

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.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. 16

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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Ex parte MARK C. HAKEY,  
STEVEN J. HOLMES,  
DAVID V. HORAK,  
and WILLIAM H. MA

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Appeal No. 1999-0768  
Application No. 08/878,136

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HEARD: November 07, 2001

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Before, WARREN, KRATZ, and PAWLIKOWSKI, Administrative Patent Judges.

KRATZ, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal from the examiner's final rejection of claims 14, 15 and 17-19, which are all of the claims pending in this application.

BACKGROUND

Appellants' invention relates to a high capacitance storage node substrate. An understanding of the invention can

be derived from a reading of exemplary claim 14, which is reproduced below.

14. A substrate with a high capacitance storage node, comprising:  
a trench formed in a substrate having sidewalls and a bottom;  
a projection of said substrate centrally positioned within said trench projecting above said bottom of said trench;  
a dielectric material coated on said sidewalls and bottom of said trench and on said projection of said substrate within said trench;  
and  
a conductive material filling said trench on top of said dielectric material.

The sole prior art reference of record relied upon by the examiner in rejecting the appealed claims is:

Keiser et al. (Keiser)                      4,671,970                      Jun. 09,  
1987

Claims 14, 15 and 17-19 stand rejected under 35 U.S.C. § 102 as being anticipated by Keiser.

We refer to the brief and to the answer for the opposing viewpoints expressed by appellants and the examiner concerning the above-noted rejection.

OPINION

Upon careful review of the entire record including the respective positions advanced by appellants and the examiner, we find ourselves in agreement with appellants that the examiner has failed to carry the burden of establishing a *prima facie* case of anticipation. Accordingly, we will reverse the examiner's § 102 rejection.

In this regard, the examiner has the initial burden of establishing a *prima facie* case of anticipation by pointing out where all of the claim limitations appear in a single reference. See *In re Spada*, 911 F.2d 705, 708, 15 USPQ2d 1655, 1657 (Fed. Cir. 1990); *In re King*, 801 F.2d 1324, 1327, 231 USPQ 136, 138-39 (Fed. Cir. 1986). As developed in appellants' brief, the examiner has not met this burden.

The examiner has not reasonably established where Keiser describes a substrate with a high capacitance storage node having a trench filled with a conductive material as herein claimed. Rather, Keiser discloses a semiconductor substrate having dielectric material filled trenches. See, e.g., column 1, line 14 through column 2, line 5 and Figure 5 of Keiser. While Keiser may use polysilicon (a conductive material) in

the process of forming a final product substrate and hence forms intermediate substrate structure(s) that include polysilicon, the examiner has not established that any fully described intermediate structure of Keiser meets appellants' claimed subject matter.

For example, each of appealed claims 14, 15 and 17 require a substrate having a trench formed therein wherein a projection of the substrate is centrally positioned within the trench and projects above the bottom of the trench. The sidewalls and bottom of the trench and the centrally located substrate projection inside the trench are coated with a dielectric material. The coated trench is filled with a conductive material and the trench and projection therein are arranged so as to provide the substrate with a high capacitance storage node. In other words, the conductive material that fills the dielectric coated trench serves as one conductor of a capacitor with the substrate serving as the other conductor with a dielectric coating therebetween. See the sentence bridging pages 15 and 16 of appellants' specification. In order for the claimed substrate to comprise

a high capacitance storage node, the dielectric is located between the two conductors; that is, the centrally located substrate projection inside the trench is, in effect, an island projection inside the trench (see page 4, lines 3 and 4 of the specification). Viewed another way, the conductive material that fills the trench surrounds the centrally positioned dielectric-coated projection of the substrate inside the trench to form the high capacitance storage node. See appellants' drawing figures 3 and 4, for example.

On the other hand, Keiser forms multiple trenches, each filled with a dielectric material. The portion of the substrate of Keiser reproduced and highlighted by the examiner at page 6 of the answer is not a projection centrally located within a trench so as to form part of a high capacitance storage node, as herein claimed.<sup>1</sup> Rather, that reproduced and

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<sup>1</sup> The claimed subject matter does not read on a substrate including two separately filled trenches separated by a portion of the substrate that extends between those two separate trenches, and with each separate trench not having projections centrally located there within. This is so since the singular article "a" is employed in the appealed claims to describe the trench, the projection and the high capacitance storage node and in light of the described location of the projection within the single trench. This interpretation of the claim language is consistent with appellants'

highlighted portion of Figure 1 of Keiser represents an active region of the substrate of Keiser that is located between a narrow and wide trench region after several processing steps but prior to completion of forming the dielectrically filled trenches desired by Keiser. See column 3, line 36 through column 6, line 5 of Keiser. Similarly, the examiner has not established how the subject matter of appealed claims 18 and 19 is met by Keiser. Accordingly, we will not sustain the examiner's stated § 102 rejection.

CONCLUSION

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specification and the claimed subject matter as a whole as it would have been understood by one of ordinary skill in the art.

The decision of the examiner to reject claims 14, 15 and 17-19 under 35 U.S.C. § 102 as being anticipated by Keiser is reversed.

REVERSED

CHARLES F. WARREN	)	
Administrative Patent Judge	)	
	)	
	)	
	)	
	)	BOARD OF PATENT
PETER F. KRATZ	)	APPEALS
Administrative Patent Judge	)	AND
	)	INTERFERENCES
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	)	
BEVERLY A. PAWLIKOWSKI	)	
Administrative Patent Judge	)	

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APPEAL NO. - JUDGE KRATZ  
APPLICATION NO.

APJ KRATZ

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APJ

DECISION: **ED**

Prepared By:

**DRAFT TYPED:** 01 Jul 02

**FINAL TYPED:**