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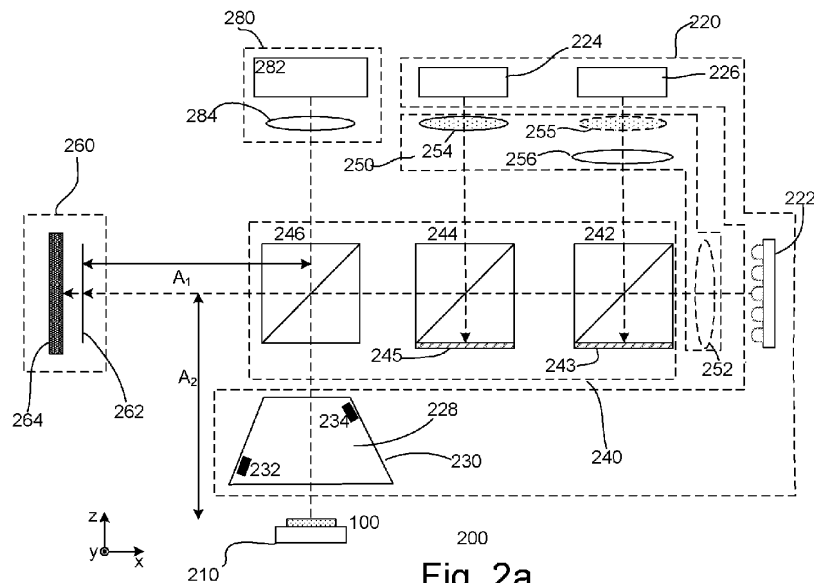


Fig. 2a

(57) Abstract: Systems and methods for inspecting a surface of a workpiece are disclosed. The workpiece may be a packaged die, processed wafer or other types of workpieces. An adapted Michelson setup is employed to produce fringe patterns from illuminating the surface with a long coherence length illumination, such as infrared (IR) illumination. The Michelson setup includes a first reflected illumination from a reference mirror and a second reflected illumination from the surface of the workpiece. The reflected illuminations are directed to an image capture module by a primary beam splitter. The reference mirror, the die surface and the primary beam splitter are configured to maintain a constant phase difference between the reflected illuminations to enable constructive interference to produce the fringe patterns. The Michelson setup enables the detection of submicron cracks, down to 0.2 – 0.25 μm . The Michelson setup can be implemented into a standalone system or in an integrated system for detecting a range of defects, from micron-sized defects or greater

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down to submicron-sized defects (e.g., as small as 0.2-0.25 μm).