

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.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. 30

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte EDWARD A. SCHROCK

Appeal No. 2003-0543
Application 09/292,745

HEARD: JULY 16, 2003

Before RUGGIERO, DIXON, and SAADAT, Administrative Patent Judges.
RUGGIERO, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on the appeal from the final rejection of claims 1-3, 6-13, 16-18, and 30-34. Claims 4, 5, 14, and 15 have been canceled. Claims 19-29 stand withdrawn from consideration as being directed to a non-elected invention.

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The claimed invention relates to a semiconductor device which is provided with copper traces for connecting active elements to an external device. More particularly, insulating layers of black oxide (cupric oxide) are formed on the copper traces, the black oxide functioning as a substitute for the conventionally used solder resist mask.

Claim 1 is illustrative of the invention and reads as follows:

1. A semiconductor device, comprising:

semiconductor active elements;

metal traces for connecting said active elements to an external device, wherein said metal is copper; and

insulating layers on said metal traces, said insulating layers including black oxide, wherein said black oxide is a substitute for a solder resist mask.

The Examiner relies on the following prior art:

Ma et al. (Ma)	5,742,483	Apr. 21, 1998
Berg et al. (Berg)	5,756,380	May 26, 1998
Shimazu	JP 06-338535	Dec. 06, 1994
(Published Japanese Patent Application) ¹		

¹A copy of a translation provided by the U.S. Patent and Trademark Office, October 2000, is included along with this decision.

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Claims 1-3, 6-13, 16-18, and 30-34, all of the appealed claims, stand finally rejected under 35 U.S.C. § 103(a) as being unpatentable over Berg in view of Shimazu.²

Rather than reiterate the arguments of Appellant and the Examiner, reference is made to the Briefs³ and Answer for the respective details.

OPINION

We have carefully considered the subject matter on appeal, the rejection advanced by the Examiner, the arguments in support of the rejection and the evidence of obviousness relied upon by the Examiner as support for the rejection. We have, likewise, reviewed and taken into consideration, in reaching our decision, Appellant's arguments set forth in the Briefs along with the Examiner's rationale in support of the rejection and arguments in rebuttal set forth in the Examiner's Answer.

² The Ma reference, not part of the stated rejection, is cited by the Examiner as providing evidentiary support for the use of metal oxide as a solder resist mask.

³ The Appeal Brief was filed March 7, 2002 (Paper No. 20). In response to the Examiner's Answer dated April 29, 2002 (Paper No. 21), a Reply Brief was filed July 1, 2002 (Paper No. 22), which was acknowledged and entered by the Examiner as indicated in the communication dated September 4, 2002 (Paper No. 24).

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It is our view, after consideration of the record before us, that the evidence relied upon and the level of skill in the particular art would not have suggested to one of ordinary skill in the art the invention as set forth in claims 1-3, 6-13, 16-18, and 30-34. Accordingly, we reverse.

In rejecting claims under 35 U.S.C. § 103, it is incumbent upon the Examiner to establish a factual basis to support the legal conclusion of obviousness. See In re Fine, 837 F.2d 1071, 1073, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988). In so doing, the Examiner is expected to make the factual determinations set forth in Graham v. John Deere Co., 383 U.S. 1, 17, 148 USPQ 459, 467 (1966), and to provide a reason why one having ordinary skill in the pertinent art would have been led to modify the prior art or to combine prior art references to arrive at the claimed invention. Such reason must stem from some teaching, suggestion or implication in the prior art as a whole or knowledge generally available to one having ordinary skill in the art. Uniroyal Inc. v. Rudkin-Wiley Corp., 837 F.2d 1044, 1051, 5 USPQ2d 1434, 1438 (Fed. Cir.), cert. denied, 488 U.S. 825 (1988); Ashland Oil, Inc. v. Delta Resins & Refractories, Inc., 776 F.2d 281, 293, 227 USPQ 657, 664 (Fed. Cir. 1985), cert.

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denied, 475 U.S. 1017 (1986); ACS Hosp. Sys., Inc. v. Montefiore Hosp., 732 F.2d 1572, 1577, 221 USPQ 929, 933 (Fed. Cir. 1984). These showings by the Examiner are an essential part of complying with the burden of presenting a prima facie case of obviousness. Note In re Oetiker, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992).

With respect to the Examiner's 35 U.S.C. § 103(a) rejection of each of the appealed independent claims 1, 8, 13, 30, and 34, based on the combination of Berg and Shimazu, Appellant asserts that the Examiner has failed to establish a prima facie case of obviousness since all of the claimed limitations are not taught or suggested by the applied prior art references. In particular, Appellant contends (Brief, pages 5 and 6; Reply Brief, pages 3 and 4), that neither Berg nor Shimazu has any teaching or suggestion of using black oxide as a substitute for a solder resist mask as claimed.

After careful review of the Berg and Shimazu references, in light of the arguments of record, we are in general agreement with Appellant's position as stated in the Briefs. In particular, in contrast to the Examiner's position, we find no teaching or suggestion in Shimazu of the use of black oxide as a

solder resist mask. While Shimazu discloses the use of a "copper oxide" as a solder mask, we find no basis for the Examiner's assertion (Answer, page 8) that "copper oxide" is known to include both brown oxide (cuprous oxide, Cu_2O), which the Examiner refers to as dicopper oxide, and black oxide (cupric oxide, CuO).

We agree with Appellant that, while dicopper oxide (Cu_2O) may identify brown oxide, the Examiner has provided no evidence to support the conclusion that "copper oxide," a term which refers to the genus of the oxides of copper, would be recognized by a skilled artisan as referring to the species of copper oxide known as black oxide (CuO). "[T]he Board cannot simply reach conclusions based on its own understanding or experience - or on its assessment of what would be basic knowledge or common sense. Rather, the Board must point to some concrete evidence in the record in support of these findings." In re Zurko, 258 F.3d 1379, 1386, 59 USPQ2d 1693, 1697 (Fed. Cir. 2001). See also In re Lee, 277 F.3d 1338, 1344-45, 61 USPQ2d 1430, 1434-35 (Fed. Cir. 2002), in which the court required evidence for the determination of unpatentability by clarifying that the principles of "common knowledge" and "common sense" may only be applied to analysis of evidence, rather than be a substitute for

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evidence. The court has also recently expanded their reasoning on this topic in In re Thrift, 298 F.3d 1357, 1363, 63 USPQ2d 2002, 2008 (Fed. Cir. 2002).

In our view, contrary to the Examiner's assertions in support of the proposed combination, the disclosure of Shimazu lacks any teaching of the use of black oxide, let alone any suggestion of the use of black oxide as a substitute for the solder resist mask in Berg. We also find nothing in the disclosure of the Ma reference, which provides a general teaching of the use of a metal oxide as a solder mask, which would suggest the use of a specific oxide, i.e., black oxide, as claimed.

Since all of the claim limitations are not taught or suggested by the applied prior art, it is our opinion that the Examiner has not established a prima facie case of obviousness with respect to the claims on appeal. Accordingly, we do not sustain the Examiner's 35 U.S.C. § 103(a) rejection of independent claims 1, 8, 13, 30, and 34, nor of claims 2, 3, 6,

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7, 9-12, 16-18, and 31-33 dependent thereon. Therefore, the Examiner's decision rejecting claims 1-3, 6-13, and 16-18, and 30-34 is reversed.

REVERSED

JOSEPH F. RUGGIERO)	
Administrative Patent Judge)	
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)	BOARD OF PATENT
JOSEPH L. DIXON)	APPEALS AND
Administrative Patent Judge)	INTERFERENCES
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