

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.

Paper No. 21

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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Ex parte ALLEN S. YU

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Appeal No. 2001-0416  
Application No. 09/074,292

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ON BRIEF

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Before WILLIAM F. SMITH, GARRIS and POTEATE, Administrative Patent Judges.

POTEATE, Administrative Patent Judge.

DECISION ON APPEAL

This is an appeal under 35 U.S.C. § 134 from the examiner's refusal to allow claims 1-3, which are all of the claims in the application.

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Claim 1 is representative of the subject matter on appeal  
and is reproduced below:

1. A method of manufacturing a semiconductor device  
having features with a dimension of  $\frac{1}{2}$  the minimum  
pitch, wherein the method comprises:

forming a target layer of material on a partially  
completed semiconductor device, wherein the target  
layer of material is to be etched to a dimension of  $\frac{1}{2}$   
the minimum pitch;

a first etch process of the target layer of  
material with masks having a dimension of the minimum  
pitch; and

a second etch process of the target layer of  
material with the masks offset by a distance of  $\frac{1}{2}$  the  
minimum pitch.

The references relied upon by the examiner are:

Keyser	4,484,978	Nov. 27, 1984
Lee et al. (Lee)	5,444,020	Aug. 22, 1995

#### Grounds of Rejection

1. Claims 1 and 2 stand rejected under 35 U.S.C. § 112,  
second paragraph, as being indefinite.

2. Claims 1 and 2 stand rejected under 35 U.S.C. § 103 as  
unpatentable over Lee.

3. Claim 3 stands rejected under 35 U.S.C. § 103 as  
unpatentable over Lee and further in view of Keyser.

We reverse as to all three grounds of rejection.

### Background

The performance of semiconductor devices is related to several factors, one of which is the width of the polysilicon gates of FET transistors formed on the device. Specification, page 1, lines 22-24. According to appellant, prior art attempts to reduce the final gate, as well as other feature dimensions have shown limited success. Id. at lines 25-29. In particular, while these methods may reduce the main feature width, the overall spacing of the feature increases such that the pitch of the device does not decrease and there is no gain in density. Id. at lines 29-31. Appellant claims to have achieved a high performance semiconductor device by a manufacturing method which produces a semiconductor device with features having a dimension of  $\frac{1}{2}$  the minimum pitch determined by the parameters of the manufacturing process. Id., page 2, lines 24-27.

### Discussion

#### 1. Rejection of claims 1 and 2 under 35 U.S.C. § 112, second paragraph

According to the examiner, the claim 1 limitation " $\frac{1}{2}$  the minimum pitch" is subjective and indefinite. In particular, the examiner maintains that this term is indefinite in that the

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specification does not include any objective method by which a skilled worker could determine whether or not a given semiconductor feature has this dimension. Examiner's answer, page 2, paragraph 1. According to appellant:

[f]or a person of ordinary skill in the art, for a person of no skill in the art or for a person of extraordinary skill in the art, the determination of the "minimum pitch" is a [sic: as] simple as opening the document called the "Design Rules" and reading the dimension under the heading "Minimum Pitch."

Appeal brief, paper no. 14, received June 19, 2000, page 6.

Appellant sets forth a detailed discussion in support of his position on pages 5-9 of his appeal brief.

The second paragraph of 35 U.S.C. § 112 requires claims to "set out and circumscribe a particular area with a reasonable degree of precision and particularity." In re Johnson, 558 F.2d 1008, 1015, 194 USPQ 187, 193 (CCPA 1977). The definiteness of the language employed in the claims must be analyzed, not in a vacuum, but in light of the teachings of the prior art and of the application disclosure as it would be interpreted by one of ordinary skill in the pertinent art. Id. The burden is on the examiner to show why one of ordinary skill in the art would not be apprised of the scope of the claims on appeal. See In re Oetiker, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444

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(Fed. Cir. 1992).

In our view, the examiner has not met this burden of showing why one of ordinary skill in the art, in light of the knowledge in the art and appellant's specification, would not be apprised of the scope of the claims on appeal. Appellant has persuasively argued that a skilled artisan, having considered the specification in its entirety, would have no difficulty understanding the scope of the term " $\frac{1}{2}$  the minimum pitch". The examiner's one sentence explanation in support of his rejection simply does not address the argument set forth in appellant's brief. Accordingly, the rejection is reversed.

2. Rejection of claims 1 and 2 under 35 U.S.C. § 103 as unpatentable over Lee

According to the examiner, Lee teaches the invention as claimed with the exception of specifying that the second mask is offset by a distance of  $\frac{1}{2}$  the minimum pitch. Examiner's answer, page 3, first and second paragraphs. The examiner maintains that "a person having ordinary skill in the art would have found it obvious to modify Lee by offsetting the masks [by] any particular amount with the anticipating [sic] of an expected result." Id., at second paragraph.

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In order to establish a prima facie case of obviousness, the examiner must identify a suggestion or motivation to modify the teachings of the cited references to achieve the claimed invention. In re Kotzab, 217 F.3d 1365, 1370, 55 USPQ2d 1313, 1316-17 (Fed. Cir. 2000). The evidence of a suggestion, teaching, or motivation to modify a reference may flow from the prior art reference itself, the knowledge of one of ordinary skill in the art, or from the nature of the problem to be solved. Pro-Mold & Tool Co. v. Great Lakes Plastics, Inc., 75 F.3d 1568, 1573, 37 USPQ2d 1626, 1630 (Fed. Cir. 1996).

We are in agreement with appellant that the examiner's conclusion of obviousness is unsupported by the prior art. See appeal brief, page 11, last paragraph - page 12. As pointed out by appellant, Lee does not intentionally offset the second mask during etching as required by the present claims. Rather, Lee's invention is directed towards "overcom[ing] many of the troubles due to mask pattern misalignment." See Lee, column 3, lines 36-38. Thus, one of ordinary skill in the art, upon reading Lee's disclosure, simply would not have been motivated to intentionally offset the masks, and, in particular, by a distance of  $\frac{1}{2}$  the minimum pitch as required by the claims.

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It is readily apparent that the examiner's rejection can only be based upon improper hindsight reasoning. See W. L. Gore & Assoc. v. Garlock, Inc., 721 F.2d 1540, 1553, 220 USPQ 303, 312-13 (Fed. Cir. 1983). ("To imbue one of ordinary skill in the art with knowledge of the invention in suit, when no prior art reference or references of record convey or suggest that knowledge, is to fall victim to the insidious effect of a hindsight syndrom wherein that which only the inventor taught is used against its teacher.") Accordingly, the rejection is reversed.

3. Rejection of claim 3 under 35 U.S.C. § 103 as unpatentable over Lee and further in view of Keyser

The examiner relies on Keyser as disclosing an etching method for integrated circuit fabrication wherein a selectively protected film is later removed to expose the substrate. Examiner's answer, page 3, last paragraph. Like Lee, Keyser fails to disclose or suggest an etching step in which the masks are offset by a distance of  $\frac{1}{2}$  the minimum pitch as required by claim 3. Accordingly, this rejection is reversed for the same reasons set forth above in connection with claim 1, from which claim 3 depends.

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In sum, we reverse the rejection of claims 1 and 2 under 35 U.S.C. § 112, second paragraph, the rejection of claims 1 and 2 under 35 U.S.C. § 103 as unpatentable over Lee and the rejection of claim 3 under 35 U.S.C. § 103 as unpatentable over Lee and further in view of Keyser

REVERSED

WILLIAM F. SMITH	)	
Administrative Patent Judge	)	
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	)	
	)	BOARD OF PATENT
BRADLEY R. GARRIS	)	APPEALS AND
Administrative Patent Judge	)	INTERFERENCES
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LINDA R. POTEATE	)	
Administrative Patent Judge	)	

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