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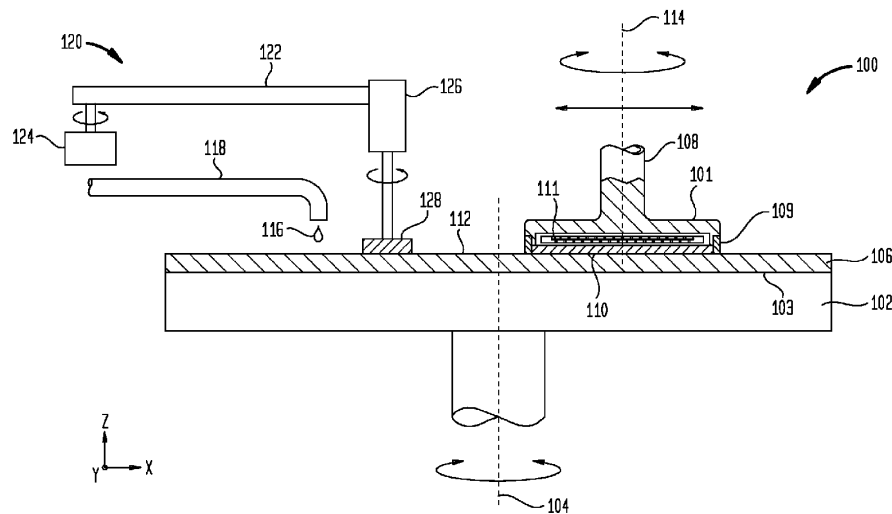
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(54) Title: CHEMICAL MECHANICAL POLISHING SMART RING

FIG. 1



(57) Abstract: Embodiments of the present disclosure generally relate to chemical mechanical polishing (CMP) of substrates. In one embodiment, a carrier head for a CMP apparatus is disclosed herein. The carrier head includes a body, a retaining ring, and a sensor assembly. The retaining ring is coupled to the body. The sensor assembly is positioned at least partially in the body. The sensor assembly includes a transmitter, an antenna, and a vibrational sensor. The transmitter has a first end and a second end. The antenna is coupled to the first end of the transmitter. The vibrational sensor is coupled to the second end. The vibrational sensor is configured to detect vibration during chemical mechanical processes with respect to radial, azimuthal, and angular axes of the carrier head.

[Continued on next page]

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