

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opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.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. 51

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte AKIHIKO OHSAKI

Appeal No. 1998-0694
Application No. 08/637,009

ON BRIEF

Before HAIRSTON, JERRY SMITH, and LALL, Administrative Patent Judges.

JERRY SMITH, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on the appeal under 35 U.S.C. § 134 from the examiner's rejection of claims 22, 24-28 and 30-36. Claims 23 and 29 have been canceled. Claims 1-21 stand

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withdrawn from consideration as being directed to a nonelected invention.

The invention pertains to a semiconductor device having a titanium silicide film formed on a silicon crystal surface.

The titanium silicide film is made thermally stable by forming a thermal oxide film on its surface, wherein the thermal oxide film comprises titanium oxide and silicon dioxide. The thermal oxide film prevents agglomeration of the titanium silicide at temperatures in which agglomeration would occur in the absence of the thermal oxide. A method for making such a semiconductor device is also disclosed and claimed.

Representative claim 22 is reproduced as follows:

22. A semiconductor device including a thermally stable titanium silicide structure comprising a titanium silicide film formed on a silicon crystal surface, and a thermal oxide, comprising titanium oxide and silicon dioxide, formed on a surface of said titanium silicide, wherein said thermal oxide film prevents agglomeration of said titanium silicide film at temperatures between 800°C and 1,000°C which agglomeration would occur in the absence of said thermal oxide.

The examiner relies on the following references:

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Levinstein et al. (Levinstein) 4,276,557 Jun. 30,
1981

Wei Yi Yang et al. (Yang), "Study of Oxidation of TiSi_2 Thin Film by XPS," Japanese Journal of Applied Physics, Vol. 23, No. 12, December, 1984, pages 1560-1567.

Admitted prior art of application Figures 1-4.

Claims 22, 24-28 and 30-36 stand rejected under 35 U.S.C. § 112, first paragraph, as being based on an inadequate disclosure. Claims 22, 24-28 and 30-36 also stand rejected under 35 U.S.C. § 103. As evidence of obviousness the examiner offers the collective teachings of Levinstein, Yang and the admitted prior art.

Rather than repeat the arguments of appellant or the examiner, we make reference to the briefs and the answer for the respective details thereof.

OPINION

We have carefully considered the subject matter on appeal, the rejections advanced by the examiner and the evidence of obviousness relied upon by the examiner as support for the obviousness rejection. We have, likewise, reviewed and taken

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into consideration, in reaching our decision, the appellant's arguments set forth in the briefs along with the examiner's rationale in support of the rejections and arguments in rebuttal set forth in the examiner's answer.

It is our view, after consideration of the record before us, that the disclosure of this application complies with the requirements of 35 U.S.C. § 112 in support of the invention as set forth in claims 22, 24-28 and 30-36. We are also of the view that the evidence relied upon and the record of this application does not support the examiner's rejection of these claims under 35 U.S.C. § 103. Accordingly, we reverse.

We consider first the rejection of claims 22, 24-28 and 30-36 under 35 U.S.C. § 112 as being based upon an inadequate disclosure. This rejection is set forth in its entirety as follows:

The claim phrase "which agglomeration would occur in the absence of said thermal oxide" is relevant terminology which only has meaning in view of the arguments of record with regard to the prior art. There is believed to be no basis in the original disclosure for such relevant claim language. Furthermore, the original disclosure

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does not suggest any critical
thickness with regard to agglomeration
[Final Rejection, page 2].

This rejection clearly relates to the written description
requirement of 35 U.S.C. § 112.

The purpose of the written description requirement is
to ensure that the applicant conveys with reasonable clarity
to those skilled in the art that they were in possession of
the invention as of the filing date of the application. For
the purposes of the written description requirement, the
invention is "whatever is now claimed." Vas-Cath, Inc. v.
Mahurkar, 935 F.2d 1555, 1564, 19 USPQ2d 1111, 1117 (Fed. Cir.
1991). Appellant points to several portions of the original
specification which are argued to support the claim recitation
that the titanium silicide film would agglomerate but for the
presence of the thermal oxide film. The examiner responds
that the original disclosure does not indicate the range of
thicknesses of such titanium silicide films which would fall
within the scope of the claims or the criticality of such
thicknesses.

We agree with the position argued by appellant, and
therefore, we do not sustain the rejection of the claims under

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35 U.S.C. § 112. The admitted prior art in appellant's specification clearly identifies the problem that the titanium silicide films of the prior art agglomerate at certain annealing temperatures. The original specification also clearly identifies that the solution to this problem is to form a thermal oxide film over the titanium silicide film which prevents such agglomeration at these annealing temperatures. Since the entire premise of the disclosed invention is that the titanium silicide agglomerates without the thermal oxide, but does not agglomerate with the thermal oxide, it is quite apparent that appellant was describing a device in which agglomeration would occur in the absence of the thermal oxide. This description is clearly commensurate in scope with the language of the claims which has been objected to by the examiner in formulating the rejection. Therefore, we conclude that the original disclosure in this application provides proper support for the invention now being claimed.

We now consider the rejection of claims 22, 24-28 and 30-36 under 35 U.S.C. § 103. In rejecting claims under 35 U.S.C.

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§ 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. 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

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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 and the relative persuasiveness of the arguments. 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). Only those arguments actually made by appellant have been considered in this decision. Arguments which appellant could have made but chose not to make in the brief have not been considered [see 37 CFR § 1.192(a)].

At this point we note that the parent application to this application (07/552,190) was also before the Board of Patent Appeals and Interferences (the Board). A rejection of claims 22, 24-28 and 30-36 was before the Board based on the same prior art applied in the rejection now before us. The Board affirmed the examiner's rejection of these claims in the parent application [decision mailed December 13, 1995 in Appeal No. 93-4100]. The reasons for rejection of the claims in this application were said to be "as stated in the

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Examiner's Answer and Board decision(s) in the parent" [Paper No. 39 in this file wrapper continuation].

Appellant amended each of the independent claims after the decision by the Board and filed evidence to the effect that the titanium silicide film of Levinstein would not suffer agglomeration in the absence of the thermal oxide. The examiner's response was that the claimed invention was not supported by the original disclosure [note supra], and the examiner also noted that the previous decision by the Board still applied to the present claims on appeal [Final Rejection, page 3].

Appellant makes two central arguments in the brief. First, appellant argues that the examiner's challenge to the sufficiency of the disclosure is not appropriate in maintaining a rejection under 35 U.S.C. § 103. Second, appellant argues that the previous decision by the Board is not material to this application because the claims have been amended and additional evidence has been submitted which was not before the Board in its earlier decision. Appellant is correct in both of these arguments.

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The examiner has never really addressed the obviousness of the claims as amended by appellant after the previous decision by the Board. As noted by appellant, the examiner cannot ignore limitations of a claim in making a prior art rejection based on any alleged inadequacies of the disclosure. All limitations of a claim must be considered in making prior art rejections. Therefore, it was improper for the examiner to essentially ignore the limitations to the appealed claims which were added by amendment after the earlier Board decision. Since the Board was never forced to consider the obviousness of the limitations added to the claims by amendment, the previous Board decision cannot be relied on to support the obviousness of the claims now on appeal.

The record in this application contains no analysis of the obviousness of a thermal oxide film over a titanium silicide film which prevents agglomeration of the silicide film at the claimed temperatures but in which agglomeration would occur in the absence of the thermal oxide. Therefore, this record does not establish a prima facie case of

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obviousness. Accordingly, we do not sustain the rejection of the claims under 35 U.S.C. § 103.

Although appellant primarily focuses on the titanium silicide film of Levinstein and the alleged fact that this titanium silicide film would not suffer agglomeration because of its thickness, the Board in the previous decision indicated that Yang was the more relevant reference. Yang clearly teaches the formation of an oxide film over a titanium silicide film. Yang teaches an example in which the titanium silicide film would have a thickness of about 540 Angstroms [note previous Board decision]. A film of this thickness is not far removed from the thicknesses at which appellant's invention is intended to work (less than 500 Angstroms). Nevertheless, we have no analysis on this record as to whether the range of devices disclosed in Yang would have suggested the obviousness of the device recited in these appealed claims. In other words, the considerations necessary to make a determination of the obviousness of the appealed claims are not presently of record in this application and are, therefore, not before us at this time.

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We acknowledge appellant's invitation to revisit the previous decision of the Board and to declare that decision as being erroneous. We do not understand what appellant's request has to do with this appeal unless appellant desires to resubmit the claims that were determined to be unpatentable in the previous decision. In that event, we take this opportunity, instead, to reaffirm all the findings and conclusions made by that panel of the Board in the previous decision.

In summary, we have not sustained either of the examiner's rejections of the claims on this record. Therefore, the decision of the examiner rejecting claims 22, 24-28 and 30-36 is reversed.

REVERSED

KENNETH W. HAIRSTON)	
Administrative Patent Judge)	
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JERRY SMITH)	BOARD OF PATENT
Administrative Patent Judge)	APPEALS AND

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