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(71) Applicant (for all designated States except US): **MI-CRON TECHNOLOGY, INC.** [US/US]; 8000 South Federal Way, P.o. Box 6, Boise, ID 83707 (US).

(72) Inventor; and

(75) Inventor/Applicant (for US only): **MACKEY, Jeffrey, L.** [US/US]; 11872 W. Patina, Boise, ID 83713 (US).

(74) Agent: **ALTMAN, Daniel E.**; Knobbe, Martens, Olson & Bear, Llp, 2040 Main Street, 14th Floor, Irvine, CA 92614 (US).

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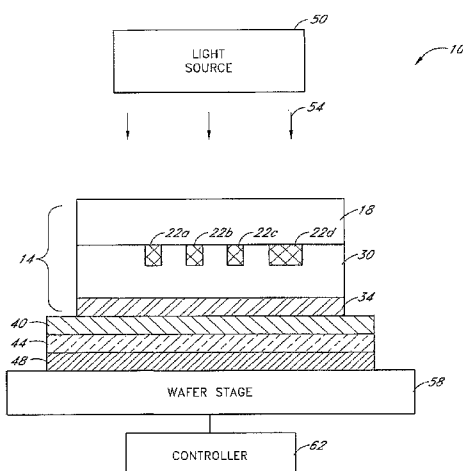
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(54) Title: PHOTOLITHOGRAPHIC SYSTEMS AND METHODS FOR PRODUCING SUB-DIFFRACTION-LIMITED FEATURES



(57) Abstract: Systems and methods for near-field photolithography utilize surface plasmon resonances to enable imaging of pattern features that exceed the diffraction limit. An example near-field photolithography system comprises a plasmon superlens template comprising a plurality of opaque features to be imaged onto photosensitive material and a metal plasmon superlens. The opaque features and the metal superlens are separated by a polymer spacer layer. Light propagates through the superlens template to form an image of the opaque features on the other side of the superlens. An intermediary layer comprising solid or liquid material is interposed between the superlens and a photoresist-coated semiconductor wafer to reduce damage resulting from contact between the superlens template and the photoresist-coated semiconductor wafer.

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