As described above, the surface of the wafer W is polished with the sliding contact between the polishing pad 102 and the wafer W. The sliding contact between the polishing pad 102 and the wafer W generates frictional heat. The frictional heat depends on a material and a shape of an exposed surface of the wafer W, and a temperature of the polishing surface 102a of the polishing pad 102 changes depending on the frictional heat. Accordingly, the temperature of the polishing surface 102a of the polishing pad 102 changes with the progress of polishing of the wafer W.

As shown in FIG. 16, the polishing apparatus is provided with a temperature sensor 107 for measuring the temperature of the polishing surface 102a of the polishing pad 102 (which hereinafter may be referred to simply as the surface temperature). The temperature sensor 107 is a non-contact temperature sensor disposed above the polishing pad 102. A radiation thermometer, for example, may be used as the temperature sensor 107. During polishing of the wafer W, the surface temperature of the polishing pad 102 is measured by the temperature sensor 107, and a measured value of the surface temperature is sent to a polishing operation controller 109. Based on the measured value of the surface temperature of the polishing pad 102, the polishing operation controller 109 monitors the polishing process and determines a polishing end point.

However, since the temperature sensor 107 measures the surface temperature of a portion, lying at a distance from the wafer W, of the polishing pad 102, the measured value of the surface temperature may not reflect a change in a temperature of the wafer W which is a heat source. Furthermore, since the position of the temperature sensor 107 with respect to the wafer W is fixed, the temperature sensor 107 cannot measure the temperature at a desired measuring point near the surface of the wafer W.

SUMMARY OF THE INVENTION

Embodiments of the present invention seek to provide a polishing apparatus and a polishing method capable of polishing a substrate (e.g., wafer) while accurately measuring a temperature at a desired measuring point near a surface of the substrate.