What is claimed is:

1. A method of polishing a substrate, comprising:

rotating a polishing table supporting a polishing pad; and

polishing the substrate by pressing the substrate against a polishing surface of the polishing pad by a polishing head,

wherein polishing the substrate includes:

an oscillation polishing process of polishing the substrate while causing the polishing head to oscillate along the polishing surface; and

a static polishing process of polishing the substrate with the oscillation of the polishing head stopped,

the static polishing process is performed after the oscillation polishing process, and

the static polishing process comprises determining a static polishing end point which is a point in time at which a rate of change of torque for rotating the polishing table has reached a change-rate threshold value.

2. The method according to claim 1, wherein polishing the substrate comprises an oscillation stop operation which stops the oscillation of the polishing head after the torque has reached a preset torque threshold value or after a current polishing time has reached a preset oscillation polishing time.

3. The method according to claim 2, wherein the oscillation stop operation comprises stopping the oscillation of the polishing head when the polishing head is at a preset stop position above the polishing table.

4. The method according to any one of claims 1 to 3, wherein determining the static polishing end point comprises determining the static polishing end point which is a point in time at which the rate of change decreases to reach the change-rate threshold value.

5. The method according to any one of claims 1 to 3, wherein determining the static polishing end point comprises determining the static polishing end point which is a point in time at which the rate of change increases to reach the change-rate threshold value.

6. The method according to any one of claims 1 to 5, wherein polishing the substrate further comprises a finish polishing process performed after the static polishing process, and

the finish polishing process comprises determining a finish polishing end point which is a point in time at which a finish polishing time has elapsed, the finish polishing time is determined based on the static polishing end point.

7. The method according to claim 6, wherein determining the finish polishing end point comprises determining the finish polishing end point by adding a preset fixed time to a polishing time at the static polishing end point or by multiplying a polishing time at the static polishing end point by a preset coefficient.

8 ~~7~~. The method according to claim 6, wherein the finish polishing process comprises polishing the substrate while causing the polishing head to oscillate along the polishing surface.

9 ~~8~~. The method according to any one of claims 1 to 8 ~~7~~, wherein the polishing head is on an axis of the polishing table while the polishing head is oscillating.

10 ~~9~~. A method of polishing a substrate, comprising:

rotating a polishing table supporting a polishing pad; and

polishing the substrate by pressing the substrate against a polishing surface of the polishing pad by a polishing head while causing the polishing head to oscillate along the

polishing surface,

wherein polishing the substrate includes:

measuring a torque for rotating the polishing table while polishing the substrate;

determining a plurality of representative values of the torque from a plurality of measured values of the torque;

generating a relational expression expressing relationship between the plurality of representative values of the torque and polishing time; and

determining a first polishing end point which is a point in time at which a predicted value of the torque, calculated from the relational expression, reaches a torque threshold value.

11 ~~10~~. The method according to claim 10 ~~9~~, wherein the plurality of representative values of the torque are a plurality of local minimum values of the torque, a plurality of local maximum values of the torque, or a plurality of moving average values of the torque.

12 ~~11~~. The method according to claim 10 ~~9~~ or 11 ~~10~~, wherein polishing the substrate comprises determining a second polishing end point which is a point in time at which a finish polishing time has elapsed, the finish polishing time is determined based on the first polishing end point.

13 ~~12~~. The method according to any one of claims 10 ~~9~~ to 12 ~~11~~, wherein the polishing head is on an axis of the polishing table while the polishing head is oscillating.

14 ~~13~~. A polishing apparatus for polishing a substrate, comprising:

a polishing table for supporting a polishing pad;

a table motor configured to rotate the polishing table;

a torque measuring device configured to measure a torque for rotating the polishing table;

a polishing head configured to polish the substrate by pressing the substrate against a polishing surface of the polishing pad;

a polishing-head oscillation arm coupled to the polishing head;

an oscillation motor coupled to the polishing-head oscillation arm and configured to cause the polishing head to oscillate along the polishing surface; and

an operation controller configured to control an operation of the polishing apparatus,

wherein the operation controller is configured to:

instruct the polishing apparatus to perform an oscillation polishing process of polishing the substrate while rotating the polishing table and causing the polishing head to oscillate along the polishing surface;

instruct the polishing apparatus to perform, after the oscillation polishing process, a static polishing process of polishing the substrate while rotating the polishing table with the oscillation of the polishing head stopped, and

determine a static polishing end point which is a point in time at which a rate of change of the torque for rotating the polishing table has reached a change-rate threshold value during the static polishing process.

15 ~~14~~. The polishing apparatus according to claim 14 ~~13~~, wherein the operation controller is configured to instruct the oscillation motor to stop the oscillation of the polishing head after the torque has reached a preset torque threshold value or after a current polishing time has reached a preset oscillation polishing time.

16 ~~15~~. The polishing apparatus according to claim 15 ~~14~~, wherein the operation controller is configured to instruct the oscillation motor to stop the oscillation of the polishing head when the polishing head is at a preset stop position above the polishing table.

17 ~~16~~. The polishing apparatus according to any one of claims 14 ~~13~~ to 16 ~~15~~, wherein the operation controller is configured to:

instruct the polishing apparatus to perform, after the static polishing process, a finish polishing process of polishing the substrate while rotating the polishing table; and

determine a finish polishing end point during the finish polishing process, the finish polishing end point is a point in time at which a finish polishing time has elapsed, the finish polishing time is determined based on the static polishing end point.

18. The polishing apparatus according to claim 17, wherein the operation controller is configured to determine the finish polishing end point during the finish polishing process by adding a preset fixed time to a polishing time at the static polishing end point or by multiplying a polishing time at the static polishing end point by a preset coefficient.

19. The polishing apparatus according to claim 17, wherein the operation controller is configured to instruct the polishing apparatus to perform the finish polishing process while rotating the polishing table and while causing the polishing head to oscillate along the polishing surface.

20 ~~17~~. The polishing apparatus according to any one of claims 14 ~~13~~ to 19 ~~16~~, wherein the polishing head is on an axis of the polishing table.

21 ~~18~~. A polishing apparatus comprising:

a polishing table for supporting a polishing pad;

a table motor configured to rotate the polishing table;

a torque measuring device configured to measure a torque for rotating the polishing table;

a polishing head configured to press a substrate against a polishing surface of the polishing pad;

a polishing-head oscillation arm coupled to the polishing head;

an oscillation motor coupled to the polishing-head oscillation arm and configured to

cause the polishing head to oscillate along the polishing surface; and

an operation controller configured to

acquire a plurality of measured values of the torque from the torque measuring device,

determine a plurality of representative values of the torque from a plurality of measured values of the torque,

generate a relational expression expressing relationship between the plurality of representative values of the torque and polishing time, and

determine a first polishing end point which is a point in time at which a predicted value of the torque, calculated from the relational expression, reaches a torque threshold value.

22 ~~19~~. The polishing apparatus according to claim 21 ~~18~~, wherein the plurality of representative values of the torque are a plurality of local minimum values of the torque, a plurality of local maximum values of the torque, or a plurality of moving average values of the torque.

23 ~~20~~. The polishing apparatus according to claim 21 ~~18~~ or 22 ~~19~~, wherein the operation controller is configured to determine a second polishing end point which is a point in time at which a finish polishing time has elapsed, the finish polishing time is determined based on the first polishing end point.

24 ~~21~~. The polishing apparatus according to any one of claims 21 ~~18~~ to 23 ~~20~~, wherein the polishing head is on an axis of the polishing table.