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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte TAKESHI KADONO and KAZUNARI KURITA

Appeal 2019-000322
Application 14/442,373
Technology Center 2800

Before RAE LYNN P. GUEST, DEBRA L. DENNETT, and LILAN REN,
Administrative Patent Judges.

REN, *Administrative Patent Judge.*

DECISION ON APPEAL

STATEMENT OF THE CASE

Appellant¹ appeals under 35 U.S.C. § 134 from a rejection² of claims 11, 12, and 14–20. We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

RELATED APPEAL

Appellant provides a related appeal for U.S. Patent Application No. 14/442,355. Br. 4.

CLAIMED SUBJECT MATTER

The claims are directed to “a method of producing a semiconductor epitaxial wafer, which can suppress metal contamination by achieving higher gettering capability.” Spec. ¶ 1. Claim 11, reproduced below, is illustrative of the claimed subject matter:

11. A semiconductor epitaxial wafer, comprising:
a semiconductor wafer containing at least one of carbon and nitrogen, wherein the least one of carbon and nitrogen is distributed throughout the semiconductor wafer; a modifying layer formed from a certain element contained as a solid solution in the semiconductor wafer, the modifying layer being

¹ The applicant under 37 C.F.R. § 1.46, and hence the appellant under 35 U.S.C. § 134, is the real party in interest, identified as “SUMCO Corporation.” Appeal Brief of March 23, 2018 (“Br.”), 3.

² Final Office Action of October 6, 2017 (“Act.”). In this opinion, we also refer to the Application filed May 12, 2015 (“Spec.”), the Examiner’s Answer of August 14, 2018 (“Ans.”), and the Reply Brief of October 12, 2018 (“Reply Br.”).

formed in a surface portion of the semiconductor wafer; and a first epitaxial layer on the modifying layer,
wherein a half width of the concentration profile of the certain element in the depth direction of the modifying layer is 100 nm or less.

Claims Appendix (Br. 18–19) (emphasis added).

REFERENCES

The prior art references relied upon by the Examiner in rejecting the claims on appeal are:

| | | |
|----------------|--------------------|---------------|
| Asayama et al. | JP2010040864 | Feb. 2, 2010 |
| Glayish et al. | US 2009/0206270 A1 | Aug. 20, 2009 |
| Ono et al. | US 2006/0266278 A1 | Nov. 30, 2006 |

REJECTIONS

The Examiner rejects claims 11, 12, and 14–20 “under 35 U.S.C. 112(b) or 35 U.S.C. 112 (pre-AIA), second paragraph” as failing to meet the definiteness rejection. Final Act. 3.

The Examiner rejects claims 11, 12, and 14–19 under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Asayama and Ono. Final Act. 4.

The Examiner rejects claim 20 under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Asayama, Ono, and Glayish. Final Act. 7.

OPINION

*Indefiniteness Rejection of Claim 11*³

We review the appealed indefiniteness rejection for error based upon the issues identified by Appellant and in light of the arguments and evidence produced thereon. *Cf. Ex parte Frye*, 94 USPQ2d 1072, 1075 (BPAI 2010) (precedential) (cited with approval in *In re Jung*, 637 F.3d 1356, 1365 (Fed. Cir. 2011) (“[I]t has long been the Board’s practice to require an applicant to identify the alleged error in the examiner’s rejections”). After having considered the evidence presented in this Appeal and each of Appellant’s contentions, we are not persuaded that reversible error has been identified, and we affirm the Examiner’s indefiniteness rejection based on the arguments raised and the evidentiary record.

The Examiner rejects claim 11 as indefinite finding that the claim term “the half width of the concentration profile” is ambiguous, rendering the scope of claim 11 unclear when read in light of the Specification. Final Act. 3. More specifically, the Examiner reasons, when read in light of the Specification, a skilled artisan may reasonably define the claim term in multiple possible ways. Ans. 3; *see also* Final Act. 3–4.

Appellant argues that a skilled artisan would have understood the term “half width of the concentration profile” to mean “full width at half maximum” (“FWHM”) – as opposed to “half width at half maximum” (“HWHM”) of the concentration profile. Br. 7. Appellant argues that the

³ Appellant does not present separate arguments for the indefiniteness rejection of claims 12 and 14–20. *See* Br. 6–10. The indefiniteness rejection of claims 12 and 14–20 therefore stands or falls with that of claim 11. *See* 37 C.F.R. § 41.37(c)(1)(iv).

ordinary dictionary definition, the prior art, as well as the Specification supports Appellant's position. *Id.*

Appellant's argument with regard to the Specification does not persuade us. The Specification does not define the term "half width." The data in Table 1 includes the "half width" of various examples which is about 50 nm but does not unequivocally define the term to mean FWHM nor limit the term to none other than FWHM. *See Spec.*, Table 1. Appellant argues that had the Examiner allowed amendments to Figures 4 and 5, "it should be possible to draw a line measuring about 50 nm[]" on these illustrations. Br. 8. We note that Figures 4 and 5 are on a scale of 0 to 2 μm . While Appellant's amended figures would have supported their interpretation of the term "half width," Appellant has not shown that a skilled artisan would have understood such a line on Figures 4 and 5 to be the recited "half width," and would necessarily excludes all other meanings but FWHM. Appellant's attorney argument, not based on the evidentiary record, does not persuade us of reversible error. As the court states in *In re Morris*, 127 F.3d 1048, 1056 (Fed. Cir. 1997):

The appellants urge us to consult the specification and some of the cited prior art . . . and interpret the disputed language more narrowly in view thereof. When read in light of this material, according to applicants, the 'true' meaning of the phrase emerges. We decline to attempt to harmonize the applicants' interpretation with the application and prior art. Such an approach puts the burden in the wrong place. It is the applicants' burden to precisely define the invention, not the PTO's. *See* 35 U.S.C. § 112, ¶ 2. . . . [T]his section puts the burden of precise claim drafting squarely on the applicant.

Appellant also provides a copy of a dictionary definition of “half width” from “<http://encyclopedia2.thefreedictionary.com/half-width> (from June 28, 2017)” whose image is reproduced below as Figure 1:

half-width

Half the width of a spectral line, measured at half the height. In some branches of spectroscopy it is customary to use the term to mean the full width at half height. See also equivalent width; line profile.

Figure. 1 An image of the dictionary definition provided by Appellant. Br. 7.

The Examiner finds that this dictionary definition is not specific as to which “branches of spectroscopy” the definition is applicable and therefore is not necessarily applicable to the ion implantation using secondary ion mass spectroscopy at issue in the Specification. Ans. 3. Appellant argues, on the other hand, that the Examiner reversibly erred in failing to apply the preponderance of the evidence standard in considering this piece of evidence. Reply Br. 2.

Although the dictionary definition of the phrase “a half width of the concentration profile” is relevant to the indefiniteness rejection, the inquiry here is whether a skilled artisan would have understood the phrase to mean FWHM only and not HWHM. *See Ex parte Miyazaki*, 89 USPQ 2d 1207, *5 (BPAI 2008) (precedential) (“[I]f a claim is amenable to two or more plausible claim constructions, the USPTO is justified in requiring the applicant to more precisely define the metes and bounds of the claimed invention by holding the claim unpatentable under 35 U.S.C. § 112, second paragraph, as indefinite.”). Because the dictionary definition does not support Appellant’s argument that the skilled artisan would have limited the

meaning to FWHM only, no reversible error has been identified in the Examiner's evaluation of this piece of evidence.

Appellant also presents a prior art reference, namely Patent No. 5,929,462 ("the '462 Patent"), which uses "FWHM" to refer to "the half-width of the photoluminescence spectrum." Br. 8 (citing '462 Patent at 4:33). We note, however, that the '462 Patent also uses the acronym "FWHM" to refer to "the half-width at half maximum." '462 Patent at 5:26–27 ("Both the half-width at half maximum of the photoluminescence spectrum (FWHM) and the current density threshold were measured to evaluate the laser characteristics of the Semiconductor optical device **10**."). Appellant does not explain why this statement in the '462 Patent supports the argument that the recited "half width" is "known in the art as 'Full Width at Half Maximum' or FWHM[.]" Br. 7. The '462 Patent is therefore not entirely consistent with the dictionary meaning provided by Appellant – further underscoring the Examiner's finding that there are multiple reasonable meanings of the disputed term.

In analyzing this case, we are mindful of the "essential purpose of patent examination [which] is to fashion claims that are precise, clear, correct, and unambiguous. Only in this way can uncertainties of claim scope be removed, as much as possible, during the administrative process." *In re Zletz*, 893 F.2d 319, 321–22 (Fed. Cir. 1989) ("During patent examination the pending claims must be interpreted as broadly as their terms reasonably allow. . . . The reason is simply that during patent prosecution when claims

can be amended, ambiguities should be recognized, scope and breadth of language explored, and clarification imposed.”).

“[I]f a claim is amenable to two or more plausible claim constructions, the USPTO is justified in requiring the applicant to more precisely define the metes and bounds of the claimed invention by holding the claim unpatentable under 35 U.S.C. § 112, second paragraph, as indefinite.” *Ex parte Miyazaki*, 89 USPQ 2d 1207, *5 (BPAI 2008) (precedential). In this case, the ’462 Patent does not clarify the ambiguity raised by the Examiner but rather provides that “FWHM” may refer to “the half-width at half maximum” (’462 Patent at 5:26–27) and that “the half-width of the photoluminescence spectrum” may refer to “FWHM” (’462 Patent at 4:33). Given the inconsistencies between the dictionary meaning and the ’462 Patent, we are not persuaded that reversible error has been identified in the Examiner’s finding that the evidence as a whole does not persuasively show that one of ordinary skill in the art would have understood the term “half width” to mean full width at half maximum only. Based on the record before us, which does not provide that other possible definitions should be excluded or are unreasonable, we sustain the Examiner’s indefiniteness rejection.

Obviousness Rejections

Review of the rejections under 35 U.S.C. § 103(a) would require considerable speculation as to the scope of the claims. Such speculation would not be appropriate. *In re Steele*, 305 F.2d 859, 862 (CCPA 1962) (“[W]e do not think a rejection under 35 U.S.C. § 103 should be based on such speculations and assumptions.”). We, therefore, decline to reach the 35 U.S.C. § 103(a) rejection as a result of our affirmance of the indefiniteness rejection, and the ambiguous meaning of the term “half width.”

Objections to the Specification

Appellant argues that the new matter objection, relating to amended Figures 4 and 5, under section 132(a) is improper. Br. 15. We decline to reach this matter which is solely within the jurisdiction of the Commissioner of Patents. *See* 37 C.F.R. § 1.181.

To the extent that the new matter objection affects or relates to the indefiniteness rejection, we affirm the objection for the reasons stated with regard to the indefiniteness rejection. *See* MPEP § 608.04(c) (“Where the new matter is confined to amendments to the specification, review of the examiner’s requirement for cancelation is by way of petition. But where the alleged new matter is introduced into or affects the claims, thus necessitating their rejection on this ground, the question becomes an appealable one, and should not be considered on petition even though that new matter has been introduced into the specification also.”).

CONCLUSION

The Examiner’s indefiniteness rejection of claims 11, 12, and 14–20 is affirmed.

We decline to reach the Examiner’s obviousness rejections of claims 11, 12, and 14–20.

| Claims Rejected | Basis | Affirmed | Reversed |
|------------------------|---|-------------------|-----------------|
| 11, 12, and 14–20 | § 112(b) or 35 U.S.C. 112 (pre-AIA), second paragraph | 11, 12, and 14–20 | |
| 11, 12, and 14–20 | § 103(a) | Not reached | Not reached |

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| Claims Rejected | Basis | Affirmed | Reversed |
|------------------------|--------------|-------------------|-----------------|
| Overall Outcome | | 11, 12, and 14–20 | |

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a). *See* 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED