

THIS OPINION WAS NOT WRITTEN FOR PUBLICATION

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(2) is not binding precedent of the Board.

Paper No. 16

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte CHRIS C. YU, JEFFREY F. HANSON,
and JEFFREY L. KLEIN

Appeal No. 96-2939
Application 08/205,423¹

ON BRIEF

Before JOHN D. SMITH, OWENS, and LIEBERMAN, Administrative
Patent Judges.

LIEBERMAN, Administrative Patent Judge.

DECISION ON APPEAL

This is an appeal under 35 U.S.C. § 134 of the examiner's
refusal to allow claims 1, 2, 4, 5, and 7 through 16, as

¹ Application for patent filed March 4, 1994.

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amended under 37 CFR § 1.116 after the final rejection.² See the amendment dated May 11, 1995 (Paper No. 7) and the advisory action dated May 23, 1995 (Paper No. 8).

THE INVENTION

Appellants' invention is directed to a method for chemical mechanical polishing (CMP) of semiconductors having a metal layer. A slurry composition containing copper sulfate, CuSO_4 , or copper perchlorate, $\text{Cu}(\text{ClO}_4)_2$, is used to polish the metal layer.

THE CLAIMS

Claims 1 and 4 are illustrative of appellants' invention and are reproduced below.

1. A method for chemical mechanical polishing a metal layer in a semiconductor device comprising the step of polishing the metal layer using a slurry comprising copper sulfate and having a pH of between approximately 4-7.

4. A method for chemical mechanical polishing a metal layer in a semiconductor device comprising the step of polishing the metal layer using a slurry comprising copper perchlorate and having a pH of between approximately 4-7.

THE REFERENCES OF RECORD

As evidence of obviousness, the examiner relies upon the

² Claims 3 and 6 were canceled in the amendment under 37 CFR § 1.116.

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following references of record.

Lowen	3,385,682	May 28, 1968
Cadien et al.	5,340,370	Aug. 23, 1994 (filed Nov. 3, 1993)

THE REJECTIONS

Claims 1, 2, 4, 5, and 7 through 16 stand rejected under 35 U.S.C. § 103 as unpatentable over Cadien in view of Lowen.

OPINION

Appellants have requested that the appealed claims be considered in four distinct groups and have supplied ample reasons for such consideration. See 37 CFR 1.192(c)(5)(1994). In contrast to appellants' position, our decision is based upon issues, which, in our analysis, are common to and shared by each of the claims before us. Accordingly, we do not find it necessary to separately discuss the four groups of claims established by appellants. We will therefore, substantially confine our discussion to that of claims 1 and 4.

We have carefully considered all of the arguments advanced by appellants and the examiner and agree with appellants that the aforementioned rejection is not well founded. Accordingly, we will not sustain the rejection.

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The examiner's rejection is based upon the disclosure in the secondary reference to Lowen of the oxidizing agents of the claimed subject matter, i.e., sulfate, and perchlorate. We find that Lowen neither discloses nor suggests to the person having ordinary skill in the art at the time the invention was made that one would have used either copper sulfate or copper perchlorate of the claimed subject matter in polishing a metal layer.

As to the utilization of a sulfate ion required by the claimed subject matter, we find no equivalency between Lowen's disclosure of persulfate ion and sulfate ion. Accordingly, patentee's use of persulfate ion neither discloses nor suggests the use of sulfate ion.

With respect to the use of a perchlorate ion, one would first have to choose a perchlorate ion from the group of oxidizing agent taught by Lowen. See column 2, lines 19-20. Once having made that choice, no additional direction is given by patentee. Only a broad class of perchlorate ion is taught. The Lowen reference offers no guidance to one having ordinary skill in the art as to the use of a particular cation. Indeed, the only cation disclosed by Lowen with any oxidizing

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agent is potassium. See column 2, line 56. We find no disclosure or suggestion by Lowen to use copper ions in any compound as required by the claimed subject matter. We conclude that the prior art relied upon by the examiner gives no indication which cations are critical and no direction as to which of the many possible choices of cation is likely to be successful. Accordingly, the choice of copper would have fallen within the "obvious to try" test. See In re O'Farrell 853 F.2d 894, 903, 7 USPQ2d 1673, 1681 (Fed. Cir. 1988).

Based upon the above analysis, we have determined that the examiner's legal conclusion of obviousness is not supported by the facts. "[W]here the legal conclusion of obviousness is not supported by facts it cannot stand." In re Warner, 379 F.2d 1011, 1017, 154 USPQ 173, 178 (CCPA 1967).

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DECISION

The rejection of claims 1, 2, 4, 5, and 7 through 16 under 35 U.S.C. § 103 as unpatentable over Cadien in view of Lowen is reversed.

The decision of the examiner is reversed.

REVERSED

	John D. Smith)	
	Administrative Patent Judge)	
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)	
	Terry J. Owens)	BOARD OF
PATENT	Administrative Patent Judge)	APPEALS AND

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Paul Lieberman) INTERFERENCES
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