

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. 22

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte MING-CHANG TENG

Appeal No. 1999-1792
Application No. 08/879,477

ON BRIEF

Before BARRETT, FLEMING and LALL, Administrative Patent Judges.

LALL, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal under 35 U.S.C. § 134 from the final rejection of claims 1-8, 12, 13, 14-21, 24, and 27-29, which constitutes all the pending claims in the application.

The invention relates to a method of depositing a metal layer, aluminum-copper alloy, at two different temperature ranges and at specified thicknesses which yield unexpectedly improved via resistance.

Appeal No. 1999-1792
Application No. 08/879,477

The invention is further illustrated by the following claim.

1. A method of depositing a metal layer on a semiconductor substrate comprising the steps of:

providing a silicon substrate having a first metal layer;

depositing an insulating layer over said metal layer;

forming via holes therein said insulating layer;

performing a sputter etch cleaning of said via holes;

depositing a barrier layer in said via holes;

depositing a film of second metal over said barrier layer, wherein said second metal is aluminum copper alloy, wherein second metal is deposited at a temperature between about 40°C to 80°C, and wherein the thickness of said second metal is between about 6,000 to 6,600 Å; and

depositing an anti-reflective coating onto said film of metal.

The Examiner relies on the following references:

Lee et al. (Lee)	5,266,521
Nov. 30, 1993	
MacNaughton et al. (MacNaughton)	5,374,592
Dec. 20, 1994	
Mueller et al. (Mueller)	5,427,666
June 27, 1995	

Admitted Prior Art (APA)

Claims 1-8, 12 and 13 stand rejected over APA in view of Mueller and MacNaughton, while claims 1-8, 12, 13, 14-21, 24, and 27-29 stand rejected over Lee in view of APA and

Appeal No. 1999-1792
Application No. 08/879,477

MacNaughton.

Appeal No. 1999-1792
Application No. 08/879,477

Rather than repeat the positions and the arguments of Appellant and the Examiner, we make reference to the briefs¹ and the answer for their respective positions.

OPINION

We have considered the rejections advanced by the Examiner.

We have, likewise reviewed Appellant's arguments against the rejections as set forth in the briefs.

It is our view, after consideration of the record before us, that the rejections under 35 U.S.C. § 103 are not proper. Accordingly, we reverse.

At the outset, we note that Appellant has elected all the claims to stand or fall together, see brief at page 7.

ANALYSIS

In our analysis, we are guided by the general proposition that in an appeal involving a rejection under 35 U.S.C. § 103,

¹ A reply brief was filed as Paper No. 19 and was considered by the Examiner without any further response, see Paper No. 21.

Appeal No. 1999-1792
Application No. 08/879,477

an Examiner is under a burden to make out a prima facie case of obviousness. If that burden is met, the burden of going forward 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 and the relative persuasiveness of the arguments. See In re Oetiker, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992); 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). We are further guided by the precedent of our reviewing court that the limitations from the disclosure are not to be imported into the claims. In re Lundberg, 244 F.2d 543, 113 USPQ 530 (CCPA 1957); In re Queener, 796 F.2d 461, 230 USPQ 438 (Fed. Cir. 1986). We also note that the arguments not made separately for any individual claim or claims are considered waived. See 37 CFR § 1.192(a) and (c). In re Baxter Travenol Labs., 952 F.2d 388, 391, 21 USPQ2d 1281, 1285 (Fed. Cir. 1991) (“It is not the function of this court to examine the claims in greater detail than argued by an appellant, looking for

Appeal No. 1999-1792
Application No. 08/879,477

nonobviousness distinctions over the prior art."); In re Wiechert, 370 F.2d 927, 936, 152 USPQ 247, 254 (CCPA 1967)("This court has uniformly followed the sound rule that an issue raised below which is not argued in this court, even of it has been properly brought here by reason of appeal is regarded as abandoned and will not be considered. It is our function as a court to decide disputed issues, not to create them.").

The Examiner has given two separate rejections under 35 U.S.C. § 103 over two combinations of references.

We consider the two rejections of in seriatim.

Rejection of claims 1-8, 12 and 13.

The Examiner explains the rejection of these claims over APA, Mueller and MacNaughton in detail on pages 4 to 6 of the Examiner's answer. We agree with the Examiner that Mueller shows a barrier layer (TiN) at 58, and MacNaughton shows a metal deposition process at the temperature range of 40° to 80°C, approximately, in Figure 4 and column 3, lines 28-33. MacNaughton, like Appellant, also is concerned with the problems of having "voids" and larger grain size particles in the making of the semiconductor

devices. However, we do not agree with the Examiner's assertion that MacNaughton's teachings of aluminum can be directly transferred to the manufacture of aluminum copper alloy. Instead, we agree with Appellant's argument, brief at page 8, "that MacNaughton teaches the use

of a deposition temperature at low temperature below 100°C to obtain small grain size is again only in relation to the deposition of aluminum and aluminum only. . . . [and] it would be erroneous to assume that everything that is taught about aluminum will also apply exactly the same way to its alloy, AlCu." The Examiner needs a bridging reference or a line of reasoning before the teachings of MacNaughton, which are solely disclosed to relate to the deposition of aluminum only, can be transferred to the manufacture involving aluminum copper alloy. This the Examiner has not done.

Therefore, we cannot sustain the rejection of claims 1-8, 12 and 13 over APA in view of Mueller and MacNaughton.

Rejection of claims 1-8, 12, 13, 14-21, 24, and 27-29.

The Examiner has given a lucid explanation of the rejection of these claims over Lee in view of APA and MacNaughton on pages 6-8 of the Examiner's answer. We agree

Appeal No. 1999-1792
Application No. 08/879,477

with the Examiner that Lee discloses the temperature range as "below 150°C for the first layer to obtain small grain [size] and high surface energy, . . . and higher . . . temperature but lower than below 350°C [for the second layer]", see Examiner's answer at page 6. However, we again disagree with the Examiner when Examiner uses the teachings of MacNaughton to modify the temperature range disclosed by Lee. Therefore, for the same rationale as above, we are of the view that the combination of Lee and MacNaughton is not justified. APA does not add any rationale to further justify the combination of MacNaughton and Lee. Therefore, we cannot sustain the obviousness rejection of claims 1-8, 12, 13, 14-21, 24, and 27-29 over Lee, APA and MacNaughton.

Finally, we note parenthetically that the Examiner has made certain other allegations. For example, answer at page 11 alleges that the original disclosed temperature range for the disclosed process was between 30° and 80°C, and was later changed to between 40°C and 80°; and answer at pages 11 and 12 alleges that the results in Figure 2C of the disclosure are not commensurate with the scope of the claims. However, according to the guidelines above, in making our decision, we have only

Appeal No. 1999-1792
Application No. 08/879,477

dealt with the issues which were actually raised before us on appeal, and we do not wish to create new issues which are not properly before us.

Appeal No. 1999-1792
Application No. 08/879,477

In conclusion, we have not sustained the rejection of claims 1-8, 12 and 13, over APA, Mueller and MacNaughton and the rejection of 1-8, 12, 13, 14-21, 24, and 27-29 over Lee, APA and MacNaughton. Accordingly, we reverse the Examiner's rejection under 35 U.S.C. § 103.

REVERSED

LEE E. BARRETT)	
Administrative Patent Judge)	
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)	
)	
)	BOARD OF PATENT
MICHAEL R. FLEMING)	APPEALS
Administrative Patent Judge)	AND
)	INTERFERENCES
)	
)	
PARSHOTAM S. LALL)	
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Appeal No. 1999-1792
Application No. 08/879,477

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