

CLAIMS

1. A polishing apparatus that polishes a surface of a polishing target, the polishing apparatus comprising:

a first electric motor that rotates and drives a polishing table that holds a polishing pad; and

a second electric motor that rotates and drives a holding unit that holds the polishing target and presses the polishing target against the polishing pad, wherein

at least one of the first and second electric motors includes a winding wire with a plurality of phases, and

the polishing apparatus comprises: a current detection unit that detects currents of at least two phases of the first and/or second electric motor;

a rectification arithmetic unit that rectifies current detection values of the at least two phases detected by the current detection unit and that outputs a rectified signal after performing addition and/or multiplication for the rectified signal; and

an end point detection unit that detects a polishing end point indicating an end of polishing of the surface of the polishing target based on a change in the output of the rectification arithmetic unit.

2. The polishing apparatus according to claim 1, wherein

the end point detection unit comprises at least one of: an amplification unit that amplifies the output of the rectification arithmetic unit; a noise removal unit that removes noise included in the output of the rectification arithmetic unit; and a subtraction unit that subtracts a

prescribed amount from the output of the rectification arithmetic unit.

3. The polishing apparatus according to claim 2, wherein

the end point detection unit comprises the amplification unit, the subtraction unit, and the noise removal unit, the subtraction unit performs the subtraction for a signal amplified by the amplification unit, and the noise removal unit removes the noise from the signal subjected to the subtraction.

4. The polishing apparatus according to claim 3, wherein

the end point detection unit comprises a second amplification unit that further amplifies the signal from which the noise is removed by the noise removal unit.

5. The polishing apparatus according to claim 2, wherein

the end point detection unit comprises the amplification unit and a control unit that controls amplification characteristics of the amplification unit.

6. The polishing apparatus according to claim 2, wherein

the end point detection unit comprises the noise removal unit and a control unit that controls noise removal characteristics of the noise removal unit.

7. The polishing apparatus according to claim 2, wherein

the end point detection unit comprises the subtraction unit and a control unit that controls subtraction characteristics of the subtraction unit.

8. The polishing apparatus according to claim 4, wherein

the end point detection unit comprises a control unit that controls amplification characteristics of the second

amplification unit.

9. A polishing method of polishing a surface of a polishing target by using a polishing apparatus, the polishing apparatus comprising: a first electric motor that rotates and drives a polishing table that holds a polishing pad; and a second electric motor that rotates and drives a holding unit that holds the polishing target and presses the polishing target against the polishing pad, wherein at least one of the first and second electric motors includes a winding wire with a plurality of phases, the method comprising:

a current detection step of detecting currents of at least two phases of the first and/or second electric motor;

a rectification arithmetic step of rectifying current detection values of the at least two detected phases and outputting a rectified signal after performing addition and/or multiplication for the rectified signal; and

an end point detection step of detecting a polishing end point indicating an end of polishing of the surface of the polishing target based on a change in the output in the rectification arithmetic step.

10. The polishing method according to claim 9, wherein

the end point detection step comprises at least one of: an amplification step of amplifying the output in the rectification arithmetic step; a noise removal step of removing noise included in the output in the rectification arithmetic step; and a subtraction step of subtracting a prescribed amount from the output in the rectification arithmetic step.

11. The polishing method according to claim 10, wherein

in the end point detection step, the subtraction of the prescribed amount is performed in the subtraction step for a signal amplified in the amplification step, and the noise is removed in the noise removal step from the signal subjected to the subtraction.

12. The polishing method according to claim 11, wherein

the end point detection step further comprises a second amplification step of further amplifying the signal from which the noise is removed in the noise removal step.