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(54) Title: MULTI-DIRECTIONAL OVERLAY METROLOGY USING MULTIPLE ILLUMINATION PARAMETERS AND ISOLATED IMAGING

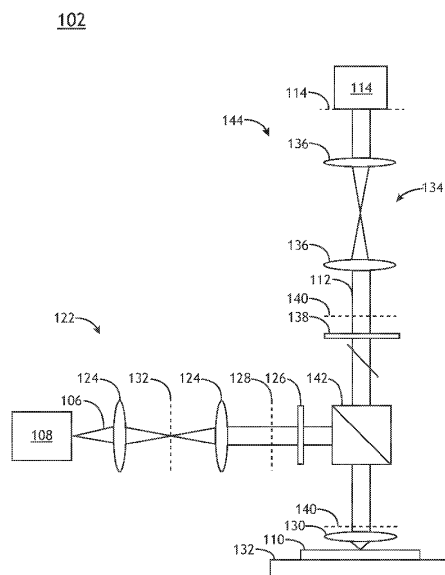


FIG. 1B

(57) Abstract: An optical metrology system may include an overlay metrology tool for characterizing an overlay target on a sample, where the overlay target includes first-direction periodic features in a first set of layers of the sample, and second-direction periodic features in a second set of layers of the sample. The overlay metrology tool may simultaneously illuminate the overlay target with first illumination beams and second illumination beams and may further generate images of the overlay target based on diffraction of the first illumination beams and the second illumination beams by the overlay target, where diffraction orders of the first illumination beams contribute to resolved image formation of only the first-direction periodic features, and where diffraction orders of the second illumination beams contribute to resolved image formation of only the second-direction periodic features. The system may further generate overlay measurements along the first and second measurement directions based on the images.

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