

The opinion in support of the decision being entered today was not written for publication in a law journal and is not binding precedent of the Board.

Paper No. 27

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte THOMAS ABRAHAM, JAMES A. BONDUR
and JAMES P. GARCIA

Appeal No. 2002-0818
Application No. 09/075,854

ON BRIEF

Before KIMLIN, PAK and KRATZ, Administrative Patent Judges.

KIMLIN, Administrative Patent Judge.

DECISION ON APPEAL

This is an appeal from the final rejection of claims 1-24 and 26-29, all the claims remaining in the present application.

Claim 1 is illustrative:

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depositing a gap fill oxide layer over the interconnect features and substrate wherein an oxide layer having angled facets are formed above the interconnect features;

depositing a sacrificial layer over the gap fill oxide layer utilizing process parameters that provide an etch to deposition ratio which substantially etches away the angled facets of the oxide layer; and

etching the layers to provide a substantially planar layer on said semiconductor substrate.

The examiner relies upon the following references as evidence of obviousness:

Nariani et al. (Nariani)	5,128,279	Jul. 7, 1992
Jain (Jain '854)	5,494,854	Feb. 27, 1996
Jain et al. (Jain '056)	5,602,056	Feb. 11, 1997
Wang et al. (Wang '606)	5,679,606	Oct. 21, 1997
Wang (Wang '631)	5,728,631	Mar. 17, 1998

Stanley Wolf Ph.D. & Richard N. Tauber Ph.D. (Wolf), Silicon Processing for the VLSI ERA, Vol. 1: Process Technology 546 (Lattice Press, Sunset Beach, CA 1986)

Appellants' claimed invention is directed to a method of forming a substantially planar dielectric layer on a semiconductor substrate. The method entails depositing a sacrificial layer in a manner that results in an etch to deposition ratio which substantially etches away the angled facets of a gap fill

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(1) claims 1, 2, 7-10, 12-15, 17, 21-25, 27 and 28 over Jain '854 in view of Wang '631;

(2) claims 3-6 and 18-20 over the stated combination of references further in view of Nariani and Jain '056; and

(3) claims 11, 16, 26 and 29 over Jain '854 in view of Wang '631 further in view of Wolf.

Upon careful consideration of the opposing arguments presented on appeal, we will not sustain the examiner's rejections for essentially the reasons set forth by appellants in their principal and reply briefs on appeal.

We concur with appellants that Jain '854 and Wang '631 fail to provide factual support for the legal conclusion that it would have been prima facie obvious for one of ordinary skill in the art to deposit a sacrificial layer over the gap fill oxide layer with process parameters that results in the substantial etching away of the angled facets of the oxide layer. As appreciated by the examiner, Jain '854, at column 7, lines 34 et seq., specifically teaches that polish layer 40 is deposited in a

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controlling the etch to deposition ratio during the deposition of the sacrificial, or polishing, layer in order to substantially etch away the angled facets of the oxide layer.

Recognizing the deficiency of Jain '854, the examiner relies upon Wang '631. However, although Wang discloses controlling the etch to deposition ratio of the deposited silicon oxide layer in accordance with the height and spacing between conductive, metallurgy lines, Wang controls the ratio in order to form voids in the silicon dioxide dielectric layer. Wang, like Jain '854, provides no teaching or suggestion of controlling the ratio such that the facets of the oxide layer are substantially etched away. While Figures 3 and 4 of Wang '631 depict the mathematical relationship between deposition rate, etching rate and angle of the facet, the most that might be said is that one of ordinary skill in the art could have performed the claimed deposition of the sacrificial layer based on this known relationship. Manifestly, what could have been done by one of ordinary skill in the art is not the standard for determining obviousness under

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In conclusion, based on the foregoing, the examiner's
decision rejecting the appealed claims is reversed.

REVERSED

EDWARD C. KIMLIN)	
Administrative Patent Judge)	
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CHUNG K. PAK)	BOARD OF PATENT
Administrative Patent Judge)	APPEALS AND
)	INTERFERENCES
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)	
PETER F. KRATZ)	
Administrative Patent Judge)	

ECK:clm

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