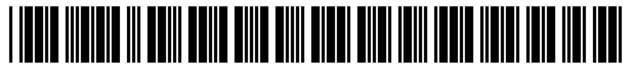

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(54) CHEMICALLY ENHANCED FOCUSED ION BEAM MICRO-MACHINING OF COPPER

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(52) **U.S. Cl.** **438/712**; 438/738
(58) **Field of Search** 438/712, 714, 438/720, 723, 738; 216/66, 72, 78

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(57) **ABSTRACT**

A method of micromachining a copper layer on a substrate is carried out by maintaining the substrate in a vacuum, bombarding a portion of the substrate with a focused particle beam from a particle source, and exposing the substrate to a supply of organic chloride or hydroxide during particle bombardment. The organic chloride or hydroxide concentration at the substrate is an amount sufficient to enhance the relative removal of the copper layer by decreasing the removal of the dielectric or increasing the removal of the copper or a combination of both.

20 Claims, 4 Drawing Sheets