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(54) Title: MONITOR CHEMICAL MECHANICAL POLISHING PROCESS USING MACHINE LEARNING BASED PROCESSING OF HEAT IMAGES

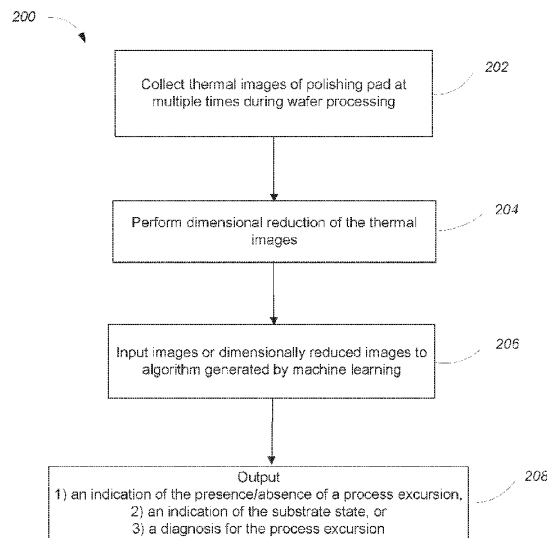


FIG. 2

(57) Abstract: A chemical mechanical polishing apparatus includes a platen having a top surface to hold a polishing pad, a carrier head to hold a substrate against a polishing surface of the polishing pad during a polishing process, a temperature monitoring system including a non-contact thermal imaging camera positioned above the platen to have a field of view of a portion of the polishing pad on the platen, and a controller. The controller is configured to receive the thermal image from the temperature monitoring system, input the thermal image into a machine learning model trained by training examples to determine an indication for one or more of 1) a presence of a process excursion, 2) a substrate state, or 3) a diagnosis for the process excursion, and receive from the machine learning model the indication.

[Continued on next page]

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