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Paper No. 11
Date: February 22, 2022

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

INFINEON TECHNOLOGIES AG,
Petitioner,

v.

ARIGNA TECHNOLOGY LTD.,
Patent Owner.

IPR2021-01382
Patent 8,247,867 B2

Before GARTH D. BAER, SHARON FENICK, and IFTIKHAR AHMED, *Administrative Patent Judges*.

BAER, *Administrative Patent Judge*.

DECISION
Granting Institution of *Inter Partes* Review
35 U.S.C. § 314

I. INTRODUCTION

Infineon Technologies AG ("Petitioner" or "Infineon") filed a Petition (Paper 2, "Pet."), requesting an *inter partes* review of claims 8 and 9 of U.S. Patent No. 8,247,867 B2 (Ex. 1001, "the '867 Patent"). Arigna Technology Ltd. ("Patent Owner") filed a Preliminary Response to the Petition (Paper 8, "Prelim. Resp.").

We have authority under 35 U.S.C. § 314 to determine whether to institute *inter partes* review. For the reasons discussed below, we institute *inter partes* review.

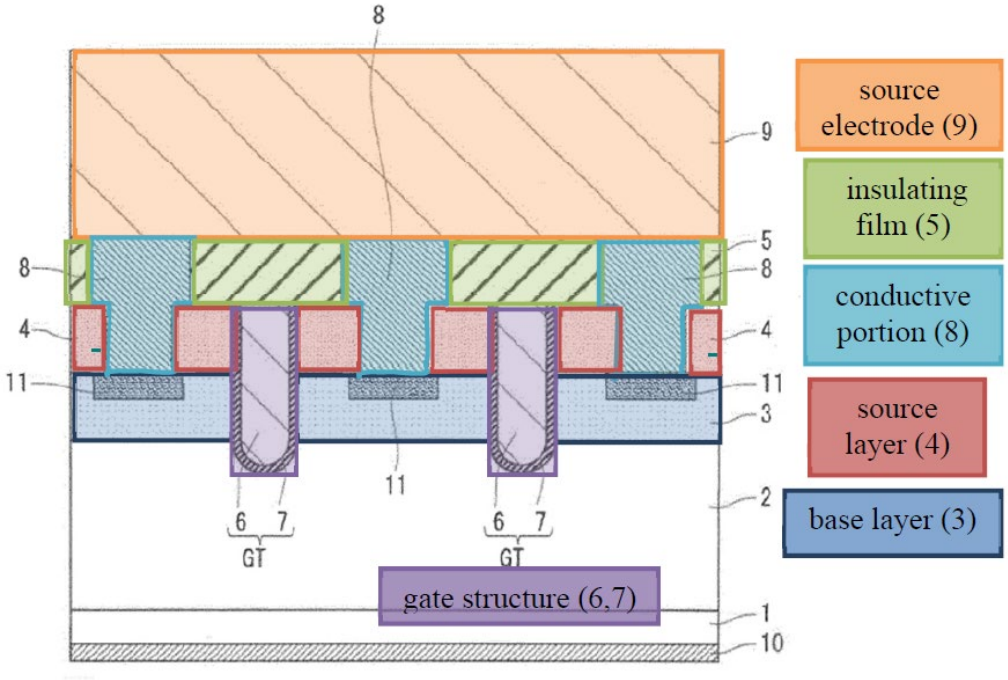
II. BACKGROUND

A. RELATED MATTERS

The '867 patent is at issue in *Arigna Technology Limited v. Volkswagen AG et al.,* Case No. 2:21-cv-00054-JRG-RSP (E.D. Tex.); ITC Proceeding 337-TA-1267 ("ITC proceeding"); and IPR2021-01321 (the "Volkswagen IPR").

B. THE '867 PATENT

The '867 patent is directed to a semiconductor device. Ex. 1001, code (54). The '867 patent's Figure 1, with Petitioner's annotations, is reproduced below.



Ex. 1001, Figure 1 (annotated)

Pet. 5. Figure 1 illustrates a cross-section of a semiconductor device. Ex. 1001, 3:35–54. The device has an n+-type substrate 1 (*id.* at 4:4–5); n-type drift layer 2 (*id.* at 4:6–10); p-type base 3 (*id.* at 4:13–14); n+-type source 4 (*id.* at 4:14–16); insulating film 5 (*id.* at 4:31–32); gate electrode 6 (*id.* at 4:19–30); gate insulating film 7 (*id.* at 4:19–30); conductive portion 8 (*id.* at 4:32–33); source electrode 9 (*id.* at 4:59–67); drain electrode 10 (*id.* at 4:5–6); and p+-type contact region 11 in base 3 (*id.* at 4:39–46).

C. Challenged Claims

Petitioner challenges claims 8 and 9. Claim 8 is independent and reproduced below:

> 8. A semiconductor device, comprising:
>
> a base layer having a first conductivity type;
>
> a source layer formed on said base layer and having a second conductivity type;

> an insulating film formed on said source layer;
>
> a plurality of gate structures penetrating said base layer;
>
> a conductive portion penetrating said insulating film and said source layer, being in contact with an upper surface of said source layer, and electrically connected to said source layer and said base layer; and
>
> a source electrode formed on said insulating film and electrically connected to said conductive portion,
>
> wherein a dimension of a part in which the upper surface of said source layer and said conductive portion are in contact with each other is 10 nm or more and 40 nm or less.

Ex. 1001, 14:1–16.

D. Asserted Grounds of Unpatentability

Petitioner asserts the following grounds of unpatentability. Pet. 1.

Reference(s)	Basis	Challenged Claims
Fujii[1]	§ 102	8, 9
Fujii	§ 103	8, 9
Inagawa[2], Hebert[3]	§ 103	8, 9

Petitioner also relies on a declaration from Dr. Jack Lee (Ex. 1002).

III. DISCRETIONARY DENIAL UNDER 35 U.S.C. § 314(a)

A. Denial based on *General Plastic*

Patent Owner asserts we should exercise our discretion to deny this Petition because it is a "parallel attack from a Petitioner with an established relationship to a previous petitioner who challenged the '867 Patent."

[1] US 6,872,653 B2, Mar. 29, 2005 (Ex. 1005, "Fujii").
[2] US 6,858,896 B2, Feb. 22, 2005 (Ex. 1006, "Inagawa").
[3] US 2009/0218619 A1, Pub. Sep. 3, 2009 (Ex. 1007, "Hebert").

Prelim. Resp. 63 (citing the Volkswagen IPR). Patent Owner relies on the framework from *General Plastic Industrial Co., Ltd. v. Canon Kabushiki Kaisha*, IPR2016-01357, Paper 19 (Sept. 6, 2017) (precedential). *Id*. at 63–69.

1. *Factor 1: whether the same petitioner previously filed a petition directed to the same claims of the same patent*

"[W]hen different petitioners challenge the same patent, we consider any relationship between those petitioners when weighing the General Plastic factors." *Valve Corp. v. Elec. Scripting Prods. Inc.*, IPR2019-00062, Paper 11, 9 (Apr. 2, 2019) ("*Valve*") (precedential). Although Petitioner has not previously challenged the same patent, Patent Owner asserts Petitioner is related to Volkswagen (the petitioner in the Volkswagen IPR) because "Volkswagen is accused of infringing the '867 Patent based on its use of Petitioner Infineon's semiconductors." Prelim. Resp. 63. On the other side, Petitioner asserts there is no "significant relationship" between it and Volkswagen because "Petitioner is not a co-defendant with Volkswagen in the pending litigation, and . . . the only commercial connection between Petitioner and Volkswagen is that Petitioner's products are incorporated into large electronic components that Volkswagen purchases from third parties." Pet. 83–84.

We agree with Petitioner. Petitioner has not previously filed a petition directed to the same claims of the same patent. Unlike the petitioner in *Valve*, Petitioner is not a co-defendant with Volkswagen in any pending litigation. *See Valve* at 9–10. Petitioner's commercial connection with Volkswagen is not enough to fairly characterize Volkswagen and Petitioner as the same petitioner. This factor weighs against denying institution.

2. *Factors 2, 4, and 5: whether at the time of filing of the first petition the petitioner knew of the prior art asserted in the second petition or should have known of it; the length of time that elapsed between the time the petitioner learned of the prior art asserted in the second petition and the filing of the second petition; and whether the petitioner provides adequate explanation for the time elapsed between the filings of multiple petitions directed to the same claims of the same patent*

According to Petitioner, "only 17 days have elapsed between the Volkswagen IPR and the filing of this Petition," and "Petitioner diligently pursued preparation of this IPR, which began before the Volkswagen IPR was filed." Pet. 84. Patent Owner asserts these facts demonstrate Petitioner "knew of the art that it was going to assert even prior to the filing of the first petition by Volkswagen." Prelim. Resp. 67. Although we agree with Patent Owner that, at the time of filing of the first petition, Petitioner knew of the prior art it asserts in this second petition, the relatively short time between the two petitions demonstrates the delay is not material. Factors 2, 4, and 5 are neutral.

3. *Factor 3: whether at the time of filing of the second petition the petitioner already received the patent owner's preliminary response to the first petition or received the Board's decision on whether to institute review in the first petition*

Petitioner filed its Petition before Patent Owner filed its preliminary response and before we issued our institution decision addressing the first petition. This factor weighs against denying institution.

4. *Factors 6 and 7: the finite resources of the Board and the requirement under 35 U.S.C. § 316(a)(11) to issue a final determination not later than 1 year after the date on which the Director notices institution of review*

Patent Owner argues "Requiring Arigna and the Board to address serial petitions challenging the same patent from related parties is inefficient

and a waste of the parties' resources." Prelim. Resp. 69. Petitioner argues "the close proximity of the Volkswagen IPR and this Petition promote the efficient use of the Board's limited resources because familiarity with the '867 Patent gained during the Volkswagen IPR may allow the Board to more quickly analyze the arguments presented in this IPR." Pet. 84. We agree with Petitioner. These factors weigh against denying institution.

5. Summary and Conclusion

We have considered the circumstances and facts before us in view of the *General Plastic* factors. For the reasons given, we are not persuaded to exercise our discretion to deny institution.

B. DENIAL BASED ON *FINTIV*

Patent Owner contends the Board should deny the Petition under § 314(a) "[g]iven the advanced state of the [parallel] ITC Proceeding—which addresses the same issues raised in the instant Petition." Prelim. Resp. 57. For the reasons that follow, we decline to exercise our discretion to deny the Petition on that basis.

The Board's precedential decision in *Apple Inc. v. Fintiv Inc.*, IPR2020-00019, Paper 11 (PTAB Mar. 20, 2020) (precedential) ("*Fintiv*"), identifies a non-exclusive list of factors parties may consider addressing where there is a related, parallel district court action to determine whether such action provides any basis for discretionary denial. *Fintiv*, Paper 11 at 5–16. Those factors include:

> 1. whether the court granted a stay or evidence exists that one may be granted if a proceeding is instituted;
>
> 2. proximity of the court's trial date to the Board's projected statutory deadline for a final written decision;

> 3. investment in the parallel proceeding by the court and the parties;
>
> 4. overlap between issues raised in the petition and in the parallel proceeding;
>
> 5. whether the petitioner and the defendant in the parallel proceeding are the same party; and
>
> 6. other circumstances that impact the Board's exercise of discretion, including the merits.

Id. at 5–6.

In evaluating the factors, we take a holistic view of whether efficiency and integrity of the system are best served by denying or instituting review. *Id.* at 6.

1. *Factor 1*

Neither party has sought a stay in the ITC proceeding, and we do not speculate about the likelihood of one. This factor is neutral.

2. *Factor 2*

The ITC proceeding has a November 28, 2022 target date for completion, which is approximately three months before the deadline for a final written decision in this proceeding. Ex. 2004, 4. Given the proximity between the projected ITC proceeding's completion date and the final written decision due date, on balance this factor at most weighs only slightly in favor of exercising our discretion to deny the Petition.

3. *Factor 3*

Patent Owner argues that there has been significant investment in the ITC Proceeding because "[t]he parties have already filed their *Markman* briefs and notices of prior art," and by the time this institution decision issues, "fact and expert discovery will be complete, and the summary judgment deadline will have passed." Prelim. Resp. 61. On the other side,

Petitioner notes its diligence in pursuing its petition and asserts the ITC investigation is in its early stage. Pet. 85. In these circumstances, we find this factor neutral.

4. *Factor 4*

As Patent Owner notes, this case involves the same claims and prior art as the parallel ITC proceeding. *Id*. at 61. We determine this factor weighs in favor of denying institution.

5. *Factor 5*

As Patent Owner concedes, "Petitioner Infineon is not a party to the ITC Proceeding." *Id*. However, according to Patent Owner, "the parties are related" because "Volkswagen is a customer of Petitioner." *Id*. at 62. Petitioner argues there is no "significant relationship" between it and Volkswagen because "Petitioner is not a co-defendant with Volkswagen in the pending litigation, and . . . the only commercial connection between Petitioner and Volkswagen is that Petitioner's products are incorporated into large electronic components that Volkswagen purchases from third parties." Pet. 83–84. Further, Petitioner argues, "[t]his Petition is the first time Petitioner has challenged the '867 Patent, and Petitioner should be allowed its 'day in court' to show that the '867 Patent is invalid." We agree with Petitioner. This factor weighs against exercising our discretion to deny institution.

6. *Factor 6*

Patent Owner contends "the merits of this Petition are particularly weak." Prelim. Resp. 63. As outlined below, we agree with Petitioner's analysis for its some, but not all, of its asserted grounds. Thus, while we determine that the merits meet the standard for institution of *inter partes*

review, we do not find that the merits are either particularly strong or weak. Thus, we find that this factor is neutral.

7. Summary and Conclusion

We have considered the circumstances and facts before us in view of the *Fintiv* factors. For the reasons given, we are not persuaded to exercise our discretion to deny institution.

IV. ANALYSIS

A. LEVEL OF SKILL IN THE ART

Petitioner contends a person of ordinary skill in the art "would be a person with a master's degree in electrical engineering (or a related degree) and at least three to five years of experience in the area of miniaturization, optimization, and fabrication processes of semiconductor devices used in integrated circuits." Pet. 8. Further, "[a] person with less education, but more relevant practical experience, is also a person of ordinary skill in the art." *Id*. At this stage, Patent Owner does not provide a description of the person of ordinary skill. *See* Prelim. Resp. 7–8.

Petitioner's description is consistent with the prior art and patent specification before us and is supported by credible expert testimony. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001) (prior art itself may reflect an appropriate level of skill). For the purpose of our decision, we adopt Petitioner's description.

B. CLAIM CONSTRUCTION

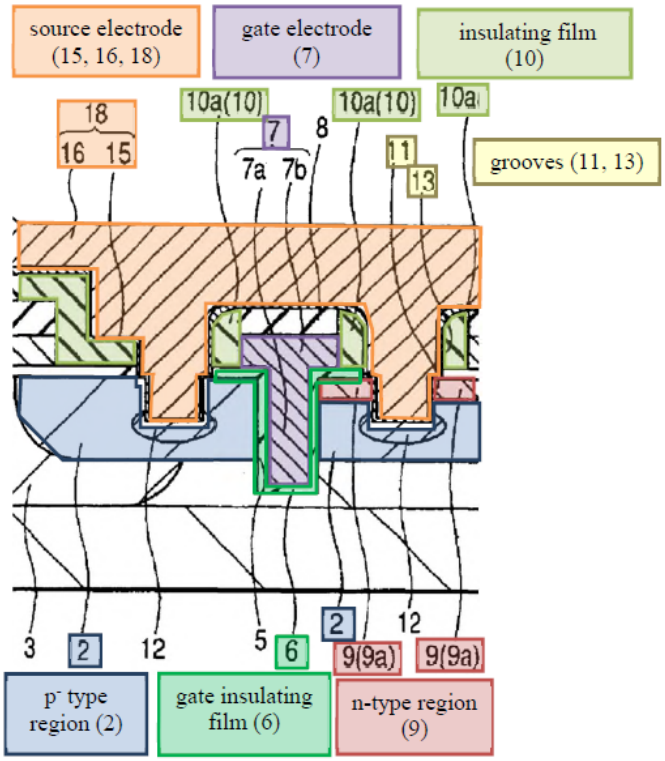
Neither party proposes any claim terms for construction. Pet. 24; Prelim. Resp. 17. We determine we need not explicitly construe any terms to determine whether to institute an *inter partes* review. *See Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed.

Cir. 2017) ("we need only construe terms 'that are in controversy, and only to the extent necessary to resolve the controversy'" (quoting *Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999))).

C. ASSERTED PRIOR ART

1. *Fujii (Ex. 1005)*

Fujii discloses a semiconductor device. Ex. 1005, code (54). Petitioner's excerpt of Figure 14, with Petitioner's annotations, is reproduced below.

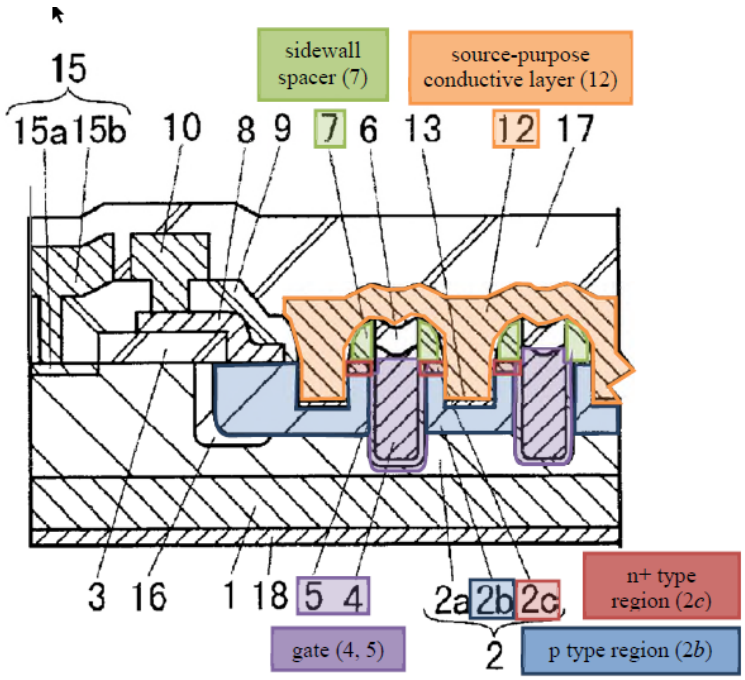


Ex. 1005, Figure 14 (excerpted and annotated)

Pet. 10. Figure 14 is a semiconductor device with the elements noted above. Ex. 1005, 2:48–50; *see* Ex. 1002 ¶¶ 36–37 (citing Ex. 1005).

2. *Inagawa (Ex. 1006)*

Inagawa discloses a semiconductor device. Ex. 1006, code (54). Inagawa's Figure 4, with Petitioner's annotations, is reproduced below.

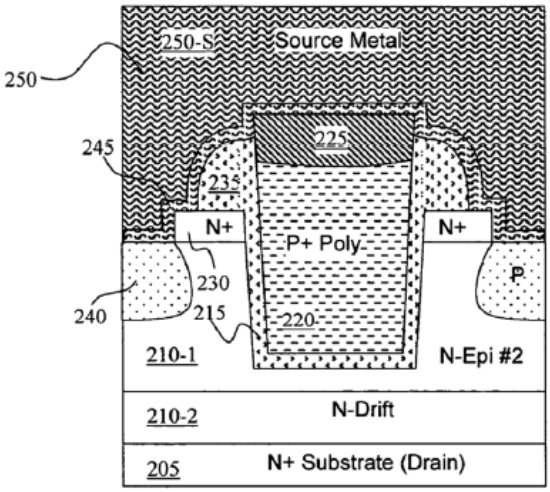


Ex. 1006, Figure 4 (annotated)

Pet. 16. Figure 4 is a semiconductor device with the elements noted above. Ex. 1006, 5:26–27; *see* Ex. 1002 ¶¶ 43–45 (citing Ex. 1006).

3. *Hebert (Ex. 1007)*

Hebert discloses a semiconductor power device with trench gate structures and sidewall spacers. Ex. 1007 ¶ 12. Herbert's Figure 10k is reproduced below.



Ex. 1007, Figure 10k

Figure 10k is a cross sectional view of a semiconductor. *Id.* ¶ 19. Hebert discloses that spacers 235 may be etched back "200 Angstroms to 2000 Angstroms." *Id.* ¶¶ 57–58.

D. OBVIOUSNESS ANALYSIS

1. Obviousness of Claims 8 and 9 based on Inagawa and Hebert

Petitioner contends claims 8 and 9 would have been obvious over Inagawa and Hebert. Pet. 57–83. Based on Petitioner's analysis and for the reasons explained below, we find Petitioner has, at this stage, demonstrated a reasonable likelihood of prevailing on this challenge.

a. Petitioner's Proposed Combination of Inagawa and Hebert

According to Petitioner, Inagawa's Figure 4 includes claim 8's base layer (2b, blue) source layer (2c, red), insulating film (7, green), gate structures (4 and 5, purple), and conductive portion/source electrode (12, orange). *See* Pet. 61–77. Claim 8 further requires "a dimension of a part in which the upper surface of said source layer and said conductive portion are in contact with each other is 10 nm or more and 40 nm or less." Although Inagawa does not specify a length for the relevant contact dimension, according to Petitioner, Hebert discloses the relevant dimension is 20–200 nm, which overlaps the claimed 10–40 nm range. *Id.* at 57–58. Further, Petitioner explains, a skilled artisan would have been motivated to use Hebert's dimension in Inagawa's device "because Inagawa and Hebert both use the sidewall spacers for the same purposes." *Id.* at 58. Petitioner goes on to explain that "[c]ombining Inagawa and Hebert would have been an obvious use of a known technique (etching sidewall spacers to expose 20 nm of the upper surface of the source regions, as taught in Hebert) to improve similar methods (etching sidewall spacers to expose an unspecified length of

the upper surface of the source regions in Inagawa) to achieve the desired advantages." *Id*. at 59 (citing *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 417–18 (2007)).

Patent Owner raises several objections to Petitioner's obviousness challenge. We address those arguments below.

b. Petitioner's Rationale for Combining Inagawa and Hebert

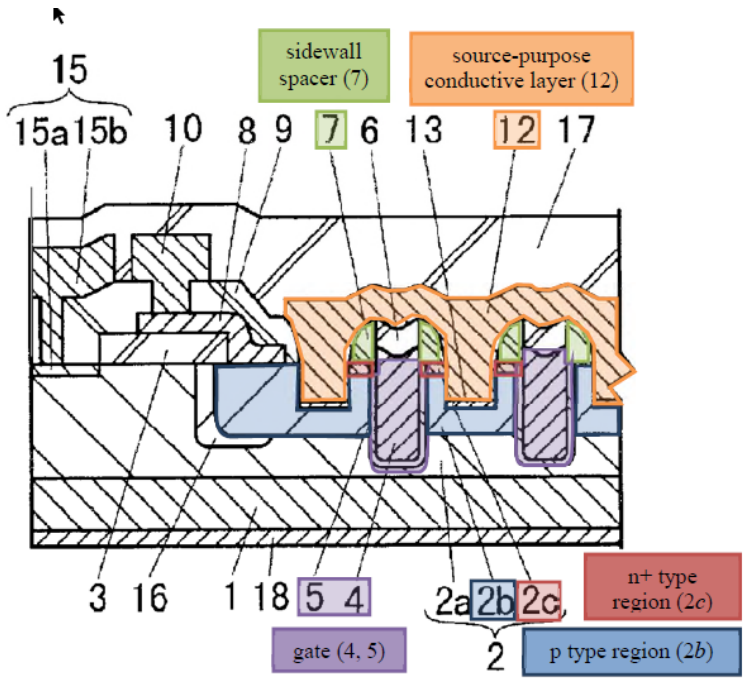
First, Patent Owner alleges Petitioner fails to identify any reason why a skilled artisan would have modified Inagawa with Hebert. Prelim. Resp. 43–45. We disagree. Given Petitioner's assertion that its proffered combination is a combination of prior art elements (Inagawa's device and Hebert's 20 nm upper surface), according to known methods, yielding only predictable results, Pet. 59, Petitioner has articulated sufficient reasoning with rational underpinning to support the legal conclusion that its proffered combination would have been obvious to one skilled in the art. *See KSR*, 550 U.S. at 418.

Patent Owner further argues that Petitioner's obviousness challenge fails because Hebert teaches away from the asserted combination. Prelim. Resp. 45–48. Hebert does so, according to Patent Owner, by teaching field effect transistors with no p-body regions, and by touting an advantage of such transistors—i.e., "no parasitic bipolar structure." *Id*. at 45 (quoting Ex. 1007 ¶ 5). Inagawa, in contrast, uses a mix of n and p body regions. *Id*. at 46–47. "Thus," Patent Owner argues, "Hebert teaches a fundamentally different device structure and disparages mixing N and P body regions, making it unlikely that a POSITA would look to Hebert to improve on Inagawa." *Id*. at 47.

We disagree with Patent Owner that Hebert teaches away from Petitioner's asserted combination. Even if Patent Owner is correct that Hebert disparages mixing n and p body regions, that would only undermine altering Hebert's device to use Inagawa's mixed n and p body regions. But that is not Petitioner's proposed combination. Instead, Petitioner proposes to use Inagawa's device with Hebert's 20 nm upper surface. *See* Pet. 57–60.

c. Insulating Film

Claim 8 recites "an insulating film formed on said source layer . . . [and] a conductive portion penetrating said insulating film." Petitioner corresponds Inagawa's sidewall spacers 7 to the claimed insulating film. Pet. 66. Petitioner's analysis relies on Inagawa's Figure 4, reproduced below, with Petitioner's annotations.



Ex. 1006, Figure 4 (annotated)

Pet. 16; *see id.* at 66, 71. Figure 4, above, is a semiconductor device with the elements noted above. According to Petitioner, Inagawa's sidewall

spacers 7 (green) are formed on semiconductor layer 2c (red), which are the claimed source layers. *Id*. at 66–67. In addition, Petitioner asserts, Inagawa's conductive portion (orange) penetrates Inagawa's sidewall spacers 7 (green). *Id*. at 71.

Patent Owner argues that Inagawa's sidewall spacers are insufficient in two respects. First, according to Patent Owner, Inagawa's sidewall spacers 7 are not formed on the source layers as claimed because "Inagawa expressly states that the side wall spacer is formed . . . 'on a side surface' of the gate pillar." Prelim. Resp. 50 (quoting Ex. 1006, 10:47–51). We disagree with Patent Owner's argument because it incorrectly assumes sidewall spacers 7 can only be formed on a single element. *See id*. at 50–51. As the figure above clearly shows, sidewall spacer 7 (green) is formed on semiconductor layer 2c (red), as well as on the side surface of gate pillar 6.

Second, Patent Owner argues that Inagawa's sidewall spacers 7 are insufficient because they are not penetrated by the conductive portion, as claim 8 requires. Specifically, according to Patent Owner, "a vertical conductive portion running parallel to the vertical side wall insulating film is not 'penetrating' the side wall insulating film." Prelim. Resp. 53; *see id*. (arguing that "[b]y that logic, any two semiconductor layers running parallel to each other would be penetrating layers"). We disagree with this argument as well. The asserted film is not merely a vertical sidewall insulating film, as Patent Owner suggests. Instead, the individual sidewall insulating film's pattern repeats horizontally, thus the sidewall spacers are a horizontal film through which the vertical conductive portion penetrates. Thus, on the current record, we agree with Petitioner that Inagawa's sidewall spacers 7 disclose the insulating film as recited in claim 8.

d. 10–40 nm Dimension

Claim 8 further recites "a dimension of a part in which the upper surface of said source layer and said conductive portion are in contact with each other is 10 nm or more and 40 nm or less." Ex. 1001, 14:13–16. Patent Owner criticizes Petitioner's reliance on Hebert for teaching the claimed dimension because, Patent Owner explains, Hebert's source layer does not have a "second conductivity type," as claim 8 requires. Prelim, Resp. 55. We disagree with Patent Owner's argument because it attacks the references individually rather than addressing the asserted combination, as set forth in the Petition. Petitioner relies on Hebert only for teaching claim 8's 10–40 nm contact dimension. *See, e.g.*, Pet. 58 (proposing to combine Inagawa with "the dimension taught in Hebert"), 60 ("it would have been obvious . . . to try to the 20 nm dimension provided in Hebert"); *see also id.* at 61–82 (relying on Inagawa for all claim elements other than the 10–40 nm dimension). Thus, it does not matter whether Hebert teaches the claimed second conductivity type because Petitioner relies on Inagawa, not Hebert, for teaching that feature.

e. Undisputed Limitations

As for the remaining limitations of claims 8 and 9, Petitioner provides a detailed analysis of how the prior art disclosures teach every element of those challenged claims. *See* Pet. 57–83. Other than as discussed above, Patent Owner does not additionally challenge Petitioner's analysis in its Preliminary Response. We have reviewed Petitioner's arguments and the underlying evidence cited in support and are persuaded that, at this stage, Petitioner sufficiently demonstrates a reasonable likelihood of succeeding in its challenges to claims 8 and 9.

2. Anticipation and Obviousness based on Fujii

Petitioner contends Fujii anticipates or, in the alternative, renders obvious claims 8 and 9. Pet. 24–56. For the reasons explained below, we find that Petitioner has not made an adequate showing that Fujii discloses or renders obvious claims 8 and 9.

As noted above, claim 8 requires "a dimension of a part in which the upper surface of said source layer and said conductive portion are in contact with each other is 10 nm or more and 40 nm or less." Ex. 1001 at 14:13–16. Petitioner asserts that Fujii teaches the claimed 10–40 nm range because it discloses three specific example widths: 0 nm, 100 nm, and 150 nm. Pet. 46–47. In addition, according to Petitioner, because Fujii elsewhere discloses that "values smaller than or larger than the respective specified values may also be within the scope of the invention," *id*. at 47 (quoting Ex. 1005, 3:26–29), a skilled artisan "would understand that Fujii teaches that the length of the contact area can be in the range of 0-150 nm." *Id*. at 47. Thus, Petitioner asserts, "the claimed range of 10-40 nm is a species of the 0–150 nm genus disclosed by Fujii." *Id*. at 48.

Petitioner notes further that "[t]he Federal Circuit has recognized that prior art discloses such a range in an analogous situation." *Id*. (citing *Iron Grip Barbell Co. v. USA Sports, Inc.*, 392 F.3d 1317, 1320–21 (Fed. Cir. 2004) ("*Iron Grip*")). In *Iron Grip*, the claimed invention was a plate with 3 handles, and the prior art disclosed a plate with 1, 2, and 4 handles. *Iron Grip*, 392 F.3d at 1321–22. The Federal Circuit reasoned that because the prior art disclosed a range of 1–4 handles, the claimed invention with 3 handles was presumptively obvious. *Id*. According to the court, a "narrower range may be obvious" when "the difference in range or value is minor." *Id*.

On this record, we find Fujii's disclosure insufficient for either anticipation or obviousness. First, Fujii's general statement that smaller/larger values than those specified "may" be within the scope of the invention is not specific enough to translate the subsequent disclosure of three discrete values into a range of values. As Patent Owner notes, were that the case, "*all* potential values would fall within the range of 'values smaller than or larger than the respective specified values,' meaning the disclosure of any value would disclose an unbounded range." Prelim. Resp. 29.

We also agree with Patent Owner that this case is distinguishable from *Iron Grip*. *See id.* at 30–33. Unlike in *Iron Grip*, where the claimed value (three handles) was relatively close to what was in the prior art (one, two, and four handles), here, as Patent Owner notes, "the difference between the first disclosed value in Fujii (0 nm) and the third disclosed value (150 nm) is 500% larger than the claimed 30 nm range." Prelim. Resp. 30. We agree with Patent Owner that "[t]his is not a 'minor' difference in range, as was the case in *Iron Grip*." *Id.* In addition, as the court in *Iron Grip* recognized, a broader range disclosure will not render obvious a narrower range when "there are new and unexpected results relative to the prior art." *Iron Grip*, 392 F.3d at 1322. That appears to be the case here because, as Patent Owner explains, the claimed 10–40 nm range is not arbitrary, but instead "allows for small cell size while still maintaining the desired low short circuit defect rate." Prelim. Resp. 31; *see id.* at 31–33 (citing Ex. 1001, Figs. 7, 8, 11:21–25); Ex. 1001, Fig. 7 (showing that dimensions below 10 nm result in

significant increases in short-circuit defect rate, while dimensions above 40 nm do not further reduce short-circuit defect rate).[4]

Given the deficiency outlined above, we find that Petitioner has not shown sufficiently that claim 8 is either anticipated or obvious over Fujii. Claim 9 depends from claim 8. Petitioner's analysis for claim 9 does not remedy the deficiency explained above for claim 8. Therefore, on this record and for the purposes of this Decision, Petitioner has not shown a reasonable likelihood that it would prevail in establishing claims 8 and 9 would have been obvious over, or anticipated by, Fujii.

Despite this deficiency, we include the Fujii-based grounds in the instituted trial. *See BioDelivery Sci. Int'l, Inc. v. Aquestive Therapeutics, Inc.*, 898 F.3d 1205, 1209 (holding that *SAS Institute, Inc. v. Iancu*, 138 S.Ct. 1348 (2018) "requires institution on all challenged claims and all challenged grounds").

V. CONCLUSION

For the foregoing reasons, we have determined that there is a reasonable likelihood that the Petitioner would prevail with respect to at least one of the claims challenged in the Petition. We therefore institute trial as to all challenged claims on all grounds stated in the Petition. We decline also to exercise our discretion to deny institution under 35 U.S.C. § 314(a).

[4] On this record, we disagree with Petitioner's characterization of the decreased defect rate due to short circuits as a solely an issue of "improvement to manufacturing," as opposed to device function. *See* Pet. 49–51 (citing *Ineos USA LLC v. Berry Plastics Corp.*, 783 F.3d 865, 870–71 (Fed. Cir. 2015)).

VI. ORDER

Accordingly, it is:

ORDERED that *inter partes* review of claims 8 and 9 of the '867 patent is instituted on all grounds in the Petition;

FURTHER ORDERED that pursuant to 35 U.S.C. § 314(c) and 37 C.F.R. § 42.4, notice is hereby given of the institution of a trial; the trial will commence on the entry date of this decision.

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