UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SONY GROUP CORPORATION,
Petitioner

v.

VISIONX TECHNOLOGIES, LLC,
Patent Owner

IPR2023-00389
U.S. Patent No. 8,035,143

PATENT OWNER'S PRELIMINARY RESPONSE TO PETITION FOR *INTER PARTES* REVIEW *37 C.F.R. §42.107*

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PATENT OWNER'S CURRENT EXHIBIT LIST[1]

Exhibit	Brief Description
2001	Yanagida-1 and English Abstract Filed with IDS
2002	IDS
2003	IDS References Considered by Examiner
2004	Consent to Proceed Before Magistrate Judge Payne
2005	Amended Docket Control Order
2006	U.S. Dist. Courts - National Judicial Caseload Profile
2007	VisionX Notice of Compliance re Infringement Contentions
2008	Sony's Notice of Compliance re Invalidity Contentions
2009	Sony's Invalidity Contentions and ID of Doc Production

[1] Relevant portions of exhibits may be highlighted to help the Board locate cited sections.

I. INTRODUCTION

Pursuant to 35 U.S.C. §313 and 37 C.F.R. §42.107, the Patent Owner, VisionX Technologies, LLC, hereby provides a Preliminary Response to the Petition for *Inter Partes* Review (IPR) filed December 22, 2022 (Paper 2, herein "Petition" or "Pet."). A Notice dated January 26, 2023 (Paper 5) set April 26, 2023 as the deadline for this Preliminary Response, which is timely filed.

A. IN CONTRAVENTION OF 37 C.F.R. §42.104(b)(4), THE PETITION FAILS TO SPECIFY WHERE CLAIM ELEMENT "AN INSULATING LAYER … *SURROUNDING A PORTION OF A LATERAL SIDE* OF THE PROJECTION PART" IN [1D] IS FOUND IN THE PRIOR ART

37 C.F.R. §42.104(b)(4) provides that "[t]he ***petition must specify where each element of the claim is found in the prior art*** patents or printed publications relied upon."[2]

The Board has consistently denied petitions that are in violation of 37 C.F.R. §42.104(b)(4). *See, e.g., Facebook, Inc. et al. v. Uniloc USA, Inc. et al.*, IPR2017-01524, Paper 7, at 20 (Dec. 4, 2017) ("Our rules further address the showing required in a petition. ***In particular, 37 C.F.R. §42.104(b)(4)*** provides that "[t]he petition must ***specify where each element of the claim is found in the prior art***

[2] Emphasis is added throughout unless otherwise noted.

patents or printed publications relied upon." (underlined emphasis in original). *See also AMC Multi-Cinema, Inc. v. Fall Line Patents, LLC*, 2021 U.S. App. LEXIS 29547 at *15 (Fed. Cir. 2021) (non-precedential) ("The statutes and regulations applicable to inter partes review … require a petitioner to provide in the petition itself an understandable explanation of the ***element-by-element specifics of its unpatentability contentions***, identifying supporting parts of the relied-on prior art. *See* 35 U.S.C. §312(a)(3) … 37 C.F.R. §§42.22(a)(2) … 42.104(b)(4)-(5)").

Petitioner refers to "Claim [1D]" or simply "[1D]"[3] as reciting "an insulating layer formed on the second surface of the semiconductor substrate to expose the projection part while surrounding a portion of a lateral side of the projection part" in claim 1 of the '143 patent. Pet. iv. [1D] includes two claim elements. Claim element (1) in [1D] recites "an insulating layer formed on the second surface of the semiconductor substrate to expose the projection part." This claim element is distinctly qualified by claim element (2) in [1D] that recites "***while surrounding a***

[3] For ease of reference, Patent Owner refers to claim clauses in the same style as the Petition. That is, "[1A]" through "[1F]" refer to the corresponding claim clauses recited in the Petition. Pet. iii.

portion of a lateral side of the projection part." While the Petition addresses claim element (1) in [1D], it remarkably fails to present any discussion of claim element (2) in [1D]. No reason is stated in the Petition why or how this significant claim element can be ignored. The claim element "while surrounding a portion of a lateral side of the projection part" ***appears only in section headings*** that reproduce [1D] (Pet. 30, 55, 71), and ***no discussion of this claim element***, or where it is found in the prior art relied upon, appears anywhere in the Petition. *Id*.

Indeed, none of the prior art relied upon in the Petition discloses claim element (2) in [1D], that is "while surrounding a portion of a lateral side of the projection part." Therefore, the fact that the Petition does not discuss this significant claim element is not an oversight. It simply cannot be found in the prior art relied upon by the Petition. In any event, Petitioner has clearly contravened the requirement of 37 C.F.R. §42.104(b)(4) by not addressing claim element (2) in [1D] at all.

The Board has confirmed that compliance with 37 C.F.R. §42.104(b)(4) is a fundamental requirement, and is part of a regulatory scheme that is "in place, among other reasons, ***to afford patent owners [a] statutorily required notice and opportunity to respond***. *See* [*Belden Inc. v. Berk-Tek LLC*, 805 F.3d 1064, 1080

(Fed. Cir. 2015)] (explaining that 'the rules and practices of the Board generally protect against loss of patent rights without the . . . notice and opportunity to respond' that the APA requires)." *Facebook, Inc.*, *supra*, at 21-22. Patent Owner has been denied the opportunity to appropriately prepare the various inter-related parts of the present Preliminary Response and its arguments in the absence of Petitioner's contention as to where claim element (2) in [1D] is found in the prior art relied upon.

In violation of 37 C.F.R. §42.104(b)(4), the Petition has failed to specify where the claim element "while surrounding a portion of a lateral side of the projection part" in [1D] is found in the prior art relied upon. Therefore, the Board should deny institution of *Inter Partes* Review. 35 U.S.C. §314(a); 37 C.F.R. §42.108(c).

B. THE '143 PATENT

The '143 patent (Ex. 1001, U.S. Patent No. 8,035,143) is directed to an image sensor. '143 patent, Abstract, 2:65-67. The image sensor comprises a semiconductor substrate (100) having a photodiode area (105), a readout circuitry that may include a plurality of transistors (110), and a metal interconnection layer (130) on a first surface. *Id*., Fig. 3, 3:26-28, 3:16-19, 1:48-52. A connection via

metal (125), i.e. a via metal that electrically connects with the readout circuitry, extends from the first surface to a second surface of the semiconductor substrate, and has a projection part (125a) projecting from the second surface. *Id*., Fig. 4, 2:7-9, 3:52-55, 4:57-60. An insulating layer (e.g., liner oxide layer 170) is formed on the second surface of the semiconductor substrate to expose the projection part while surrounding a portion of a lateral side of (i.e. partially surrounding a lateral side of) the projection part. *Id*., Figs. 7-9, 2:10-13, 5:4-5, 5:22-26, 5:34-37. The insulating layer has a thickness thinner than a projection height (measured from the second surface of the semiconductor substrate) of the projection part. *Id*., Figs. 7-9, 4:57-60, 5:6-9. A metal pad (180) is formed on the insulating layer such that the metal pad covers the projection part. *Id*., Figs. 8-9, 5:39-40, 5:62-67.

C. CLAIM INTERPRETATION

"***A connection via metal***" in [1C] refers to a via metal that electrically connects with the "readout circuitry" in [1A].

In *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005), the court reaffirmed the importance of reading the claims in view of the specification: "The claims, of course, do not stand alone. Rather, they are part of 'a fully integrated written instrument,' *Markman*, 52 F.3d at 978, consisting principally of a

specification that concludes with the claims. For that reason, claims 'must be read in view of the specification, of which they are a part.' *Id*. at 979. As we stated in *Vitronics*, ***the specification 'is always highly relevant to the claim construction analysis***. ***Usually, it is dispositive;*** it is the single best guide to the meaning of a disputed term.' 90 F.3d at 1582." *Id.* at 1315. The *Phillips* court, quoting from an earlier case, reaffirmed that "[i]t is fundamental that claims are to be construed in the light of the specifications and ***both are to be read with a view to ascertaining the invention***." *Id*. at 1316 (citation omitted).

The '143 patent's detailed description and drawings clearly point to the fact that "***a connection via metal***" electrically connects with transistor 110 of the readout circuitry. As examples, the '143 patent describes:

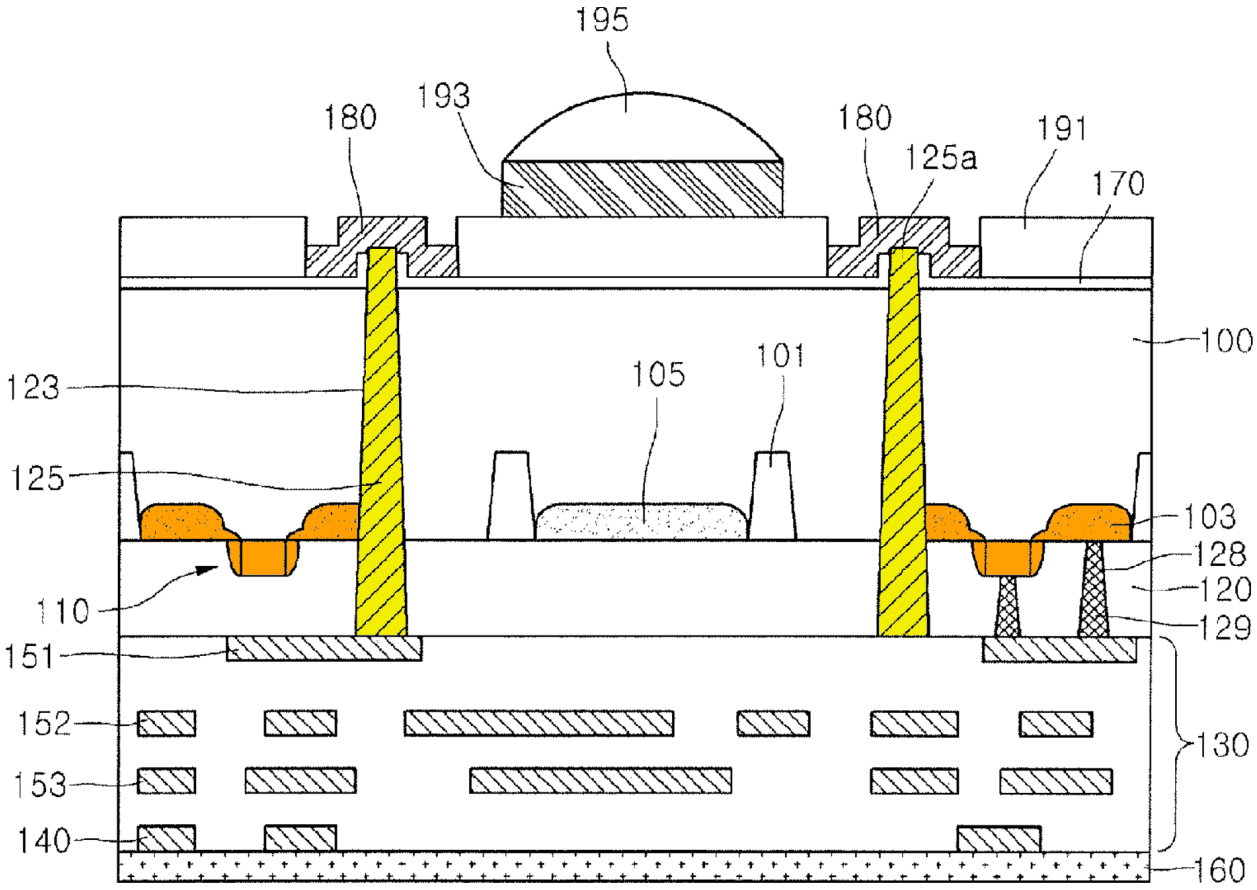
"***The readout circuit may include a plurality of transistors 110***." '143 patent, 3:17-18.

"***The connection via metal 125 electrically connects the transistors 110*** with a metal pad to be formed in a subsequent process." *Id*., 3:53-55.

Moreover, the drawings of the '143 patent make clear that connection via metals 125 electrically connect with transistors 110 of the readout circuitry. These connections are shown in all Figures 1-13; no Figure is without connection via

metals 125 connecting with transistors 110 of the readout circuitry. *Id*., Figs. 1-13. In particular, color-highlighted Figure 9 below shows that connection via metals 125 (yellow) electrically connect with respective transistors 110 (orange) of the readout circuitry.[4]

[4] Although only connection via metal 125 and transistor 110 on the *left* in Figure 9 are labeled with reference numerals, the '143 patent also treats the similarly depicted unlabeled items on the *right* as connection via metal 125 and transistor 110. *See, e.g.,* '143 patent, 3:56-58, 4:57-65, 5:28-30.



'143 Patent Fig. 9

The claim's logic also supports that "***a connection via metal***" electrically connects with the "readout circuitry." Claim 1 recites "a semiconductor substrate formed on a ***first surface thereof with a readout circuitry*** and a photodiode area; … ***a connection via metal extending from the first surface to a second surface*** of the semiconductor substrate; … ." The term "connection" indicates items are connected, and the phrase "extending from the first surface to a second surface" indicates where the connection occurs. That is, the claim language indicates a

connection occurs between a first and a second surface. By logic, the extension of a connection via metal need be for the purpose of connection between the surface from which it extends and the surface to which it extends. Accordingly, "a connection via metal" electrically connects "the first surface" - including the "readout circuitry" which is part of the first surface - with the second surface.

The phrase "***connection via metal***" appears twenty seven (27) times in the specification of the '143 patent. Each time it is used consistently with the meaning that it comprises a via metal that electrically connects with the readout circuitry. *See, e.g. id,* 2:32-34 ("metal interconnection layer is ***electrically connected with the readout circuitry and the connection via metal***;"); and *id.,* 2:44-47 (same).

Accordingly, one cannot implement "***a connection via metal***" as disclosed and claimed in the '143 patent with a via metal that does not electrically connect with the readout circuitry.

D. ART REFERENCES RELIED UPON IN THE PETITION

The Petition's violation of 37 C.F.R. §42.104(b)(4) should end the inquiry and result in denial of institution of *Inter Partes* Review. Assuming for the sake of argument that the Petition is in compliance with 37 C.F.R. §42.104(b)(4) (and it is

not), the art references relied upon in the Petition do not disclose or render obvious claim 1 of the '143 patent.

Sumi (Ex. 1005) does not disclose or make obvious claim elements "a connection via metal" in [1C], "an insulating layer ... surrounding a portion of a lateral side of the projection part" in [1D], or the insulating layer having "a thickness thinner than a projection height of the projection part" in [1F].

Shiraiwa (Ex. 1008) is duplicative of Sumi and discloses less than Sumi. Shiraiwa, singly or in combination with Sumi, does not disclose or make obvious claim elements "a connection via metal" in [1C], "an insulating layer ... surrounding a portion of a lateral side of the projection part" in [1D], or the insulating layer having "a thickness thinner than a projection height of the projection part" in [1F]. It appears that Shiraiwa has been introduced to provide an opportunity in the Petition to present a misleadingly modified combined drawing of Shiraiwa and Sumi that has inexplicably deleted a significant portion of Sumi's drawing.

Yanagida-1 (Ex. 1006) does not disclose or make obvious claim elements "a connection via metal" in [1C], "an insulating layer ... surrounding a portion of a

lateral side of the projection part" in [1D], or the insulating layer having "a thickness thinner than a projection height of the projection part" in [1F].

In addition, the Board should exercise its discretion under 35 U.S.C. §325(d) and, separately under 35 U.S.C. §314(a), to deny the Petition.

For at least these reasons as discussed in detail below, Patent Owner respectfully requests that the Board deny the Petition and not institute trial.[5]

II. GROUNDS 1 AND 2 FAIL TO DISCLOSE OR MAKE OBVIOUS ALL ELEMENTS OF CLAIM 1

Under Grounds 1 and 2, Sumi is the only art reference relied upon as rendering claim 1 obvious. As discussed below, Sumi fails to disclose or make obvious all elements of claim 1.

A. SUMI DOES NOT DISCLOSE OR MAKE OBVIOUS [1C], [1D], OR [1F]

In addition to other claim elements missing in Sumi, Sumi does not disclose or make obvious "***a connection via metal***" in [1C] or "***an insulating layer …***

[5] The fact that a claim element is not discussed in this Preliminary Response does not indicate that Patent Owner agrees that the claim element was disclosed or made obvious as argued in the Petition.

surrounding a portion of a lateral side of the projection part" in [1D], or the insulating layer having "***a thickness thinner than a projection height*** of the projection part" in [1F].

1. SUMI DOES NOT DISCLOSE OR MAKE OBVIOUS CLAIM ELEMENT "A CONNECTION VIA METAL" IN [1C]

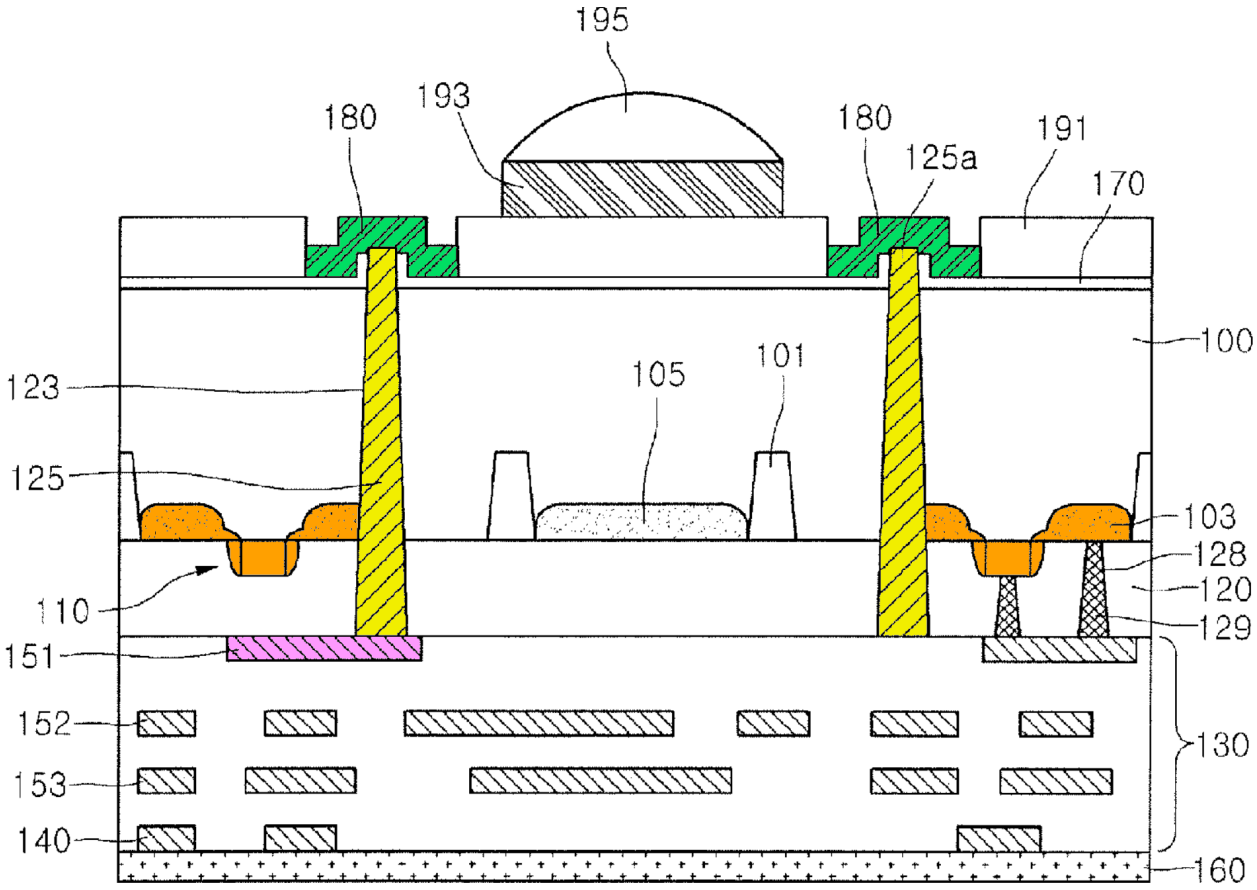
Sumi does not disclose or make obvious "***a connection via metal***" in [1C]. The Petition asserts that "[c]onductive layer 13 is a 'connection via' because it forms an electrical pathway from one metal layer to another by way of an opening ('opening 11') formed through one or more intervening layers, just like the '143 patent's connection via metal 125 through connection via 123." Pet. 28. Contrary to the Petition's assertion, conductive layer 13 of Sumi is ***not*** "just like the '143 patent's connection via metal 125." *Id*.

While both conductive layer 13 of Sumi and connection via metal 125 of the '143 patent may form an electrical pathway from one metal layer to another by way of an opening, connection via metal 125 of the '143 patent additionally electrically connects with transistor 110 of the readout circuitry, whereas conductive layer 13 of Sumi does not. '143 patent, 3:53-55, Fig. 9; Sumi, [0016], Fig. 3B. Even assuming that conductive layer 13 of Sumi is metal (which the

Petition acknowledges that Sumi does not disclose, Pet. 15), forming an electrical pathway from one metal layer to another by way of an opening does not mean it is "***a connection via metal***" as disclosed and claimed in the '143 patent. As discussed *supra* §I.C, "***a connection via metal***" refers to a via metal that electrically connects with the "readout circuitry." The '143 patent also makes clear that this electrical connection with the readout circuitry is in addition to electrical connection with any other metals, such as first metal interconnection 151 and metal pad 180. As examples, the '143 patent describes:

"The first metal interconnections 151 may be electrically connected with at least one of the connection via metal 125 ... ." *Id*., 3:65-66. And "the metal pad 180 is formed on the backside of the semiconductor substrate 100 such that the metal pad 180 is ... making contact with the connection via metal 125... ." *Id*., 5:62-66.

Color-highlighted Figure 9 below shows that connection via metals 125 (yellow) electrically connect with respective transistors 110 (orange) of the readout circuitry, in addition to first metal interconnection 151 (pink) and respective metal pads 180 (green).

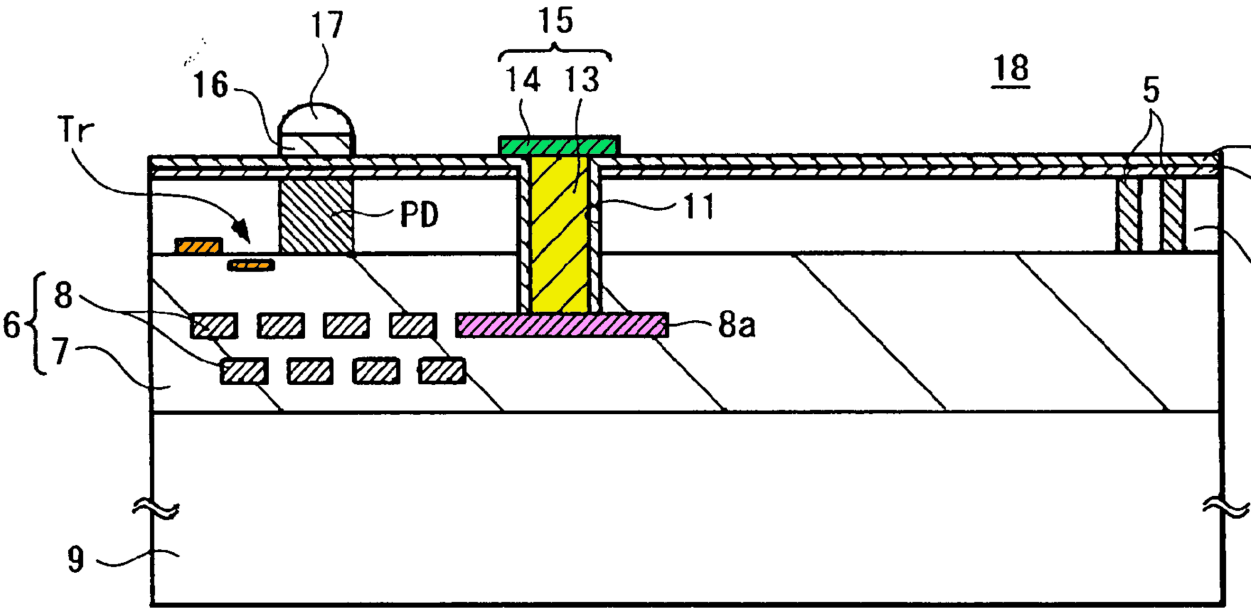


'143 Patent Fig. 9

Thus, while both conductive layer 13 of Sumi and connection via metal 125 of the '143 patent may form an electrical pathway from one metal layer to another, connection via metal 125 of the '143 patent additionally electrically connects with transistor 110 of the readout circuitry.

The Petition asserts that conductive layer 13 and transistor Tr of Sumi correspond respectively to the "connection via metal" and "readout circuitry" in claim 1. Pet. 18, 23-24, 28-29. But Sumi does not disclose that conductive layer

13 electrically connects with transistor Tr. Sumi merely discloses: "A conductive layer 13 that connects to the wiring layer 8a … and an electrode pad 14 that connects to the conductive layer 13 … ." Sumi, [0016]. Color-highlighted Figure 3B below also shows that conductive layer 13 (yellow) electrically connects with wiring layer 8a (pink), and electrode pad 14 (green), ***but not transistor Tr*** (orange).



Sumi Fig. 3B

Without any corresponding disclosure, speculating that conductive layer 13 electrically connects with transistor Tr would constitute inappropriate hindsight bias. In *Zoltek Corp. v. United States*, 815 F.3d 1302 (Fed. Cir. 2016), the Federal Circuit reaffirmed that "[t]he Court has recognized 'the distortion caused by

hindsight bias' and 'arguments reliant upon *ex post* reasoning' in determining obviousness. *KSR*, 550 U.S. at 421; … ('It appears that [the expert] relied on the … patent itself as her roadmap for putting what she referred to as pieces of a 'jigsaw puzzle' together.')" *Id*. at 1313 (citations omitted). Similarly, Petitioner cannot rely on the '143 patent itself as a guide to speculate that Sumi's conductive layer 13 (yellow) electrically connects with transistor Tr (orange), where no such connection is shown or disclosed in Sumi. As equally speculative approaches, conductive layer 13 could have been connected with a ground line, a power line, or another component integrated elsewhere in image sensor 18.

Thus, Sumi fails to disclose or make obvious "a connection via metal" in [1C].

2. IN CONTRAVENTION OF 37 C.F.R. §42.104(b)(4), THE PETITION FAILS TO SPECIFY WHERE CLAIM ELEMENT "AN INSULATING LAYER … *SURROUNDING A PORTION OF A LATERAL SIDE* OF THE PROJECTION PART" IN [1D] IS FOUND IN SUMI

Petitioner has clearly contravened the requirement of 37 C.F.R. §42.104(b)(4) by failing to specify where the claim element "an insulating layer … ***surrounding a portion of a lateral side*** of the projection part" in [1D] is found in

Sumi. Indeed, Petitioner has failed to specify where this claim element is found ***in any of the art references*** relied upon.

Petitioner refers to "Claim [1D]" or simply "[1D]" as reciting "an insulating layer formed on the second surface of the semiconductor substrate to expose the projection part while surrounding a portion of a lateral side of the projection part" in claim 1 of the '143 patent. Pet. 30-31. Manifestly [1D] includes two claim elements. Claim element (1) in [1D] recites "an insulating layer formed on the second surface of the semiconductor substrate to expose the projection part." This claim element is distinctly qualified by claim element (2) in [1D] that recites "***while surrounding a portion of a lateral side of the projection part***." While the Petition addresses claim element (1) in [1D], it remarkably fails to address claim element (2) in [1D]. No reason is stated in the Petition why or how this significant claim element can be ignored.

The '143 patent's detailed description and drawings make clear that claim element (2) in [1D] refers to the insulating layer ***partially surrounding the lateral side*** of the projection part. As examples, the '143 patent describes:

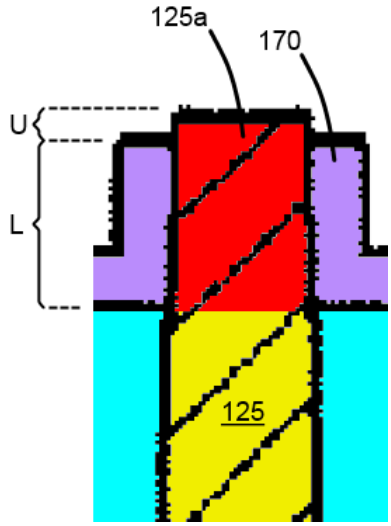
"[A]n insulating layer formed on the first surface of the semiconductor substrate to expose the projection part ***while surrounding a portion of a lateral side of the projection part***." '143 patent, Abstract.

"[A]n insulating layer formed on the second surface of the semiconductor substrate to expose the projection part ***while surrounding a portion of a lateral side of the projection part***." *Id*., 2:10-13.

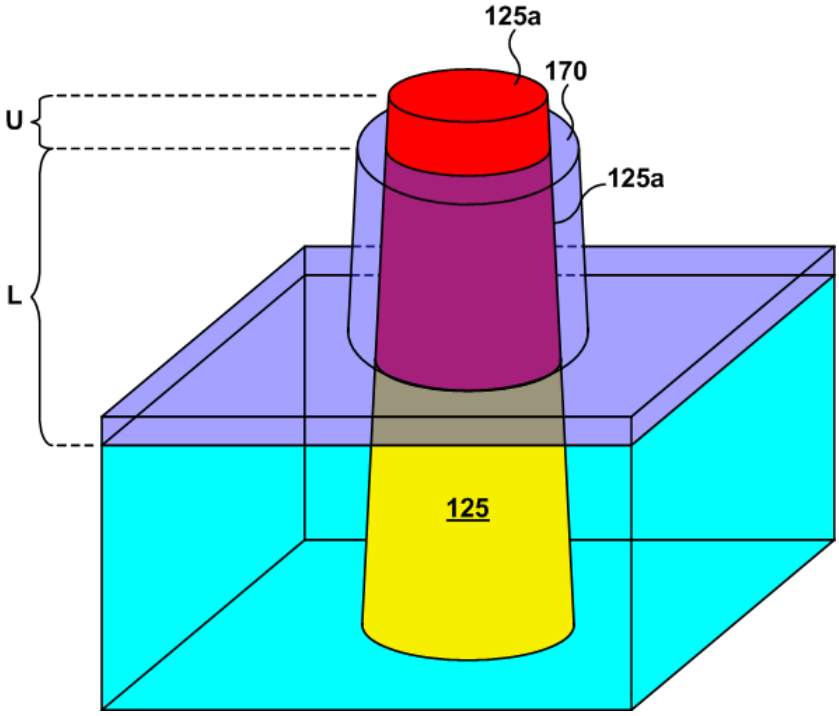
"The liner oxide layer 170 may be formed ***at a portion of the projection part 125a*** protruding from the backside of the semiconductor substrate 100. The liner oxide layer 170 ***partially surrounds a lateral side of the projection part 125a***." *Id*., 5:33-37.

The Petition states that "the 'liner oxide layer 170' itself constitutes the 'insulating layer.'" Pet. 71. Figures 7, 8, and 9 of the '143 patent all illustrate that the insulating layer (e.g., liner oxide layer 170) ***partially surrounds a lateral side*** of projection part 125a. For example, the annotated and color-highlighted figures below correspond to a portion of Figure 7 in the '143 patent and a three-dimensional representation thereof (PR-Fig. 1), and show insulating layer 170 (purple) surrounds only a lower part (L) of the lateral side of projection part 125a

(red). The upper part (U) of the lateral side of projection part 125a is not surrounded by insulating layer 170.



'143 Patent Fig. 7

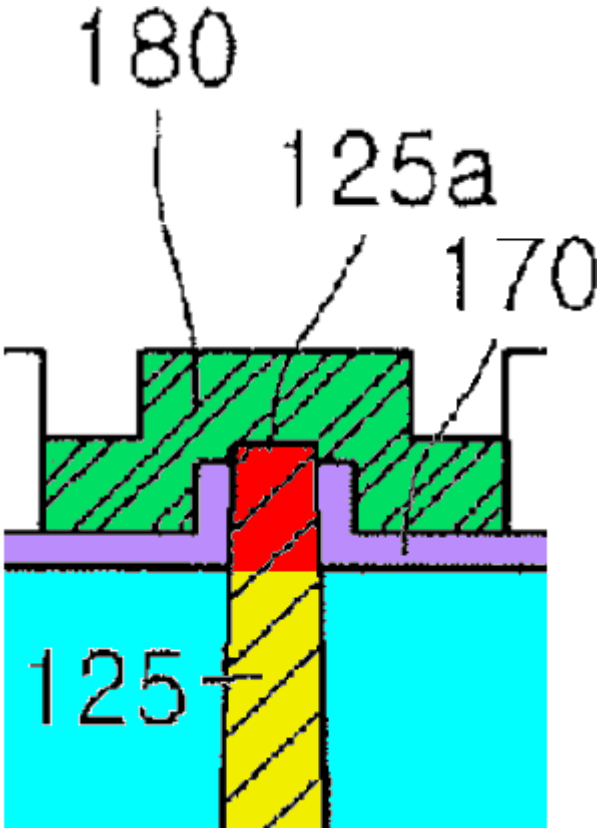


PR-Fig. 1

Claim element (2) in [1D] contributes to defining a structure that, among providing other advantages, helps in inhibiting connection failure with the "metal pad" in [1E] (i.e. "a metal pad formed on the insulating layer such that the metal pad covers the projection part"). The '143 patent describes: "The projection part 125a inhibits the connection failure of the metal pad ... and the connection via metal 125. In other words, the projection part 125a firmly maintains the electric

connection of the metal pad and the connection via metal 125." '143 patent, 4:61-65.

Because the insulating layer is "surrounding ***a portion*** of a lateral side of the projection part" as claimed, projection part 125a projects beyond insulating layer 170 (as indicated by bracket "U" in the annotated Fig. 7 and PR-Fig. 1 above). Among other advantages, the total contacting area of projection part 125a exposed to metal pad 180 is increased, which helps in inhibiting connection failure between connection via metal 125 and metal pad 180 that covers it and provides a more reliable electrical and mechanical contact. The annotated and color-highlighted figure below corresponds to a portion of Figure 9 in the '143 patent, and shows connection via metal 125 (yellow), projection part 125a thereof (red), insulating layer 170 (purple), and metal pad 180 (green). *Id*., Fig. 9.



'143 Patent Fig. 9

Insulating layer 170 ***partially surrounding a lateral side*** of projection part 125a results in various advantages, such as enabling projection part 125a of connection via metal 125 to firmly maintain the connection by increasing the contacting area of connection via metal 125 that metal pad 180 covers. Accordingly, element (2) in [1D], as disclosed and claimed in the '143 patent, requires the insulating layer to ***partially, and not fully,*** surround the lateral side of the projection part.

Petitioner has not provided a proposed claim interpretation for the claim element "an insulating layer … ***surrounding a portion of a lateral side*** of the projection part" in [1D]. Instead, Petitioner has stated that "ordinary and customary meaning" applies to the claims. Pet. 8-9. Yet, it has failed to recite the claim element "an insulating layer … ***surrounding a portion of a lateral side*** of the projection part" anywhere in its discussion for ***any*** art reference to specify where, according to a purported "ordinary and customary meaning," the claim element is found in the prior art relied upon.

Such gamesmanship provides no notice or opportunity to appropriately respond in the Preliminary Response and places the burden on Patent Owner to respond not knowing Petitioner's contention and reasoning as to where the claim element is purportedly found in the prior art. This gamesmanship also allows Petitioner to pursue conflicting positions in the IPR and litigation. It is Petitioner's burden to specify, ***in the Petition itself***, where each claim element is found in the prior art relied upon. Instead, Petitioner apparently wishes to stake out its position ***after*** Patent Owner's response.

Setting aside all other arguments, 37 C.F.R. §42.104(b)(4) provides a straightforward rule as it requires Petitioner to specify where each claim element,

including "an insulating layer … ***surrounding a portion of a lateral side*** of the projection part," is found in the prior art relied upon. Petitioner has clearly violated this rule – with respect to ***all*** art references relied upon. The Petition should therefore be denied.

With respect to Sumi, the Petition states: "Conductive layer 13 is then formed inside opening 11 on insulation film 12 to expose the top surface of conductive layer 13, while ***the lateral sides of conductive layer 13 extending*** beyond silicon layer 3—i.e., the "projection part"—***are surrounded by insulation film 12***, … ." Pet. 30. Thus, the Petition maintains that the "lateral sides of conductive layer 13" are "surrounded by insulation film 12" rather than being ***partially*** surrounded by insulation film 12 (the "insulating layer"). The Petition never addresses the claim element "an insulating layer … ***surrounding a portion of a lateral side*** of the projection part" in [1D], and completely ignores the operative phrase "surrounding ***a portion*** of a lateral side," while providing no reason for doing so.

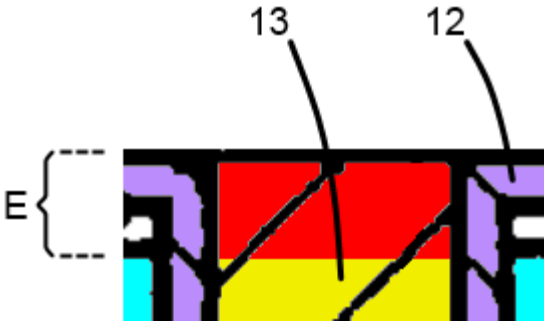
The fact that the Petition does not address claim element (2) in [1D] is not an inadvertent omission, since Sumi (like all other art references relied upon in the Petition) does not disclose that its "insulating layer" surrounds "***a portion*** of a

lateral side of the projection part." The Petition has recited claim element (2) in [1D], that is "an insulating layer … surrounding a portion of a lateral side of the projection part," ***only in its section headings*** (Pet. 30, 55, 71), without any discussion. As such, the Petition fails to specify where claim element (2) in [1D] is found in Sumi in violation of 37 C.F.R. §42.104(b)(4).

3. SUMI DOES NOT DISCLOSE OR MAKE OBVIOUS CLAIM ELEMENT "AN INSULATING LAYER … *SURROUNDING A PORTION OF A LATERAL SIDE* OF THE PROJECTION PART" IN [1D]

Sumi, like all other art references relied upon in the Petition, does not disclose or make obvious "an insulating layer … ***surrounding a portion of a lateral side*** of the projection part" in [1D].

Insulation film 12 (the "insulating layer" of Sumi) is a trench liner that lines the interior sidewalls of opening 11 in which conductive layer 13 is formed: "Further, for example, an insulation film 12 such as a silicon oxide film is formed from the inside wall of the opening 11 … A conductive layer 13 … inside the opening 11 is formed … ." Sumi, Fig. 3B, [0016]. The annotated and color-highlighted figure below corresponds to a portion of Figure 3B of Sumi, and shows conductive layer 13 (yellow), upper part thereof (red), and insulation film 12 (purple). *Id*., Fig. 3B.

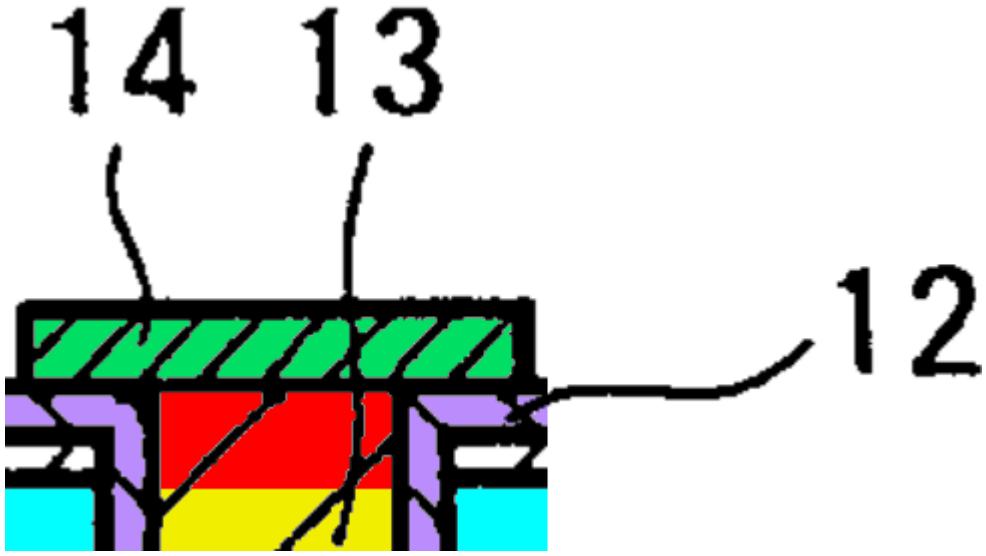


Sumi Fig. 3B

As seen above, insulation film 12 is coextensive with the lateral side of conductive layer 13, including the lateral side of upper part (red) of conductive layer 13. *Id*., Fig. 3B. In other words, ***insulation film 12 surrounds the entirety (E) of the lateral side of the asserted "projection part."*** Thus, Sumi does not disclose or make obvious "an insulating layer … surrounding ***a portion*** of a lateral side of the projection part."

Moreover, Sumi fails to disclose a reason for or any benefit derived from "an insulating layer … surrounding ***a portion*** of a lateral side of the projection part." In particular, in contrast to the '143 patent, upper part (red) (the asserted "projection part," Pet. 29) of conductive layer 13 does not project beyond insulation film 12 (the asserted "insulating layer"), and does not provide increased contacting area to improve the connection of conductive layer 13 with electrode pad 14 (the asserted "metal pad," Pet. 31-32).

The annotated and color-highlighted figure below corresponds to a portion of Figure 3B of Sumi, and shows conductive layer 13 (yellow), upper part thereof (red), insulation film 12 (purple), and electrode pad 14 (green). Sumi, Fig. 3B.



Sumi Fig. 3B

Sumi does not disclose or suggest extending upper part (red) of conductive layer 13 (yellow) beyond insulation film 12 (purple). Nor does Sumi disclose any reason for or benefit derived from upper part (red) of conductive layer 13. For example, upper part (red) does nothing to inhibit connection failure between electrode pad 14 and conductive layer 13. Upper part (red) is shown to extend directly upward from the lower part of conductive layer 13 (yellow), such that electrode pad 14 (green) covers the same contacting area of conductive layer 13 as

it would have covered without designating upper part (red) a purported "projection part." *Id*., Fig. 3B.

Sumi only states that "an electrode pad 14 that connects to the conductive layer 13 and faces to the rear surface is formed, and what is called a rear surface electrode 15 is formed." *Id*., [0016]. Thus, Sumi not only fails to disclose or make obvious "an insulating layer … surrounding ***a portion*** of a lateral side of the projection part," Sumi also fails to discuss any reason for or benefit derived from surrounding ***a portion*** of a lateral side of the projection part.

As noted above, the Petition avoids discussing the claim phrase "***a portion*** of a lateral side" altogether. *See supra* §I.A; Pet. 30-31. Instead, the Petition attempts to misdirect attention by quoting a sentence of the '143 patent that does not pertain to the claim phrase "***a portion*** of a lateral side," but rather, pertains to a separate feature of liner oxide layer 170 ("insulating layer") that is similar to insulation film 12 of Sumi, and then asserts false equivalence because of this similarity. Also, the Petition only quotes a selected bit of the sentence of the '143 patent in order to obscure the fact that the sentence does not pertain to the claim phrase "***a portion*** of a lateral side."

The Petition asserts: "This structure shown in Figure 3B is consistent with the structure described in the '143 patent and shown in Figure 9 (*see also* annotated Fig. 9 above) in which the top surface of projection part 125a is exposed (and subsequently covered by pad 180) while the lateral sides of the projection part are surrounded by oxide layer 170. '143 patent, 5:30-3[2] [*sic*] ('liner oxide layer 170 is formed on the entire surface of the backside except for a top of the projection part 125a'). Thus, Sumi's insulation film 12 meets [1D] for the same reasons the '143 patent's oxide layer 170 does." Pet. 31. This assertion is wrong and misleading.

First, as discussed above, Figure 3B of Sumi is ***not*** "consistent with the structure described in the '143 patent and shown in Figure 9." *Id*. For example, Figure 3B of Sumi shows insulation film 12 surrounds the entirety of the lateral side of conductive layer 13 (including the entirety of the lateral side of the upper part thereof), while the '143 patent describes and shows in Figure 9 that the "liner oxide layer 170 ***partially surrounds*** a lateral side of the projection part 125a." '143 patent, 5:36-37.

Second, the portion of the '143 patent that the Petition has produced is incomplete and does not even support its wrong assertion. The complete sentence

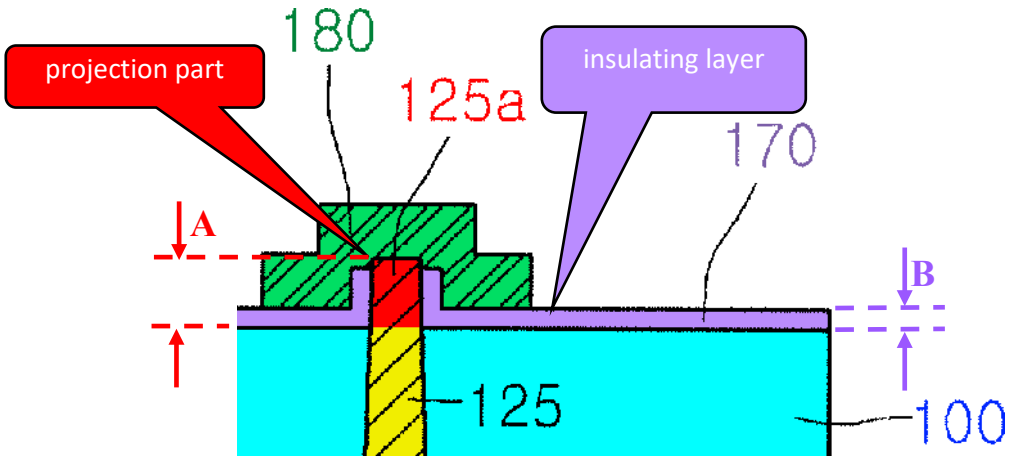
is reproduced here for clarity: "Accordingly, ***the projection part 125a of the connection via metal 125 protrudes from the backside of the semiconductor substrate*** 100, and the liner oxide layer 170 is formed on the entire surface of the backside except for a top of the projection part 125a." '143 patent, 5:28-32. As is readily understood from the complete sentence, the incomplete portion quoted by the Petition simply describes how much of the surface of the backside of semiconductor substrate 100 liner oxide layer 170 ("insulating layer") covers. The complete sentence is also consistent with the projection part in the '143 patent protruding from the backside of the semiconductor substrate and having a portion of a lateral side thereof surrounded by the insulating layer.

The proposition that liner oxide layer 170 and Sumi's insulation film 12 both cover similar amounts of a semiconductor substrate (even if true) is not dispositive as to whether insulation film 12 meets claim element (2) in [1D], that is "an insulating layer … ***surrounding a portion of a lateral side*** of the projection part." The Petition's assertion that Sumi's insulation film 12 meets the requirements of the "***insulating layer***" because of a purported similarity that is unrelated to claim element (2) in [1D] is a false equivalence. Pet. 31.

As discussed above, the wrong and misleading assertion by the Petition is an attempt to misdirect attention from the fact that the Petition has not discussed the claim phrase "***a portion*** of a lateral side" at all. The Petition has deliberately avoided any discussion of the claim element "an insulating layer … ***surrounding a portion of a lateral side*** of the projection part," or the claim phrase "***a portion*** of a lateral side."

4. PETITIONER'S RELIANCE ON SUMI'S DRAWINGS TO DISCLOSE OR MAKE OBVIOUS CLAIM ELEMENT "WHEREIN THE INSULATING LAYER HAS A THICKNESS THINNER THAN A PROJECTION HEIGHT OF THE PROJECTION PART" IN [1F] CONTRADICTS SETTLED PATENT LAW

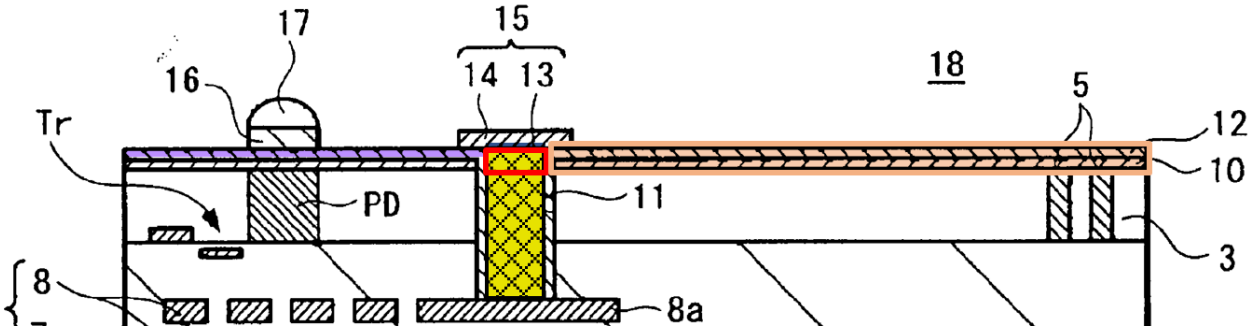
The claim element "wherein the insulating layer has ***a thickness thinner than a projection height*** of the projection part" (the "thinner limitation") is a significant limitation and is a compelling ground of distinction over all the art references in the Petition. This thinner limitation feature is illustrated below where a close up of the projection part meets the insulating layer in the '143 Patent.



'143 Patent Fig. 8 (shown in part)

The '143 Patent explains that "[t]he liner oxide layer 170 has a thickness ***thinner than that of the projection part 125a*** … ." '143 patent, 5:7-8. As seen from the height (**B**) of insulating layer 170, the thickness of the insulating layer is thinner than the projection height (**A**) of projection part 125a. The '143 Patent further explains that this configuration is beneficial, because "the metal pad can be connected with only the connection via metal 125." *Id.* 4:67–5:1. In particular, during the manufacturing process, "[a]s shown in FIG. 8, a metal pad 180 is formed to cover the projection part 125a," *Id.* 5:39-40.

The "Related Art" that Petitioner relies upon in Sumi does not disclose this feature. Petitioner relies upon the image in Figure 3B of Sumi to disclose this limitation as shown below.



Pet. 33 (Sumi Fig. 3B annotated by Petitioner) (shown in part)

In particular, Petitioner asserts that "insulation film 12 meets [this limitation] because this layer is thinner than the projection part [indicated with the red rectangle] of conductive layer 13." *Id*. This is incorrect.

Dimensions purportedly reflected in patent drawings may not be relied upon, absent a discussion of those dimensions in the written description of the patent's specification. *See Hockerson-Halberstadt, Inc. v. Avia Grp. Int'l, Inc.*, 222 F.3d 951, 956 (Fed. Cir. 2000) ("[I]t is well established that patent drawings do not define the precise proportions of the elements ***and may not be relied on to show particular sizes if the specification is completely silent on the issue***."); *see also Nystrom v. TREX Co.*, 424 F.3d 1136, 1149 (Fed. Cir. 2005) (concluding it was error to "not properly apply[] the principles set forth in our prior precedents that arguments based on drawings not explicitly made to scale in issued patents are

unavailing"). ***Sumi does not discuss the thickness of the relied upon layers absolutely or in relative terms*** or state that the drawing is made to scale. As such it would be error for the Board to rely upon this figure for the "thinner limitation," and Petitioner's argument should be rejected.

III. GROUNDS 3 AND 4 FAIL TO DISCLOSE OR MAKE OBVIOUS ALL ELEMENTS OF CLAIM 1

Under Grounds 3 and 4, a combination of Shiraiwa and Sumi are relied upon as rendering claim 1 obvious. As discussed below, the combination fails to disclose or make obvious all elements of claim 1.

A. COMBINATION OF SHIRAIWA AND SUMI DOES NOT DISCLOSE OR MAKE OBVIOUS [1C], [1D], OR [1F]

Shiraiwa is duplicative of Sumi. The Petition has perplexingly introduced Shiraiwa as a reference for combination with Sumi. Pet. 45. Shiraiwa lacks every claim element that is lacking in Sumi. Like Sumi, Shiraiwa does not disclose or make obvious "***a connection via metal***" in [1C] or "***an insulating layer … surrounding a portion of a lateral side of the projection part***" in [1D], or the insulating layer having "***a thickness thinner than a projection height*** of the projection part" in [1F].

Moreover, Petitioner has clearly contravened the requirement of 37 C.F.R. §42.104(b)(4) by failing to specify where the claim element "an insulating layer … ***surrounding a portion of a lateral side*** of the projection part" in [1D] is found in Shiraiwa.

In addition, Shiraiwa discloses less than Sumi. *See, e.g.,* Pet. 46 ("Shiraiwa discloses (but does not illustrate) that a pad is formed on the rear surface side to connect to wiring 32"); Pet. 47 ("Shiraiwa's disclosed (but not illustrated) electrical connection between a rear-surface 'pad' and 'wiring 32'"); Pet. 50 ("the pad (disclosed by not illustrated) …").

It is Sumi, not Shiraiwa, that supplies the relied upon features to the combination of Shiraiwa and Sumi. *See, e.g.,* Pet. 48-49 ("Sumi's opening 11," "Sumi's conductive layer 13," "Sumi's rear surface electrode 15," "Sumi's electrode pad 14"); *see also, e.g.,* Pet. 54 (referring to Sumi's conductive layer 13, electrode pad 14, and rear surface electrode 15 as making [1C] obvious in the combination of Shiraiwa and Sumi); Pet. 56 (referring to Sumi's electrode pad 14 and rear surface electrode 15 as making [1E] obvious in the combination).

The Petition proposes, in a quite opaque manner, that it would have been obvious for a POSA to implement Sumi's features of opening 11, conductive layer

13, electrode pad 14, and rear surface electrode 15 in Shiraiwa, even though Shiraiwa has no drawings (and no descriptive language) with respect to these features. Pet. 47-50. The Petition has not set forth any disclosure provided by Shiraiwa that was not already provided by Sumi.

Introduction of Shiraiwa as a duplicative reference that discloses less than Sumi is baffling, but it has provided an opportunity to reintroduce what was already presented with respect to Sumi, ***with the benefit of an improperly modified combined drawing*** that has inexplicably deleted a significant portion of Sumi's drawing from the combination. Petitioner's improperly modified Figure 1 of Shiraiwa has been presented seven times (in six different versions) as the combined Shiraiwa+Sumi drawing. Pet. 49, 55-58, 60.

As illustrated below, when combining the Sumi and Shiraiwa drawings, the Petition has misleadingly and contrary to its own expert's statements omitted large portions of insulation film 12 of Sumi that must accompany Sumi's conductive layer 13 and be on the sidewalls thereof. *Id*. No explanation is provided for deletion of insulation film 12 from the sidewalls of conductive layer 13. This improperly modified drawing appears to be the primary reason a duplicative reference such as Shiraiwa has been introduced in the Petition.

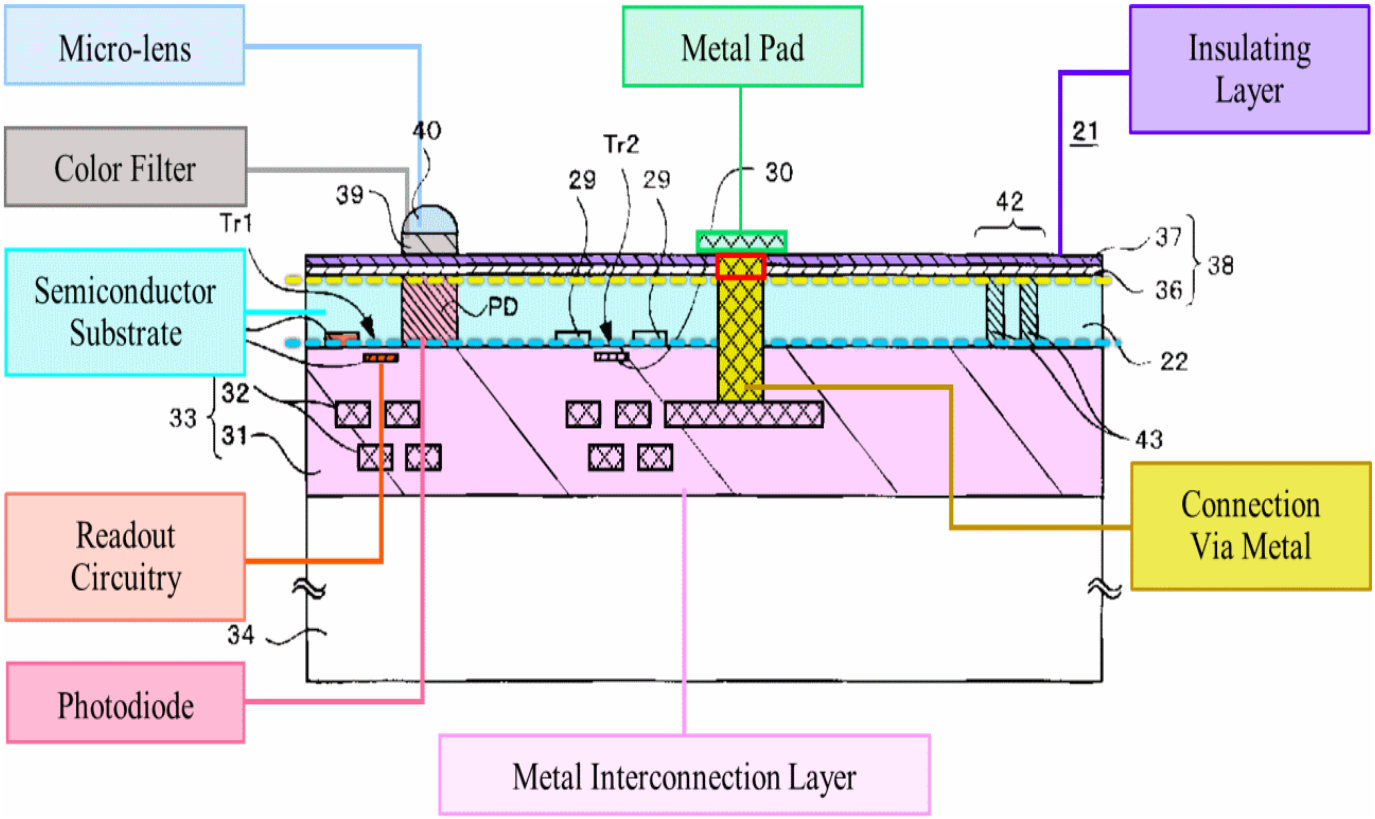
1. COMBINATION OF SHIRAIWA AND SUMI DOES NOT DISCLOSE OR MAKE OBVIOUS "A CONNECTION VIA METAL" IN [1C]

Shiraiwa, alone or in combination with Sumi, does not disclose or make obvious "***a connection via metal***" in [1C]. As acknowledged by the Petition, Shiraiwa by itself does not disclose the claim element "***a connection via metal***." The Petition relies on Sumi for this claim element. *See, e.g.,* Pet. 54 ("the Metal-Shiraiwa-Sumi Sensor uses … conductive layer 13 … of Sumi's rear surface electrode 15"). The Petition asserts that ***conductive layer 13 of Sumi*** in the proposed combination of Shiraiwa with Sumi meets "***a connection via metal***" "for the same reasons discussed" with respect to Sumi alone. *Id*., 55 ("Thus, metal conductive layer … of the Metal-Shiraiwa-Sumi Sensor meets [1C] for the same reasons discussed in §VIII.B."). However, as discussed *supra* §II.A.1, conductive layer 13 of Sumi does not meet "***a connection via metal***" in [1C].

The Petition asserts that conductive layer 13 of Sumi and MOS transistors Tr1 of Shiraiwa correspond respectively to the "***connection via metal***" and "***readout circuitry***" in claim 1. Pet. 49, 51-52, 54-55. But Shiraiwa and Sumi do not provide a reason for a proposed combination that would electrically connect conductive layer 13 of Sumi with MOS transistors Tr1 of Shiraiwa. Sumi

discloses "[a] conductive layer 13 that connects to the wiring layer 8a … and an electrode pad 14 that connects to the conductive layer 13 … ." Sumi, Fig. 3B, [0016]. Shiraiwa describes the purpose of MOS transistors Tr1 as "a plurality of MOS transistors Tr1 serving as means for reading signal charges of the photodiode PD, …" (Shiraiwa, Fig. 1, [0026]), which the Petition contends discloses the "readout circuitry" in [1A]. Pet. 51-52. The Petition has contended that Sumi disclosed a "readout circuitry" in a similar manner. *See, e.g.,* Pet. 23-24. Thus, Shiraiwa does not provide any additional disclosure regarding the "readout circuitry."

Even the Petition's illustration of its proposed Shiraiwa+Sumi combination (reproduced below) shows that conductive layer (yellow) connects with wiring 32 (pink), and electrode pad (green), ***but not MOS transistors Tr1*** (orange, far left). Pet. 49.



Shiraiwa+Sumi Drawing from Pet. 49

Without any corresponding disclosure, speculating that the proposed Shiraiwa+Sumi combination would electrically connect conductive layer 13 of Sumi (labeled "connection via metal" in the Petition's drawing above) with MOS transistors Tr1 of Shiraiwa amounts to an impermissible hindsight reconstruction. *See Zoltek Corp.*, *supra*.

As equally speculative approaches, conductive layer 13 of Sumi could have been connected with a ground line, a power line, or another component integrated

elsewhere in solid-state imaging element 21. Indeed, even in the Petition's illustration of its proposed Shiraiwa+Sumi combination above, it would have been simpler for conductive layer 13 (yellow) to connect with peripheral circuit CMOS transistor Tr2 rather than with MOS transistors Tr1, since conductive layer 13 is closer to peripheral circuit CMOS transistor Tr2.

2. IN CONTRAVENTION OF 37 C.F.R. §42.104(b)(4), THE PETITION FAILS TO SPECIFY WHERE CLAIM ELEMENT "AN INSULATING LAYER … *SURROUNDING A PORTION OF A LATERAL SIDE* OF THE PROJECTION PART" IN [1D] IS FOUND IN A COMBINATION OF SHIRAIWA AND SUMI

As is the case with Sumi (*see supra* §II.A.2), the Petition has contravened the requirement of 37 C.F.R. §42.104(b)(4) by its failure to specify where the claim element "an insulating layer … ***surrounding a portion of a lateral side*** of the projection part" in [1D] is found in Shiraiwa, or a combination of Shiraiwa and Sumi.

As discussed above with respect to Sumi alone, one of the advantages of "the connection via metal having a projection part" is to assist in inhibiting connection failure with the "metal pad." '143 patent, Fig. 9, 4:61-65. Among other advantages, projection part 125a of connection via metal 125 functions to firmly maintain the connection by increasing the contacting area of connection via

metal 125 that metal pad 180 covers. *Id*. The claimed structure "an insulating layer … ***surrounding a portion of a lateral side*** of the projection part" contributes to this increased contacting area.

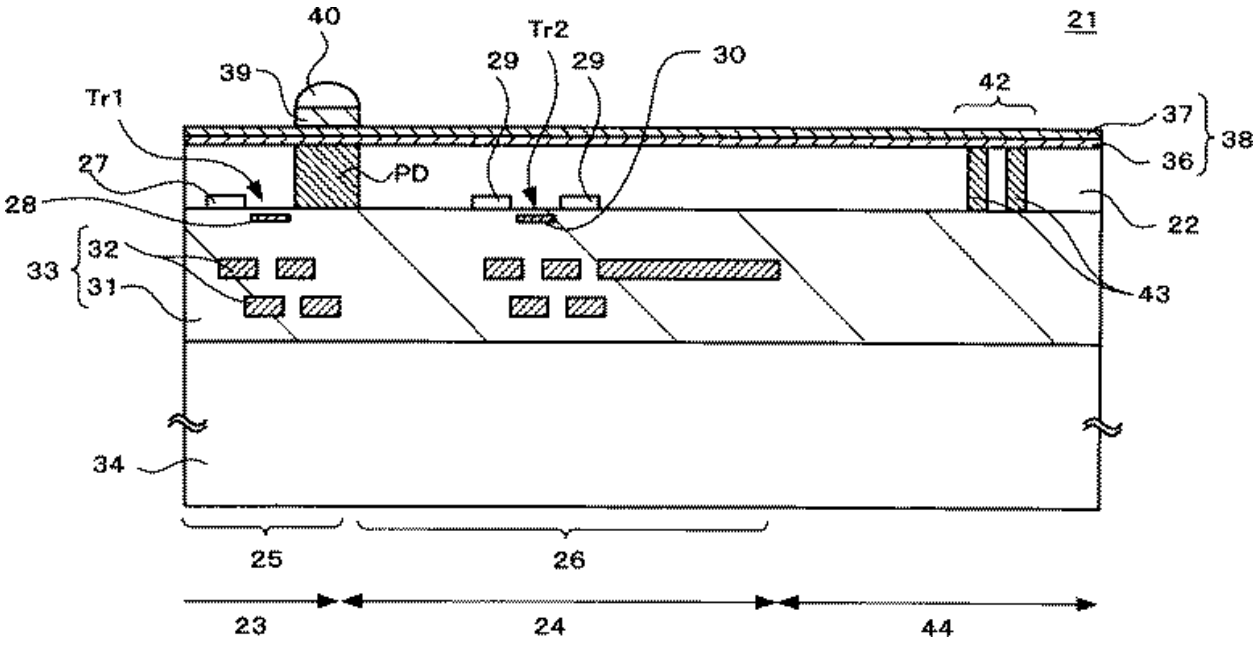
The '143 patent's detailed description and drawings make clear that this limitation refers to the insulating layer partially surrounding the lateral side of the projection part. For example, the '143 patent states: "The liner oxide layer 170 ***partially surrounds a lateral side*** of the projection part 125a." *Id*., 5:36-37, Figs. 7-9. As such, projection part 125a projects beyond insulating layer 170 since it partially surrounds the lateral side of projection part 125a. Claim element (2) in [1D] requires the insulating layer to ***partially, and not fully,*** surround the lateral side of the projection part.

Moreover, as is the case with Sumi, the Petition has avoided any discussion of the claim element "an insulating layer … ***surrounding a portion of a lateral*** side of the projection part" with respect to Shiraiwa or a combination of Shiraiwa and Sumi. Pet. 55-56.

3. COMBINATION OF SHIRAIWA AND SUMI DOES NOT DISCLOSE OR MAKE OBVIOUS CLAIM ELEMENT "AN INSULATING LAYER … *SURROUNDING A PORTION OF A LATERAL SIDE* OF THE PROJECTION PART" IN [1D]; THE PETITION HAS REPEATEDLY PRESENTED IMPROPERLY MODIFIED DRAWINGS FOR THE COMBINATION

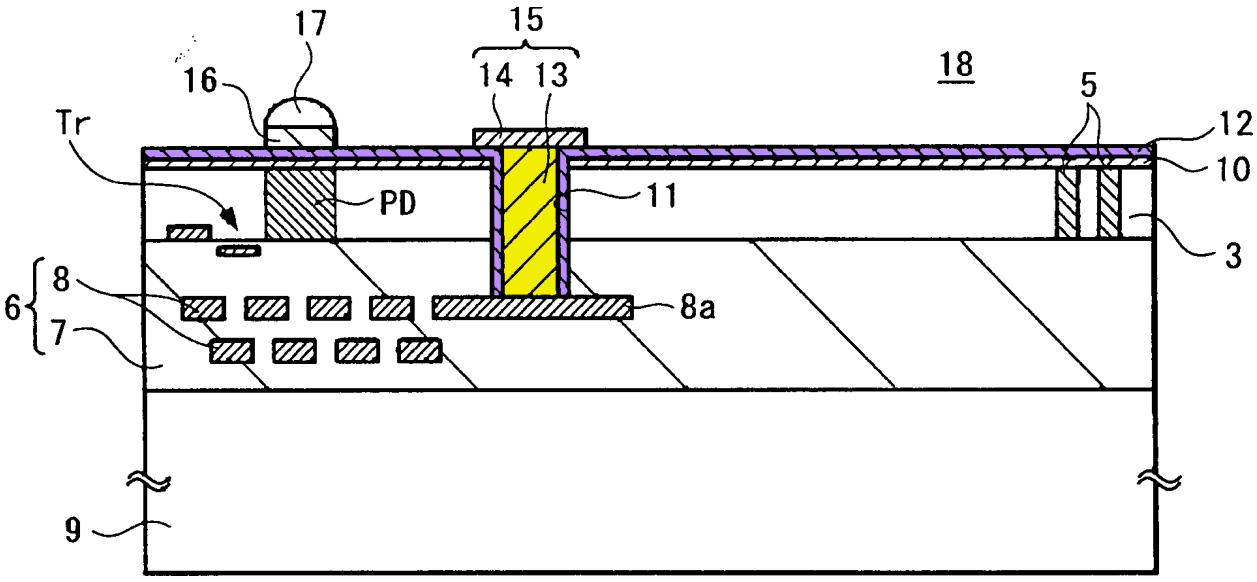
Shiraiwa and Sumi, alone or in combination, do not disclose or make obvious "an insulating layer … ***surrounding a portion of a lateral side*** of the projection part" in [1D]. Moreover, the Petition has repeatedly presented ***misleadingly modified*** drawings for the proposed combination of Shiraiwa and Sumi. In its combined Shiraiwa+Sumi drawings, the Petition has, improperly and contrary to its own expert's statements, omitted large portions of insulation film 12 of Sumi that must accompany Sumi's conductive layer 13 and be on the sidewalls thereof. Pet. 49, 55-58, 60. The improper modification has been presented seven times (in six different versions) in the combined Shiraiwa+Sumi drawings. *Id*.

Below is the original unmodified Figure 1 of Shiraiwa.



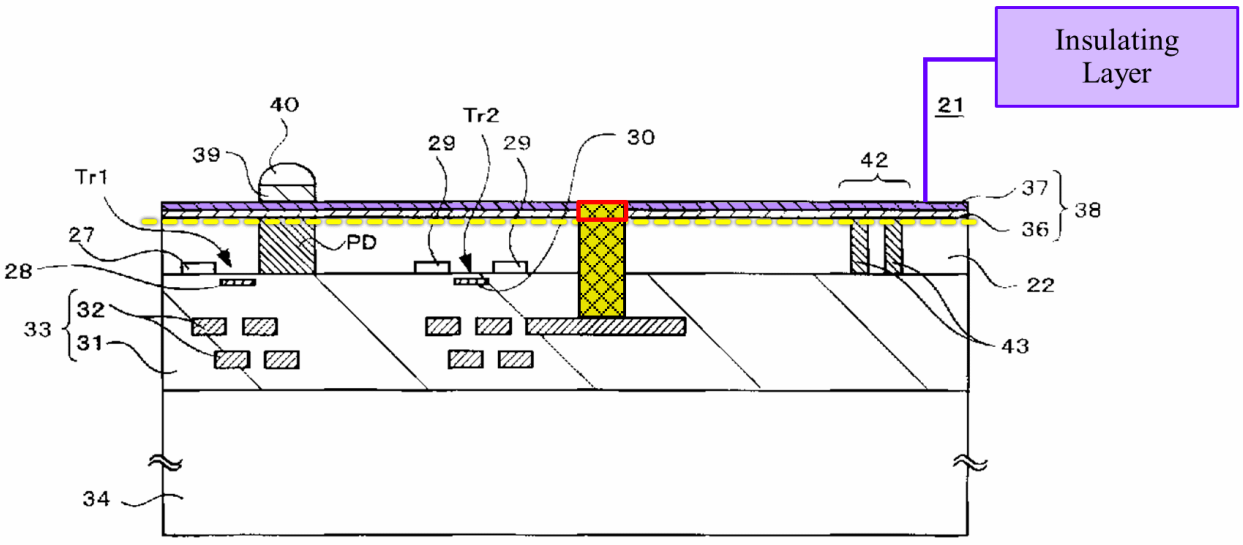
Shiraiwa Fig. 1

The color-highlighted original Figure 3B of Sumi (below) shows that insulation film 12 (purple) lines the sidewalls of opening 11 in which conductive layer 13 (yellow) is formed: "Further, for example, an insulation film 12 such as a silicon oxide film is formed from the inside wall of the opening 11 … A conductive layer 13 … inside the opening 11 is formed … ." Sumi, Fig. 3B, [0016].



Sumi Fig. 3B

Yet the proposed Shiraiwa+Sumi combined drawings in the Petition (one of which is reproduced below) show Shiraiwa's Figure 1 modified to include opening 11 and conductive layer 13 of Sumi's Figure 3B, but ***inexplicably omits insulation film 12*** that Sumi teaches must accompany opening 11 and conductive layer 13. Pet. 56.



Improperly Modified Shiraiwa+Sumi Drawing (Pet. 56)
(Modified Shiraiwa Fig. 1)

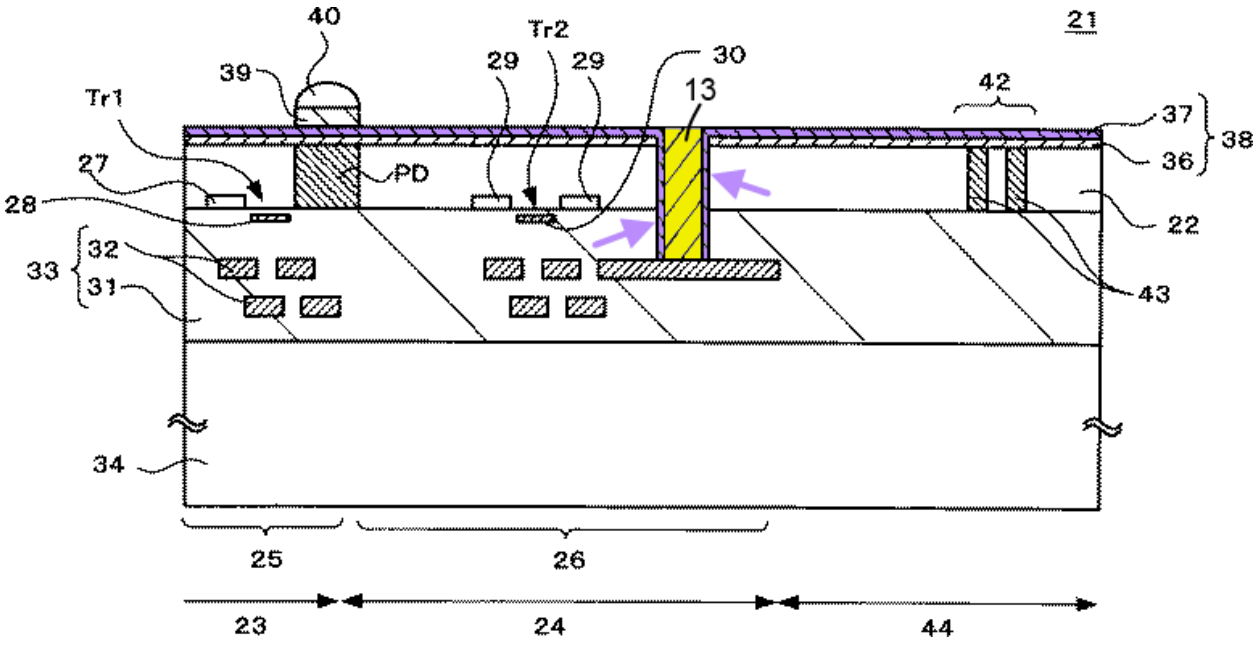
Petitioner's expert acknowledges that in the proposed Shiraiwa+Sumi combined drawing, insulation film 12 of Sumi corresponds to silicon oxide film 37 of Shiraiwa, and silicon oxide film 37 of Shiraiwa must be on the sidewalls of opening 11 of Sumi and surround conductive layer 13 of Sumi:

"Sumi's opening 11 would be formed through nitride film 36 and semiconductor substrate 22 … . Next, ***Shiraiwa's silicon oxide film 37*** would be formed over nitride film 36 (Shiraiwa, [0039]), which ***would also therefore cover the inside wall of the opening*** (Sumi, [0016]). Guidash, ¶169. Sumi's conductive layer 13 would then be formed inside the opening … ." Pet. 48-49; Guidash (Ex. 1003), ¶¶168-169.

"Silicon oxide film 37 of the Metal-Shiraiwa-Sumi Sensor meets [1D] for the same reasons discussed in §VIII.C.5 that Sumi's insulation film 12 meets [1D] … ***silicon oxide film 37 is formed on the inside wall of opening 11*** … ***conductive layer 13 is*** formed in the opening … the lateral sides … are ***surrounded by silicon oxide film 37*** (purple)." Pet. 55-56; Guidash, ¶184.

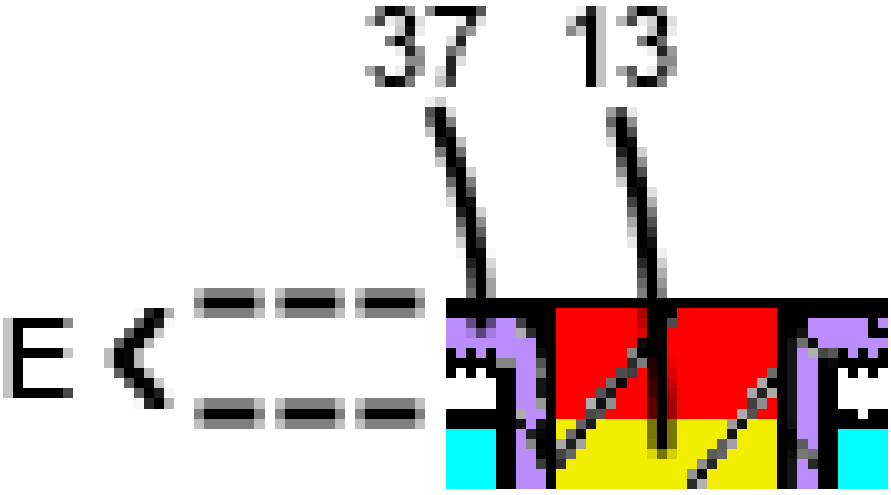
"Like Sumi's description of 'insulation film 12,' Shiraiwa describes the insulating film 37 as 'silicon oxide,' … ." Pet. 58; Guidash, ¶187.

Below, in PR-Fig. 2, Patent Owner provides a corrected version of the combined Shiraiwa+Sumi drawing that fixes the Petition's improperly modified drawings. PR-Fig. 2 includes the proper extent of silicon oxide film 37 of Shiraiwa (in purple, and pointed to by purple arrows) lining the sidewalls of conductive layer 13 (yellow) of Sumi.



PR-Fig. 2 (Corrected Shiraiwa+Sumi Drawing)

The annotated and color-highlighted Figure PR-Fig. 3 below illustrates a portion of PR-Fig. 2 with additional color highlighting, and shows conductive layer 13 (yellow) of Sumi, upper part thereof (red), and silicon oxide film 37 (purple) of Shiraiwa that is improperly and inexplicably omitted from the sidewalls of conductive layer 13 in the Petition's drawings.



PR-Fig. 3

Shiraiwa and Sumi, singly or in combination, do not disclose or suggest extending upper part (red) of conductive layer 13 beyond silicon oxide film 37 (purple). Nor do they disclose any reason for or benefit derived from the upper part (red) of conductive layer 13. For example, upper part (red) does nothing to inhibit connection failure between conductive layer 13 and a subsequently formed metal pad (not shown). Upper part (red) does not increase the contacting area of conductive layer 13 that the metal pad would cover. Upper part (red) is shown to extend directly from the lower part (yellow), such that the metal pad would cover the same contacting area of conductive layer 13 as it would have covered without a purported "projection part."

Sumi simply describes: "an electrode pad 14 that connects to the conductive layer 13 and faces to the rear surface is formed, and what is called a rear surface electrode 15 is formed." Sumi, [0016]. Further, Shiraiwa does not touch upon inhibiting connection failure since Shiraiwa has no drawings (and no descriptive language) with respect to opening 11, conductive layer 13, electrode pad 14, or rear surface electrode 15 in Sumi.

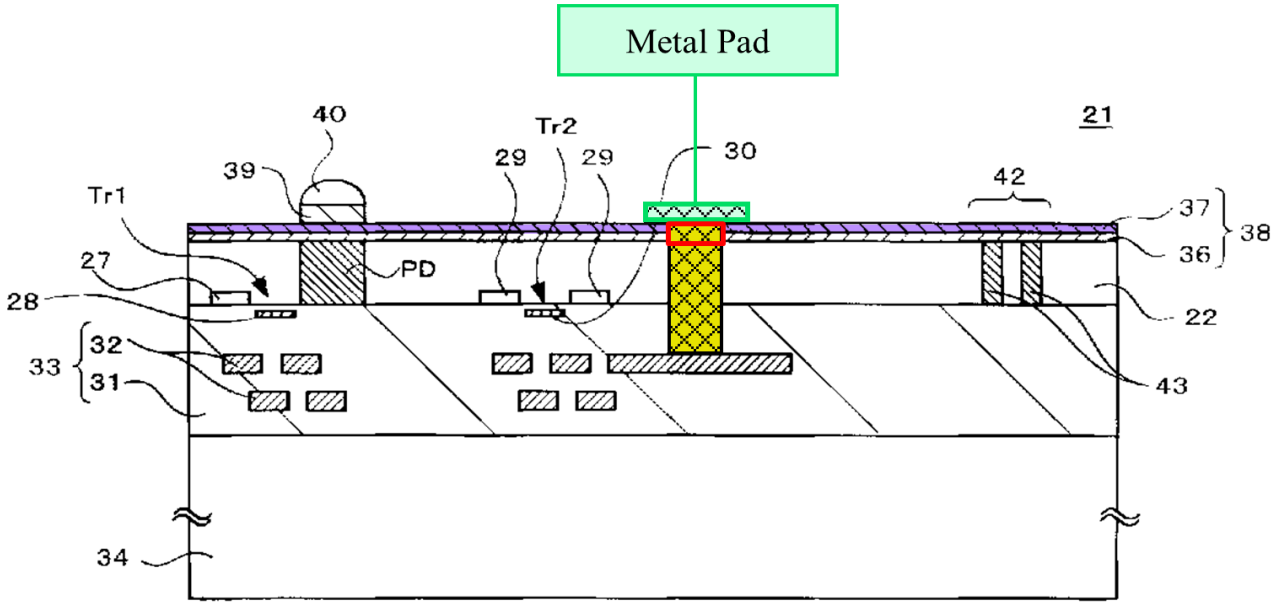
Just as Shiraiwa and Sumi fail to discuss any reason for or benefit derived from "a projection part," Shiraiwa and Sumi likewise fail to disclose the corresponding structure of an insulating layer ***partially, and not fully, surrounding the lateral side of the projection part***. As seen in PR-Fig. 3 above, silicon oxide film 37 is coextensive with the side of upper part (red) of conductive layer 13. As a result, ***silicon oxide film 37 surrounds the entirety*** (bracket "E" in PR-Fig. 3) ***of the lateral side of the asserted "projection part***." The Petition simply asserts "***the lateral sides*** of the projection part (red)—i.e., the portion of conductive layer 13 extending beyond semiconductor substrate 22—***are surrounded*** by silicon oxide film 37 (purple)." Pet. 56. The Petition avoids any discussion of the claim phrase ***"a portion of a lateral side***." Thus, the proposed Shiraiwa and Sumi combination

does not disclose or make obvious "an insulating layer … ***surrounding a portion of a lateral side*** of the projection part" in [1D].

4. PETITIONER'S RELIANCE ON COMBINED DRAWINGS OF SHIRAIWA AND SUMI TO DISCLOSE OR MAKE OBVIOUS CLAIM ELEMENT "WHEREIN THE INSULATING LAYER HAS A THICKNESS THINNER THAN A PROJECTION HEIGHT OF THE PROJECTION PART" IN [1F] CONTRADICTS SETTLED PATENT LAW

As noted, none of Shiraiwa's drawings shows opening 11, conductive layer 13, electrode pad 14, or rear surface electrode 15 of Sumi. Shiraiwa, Figs. 1-10. With respect to Shiraiwa, Petitioner impermissibly relies upon Shiraiwa+Sumi modified drawing to disclose dimensions that are not described in the detailed description of either Shiraiwa or Sumi.

The Petition states that "the height of the portion of the conductive layer 13 extending beyond semiconductor substrate 22 in the Metal-Shiraiwa-Sumi Sensor … is at least equal to the ***sum of the thicknesses*** of nitride film 36 and oxide film 37." Pet. 57 (emphasis in original). The Petition's Shiraiwa+Sumi drawing showing nitride film 36 and oxide film 37 is reproduced below.



Shiraiwa+Sumi Drawing (Pet. 57)

Shiraiwa does not discuss the thickness of the relied upon layers absolutely or in relative terms. Shiraiwa does not specifically discuss thickness or affirmatively state that its drawings are to scale. Petitioner's argument that Shiraiwa discloses the "thinner limitation" fails for the same reason discussed with respect to Sumi. *Hockerson-Halberstadt*, *supra*, at 956; *Nystrom*, *supra*, at 1149.

IV. GROUNDS 5 AND 6 FAIL TO DISCLOSE OR MAKE OBVIOUS ALL ELEMENTS OF CLAIM 1

Under Grounds 5 and 6, Yanagida-1 is the only art reference relied upon as rendering claim 1 obvious. As discussed below, Yanagida-1 fails to disclose or make obvious all elements of claim 1.

A. YANAGIDA-1 DOES NOT DISCLOSE OR MAKE OBVIOUS [1C], [1D], OR [1F]

In addition to other claim elements lacking in Yanagida-1, Yanagida-1 does not disclose or make obvious "***a connection via metal***" in [1C], "***an insulating layer … surrounding a portion of a lateral side of the projection part***" in [1D], or the insulating layer having "***a thickness thinner than a projection height*** of the projection part" in [1F].

1. YANAGIDA-1 DOES NOT DISCLOSE OR MAKE OBVIOUS "A CONNECTION VIA METAL" IN [1C]

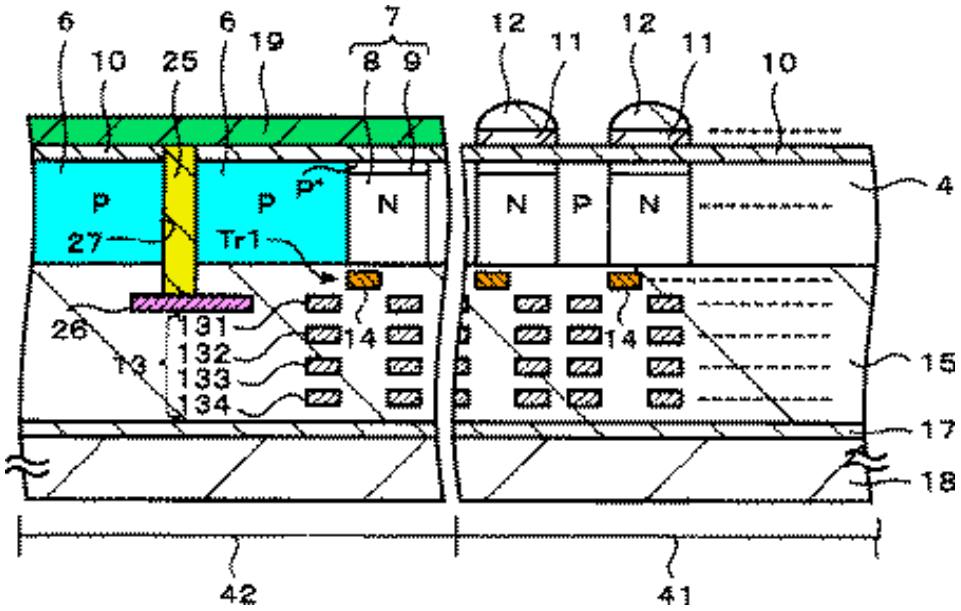
Yanagida-1 does not disclose or make obvious "***a connection via metal***" in [1C]. The Petition asserts that conductive material layer 25 and MOS type transistors Tr1 of Yanagida-1 correspond respectively to the "***connection via metal***" and "***readout circuitry***" in claim 1. Pet. 63 (annotated drawing), 68 (annotated drawing), 70. But Yanagida-1 does not disclose that conductive material layer 25 electrically connects with MOS type transistors Tr1. Rather, Yanagida-1 discloses that conductive material layer 25 connects to grounding wiring 26 in order to ground semiconductor well region 6 and light shielding film 19:

"***the ground voltage*** or a voltage capable of extracting minority carriers ***is applied*** … ***to the conductive material layer 25*** by an externally disposed voltage application means ***via the wiring 26***, … ." Yanagida-1, [0072].

"the conductive material layer 25 is formed in the semiconductor well region 6 in the peripheral section of the optical black region 42, ***and the ground voltage*** or a voltage capable of extracting minority carriers (positive or negative voltage) is applied to the conductive material layer 25 … ." *Id*., [0051].

"the ***conductive material layer 25 is formed to reach the grounding wiring 26*** formed in the insulating layer 15, and thus ***the light shielding film 19 is also grounded through the conductive material layer 25*** and the wiring 26." *Id*., [0044].

Color-highlighted Figure 6J below also shows that conductive material layer 25 (yellow) electrically connects with grounding wiring 26 (pink), semiconductor well region 6 (blue), and light shielding film 19 (green), ***but not MOS type transistors Tr1*** (orange).



Yanagida-1 Fig. 6J

The fact that Yanagida-1 discloses several connections for conductive material layer 25, such as grounding wiring 26, semiconductor well region 6, and light shielding film 19, but does not include MOS type transistors Tr1 among the several connections disclosed points away from the speculative proposition that conductive material layer 25 connects with MOS type transistors Tr1. Without any corresponding disclosure, speculating that conductive material layer 25 electrically connects with MOS type transistors Tr1 would constitute inappropriate hindsight bias. *See Zoltek Corp.*, *supra*. Thus, Yanagida-1 does not disclose or make obvious "***a connection via metal***" in [1C].

2. IN CONTRAVENTION OF 37 C.F.R. §42.104(b)(4), THE PETITION FAILS TO SPECIFY WHERE CLAIM ELEMENT "AN INSULATING LAYER … *SURROUNDING A PORTION OF A LATERAL SIDE* OF THE PROJECTION PART" IN [1D] IS FOUND IN YANAGIDA-1

Petitioner has clearly contravened the requirement of 37 C.F.R. §42.104(b)(4) by failing to specify where the claim element "an insulating layer … ***surrounding a portion of a lateral side*** of the projection part" in [1D] is found in Yanagida-1. As discussed above, the claim element "an insulating layer … ***surrounding a portion of a lateral side*** of the projection part" in [1D] refers to the insulating layer ***partially surrounding the lateral side*** of the projection part that, among other things, contributes to defining a structure that provides various advantages, such as inhibiting connection failure with the "metal pad" in [1E]. *See supra* §II.A.2.

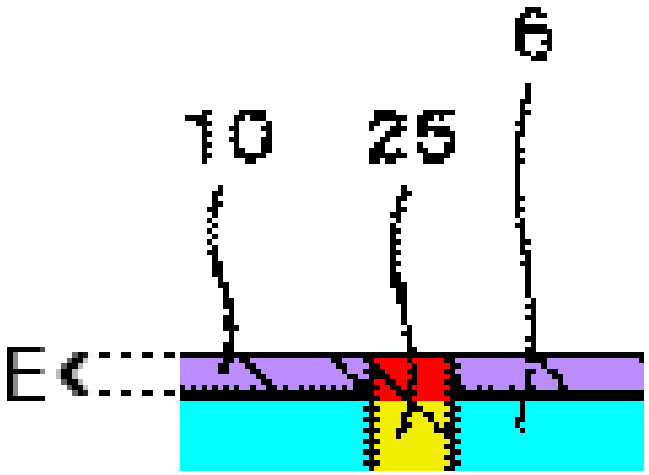
The Petition asserts the alleged insulating layer of Yanagida-1 "***surrounds the lateral sides***" of the purported projection part of Yanagida-1 rather than "surrounding ***a portion of*** a lateral side" as claimed. Pet. 72. The Petition ignores operative language of the claim, and provides no reason for doing so. Therefore, the Petition fails to specify where the claim element "an insulating layer …

surrounding a portion of a lateral side of the projection part" in [1D] is found in Yanagida-1, in contravention of 37 C.F.R. §42.104(b)(4).

3. YANAGIDA-1 DOES NOT DISCLOSE OR MAKE OBVIOUS CLAIM ELEMENT "AN INSULATING LAYER … *SURROUNDING A PORTION OF A LATERAL SIDE* OF THE PROJECTION PART" IN [1D]

Yanagida-1, like other art references relied upon in the Petition, does not disclose or make obvious "an insulating layer … ***surrounding a portion of a lateral side*** of the projection part" in [1D].

The Petition asserts that the upper part of conductive material layer 25 of Yanagida-1 corresponds to the "***projection part***" in claim 1. Pet. 70. However, a lateral side of the upper part of conductive material layer 25 of Yanagida-1 is ***fully and not partially surrounded*** by antireflective film 10. The color-highlighted figure below corresponds to a portion of Figure 6J of Yanagida-1, and shows conductive material layer 25 (yellow), upper part thereof (red), antireflective film 10 (purple). Yanagida-1, Fig. 6J.



Yanagida-1 Fig. 6J

As seen above, antireflective film 10 ***surrounds the entirety (E) of the lateral side of upper part (red)*** of conductive material layer 25. Thus, Yanagida-1 does not disclose "an insulating layer … surrounding ***a portion*** of a lateral side of the projection part."

Just as Yanagida-1 does not disclose the structure of an insulating layer ***partially, and not fully, surrounding the lateral side*** of the "projection part," Yanagida-1 likewise fails to disclose any reason for or a benefit derived from partially surrounding the lateral side. Yanagida-1 does not disclose extending upper part (red) of conductive material layer 25 beyond antireflective film 10. Yanagida-1 does not discuss increased contacting area or inhibiting connection failure between conductive material layer 25 and light shielding film 19.

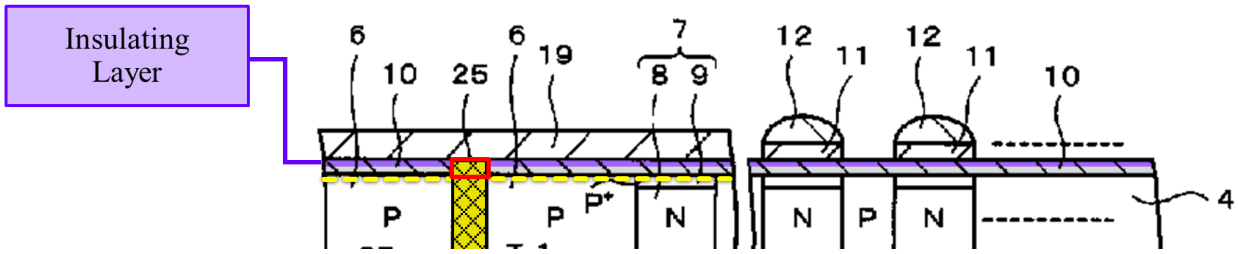
Thus, Yanagida-1 does not disclose or make obvious "an insulating layer … ***surrounding a portion of a lateral side*** of the projection part" in [1D].

4. YANAGIDA-1 DOES NOT DISCLOSE OR MAKE OBVIOUS "WHEREIN THE INSULATING LAYER HAS A THICKNESS THINNER THAN A PROJECTION HEIGHT OF THE PROJECTION PART" IN [1F]

Yanagida-1 does not disclose or make obvious the insulating layer having "***a thickness thinner than a projection height*** of the projection part" in [1F].

a. PETITIONER'S RELIANCE ON YANAGIDA-1'S DRAWINGS TO DISCLOSE OR MAKE OBVIOUS [1F] CONTRADICTS SETTLED PATENT LAW

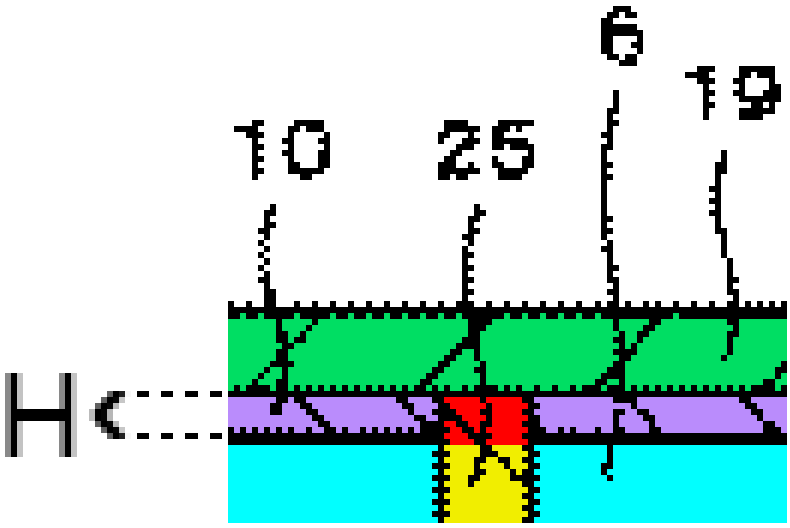
Petitioner claims that Yanagida-1 meets the "thinner limitation." Pet. 74. However, Petitioner's analysis suffers from the same fundamental flaw as its analysis of Shiraiwa and Sumi: Petitioner contradicts settled patent law by improperly relying upon Yanagida-1's drawing (reproduced below) to disclose dimensions where ***Yanagida-1 does not discuss the thickness of the relied upon layers absolutely or in relative terms***. Yanagida-1 does not discuss the size of the relied upon elements or give any indication that its figures are accurately drawn to scale. Yanagida-1 does not mention any specified thickness for antireflective film 10 or the Petitioner's identified "projection part." *Hockerson-Halberstadt*, *supra*, at 956; *Nystrom*, *supra*, at 1149.



Pet. 74 (Petitioner's coloring and annotations)

b. EVEN IF DRAWINGS COULD BE RELIED UPON, YANAGIDA-1 DOES NOT DISCLOSE OR MAKE OBVIOUS [1F]

The Petition asserts that antireflective film 10 and the upper part of conductive material layer 25 of Yanagida-1 correspond respectively to the "***insulating layer***" and "***projection part***" in claim 1. Pet. 70-72. However, in Yanagida-1, the thickness of antireflective film 10 is shown to be the same as the height of the upper part of conductive material layer 25. Yanagida-1, Figs. 2, 6J. The annotated and color-highlighted figure below corresponds to a portion of Figure 6J of Yanagida-1, and shows conductive material layer 25 (yellow), upper part thereof (red), and antireflective film 10 (purple). *Id.*, Fig. 6J.



Yanagida-1 Fig. 6J

In the '143 patent, "***a projection height***" refers to the height of projection part 125a from the backside of semiconductor substrate 100. '143 patent, 4:57-60. As seen above, upper part (red) of conductive material layer 25 has a height (H) from the backside of semiconductor substrate 6 (blue). Yangida-1, Fig. 6J. ***The thickness of antireflective film 10 (purple) is the same as the height (H) of upper part (red) of conductive material layer 25***. Thus, Yanagida-1 does not disclose or make obvious "wherein the insulating layer has a thickness thinner than a projection height of the projection part."

Petitioner asserts that the "antireflective film comprises both an oxide film and nitride film. Yanagida-1, [0026]" and thus "the thickness of the projection part in Yanagida-1 exceeds the thickness of the oxide insulating layer in antireflective

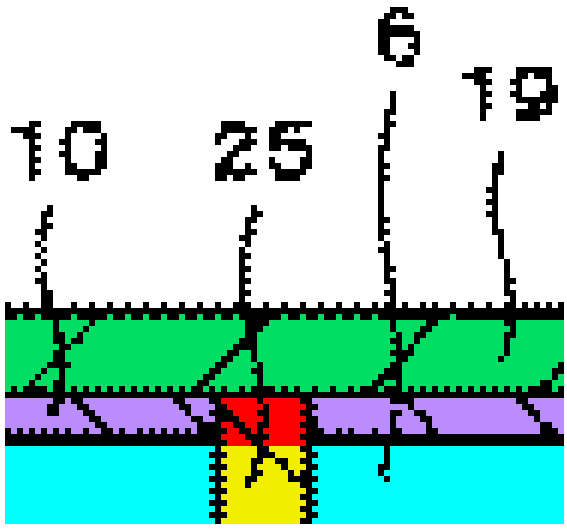
film 10." Pet. 74. However, the cited sentence of Yanagida-1 does not disclose that "antireflective film comprises both an oxide film and nitride film" as the Petition asserts. *Id*. The Petition has concocted this disclosure. Notably, the Petition avoids directly quoting the sentence in [0026] of Yanagida-1 which the Petition cites as its sole support. The sentence is reproduced in full here for clarity: "On one principal face side of the single crystal silicon layer 4, i.e., the back face side (upper side in the figure), ***a color filter 11 is formed via an antireflective film (oxide film and nitride film) 10***, and on-chip lenses 12 are formed on the color filter 11 at the positions corresponding to the photoelectric conversion elements 7." Yanagida-1, [0026].

In this sentence, Yangida-1 merely lists "oxide film and nitride film" in a parenthetical phrase immediately after "antireflective film." When this sentence is viewed alone and without context, the meaning of the parenthetical phrase is arguably ambiguous; it could mean either: (1) oxide film and nitride film are both suitable material choices for antireflective film 10, or (2) antireflective film 10 comprises both oxide film and nitride film. However, when viewed in the entire context of Yanagida-1, the first meaning is plainly more sensible. The Petition avoids directly quoting this sentence in order to conceal its apparent ambiguity

standing alone, sidestep its meaning being interpreted in context, and insinuate a disclosure that Yanagida-1 plainly does not provide. Pet. 74.

Patent Owner notes:

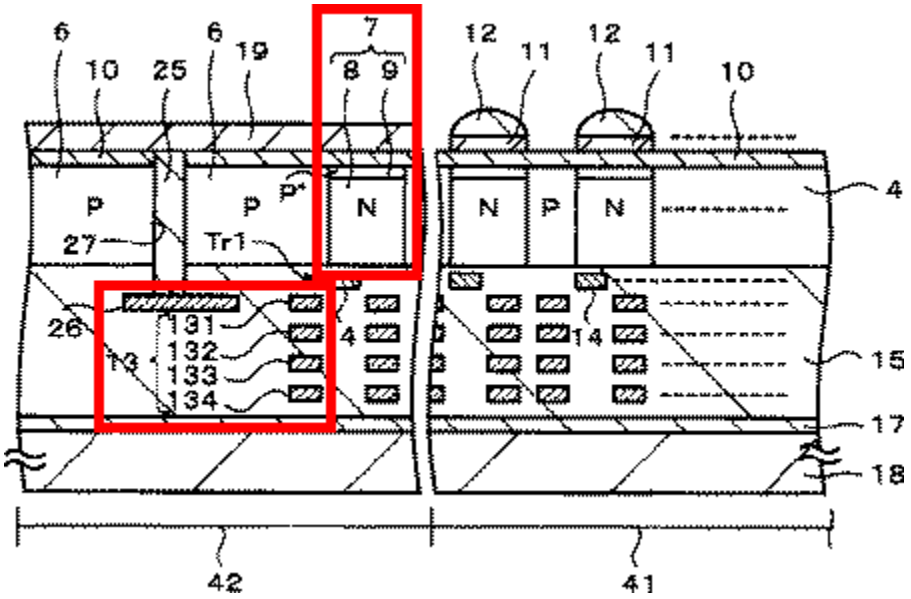
- Antireflective film 10 is illustrated as a single film in every Figure it appears in. Yanagida-1, Figs. 2, 5-10. None of the Figures delineates two films in antireflective film 10. The color-highlighted figure below corresponds to a portion of Figure 6J of Yanagida-1, and shows antireflective film 10 (purple) as a single film. *Id*., Fig. 6J.



Yanagida-1 Fig. 6J

- Yanagida-1 uses brackets grouping multiple reference numerals to distinguish multi-layer elements elsewhere in the drawings, but does not use a bracket or multiple reference numerals for antireflective film

10. For example, element 7 uses a bracket to group constituent layers' reference numerals 8 and 9. *Id*., Figs. 2, 5-9. As another example, element 13 uses a bracket to group constituent layers' reference numerals 131-134. *Id*. These bracketed elements are outlined red in annotated Figure 6J below. *Id*., Fig. 6J. In contrast, Yanagida-1 uses a single reference numeral for antireflective film 10.



Yanagida-1 Fig. 6J

- The phrase "antireflective film" appears five (5) times in Yanagida-1, and always uses the singular form. *Id*., [0026] ("***an*** antireflective ***film***"); *id*. [0031] ("the antireflective ***film*** 10"); *id*. [0063] ("***an*** antireflective ***film***"); *id*. [0063] ("the antireflective ***film***"); *id*. [0086]

("10 --- antireflective ***film***"). This element is never referred to using the plural form. The term "***films***" does not appear in Yanagida-1.

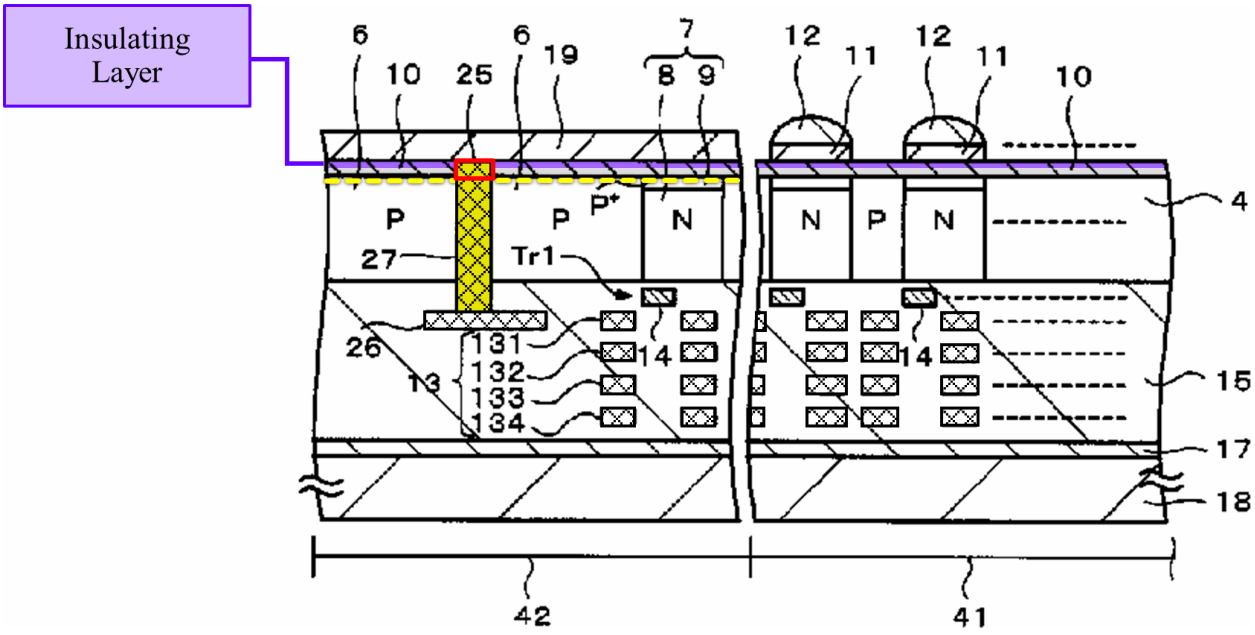
- The sentence (*id*., [0026]) does not expressly state that antireflective film 10 comprises both oxide film and nitride film. For example, there are no key terms such as "comprises," "includes," "both," "two," "bi-layer," "multi-film," etc. that would indicate the parenthetical phrase is describing a structure having two films as opposed to describing suitable film materials. *Id*.
- The sentence (*id*., [0026]) does not inherently indicate that antireflective film 10 comprises both oxide film and nitride film. For example, Yanagida-1 is entirely silent with respect to a configuration of oxide film and nitride film. There are no interrelation terms such as "over," "adjacent to," etc. that would indicate the parenthetical phrase is describing a structure having two films as opposed to describing suitable film materials. *Id*.
- The sentence (*id*., [0026]) is the first description of antireflective film 10 in Yanagida-1. The sentence lists two types of materials. *Id*. They are never referred to again for antireflective film 10. Listing

> suitable materials for an element upon the first description of that element is typical in patent practice. Yanagida-1 follows this typical practice elsewhere. For example, Yanagida-1 lists suitable material for semiconductor substrate 4 using a parenthetical phrase upon the first description of this element. *Id*., [0003] ("the semiconductor substrate (single crystal silicon layer) … ."). As another example, Yanagida-1 lists suitable materials for conductive material layer 25 upon the first description of this element. *Id*., [0036]-[0037] ("conductive material layer 25 is formed … metal materials, such as AlCu, Al, AlSi, or W can be used.").

When viewed in the entire context of Yanagida-1, the most sensible meaning of the above parenthetical phrase is that oxide and nitride films are both suitable material choices for antireflective film 10. When viewed alone and without context, the above parenthetical phrase is ambiguous at best. And in no event is it a clear, unequivocal disclosure that antireflective film 10 comprises both oxide and nitride films. Thus, Petitioner has not met its burden and has failed to show that antireflective film 10 is other than what is consistently illustrated in Yanagida-1's drawings as a single layer, and what is repeatedly treated as a unitary layer in the

detailed description of Yanagida-1. Moreover, antireflective film 10 is not shown or disclosed to be thinner than a projection height of the "projection part" in Yanagida-1. As such, Yanagida-1 does not disclose or make obvious "***wherein the insulating layer has a thickness thinner than a projection height of the projection part***" in [1F].

Even assuming Yanagida-1 discloses that antireflective film 10 comprises both oxide and nitride films (and it does not when considering the entire context of Yanagida-1), such disclosure does not mean that "***the oxide film***" "***has a thickness thinner than a projection height of the projection part***" (Pet. 74), since Yanagida-1 is entirely silent as to how such "oxide film" would be configured. The Petition has impliedly conjectured that the supposed oxide and nitride films would be distinct, arranged sequentially vertically and coextensive laterally, with the oxide over the nitride, as indicated by the Petition drawing-in a purple region (despite such region not being delineated in any Figure of Yanagida-1) in the upper half of antireflective film 10 in its annotated Figure (reproduced below) corresponding to Figure 6J of Yanagida-1. Pet. 72.



Yanagida-1 Fig. 6J (from Pet. 72)

The Petition's approach is entirely speculative, since Yanagida-1 is silent as to how such supposed oxide and nitride films would be configured. As equally speculative approaches that are not set forth in the Petition, antireflective film 10 in Yanagida-1 could have arranged oxide and nitride films sequentially laterally, with the first film residing under on-chip lenses 12 in image pickup region 41 (right side of annotated Fig. 6J above) and the second film residing under light shielding film 19 in optical black region 42 (left side of annotated Fig. 6J above). As another speculative approach, antireflective film 10 could comprise oxide and nitride films as a compound film, that is, oxide and nitride deposited concurrently to form a compound film.

These equally speculative approaches would result in the "oxide film" not having "***a thickness thinner than a projection height of the projection part***." However, the Petition and its expert have avoided any discussion of these equally speculative approaches. Likewise, no rationale is provided for the approach shown in the Petition's annotated Figure. Instead, the expert simply parrots the unsupported conclusory assertion of the Petition that "the thickness of the projection part in Yanagida-1 exceeds the thickness of the insulating oxide film." Pet. 74; Guidash, ¶221.

Moreover, the Petition presenting its speculative approach implicitly through an annotated drawing without providing written rationale regarding that approach or alternative approaches plainly highlights that the Petition is inappropriately relying on hindsight bias and *ex post* reasoning rather than any knowledge or reasoning conveyed by Yanagida-1. Thus, even assuming Yanagida-1 discloses that antireflective film 10 comprises both oxide and nitride films (and it does not when considering the entire context of Yanagida-1), such disclosure does not mean the "oxide film" "***has a thickness thinner than a projection height of the projection part***."

V. DEPENDENT CLAIMS 2-4

Claims 2-4 depend from independent claim 1 and have limitations in addition to those in claim 1 that render them nonobvious for additional reasons. However, since Patent Owner has shown claim 1 to be nonobvious over the art references relied upon in the Petition, additional arguments applicable to each dependent claim are not presented here.

VI. THE BOARD SHOULD EXERCISE ITS DISCRETION TO DENY INSTITUTION UNDER 35 U.S.C. §325(d)

Under §325(d), the Board uses the following two-part framework: "(1) whether the same or substantially the same art previously was presented to the Office or whether the same or substantially the same arguments previously were presented to the Office; and (2) … whether the petitioner has demonstrated that the Office erred in a manner material to the patentability of challenged claims. If a condition in the first part of the framework is satisfied and the petitioner fails to make a showing of material error, ***the Director generally will exercise discretion not to institute inter partes review***." *Advanced Bionics, LLC v. Med-El Elektromedizinische*, IPR2019-01469, Paper 6, at 8-9 (Feb. 13, 2020) (precedential).

Turning to the first part of the *Advanced Bionics* framework, Yanagida-1 relied upon in the Petition is substantially the same art previously presented to the Office. During prosecution of the '143 patent, Applicant submitted Yanagida-1 and a complete English translation of its Abstract (Ex. 2001) with an Information Disclosure Statement (IDS) (Ex. 2002). Yanagida-1 was one of only two art references submitted with the IDS. Ex. 2002. The Examiner confirmed the submission by initialing the IDS and adding a note that both art references were considered. Ex. 2003.

The Petition asserts that Yanagida-1 was "not 'presented to the office'" because "[t]he English translation of the Abstract fails to disclose several elements disclosed by Yanagida-1, … ." Pet. 85. As an initial matter, the Board considers filing an IDS, as presenting a reference to the Office. *See, e.g., Advanced Bionics*, 7-8 ("***Previously presented art*** includes **...** art provided to the Office by an applicant, ***such as on an Information Disclosure Statement (IDS)*** ..."). Further, an applicant is not required to provide a full English translation of a foreign language art reference as part of an IDS. According to 37 C.F.R. §1.98(a), "[a]ny information disclosure statement … shall include … [a] copy of the translation ***if a written English-language translation*** of a non-English-language document, ***or***

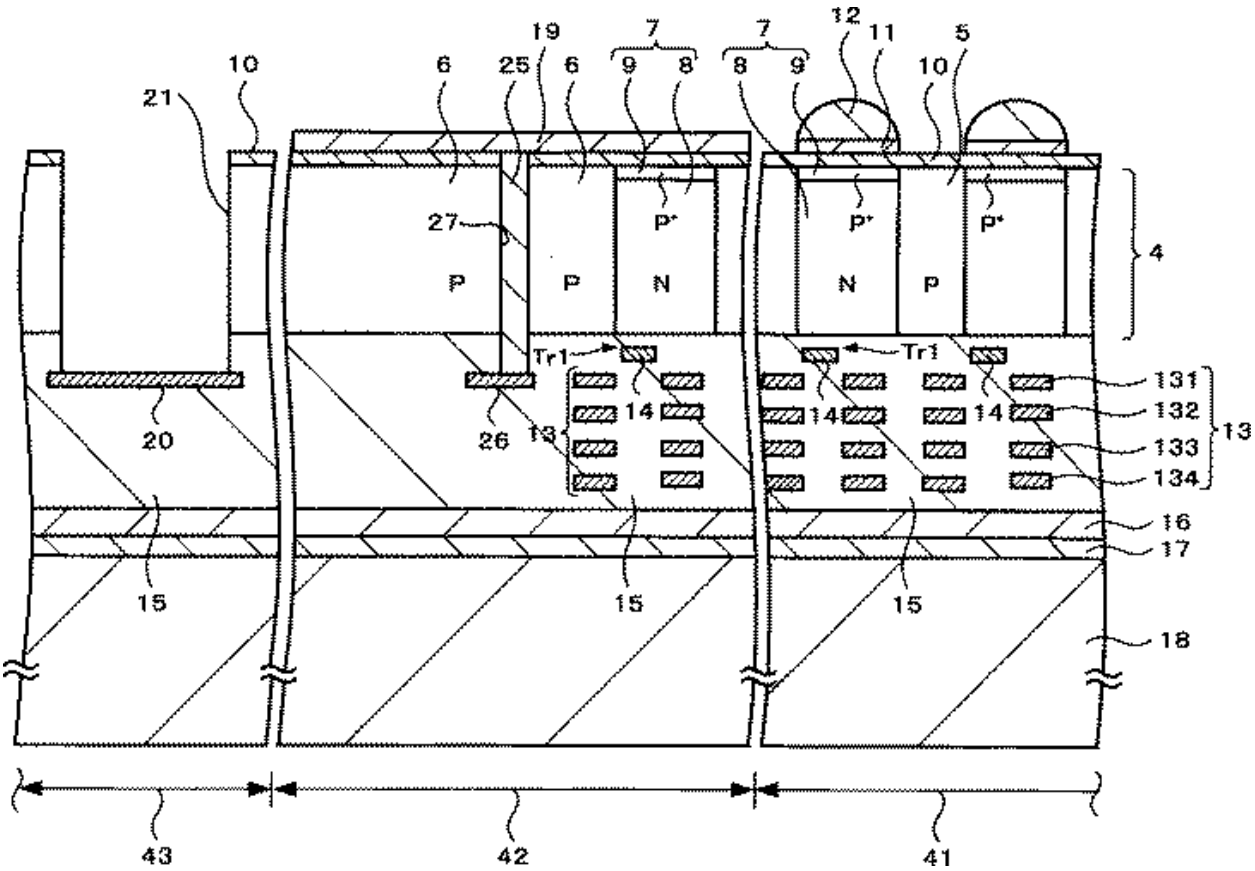
portion thereof is within the possession, custody, or control of, or is readily available ... ."

The Office requires only a ***concise*** English explanation of the ***relevance*** of a foreign language art reference in an IDS, and not a detailed statement of which claim elements applicant contends are present and which are missing from the foreign language art. *See* M.P.E.P. §609.04(a)(III) ("Each information disclosure statement must further include ***a concise explanation of the relevance*** … about the content of the information listed ***that is not in the English language***."). Furthermore, an English language Abstract may satisfy the requirement of a concise explanation of the relevance of the foreign art: "***Submission of an English language abstract of a reference***, such as one generated by a foreign patent office, ***may fulfill the requirement for a concise explanation***." *Id*.

The English language Abstract together with the drawings with English numerals provide a concise representation of Yanagida-1 and its relevance. The Examiner did not ask for additional explanation or a full translation of Yanagida-1, and instead noted that the reference was "considered" (Ex. 2003), indicating that the Examiner determined that Yanagida-1 was sufficiently presented.

The Petition contends that Yanagida-1's Abstract filed with the IDS fails to disclose "(1) the connection via metal with a projection part, (2) the insulation layer (*i.e.*, the oxide film in the antireflective layer), (3) a metal pad, and (4) the thickness of the insulation layer being less than the height of the projection part." Pet. 85.

The Petition's contention is incorrect. Petitioner itself has repeatedly equated "the connection via metal" with "conductive material layer 25." *See supra* §IV.A.1. For example, the Petition likens the claim element "connection via metal" to "conductive material layer 25" in "hole 27." Pet. 70. Contrary to the Petition's contention that Yanagida-1's Abstract fails to disclose "the connection via metal with a projection part," conductive material layer 25 is shown in the Abstract's drawing (reproduced below) filed with the IDS, and referenced two times in the Abstract.



Yanagida-1 (Abstract Figure filed with IDS)

Moreover, conductive material layer 25 is shown to extend beyond "semiconductor substrate 4" in the Abstract's drawing (and "semiconductor substrate 4" is referenced several times in the Abstract). As such, the purported "connection via metal with a projection part" is shown and disclosed in the Abstract in substantially the same extent that the Petition purports they are disclosed in the full translation of Yanagida-1.

With respect to the purported "insulation layer," the Abstract's drawing (above) does show film 10 as being situated over semiconductor substrate 4, but does not recite in words that film 10 is an "insulation layer." However, the Examiner may very reasonably determine that whether film 10 is an insulator or not makes no difference in the patentability analysis since film 10 is not thinner than the projection height of conductive material layer 25. Further, the Examiner may quite reasonably determine that regardless of whether film 10 is an insulator or not, it is shown as fully, and not partially, surrounding the lateral side of the purported projection part.

Moreover, the only element analogous to a "via" - that is conductive material layer 25 in hole 27 - is shown in the Abstract's drawing as not being connected to a readout circuitry of "photoelectric conversion elements 7" (which is shown in the Abstract's drawings and also recited in words). In fact, the Abstract states that conductive material layer 25 (which is analogized to the "connection via metal" in the Petition) is grounded ("Ground potential is applied to the conductor material layer 25 ... ."). Thus, the Examiner may very reasonably determine that conductive material layer 25 does not disclose or make obvious the claimed "connection via metal."

Therefore, the Examiner may quite reasonably conclude three of the claim elements are missing from Yanagida-1's Abstract, and indeed missing from all Yanagida-1's drawings that were before the Examiner with English numerals. That, is the Examiner may reasonably conclude that "connection via metal" in [1C], an insulating layer "surrounding a portion of a lateral side of the projection part" in [1D], and an insulating layer with "a thickness thinner than a projection height of the projection part" in [1F] are missing in Yanagida-1's drawings and Abstract. Thus, the first part of *Advanced Bionics* is satisfied, and Yanagida-1 relied upon in the Petition is substantially the same art previously presented to the Office.

Under the second part of the *Advanced Bionics* framework, Petitioner fails to make a showing of material error by the Office with respect to Yanagida-1. The Petition makes a conclusory and speculative assertion that "to the extent the Examiner even considered Yanagida-1, 'specific teachings of [Yanagida-1] impact[ing] patentability of the challenged claims' were 'misapprehend[ed] or overlook[ed].'" Pet. 86. The Petition then completely fails to identify any specific teaching of Yanagida-1 that the Examiner purportedly misapprehended or overlooked. *Id*. Petitioner mentions that "[t]he Petition is supported by an English

translation of the entirety of Yanagida-1, and a new expert declaration (Guidash) explaining how POSAs would have understood Yanagida-1." *Id*. However, the Petition also completely fails to identify any specific part of its translation or new expert declaration it considers applicable. *Id*.

"If reasonable minds can disagree regarding the purported treatment of the art or arguments, it cannot be said that the Office erred in a manner material to patentability." *Advanced Bionics*, 9. Indeed, it would have been quite reasonable for the Examiner, after due consideration, to conclude that Yanagida-1 fails to disclose or make obvious claim elements [1C], [1D], and [1F] discussed above. The Examiner need not determine whether additional claim elements were missing or other claim elements were present. It is enough for the Examiner to conclude that at least some claim elements, such as claim elements [1C], [1D], and [1F], were missing based on the Abstract and the drawings.

Thus, it cannot at all be said that the Office materially erred. "At bottom, this framework reflects a commitment to defer to previous Office evaluations of the evidence of record unless material error is shown." *Advanced Bionics*, 9. Petitioner fails to make a showing of material error by the Office. Under *Advanced*

Bionics reconsidering the Office's previous evaluation of Yanagida-1 is unwarranted.

Moreover, the arguments Petitioner has presented with respect to the other art references relied upon, that is Sumi and Shiraiwa (which is itself duplicative of Sumi), are substantially the same as those presented with respect to Yanagida-1. *See supra* §§II.A, III.A, IV.A.

The Board should exercise discretion under §325(d) not to institute *Inter Partes* Review.

VII. THE BOARD SHOULD EXERCISE ITS DISCRETION TO DENY INSTITUTION UNDER 35 U.S.C. §314(a)

As detailed below, the factors listed in *Apple Inc. v. Fintiv, Inc.*, IPR2020-00019, Paper 15, at 7-8 (May 13, 2020) (informative) favor discretionary denial under §314(a).

Factor 1: The "EDTX Proceeding" (*VisionX Tech., LLC. v. Sony et al.,* Case No. 2:22-cv-00178, filed May 26, 2022 (E.D. Tex.)) is ongoing before Magistrate Judge Payne in the Eastern District of Texas.[6] Sony has not moved to stay the case

[6] During the parties' scheduling conference on September 26, 2022, the Sony Defendants and Patent Owner consented to trial before the Magistrate Judge,

pending the resolution of this IPR, nor is there evidence that such a stay would be granted. For example, in a recent denial issued by Judge Payne, the Court noted that the Supreme Court's decision in *SAS Inst., Inc. v. Iancu*, 138 S. Ct. 1348 (2018), "precluded the PTAB from instituting only a portion of the patent claims, so any institution decision occurring after *SAS* provides a weaker inference that the PTAB will determine that all challenged claims are unpatentable." *Peloton Interactive, Inc. v. Flywheel Sports, Inc.*, Case No. 2:18-cv-390, 2019 WL 3826051, at *5 (E.D. Tex. Aug. 14, 2019) (Payne, J.) (holding that "*SAS* alters the Motion to Stay analysis and makes institution decisions less indicative that all claims will be found unpatentable"); *see also Arbor Global Strategies LLC v. Samsung Elec. Co., Ltd.*, Case No. 2:19-cv-333, 2020 WL 6305883, at *8 (E.D. Tex. Aug. 10, 2020) (Payne, J.) (holding that a movant "may need to show that the Board is likely to invalidate every asserted claim—a showing that may require more than just pointing to a successful petition").

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further increasing the likelihood that the EDTX Proceeding will reach trial before the Board issues any final written decision. Ex. 2004 at 3.

Similarly, in evaluating motions to stay pending an IPR proceeding, Judge Payne also considers whether the Board has granted institution with respect to all asserted patents. *See Peloton Interactive*, *supra*, at *4 (noting that "the simplification factor weighed against a stay where the PTAB had not instituted IPR proceedings for all asserted patents"). In the EDTX Proceedings, Patent Owner has asserted three patents against Sony, each targeting different features of Sony's CMOS image sensors. Each of the asserted patents are subject to a Petition for IPR filed by Sony: IPR2023-00389 (Patent 8,035,143); IPR2023-00296 (Patent 7,867,808); and IPR2023-00298 (Patent 7,868,366).

As a result, in order to prevail on a motion to stay, Sony would have to show not only that the Board is likely to invalidate every asserted claim, but that the Board is likely to invalidate every asserted claim in every asserted patent.

Accordingly, this factor favors denial of institution because Petitioner has not sought a stay pending outcome of any of the three IPRs, and evidence exists that the EDTX Proceeding Judge would not grant a stay even if institution were to occur, especially if institution does not occur for all three IPRs.

Factor 2: If the Board reaches its institution decision within three months of receiving the preliminary response, 35 U.S.C. §314(b), and issues a final written

decision within 1 year of institution, 35 U.S.C. §316(a)(11), a final written decision would likely not issue until around late July 2024 - 4 months after the scheduled trial date of March 18, 2024 (Ex. 2005 at 1) and 2 months after the median statistics for the Eastern District of Texas suggest the trial would occur (Ex. 2006 at 35). As a result, a final written decision here is highly unlikely to issue early enough to avoid duplication or simplify any issues for trial. Thus, this factor favors denial.

Factor 3: The investment in the parallel proceedings is significant. In the EDTX Proceeding, the parties have exchanged discovery, including technical, marketing ,and sales materials relating to Sony's CMOS image sensor products. Similarly, both infringement and invalidity contentions have already been served. Ex. 2007; Ex. 2008. The parties are also on the eve of the claim construction process, with deadlines for exchanging terms and proposed constructions coming up next month in May and claim construction briefing starting in July of 2023. Ex. 2005 at 4-5. This factor also favors denial.

Factor 4: All of Sony's art references asserted against independent claim 1 in this proceeding are also part of its preliminary invalidity contentions in the EDTX Proceeding. *See, e.g.,* Ex. 2009 at 137 (*Sumi*), 136 (*Shiraiwa* + *Sumi*), 135

(*Yanagida-1*). Thus, instituting this proceeding would lead to entirely duplicative efforts here and in the EDTX Proceeding.

Petitioner Sony argues that this factor weighs against denial because it "stipulates that, should the Board institute review, Petitioner and the other defendants will not rely upon any invalidity grounds based on Sumi, Shiraiwa, and/or Yanagida-1 (*i.e.*, the primary references herein)." Pet. 84. However, such a narrow stipulation still favors exercising discretionary denial. As the Board noted in its precedential opinion in *Sotera Wireless, Inc. v. Masimo Corp.*, IPR2020-01019, Paper 12 (Dec. 1, 2020), what is important is whether the "Petitioner broadly stipulates to not pursue 'any ground raised ***or that could have been reasonably raised***.'" *Id.* at 19.

Petitioner's offer to conditionally litigate one set of invalidity theories in the PTAB and a separate set of invalidity theories in the EDTX Proceeding does little to provide an "inexpensive resolution of every proceeding." *See* 37 C.F.R. §42.1(b). In fact, Petitioner's approach simply increases the costs for all parties, creating a duplication of litigation rather than the desired "cost-effective alternative to litigation." *See* 77 Fed. Reg. 48680-01 (Aug. 14, 2012). Thus, this factor favors denial.

Factor 5: Petitioner is a party to the Texas Litigation. Pet. x. Under the Board's precedential *Sotera* opinion, when the parties are the same, this factor supports denying institution. *Sotera*, *supra*, at 19.

Factor 6: As discussed above, the merits of this Petition are particularly weak. Sumi (Grounds 1 and 2) fails to disclose or make obvious [1C], [1D], or [1F] in claim 1. Shiraiwa+Sumi (Grounds 3 and 4) fail to disclose or make obvious [1C], [1D], or [1F] in claim 1. Yanagida-1 (Grounds 5 and 6) fails to disclose or make obvious [1C], [1D], or [1F] in claim 1. Therefore, it is unlikely that the Petition would prevail in its challenges to the claims.

Additionally, as mentioned above, Petitioner is pursuing two additional IPR petitions against the other asserted patents from the underlying litigation. As with the instant Petition, those Petitions are also particularly weak. For example, in IPR2023-00296, Patent Owner's Preliminary Response illustrates how various claim elements are missing in each asserted ground. Similarly, in IPR2023-00298, Patent Owner's Preliminary Response illustrates how various claim elements are missing in each asserted ground.

On balance, the *Fintiv* factors favor discretionary denial.

VIII. CONCLUSION

For at least the foregoing reasons, Patent Owner respectfully requests that the Board deny the Petition and not institute trial.

Respectfully submitted,

Date: April 24, 2023

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CERTIFICATE OF WORD COUNT

Pursuant to 37 C.F.R. § 42.24, the undersigned certifies that the paper, Patent Owner's Preliminary Response, contains 13,679 words excluding a table of contents, a table of authorities, a certificate of service, a certificate of word count, or exhibit list, but including annotations added to figures. In making this certification, Patent Owner has relied on the word count feature of the word processing system used to prepare the paper, and manually adding the number of words present in annotations to figures.

Date: April 24, 2023

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CERTIFICATE OF SERVICE

I hereby certify that on April 24, 2023 copies of the foregoing PATENT OWNER'S PRELIMINARY RESPONSE and all documents filed with it were served via electronic mail, as agreed to by counsel, upon the following counsel for the Petitioner:

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