

this change is directly reflected to the motor current and causes false detection of the polishing end point.

[0012] Therefore, an object of an aspect of the present invention is to improve accuracy of polishing end point detection.

SUMMARY

[0013] There is provided a polishing apparatus according to an aspect, including: a polishing table for holding a polishing pad for polishing a polishing target; a first driving unit that rotationally drives the polishing table; a first rotary joint that has a rotating body that is rotationally driven by the first driving unit, a housing provided around the rotating body, and a seal portion that seals between the rotating body and the housing; a current detecting unit that detects a current which is correlated with driving load of the first driving unit; a friction detecting unit that detects sliding friction in the seal portion of the first rotary joint; and an end point detecting apparatus that detects a polishing end point of the polishing target on the basis of the current detected by the current detecting unit and the sliding friction detected by the friction detecting unit.

[0014] There is provided a polishing apparatus according to an aspect, including: a substrate holding unit that holds a polishing target to be pressed onto a polishing pad for polishing the polishing target; a second

driving unit that rotationally drives the holding unit; a second rotary joint that has a rotating body that is rotationally driven by the second driving unit, a housing provided around the rotating body, and a seal portion that seals between the rotating body and the housing; a current detecting unit that detects a current which is correlated with driving load of the second driving unit; a friction detecting unit that detects sliding friction in the seal portion of the second rotary joint; and an end point detecting apparatus that detects a polishing end point of the polishing target on the basis of the current detected by the current detecting unit and the sliding friction detected by the friction detecting unit.

[0015] Moreover, the polishing apparatus according to an embodiment: a first rotation stopping member fixed to the housing; and a second rotation stopping member that comes into contact with the first rotation stopping member to stop rotation of the housing, wherein the friction detecting unit can include a force detecting unit that detects contact force between the first rotation stopping member and the second rotation stopping member.

[0016] Moreover, in an embodiment of the polishing apparatus, the force detecting unit can include at least one of a load cell, a strain gauge, a pressure sensor and a piezoelectric element provided on at least one of contact portions between the first rotation stopping member and the second rotation stopping member.

[0017] Moreover, the polishing apparatus according to an

embodiment further includes: a first rotation stopping member fixed to the housing, and a second rotation stopping member that comes into contact with the first rotation stopping member to stop rotation of the housing, wherein the friction detecting unit can include a motion detecting unit that detects a physical quantity caused by a displacement of the first rotation stopping member.

[0018] Moreover, in an embodiment of the polishing apparatus, the motion detecting unit can include at least one of a displacement sensor, a speed sensor and an acceleration sensor provided on the first rotation stopping member.

[0019] Moreover, in an embodiment of the polishing apparatus, on at least one of contact portions between the first rotation stopping member and the second rotation stopping member, an elastic member which undergoes elastic deformation in accordance with contact therebetween may be provided.

[0020] Moreover, in an embodiment of the polishing apparatus, the end point detecting apparatus can include a signal processing unit that generates a signal for detection of a polishing end point of the polishing target on the basis of the current detected by the current detecting unit and the sliding friction detected by the friction detecting unit, and an end point detecting unit that detects the polishing end point of the polishing target on the basis of the signal for detection of the polishing end point which is generated by the signal processing unit.

[0021] Moreover, in an embodiment of the polishing apparatus, the signal processing unit can stop output of the signal for

detection of the polishing end point when it is detected that a change larger than a threshold is contained in the sliding friction detected by the friction detecting unit.

[0022] Moreover, in an embodiment of the polishing apparatus, the signal processing unit can configure a difference between a first signal which is correlated with the current detected by the current detecting unit and a second signal which is correlated with the sliding friction detected by the friction detecting unit as the signal for detection of the polishing end point.

[0023] Moreover, in an embodiment of the polishing apparatus, the signal processing unit can include a band elimination filter that removes a predetermined frequency component from a second signal which is correlated with the sliding friction detected by the friction detecting unit, and can output the signal for detection of the polishing end point on the basis of the second signal from which the predetermined frequency component is removed by the band elimination filter and a first signal which is correlated with the current detected by the current detecting unit.

[0024] Moreover, in an embodiment of the polishing apparatus, the signal processing unit can include an abnormality detection function in which a signal indicating that abnormality arises in the first or second rotary joint is outputted when it is detected that a change larger than a threshold is contained in the sliding friction detected by the friction detecting unit.

[0025] According to various embodiments, accuracy of