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MURPHY, BILAK & HOMILLER/INFINEON TECHNOLOGIES 1255 CRESCENT GREEN SUITE 200 CARY, NC 27518			GRAYBILL, DAVID E	
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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte NICO CASPARY and HANS-JOACHIM SCHULZE

Appeal 2019-006692
Application 15/189,067
Technology Center 2800

Before ADRIENE LEPIANE HANLON, TERRY J. OWENS, and
LILAN REN, *Administrative Patent Judges*.

OWENS, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Pursuant to 35 U.S.C. § 134(a), Appellant appeals from the Examiner's decision to reject claims 1–6, 8–12, and 20.¹ We have jurisdiction under 35 U.S.C. § 6(b).

We REVERSE.

¹ We use the word Appellant to refer to “applicant” as defined in 37 C.F.R. § 1.42(a). Appellant identifies Infineon Technologies AG as the real party in interest (Appeal Br. 2).

CLAIMED SUBJECT MATTER

The claims are directed to METHOD OF MANUFACTURING A SILICON WAFER. Claim 1, reproduced below, is illustrative of the claimed subject matter:

A method of manufacturing a silicon wafer, the method comprising:

extracting an n-type silicon ingot over an extraction time period from a silicon melt comprising n-type dopants;

adding p-type dopants to the silicon melt over at least part of the extraction time period in a controlled manner, so as to compensate an n-type doping in then-type silicon ingot by 20% to 80% with p-type doping, and so that an electrically active net doping concentration in then-type silicon ingot varies by less than 60% from an average value for at least 40% of an axial length of the n-type silicon ingot, the electrically active net doping concentration being based on a difference between doping concentrations of donors and acceptors in then-type silicon ingot; and

slicing the silicon ingot.

REFERENCES

The prior art relied upon by the Examiner is:

Name	Reference	Date
Harada	US 2011/0263126 A1	Oct. 27, 2011
Seipel	US 2014/0069324 A1	Mar. 13, 2014

REJECTIONS

The claims stand rejected as follows: claims 1–6, 8–12, and 20 under 35 U.S.C. § 112(b) as being indefinite for failing to particularly point out and distinctly claim the subject matter which the inventors regard as the invention; claim 11 under 35 U.S.C. § 112(a) as failing to comply with the enablement requirement; and claims 1–6, 8–12, and 20 under 35 U.S.C. § 103 over Seipel in view of Harada.

OPINION

Rejection under 35 U.S.C. § 112(b)

“[T]he indefiniteness inquiry asks whether the claims ‘circumscribe a particular area with a reasonable degree of precision and particularity.’” *Marley Mouldings Ltd. v. Mikron Industries Inc.*, 417 F.3d 1356, 1359 (Fed. Cir. 2005) (quoting *In re Moore*, 439 F.2d 1232, 1235 (CCPA 1971)).

The Examiner concludes that “electrically active net doping concentration” in claim 1 is indefinite because “there is no art recognized definition of the language, the claim language is not otherwise explicitly defined in the disclosure, and the plain meaning of the claim language is otherwise indeterminable” (Ans. 6), and “‘being based on a difference between doping concentrations of donors and acceptors in the n-type silicon ingot’ is not definitional - it merely describes a vague relationship, specifically, ‘being based on’” (*Id.*).

As indicated by claim 1, the electrically active net doping concentration is the difference between the doping concentrations of electrically active donors (n-type dopants) and electrically active acceptors (p-type dopants) in the n-type silicon ingot. Hence, “electrically active net doping concentration” is not indefinite.

The Examiner concludes that “retrograde” in claim 11 is indefinite because “the relative term(s) of degree is/are not defined by the claim(s), and the specification does not provide a standard for ascertaining the requisite degree, hence, the claim(s) fail(s) to inform, with reasonable certainty, those skilled in the art about the scope of the invention” (Ans. 10).

As with any ground of rejection, the Examiner bears the initial burden of establishing a prima facie case of unpatentability. *See In re Oetiker*, 977 F.2d 1443, 1445 (Fed. Cir. 1992). The Examiner does not provide a substantive explanation as to why the claim term “retrograde” would have been unclear to one of ordinary skill in the art in view of the Appellant’s Specification. The Examiner’s mere assertions that the Specification does not provide a standard for ascertaining the requisite degree and that the claim fails to inform, with reasonable certainty, those skilled in the art about the scope of the invention do not provide prima facie evidence of indefiniteness.

Rejection under 35 U.S.C. § 112(a)

A specification complies with the 35 U.S.C. § 112(a) enablement requirement if it allows those of ordinary skill in the art to make and use the claimed invention without undue experimentation. *See In re Wright*, 999 F.2d 1557, 1561 (Fed. Cir. 1993); *Atlas Powder Co. v. E.I. du Pont De Nemours & Co.*, 750 F.2d 1569, 1576 (Fed. Cir. 1984).

The Examiner finds that

because there is no direction provided by the inventor showing how to make or use the claimed invention, including working examples, and, in view of the related specification objections and the 112, first and second paragraph rejections of claim(s) 1 and 11, one skilled in the art would be unable to make and use the entire scope of the claimed invention, at least without undue experimentation. [Final Rej. 7]

The Examiner does not address the Appellant's Specification and explain why, in view thereof, one of ordinary skill in the art would have been unable without undue experimentation to apply a thermal budget to a boron doped crucible by heating that is configured to set to a retrograde profile of boron in the crucible. The Examiner, therefore, has not established a prima facie case of nonenablement of the method claimed in the Appellant's claim 11.

Rejection under 35 U.S.C. § 103

We need address only the sole independent claim, i.e., claim 1.

Seipel discloses "a crucible for producing a silicon block, the crucible comprising a crucible wall surrounding an interior, and an opening for filling silicon into the interior, wherein the crucible wall comprises at least one doping means for providing a dopant for the silicon within the crucible."

[¶ 5]

Harada (¶ 47) is relied upon by the Examiner for a disclosure of slicing a silicon ingot (Final Rej. 25).

The Examiner parrots the language of claim 1, and without citing to any disclosure in Seipel asserts that any limitations in claim 1 that are not disclosed by Seipel are inherent, obvious design choice, optimization of parameters and range limitations, or result effective variables (Final Rej. 9, 13, 14, 16, 19–22).

The Examiner has the initial burden of establishing a prima facie case of obviousness. *See In re Piasecki*, 745 F.2d 1468, 1472 (Fed. Cir. 1984); *In re Rinehart*, 531 F.2d 1048, 1051 (CCPA 1976). Meeting that burden requires establishing that the applied prior art would have provided one of

ordinary skill in the art with an apparent reason to modify the prior art to arrive at the claimed invention. *See KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007). The Examiner's mere assertions do not provide that apparent reason.

DECISION

The Examiner's rejections are reversed.

CONCLUSION SUMMARY

In summary:

Claims Rejected	35 U.S.C. §	Reference(s)/Basis	Affirmed	Reversed
1-6, 8-12, 20	112(b)	Indefiniteness		1-6, 8-12, 20
11	112(a)	Nonenablement		11
1-6, 8-12, 20	103	Seipel, Harada		1-6, 8-12, 20
Overall Outcome				1-6, 8-12, 20

REVERSED