

The opinion in support of the decision being entered today was not written for publication in a law journal and is not binding precedent of the Board.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. 12

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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Ex parte YUNG-KUAN HSIAO

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Appeal No. 2001-0228  
Application No. 09/116,612

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ON BRIEF

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Before KIMLIN, OWENS and JEFFREY T. SMITH, Administrative Patent Judges.

KIMLIN, Administrative Patent Judge.

DECISION ON APPEAL

This is an appeal from the final rejection of claims 1-15, all the claims in the present application. Claim 1 is illustrative:

1. A method for forming a patterned composite stack layer within a microelectronics fabrication comprising:

providing a substrate;

forming over the substrate a blanket first silicon layer;

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forming upon the blanket first silicon layer a blanket silicon containing dielectric layer;

forming upon the blanket silicon containing dielectric layer a blanket second silicon layer;

forming upon the blanket second silicon layer a blanket organic polymer anti-reflective coating (ARC) layer;

forming upon the blanket organic polymer anti-reflective coating (ARC) layer a patterned photoresist layer; and

etching sequentially while employing the patterned photoresist layer as a photoresist etch mask layer the blanket organic polymer anti-reflective coating (ARC) layer, the blanket second silicon layer, the blanket silicon containing dielectric layer and the blanket first silicon layer to form a patterned composite stack layer comprising a patterned second silicon layer coextensive with a patterned silicon containing dielectric layer in turn coextensive with a patterned first silicon layer, where the sequential etching is undertaken employing a single plasma etch method employing an etchant gas composition which upon plasma activation forms a chlorine containing etchant species.

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

Kolar et al. (Kolar)	5,162,259	Nov. 10, 1992
Azuma et al. (Azuma)	5,759,746	Jun. 02, 1998
Huang et al. (Huang)	5,837,428	Nov. 17, 1998

According to appellant, "[t]he present invention provides a method for efficiently and with attenuated microloading effect forming within a microelectronics fabrication a patterned composite silicon/dielectric/silicon stack layer" (page 3 of Brief, penultimate paragraph). The claimed method

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employs an organic polymer anti-reflective coating under the photoresist layer and "a single plasma etch method employing an etchant gas composition which upon plasma activation forms a chlorine containing etchant species" (claim 1).

Appealed claims 1-15 stand rejected under 35 U.S.C. § 103 as being unpatentable over Huang in view of Kolar.

Upon careful consideration of the opposing arguments presented on appeal, we concur with appellant that the examiner has not established a prima facie case of obviousness for the claimed method. Accordingly, we will reverse the examiner's rejection.

The examiner recognizes that Huang, the primary reference, "differs from the instant claimed invention by using three sequential etching steps instead of [a] single sequential etching step" (page 5 of Answer, sixth paragraph). However, the examiner relies upon Kolar for "performing a single sequential etching step to etch all layers of the stack layers using chlorine based reactive etch gases (Col 3, lines 17-45)" (page 5 of Answer, penultimate paragraph). The examiner explains that:

Although, Kolar does not clearly recite sequentially etching of the tri-layer using a single

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plasma etch method employing an etchant gas composition which upon plasma activation forms a chlorine containing species, Kolar does specifically disclose [sic, disclose] that the **sequential** etch of the tri-layer can be carried out using a plasma etching process to etch **all** layers (col 3, lines 17-18) [page 6 of Answer, last paragraph].

Our reading of Kolar does not correspond to the examiner's understanding. Specifically, Kolar discloses that "[t]he sequential etch can be carried out using a plasma etching process to etch all layers, or alternatively, the etching can be carried out by a combination of plasma etching and liquid chemical etching" (column 3, lines 17-22). In our view, a reasonable interpretation of the Kolar disclosure is that the operation can be carried out either by plasma etching, alone, or in combination with liquid chemical etching, but not that the plasma etching can be performed via a single plasma etching step, as required by the appealed claims. As recognized by the examiner, although Huang employs only plasma etching, the operation entails three sequential plasma etching steps. Hence, there is simply no teaching or suggestion in either reference to perform the etching operation with a single plasma etch method. In addition, we also note that Kolar does not disclose etching a composite

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silicon/ dielectric/silicon stack layer as required by  
appellant and disclosed by Huang.

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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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TERRY J. OWENS	)	BOARD OF PATENT
Administrative Patent Judge	)	APPEALS AND
	)	INTERFERENCES
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	)	
JEFFREY T. SMITH	)	
Administrative Patent Judge	)	

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