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(54) **Title:** OVERLAY TARGETS WITH ORTHOGONAL UNDERLAYER DUMMYFILL

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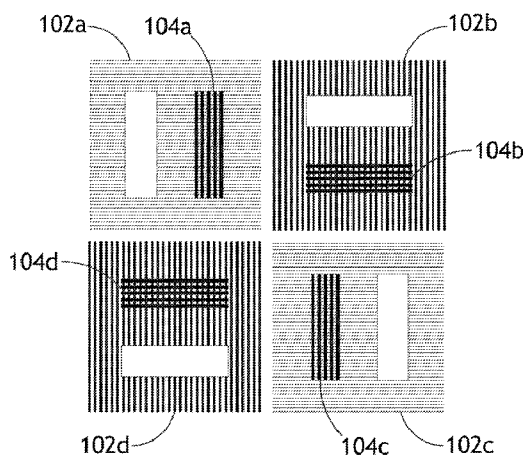


FIG. 1A

(57) **Abstract:** The disclosure is directed to designing and using an overlay target with orthogonal underlayer dummyfill. According to various embodiments, an overlay target may include one or more segmented overlay pattern elements forming at least one overlay target structure. The overlay target may further include one or more inactive pattern elements forming at least one dummyfill target structure. Each of the one or more inactive pattern elements may include dummyfill segmented along an axis orthogonal to a segmentation axis of at least one proximately disposed overlay pattern element. In some embodiments, each of the target structures or layers may be formed from a separate process layer successively disposed upon a substrate, such as a silicon wafer. In some embodiments, the overlay and dummyfill target structures may be twofold or fourfold rotationally symmetric to allow for certain manufacturing or metrology advantages.