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(54) Title: METHOD AND APPARATUS FOR CLEANING WORKPIECE SURFACES AND MONITORING PROBES DURING WORKPIECE PROCESSING

(57) Abstract

The present invention provides methods and apparatus which permit the in-process, in situ, substantially real time measurement of the actual thickness of a surface layer of a workpiece, e.g., a semiconductor wafer. A probe is disposed proximate the outer perimeter of a polishing pad on a CMP table such that the probe establishes optical contact with the wafer surface as a portion of the wafer extends beyond the outer perimeter of the polishing pad. A reflected signal received by the probe is analyzed to calculate the thickness of the surface layer. Alternatively, the reflective characteristics of the semiconductor layers may effect the nature of the reflected signal; changes in the reflected signal can be detected to indicate when a metallic layer has been removed from an oxide layer. In accordance with another aspect of the present invention, a nozzle assembly having a plurality of fluid outlets may be provided to apply a stream of deionized water at the surface under inspection to thereby remove excess slurry and debris from the local region of the workpiece being inspected. A second fluid nozzle may be provided to apply a stream of deionized water to the tip of the probe tip to thereby clean the probe tip between endpoint detection cycles. The nozzle assembly may also include a third fluid nozzle for applying a stream of nitrogen gas to thereby deflect debris away from the probe tip during the endpoint detection procedure and a fourth fluid nozzle for applying a stream of nitrogen gas to thereby remove water and debris from the probe tip during the endpoint detection procedure.

