

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.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 KUO-YU CHOU and TONG-CHERN ONG

Appeal No. 2005-1937
Application No. 09/978,420

ON BRIEF

Before LEVY, BLANKENSHIP, and SAADAT, Administrative Patent Judges.
LEVY, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal from the examiner's final rejection of claims 1-3, 6 and 13, which are all of the claims pending in this application.

We AFFIRM.

BACKGROUND

The appellant's invention relates to microelectronic fabrications (specification, page 1).

Claim 1 is representative of the invention, and is reproduced as follows:

1. A method for fabricating a microelectronic fabrication comprising:

providing a substrate;

forming over the substrate a series of patterned conductor layers separated by a series of dielectric layers; and

forming over the substrate in electrical connection with the series of patterned conductor layers separated by the series of dielectric layers at least one fuse layer formed simultaneously with an alignment mark, wherein the at least one fuse layer is formed at a level no lower than a highest of the series of patterned conductor layers and wherein the at least one fuse layer and the highest of the series of patterned conductor layers are formed of different conductor materials.

The prior art references of record relied upon by the examiner in rejecting the appealed claims are:

Koike	6,392,300	May 21, 2002 (filed Jun. 28, 2000)
Wang et al. (Wang)	2002/0155672 A1	Oct. 24, 2002 (filed Apr. 13, 2001)

Claims 1-3, 6 and 13 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Wang in view of Koike.

Rather than reiterate the conflicting viewpoints advanced by the examiner and the appellants regarding the above-noted rejection, we make reference to the answer (mailed February 9, 2005) for the examiner's complete reasoning in support of the rejection, and to the brief (Revised Appeal Brief, filed January 5, 2005) for appellants' arguments thereagainst.

Only those arguments actually made by appellants have been considered in this decision. Arguments which appellants could have made but chose not to make in the brief have not been considered. See 37 CFR § 41.37(c)(1)(vii)(eff. Sept. 13, 2004).

OPINION

In reaching our decision in this appeal, we have carefully considered the subject matter on appeal, the rejection advanced by the examiner, 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, appellants' arguments set forth in the brief along with the examiner's rationale in support of the rejection and arguments in rebuttal set forth in the examiner's answer.

Upon consideration of the record before us, we make the determinations which follow. We observe at the outset

appellants (brief, pages 3-11) present arguments with respect to claims 1, 3 and 13. Accordingly, we select claims 1, 3 and 13 as representative of the rejected claims and consider claims 2 and 6 to stand or fall with the claims from which they depend. We begin with claim 1.

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. 1988); Ashland Oil, Inc. v. Delta Resins & Refractories, Inc., 776 F.2d 281, 293, 227 USPQ 657, 664 (Fed. Cir. 1985); 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). If that burden is met, the burden then shifts to the applicant to overcome the prima facie case with argument and/or evidence. Obviousness is then determined on the basis of the evidence as a whole. See id.; In re Hedges, 783 F.2d 1038, 1039, 228 USPQ 685, 686 (Fed. Cir. 1986); In re Piasecki, 745 F.2d 1468, 1472, 223 USPQ 785, 788 (Fed. Cir. 1984); and In re Rinehart, 531 F.2d 1048, 1052, 189 USPQ 143, 147 (CCPA 1976).

The examiner's position (answer, page 4) is that Wang does not teach forming the fuse layer simultaneously with an alignment mark. To overcome this deficiency of Wang, the examiner turns to Koike for a teaching of forming an alignment mark simultaneously with the forming of a fuse. The examiner asserts (answer, page 5) that Wang and Koike are combinable because they are from the same field of endeavor. It is asserted (id.) that the motivation for combining the references "is to provide an alignment mark for positioning a laser to allow for blowing of the fuse."

Appellants' position (brief, page) is that "Koike . . . teaches that only either a bond pad or a fuse pad is formed simultaneously with an alignment mark, but not both a bond pad

and a fuse layer are formed simultaneously with the alignment mark." It is argued (brief, page 8) that "or" is intended by Koike as mutually exclusive with respect to formation of either one of a bond pad and a fuse layer with an alignment mark. Appellants further assert (id.) that if Koike intended more than one of the pairs of options, Koike would have employed alternative common terminology i.e., and/or.

Appellants further assert (brief, page 8) that Wang and Koike cannot properly be combined because mere existence in the same field of endeavor is insufficient to establish a prima facie case of obviousness. Appellants additionally assert (brief, page 10) that:

appellant notes that Wang at paragraph 0021 teaches that "a passivation layer 118 is formed over the substrate 100 exposing just the bonding pad 112a and the metal fuses 112b." Thus, in addition to being silent with regard to the presence of an alignment mark formed simultaneously with a fuse layer and a bond pad, it might also be explicit or at least implicit within Wang that Wang does not form any other layers simultaneously with Wang's bonding pad 112a and metal fuses 112b, but rather "just the bonding pad 112a and the metal fuses 112b." Had Wang simultaneously formed an alignment mark, the same would also have clearly been exposed for proper alignment purposes that are suggested as needed by the Examiner.

It is further argued (brief, page 11) that "Wang clearly teaches that just a fuse layer and a bond pad are exposed by a

passivation layer, and that based on this teaching, Wang may reasonably be interpreted as explicit as to the absence of other exposable structures. It is additionally argued (id.) that:

Applicant is unable to conjecture with certainty as to how Wang positions a laser to sever one of Wang's fuses. However, Wang clearly excludes and does not require an alignment mark formed at an identical level to effect such a result since Wang has explicitly taught otherwise. As pure conjecture, perhaps Wang might employ an alignment mark formed at a lower level, or in an alternative perhaps one of Wang's fuse layers may be employed as an alignment mark.

From our review of Wang, we find no disclosure of an alignment mark, or any disclosure of a fuse layer formed simultaneously with an alignment mark. However, we find from the curved edges of the semiconductor device shown in figure 4 that the chip extends beyond the edges of the circuit shown in the figure, and that the circuit shown is but a small part of the overall chip. Although Wang is silent as to an alignment mark, we find that the language (paragraph 21, lines 1-3):

A passivation layer 118 is formed over the substrate 100 exposing just the bonding pad 112a and the metal fuses 112b.

does not preclude the existence of an alignment mark. Rather, we find that an alignment mark is not shown because it is not part of Wang's invention, which is directed to forming fuses. We additionally find that the term "just" refers to the fact that

only the fuses 112b and the bond pad 112a are referred to because they are the only components exposed above the barrier layer 110, when the oxide layer and the nitride layer are patterned to expose bonding pad 112a and the metal fuses 112b. We add that in figure 4, the T-shaped element labeled 112b (located between passivation layer portions 118) is in fact the bond pad 112a. Thus, we are not persuaded by appellants' argument (brief, page 11) that Wang's use of the term "just" excludes and does not require an alignment mark formed at an identical level.

Turning to Koike, we observe that appellants (brief, page 9) do not dispute the examiner's finding that the references are in the same field of endeavor. From our review of Koike, we agree with the examiner (answer, page 5) that at the same time the alignment mark 27A is formed, the metal fuse (not shown) or the bonding pad 27B is shown (col. 2, lines 8-11 and col. 6, lines 24-27). We agree with appellants (brief, page 6) that the term "or" as used in Koike refers to either a bond pad or fuse layer is formed simultaneously with the alignment mark. However, although we additionally agree with appellants (brief, page 8) that Koine's reference to "or" means that only one of a fuse or bond pad will be simultaneously formed with the alignment mark, we do not agree with appellants (id.) that the term "or" is meant

to be mutually exclusive with respect to the entire chip. We agree that at a given location of the substrate, either a bond pad or fuse will be formed simultaneously with an alignment mark. However, when one considers the semiconductor device as a whole, we interpret the language of Koike to be that in some areas, there will be a fuse formed simultaneously with the alignment mark, and that in other areas of the device, there will be a bond pad formed simultaneously with the alignment mark.

Koike discloses (col. 8, lines 29-41) to the effect that the alignment mark should not be removed, because the alignment mark is for positioning the laser for blowing the fuse. If the alignment mark is removed, fuse-blow cannot be carried out. From this disclosure of Koike, we find that the alignment mark should not be removed, because it is needed for aligning the laser for fuse-blow. We are in agreement with appellants' assertion (brief, page 11) that "[a]pplicant is unable to conjecture with certainty as to how Wang positions a laser to sever one of Wang's fuses" as Wang is silent as to alignment marks. However, we do not agree with appellants (id.) that Wang clearly excludes and does not require an alignment mark. As stated, supra, we do not interpret Wang's "exposing just the bonding pad 112a and the metal fuses 112b" to mean that an alignment mark is excluded, but

rather that the bonding pad and fuse are exposed because they are the only elements above the barrier layer. From Wang's disclosure of fuses and silence as to an alignment mark, and Koike's disclosure that an alignment mark is needed to align the laser for fuse-blowing, we find that an artisan would have been motivated to provide Wang with alignment marks for the fuses, as taught by Koike. We do not agree with the examiner (answer, page 5) that Wang and Koike are combinable because they are in the same field of endeavor. The fact that the references are from the same field of endeavor means that they are from analogous arts, and an artisan would have considered Koike as part of the prior art to be considered. However, this alone is not a motivation to combine the teachings of Wang and Koike. However, we agree with the examiner that the motivation for combining the teachings of Wang and Koike is to provide alignment marks for positioning a laser for fuse-blowing.

From all of the above, we find that the teachings of Wang and Koike suggest the language of claim 1, and are not convinced of any error on the part of the examiner. The rejection of claim 1 under 35 U.S.C. § 103(a) is therefore affirmed. As claims 2 and 6 fall with claim 1, the rejection of claims 2 and 6 under 35 U.S.C. § 103(a) is affirmed.

We turn next to claims 3 and 13. The examiner's position (answer, page 5) is that Wang teaches a fuse layer formed simultaneously with a bond pad. Appellants' position (brief, page 6) is that claims 3 and 13 recite the simultaneous formation of a bond pad, fuse layer and alignment mark, and that each of the references teach simultaneous formation of only two of those components.

We make reference to our findings, supra, with respect to the teachings and suggestions of Wang and Koine with respect to claim 1. From our review of Wang, we agree with the examiner that Wang discloses concurrently forming the fuses and the bonding pads (paragraphs 7 and 8). Upon combining the teachings of Wang and Koike, the resultant structure will be simultaneously formed alignment mark, bond pad and fuse layer. With regard to appellants' assertion (brief, page 6) that each of the references teaches simultaneous formation of only two of the components, we note that the issue is not what each of the references teach, but rather what the references as a whole would have suggested to an artisan. Accordingly, we do not agree with appellants that an artisan might conclude that only two of the components may be simultaneously formed, since in Koike, the overall device will have areas where an alignment mark was formed at the same time as

a fuse, and in other areas, the alignment mark will be formed with a bonding pad.

From all of the above, we find that the teachings of Wang and Koike suggest the language of claims 3 and 13, and are not convinced of any error on the part of the examiner. The rejection of claims 3 and 13 under 35 U.S.C. § 103(a) is therefore affirmed.

CONCLUSION

To summarize, the decision of the examiner to reject claims 1-3, 6 and 13 under 35 U.S.C. § 103 is affirmed. No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a)(1)(iv).

AFFIRMED

STUART S. LEVY)	
Administrative Patent Judge)	
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)	BOARD OF PATENT
HOWARD B. BLANKENSHIP)	APPEALS
Administrative Patent Judge)	AND
)	INTERFERENCES
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