate processing apparatus having a substrate cleaning apparatus according to any of claims 1 to 7.

CLAIMS

[Claim 1] A substrate cleaning apparatus for cleaning a substrate, comprising:

a roll holder configured to support an elongated roll cleaning member and rotate the roll cleaning member;

an actuator configured to press the roll cleaning member against a surface of the substrate so that the roll cleaning member applies a predetermined load to the substrate at the time of cleaning the substrate, and to separate the roll cleaning member from the surface of the substrate;

a roll holder supporting unit configured to move together with the roll holder by actuation of the actuator while supporting the roll holder, in the direction of pressing the roll cleaning member against the surface of the substrate or in the direction of separating the roll cleaning member from the surface of the substrate;

a load cell provided between the roll holder supporting unit and the roll holder and configured to measure the load applied to the substrate by the roll cleaning member, by measuring the load applied in the direction of pressing the roll cleaning member against the substrate ; and

a controller configured to perform feedback control of the load by controlling an output of the actuator based on a measured value of the load cell.

[Claim 2] The substrate cleaning apparatus according to claim 1, wherein the roll holder supporting unit comprises at least an elongated portion extending in a direction parallel to the surface of the substrate so that the roll holder supporting unit supports the roll holder at a position along a central axis of the substrate.

[Claim 3] The substrate cleaning apparatus according to claim 1, wherein the load cell is provided at a substantially central area along a longitudinal direction of the roll holder and is coupled to the roll holder supporting unit.

[Claim 4] The substrate cleaning apparatus according to claim 1, wherein the controller is configured to start the feedback control of the load from when the roll cleaning member applies the load to the substrate.

[Claim 5] The substrate cleaning apparatus according to claim 1, wherein the controller arbitrarily sets, for each preset load, timing to start the feedback control of the load applied to the substrate.

[Claim 6] The substrate cleaning apparatus according to claim 4 or 5, wherein an electropneumatic regulator is used as a regulating device, and the controller arbitrarily sets, for each preset load, an operation amount of the electropneumatic regulator before starting the feedback control of the load applied to the substrate.

[Claim 7] A substrate processing apparatus having a substrate cleaning apparatus according to any one of claims 1 to 6.