

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.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. 14

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte CHUE-SAN YOO
and
CHENG-YEH SHIH

Appeal No. 2002-0528
Application No. 09/524,519

ON BRIEF

Before OWENS, TIMM, and DELMENDO, Administrative Patent Judges.
DELMENDO, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on an appeal under 35 U.S.C. § 134 (2002) from the examiner's final rejection of claims 25 through 27 (final Office action mailed Jan. 3, 2001, paper 6), which are all the claims pending in the above-identified application.

The subject matter on appeal relates to "[f]ield oxide regions on the surface of a silicon substrate with increased threshold voltages and reduced leakage currents." Further details of this appealed subject matter are recited in

representative claim 25, the sole independent claim on appeal,
reproduced below:

25. Field oxide isolation regions on the surface of a silicon substrate with increased threshold voltages and reduced leakage currents, comprised of:

a silicon substrate having field oxide formed by local oxidation of silicon (LOCOS) resulting in thinner portions on the perimeter of said field oxide, said field oxide surrounding device areas on said substrate;

said field oxide having sidewall portions formed from an insulating layer that is conformally deposited and anisotropically etched back to increase the thickness of said thinner portions on said perimeter of said field oxide;

channel-stop implant regions formed by implanting a dopant through said field oxide and through said sidewall portions formed from said insulating layer, said channel-stop implant regions having a modified implant profile resulting from said implanting of said dopant through said sidewall portions thereby increasing said threshold voltages and reducing said leakage currents.

In addition to appellants' admitted prior art (Figure 1 of the present specification), the examiner relies on the following prior art reference as evidence of unpatentability:

Liaw et al. 5,672,538 Sep. 30, 1997
(Liaw)

Claims 25 through 27 on appeal stand rejected under 35 U.S.C. § 103(a) as unpatentable over Liaw in view of the appellants' admitted prior art. (Examiner's answer mailed Oct. 19, 2001, paper 13, pages 3-4.)

We reverse.

Liaw describes a device comprising a P-doped <100> oriented monocrystalline silicon wafer 10, field oxide isolation structure 12 formed by local oxidation of silicon (LOCOS), and a residual pocket 16 formed from a silicon oxide layer 14. (Column 3, line 11 to column 4, line 13; Figure 4.) As acknowledged by the examiner (answer, page 3), Liaw's device differs from the invention recited in appealed claim 25 in that it lacks "channel-stop implant regions formed by implanting a dopant through said field oxide and through said sidewall portions formed from said insulating layer, said channel-stop implant regions having a modified implant profile resulting from said implanting of said dopant through said sidewall portions thereby increasing said threshold voltages and reducing said leakage currents."

In an attempt to account for this difference, the examiner relies on Figure 1 (prior art) of the present specification. (Answer, page 3.) Specifically, the examiner's position is stated as follows (id.):

[A]pplicant [sic, applicants'] admitted prior art show [sic, shows] that it is well known in the art to form channel-stop regions (34) on the semiconductor substrate (10) after the formation of the field oxide (20) to reduce leakage current. (See Fig. 1).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to form channel-stop regions after the formation of the field oxide and the sidewall

portion (16) of Liaw in view of applicant's [sic, applicants'] admitted prior art, to reduce leakage current.

We cannot agree with the examiner's analysis. As pointed out by the appellants (appeal brief filed Jul. 16, 2001, paper 12, page 5), the structure depicted in Figure 1 of the present specification does not contain any sidewall portions or residual pockets as shown in Liaw. Hence, even if combined, the collective teachings of Liaw and the appellants' admitted prior art would have led one of ordinary skill in the art to implant the channel-stop regions before the formation of the residual pockets 16. Absent any additional evidence constituting the requisite motivation, suggestion, or teaching that would have led one of ordinary skill in the art to implant the channel-stop regions after the formation of the residual pockets 16 in Liaw, we must agree with the appellants (appeal brief, page 6) that the examiner's reasoning is based on impermissible hindsight reconstruction. In re Lee, 277 F.3d 1338, 1343, 61 USPQ2d 1430, 1433 (Fed. Cir. 2002) ("The factual inquiry whether to combine references must be thorough and searching.'...It must be based on objective evidence of record. This precedent has been reinforced in myriad decisions, and cannot be dispensed with."); W.L. Gore & Assoc. v. Garlock, Inc., 721 F.2d 1540, 1553, 220 USPQ 303, 312-13 (Fed. Cir. 1983) ("To imbue one of ordinary

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skill in the art with knowledge of the invention in suit, when no prior art reference or references of record convey or suggest that knowledge, is to fall victim to the insidious effect of a hindsight syndrome wherein that which only the inventor taught is used against its teacher.”).

For these reasons, we reverse the examiner’s rejection under 35 U.S.C. § 103(a) of appealed claims 25 through 27 as unpatentable over Liaw in view of the appellants’ admitted prior art.

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The decision of the examiner is reversed.

REVERSED

Terry J. Owens)	
Administrative Patent Judge)	
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)	BOARD OF PATENT
Catherine Timm)	
Administrative Patent Judge)	APPEALS AND
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Romulo H. Delmendo)	
Administrative Patent Judge)	

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