

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte YAOJIAN LENG,
HONGLIN GUO and
JOE W. MCPHERSON

Appeal No. 2005-0198
Application 10/319,149

ON BRIEF

Before WARREN, OWENS, and WALTZ, Administrative Patent Judges.
WALTZ, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on an appeal from the primary examiner's final rejection of claims 1, 2 and 8 through 11. Claims 3 through 7 and 12 are the only other claims pending in this application. Claims 3-7 and 12 stand objected to by the examiner as depending on a rejected base claim but would be allowable if

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rewritten in independent form including all the limitations of the base claim and any intervening claims (final Office action dated Jan. 22, 2004, page 3; Brief, page 2; Answer, page 7).¹ We have jurisdiction pursuant to 35 U.S.C. § 134.

According to appellants, the invention is directed to a method for reducing light induced corrosion and re-deposition of metal features of semiconductor material by incorporating a photon-blocking layer below the PMD layer to limit the exposure of the semiconductor material to light having energy greater than or equal to a band gap energy of the material (Brief, page 3). Representative independent claim 1 is reproduced below:

1. A method for reducing light induced corrosion and re-deposition of metal features of semiconductor material comprising:

limiting exposure of said semiconductor material to light having energy greater than or equal to a band gap energy of the semiconductor material by incorporating a photon-blocking layer in said semiconductor material below the PMD layer.

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

Pernyeszi et al. (Pernyeszi) 5,031,017 Jul. 09, 1991

¹ We fail to understand how the examiner could indicate that claims 3-7 and 12 are allowable when there is a pending rejection of claims 1-12 under the second paragraph of section 112 (Answer, page 3). However, this issue becomes moot in view of our decision *infra* in this appeal.

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Kao et al. (Kao)	6,249,044 B1	Jun. 19, 2001
Rhodes (filed Feb. 7, 2001)	6,611,013 B2	Aug. 26, 2003

Claims 1-12 stand rejected under 35 U.S.C. § 112, second paragraph, as indefinite (Answer, page 3). Claims 1, 2, 8 and 9 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Kao in view of Pernyeszi (*id.*). Claims 10 and 11 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Kao in view of Pernyeszi and Rhodes (Answer, page 4).

We reverse all of the examiner's rejections on appeal essentially for the reasons stated in the Brief and those reasons set forth below.

OPINION

A. *The Rejection under § 112, ¶2*

The examiner finds that the PMD layer recited in claim 1 on appeal is described in the specification but "it is not understood what a PMD layer is and the specification does not explain what it is or what its characteristics are" (Answer, page 3).

Appellants argue that the PMD layer is discussed in the specification at page 4, ll. 23-24, and is also shown as element 16 in Figure 3 (Brief, page 6). Thus appellants submit that

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claims 1-12, read in light of the specification, reasonably apprise those skilled in the art of the scope of the invention (*id.*).

As correctly stated by appellants, the legal standard for definiteness of claim language is whether a claim reasonably apprises one of ordinary skill in the art of its scope when read in light of the specification. See *In re Warmerdam*, 33 F.3d 1354, 1361, 31 USPQ2d 1754, 1759 (Fed. Cir. 1994). The PMD layer is described as the "Poly-Metal Dielectric layer 16" on page 4, ll. 23-24, of the specification, referring to Figure 3. As seen from Figure 3, the PMD layer 16 is a layer that encompasses or surrounds more than one metal, e.g., the copper (Cu) metal interconnect 8 and the contact metal tungsten (W)(see the specification, page 2, ll. 17-21). Accordingly, from the plain language of the claim, as read in light of the specification, one of ordinary skill in this art would have been apprised that the scope of the contested language defines a dielectric (non-conductive)² layer that surrounds the first layer metal interconnects and a plurality of contacts.

² See *Hackh's Chemical Dictionary*, 3rd ed., p. 270, The Blakiston Co., Inc., 1953, where "dielectric" is defined as an "insulator or non-conductor of electricity."

For the foregoing reasons and those stated in the Brief, we determine that the examiner has failed to meet the burden of establishing that one of ordinary skill in this art would not have been apprised of the scope of the language recited in claim 1 on appeal. Therefore we reverse the examiner's rejection of claims 1-12 under the second paragraph of section 112.

B. The Rejections under § 103(a)

With regard to the rejection over Kao in view of Pernyeszi, the examiner finds that Kao discloses a method of forming a light shield layer on an integrated circuit where light is blocked by an opaque metal layer 22 (Answer, paragraph bridging pages 3-4). The examiner apparently recognizes that Kao fails to disclose or suggest that the photon-blocking layer is below the PMD layer since the examiner applies Pernyeszi to show that a photon blocking layer "should be applied directly on the IC [integrated circuit]" (Answer, page 4). From these findings, the examiner concludes that it would have been obvious to modify the Kao structure to provide the photon blocking layer directly on the IC as shown by Pernyeszi "to provide it in the ideal place" (*id.*).

We determine that the examiner has failed to establish a case of *prima facie* obviousness for several reasons. The examiner finds that Kao discloses the shield is above layers 33

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and 35 but following the teachings of Pernyeszi the shield layer would *then* be on layer 33 which places it below layers 35 and 37 (Answer, page 5). Therefore the examiner finds that the Kao structure as modified by Pernyeszi would have a shield below the layer of insulator 35 and the contact structure 37 "which, is the same, apparently, as the PMD layer." *Id.* First, even assuming *arguendo* the propriety of the examiner's proposed modification, on this record the examiner has not established that both the insulating material 35 or the under bump layer 37 (called the contact structure by the examiner) is the "same" as the PMD layer recited in claim 1 on appeal (see the Brief, page 7). Second, the examiner has not established any specific motivation, suggestion or reasoning to support the proposed modification of the Kao structure. See *In re Dembiczak*, 175 F.3d 994, 999, 50 USPQ2d 1614, 1617 (Fed. Cir. 1999). The examiner has generally stated the motivation as modifying the structure of Kao as taught by Pernyeszi "to provide it [the photon blocking layer] in the ideal place." Answer, page 4. However, on this record, the examiner has failed to establish any convincing reason or point to any specific disclosure or teaching from Pernyeszi regarding the "ideal place" that would have motivated one of ordinary skill in this art to modify the structure of Kao as proposed. Third,

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the examiner has not explained how the proposed modification where the shield is below the under bump layer 37 could be accomplished since Kao teaches that the light shield 22 is a *portion* of an under bump layer 37 (col. 3, ll. 18-19). The examiner's proposed modification fails to account for the teaching in Kao that the light shield is located so as to block ambient light from reaching light sensitive portions of the IC (col. 3, ll. 50-53). Finally, Pernyeszi specifically teaches away from the proposed modification by teaching that the application of the shield normally follows the fabrication of the active elements on the wafer, metallization to form contacts, and the passivation layer (col. 7, ll. 21-28). We construe this teaching in Pernyeszi to mean that the shield should be the top layer over the integrated circuits, metal contacts, and the passivation layer, contrary to the examiner's proposed modification of the Kao structure.

For the foregoing reasons, we determine that the examiner has not established a *prima facie* case of obviousness in view of the reference evidence. With regard to the rejection of claims 10 and 11, we determine that Rhodes has been applied by the examiner to show the use of chemical-mechanical polishing (CMP) to planarize a light-shielding structure (Answer, page 4).

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Therefore, the citation of Rhodes does not cure the deficiencies discussed above. Accordingly, we determine that the examiner has also not established a *prima facie* case of obviousness with regard to the rejection of claims 10 and 11.

The rejection of claims 1, 2, 8 and 9 under 35 U.S.C. § 103(a) over Kao in view of Pernyeszi is reversed. The rejection of claims 10 and 11 under 35 U.S.C. § 103(a) over Kao in view of Pernyeszi and Rhodes is reversed.

The decision of the examiner is reversed.

REVERSED

Charles F. Warren)	
Administrative Patent Judge)	
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)	BOARD OF PATENT
Terry J. Owens)	APPEALS AND
Administrative Patent Judge)	INTERFERENCES
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