

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

AVX CORPORATION,
Petitioner,

v.

PRESIDIO COMPONENTS, INC.,
Patent Owner.

Case IPR2018-00292
Patent 7,307,829 B1

Before BEVERLY M. BUNTING, JEFFREY W. ABRAHAM, and
SCOTT B. HOWARD, *Administrative Patent Judges*.

HOWARD, *Administrative Patent Judge*.

FINAL WRITTEN DECISION
35 U.S.C. § 318(a) and 37 C.F.R. § 42.73

I. INTRODUCTION

AVX Corporation (“Petitioner”) filed a Petition seeking *inter partes* review of claims 9–11 and 32–34 (the “challenged claims”) of U.S. Patent No. 7,307,829 B1 (Ex. 1001, “the ’829 patent”). Paper 2 (“Pet.”). Presidio Components, Inc. (“Patent Owner”) did not file a Patent Owner Preliminary Response to the Petition. We instituted an *inter partes* review of claims 9–11 and 32–34 on all grounds of unpatentability alleged in the Petition. Paper 5 (“Institution Decision” or “Inst. Dec.”).

After institution of trial, Patent Owner filed a Patent Owner Response (Paper 8, “PO Resp.”). Petitioner filed a Reply (Paper 11, “Reply”).¹ The Board filed a transcript of the Oral Hearing held on February 12, 2019. Paper 14 (“Tr.”).

Petitioner relies on Declarations by Todd Hubing. Ex. 1002; Ex. 1017. Patent Owner relies on a Declaration by Michael Randall. Ex. 2001.

The Board has jurisdiction under 35 U.S.C. § 6(b). This Final Written Decision issues pursuant to 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73. For the reasons that follow, we determine that Petitioner has shown by a preponderance of the evidence that challenged claims 9–11 and 32–34 are unpatentable.

¹ The Reply only recites the page number for page 1. All references to page numbers are based on that pagination. Although our rules do not require the inclusion of page numbers, Counsel is encouraged to include page numbers on all future filings with the Board.

II. BACKGROUND

A. *Related Proceedings*

Patent Owner indicates that there are no related proceedings.

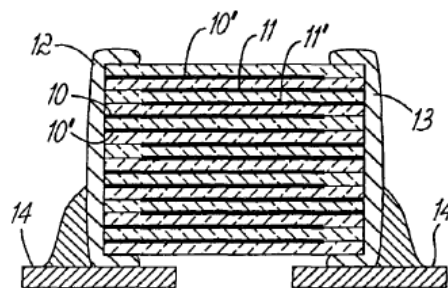
Paper 4, 1. Petitioner indicates that the '829 patent is a continuation-in-part of U.S. Patent No. 7,075,776 ("the '776 patent") and that a petition for *inter partes* review was filed for that patent and assigned AIA Review No.

IPR2018-00167. Pet. 1. Additionally, Petitioner states that the '776 patent is a grandchild of U.S. Patent No. 6,816,356 ("the '356 patent"), and lists several proceedings involving the '356 patent. *Id.*

B. *The '829 Patent*

The '829 patent, titled "Integrated Broadband Ceramic Capacitor Array," issued on December 11, 2007. Ex. 1001, at [54], [45]. The '829 patent is directed to "a capacitor having an effective wideband performance in an integrated, cost-effective structure." *Id.* at 4:40–42.

The '829 patent explains that the performance of capacitors in electronic circuits can vary over different frequencies. *Id.* at 1:41–52. The '829 patent depicts a prior art multilayer ceramic capacitor in Figure 2A, reproduced below.



PRIOR ART
FIG. 2A

Figure 2A of the '829 patent "illustrates a known multilayer monolithic capacitor structure" (*id.* at 5:29–30), and shows internal plates 10 and 11

extending from the sides of the structure, with conductive material 12 and 13 at each end to form a connection point for any plate extending to that side. *Id.* at 2:31–36. The plates extend in pairs of upper and lower plates, 10 and 10', respectively, from the left side, and 11 and 11', respectively, from the right side. *Id.* at 2:36–39. Each set of adjacent plates, 10/11' and 10'/11 form a parallel plate capacitor. *Id.* at 2:40–41. This configuration results in a network of parallel-connected capacitors, and provides a “relatively large” capacitance value for the size of the device. *Id.* at 2:48–57.

Figure 4A of the '829 patent depicts an alternative type of capacitor known in the prior art, as reproduced below.

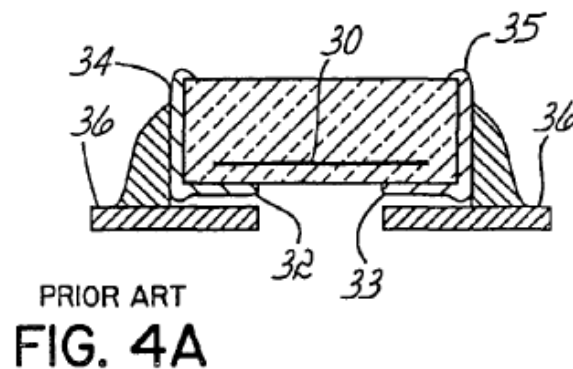


Figure 4A “illustrates a known high frequency buried layer monolithic capacitor structure” (*id.* at 5:34–35), and shows a structure including internal conductive plate 30 positioned to overlay conductive plates 32 and 33 on the outer surface of the device, which extend from conductive ends 34 and 35 (*id.* at 3:6–10). This configuration results in a series combination of capacitors, which provides “good high frequency performance but relatively low capacitance value.” *Id.* at 3:12–18.

The '829 patent explains that the different prior art structures represent “a tradeoff between capacitance value and broadband performance,” and “[o]ne known approach to managing series resistance and

series inductance, is to parallel connect two capacitors,” a larger valued capacitor (having a lower resonant frequency), and a smaller valued capacitor (chosen for high frequency performance). *Id.* at 3:37–44.

According to the '829 patent, there are several drawbacks to using parallel capacitor combinations, including variations in measured capacitance, production complications, and increased device height. *Id.* at 4:16–32.

To overcome these drawbacks, the '829 patent discloses a “monolithic capacitor structure” that includes both a “lower frequency, higher value capacitor” and a “higher frequency, lower value capacitor” in a single dielectric body. *Id.* at [57]. The capacitors are formed as a series of plates arranged in a “substantially parallel and opposed configuration” in different regions of the dielectric body or on an external surface. *Id.* at 4:53–5:3. The '829 patent further discloses that the conductive structures can be “opposed edges that are positioned to form a fringe-effect capacitance.” *Id.* at 5:4–5.

One embodiment of the claimed invention is illustrated in Figure 9A of the '829 patent, reproduced below.

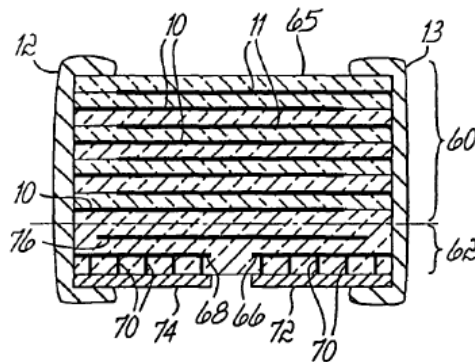


FIG. 9A

Figure 9A “illustrates a first embodiment of an integrated wideband capacitor in accordance with one aspect of the present invention” of the '829 patent. *Id.* at 5:48–50. Figure 9A shows an upper section 60 including

plates 10 and 11 extending from conductive contacts 12 and 13, respectively, and a lower section 62, including two additional internal plates 66 and 68, which extend from end contacts 13 and 12, respectively. *Id.* at 6:64–7:5, 7:15–21. Figure 9A further shows that end contacts 13 and 12 are coupled to external conductive plates 72 and 74, respectively. *Id.* Plates 66 and 68 are “capacitively coupled to a floating interior plate 76.” *Id.* at 7:22–26. In this configuration, a high value capacitor is formed in the upper section, and a high frequency capacitor is formed in the lower section. *Id.* at 6:66–7:1, 7:15–17.

According to the ’829 patent,

[t]he composition of the integrated capacitor array can be varied in order to tune the wideband capacitor to a particular application. Further, the integrated capacitor array of the present invention provides superior performance by providing less insertion loss than combinations of discrete capacitors. In addition, the wideband capacitor of the present invention is smaller and easier to handle and mount on a circuit board than combinations of discrete capacitors.

Id. at 4:45–52; *see also id.* at 7:32–38 (stating that high frequency performance is affected by the relative position of plate 76 and the nearest multi-layer plate 10 in upper section 60).

C. *Challenged Claims*

Petitioner challenges claims 9–11 and 32–34 of the ’829 patent. Representative claims 9 and 32 are the only independent claim challenged, and are reproduced below:

9. A capacitor comprising:

a substantially monolithic dielectric body comprising one end, an opposite end, and first and second external surfaces;

first and second contacts on the first and second external surfaces, respectively;

a higher frequency, lower value, first capacitor formed by first conductive plates in the dielectric body near the one end, the first capacitor being electrically connected between the first and second contacts;

a higher frequency, lower value, second capacitor formed by second conductive plates in the dielectric body near the opposite end, the second capacitor being electrically connected between the first and second contacts in a parallel circuit with the first capacitor;

a lower frequency, higher value third capacitor formed by third conductive plates in the dielectric body intermediate the one end and the opposite end and between the first capacitor and the second capacitor, the third capacitor being electrically connected between the first and second contacts in a parallel circuit with the first capacitor and the second capacitor.

32. A monolithic capacitor comprising

a three-dimensional dielectric body, having first and second external conductive contacts;

a first conductive plate internal to said dielectric body, extending within said body and conductively connected to said first external conductive contact;

a second conductive plate internal to said dielectric body, extending within said body and conductively connected to said second external conductive contact, wherein said first and second conductive plates are substantially parallel and opposed in at least one region of said body, to form a capacitor therebetween;

a third conductive plate internal to said dielectric body, extending within said body and not conductively connected to any external conductive contacts, wherein said second and third conductive plates are substantially parallel and opposed in at least one region of said body, to form a capacitor therebetween;

a first external conductive plate positioned on an external surface of the dielectric body and conductively connected to the first external conductive contact; and

a second external conductive plate positioned on an external surface of the dielectric body and conductively connected to the second external conductive contact, the second external conductive plate being substantially coplanar with the first external conductive plate.

Id. at 16:62–17:16, 2:23–50.

D. The Asserted Grounds

Petitioner asserts the following grounds of unpatentability:

Reference(s)	Basis ²	Challenged Claims
Kuroda ³	§ 102(b)	9–11
Kuroda and Hiroyuki ^{4,5}	§ 103(a)	32–34

E. Undisputed Facts

The Petition included a Statement of Material Fact:

The earliest potential effective filing date of the claims of the '829 patent is May 17, 2002. (*See* Ex. 1001.) Japanese Unexamined Utility Model Application Publication H5-21429

² The Leahy-Smith America Invents Act (“AIA”) included revisions to 35 U.S.C. §§ 102, 103 that became effective on March 16, 2013. Because the '829 patent issued from an application filed before March 16, 2013, we apply the pre-AIA versions of the statutory bases for unpatentability.

³ Japanese Publication No. HS-21429, published March 19, 1993 (Ex. 1003 (English Translation); Ex. 1005 (original)). All references to foreign language documents in this Decision are made to the corresponding English translation.

⁴ Japanese Publication No. H10-214751, published August 11, 1998 (Ex. 1006 (English Translation); Ex. 1010 (original)).

⁵ Petitioner refers to the reference as Hiroyuki whereas Patent Owner refers to it as Fujimori. *See* PO Resp. 1 n.1. We refer to the reference as Hiroyuki.

(“Kuroda,” Ex. 1003-Certified Translation; Ex. 1005-Original) was published on March 19, 1993, and is prior art under 35 U.S.C. §102(b). Japanese Unexamined Utility Model Application Publication H10-214751 (“Hiroyuki,” Ex. 1006-Certified Translation; Ex. 1010-Original) was published on August 11, 2008, and is prior art under 35 U.S.C. §102(b).

Pet. 2. Patent Owner did not deny any of the facts listed in Petitioner’s Statement of Material Fact. *See generally* PO Resp. Accordingly, all of the facts listed in the Statement of Material Facts are “considered admitted.” *See* 37 C.F.R. §§ 42.22(c), 42.23(a).

III. ANALYSIS

A. Claim Construction

In this *inter partes* review, we construe claim terms in an unexpired patent according to their broadest reasonable construction in light of the specification of the patent in which they appear. 37 C.F.R. § 42.100(b) (2017).⁶ Consistent with that standard, claim terms are given their ordinary and customary meaning, as would be understood by one of ordinary skill in the art in the context of the entire disclosure. *See In re Translogic Tech., Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007). There are, however, two exceptions to that rule: “1) when a patentee sets out a definition and acts as his own lexicographer,” and “2) when the patentee disavows the full scope

⁶ Per recent regulation, the Board will construe claims “using the same claim construction standard that would be used to construe the claim in a civil action under 35 U.S.C. 282(b)” for petitions filed on or after November 13, 2018. *See* Changes to the Claim Construction Standard for Interpreting Claims in Trial Proceedings Before the Patent Trial and Appeal Board, 83 Fed. Reg. 51,340 (Oct. 11, 2018) (to be codified at 37 C.F.R. pt. 42). Because Petitioner filed the Petition before November 13, 2018, we apply the broadest reasonable interpretation standard.

of a claim term either in the specification or during prosecution.” *Thorner v. Sony Comput. Entm’t Am. LLC*, 669 F.3d 1362, 1365 (Fed. Cir. 2012).

If an inventor acts as his or her own lexicographer, the definition must be set forth in the specification with reasonable clarity, deliberateness, and precision. *Renishaw PLC v. Marposs Societa’ per Azioni*, 158 F.3d 1243, 1249 (Fed. Cir. 1998). Although it is improper to read a limitation from the specification into the claims, claims must be read in view of the specification of which they are a part. *Microsoft Corp. v. Multi-Tech Sys., Inc.*, 357 F.3d 1340, 1347 (Fed. Cir. 2004); *In re Van Geuns*, 988 F.2d 1181, 1184 (Fed. Cir. 1993).

Here, Petitioner offers constructions for the following terms: (1) “substantially monolithic dielectric body,” (2) “second parallel surface,” and (3) “substantially coextensive.” Pet. 5–14. Patent Owner offers its own construction for “substantially coextensive” and proposes constructions for “end” and “substantially parallel and opposed.” PO Resp. 9–15. Petitioner disagrees with those constructions and proposes alternate constructions. Reply 3–18, 21–24. Having considered the evidence presented, we determine that express construction of only the terms “end,” “substantially parallel and opposed,” and “co-extensive” are necessary for purposes of this Decision. *See Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (stating that “we need only construe those claim limitations ‘that are in controversy, and only to the extent necessary to resolve the controversy,’” (quoting *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999))).

1. “End”

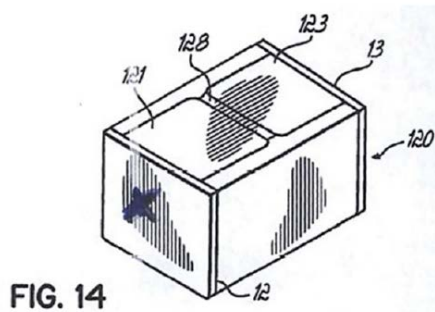
Claim 9 requires “a substantially monolithic dielectric body comprising one end [and an] opposite end.” Ex. 1001, 16:63–65.

a. Patent Owner’s Argument

Patent Owner argues “end,” as used in claim 9 of the ’829 patent, means “the extreme or last part lengthwise of the capacitor.” PO Resp. 10; *see also id.* at 3–10.

According to Patent Owner, “the ’829 patent describes the ends of the capacitor as the last surfaces of the capacitor in the lengthwise direction.” *Id.* at 9–10; *see also id.* at 7–9 (describing the use of the term “end” in the ’829 patent). As a specific example, Patent Owner argues Figure 14 “is a perspective view of an embodiment of the invention of the ’829 patent” and “[it] is an **end** view of the embodiment of Fig. 11A.” *Id.* at 7 (citing Ex. 1001, 5:65–6:3, 10:1–6). Patent Owner further argues that the ’829 patent repeatedly “describes an end of the capacitor as the last surface of the capacitor in the lengthwise direction” and “confirms that the top and bottom of the capacitor are not ‘ends.’” *Id.* at 8 (citing Ex. 2001 ¶¶ 27–29, 37).

Patent Owner also argues that Petitioner’s expert agrees with Patent Owner’s “analysis of the ’829 patent, and the identification of what constitutes an ‘end’ of the capacitor.” *Id.* (citing Ex. 2003, 79:7–86:25). According to Patent Owner, “Petitioner’s expert confirmed that Fig. 13 is an **end** view” and identified the ends of Figure 14 as “the last surfaces of the capacitor in the lengthwise direction.” *Id.* (citing Ex. 2003, 79:7–86:25). A marked-up version of Figure 14 is reproduced below.



PO Resp. 9. Figure 14 “is a perspective view of . . . an integrated wideband capacitor in accordance with the principles of the [’829 patent].” Ex. 1001, 6:1–3. According to Patent Owner, Petitioner’s expert identified an end of the version of Figure 14 above with a blue “X.” PO Resp. 8–9.

Patent Owner also argues that its proposed construction “is also consistent with the opinions of an expert retained by the Petitioner in a district court litigation, as well as the [Hiroyuki] reference, as well as the Petitioner’s expert’s analysis of [Hiroyuki], as well as EIA-198-3-E Detail Specification Sheet for capacitors.” *Id.* at 10; *see also id.* at 4–7 (citing Ex. 2001 ¶¶ 42–50, 53–55; Ex. 2004; Ex. 2005; Ex. 2006; Ex. 1006 ¶¶ 18, 19, 21; Ex. 2003, 82:6–86:24; Ex. 2009). And, according to Patent Owner, its proposed construction is also consistent with a definition from Meriam Webster’s Dictionary—which “defines ‘end’ as ‘the extreme or last part lengthwise’”—as well as the definition from dictionary.com and the “federal courts [sic] definition of ‘proximate end.’” PO Resp. 10 (quoting Ex. 2008) (citing Ex. 2001 ¶ 59).

b. Petitioner’s Arguments

Petitioner disagrees with Patent Owner’s construction. Reply 3–18.

First, Petitioner argues claim 9 recites a “dielectric body” with one end and an opposite end. *Id.* at 3. According to Petitioner, Patent Owner’s

construction focuses on the capacitor, and not the dielectric body. *Id.* at 3–4 (citing Ex. 1017 ¶ 110). Petitioner further argues that “[Patent Owner’s] expert acknowledged that the end of the capacitor is not necessarily the same as the end of the dielectric body, due to the presence of terminations on surfaces of the dielectric body.” *Id.* at 4 (citing Ex. 1018, 39:23–40:5).

Second, Petitioner argues that the ’829 patent uses the term “end” in different contexts to describe different parts of the capacitor and that many of those uses “are inconsistent with Presidio’s construction for ‘end,’ which looks only to the extreme part of the capacitor in one direction (i.e., the ‘lengthwise’ direction).” *Id.* (citing Ex. 1017 ¶¶ 103–106). For example, Petitioner focuses on Figure 14, which according to the ’829 patent shows that “the *ends of the chip* are provided with an insulating coating 128.” *Id.* (quoting Ex. 1001, 11:4–6). According to Petitioner, contrary to Patent Owner’s proposed construction, Figure 14 (reproduced above) shows that the upper surface of the capacitor chip is provided with coating 128. *Id.* at 4–5. Petitioner also argues that Patent Owner’s construction is nonsensical when applied to other embodiments of the ’829 patent. *Id.* at 5–8.

Third, Petitioner argues that Patent Owner and its expert are unable to define “lengthwise,” a component of Patent Owner’s proposed construction. *See id.* at 9–14. For example, Petitioner argues that Patent Owner’s expert was unable to determine the lengthwise direction for several designs. *Id.* at 9–10. Additionally, Petitioner argues to the extent that Patent Owner’s expert was able to provide a standard—when the reference defines a length of the capacitors—if that definition was applied to claim 9, then claim 9 would not read on any embodiments of the ’829 patent. *Id.* at 11–14.

Fourth, Petitioner argues that Patent Owner’s construction is premised on the assumption that there can only be two ends and that Kuroda does not explicitly label its top and bottom surfaces as ends. *Id.* at 14. However, Petitioner argues that there is no requirement that the reference uses the same words as the claims and argues that claim 9, read as a whole, does not suggest that a dielectric body can only have two ends. *Id.* at 14–16.

Fifth, Petitioner argues “Dr. Hubing never agreed that ‘end’ as used in claim 9 should be construed as proposed by [Patent Owner].” *Id.* at 16 (citing Ex. 1017 ¶¶ 62–77); *see also id.* at 15–16 (discussing Dr. Hubing’s testimony).

Finally, Petitioner argues “[Patent Owner] cherry-picks a secondary [dictionary] definition for ‘end,’ while ignoring the primary (and more suitable) definition of ‘end’ from that same dictionary—‘the part of an area that lies at the boundary.’” *Id.* at 17 (quoting Ex. 2008, 2). According to Petitioner, “[t]his construction is consistent with both the primary dictionary definition of ‘end,’ as well as how a POSITA would understand the term from the ’829 patent (including in all of its embodiments and all of its various uses of ‘end’).” *Id.* (citing Ex. 1017 ¶¶ 6, 102–110).

c. Our analysis

In construing the claims, our analysis begins with, and remains centered on, the language of the claims themselves. *See Interactive Gift Express, Inc. v. Compuserve Inc.*, 256 F.3d 1323, 1331 (Fed. Cir. 2001). “[C]laims are not to be read in a vacuum, and limitations therein are to be interpreted in light of the specification in giving them their ‘broadest reasonable interpretation.”’ *In re Marosi*, 710 F.2d 799, 802 (Fed. Cir. 1983) (quoting *In re Okuzawa*, 537 F.2d 545, 548 (CCPA 1976)). “[T]he broadest

reasonable interpretation must be reasonable in light of the claims and specification.” *PPC Broadband, Inc. v. Corning Optical Commc’ns RF, LLC*, 815 F.3d 747, 755 (Fed. Cir. 2016). The broadest reasonable interpretation does not mean the broadest possible interpretation, our construction “cannot be divorced from the specification and the record evidence.” *In re NTP, Inc.*, 654 F.3d 1279, 1288 (Fed. Cir. 2011).

We have reviewed the parties’ contentions and supporting evidence and agree with Petitioner that “end” as used in claim 9 means “the part of an area that lies at a boundary.”

This construction is consistent with the words of the claim. Claim 9 does not recite the *ends of the capacitors*, as implied by Patent Owner’s construction. Instead, the language of claim 9, read as a whole, suggests that the “substantially monolithic dielectric body compris[es] one end [and] an opposite end.” Ex. 1001, 16:63–64. Thus, we understand the term “end” as referring to the end of the body, and not limited to just the end of the capacitors.

The written description of the ’829 patent confirms our interpretation. We are not persuaded with Patent Owner’s argument that “the ’829 patent describes the ends of the capacitor as the last surfaces of the capacitor in the lengthwise direction.” See PO Resp. 9–10. Patent Owner has not directed to us to any portion of the written description that defines the term end in the way Patent Owner does—either explicitly or implicitly—with reasonable clarity, deliberateness, and precision. See *Renishaw*, 158 F.3d at 1249 (“The patentee’s lexicography must, of course, appear ‘with reasonable clarity, deliberateness, and precision’ before it can affect the claim.” (quoting *In re Paulsen*, 30 F.3d 1475, 1480 (Fed. Cir. 1994))). To the contrary, the written

description of the '829 patent explicitly describes the top surface of the capacitor of Figure 14 as the “end.” That is, although Patent Owner contends that, under its proposed definition, the side surface marked with an “X” on version of Figure 14 reproduced above on page 12 is an end (PO Resp. 8–9), the written description of the '829 patent explicitly identifies the portion of the capacitor with insulating coating 128 as an end: “Fig. 14 also illustrates another embodiment in that the *ends of the chip* are provided with an insulating coating 128” See Ex. 1001, 11:4–6 (emphasis added). As illustrated in Figure 14, it is not the side marked with the “X” that has insulating coating 128, but the upper surface or end. See Ex. 1001, Fig. 14.

We are not persuaded by Patent Owner’s contention—which Patent Owner contends is supported by the testimony of Dr. Randall—that the description of Figure 14 contains an error. See Tr. 34, 40. Specifically, Dr. Randall testified that a person of ordinary skill in the art would replace “ends of the chip” with “ends of 125 and 126” in the description of Figure 14:

Q. And that passage I just read you referenced it specifically being on the ends of the chip. Do you recall that?

A. Yeah. I believe that’s an error.

Q. Well, that is an error under your interpretation of the word “ends”?

A. I think a person with skill in the art reading this paragraph and the section in totality, as you mentioned before, would understand that the ends that they are talking about are the actual ends of the surface electrodes. I think it is 125 and 126. *And I believe that when they say “ends of the chip,” I think “of the chip” is not correct. I think it should say “ends of 125 and 126.”* It just makes more sense if you read down through the rest of that paragraph.

Ex. 1018, 115:22–116:11 (emphasis added). Adding Dr. Randall’s proposed edits with deletions stricken and additions in italics, results in the following sentence: “Fig. 14 also illustrates another alternative embodiment in that the ends of ~~the chip~~ 125 *and* 126 are provided with an insulated coating 128 to provide an electrical barrier from shorting with other devices.” See Ex. 1001, 11:4–7; Ex. 1018, 115:22–116:11.

We do not credit the testimony of Dr. Randall in this regard. First, the edit suggested by Dr. Randall results in a sentence that is not consistent with Figure 14. Although the edited sentence states that insulated coating 128 is on ends 125 and 126, Figure 14 clearly shows that is not where the insulated coating 128 is located. Instead, insulated coating 128 is on the top surface of the chip, which is not specifically identified. Second, Dr. Randall does not provide any support, such as a different section describing Figure 14, to support his edits. Instead, Dr. Randall’s opinion is mere *ipse dixit*. Because insulated coating 128 is not shown on ends 125 or 126, and the suggested edit lacks any support in the text of the ’829 patent, we find Dr. Randall’s opinion on this matter not credible and give it minimal weight. See 37 C.F.R. § 42.65 (a); *Rohm and Haas Co. v. Brotech Corp.*, 127 F.3d 1089, 1092 (Fed. Cir. 1997) (noting that a fact finder is not required to “credit the unsupported assertions of an expert witness”); *Ashland Oil, Inc. v. Delta Resins & Refractories, Inc.*, 776 F.2d 281, 294 (Fed. Cir. 1985) (noting that the “[l]ack of factual support” for an expert opinion “may render the testimony of little probative value”).

Moreover, our construction is consistent with the broadest of the general purpose dictionary definitions provided by the parties. That is, under Patent Owner’s proposed construction, only the last part or boundary

in the lengthwise direction is considered. *See* Ex. 2002, 2 (“the extreme or last part lengthwise”). However, the definition that we adopt applies to the last part or boundary, without any limitation imposed on the direction. *See id.* (the part of an area that lies at the boundary). A construction that is not the broadest construction consistent with the specification is not the broadest reasonable interpretation. *See In re Trans Holdings Corp.*, 498 F.3d 1290, 1299 (Fed. Cir. 2007) (using broadest dictionary definition to construe claim term).

Finally, we have considered the extrinsic evidence cited by Patent Owner, including claim constructions of different patents with different specifications. Although “extrinsic evidence may be used only to assist in the proper understanding of the disputed limitation; it may not be used to vary, contradict, expand, or limit the claim language from how it is defined, even by implication, in the specification or file history.” *Bell Atl. Network Servs., Inc. v. Covad Commc’ns Group, Inc.* 262 F.3d 1258, 1269 (Fed. Cir. 2001). Therefore, we decline to narrow the scope of “end” based on Patent Owner’s extrinsic evidence.

Accordingly, based on the entire record, we construe the term “end” to mean “the part of an area that lies at a boundary.”

2. “Substantially Parallel and Opposed”

Claim 32 requires that a first conductive plate and a second conductive plate be “substantially parallel and opposed in at least one region of said body, to form a capacitor therebetween.” Ex. 1001, 20:33–35.

a. *The Parties’ Arguments*

Patent Owner argues that “substantially” in the phrase “substantially parallel and opposed” as recited in claim 32 modifies both parallel and

opposed. PO Resp. 13. According to Patent Owner, “when an adverb or adjective is paired with multiple words that follow, they modify all the words that follow.” *Id.* (citing Ex. 2011).

Patent Owner also argues that “opposed means ‘placed opposite each other.’” *Id.* (citing Ex. 2001 ¶ 80); *see also id.* at 13–15 (providing argument supporting construction). Patent Owner further argues that a person of ordinary skill in the art would “understand that there are no internal conductive plates between conductive plates that are opposed,” as that term is used in claim 32. PO Resp. 15 (citing Ex. 2001 ¶ 80). According to Patent Owner, the ’829 patent describes the embodiment in Figure 17A as having a first plurality of conductive plates and second plurality of opposed conductive plates. *Id.* at 13–14. Patent Owner argues that in Figure 17A there are no intervening conductive plates between the opposed plates. *Id.* at 14–15 (citing Ex. 2001 ¶ 78).

Petitioner argues there is nothing in the ’829 patent that indicates that the presence of an intervening plate between two conductive plates prevents those plates from being “substantially parallel and opposed” as recited in claim 32. Reply 21. Petitioner further argues that Patent Owner’s proposed construction ignores the phrase “in at least one region” of the dielectric body. *Id.* at 22. Therefore, according to Petitioner, even if the claim excludes an intervening plate, it is only excluded for that one region of the body. *Id.*; *see also id.* at 23–24 (arguing that no intricate analysis of the degree of overlap is required; instead, all that is required is that the plates are opposed in any region of the capacitor).

Petitioner further argues that the term “substantially” modifies parallel, but not opposed. *Id.* at 23. According to Petitioner, although the

term “substantially parallel is used seven times in the body of the ’829 patent (excluding the claims), the terms “substantially opposed” and “substantially parallel and opposed” are never used. *Id.* (citing Ex. 1017 ¶ 119); *see also* Ex. 1017 ¶ 119 (identifying the seven uses of substantially parallel at Ex. 1001, 7:30, 11:28, 13:16, 13:42, 13:63–64, 14:18, and 14:38).

b. Our Analysis

We have reviewed the parties’ contentions and supporting evidence and agree with Petitioner that “substantially” modifies parallel, but not opposed. We also agree with Petitioner that the claim limitation “substantially parallel and opposed in at least one region of the body” does not preclude the use of intervening plates between the second and third conductive plates.

Specifically, we do not agree with Patent Owner’s contention that claim 32 requires plates that are substantially opposed. In support of its construction, Patent Owner relies on a website called “The Editor’s Blog.” *See* PO Resp. 13 (citing Ex. 2011, a printout of The Editor’s Blog). This evidence is not convincing, at least because the authoritative nature of the website is unclear. For example, Patent Owner does not offer supporting evidence demonstrating that this website is often used for grammar rules, or that the author of the website is considered an expert in the field of grammar. Moreover, although the website provides a logical argument in support of a “rule” regarding what the adjective modifies (Ex. 2011, 1–3), the website acknowledges a lack of support for its “rule”:

This reader asked about a source for rules on the subject. *The Chicago Manual of Style* mentions coordinate nouns only briefly.

It points out that repeating an article before each noun isn't necessary but isn't prohibited. So—

He nodded to the president, the senator, and the mayor before stepping to the podium.

He nodded to the president, senator, and mayor before stepping to the podium.

I found nothing in *Garner's* or *Hart's Rules* relating to the topic.

Ex. 2011, 4.

Moreover, as noted by Petitioner, although the term *substantially parallel* is used seven times in the description of the preferred embodiment, the term *substantially opposed* is not. See Ex. 1001, 7:30, 11:28, 13:16, 13:42, 13:63–64, 14:18, 14:38.

Finally, Patent Owner's construction would render dependent claim 34, which depends from claim 32, superfluous. That is, if “substantially” modified “opposed,” as proposed by Patent Owner, then claim 32 would require the plates to be “largely but not wholly placed opposite each other.” See PO Resp. 15. That is effectively the same as the definition of substantially coextensive proposed by Patent Owner: “having largely not wholly the same spatial scope or boundaries.” See *id.* at 12. However, it is improper to read a limitation of a dependent claim into the independent claim on which it depends. See *SanDisk Corp. v. Kingston Tech. Co.*, 695 F.3d 1348, 1361 (Fed. Cir. 2012) (stating that “[w]here, as here, the sole difference between the independent claim and the dependent claims is the limitation that one party is trying to read into the independent claim, the doctrine of claim differentiation is at its strongest” (internal quotation marks omitted)); *Phillips v. AWH Corp.*, 415 F.3d 1303, 1315 (Fed. Cir. 2005) (en banc) (“[T]he presence of a dependent claim that adds a particular limitation

gives rise to a presumption that the limitation in question is not present in the independent claim.”).

Accordingly, under the broadest reasonable interpretation of “substantially parallel and opposed,” the term “substantially” modifies “parallel” and does not modify “opposed.”

We also do not agree with Patent Owner that the ’829 patent excludes intervening plates between the opposed conductive plates. As discussed above, the Federal Circuit has held that that a patent applicant can act as his own lexicographer and limit the scope of the claim based on statements in the specification:

Our case law has recognized that “the specification may reveal a special definition given to a claim term by the patentee that differs from the meaning it would otherwise possess.” [*Phillips*, 415 F.3d] at 1316. When the patentee acts as its own lexicographer, that definition governs. *See id.* “To act as its own lexicographer, a patentee must ‘clearly set forth a definition of the disputed claim term’ other than its plain and ordinary meaning.” *Thorner v. Sony Comput. Entm’t Am. LLC*, 669 F.3d 1362, 1365 (Fed. Cir. 2012) (quoting *CCS Fitness, Inc. v. Brunswick Corp.*, 288 F.3d 1359, 1366 (Fed. Cir. 2002)). We have also found instances where “the specification may reveal an intentional disclaimer, or disavowal, of claim scope.” *Phillips*, 415 F.3d at 1316. In those situations, it is again the inventor’s disavowal that is dispositive of the claim construction. *See id.* “To disavow claim scope, the specification must contain ‘expressions of manifest exclusion or restriction, representing a clear disavowal of claim scope.’” *Retractable Techs., Inc. v. Becton, Dickinson & Co.*, 653 F.3d 1296, 1306 (Fed. Cir. 2011) (quoting *Epistar Corp. v. Int’l Trade Comm’n*, 566 F.3d 1321, 1335 (Fed. Cir. 2009)).

Cont’l Circuits LLC v. Intel Corp., 915 F.3d 788, 796–97 (Fed. Cir. 2019).

Although Patent Owner has identified a use in the ’829 patent where the opposed plates do not have any intervening plates (PO Resp. 13–14), that

description is not enough to show a clear disavowal of claim scope. Patent Owner has not pointed to any language in the Specification stating that intervening plates are improper or prohibited. Nor does Patent Owner point to any evidence from the prosecution history of the '829 patent disavowing the inclusion of intervening plates.

Moreover, when describing the Figure 10A embodiment (reproduced below), we understand the '829 patent as describing plates as opposed even though there are intervening plates.

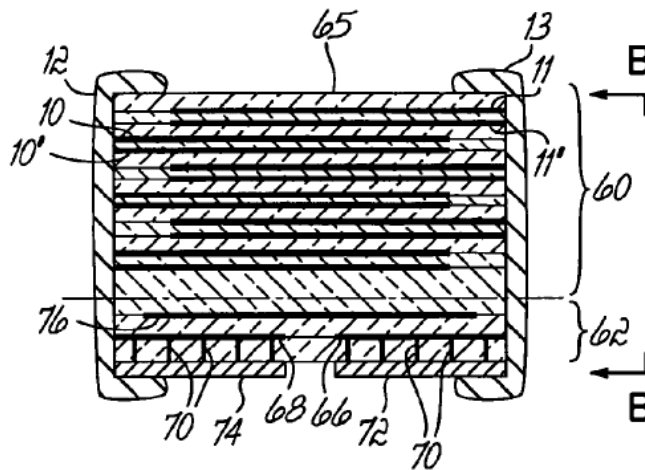


FIG. 10A

Figure 10A “illustrates a second embodiment of an integrated wideband capacitor in accordance with further aspects of the present invention.”

Ex. 1001, 5:53–55. According to the '829 patent,

the edges of floating internal plate 76 have been withdrawn toward the interior of the device, which has the effect of lowering the capacitance and inductance between plate 76 and plates 72 and 74. The reduced capacitance results from the reduced area of plate 76 that is opposed by plates 72 and 74.

Id. at 8:11–16 (emphasis added). Although the '829 patent describes plate 76 as opposed by plates 72 and 74, as illustrated in Figure 10A, plates 66 are

located between the opposed plates. Accordingly, at least one embodiment of the '829 patent has intervening plates located between opposed plates. Therefore, the '829 patent does not contain a clear disavowal of intervening plates between opposed plates.

Accordingly, we construe “substantially parallel and opposed in at least one region of the body” to mean “substantially parallel, and opposed in at least one region of the body, such that there may be intervening plates positioned between the opposed plates.

3. *“Substantially Coextensive”*

Dependent claim 34 additionally requires that the third conductive plate be “substantially coextensive with the first and second conductive plates.” Ex. 1001, 20:61–62.

a. *The Parties’ Arguments*

Petitioner argues that the phrase “substantially coextensive” should be interpreted to mean “having a substantially similar spatial scope or boundaries sufficient to create a capacitance therebetween.” Pet. 11–14. Petitioner argues, based on a general purpose dictionary definition, that coextensive means “having the same spatial or temporal scope or boundaries.” *Id.* at 11 (quoting Ex. 1009, 222). Petitioner further argues that the inclusion of “the term ‘substantially’ makes clear that the first, second, and third conductive plates need not have the same exact ‘scope or boundaries.’” *Id.* at 12 (citing Ex. 1002 ¶ 36); *see also id.* at 11–12.

Additionally, Petitioner argues that the '829 patent requires “that the various conductive plates share sufficient scope (i.e., sufficient overlap) such that a capacitance is formed between the conductive plates.” Pet. 12 (citing Ex. 1002 ¶ 37); *see also id.* at 12–14. Petitioner further argues, “nowhere

does the '829 patent provide any indication of exactly how similar the 'scope or boundaries' of the various conductive plates need be to satisfy the phrase 'substantially coextensive.'" *Id.* at 12. According to Petitioner, outside of the claims, the '829 patent never uses the phrase "substantially coextensive" or even the word "coextensive." Reply 29–30.

Patent Owner argues that the phrase "substantially coextensive" as recited in claim 34 means "having largely but not wholly the same spatial scope or boundaries." PO Resp. 12; *see also id.* at 10–12. According to Patent Owner, a person of ordinary skill in the art would have understood that "substantially coextensive" denotes a spatial relationship. *Id.* at 11. Patent Owner further argues that substantially was construed—with respect to a related patent—to mean "largely but not wholly" and that coextensive is defined in the dictionary to mean "having the same spatial or temporal scope of boundary." *Id.* (citing Ex. 2009, 8; Ex. 1009, 222). Patent Owner further argues that the temporal aspect of the definition is not applicable in the context of the '829 patent. *Id.* (citing Ex. 2001 ¶ 65).

Patent Owner also argues that a person of ordinary skill in the art would not have associated the phrase "substantially coextensive" with the ability to create a capacitance; instead, it relates to a spatial relationship. *Id.* at 11–12 (citing Ex. 2001 ¶¶ 68–71). Additionally, Patent Owner argues that such a construction would be superfluous to the limitation recited in claim 32 "that the second and third conductive plates are arranged 'to form a capacitor therebetween.'" *Id.* at 12 (citing Ex. 2001 ¶ 72; Ex. 1001, claim 32).

b. Our Analysis

With the exception of whether or not a capacitor needs to be formed, both Petitioner and Patent Owner propose substantially the same definition, based on similar general purpose dictionary definitions. The difference between the two definitions is Petitioner's includes the word "substantially" and Patent Owner's substitutes the definition of the term substantially. *Compare* Pet. 14 ("substantially similar spatial scope or boundaries"), *with* PO Resp. 12 ("having largely but not wholly the same spatial scope or boundaries").

The Federal Circuit has held that the term "substantially" is a term of approximation. *Cordis Corp. v. Medtronic AVE, Inc.*, 339 F.3d 1352, 1360 (Fed. Cir. 2003) (citing *Epcon Gas Sys., Inc. v. Bauer Compressors, Inc.*, 279 F.3d 1022, 1031 (Fed. Cir. 2002)). Although no uniform construction of substantially is applied, the Federal Circuit has used the definition "largely, but not necessarily wholly." *LNG Eng'g Plastics, Inc. v. Miller Waste Mills, Inc.*, 275 F.3d 1347, 1354–56 (Fed. Cir. 2001); *see also Backson Marine, Inc. v. NFM, Inc.*, 144 F. App'x 862, 867 (Fed. Cir. 2005) (concluding "that the 'substantially open' limitation calls for drain grooves that are 'largely but not necessarily wholly open'"); *Foremost in Packaging Sys. v. Cold Chain Techs.*, No. 05-CV-24-JVS (MLGX), 2005 WL 6300783, at *18 (C.D. Cal. Nov. 21, 2005), *aff'd sub nom. Foremost in Packaging Sys., Inc. v. Cold Chain Techs., Inc.*, 485 F.3d 1153 (Fed. Cir. 2007) ("The Court finds that 'substantially' is in an ideal embodiment commonly understood to mean 'virtually entirely,' but actually means something less, like 'largely but not necessarily wholly.'"). Accordingly, as used in the '829 patent, "substantially" means "largely, but not necessarily, wholly."

To the extent that Patent Owner’s proposed construction would exclude plates that have wholly the same spatial scope or boundaries, we do not agree with that aspect of the construction. Nothing in the Specification indicates that the claim should be construed to exclude plates that were perfectly extensive, as opposed to substantially coextensive. Nor would such a construction be the broadest reasonable construction.

We agree with Patent Owner that “substantially coextensive” does not require that a capacitance be formed between the plates. Petitioner has not directed us to any portion of the written description or prosecution history where the applicant—either explicitly or implicitly—defined coextensive in terms of the ability to form a capacitance. *See Renishaw*, 158 F.3d at 1249.

Accordingly, we conclude that “substantially coextensive” as recited in claim 34 means “having largely, but not necessarily wholly, the same spatial scope or boundaries.”

B. Legal Principles

1. Anticipation

“A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.” *Verdegaal Bros. Inc., v. Union Oil Co.*, 814 F.2d 628, 631 (Fed. Cir. 1987). Moreover, “[b]ecause the hallmark of anticipation is prior invention, the prior art reference—in order to anticipate under 35 U.S.C. § 102—must not only disclose all elements of the claim within the four corners of the document, but must also disclose those elements ‘arranged as in the claim.’” *Net MoneyIN, Inc. v. VeriSign, Inc.*, 545 F.3d 1359, 1369 (Fed. Cir. 2008). Whether a reference anticipates is assessed from the perspective of an ordinarily skilled artisan. *See Dayco Prods., Inc. v. Total*

Containment, Inc., 329 F.3d 1358, 1368 (Fed. Cir. 2003) (“[T]he dispositive question regarding anticipation [i]s whether *one skilled in the art* would reasonably understand or infer from the [prior art reference’s] teaching that every claim element was disclosed in that single reference.”).

2. *Obviousness*

In *Graham v. John Deere Co. of Kansas City*, 383 U.S. 1 (1966), the Supreme Court set out a framework for assessing obviousness under 35 U.S.C. § 103 that requires consideration of four factors: (1) the “level of ordinary skill in the pertinent art,” (2) the “scope and content of the prior art,” (3) the “differences between the prior art and the claims at issue,” and (4) “secondary considerations” of non-obviousness such as “commercial success, long-felt but unsolved needs, failure of others, etc.” *Id.* at 17–18. “While the sequence of these questions might be reordered in any particular case,” *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 407 (2007), the Federal Circuit has “repeatedly emphasized that an obviousness inquiry requires examination of all four *Graham* factors and that an obviousness determination can be made only after consideration of each factor.” *Nike, Inc. v. Adidas AG*, 812 F.3d 1326, 1335 (Fed. Cir. 2016). We note that, with respect to the fourth *Graham* factor, the parties have not presented argument or evidence directed to secondary considerations of nonobviousness. The analysis below addresses the first three *Graham* factors.

C. *Level of Ordinary Skill in the Art*

The level of ordinary skill in the art is “a prism or lens” through which we view the prior art and the claimed invention. *Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001).

Factors pertinent to a determination of the level of ordinary skill in the art include (1) educational level of the inventor; (2) type of problems encountered in the art; (3) prior art solutions to those problems; (4) rapidity with which innovations are made; (5) sophistication of the technology; and (6) educational level of workers active in the field. *Envtl. Designs, Ltd. v. Union Oil Co.*, 713 F.2d 693, 696–97 (Fed. Cir. 1983) (citing *Orthopedic Equip. Co. v. All Orthopedic Appliances, Inc.*, 707 F.2d 1376, 1381–82 (Fed. Cir. 1983)). “Not all such factors may be present in every case, and one or more of these or other factors may predominate in a particular case.” *Id.* Moreover, “[t]hese factors are not exhaustive but are merely a guide to determining the level of ordinary skill in the art.” *Daiichi Sankyo Co. v. Apotex, Inc.*, 501 F.3d 1254, 1256 (Fed. Cir. 2007). In determining a level of ordinary skill, we also may look to the prior art, which may reflect an appropriate skill level. *Okajima*, 261 F.3d at 1355. Additionally, the Supreme Court informs us that “[a] person of ordinary skill is also a person of ordinary creativity, not an automaton.” *KSR*, 550 U.S. at 421.

Petitioner argues that a person of ordinary skill in the art in the context of the ’829 patent “is generally one who has a Bachelor’s degree in electrical engineering along with several years of relevant applied research and/or industry work experience in the field of multilayer ceramic capacitors.” Pet. 4 (citing Ex.1002 ¶¶ 17–18).

Patent Owner does not expressly address the level of ordinary skill in the art in the Patent Owner’s Response. *See generally* PO Resp. However, Dr. Randall testifies that a person of ordinary skill in the art “would have had a Master’s Degree in Materials Science and Engineering or analogous degree, and at least two years of industry experience with capacitor design

and/or manufacturing.” Ex. 2001 ¶ 16. Dr. Randall further testifies that his opinions would not change if the person of ordinary skill in the art only had a Bachelor’s Degree. *Id.* ¶ 17.

Based on the entire record, as argued by Petitioner and Patent Owner in their respective papers,⁷ we accept Petitioner’s formulation, finding that the person of ordinary skill in the art would have had “a Bachelor’s degree in electrical engineering along with several years of relevant applied research and/or industry work experience in the field of multilayer ceramic capacitors.”⁸

D. The Prior Art References

1. Kuroda (Ex. 1003)

Kuroda is directed to “[a] multilayer capacitor wherein a high capacitance first capacitor portion C_1 and a low capacitance second capacitor portion C_2 are formed within a sintered body 12 separated by a distance d .” Ex. 1003, [57]. Kuroda depicts several embodiments wherein capacitor portions C_1 and C_2 are formed from a plurality of overlying internal

⁷ “A brief must make all arguments accessible to the judges, rather than ask them to play archeologist with the record.” *DeSilva v. DiLeonardi*, 181 F.3d 865, 866–67 (7th Cir. 1999); *see also* Paper 6, 3 (“The patent owner is cautioned that any arguments for patentability not raised in the response will be deemed waived.”); *cf.* 37 C.F.R. § 42.104(b) (“The Board may exclude or give no weight to the evidence where a party has failed to state its relevance or to *identify specific portions of the evidence that support the challenge.*”) (emphasis added).

⁸ We note that neither Petitioner nor Patent Owner has argued that a different level of skill in the art would result in a different outcome. Accordingly, the findings and conclusion in this Decision would be the same even if we adopted Mr. Randall’s definition.

electrodes connected to external electrodes formed on the end faces of the sintered body. *Id.* ¶ 7. Kuroda explains that the distance d between capacitor portions C_1 and C_2 is greater than the distance between the plurality of overlying internal electrodes that form each of C_1 and C_2 . *Id.* ¶ 8. Kuroda teaches achieving different capacitance values for C_1 and C_2 by (1) varying the number of layers in each of C_1 and C_2 , (2) varying the distance between the electrodes in each of C_1 and C_2 , and/or (3) using non-connected internal electrodes to form C_2 . *Id.* ¶¶ 7–10.

Kuroda depicts one embodiment of its multilayer capacitor in Figure 1, reproduced below.

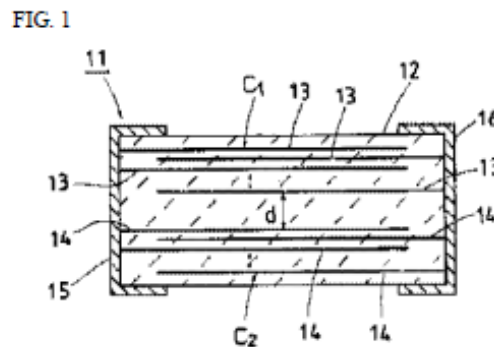


Figure 1 of Kuroda shows a cross-sectional view of a multilayer capacitor having first capacitor C_1 and second capacitor C_2 disposed within sintered body 12, and separated by gap d . *Id.* ¶ 7. First capacitor C_1 is formed from a plurality of internal electrodes 13 positioned to overlay each other. *Id.* Second capacitor C_2 is similarly formed from a plurality of internal electrodes 14. *Id.* Each of internal electrodes 13 and 14 lead out to one of external electrodes 15 and 16, formed on a pair of “end faces” of sintered body 12. *Id.*

Kuroda depicts another embodiment in Figure 5, reproduced below.

FIG. 5

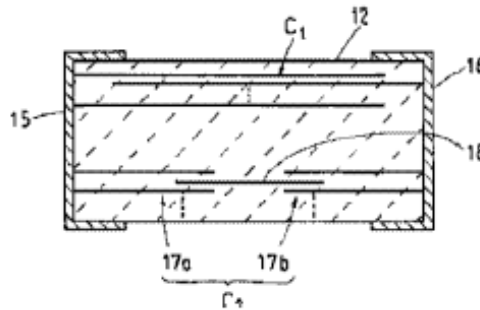


Figure 5 of Kuroda depicts a cross-sectional view of a multilayer capacitor having first capacitor C₁ formed from a plurality of internal electrodes, each leading out to one of external electrodes 15 and 16, and positioned to overlay each other (similar to C₁ in Figure 1). *Id.* ¶ 10. Figure 5 also shows second capacitor C₂ formed from a plurality of internal, co-planar electrodes 17a and 17b, each attached to external electrodes 15 and 16, respectively, and connected in series to internal electrode 18, which is not connected to an external electrode. *Id.*

Kuroda depicts a third embodiment in Figure 6, reproduced below.

FIG. 6

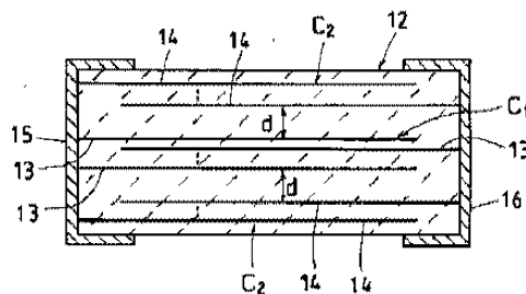


Figure 6 of Kuroda depicts a cross-sectional view of a multilayer capacitor having two second capacitor portions, C₂ and C₂, “disposed both above and below the first capacitor portion C₁.” *Id.* ¶ 10. According to Kuroda, the configuration shown in Figure 6 will “eliminate directionality.” *Id.*

2. *Hiroyuki (Ex. 1006)*

Hiroyuki is directed to a simple, reliable, and cost effective method for manufacturing capacitors using surface capacitive electrodes. Ex. 1006 ¶ 10. Hiroyuki's method includes forming a capacitor having a single internal capacitive electrode and a corresponding single surface capacitive electrode, or a single pair of internal capacitive electrodes and a corresponding pair of surface capacitive electrodes. *Id.* ¶ 11.

E. *Claims 9–11 – Anticipated by Kuroda*

1. *Claim 9*

Petitioner argues that Kuroda discloses every element recited in claim 9 and that those elements are arranged in the same manner as set forth in the claim. Pet. 15–29; *see also* Reply 1–20.

a. *Analysis of Undisputed Limitations*

Claim 9 recites a capacitor comprising “a substantially monolithic dielectric body comprising . . . first and second external surfaces.” Ex. 1001, 16:62–65. Petitioner argues Kuroda's “capacitor 11 includes a ‘sintered body 12 made from a dielectric ceramic,’” which is a substantially monolithic dielectric body. Pet. 17–18 (citing Ex. 1003 ¶¶ 6, 7; Ex. 1002, 22). Petitioner further argues Kuroda's sintered body 12 includes “end faces” on which “external electrodes 15 and 16” are formed as required in claim 1. *Id.* at 18 (quoting Ex. 1003 ¶ 7) (citing Ex. 1002, 23).

Claim 9 further recites “first and second contacts on the first and second external surfaces, respectively.” Ex. 1001, 16:66–67. Petitioner argues Kuroda discloses two contacts, external electrodes 15 and 16, on the first and second external surfaces, respectively. Pet. 19–20 (citing Kuroda ¶¶ 7, 10, Figs. 1, 5, 6; Ex. 1002, 24).

Claim 9 next recites “a higher frequency, lower value, first capacitor formed by first conductive plates disposed in the dielectric body . . . , the first capacitor being electrically connected between the first and second contacts.” Ex. 1001, 17:1–4. Petitioner directs us to the lower C_2 in Figure 6 of Kuroda, arguing that the lower C_2 is formed by first conductive plates (the plurality of internal electrodes 14) disposed within the sintered body 12 and electrically connected between the first and second contacts (external electrodes 15 and 16). Pet. 20–21 (citing Ex. 1003 ¶¶ 7, 8, 10, Figs. 1, 5, 6; Ex. 1002, 24–26). Petitioner further argues that a person of ordinary skill in the art “would recognize that such a capacitor is equivalent to the claimed ‘higher frequency, lower value, first capacitor.’” *Id.* at 21–22 (citing Ex. 1002, 25).

Claim 9 further recites “a higher frequency, lower value, second capacitor formed by second conductive plates disposed in the dielectric body . . . , the second capacitor being electrically connected between the first and second contacts in a parallel circuit with the first capacitor.” Ex. 1001, 17:5–9. Petitioner argues that upper C_2 in Kuroda Figure 6 is formed by second conductive plates (the plurality of internal electrodes 14) disposed within the sintered body 12, electrically connected between the first and second contacts (external electrodes 15 and 16), and in a parallel circuit with the first capacitor (lower C_2). Pet. 23–24 (citing Ex. 1003 ¶¶ 7, 8, 10, Fig. 6; Ex. 1002, 26–27). Petitioner further argues that a person of ordinary skill in the art “would recognize that such a capacitor is equivalent to the claimed ‘higher frequency, lower value, second capacitor.’” *Id.* at 25–26 (citing Ex. 1002, 27).

Claim 9 next recites “a lower frequency, higher value, third capacitor formed by a first plurality of conductive plates disposed within the dielectric body . . . between the first capacitor and the second capacitor.” Ex. 1001, 17:10–13. Petitioner directs us to C_1 in Figure 6 of Kuroda, noting that it is formed by third internal plates (internal electrodes 13) located between the first capacitor (lower C_2) and the second capacitor (upper C_2). Pet. 26 (citing Ex. 1003 ¶¶ 7, 8, 10, Fig. 6; Ex. 1002, 28–29). Petitioner argues Kuroda describes C_1 as “a ‘high capacitance capacitor’ effective in a ‘low frequency band.’” *Id.* (quoting Ex. 1003 ¶ 2). Petitioner further argues that a person of ordinary skill in the art “would recognize that such a capacitor is equivalent to the claimed ‘lower frequency, higher value, [third] capacitor.’” *Id.* at 26–27 (citing Ex. 1002, 28–29).

Finally, claim 9 recites that “the third capacitor being electrically connected between the first and second contacts in a parallel circuit with the first capacitor and the second capacitor.” Ex. 1001, 17:13–16. Petitioner argues that the third capacitor (C_1) is electrically connected between the first and second contacts (external electrodes 15 and 16) in a parallel circuit with the first capacitor (lower C_2) and second capacitor (upper C_2). Pet 28–29 (citing Ex. 1003 ¶¶ 7, 8, 10, Figs. 1, 3, 5–7; Ex. 1002, 29). Petitioner further argues that “Kuroda states that ‘the first capacitor portion C_1 , with the relatively high capacitance, and the second capacitor portion C_2 , with the low capacitance, are connected in parallel between external electrodes 15 and 16.’” *Id.* at 28 (quoting Ex. 1003 ¶ 8). Petitioner also argues “[t]he two capacitor portions C_2 and the capacitor portion C_1 of Fig. 6 of Kuroda are likewise connected in parallel by virtue of their respective connections

between external electrodes 15 and 16.” *Id.* (citing Ex. 1003, Fig. 6; Ex. 1002, 29).

Patent Owner does not dispute Petitioner’s argument that Kurdo discloses all of the limitations recited above and that the elements are arranged in the same manner is set forth in claim 9. *See generally* PO Resp. We previously instructed Patent Owner that “any arguments for patentability not raised in the [Patent Owner Response] will be deemed waived.” Paper 6, 3; *see also* 37 C.F.R. § 42.23(a) (“Any material fact not specifically denied may be considered admitted.”); *In re NuVasive, Inc.*, 842 F.3d 1376, 1380–81 (Fed. Cir. 2016) (determining Patent Owner waived arguments made only in its Preliminary Response but not raised in the Patent Owner Response after institution).

Based on the evidence before us and reasons set forth in the Petition (Pet. 15–19), we find that the Kuroda teaches:

A capacitor comprising:

a substantially monolithic dielectric body comprising . . .
first and second external surfaces;

first and second contacts on the first and second external
surfaces, respectively;

a higher frequency, lower value, first capacitor formed by
first conductive plates in the dielectric body . . . , the first
capacitor being electrically connected between the first and
second contacts;

a higher frequency, lower value, second capacitor formed
by second conductive plates in the dielectric body . . . , the second
capacitor being electrically connected between the first and
second contacts in a parallel circuit with the first capacitor;

a lower frequency, higher value third capacitor formed by
third conductive plates in the dielectric body . . . between the first
capacitor and the second capacitor, the third capacitor being

electrically connected between the first and second contacts in a parallel circuit with the first capacitor and the second capacitor. Specifically, based on the undisputed evidence discussed above, we agree with Petitioner that the lower C_2 in Kuroda's Figure 6 is the "first capacitor," the upper C_2 in Kuroda's Figure 6 is the "second capacitor," and that the C_1 in Kuroda's Figure 6 is the "third capacitor" recited in claim 9.

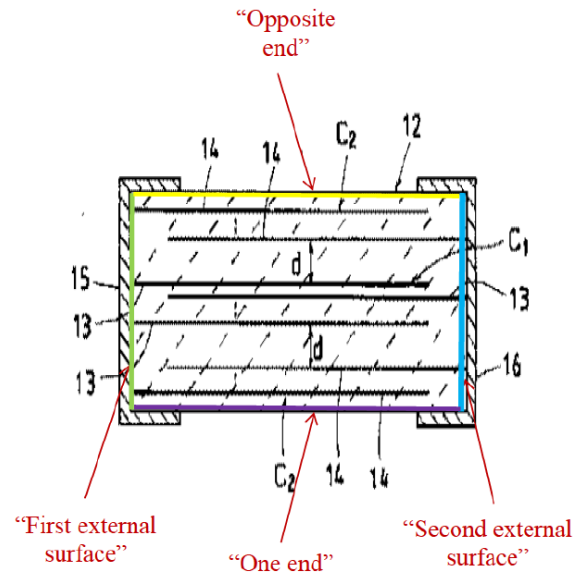
b. The Disputed "End" Limitations

In addition to the undisputed limitations discussed above, claim 9 sets forth several limitations related to certain ends of the dielectric body. Specifically, claim 9 recites that the "substantially dielectric body compris[es] one end [and] an opposite end." Ex. 1001, 16:63–64. Claim 9 further requires a "a first capacitor formed . . . near the one end," "a second capacitor . . . near the opposite end," and "a third capacitor formed . . . intermediate the one end and the opposite end." *Id.* at 17:1–12.⁹

i. Petitioner's Arguments

Petitioner argues Kuroda's sintered body 12 includes "end faces" on which "external electrodes 15 and 16" are formed, as required in claim 1. Pet. 18 (quoting Ex. 1003 ¶ 7) (citing Ex. 1002, 23). Petitioner also argues that the sintered body includes a top surface and a bottom surface, which corresponds to the "one end" and the "opposite end" required by claim 9. *Id.* (citing Ex. 1002, 23). To support its arguments, Petitioner annotated Figure 6 of Kuroda, which is reproduced below from the Petition. *Id.* at 18–19; Ex. 1002, 23.

⁹ The limitations identified above are sometimes referred to collectively as the "disputed 'end' limitations."

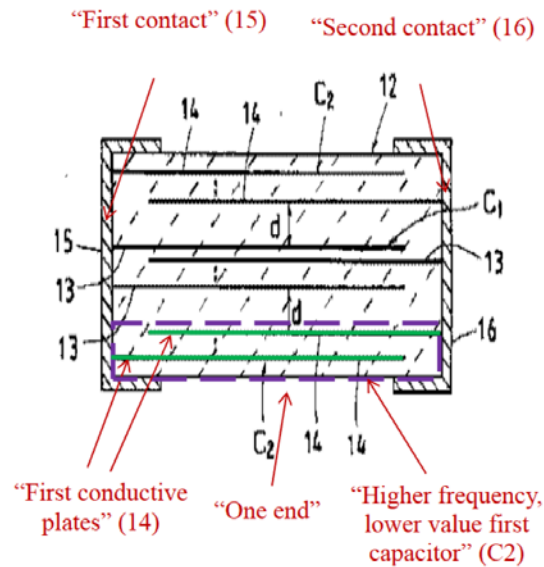


Pet. 19 (annotated by Petitioner). Petitioner’s annotated Figure 6 shows a cross-sectional view of a multilayer capacitor, wherein Petitioner identifies the first external surface (highlighted in green) and the second external surface (highlighted in blue) as the surfaces that face external electrodes 15 and 16, respectively. Pet. 18; *see also* Reply 19. Additionally, the figure shows “one end” at the bottom surface (highlighted in purple) and an “opposite end” at the top surface (highlighted in yellow). Pet. 18.¹⁰

With regard to the location of the “first capacitor,” Petitioner directs us to the lower C₂ in Figure 6 of Kuroda—which we found above to be the “first capacitor”—and argues that the lower C₂ is disposed within the sintered body 12 near the one end. Pet. 20–21 (citing Ex. 1003 ¶¶ 7, 8, 10, Figs. 1, 5, 6; Ex. 1002, 24–26). To support its arguments, Petitioner

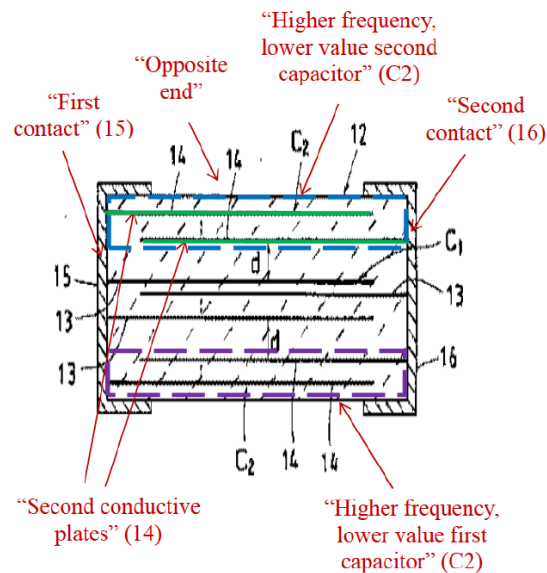
¹⁰ Petitioner also argues that Kuroda discloses an “end” and an “opposite end” under Patent Owner’s proposed construction. Reply 19–20. Because we did not adopt Patent Owner’s construction of “end,” we do not address that argument.

annotated Figure 6 of Kuroda, which is reproduced below from the Petition. *Id.* at 22–23.



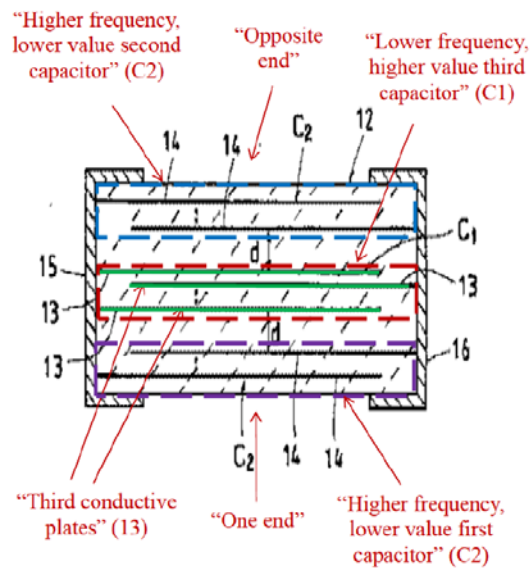
Id. at 23 (annotated by Petitioner). Petitioner’s annotated Figure 6 shows a cross-sectional view of a multilayer capacitor, wherein Petitioner identifies the “higher frequency, lower value first capacitor” (highlighted in purple) and the “first conductive plates” (highlighted in green). *Id.* at 22–23.

With regard to the location of the “second capacitor,” Petitioner directs us to upper C₂ in Kuroda Figure 6—which we found above to be the “second capacitor”—and argues that upper C₂ is disposed within the sintered body 12 near the opposite end. Pet. 23–24 (citing Ex. 1003 ¶¶ 7, 8, 10, Fig. 6; Ex. 1002, 26–27). To support its arguments, Petitioner annotated Figure 6 of Kuroda, which is reproduced below from the Petition. *Id.* at 24–25.



Id. at 25 (annotated by Petitioner). Petitioner’s annotated Figure 6 shows a cross-sectional view of a multilayer capacitor, wherein Petitioner identifies the “higher frequency, lower value second capacitor” (highlighted in blue) and the “second conductive plates” (highlighted in green). *Id.* at 24–25.

With regard to the location of the “third capacitor,” Petitioner directs us to C_1 in Kuroda’s Figure 6—which we found above to be the “third capacitor”—and argues that it is located intermediate the one end (bottom surface) and the opposite end (upper surface). Pet. 26 (citing Ex. 1003 ¶¶ 7, 8, 10, Fig. 6; Ex. 1002, 28–29). To support its arguments, Petitioner annotated Figure 6 of Kuroda, which is reproduced below from the Petition. *Id.* at 27.



Id. (annotated by Petitioner). Petitioner’s annotated Figure 6 shows a cross-sectional view of a multilayer capacitor, wherein Petitioner identifies the “lower frequency, higher value third capacitor” (highlighted in red) and the “third conductive plates” (highlighted in green). *Id.*

ii. *Patent Owner’s Arguments*

With regard to the disputed limitations recited above, Patent Owner argues that Petitioner’s identification of “one end” and an “opposite end” “flies in the face” of Kuroda. PO Resp. 20. Specifically, Patent Owner argues that “Kuroda discloses the relationship between internal electrodes 13, 14 and external electrodes 15 and 16, and that ‘internal electrodes 13 lead out to *external electrodes 15 and 16 that are formed alternately on a pair of end faces of the sintered body 12.*’” *Id.* (citing Ex. 2001 ¶¶ 104–105; Ex. 1003 ¶ 7). That is, according to Patent Owner, Kuroda states that “the ‘end faces’ are the last surfaces of the capacitor in the lengthwise direction.” *Id.* (citing Ex. 2001 ¶ 106).

Patent Owner further argues that Petitioner's argument is inconsistent with the testimony of Petitioner's expert witness. PO Resp. 20.

Specifically, Patent Owner argues,

Petitioner's own expert confirmed that the ends of the capacitor disclosed in Kuroda are the last surfaces of the capacitor in the lengthwise direction (Exhibit 2003, at 20:25–22:6), and identified them in blue ink (Exhibit 3 of Exhibit 2003). Petitioner's expert also and [sic] identified the surfaces that Petitioner claims are "one end" and "opposite end," as the top and bottom of the capacitor, not ends. (Exhibit 2003, at 47:19–48:6).

Id.

Patent Owner further argues that Petitioner's identification "flies in the face" of the examples in Kuroda, Petitioner's own patent, "the opinions of an expert retained by the Petitioner in a district court litigation, the Hiroyuki reference, as well as Petitioner's expert's analysis of Hiroyuki, and the EIA-198-3-E Detail Specification Sheet for capacitors." *Id.* at 20–21.

iii. Our analysis

With regard to the disputed "end" limitations, based on the record and the parties' arguments, we are persuaded Kuroda discloses "a substantially dielectric body comprising one end [and] and an opposite end," a "first capacitor formed . . . near the one end" a "second capacitor formed . . . near the opposite end," and a "third capacitor formed . . . intermediate the one end and the opposite end," as recited in claim 9. Specifically, Petitioner's annotated version of Kuroda's Figure 6 reproduced above at page 41 demonstrates persuasively how Kuroda discloses a first capacitor near the one end at the bottom of the figure, a second capacitor near the opposite end at the top of the figure, and a third capacitor located intermediate the one end

and the opposite end. Because the locations identified as the “one end” and the “opposite end” are parts of the body that lie at a boundary, based on our claim construction, they are “ends” as used in claim 9. *See* Ex. 1002, 22–29; Ex. 1017 ¶¶ 3, 6, 111–113. We find Dr. Hubing’s testimony, which applies our claim construction, to be credible. *See* Ex. 1002, 22–29; Ex. 1017 ¶¶ 3, 6, 111–113.

Because Patent Owner’s argument is premised on a claim construction that we reject (*see* PO Resp. 20–21), Patent Owner’s argument that Kuroda does not disclose the disputed “end” limitations as recited in claim 9 is not commensurate with the scope of the claim and, therefore, not persuasive. *See In re Self*, 671 F.2d 1344, 1348 (CCPA 1982) (arguments based on limitations not found in the claim are immaterial).

Additionally, Patent Owner argues that Petitioner identifies an end in a different manner than it is identified by the industry. *See* PO Resp. 20–21. This argument is not persuasive because it is not the proper analysis in determining whether or not a reference anticipates a claim. Instead, the proper analysis is “a comparison of the construed claim to the prior art.” *Key Pharms. v. Hercon Labs. Corp.*, 161 F.3d 709, 714 (Fed. Cir. 1998) (citing *Beachcombers, Int’l, Inc. v. WildeWood Creative Prods., Inc.*, 31 F.3d 1154, 1160, 1163 (Fed. Cir. 1994); *Glaxo Inc. v. Novopharm Ltd.*, 52 F.3d 1043, 1047 (Fed. Cir. 1995)).

Moreover, we are not persuaded by Patent Owner’s argument that Dr. Hubing’s testimony, directed to the location of what Kuroda identifies as “end caps,” establishes that “the ends of the capacitor disclosed in Kuroda are the last surfaces of the capacitor in the lengthwise direction.” *See* PO Resp. 20 (citing Ex. 2003, 20:25–22:6, 47:19–48:6). Although Dr. Hubing

identifies what Kuroda calls the “end caps” (Ex. 2003, 20:25–22:6), the claim limitation is directed to the location of the “end,” not an end cap. Similarly we are not persuaded by Dr. Hubing’s testimony regarding the top and bottom of the capacitor. There is nothing inconsistent in calling a surface both an end and either a top or bottom to give a more specific identification of its location. See Ex. 1017 ¶ 92 (“Thus, surfaces of a capacitor may be an ‘end’ even if they are labeled as ‘top’ or ‘bottom’.” (emphasis omitted)); see also *In re May*, 574 F.2d 1082, 1090 (CCPA 1978) (There is no requirement in an obviousness analysis for the prior art to “contain a description of the subject matter of the appealed claim in *ipsissimis verbis*.”) Under our construction, a hexahedron design such as Kuroda has six ends, a left end, a right end, a front end, a back end, a top end, and a bottom end, depending on the orientation of the device. See Ex. 1017 ¶ 92. Kuroda’s identification of its six ends is consistent with the ’829 patent’s identification of the “top surface” as an “end.” See Ex. 1001, 11:4–6, Fig. 14; Ex. 1017 ¶ 104.

For the same reasons as discussed above in connection with Dr. Hubing’s testimony, we do not find Kuroda’s identification of the “end faces of sintered body 12” to be apposite. See PO Resp. 20 (quoting Ex. 2001 ¶¶ 104–105; Ex. 1003 ¶ 7) (emphasis omitted).

We have considered the entirety of the evidence submitted by the parties, both for and against anticipation, and determine Petitioner has shown by a preponderance of the evidence that claim 9 of the ’829 patent is anticipated by Kuroda.

2. *Claims 10–11*

Petitioner presents similar evidence and makes similar arguments regarding claims 10 and 11 (Pet. 29–32), which depend from claim 9, and require that “the first, second and third plates are substantially perpendicular to the first external surface of the dielectric body” (Ex. 1001, 17:17–19) and that “the first external surface is substantially parallel to the second parallel surface” (*id.* at 17:20–22).

Patent Owner does not separately address the additional limitations recited in claims 10 and 11. *See generally* PO Resp.

Having considered the entirety of the evidence submitted by the parties, both for and against anticipation, we determine that Petitioner has shown by a preponderance of the evidence that claims 10 and 11 of the ’829 patent are anticipated by Kuroda.

F. *Claims 32–34 – Obvious over Kuroda and Hiroyuki*

1. *Claim 32*

a. *Uncontested Limitations*

Claim 32 recites a “monolithic capacitor.” Ex. 1001, 20:32. Petitioner argues “Kuroda is directed to a monolithic ‘multilayer capacitor’ having a ‘high capacitance first capacitor portion C1’ and a ‘low capacitance second capacitor portion C2.’” Pet. 33 (citing Ex. 1003, Title, Abstract, Figs. 1, 5, 6; Ex. 1002, 32–33). More specifically, Petitioner points to Kuroda’s Figure 5. *Id.* at 33–34.

Claim 32 further recites “a three-dimensional dielectric body, having first and second external conductive contacts.” Ex. 1001, 20:24–25. Petitioner argues Kuroda teaches this limitation. Pet. 34–36. Specifically, Petitioner argues Kuroda teaches sintered body 12, which is a three-

dimensional dielectric body having first and second external contacts (external electrodes 15 and 16). *Id.* at 34 (citing Ex. 1003 ¶¶ 7, 8, 10, Figs. 1, 5; Ex. 1002, 33–34). Petitioner also argues that although Figures 1 and 5–7 show a cross-section of a sintered body 12, a person having ordinary skill in the art “would readily recognize that the ‘sintered body 12’ is a three-dimensional dielectric body, at least because the ‘sintered body 12’ is formed into a single block or body having a dielectric therein and having three dimensions (*i.e.*, a height, width, and depth).” *Id.* at 34–35 (citing Ex. 1002, 33–34; Ex. 1003 ¶ 6).

Claim 32 also recites “a first conductive plate internal to said dielectric body, extending within said body and conductively connected to said first external conductive contact.” Ex. 1001, 20:27–29. Petitioner directs us to capacitor portion C_1 in Kuroda’s Figure 5. Pet. 36–38 (citing Ex. 1003 ¶¶ 7, 8, Figs. 1, 5; Ex. 1002, 34–35). Petitioner argues that capacitor portion C_1 contains a first conductive plate (“one or more of ‘internal electrodes 13’”) that are internal to the dielectric body (“sintered body 12”) and conductively connected to the first external conductive contact (“external electrode 16”). *Id.* at 36 (citing Ex. 1003 ¶ 7, Figs. 1, 5; Ex. 1002, 34–35).

Claim 32 further recites “a second conductive plate internal to said dielectric body, extending within said body and conductively connected to said second external conductive contact, wherein said first and second conductive plates are substantially parallel and opposed in at least one region of said body, to form a capacitor therebetween.” Ex. 1001, 20:30–35. Petitioner directs us to capacitor portion C_1 , which includes a second conductive plate (“one or more of ‘internal electrodes 13’”) extending within

the dielectric body and conductively connected to the second external conductive contact (“external electrode 15”). Pet. 38–39 (citing Ex. 1003 ¶¶ 7, 8, Fig. 1, 5; Ex. 1002, 35–36). Petitioner argues that a person of ordinary skill in the art would have understood the multiple dots in Kuroda Figure 5 to mean that capacitor portion C_1 “may include any number of opposing electrode plates 13 extending from either of external electrodes 15, 16 and the corresponding surfaces of the sintered body 12 on which those external electrodes are formed.” *Id.* at 39 (citing Ex. 1002, 34, 36). Petitioner also argues Kuroda teaches that the first and second conductive plates are substantially parallel and opposed in at least one region of the dielectric body to form a capacitor therebetween. *Id.* at 40 (citing Ex. 1003 ¶¶ 7, 8, Figs. 1, 5, 6; Ex. 1002, 35–36).

Claim 32 also recites “a first external conductive plate positioned on an external surface of the dielectric body and conductively connected to the first external conductive contact” and “a second external conductive plate positioned on an external surface of the dielectric body and conductively connected to the second external conductive contact, the second external conductive plate being substantially coplanar with the first external conductive plate.” Ex. 1001, 20:43–50. Petitioner argues capacitor portion C_2 includes a conductive plate (the electrode corresponding to capacity portion 17b), which is *internal* to the sintered body 12 and conductively connected to the first external conductive contact (external electrode 16), and another conductive plate (the electrode corresponding to capacity portion 17a), which is *internal* to the sintered body 12 and conductively connected to the second external conductive contact (external electrode 15). Pet. 43–44 (citing Ex. 1003 ¶ 10, Figs. 1, 5; Ex. 1002, 39–40). Petitioner

further argues capacity portions 17a and 17b are arranged in a co-planar configuration. *Id.* at 44 (citing Ex. 1003, Fig. 5).

Petitioner acknowledges that Kuroda discloses only internal conductive coplanar plates, but argues that Hiroyuki teaches positioning plates on an external surface of a dielectric body in a coplanar configuration to form a fringe-effect capacitance between them. Pet. 44–46 (citing Ex. 1006 ¶¶ 3, 11, 18, 41–43, Figs. 1, 5). Petitioner also argues that “[a] person of ordinary skill in the art would modify the structure of Kuroda such that the pair of electrodes corresponding to capacity portions 17a and 17b were formed on the external surface of the dielectric body as taught by Hiroyuki instead of internally within the dielectric body.” *Id.* at 46 (citing Ex. 1002, 41). Petitioner further argues that a person of ordinary skill in the art would have been motivated to modify Kuroda to include coplanar electrodes on an external surface to “allow easier adjustment of the capacitance of the capacitor portion C2, easier optical recognition capabilities, and to improve device reliability and manufacturing.” *Id.* (citing Pet. 59–62; Ex. 1002, 41–42).

Petitioner also argues that a person of ordinary skill in the art would have combined the teachings of Kuroda and Hiroyuki with a reasonable likelihood of successfully forming a functioning capacitor. *Id.* at 60.

Patent Owner does not argue that the prior art does not teach any of the limitations recited above or that a person of ordinary skill in the art would not have combined the teachings in the manner argued in the Petition. *See generally* PO Resp. Nor does Patent Owner challenge Petitioner’s reason to combine the teachings of Kuroda and Hiroyuki. *See id.*

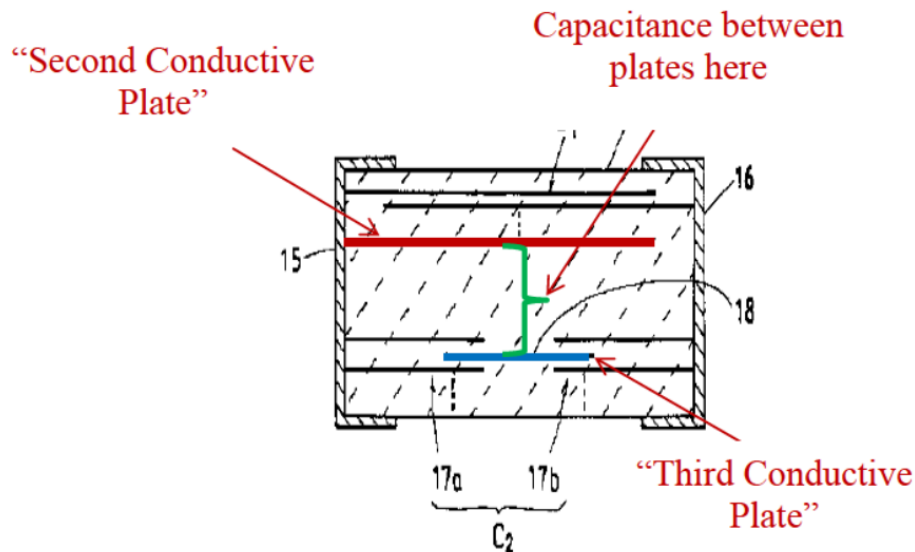
Based on the evidence before us and reasons set forth in the Petition (Pet. 33–40, 43–46, 58–60), we find that the Kuroda teaches the “three dimensional dielectric body . . . ,” “first conductive plate internal to said dielectric body . . . ,” and “second conductive plate internal to said dielectric body . . .” limitations recited in claim 32; that the combination of Kuroda and Hiroyuki teach the “first external conductive plate” and “second external conductive plate” limitations recited in claim 32; and that a person of ordinary skill in the art would have combined the teachings of Kuroda and Hiroyuki in the manner argued in the Petition.

b. Petitioner’s Arguments Regarding the Contested Limitation

Claim 32 also recites “a third conductive plate internal to said dielectric body, extending within said body and not conductively connected to any external conductive contacts, wherein said second and third conductive plates are substantially parallel and opposed in at least one region of said body, to form a capacitor there between.” Ex. 1001, 20:36–41. Petitioner points to capacitor portion C₂ as shown in Kuroda Figure 5, which includes non-connected internal electrode 18. Pet. 41–43 (citing Ex. 1003 ¶ 10, Fig. 5; Ex. 1002, 36–39). Petitioner argues that non-connected internal electrode 18 is not conductively connected to external electrodes 15, 16. *Id.* at 41 (citing Ex. 1003 ¶ 10). Petitioner further argues that the third conductive plate (non-connected internal electrode 18) is substantially parallel to and opposed to the second conductive plate (the lowermost of internal electrode 13) in a central region of the sintered body 12 and that no other electrodes are located between non-connected internal electrode 18 and the lowermost of internal electrode 13. *Id.* at 42 (citing Ex. 1003, Fig. 5; Ex.

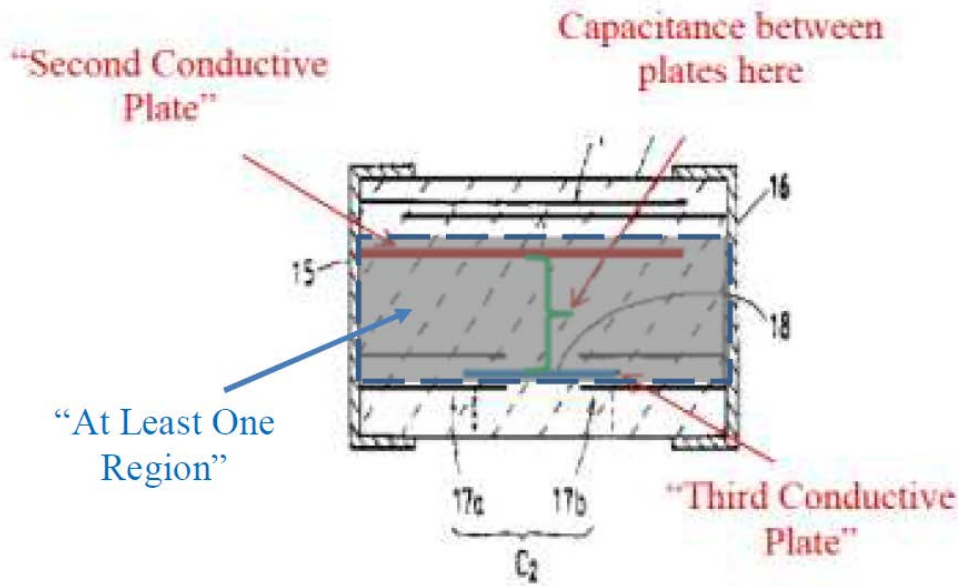
1002, 37–39); *see also* Reply 22 (arguing that plates only have to be substantially parallel and opposed in a region of the body); Ex. 1017 ¶ 118.

To support its arguments, Petitioner presents annotated Figure 5 of Kuroda, which is reproduced below from the Petition. *Id.* at 43.



Id. (annotated by Petitioner). Petitioner’s annotated Figure 5 shows a third conductive plate (highlighted in blue), a second conductive plate (highlighted in red), and a capacitance between them (highlighted in green). *Id.* at 41–43.

Petitioner further argues that the third and second plates are in a region of the body. Pet. 42–43; Reply 28–29. Specifically, Petitioner argues that Kuroda’s Figure 5 shows “the ‘third conductive plate’ (e.g., ‘non-connected internal electrode 18’) is substantially parallel and opposed to this ‘second conductive plate’ (e.g., the lowermost ‘internal electrode 13’ in capacitor portion C1) *in a central region of the sintered body 12.*” Pet. 42 (emphasis added). Petitioner further directs us to an annotated version of Kuroda Figure 5, reproduced below. Reply 29.



Id. (annotated by Petitioner). In the version of Kuroda’s Figure 5 shown above, Petitioner annotates both the third and second conductive plates (highlighted red and blue, respectively) and identifies how they are in at least one region (blue dashed line). *Id.*; *see also* Ex. 1017 ¶ 142. Petitioner argues “claim 32 does not require a specific region of the dielectric body” and that “the dielectric in which both the second and third conductive plates are located meets this element.” Reply 28; Ex. 1017 ¶ 142. Petitioner further argues that the fact “[t]hat other regions can be distinguished does not change the fact that electrodes 13 and 18 of Kuroda are in ‘at least one region.’” Reply 28 (citing Ex. 1017 ¶ 142).

Petitioner also argues that “[b]ecause the non-connected internal electrode 18 and lowermost internal electrode 13 are respective conductors that are separated by a dielectric, a capacitor is necessarily formed between the electrodes.” Pet. 42 (citing Ex. 1002, 37). In its Reply, Petitioner reiterates that “a capacitance (and a capacitor) necessarily exists between two plates separated by a dielectric.” Reply 24 (citing Ex. 1017 ¶¶ 123–

131); *see also id.* (“Presidio’s expert acknowledges that a capacitance exists between two conductive plates separated by a dielectric, as demonstrated by $C = \epsilon A/t$.” (citing Ex. 2001¶ 76)). In response to arguments by Patent Owner, Petitioner further argues, based on a computer model analysis performed by Dr. Hubing, that there is not complete shielding between the second and third conductive plates. Reply 25; Ex. 1017, Appx. A; *see also* Reply 24–25 (discussing Figure 10A of the ’829 patent). According to Petitioner, this confirms that a capacitor is formed between electrodes 13 and 18.

Petitioner further argues that Patent Owner’s argument that a voltage difference is necessary to form a capacitor (PO Resp. 32) is “plainly wrong.” Reply 25. Specifically, Petitioner argues that “[a]capacitor need not be connected to a voltage for it to be a capacitor or for it to have a capacitance.” *Id.* at 25–26 (citing Ex. 1017 ¶¶ 132–134). Petitioner also argues Patent Owner’s argument is “irrelevant” because “Kuroda’s capacitors are . . . connected to a voltage when in use.” *Id.* at 26 (citing Ex.1017 ¶ 136; Ex.1018, 138:2–140:19, 145:25–146:24).

Finally, Petitioner argues Kuroda does not teach away from the claimed invention. *See* Reply 26–28. According to Petitioner, teaching away is not applicable when a single references “anticipates” that limitation:

Second, a “teaches away” argument is irrelevant to whether Kuroda anticipates such elements—the capacitance exists or it does not. Presidio’s argument amounts to an assertion that a designer would prefer no capacitance between the opposed electrodes in Kuroda’s capacitor portions C1 and C2. However, this alleged preference cannot change the fact that a capacitance nonetheless exists.

Id. at 27.

c. *Patent Owner's Arguments Regarding the Contested Limitation*

Patent Owner argues that Kuroda does not teach a third conductive plate that is “substantially parallel and opposed” to the second conductive plate. PO Resp. 21–25.

First, Patent Owner argues “[b]ecause there [are] intervening plates between what Petitioner has identified as the second and third conductive plates, a POSITA would not consider them to be opposed.” *Id.* at 23 (citing Ex. 2001 ¶¶ 78, 123).

Second, Patent Owner argues that because “substantially” modifies “opposed,” Petitioner’s argument “that there is, at most, only a center portion of third conductive plate 18 that is opposed to second conductive plate 13” is insufficient. *Id.*; *see also id.* at 23–25 (arguing Petitioner did not perform the type of analysis Petitioner’s expert says is necessary) (citing Ex. 2003, 87:3–88:9). According to Patent Owner, Kuroda does not contain the information necessary to perform a proper analysis to determine whether the plates are substantially opposed. *Id.* at 24–25 (citing Ex. 2001 ¶¶ 126–128).

Third, Patent Owner argues Petitioner has failed to show that the second and third capacitors “form a capacitor therebetween.” *Id.* at 26–33. Specifically, Patent Owner argues that Petitioner has not shown “that electrode 18 [(what Petitioner has identified as the third conductive plate)] is not completely shielded from lower most electrode 13 (i.e., what the Petitioner and Petitioner’s expert identify as the ‘second Conductive Plate’) at least by electrodes 17a and 17b.” *Id.* at 26. According to Patent Owner, “[a]n electrode is shielded when a conductor, and/or its associated field lines block the field lines between the two conductors at issue.” *Id.* (citing

Ex. 2001 ¶ 137). Patent Owner further argues that because Kuroda does not disclose that electrode 18 is not completely shielded, “Kuroda does not directly, or inherently, disclose a capacitor between the lowest electrode 13 and electrode 18.” *Id.* at 26–27 (citing Ex. 2001 ¶ 138).

Fourth, Patent Owner argues “Kuroda teaches away from developing a capacitance between the lowest internal electrode 13, and non-connected electrode 18.” PO Resp. 27 (citing Ex. 2001 ¶ 140). According to Patent Owner, having a capacitance between those conductors would result in a reduced bandwidth, which is contrary to the teaching of Kuroda. *Id.* at 27–30.

Fifth, Patent Owner argues that Petitioner has not shown how the third conductive plate “connects electrically to a potential that is different from that of the lowest electrode 13.” *Id.* at 31 (citing Ex. 2001 ¶ 150).

According to Patent Owner, a person of ordinary skill in the art “understands that a capacitor must be connected between two different electrical potentials in order to function as a capacitor (i.e., to form a capacitance)” and would therefore “not understand that there would be a capacitance formed between the lowest internal electrode 13 and electrode 18, even as surmised by Petitioner and Petitioner’s expert.” *Id.* (citing Ex. 2001 ¶ 150); *see also id.* at 32 (arguing that “the two conductors must be at different electrical potentials (i.e., must have a potential difference or voltage between them) in order for a capacitance to exist between them”) (citing Ex. 2001 ¶ 152). Moreover, Patent Owner points out that, although Kuroda discusses capacitors C_1 and C_2 in great detail, Kuroda “does not mention, much less describe, the capacitor alleged to be formed between electrodes 18 and 13.” *Id.* at 32 (citing Ex. 2001 ¶ 151).

Patent Owner further argues that “Petitioner and Petitioner’s expert appear to concede that no capacitance will exist between two conductors if one conductor is entirely shielded from the other conductor” and that Petitioner has failed “to prove electrodes are not entirely shielded from one another, or to even try to.” *Id.* at 33 (citing Ex. 1002, 38; Ex. 2001 ¶ 154).

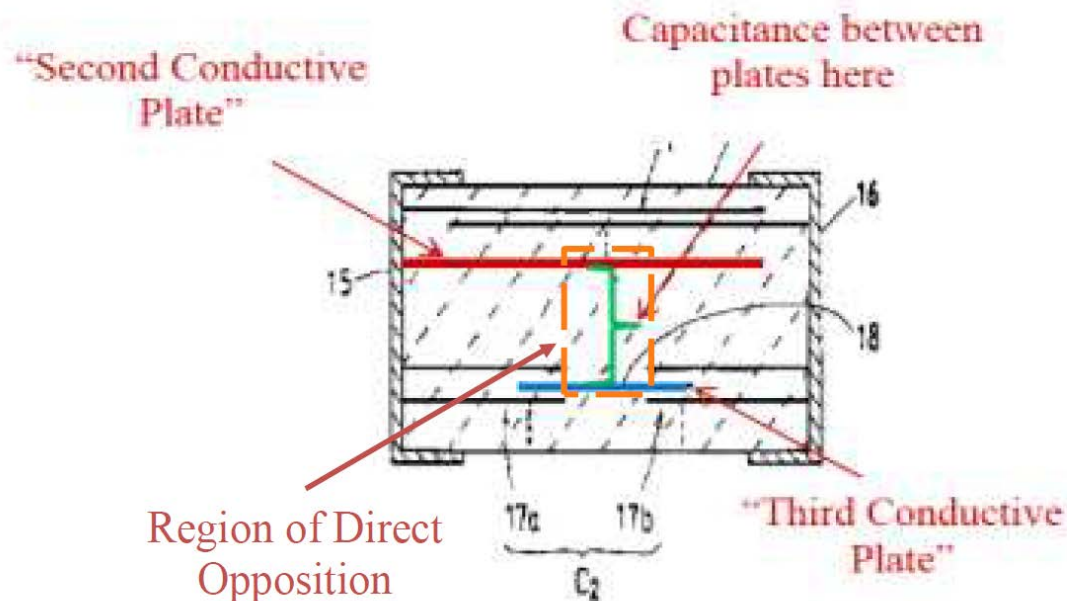
Finally, Patent Owner argues that lowermost electrode 13 and electrode 18 are in separate regions of the capacitor. PO Resp. 33–34. Therefore, according to Patent Owner, “Kuroda does not disclose electrodes 13 and 18 in any one region, as all of the disclosed electrodes 13 are in region C1 of the device, and all of electrodes 18 are in region C2 of the device.” *Id.* at 34 (citing Ex. 2001 ¶ 155).

d. Our Analysis

After reviewing the arguments and information presented by both parties, we find Kuroda teaches a “third conductive plate . . .” as recited in claim 32.

Specifically, the undisputed evidence establishes that Kuroda’s electrode 18 (hereinafter “the third conductive plate”) is “not conductively connected to any external conductive contacts” and is substantially parallel to lowermost electrode 13 (hereinafter “the second conductive plate”). *See* Ex. 1003, Fig. 5, ¶¶ 7, 10; Ex. 1002, 36–39; *see generally* PO Resp.

Furthermore, we find that the second and third conductive plates are opposed in at least one region of the body. Specifically, because the third conductive plate is shown directly below at least a portion of the second conductive plate, “the two plates are opposed.” *See* Ex. 1003, Fig. 5; Ex. 1002, 37–39; Ex. 1017 ¶¶ 120–122. This opposition is shown in the annotated version of Kuroda’s Figure 5 reproduced below.



Reply 22 (annotated by Petitioner). This version of Kuroda's Figure 5 has been annotated by Petitioner to identify the "[r]egion of [d]irect [o]pposition" between the second and third conductive plates. *Id.*

We are not persuaded by Patent Owner's arguments and evidence directed to the "opposed" limitation. Critically, Patent Owner's arguments are based on (1) the existence of intervening plates between the third and second conductive plates and (2) whether the plates are substantially opposed. See PO Resp. 23–25. However, because we construed the term "substantially parallel and opposed" to be broad enough to allow intervening plates and plates that are not substantially opposed, those arguments are inapposite.

We also find that a capacitor is formed between the second and third conductive plates. In particular, both declarants agree that a capacitance exists between two conductive plates separated by a dielectric. Ex. 1002, 37; Ex. 2001 ¶ 76. As shown in Petitioner's annotated version of Kuroda

Figure 5, conductive plates 13 and 18 are separated by a dielectric, and, therefore, would form a capacitor. Additionally, we find the unchallenged computer analysis performed by Dr. Hubing, confirming the lack of complete shielding caused by field lines between the coplanar electrodes of Kuroda, to be persuasive. *See* Ex. 1017, Appx. A (computer analysis); Tr. 38:11–15 (stating Patent Owner chose not to cross-examine D. Hubing about the computer simulation). As shown in Dr. Hubing’s analysis, although intervening plates 17 between the third and second conductive plates effect the degree of capacitance, they do not fully shield the plates, thereby preventing the plates from “form[ing] a capacitor therebetween” as recited in claim 32. Ex. 1017 ¶¶ 127–128, Appx. A.

We do not agree with Patent Owner’s arguments attempting to rebut Petitioner’s persuasive showing that a capacitor is formed.

First, Patent Owner focuses on the supposed absence of proof in the Petition, namely that Petitioner fails to show that electrode 18 is not completely shielded from lowermost electrode 13. *See* PO Resp. 26–27. However, Petitioner addressed sufficiently this argument in the Reply and Dr. Hubing’s second declaration. That is, Dr. Hubing’s computer simulation sufficiently shows that the intervening plates do not fully shield the third and second conductive plates, confirming Petitioner’s argument in the Petition that the plates “form a capacitor therebetween.” *See* Ex. 1017 ¶¶ 127–128, Appx. A.

Second, we agree with Petitioner that Patent Owner’s teaching away argument is inapposite. *See* PO Resp. 27–30 (discussing teaching away argument). As the Supreme Court recognized in *KSR*, “when the prior art teaches away from combining certain known elements, discovery of a

successful means of combining them is more likely to be nonobvious.” 550 U.S. at 416 (citing *United States v. Adams*, 383 U.S. 39, 51–52 (1966)). Although teaching away is relevant when discussing a modification of a feature or combining references,¹¹ it is not relevant when, as in this case, the issue is whether the primary prior art reference expressly teaches a limitation. *Cf. Seachange Int’l, Inc., v. C-Cor, Inc.*, 413 F.3d 1361, 1380 (Fed. Cir. 2005) (“Teaching away is irrelevant to anticipation.”).¹²

Moreover, there is no persuasive factual support for Patent Owner’s teaching away argument. According to Patent Owner, “Kuroda teaches away from developing a capacitance between the lowest internal electrode 13, and non-connected electrode 18” because it would result in Kuroda failing to achieve its wide-bandwidth objectives. PO Resp. 27–28 (citing Ex. 2001 ¶ 140). However, as we find above, the evidence of record demonstrates that a capacitance is formed between those electrodes. Therefore, we are not persuaded by Patent Owner’s position that Kuroda teaches away from forming a capacitance between those plates. *See DePuy*, 567 F.3d at 1327 (A reference does not teach away when it “does not ‘criticize, discredit, or otherwise discourage’ investigation into the invention claimed.” (quoting *In re Fulton*, 391 F.3d 1195, 1201 (Fed. Cir. 2004))).

We also do not agree with Patent Owner’s position that Kuroda “does not show a capacitor, as there is no indication how the ‘Third Conductive

¹¹ *See DePuy Spine, Inc. v. Medtronic Sofamor Danek, Inc.*, 567 F.3d 1314, 1327 (Fed. Cir. 2009)

¹² A teaching away argument would have been relevant if it was directed to whether a person of ordinary skill in the art would have (1) modified Kuroda or (2) combined the teachings of Hiroyuki with Kuroda.

Plate’ connects electrically to a potential that is different from that of lowest electrode 13.” PO Resp. 31 (citing Ex. 2001 ¶ 150); *see also id.* at 31–32 (arguing why no capacitor is formed). As shown and described in Kuroda, the second plate is electrically connected to external electrode 15 while the third plate is not electrically connected to an external conductive contact. *See* Ex. 1003 ¶¶ 7, 10, Fig. 5; *see also* Ex. 1017 ¶ 136. Specifically, Patent Owner’s expert testified that in a similar design in Figure 19A of the ’829 patent, a voltage difference exists between the plate connected to an external conductive contact (such as the second plate) and a plate not electrically connected to an external conductive contact (such as the third plate). *See* Ex. 1018, 137:14–140:19, 145:4–146:24. We find that just like in the example of Figure 19A of the ’829 patent, with a similar configuration, one of skill in the art would have understood that a voltage difference will exist in Kuroda’s device. *See* Ex. 1017 ¶ 36 (“In the same way that the capacitors of the ’829 patent would be connected to a voltage when in use, a POSITA would recognize that, in use, the capacitor of Kuroda is connected to a voltage source such that there would be a voltage difference across its external electrodes 15 and 16.”) (citing Ex. 1018, 137:14–140:19, 145:4–146:24).

We also do not agree with Patent Owner’s contention that Petitioner has not identified the second and third plates as being in at least one region of the body. *See* PO Resp. 33–34. As a preliminary matter, we note that neither Petitioner nor Patent Owner requested that we construe this limitation. Additionally, the detailed description of the invention section in the ’829 patent does not use the term “region” and thus provides little guidance as to what it means. *See generally* Ex. 1001 (the word “region”

appears in only the “summary of the invention” and the claims, not the detailed description of the invention).

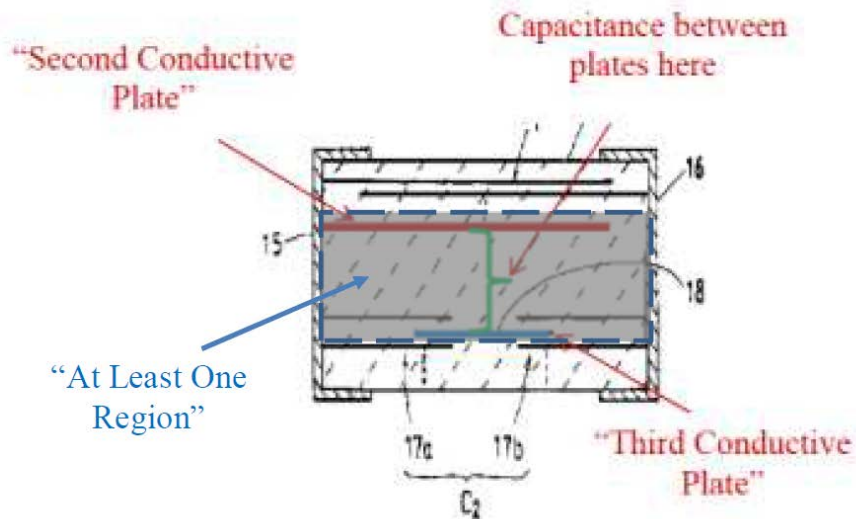
Moreover, Patent Owner’s implicit construction is inconsistent with the words of the claim. According to Patent Owner, there must be a region that contains both the second and third conductive plates. *See* PO Resp. 33–34. But that is not what the claim says. The phrase is “in *at least* one region of the body.” Ex. 1001, 20:36–41 (emphasis added). The use of “at least one” implies that there can be more than one region of the body considered. Thus, even if the limitation modifies the location of the second and third plates—which as discussed below it does not—the claim does not recite that they are in one region.

Instead, based on the ordinary meaning of the entire phrase, the “at least one region of the body” does not modify the location of the second and third plates. The entire phrase is “wherein said second and third conductive plates are substantially parallel and opposed in at least one region of the body.” Ex. 1001, 20:36–41. The location portion of the phrase—“in at least one region of the body”—modifies opposed, and possibly substantially parallel. Based on the plain meaning of the limitation, it does not modify the location of the two conductive plates.

Finally, even if we were to agree with Patent Owner that the limitation requires the second and third conductive plates to be in a single region of the body, the outcome here would not change. Neither Patent Owner, Patent Owner’s expert, nor the ’829 patent provide any guidance on what defines a region of the body in the ’829 patent. *See* PO Resp. 33–34; Ex. 2001 ¶¶ 155–156; Ex. 1001. And it is inapposite that Kuroda does not define relevant regions of the body. *See May*, 574 F.2d at 1090 (There is no

requirement in an obviousness analysis for the prior art to “contain a description of the subject matter of the appealed claim in *ipsissimis verbis*.”).

Instead, as shown in Petitioner’s annotated version of Kuroda’s Figure 5 reproduced below, the plates are in a single region. Reply 29.



Petitioner has annotated Kuroda’s Figure 5 to identify the “Second Conductive Plate,” the “Third Conductive Plate,” and the “At Least One Region.” *Id.*; *see also id.* at 28. Although Patent Owner identifies other regions that may not include both the second and third conductive plates (*see* PO Resp. 33–34), that does not refute Petitioner’s assertion that the second and third conductive plates can be found in at least one region. *Cf. Unwired Planet, LLC v. Google Inc.*, 841 F.3d 995, 1002 (Fed. Cir. 2016) (“It does not matter that the use of alphabetical order for locations would not always result in farther-over-nearer ordering. It is enough that the combination would sometimes perform all the method steps, including farther-over-nearer ordering.”) (citing *Hewlett-Packard Co. v. Mustek Sys., Inc.*, 340 F.3d 1314, 1326 (Fed. Cir. 2003)).

We have considered the entirety of the evidence submitted by the parties, both for and against obviousness, and determine that Petitioner has shown by a preponderance of the evidence that claim 32 of the '829 patent is unpatentable as obvious in view of Kuroda and Hiroyuki.

2. *Claim 33*

Claim 33, which depends from claim 32, recites:

additional conductive plates internal to the dielectric body, extending within the body and conductively connected to the conductive contacts on respective first and second exterior surfaces thereof, wherein the additional plates are substantially parallel and arranged in opposed pairs in at least one region of the body, the respective plates in each pair extending from respective ones of the contacts, to form additional capacitors.

Ex. 1001, 20:51–59.

Petitioner argues Kuroda teaches the additional limitation set forth in claim 33. *See* Pet. at 46–52. Patent Owner does not separately address the additional limitation recited in claim 33. *See generally* PO Resp.

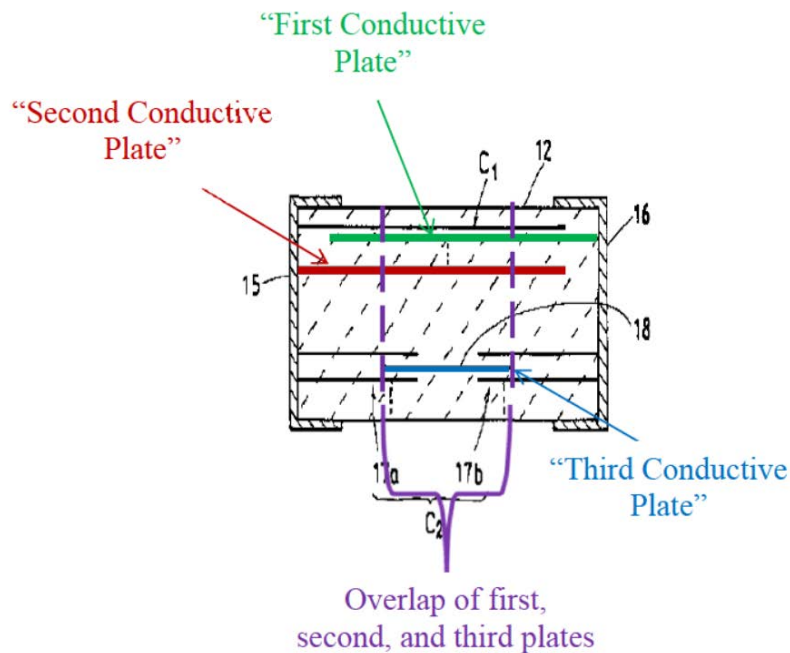
Having considered the entirety of the evidence submitted by the parties, both for and against obviousness, we determine that, for the reasons given in the Petition, Petitioner has shown by a preponderance of the evidence that claim 33 of the '829 patent is unpatentable as obvious in view of Kuroda and Hiroyuki.

3. *Claim 34*

Claim 34 depends from claim 32, and further requires that “the third conductive plate is substantially coextensive with the first and second conductive plates.” Ex. 1001, 20:60–62.

a. *Petitioner's Arguments*

Petitioner argues Kuroda teaches the additional limitation recited in claim 34. *See* Pet. 53–58; Reply 29–34. Specifically, Petitioner directs us to Kuroda's Figure 5, which Petitioner contends depicts substantial overlap between the conductive plates. Pet. 52–55 (citing Ex. 1003 ¶ 7, Fig. 5; Ex. 1003, 47–48). To support its arguments, Petitioner annotated Figure 5 of Kuroda, which is reproduced below from the Petition. *Id.* at 53.



Petitioner's annotated Figure 5 shows the first, second, and third conductive plates (highlighted in green, red, and blue, respectively) and their overlap (shown by dashed purple lines). *Id.* Petitioner contends that "at least due to this substantial overlap among the first, second, and third conductive plates as shown in annotated Fig. 5 above, Kuroda teaches a third conductive plate (*e.g.*, 'non-connected internal electrode 18') [that] is substantially coextensive with the first and second conductive plates." *Id.* at 54. Additionally, according to Petitioner, Kuroda's Figure 5 is not drawn to

scale and a person of ordinary skill in the art “would understand that, when actually constructed, the capacitors depicted in Kuroda would have ‘substantially coextensive’ plates.” Reply 30 (citing Ex. 1017 ¶ 135; Ex. 2003, 93:12–20, 133:6–136:7).

Alternatively, Petitioner argues “it would have been an obvious design choice to a person of ordinary skill in the art to vary the sizes and, accordingly, the overlap of the various conductive plates of Kuroda in order to predictably vary the capacitance exhibited between the various first, second, and third conductive plates.” Pet. 56 (citing Ex. 1002, 48). According to Petitioner, it was well known that “changing the size and shape of electrode plates (and thus the area of overlap between adjacent electrode plates) in a multi-layer capacitor will predictably change the overall capacitance of that capacitor.” *Id.* (citing Ex. 1002, 48). For example, Petitioner argues Levinson¹³ “discusses how capacitance value is determined by the ‘size of each electrode’” and the “overlap area between electrodes.” *Id.* (citing Ex. 1007, 4:22–26; Ex. 1003, 49). Petitioner also argues that because capacitor overlap was a known result-effective variable, modifying the amount of overlap would have been a matter of routine design choice. *Id.* at 56–58 (citing *In re Applied Materials, Inc.*, 692 F.3d 1289, 1297 (Fed. Cir. 2012)).

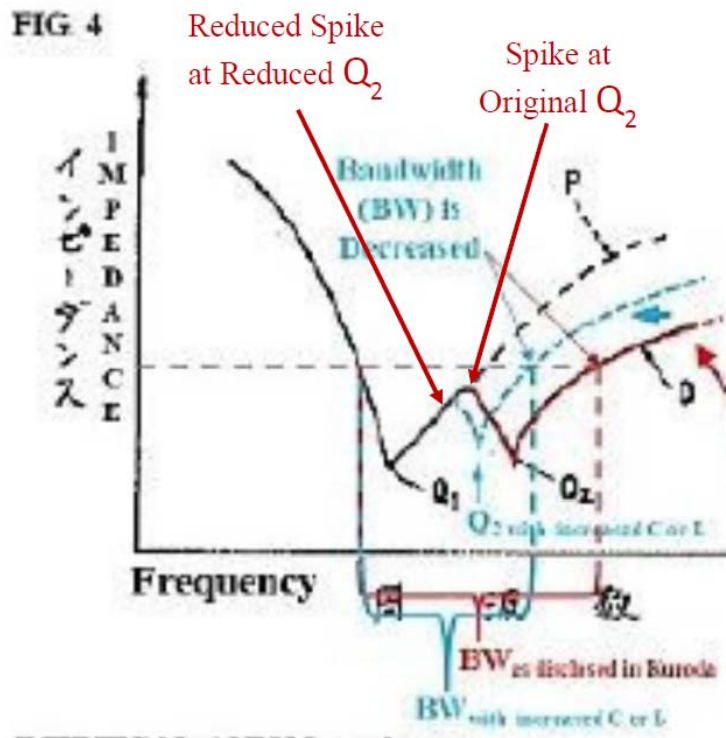
Petitioner further argues that Kuroda does not teach away from modifying the size of the plates so that they are substantially coextensive. See Reply 30–34. First, Petitioner argues “Kuroda and the ’829 patent tout the same objective of increasing broadband performance and seek to achieve

¹³ U.S. Patent 4,419,713, issued Dec. 6, 1983 (Ex. 1007).

this objective in the same way—by combining different value capacitors in a single body.” *Id.* at 30 (citing Ex. 1017 ¶¶ 156–158). Therefore, according to Petitioner, if substantially coextensive plates “actually had a detrimental effect on improving broadband performance in Kuroda, it would have the same effect in the capacitors of the ’829 patent.” *Id.* (emphasis omitted) (citing Ex. 1017 ¶¶ 156–158). Petitioner further argues neither the ’829 patent nor Patent Owner “provide[s] any indication as to how or why the ‘substantially coextensive’ plates of claim 34 do not thwart the objective of the ’829 patent yet somehow teach away from the objective of Kuroda.” *Id.* at 30–31.

Second, Petitioner argues there is no teaching away because Kuroda does not teach having the “largest possible bandwidth.” *Id.* at 31. Instead, according to Petitioner, a person of ordinary skill in the art may have recognized that although “increasing the capacitance of portion C2 reduces the resonance frequency Q2 and bandwidth of the device,” it also provides a benefit “of reduced impedance spikes and improved performance.” *Id.* (citing Ex. 1017 ¶¶ 148–150); *see also id.* at 33–34 (discussing benefits of reduced impedance spikes and improved performance benefits resulting from the reduced bandwidth) (citing Ex. 1017 ¶¶ 148–150; Ex. 2001 ¶¶ 169–170). Petitioner further argues that although there is a reduced bandwidth, it is still larger than in traditional capacitors. *Id.* at 32–33 (citing Ex. 1017 ¶ 154).

Petitioner directs us to an annotated and modified version of Kuroda’s Figure 4, reproduced below.



Reply 32 (modification and annotations made by both Petitioner and Patent Owner). “[A]s illustrated in [Figure] 4, in the multilayer capacitor of the present embodiment [of Kuroda], impedance-frequency characteristics indicated by the solid line Q, which have the resonance points Q_1 and Q_2 ” are shown “in contrast to the impedance-frequency characteristics of a multilayer capacitor that is structured from a single capacitor portion within a single sintered body, as illustrated in [Figure] 4 (dotted line P).” Ex. 1003 ¶ 9. Figure 4 was originally modified and annotated by Patent Owner’s expert (Ex. 2001¶ 169) and then further annotated in red by Dr. Hubing to show the original impedance spike of Kuroda and the reduced spike of modified Kuroda. Ex. 1017 ¶ 149.

b. Patent Owner’s Arguments

Patent Owner argues Kuroda does not teach the additional limitation recited in claim 34. See PO Resp. 34–36. Specifically, Patent Owner argues

“Petitioner’s expert testified that Kuroda does not teach or disclose this limitation, thereby directly refuting Petitioner’s argument.” *Id.* at 35 (citing Ex. 2003, 91:25–93:10). Patent Owner points out that Petitioner’s expert testified that Kuroda lacks sufficient information for one to determine whether Kuroda teaches the limitation. *Id.* at 35–36 (citing Ex. 2003, 94:23–95:18, 97:18–98:9, 100:2–103:25). Therefore, according to Patent Owner, “Kuroda does not disclose that ‘the third conductive plate is substantially coextensive with the first and second conductive plates.’” *Id.* at 36 (citing Ex. 2001 ¶¶ 161–165).

Patent Owner further argues that a person of ordinary skill in the art would not have been motivated to modify the first, second, and third conductive plates in order to render them substantially coextensive. *See* PO Resp. 36–41. According to Patent Owner, the modifications necessary to make the plates coextensive “are taught against by Kuroda.” *Id.* at 37 (citing Ex. 2001 ¶¶ 166–178). Such modifications would result in increasing the capacitance or impedance of C_2 or decreasing the capacitance or impedance of C_1 , which is inconsistent with Kuroda’s teaching of having a relatively high capacitance (C_1) combined with a relatively high inductance and a relatively low capacitance (C_2) combined with a relatively low inductance. *Id.* at 37–41.¹⁴

¹⁴ Patent Owner further argues that claim limitation is not met under Petitioner’s claim construction requiring a capacitance to be created. PO Resp. 41–42. Because we did not adopt that portion of Petitioner’s claim construction, that argument is moot.

c. Our Analysis

Based on the record and the parties' arguments, we are persuaded Kuroda teaches that "the third conductive plate is substantially coextensive with the first and second conductive plates," as recited in claim 34.

As discussed above, "substantially coextensive" means "having largely, but not necessarily wholly, the same spatial scope or boundaries." See Section II.A.3.b, *supra*. Applying that definition, Kuroda's Figure 5 shows that the third conductive plate has largely the same spatial scope or boundaries as the first and second conductive plates. See Ex. 1003, Fig. 5; see also Ex. 1002, 46–48 ("As demonstrated in annotated Fig. 5 of Kuroda above, the first, second, and third conductive plates of Kuroda have a sufficient overlap such that these plates have a substantially similar scope or boundaries . . ."). That is, every location in the third conductive plate overlaps with a location in both the first and second conductive plates. This is illustrated in Petitioner's annotated version of Kuroda's Figure 5 reproduced above at page 63.

We do not agree with Patent Owner's argument that Dr. Hubing conceded Kuroda does not teach this limitation. See PO Resp. 35 (citing Ex. 2003, 91:25–93:10). Patent Owner relies on only a portion of Dr. Hubing's answer and cuts out a portion of Dr. Hubing's testimony. Dr. Hubing's entire testimony, including the remainder of his answer *not* cited in the Patent Owner's Response (which is in italics), is as follows:

Q· So my question is: Is electrode 18 substantially coextensive with the electrode that emanates from the left side of the capacitor right about where the arrow from 15 ends?

MR. HOUSTON: Objection, form.

THE WITNESS: The word “coextensive” I think I did reference in the declaration as also not being a term when we actually reference the dictionary definition, and then we tried to define that in the declaration. But the dictionary definition basically said sharing the same boundaries. I guess, in this particular drawing right here, those two plates do not share the same boundaries. So you could interpret and say they are not coextensive, if you wanted to.

BY MR. SCHATZ:

Q· They are not substantially coextensive?

A· You could make that argument, yes.

Q· And that’s your belief?

A I don't really know -- the word “coextensive” was particularly troublesome because it’s not well defined. It doesn’t seem to -- it doesn't mean sharing the same boundaries. So what it does mean, we just had to kind of try to interpret.

I personally wouldn’t say that I – I wouldn’t pretend to understand exactly what the writer of the patent meant by the word coextensive.

Q I take it then you’re not taking -- you're not of the opinion that conductive plate 18 is substantially coextensive with the plate that we identified before, which is the plate emanating from the left side of Figure 5 right about where the line from 15 ends?

A· Yeah, let me say, in this drawing, I’ll take the position that it's not substantially coextensive. But, of course, this drawing is greatly inflated in the vertical dimension, compressed in the horizontal dimension. If we were to look at an actual capacitor with a structure like this where basically vertically they are sharing more than 90 percent of that area, then I’m willing to say, okay.

And that would be different than my view of what you asked about, you asked about this particular drawing.

Ex. 2003, 91:25–93:20 (emphasized portion not cited by Patent Owner).

First, it does not appear that Dr. Hubing's testimony is consistent with our claim construction. Second, although Dr. Hubing may have agreed that the specific drawing may not have substantially coextensive plates, the italicized testimony—which Patent Owner cut from its quotation—makes it clear that Dr. Hubing testified that a person of ordinary skill in the art would have realized that the drawing was not dimensionally accurate and that the actual capacitor would have had substantially coextensive plates. Ex. 2003, 93:11–20; Ex. 1017 ¶ 145. That testimony stands unrebutted by Patent Owner and Patent Owner's expert, Dr. Randall. See PO Resp. 34–42; Ex. 2001 ¶¶ 157–165. We credit Dr. Hubing's testimony explaining that a person of ordinary skill in the art would have understood what a capacitor built based on Kuroda's Figure 5 would have looked like. Thus, contrary to Patent Owner's argument, Dr. Hubing provided persuasive and compelling testimony explaining why a person of ordinary skill in the art would have understood that Kuroda teaches this limitation.

Petitioner's expert, Dr. Randall, quotes the above testimony of Dr. Hubing but omits the qualifying testimony in italics. See Ex. 2001 ¶ 160. Based on that omission, we are not persuaded by Dr. Randall's testimony in this regard given the importance and criticality of the omitted testimony.

We also do not agree with Patent Owner's assertion that Kuroda does not contain sufficient information to determine whether the plates are substantially coextensive. See PO Resp. 35–36. First, as discussed above, Dr. Hubing testifies persuasively that a person of ordinary skill in the art would have understood that the third plate is substantially coextensive with the first and second plates. See Ex. 2003, 93:11–20; Ex. 1017 ¶ 145. Second, our review of the '829 patent reveals that it likewise lacks any of the

details that Patent Owner now claims are necessary to determine that plates are substantially coextensive. See Reply 29–30; Ex. 1017 ¶¶ 144–145; see *generally* Ex. 1001. Critically, the lack of detailed dimensions of the plate in the ’829 patent supports Dr. Hubing’s testimony that a person of ordinary skill in the art would have understood, or at least been able to determine, that Kuroda’s plates are substantially coextensive.

Moreover, the Federal Circuit guides that “the question under 35 USC § 103 is not merely what the references expressly teach but what they would have suggested to one of ordinary skill in the art at the time the invention was made.” *Merck & Co. v. Biocraft Labs., Inc.*, 874 F.2d 804, 807–08 (Fed. Cir. 1989) (quoting *In re Lamberti*, 545 F.2d 747, 750 (CCPA 1976)). Moreover, “[e]very patent application and reference relies to some extent upon knowledge of persons skilled in the art to complement that [which is] disclosed” *In re Bode*, 550 F.2d 656, 660 (CCPA 1977) (quoting *In re Wiggins*, 488 F.2d 538, 543 (CCPA 1973)). Those persons “must be presumed to know something” about the art “apart from what the references disclose.” *In re Jacoby*, 309 F.2d 513, 516 (CCPA 1962). Additionally, the skilled artisan is “a person of ordinary creativity, not an automaton.” *KSR*, 550 U.S. at 421. Furthermore, there is no requirement in an obviousness analysis for the prior art to “contain a description of the subject matter of the appealed claim in *ipsissimis verbis*.” *May*, 574 F.2d at 1090. Thus, even if Kuroda did not expressly teach the limitation recited in claim 34, the evidence of record demonstrates sufficiently that Kuroda at least suggests it to a person having ordinary skill in the art.

Because we have determined that Kuroda teaches or suggests the limitation recited in claim 34, Petitioner’s arguments regarding whether a

person of ordinary skill would have modified the dimensions of the various plates, along with Patent Owner's opposing arguments, are moot.

We have considered the entirety of the evidence submitted by the parties, both for and against obviousness, and determine that Petitioner has shown by a preponderance of the evidence that claim 34 of the '829 patent is unpatentable as obvious in view of Kuroda and Hiroyuki.

IV. CONCLUSION

Petitioner has demonstrated by a preponderance of the evidence that:

Claims 9–11 are unpatentable under 35 U.S.C. § 102(b) as anticipated by Kuroda; and

Claims 32–34 are unpatentable under 35 U.S.C. § 103(a) over Kuroda and Hiroyuki.

V. ORDER

For the reasons given, it is hereby

ORDERED that claims 9–11 and 32–34 of the '829 patent are held unpatentable; and

FURTHER ORDERED that because this Decision is final, a party to the proceeding seeking judicial review of the Decision must comply with the notice and service requirements of 37 C.F.R. § 90.2.

IPR2018-00292
Patent 7,307,829 B1

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