

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.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. 16

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte FLOYD SCHEMMEL and RICHARD THORNE

Appeal No. 2001-0953
Application No. 08/923,651

ON BRIEF

Before FLEMING, RUGGIERO, and BLANKENSHIP, ***Administrative Patent Judges.***

FLEMING, ***Administrative Patent Judge.***

DECISION ON APPEAL

This is a decision on appeal from the final rejection of claims 1-12, all the claims pending in the instant application. Claims 13-17 have been withdrawn from consideration.

Invention

The invention relates to an apparatus and method for automatically detecting feedback in individual silicon chips. See page 1 of Appellants' specification. In particular, the

Appeal No. 2001-0953
Application No. 08/923,651

invention is an apparatus and method for automatically detecting defects on silicon dies on a silicon wafer. The apparatus automatically detects defects by having an image acquisition system and a computer connected to the image acquisition system. The computer analyzes a random sample of silicon dies to determine an average or standardized die image. The statistical die model is compared to silicon dies on a silicon wafer to determine if the silicon dies have surface defects. See page 5 of Appellants' specification.

Independent claim 1 present in the application is reproduced as follows:

1. An apparatus for automatically detecting defects on silicon dies on a silicon wafer comprising:

an image acquisition system; and

a computer connected to said image acquisition system wherein said computer automatically aligns said silicon wafer, automatically obtains an image of a plurality of silicon dies, automatically calculates a statistical die model from a samples [sic; sample] of silicon dies, and automatically compares said statistical die model to a plurality of silicon die images to determine if said silicon dies have surface defects; and if said silicon dies have surface defects stores the location of said silicon dies containing defects and the location of said surface defects on the silicon wafer in memory.

References

The references relied on by the Examiner are as follows:

Sandland et al. (Sandland)	4,618,938	Oct. 21, 1986
Iwakiri et al. (Iwakiri)	5,537,325	Jul. 16, 1996
Tanaka et al. (Tanaka)	5,568,563	Oct. 22, 1996

Rejections at Issue

Claims 1-12 stand rejected under 35 U.S.C. § 103 as being unpatentable over Sandland, Tanaka and Iwakiri.

Throughout our opinion, we make reference to the briefs¹ and answer.

OPINION

With full consideration being given to the subject matter on appeal, the Examiner's rejection and arguments of Appellants and the Examiner, for the reasons stated *infra*, we reverse the Examiner's rejection of claims 1-12 under 35 U.S.C. § 103.

In rejecting claims under 35 U.S.C. § 103, the Examiner bears the initial burden of establishing a *prima facie* case of

¹ Appellants filed an appeal brief on June 19, 2000. Appellants filed a reply brief on August 17, 2000. The Examiner mailed an office communication on September 11, 2000, stating that the reply brief has been entered and considered.

Appeal No. 2001-0953
Application No. 08/923,651

obviousness. ***In re Oetiker***, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992). ***See also In re Piasecki***, 745 F.2d 1468, 1472, 223 USPQ 785, 788 (Fed. Cir. 1984). The Examiner can satisfy this burden by showing that some objective teaching in the prior art or knowledge generally available to one of ordinary skill in the art suggests the claimed subject matter. ***In re Fine***, 837 F.2d 1071, 1074, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988). Only if this initial burden is met does the burden of coming forward with evidence or argument shift to the Appellants. ***Oetiker***, 977 F.2d at 1445, 24 USPQ2d at 1444. ***See also Piasecki***, 745 at 1472, 223 USPQ at 788.

An obviousness analysis commences with a review and consideration of all the pertinent evidence and arguments. "In reviewing the [E]xaminer's decision on appeal, the Board must necessarily weigh all of the evidence and arguments." ***In re Oetiker***, 977 F.2d at 1445, 24 USPQ2d at 1444. "[T]he Board must not only assure that the requisite findings are made, based on evidence of record, but must also explain the reasoning by which the findings are deemed to support the agency's conclusion."

Appeal No. 2001-0953
Application No. 08/923,651

In re Lee, 277 F.3d 1338, 1344, 61 USPQ2d 1430, 1434 (Fed. Cir. 2002). With these principles in mind, we commence review of the pertinent evidence and arguments of Appellants and Examiner.

Appellants argue that none of the references show, teach or suggest the limitations recited in claim 1. In particular, Appellants argue that claim 1 requires a computer connected to the image acquisition system which, in addition to automatically aligning the silicon wafer and obtaining an image of a plurality of silicon dies, automatically calculates a statistical die model from a sample of silicon dies. Appellants argue that this limitation is not taught or suggested by Sandland, Tanaka, Iwakiri or any proper combination of these references either alone or in the combination as claimed. See page 4 of Appellants' brief. Appellants have similar arguments as to the other independent claim, claim 9. See page 7 of the brief.

We note that Appellants' claim 1 recites

a computer connected to said image acquisition system wherein said computer automatically aligns said silicon wafer, automatically obtains an image of a plurality of silicon dies, automatically calculates a statistical die model for the samples of silicon dies.

Similarly, we find that claim 9 recites

wherein said computer automatically aligns said silicon wafer, automatically obtains images of a plurality of

Appeal No. 2001-0953
Application No. 08/923,651

silicon dies, automatically calculates a statistical die model from a sample of silicon dies.

The Examiner relies on Tanaka for the teaching of the above limitations. See pages 2 and 3 of the answer.

Appellants respond to the Examiner by pointing out that Tanaka does not teach the limitation of automatically calculating a statistical die model from a sample of silicon dies. Appellants point out that Tanaka teaches at the top of column 4 that only one die is scanned and that this die must be a flawless die and from this flawless die parameters are derived. See page 3 of the Appellants' reply brief.

Upon our review of Tanaka, we find that Tanaka teaches that flawless wafer 1 is put on a moving mechanism 3. The CCD camera 5 scans the flawless wafer 1 and the image data are stored to the frame memory 8. On the basis of these data, a set of fundamental pattern vectors are generated. See column 4, lines 1-10. Upon our complete review of Tanaka, we fail to find that Tanaka teaches a computer that automatically obtains an image of a plurality of silicon dies and automatically calculates a statistical die model from a sample of silicon dies as recited in Appellants' claims.

Appeal No. 2001-0953
Application No. 08/923,651

In view of the foregoing, we have not sustained the
Examiner's rejection of claims 1-12 under 35 U.S.C. § 103.

REVERSED

MICHAEL R. FLEMING)	
Administrative Patent Judge)	
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)	BOARD OF PATENT
JOSEPH F. RUGGIERO)	APPEALS
Administrative Patent Judge)	AND
)	INTERFERENCES
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HOWARD B. BLANKENSHIP)	
Administrative Patent Judge)	

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Appeal No. 2001-0953
Application No. 08/923,651

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