WHAT IS CLAIMED IS:

1. A substrate processing apparatus comprising:

a table for supporting a substrate;

a pad holder for holding a polishing pad for polishing the substrate supported by the table;

an elevating mechanism for elevating the pad holder with respect to the substrate;

a swing mechanism for swinging the pad holder in a radial direction of the substrate;

a supporting member for supporting the polishing pad swung to outside the table by the swing mechanism;

a driving mechanism for adjusting at least one of a height and a distance to the substrate of the supporting member while polishing the substrate, and

a film thickness measuring instrument for measuring a film thickness profile of a surface to be polished of the substrate while polishing the substrate, wherein

the driving mechanism is configured to adjust at least one of the height and the distance to the substrate of the supporting member in accordance with the film thickness profile measured by the film thickness measuring instrument.

2. The substrate processing apparatus according to claim 1, wherein

the supporting member includes a first supporting member arranged in a swing path of the polishing pad outside the table and a second supporting member arranged in a swing path of the polishing pad at an opposite side of the first supporting member across the table.

3. The substrate processing apparatus according to claim 2, wherein

the first supporting member and the second supporting member each have a support surface configured to support a whole polishing surface of the polishing pad, the polishing surface being to be brought into contact with the substrate.

4. The substrate processing apparatus according to claim 1, wherein

the driving mechanism is configured such that the driving mechanism lowers the height of the supporting member or widens the distance to the substrate of the supporting member when a film thickness on an edge portion of the substrate is thicker than a film thickness in a center portion in the film thickness profile measured by the film thickness measuring instrument.

5. The substrate processing apparatus according to claim 1, further comprising

a substrate thickness measuring instrument for measuring a thickness of the substrate installed on the table, wherein

the driving mechanism is configured to adjust the height of the supporting member based on the thickness of the substrate measured by the substrate thickness measuring instrument.

6. The substrate processing apparatus according to claim 1, further comprising

a diameter measuring instrument for measuring a diameter of the substrate installed on the table, wherein

the driving mechanism is configured to adjust the distance to the substrate of the supporting member based on the diameter of the substrate measured by the diameter measuring instrument.

7. The substrate processing apparatus according to claim 1, wherein

the supporting member includes a plurality of supporting members divided by a virtual division line, the virtual division line running along the radial direction of the substrate, and

the driving mechanism is configured to adjust at least one of the height and the distance to the substrate of the supporting member while polishing the substrate independently, for each of the plurality of supporting members.

8. The substrate processing apparatus according to claim 1, wherein

the supporting member has a support surface for supporting a polishing surface of the polishing pad, the polishing surface being to be brought into contact with the substrate, the support surface of the supporting member having an implanted dresser for toothing the

polishing pad.

9. The substrate processing apparatus according to claim 1, wherein

the supporting member has a support surface for supporting a polishing surface of the polishing pad, the polishing surface being to be brought into contact with the substrate, the support surface of the supporting member having an implanted vacuum passage communicated with a vacuum member.

10. The substrate processing apparatus according to claim 1, wherein

the swing mechanism includes a first arm for holding the pad holder, a second arm for holding a cleaning tool holder for holding a cleaning tool, a third arm for holding a pad holder for holding a polishing pad with a diameter different from a diameter of the polishing pad, a fourth arm for holding a photographing member, a swing shaft that supports the first, second, third, and fourth arms, and a rotation drive mechanism for rotatably driving the swing shaft, and

each of the first, second, third, and fourth arms is radially arranged in a peripheral area of the swing shaft.

11. The substrate processing apparatus according to claim 10, wherein

the second arm is configured to further hold atomizers together with the cleaning tool, the atomizers being arranged at both sides of the cleaning tool.

12. A substrate processing method comprising:

an installing step of installing a substrate on a table;

a pressing step of pressing a polishing pad against the substrate, the polishing pad being for polishing the substrate installed on the table;

a swinging step of swinging the polishing pad in a radial direction of the substrate;

an adjusting step of adjusting at least one of a height and a distance to the substrate of a supporting member while polishing the substrate, the supporting member being for supporting the polishing pad swung to outside the table in the swinging step, and

a film thickness measuring step of measuring a film thickness profile of a surface

to be polished of the substrate while polishing the substrate, wherein

the adjusting step includes adjusting at least one of the height and the distance to the substrate of the supporting member in accordance with the film thickness profile measured in the film thickness measuring step.

13. The method according to claim 12, wherein

the adjusting step includes lowering the height of the supporting member or widening the distance to the substrate of the supporting member when a film thickness on an edge portion of the substrate is thicker than a film thickness in a center portion in the film thickness profile measured in the film thickness measuring step.