

UNITED STATES INTERNATIONAL TRADE COMMISSION

Washington, D.C.

In the Matter of

**CERTAIN AUDIO PLAYERS AND
COMPONENTS THEREOF (II)**

Inv. No. 337-TA-1330

**INITIAL DETERMINATION ON VIOLATION OF SECTION 337 AND
RECOMMENDED DETERMINATION ON REMEDY AND BOND**

Administrative Law Judge Cameron Elliot

(September 15, 2023)

Pursuant to the Notice of Investigation and Rule 210.42(a) of the Rules of Practice and Procedure of the United States International Trade Commission, this is my Initial Determination in the matter of *Certain Audio Players and Components Thereof (II)*, Investigation No. 337-TA-1330.



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TABLE OF ABBREVIATIONS

CDX	Complainant's Demonstrative Exhibit
CIB	Complainant's Revised Initial Post-Hearing Brief
CPB	Complainant's Pre-Hearing Brief
CPX	Complainant's Physical Exhibit
CRB	Complainant's Reply Post-Hearing Brief
CX	Complainant's Exhibit
Hr'g Tr.	Hearing Transcript
JX	Joint Exhibit
RDX	Respondents' Demonstrative Exhibit
RIB	Respondents' Initial Post-Hearing Brief
RPB	Respondents' Pre-Hearing Brief
RPX	Respondents' Physical Exhibit
RRB	Respondents' Reply Post-Hearing Brief
RX	Respondents' Exhibit

I. INTRODUCTION

A. Procedural Background

Complainant Google LLC (“Google”) filed the complaint underlying this investigation on August 9, 2022. The complaint alleged respondent Sonos, Inc. (“Sonos”) imports or sells in connection with an importation certain audio players and components thereof that infringe one or more claims of U.S. Patent Nos. 11,024,311 (“the 311 patent”), 9,812,128 (“the 128 patent”), 9,632,748 (“the 748 patent”), and 11,050,615 (“the 615 patent”) (together, the “Asserted Patents”).

By publication of a notice in the *Federal Register* on September 15, 2022, the U.S. International Trade Commission ordered that:

Pursuant to subsection (b) of section 337 of the Tariff Act of 1930, as amended, an investigation be instituted to determine whether there is a violation of subsection (a)(1)(B) of section 337 in the importation into the United States, the sale for importation, or the sale within the United States after importation of products identified in paragraph (2) by reason of infringement of one or more of claims 1-3, 8-12, 14-18, and 20 of the ’311 patent; claims 1-3, 5-8, 10-13, and 15 of the ’128 patent; claims 1-4, 7, 9-12, 14, and 15 of the ’748 patent; and claims 1-3, 5-9, 11, 15-17, and 19 of the ’615 patent, and whether an industry in the United States exists as required by subsection (a)(2) of section 337[.]

87 Fed. Reg. 56701 (Sep. 15, 2022).

On September 9, 2022, the investigation was assigned to me. EDIS Doc. ID 779882. On September 30, 2022, I set a target date of January 16, 2024 for completion of this investigation. Order No. 3. Also on September 30, 2022, I set a *Markman* hearing date of January 3, 2023, and the evidentiary hearing for June 20-26, 2023. Order No. 4. The *Markman* hearing was cancelled on December 22, 2022, and the parties’ claim construction disputes were resolved on February 15, 2023. Order Nos. 8, 14.

On December 15, 2022, Google moved (1330-003) to amend the complaint and notice of investigation to allege infringement of additional patent claims. The motion was granted-in-part via initial determination on January 4, 2023; and claim 19 of the 311 patent, claims 4, 9, and 14 of

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the 128 patent, and claims 10, 12, and 18 of the 615 patent were added to the investigation. Order No. 11. On February 3, 2023, the Commission determined not to review Order No. 11. EDIS Doc. ID 789400.

On March 24, 2023, Google moved (1330-016) for partial termination of the investigation by withdrawal of: claims 2, 3, 11, 12, and 15 of the 311 patent; and claims 5, 10, and 15 of the 128 patent. The motion was granted via initial determination on March 27, 2023. Order No. 20. On April 10, 2023, the Commission determined not to review Order No. 20. EDIS Doc. ID 794086.

On April 20, 2023, Google moved (1330-019) for summary determination that the economic prong and importation requirements are satisfied. The portion regarding importation was granted via initial determination on May 8, 2023. Order No. 27. On June 6, 2023, the Commission determined not to review Order No. 27. EDIS Doc. ID 797917. The portion regarding economic prong was granted via initial determination on May 26, 2023. Order No. 31. On June 28, 2023, the Commission determined to review Order No. 31, and on review, affirm the initial determination in relevant part. EDIS Doc. ID 799529.

On May 22, 2023, Google moved (1330-028) for partial termination of the investigation by withdrawal of: claims 8-9 and 14 of the 311 patent; claims 1-4, 6-9, and 11-14 of the 128 patent (thereby terminating the 128 patent from the investigation); claims 4, 11-12, and 14-15 of the 748 patent; and claims 7-8 of the 615 patent. The motion was granted via initial determination on May 23, 2023. Order No. 30. On June 8, 2023, the Commission determined not to review Order No. 30. EDIS Doc. ID 798099.

On June 16, 2023, Google moved (1330-046) for partial termination of the investigation by withdrawal of: claims 1 and 20 of the 311 patent; claims 1-3 of the 748 patent; and claims 2, 3, 10-12, 15, and 18 of the 615 patent. The motion was granted via initial determination on June

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21, 2023. Order No. 40. On July 10, 2023, the Commission determined not to review Order No. 40. EDIS Doc. ID 800011.

The evidentiary hearing took place on June 20-26, 2023. Pursuant to the procedural schedule and Order No. 71, the parties submitted initial and reply post-hearing briefs on July 10, 2023 and July 17, 2023, respectively.

On July 18, 2023, Sonos moved (1330-048) to correct a variety of typographical errors across all five days of testimony. On August 16, 2023, Google moved (1330-049) to de-designate a portion of the fifth day of testimony, moving it from the confidential to the public record. The motions were granted via Order Nos. 42 and 43, respectively; and replacement transcripts were entered into the record on August 21, 2023. EDIS Doc. IDs 802806-9, 802811, 802813-7.

As of the date of this initial determination, no motions remain pending.

B. The Parties

Complainant Google LLC is a Delaware company with a principal place of business in Mountain View, CA. CIB at 2. Google “designs, develops, and offers customer service” for its Nest line of products, among others, which use the voice-responsive tool Google Assistant. *Id.* Google states that it “owns all right, title and interest in asserted U.S. Patent Nos. 9,632,748, 11,024,311, and 11,050,615.” *Id.*

Respondent Sonos Inc. is a Delaware corporation, with a principal place of business in Santa Barbara, CA. RIB at 1. According to Google, “Sonos designs a line of wireless speaker products incorporating Sonos Voice Assistant. These products are manufactured abroad and imported into the United States for sale by Sonos, among others.” CIB at 2.



C. The Asserted Patents and Claims

The 748 patent, entitled “Device Designation for Audio Input Monitoring,” issued April 25, 2017, to Alexander Faaborg. The 748 patent reports an assignment on its face to Google Inc. and claims priority to a provisional application filed June 24, 2014.

The 311 patent, entitled “Device Leadership Negotiation Among Voice Interface Devices,” issued June 1, 2021, to Kenneth Mixter, Diego Melendo Casado, Alexander Houston Gruenstein, Terry Tai, Christopher Thaddeus Hughes, and Matthew Nivan Sharifi. The 311 patent reports an assignment on its face to Google LLC and claims priority to a provisional application filed October 9, 2014.

The 615 patent, entitled “Apparatus and Method for Seamless Commissioning of Wireless Devices,” issued on June 29, 2021, to Jeffrey P. Mathews and Lee R. Taylor. The 615 patent reports an assignment on its face to Google LLC and claims priority to a provisional application filed on April 11, 2012.

The Asserted Patents involve computerized devices linked together in a network. The claims of the 748 patent encompass methods and apparatuses for determining which devices among a group should perform speech recognition on a given spoken audio command. *See* 748 patent at cls. 1, 7. The 311 patent functions similarly, claiming methods and apparatuses for the same determination, but based on “first values” and “second values.” *See* 311 patent at cls. 1, 10, 16. The 615 patent claims are unrelated to speech recognition and cover methods and apparatuses for commissioning electronic devices onto a network. *See* 615 patent at cls. 1, 11, 16.

The following patent claims are presently at issue in this investigation, according to Google’s briefing:



Asserted Patent	Infringement Claims	Domestic Industry Claims
9,632,748	7, 9, 10	7, 9, 10
11,024,311	10, 16-19	10, 11, 16, 17
11,050,615	1, 5, 6, 9, 16, 17, 19	1, 5, 6, 9, 16, 17, 19

See generally CIB at xi.

D. Products at Issue

1. Domestic Industry Products

The domestic industry articles in this investigation are a collection of Nest-branded smart speakers which support the voice-activated Google Assistant software. CIB at 7-8; Hr’g Tr. (Gruenstein) at 21:2-7. The products employ speech recognition technologies to respond to users’ queries or commands, and then provide audio and/or visual output in response. *Id.* at 21:5-21. Google alleges the following models practice one or more claims of the Asserted Patents: Nest Hub, Nest Hub Max, Nest Audio, Nest Mini, and Nest Wifi (together, the “DI Products”). CIB at 7-8.

To efficiently show practice of the claims of the Asserted Patents, the parties agree that the Next Hub Max is representative of all DI Products for the 615 patent. CIB at 119; RIB at 99. Accordingly, for the purposes of this investigation, the Nest Hub Max is accepted as representative of all DI Products with respect to the 615 patent.

Google does not make any assertions of representativeness for the 748 patent or 311 patent, which, as noted, concern distinct technical features and issues from the 615 patent. *See generally* CIB at 7-8, 27-33, 76-84; CRB at 12-13, 29-37. Google’s expert, Dr. Mark Mahon, however, testified that there is no difference between the operation of the five DI Products as it concerns the

748 and 311 patents. Hr’g Tr. (Mahon) at 162:20-163:3. Sonos does not contest Dr. Mahon’s opinion. *See generally* RIB; RRB.

2. Accused Products

The accused articles in this investigation are, according to Google, “certain voice controllable audio player devices . . . and networked audio player devices” from Sonos. CIB at 7. Google identifies two groups of accused articles products, those that infringe the asserted claims of the 748 and 311 patents (hereafter, “748 Accused Products” and “311 Accused Products,” respectively), and then that same group plus additional models that infringe the asserted claims of the 615 patent (hereafter, “615 Accused Products”):

“748 Accused Products” / “311 Accused Products”	“615 Accused Products”
Sonos One	Sonos One
~	Sonos One SL
Sonos Move	Sonos Move
Sonos Roam	Sonos Roam
~	Sonos Roam SL
~	Sonos Five
Sonos Arc	Sonos Arc
~	Sonos Arc SL
Sonos Beam	Sonos Beam
~	Sonos Ray
~	Sonos Amp
~	Sonos Port
~	Sonos Sub Gen 3
~	Sonos Sub Mini
Sonos Era (100 and 300)	Sonos Era (100 and 300)

See CIB at 7.

As with the DI Products, the parties jointly identify the Sonos One model as representative of all the 615 Accused Products. CIB at 109; RIB at 91. Accordingly, the Sonos One is accepted as representative with respect to the 615 patent for this determination. And Dr. Mahon testified that there is no difference between the 748/311 Accused Products as it concerns the 748 and 311

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patents. Hr’g Tr. (Mahon) at 165:9-19. Sonos does not contest Dr. Mahon’s opinion. *See generally* RIB; RRB.

The parties further dispute whether an additional group of Sonos products should be adjudicated as part of the investigation—eight models described by Sonos as “Redesigned Products” or “NIAs.” RIB at 3. Sonos takes the position they should be:

The original Accused and DI Products are identified in the Table of Abbreviations. Out of an abundance of caution, Sonos developed Redesigned Products that are also at issue. For the Voice Patents, Sonos developed, imported, and produced discovery regarding seven alternative redesigns. Each of those products, identified as SVC NIAs #1-7, is a Sonos One speaker provisioned with software implementing a redesign. For the ’615 Patent, Sonos developed, imported, and produced discovery regarding a redesign identified as NIA #1. Google argues the redesigns are not sufficiently fixed to be adjudicated but does not assert that the ’615 Patent NIA infringes. For the voice patents, Google only contends that SVC NIAs #2-6 infringe the ’748 Patent and #2-5 and 7 infringe the ’311 Patent. The Redesigned Products are fixed and definite, should be adjudicated in this proceeding, and do not infringe any of the Asserted Patents.

(RIB at 3) and provides the following table:

NIA	Shorthand	Prototype/Source Code (exhibit (bates no.); source code folder)
SVC #1	[REDACTED]	RPX-1C-3C (PX-Sonos-ITC13XX-1 ~3); Voice01
SVC #2	[REDACTED]	RPX-4C-6C (PX-Sonos-ITC1330-3 ~5); Voice02
SVC #3	[REDACTED]	RPX-7C-9C (PX-Sonos-ITC13XX-4 ~6); Voice03
SVC #4	[REDACTED]	RPX-10C-12C (PX-Sonos-ITC13XX-7 ~9); Voice04
SVC #5	[REDACTED]	RPX-13C-14C (PX-Sonos-ITC1330-6 ~7); Voice05
SVC #6	[REDACTED]	RPX-15C-17C (PX-Sonos-ITC13XX-10 ~12); Voice06
SVC #7	[REDACTED]	RPX-18C-19C (PX-Sonos-ITC1330-8 ~9); Voice07
Setup	[REDACTED]	RPX-20C-22C (PX-Sonos-ITC1330-1 ~ -2); Setup01

(*id.* at 19).

Sonos applies the four-factor test promulgated by the Commission: (1) whether the product is within the scope of the investigation; (2) whether the product has been imported; (3) whether the product is sufficiently fixed in design; and (4) whether the product has been sufficiently disclosed by respondent during discovery. *See* RIB at 20-24; *Certain Human Milk Oligosaccharides and Methods of Producing the Same*, Inv. No. 337-TA-1120, Comm’n Op. at 18

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(June 8, 2020) (“*Human Milk*”). Sonos argues, without dispute from Google, that: the NIAs fall within the scope of the investigation (factor 1), have been imported into the U.S. (factor 2), and were sufficiently disclosed during the discovery period of the investigation (factor 4). RIB at 20-22; *see* CIB at 26-27, 75-76, 119; *see generally* CRB.

As for factor 3—whether the products are sufficiently fixed in design—the record shows that they are. Sonos contends:

[It] described the NIAs in its discovery responses, created and produced source code implementing each redesign, and embodied them in working physical devices. *See* Tr. (Agerbak) 730:1-731:17. Sonos tested both the NIA code and the NIA prototypes and confirmed “they worked.” *Id.* 737:2-17. As Mr. Agerbak testified, Setup NIA #1 can be used “to set up the player as a Sonos system,” and each SVC NIA “responded to the wake word, and that voice could be used to initiate music playback on – for each NIA.” *Id.* If Sonos chose, it could commercially release the NIAs within a week. *Id.* (Agerbak) 735:23-736:19.

RIB at 21. Sonos adds, “Mr. Agerbak testified that Sonos produced the relevant NIA code, confirmed that the produced NIA code was used to build the updates installed on the physical prototypes, and confirmed each prototype embodied the appropriate NIA.” *Id.* at 22 (citing Hr’g Tr. (Agerbak) at 737:18-739:5); *see id.* at 23-24 (citing *Certain Audio Players & Controllers*, Inv. No. 337-TA-1191, Order No. 19 at 4-5 (Sept. 4, 2020)).

Google’s counter argument is principally that a “smoke test,” a Sonos-internal term, has yet to be run on the NIAs, and that some amount of changes will yet need to be made because “the NIAs would have to [be] ‘implemented in Sonos’s latest code,’ which has not yet been done, before being released to any customers.” CIB at 27. But the promise or infeasibility of commercial release is not the test for “sufficiently fixed in design.” Rather, the Commission has a “policy in favor of adjudicating redesigns to prevent subsequent and potentially burdensome proceedings that could have been resolved in the first instance in the original Commission Investigation.” *Human Milk*, Inv. No. 337-TA-1120, Comm’n Op. at 18. And here, the design of the NIAs is clear. The

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products comprise the complete hardware of an existing Sonos One speaker with software changes—changes particularly identified in the source code and limited to the feature set which serve as the basis for Google’s claims of infringement. As noted by Sonos, there is no contention that the products are somehow inoperable. RRB at 12. The Commission has previously affirmed the “sufficiently fixed” nature of this type of alteration. *Certain Mobile Devices with Multifunction Emulators*, Inv. No. 337-TA-1170, Initial Determination at 13-15 (Mar. 16, 2021) (non-reviewed in relevant part) (“The Software-Modified Products are similarly situated. They too involve an otherwise identical copy of an Accused Product but with certain lines of driver code, previously present, but later deleted.”).

Accordingly, the Redesigned Products will be considered for infringement under the Asserted Patents.

II. STANDARDS OF LAW

A. Standing

Commission Rule 210.12 states in relevant part “[f]or every intellectual property based complaint (regardless of the type of intellectual property involved), [the complaint must] include a showing that at least one complainant is the owner or exclusive licensee of the subject intellectual property.” 19 C.F.R. § 210.12(a)(7). In determining whether this rule is met, the Commission looks to the standing requirement used by courts in patent infringement cases. *Certain Audio Processing Hardware, Software, and Products Containing the Same*, Inv. No. 337-TA-1026, Comm’n Op. at 9 (April 18, 2018) (citations omitted).

B. Claim Construction

“The construction of claims is simply a way of elaborating the normally terse claim language in order to understand and explain, but not to change, the scope of the claims.” *Embrex, Inc. v. Serv. Eng’g Corp.*, 216 F.3d 1343, 1347 (Fed. Cir. 2000). Although most of the disputed

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claim terms were construed in an earlier order, some of the issues presented below are only resolvable with additional claim construction.

Claim construction focuses on the intrinsic evidence, which consists of the claims themselves, the specification, and the prosecution history. *See Phillips v. AWH Corp.*, 415 F.3d 1303, 1314 (Fed. Cir. 2005) (en banc); *see also Markman v. Westview Instr., Inc.*, 52 F.3d 967, 979 (Fed. Cir. 1995) (en banc). As the Federal Circuit in *Phillips* explained, courts must analyze each of these components to determine the “ordinary and customary meaning of a claim term” as understood by a person of ordinary skill in art at the time of the invention. 415 F.3d at 1313. “Such intrinsic evidence is the most significant source of the legally operative meaning of disputed claim language.” *Bell Atl. Network Servs., Inc. v. Covad Commc'ns Grp., Inc.*, 262 F.3d 1258, 1267 (Fed. Cir. 2001).

“It is a ‘bedrock principle’ of patent law that ‘the claims of a patent define the invention to which the patentee is entitled the right to exclude.’” *Phillips*, 415 F.3d at 1312 (quoting *Innova/Pure Water, Inc. v. Safari Water Filtration Sys., Inc.*, 381 F.3d 1111, 1115 (Fed. Cir. 2004)). “Quite apart from the written description and the prosecution history, the claims themselves provide substantial guidance as to the meaning of particular claims terms.” *Id.* at 1314; *see Interactive Gift Express, Inc. v. Compuserve Inc.*, 256 F.3d 1323, 1331 (Fed. Cir. 2001) (“In construing claims, the analytical focus must begin and remain centered on the language of the claims themselves, for it is that language that the patentee chose to use to ‘particularly point [] out and distinctly claim [] the subject matter which the patentee regards as his invention.’”). The context in which a term is used in an asserted claim can be “highly instructive.” *Phillips*, 415 F.3d at 1314. Additionally, other claims in the same patent, asserted or unasserted, may also provide guidance as to the meaning of a claim term. *Id.* “Courts do not rewrite claims; instead, we give

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effect to the terms chosen by the patentee.” *K-2 Corp. v. Salomon S.A.*, 191 F.3d 1356, 1364 (Fed. Cir. 1999). “[T]he specification ‘is always highly relevant to the claim construction analysis. Usually it is dispositive; it is the single best guide to the meaning of a disputed term.’” *Phillips*, 415 F.3d at 1315 (quoting *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996)). “[T]he specification may reveal a special definition given to a claim term by the patentee that differs from the meaning it would otherwise possess. In such cases, the inventor’s lexicography governs.” *Id.* at 1316.

In addition to the claims and the specification, the prosecution history should be examined, if in evidence. *Phillips*, 415 F.3d at 1317; see *Liebel-Flarsheim Co. v. Medrad, Inc.*, 358 F.3d 898, 913 (Fed. Cir. 2004). The prosecution history can “often inform the meaning of the claim language by demonstrating how the inventor understood the invention and whether the inventor limited the invention in the course of prosecution, making the claim scope narrower than it would otherwise be.” *Phillips*, 415 F.3d at 1317; see *Chimie v. PPG Indus. Inc.*, 402 F.3d 1371, 1384 (Fed. Cir. 2005) (“The purpose of consulting the prosecution history in construing a claim is to exclude any interpretation that was disclaimed during prosecution.”).

When the intrinsic evidence does not establish the meaning of a claim, then extrinsic evidence (*i.e.*, all evidence external to the patent and the prosecution history, including dictionaries, inventor testimony, expert testimony, and learned treatises) may be considered. *Phillips*, 415 F.3d at 1317. Extrinsic evidence is generally viewed as less reliable than the patent itself and its prosecution history in determining how to define claim terms. *Id.* “The court may receive extrinsic evidence to educate itself about the invention and the relevant technology, but the court may not use extrinsic evidence to arrive at a claim construction that is clearly at odds with

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the construction mandated by the intrinsic evidence.” *Elkay Mfg. Co. v. Ebco Mfg. Co.*, 192 F.3d 973, 977 (Fed. Cir. 1999).

The construction of a claim term is generally guided by its ordinary meaning. However, courts may deviate from the ordinary meaning when: (1) “the intrinsic evidence shows that the patentee distinguished that term from prior art on the basis of a particular embodiment, expressly disclaimed subject matter, or described a particular embodiment as important to the invention”; or (2) “the patentee acted as his own lexicographer and clearly set forth a definition of the disputed claim term in either the specification or prosecution history.” *Edwards Lifesciences LLC v. Cook Inc.*, 582 F.3d 1322, 1329 (Fed. Cir. 2009); *see Apple Inc. v. Wi-LAN Inc.*, 25 F.4th 960, 967 (Fed. Cir. 2022); *GE Lighting Sols., LLC v. AgiLight, Inc.*, 750 F.3d 1304, 1309 (Fed. Cir. 2014) (“the specification and prosecution history only compel departure from the plain meaning in two instances: lexicography and disavowal.”); *Omega Eng’g, Inc. v. Raytek Corp.*, 334 F.3d 1314, 1324 (Fed. Cir. 2003) (“[W]here the patentee has unequivocally disavowed a certain meaning to obtain his patent, the doctrine of prosecution disclaimer attaches and narrows the ordinary meaning of the claim congruent with the scope of the surrender.”); *Rheox, Inc. v. Entact, Inc.*, 276 F.3d 1319, 1325 (Fed. Cir. 2002) (“The prosecution history limits the interpretation of claim terms so as to exclude any interpretation that was disclaimed during prosecution.”). Nevertheless, there is a “heavy presumption that a claim term carries its ordinary and customary meaning.” *CCS Fitness, Inc. v. Brunswick Corp.*, 288 F.3d 1359, 1366 (Fed. Cir. 2002) (citations omitted). The standard for deviating from the plain and ordinary meaning is “exacting” and requires “a clear and unmistakable disclaimer.” *Thorner v. Sony Computer Entm’t Am. LLC*, 669 F.3d 1362, 1366-67 (Fed. Cir. 2012); *see Epistar Corp. v. Int’l Trade Comm’n*, 566 F.3d 1321, 1334 (Fed. Cir. 2009)

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(requiring “expressions of manifest exclusion or restriction, representing a clear disavowal of claim scope” to deviate from the ordinary meaning) (citation omitted).

C. Infringement

“An infringement analysis entails two steps. The first step is determining the meaning and scope of the patent claims asserted to be infringed. The second step is comparing the properly construed claims to the device accused of infringing.” *Markman*, 52 F.3d at 976. A patentee may prove infringement either literally or under the doctrine of equivalents. Infringement of either sort must be proven by a preponderance of the evidence. *SmithKline Diagnostics, Inc. v. Helena Labs. Corp.*, 859 F.2d 878, 889 (Fed. Cir. 1988). A preponderance of the evidence standard “requires proving that infringement was more likely than not to have occurred.” *Warner-Lambert Co. v. Teva Pharm. USA, Inc.*, 418 F.3d 1326, 1341 n.15 (Fed. Cir. 2005).

Literal infringement is a question of fact. *Finisar Corp. v. DirecTV Group, Inc.*, 523 F.3d 1323, 1332 (Fed. Cir. 2008). “To establish literal infringement, every limitation set forth in a claim must be found in an accused product, exactly.” *Microsoft Corp. v. GeoTag, Inc.*, 817 F.3d 1305, 1313 (Fed. Cir. 2016) (quoting *Southwall Techs., Inc. v. Cardinal IG Co.*, 54 F.3d 1570, 1575 (Fed. Cir. 1995)). If any claim limitation is absent, there is no literal infringement of that claim as a matter of law. *Bayer AG v. Elan Pharm. Research Corp.*, 212 F.3d 1241, 1247 (Fed. Cir. 2000).

Doctrine of equivalents is also a form of infringement. One rubric for evaluating if a claimed feature is not literally, but nonetheless equivalent to, a claimed feature is known as the function-way-result test. Under this test, the accused feature is equivalent to the claim limitation when “it performs substantially the same function in substantially the same way to obtain the same result.” *Duncan Parking Techs., Inc. v. IPS Grp., Inc.*, 914 F.3d 1347, 1362 (Fed. Cir. 2019) (quoting *Graver Tank & Mfg. Co. v. Linde Air Prods. Co.*, 339 U.S. 605, 608 (1950)). Another is

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known as the insubstantial differences test, where “[a]n element in the accused device is equivalent to a claim limitation if the only differences between the two are insubstantial.” *Voda v. Gordia Corp.*, 536 F.3d 1311, 1326 (Fed. Cir. 2008) (citing *Honeywell Int’l Inc. v. Hamilton Sundstrand Corp.*, 370 F.3d 1131, 1139 (Fed. Cir. 2004)). The Supreme Court has further instructed, “the proper time for evaluating equivalency . . . is at the time of infringement, not at the time the patent was issued.” *Warner-Jenkinson Co., Inc. v. Hilton Davis Chem. Co.*, 520 U.S. 17, 37 (1997).

In addition to direct infringement, Section 271 of the Patent Act defines two categories of indirect infringement, inducement of infringement and contributory infringement. 35 U.S.C. § 271. For indirect infringement violations under Section 337, the direct infringement element may occur after importation, so long as all the other elements of indirect infringement are met at the time of importation. *See Certain Vision-Based Driver Assistance System Cameras and Components Thereof*, Inv. No. 337-TA-907, Comm’n Op. at 19 (Dec. 1, 2015) (citing *Suprema, Inc. v. Int’l Trade Comm’n*, 796 F.3d 1338, 1348 (Fed. Cir. 2015)). It is well settled that “[a]bsent direct infringement of the patent claims, there can be neither contributory infringement ... nor inducement of infringement.” *Met-Coil Sys. Corp. v. Korner Unltd., Inc.*, 803 F.2d 684, 687 (Fed.Cir.1986) (citations omitted).

As to the first category, “[w]hoever actively induces infringement of a patent shall be liable as an infringer.” 35 U.S.C. § 271(b); *see DSU Med. Corp. v. JMS Co.*, 471 F.3d 1293, 1305 (Fed. Cir. 2006) (en banc) (“To establish liability under section 271(b), a patent holder must prove that once the defendants knew of the patent, they actively and knowingly aided and abetted another’s direct infringement.”) (citations omitted). “The mere knowledge of possible infringement by others does not amount to inducement; specific intent and action to induce infringement must be proven.” *Id.* (citations omitted). A defendant’s belief regarding patent validity is not a defense to

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a claim of induced infringement. *Commil USA, LLC v. Cisco Sys., Inc.*, 135 S. Ct. 1920 (2015). A defendant's willful blindness on the question of infringement will satisfy the knowledge requirement. *Global-Tech Appliances, Inc. v. SEB S.A.*, 563 U.S. 754, 765, 768-771 (2011). The requisite intent to induce infringement "may be established through circumstantial evidence" and "may be inferred from all of the circumstances." See *Broadcom Corp. v. Qualcomm, Inc.*, 543 F.3d 683, 699 (Fed. Cir. 2008) (citing *DSU Med. Corp. v. JMS Co.*, 471 F.3d 1293 (Fed. Cir. 2006); *Water Techs. Corp. v. Claco, Ltd.*, 850 F.2d 660, 669 (Fed. Cir. 1988)).

As to the second category, "a party who sells a component with knowledge that the component is especially designed for use in a patented invention, and is not a staple article of commerce suitable for substantial noninfringing use, is liable as a contributory infringer." *Wordtech Sys., Inc. v. Integrated Networks Solutions, Inc.*, 609 F.3d 1308, 1316 (Fed. Cir. 2010). Contributory infringement is premised upon a finding that: (1) the entity sells, offers to sell, or imports into the United States a component of a product; (2) the component has no substantial non-infringing use; (3) the component constitutes a material part of the claimed invention; (4) the entity was aware of the patent and knew that the product may be covered by a claim of the patent; and (5) the use of the component in the product directly infringes the claim. See *Certain Gaming & Entm't Consoles, Related Software, & Components Thereof*, Inv. No. 337-TA-752, Initial Determination (Remand) at 7-8 (Mar. 22, 2013) (citing 35 U.S.C. § 271(c); *Arris Group v. British Telecomm. PLC*, 639 F.3d 1368, 1376 (Fed. Cir. 2011)), *non-reviewed*, Notice (May 23, 2013). As with inducement, willful blindness on the question of infringement will satisfy the knowledge requirement. *Global-Tech*, 563 U.S. at 765, 768-771.

D. Domestic Industry

In an investigation based on a claim of patent infringement, section 337 requires that an industry in the United States, relating to the articles protected by the patent, exist or be in the process of being established. 19 U.S.C. § 1337(a)(2). Under Commission precedent, the domestic industry requirement has been divided into (i) a “technical prong” (which requires articles covered by the asserted patent) and (ii) an “economic prong” (which requires certain levels of activity with respect to the protected articles or patent itself). *See Certain Video Game Systems and Controllers*, Inv. No. 337-TA-743, Comm’n Op. at 6-7 (April 14, 2011) (“*Video Game Systems*”).

1. Technical Prong

The technical prong of the domestic industry requirement is satisfied when the complainant in a patent-based section 337 investigation establishes that it is practicing or exploiting the patents at issue. *See* 19 U.S.C. §§ 1337 (a)(2), (3); *Certain Microsphere Adhesives, Process for Making Same and Prods. Containing Same, Including Self-Stick Repositionable Notes*, Inv. No. 337-TA-366, Comm’n Op. at 8 (U.S.I.T.C. Jan. 16, 1996). “In order to satisfy the technical prong of the domestic industry requirement, it is sufficient to show that the domestic industry practices any claim of that patent, not necessarily an asserted claim of that patent.” *Certain Ammonium Octamolybdate Isomers*, Inv. No. 337-TA-477, Comm’n Op. at 55 (U.S.I.T.C. Aug. 28, 2003). Historically, the Commission permits the complainant’s products, and those of its licensees, to be considered for technical prong purposes. *See Certain Magnetic Tape Cartridges and Components Thereof*, Inv. No. 337-TA-1058, Comm’n Op. at 28-29 (April 9, 2019).

The test for claim coverage for the purposes of the technical prong of the domestic industry requirement is the same as that for infringement. *See Certain Doxorubicin and Preparations Containing Same*, Inv. No. 337-TA-300, Initial Determination at 109 (U.S.I.T.C. May 21, 1990), *aff’d*, Views of the Commission at 22 (U.S.I.T.C. Oct. 31, 1990); *Alloc, Inc. v. Int’l Trade Comm’n*,

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342 F.3d 1361, 1375 (Fed. Cir. 2003). “First, the claims of the patent are construed. Second, the complainant’s article or process is examined to determine whether it falls within the scope of the claims.” *Certain Doxorubicin and Preparations Containing Same*, Initial Determination at 109. As with infringement, the technical prong of the domestic industry can be satisfied either literally or under the doctrine of equivalents. *Certain Dynamic Sequential Gradient Devices and Component Parts Thereof*, Inv. No. 337-TA-335, ID at 44, Pub. No. 2575 (U.S.I.T.C. May 15, 1992). In short, the patentee must establish by a preponderance of the evidence that the domestic product practices one or more claims of the patent.

2. Economic Prong

The “economic prong” of the domestic industry requirement is satisfied when there exists in the United States, in connection with products practicing at least one claim of the patent at issue: (A) significant investment in plant and equipment; (B) significant employment of labor or capital; or (C) substantial investment in its exploitation, including engineering, research and development, and licensing. 19 U.S.C. § 1337(a)(3). Establishment of the “economic prong” is not dependent on any “minimum monetary expenditure” and there is no need for a complainant “to define the industry itself in absolute mathematical terms.” *Certain Stringed Musical Instruments and Components Thereof*, Inv. No. 337-TA-586, Comm’n Op. at 25-26 (May 16, 2008) (“*Stringed Instruments*”). However, a complainant must substantiate the significance of its activities with respect to the articles protected by the patent. *Certain Printing and Imaging Devices and Components Thereof*, Inv. No. 337-TA-690, Comm’n Op. at 30 (Feb. 17, 2011) (“*Imaging Devices*”). Further, a complainant can show that its activities are significant by showing how those activities are important to the articles protected by the patent in the context of the company’s operations, the marketplace, or the industry in question. *Id.* at 27-28. That significance, however, must be shown in a quantitative context. *Lelo Inc. v. Int’l Trade Comm’n*, 786 F.3d 879, 886 (Fed.

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Cir. 2015). The Federal Circuit noted that when the ITC first addressed this requirement, it found the word “‘significant’ denoted ‘an assessment of the *relative* importance of the domestic activities.’” *Id.* at 883-4 (internal citation omitted) (emphasis added). In general, “[t]he purpose of the domestic industry requirement is to prevent the ITC from becoming a forum for resolving disputes brought by foreign complainants whose only connection with the United States is ownership of a U.S. patent.” *Certain Battery-Powered Ride-On Toy Vehicles*, Inv. No. 337-TA-314, USITC Pub. No. 2420, Initial Determination at 21 (Aug. 1991); *see Certain Vacuum Insulated Flasks and Components Thereof*, Inv. No. 337-TA-1216, Notice at 3-4 (Oct. 21, 2021) (“Given the nature and extent of [complainant’s] investments in plant and equipment as a whole, [complainant] is not a mere importer.”).

E. Invalidity

1. 35 U.S.C. § 101

Section 101 states:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

35 U.S.C. § 101. To determine patent eligibility under § 101, courts apply the two-step *Alice* test and first “determine whether the claims at issue are directed to a patent-ineligible concept,” and then if so, “examine the elements of the claim to determine whether it contains an ‘inventive concept’ sufficient to ‘transform’ the claimed abstract idea into a patent-eligible application.” *Alice Corp. Pty. v. CLS Bank Intern.*, 573 U.S. 208, 217-18, 221 (2014). “The ‘directed to’ inquiry applies a stage-one filter to claims, considered in light of the specification, based on whether ‘their character as a whole is directed to excluded subject matter.’” *Enfish, LLC v. Microsoft Corp.*, 822 F.3d 1327, 1335 (Fed. Cir. 2016) (citing *Internet Patents Corp. v. Active Network, Inc.*, 790 F.3d 1343, 1346 (Fed. Cir. 2015); *Genetic Techs. Ltd. v. Merial L.L.C.*, 818 F.3d 1369, 1375 (Fed. Cir.

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2016)). To save a patent at the second step, an inventive concept must be evident in the claims. *Synopsys, Inc. v. Mentor Graphics Corp.*, 839 F.3d 1138, 1151-52 (Fed. Cir. 2016).

2. 35 U.S.C. § 102

Under the previous version of 35 U.S.C. § 102, a patent claim is invalid as anticipated if:

- (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant;
- (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of the application for patent in the United States;

35 U.S.C. § 102 (pre-AIA). Under the current version, a patent claim is invalid as anticipated if:

- (1) the claimed invention was patented, described in a printed publication, or in public use, on sale, or otherwise available to the public before the effective filing date of the claimed invention; or
- (2) the claimed invention was described in a patent issued under section 151, or in an application for patent published or deemed published under section 122(b), in which the patent or application, as the case may be, names another inventor and was effectively filed before the effective filing date of the claimed invention.

35 U.S.C. § 102 (AIA). “A patent is invalid for anticipation if a single prior art reference discloses each and every limitation of the claimed invention. Moreover, a prior art reference may anticipate without disclosing a feature of the claimed invention if that missing characteristic is necessarily present, or inherent, in the single anticipating reference.” *Schering Corp. v. Geneva Pharm., Inc.*, 339 F.3d 1373, 1377 (Fed. Cir. 2003) (citations omitted); see *Santarus, Inc. v. Par Pharm., Inc.*, 694 F.3d 1344, 1354 (Fed. Cir. 2012). “A century-old axiom of patent law holds that a product ‘which would literally infringe if later in time anticipates if earlier.’” *Upsher-Smith Labs., Inc. v. Pamlab, L.L.C.*, 412 F.3d 1319, 1322 (Fed. Cir. 2005) (citing *Schering Corp.*, 339 F.3d at 1322). Anticipation, and all other grounds of patent invalidity, must be proved by clear and convincing evidence. *Microsoft Corp. v. i4i Ltd. P’ship*, 564 U.S. 91, 95 (2011).

3. 35 U.S.C. § 103

Pursuant to the previous version of 35 U.S.C. § 103:

A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

35 U.S.C. § 103(a) (pre-AIA). Under the current version:

A patent for a claimed invention may not be obtained, notwithstanding that the claimed invention is not identically disclosed as set forth in section 102, if the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have been obvious before the effective filing date of the claimed invention to a person having ordinary skill in the art to which the claimed invention pertains. Patentability shall not be negated by the manner in which the invention was made.

35 U.S.C. § 103(a) (AIA). “Obviousness is a question of law based on underlying questions of fact.” *Scanner Techs. Corp. v. ICOS Vision Sys. Corp. N.V.*, 528 F.3d 1365, 1379 (Fed. Cir. 2008).

The underlying factual determinations include: “(1) the scope and content of the prior art, (2) the level of ordinary skill in the art, (3) the differences between the claimed invention and the prior art, and (4) objective indicia of non-obviousness.” *Id.* (citing *Graham v. John Deere Co. of Kansas City*, 383 U.S. 1, 17-18 (1966)). These factual determinations are often referred to as the “*Graham* factors.”

The critical inquiry in determining the differences between the claimed invention and the prior art is whether there is a reason to combine the prior art references. *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 418-21 (2007). In *KSR*, the Supreme Court rejected the Federal Circuit’s rigid application of the teaching-suggestion-motivation test. While the Court stated that “it can be important to identify a reason that would have prompted a person of ordinary skill in the relevant

field to combine the elements in the way the claimed new invention does,” it described a more flexible analysis:

Often, it will be necessary for a court to look to interrelated teachings of multiple patents; the effects of demands known to the design community or present in the marketplace; and the background knowledge possessed by a person having ordinary skill in the art, all in order to determine whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue As our precedents make clear, however, the analysis need not seek out precise teachings directed to the specific subject matter of the challenged claim, for a court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ.

Id. at 418. Since *KSR*, the Federal Circuit has announced that, where a patent challenger contends that a patent is invalid for obviousness based on a combination of prior art references, “the burden falls on the patent challenger to show by clear and convincing evidence that a person of ordinary skill in the art would have had reason to attempt to make the composition or device . . . and would have had a reasonable expectation of success in doing so.” *PharmaStem Therapeutics, Inc. v. ViaCell, Inc.*, 491 F.3d 1342, 1360 (Fed. Cir. 2007); *see KSR*, 550 U.S. at 399 (“The proper question was whether a pedal designer of ordinary skill in the art, facing the wide range of needs created by developments in the field, would have seen an obvious benefit to upgrading Asano with a sensor.”). As one example, “if there’s a known technique to address a known problem using ‘prior art elements according to their established functions,’ then there is a motivation to combine.” *Intel Corp. v. PACT XPP Schweiz AG*, 61 F.4th 1373, 1380 (Fed. Cir. 2023) (citation omitted).

An obviousness determination should also include a consideration of how “secondary considerations” such as “commercial success, long felt but unsolved needs, failure of others, etc., might be utilized to give light to the circumstances surrounding the origin of the subject matter sought to be patented.” *Graham*, 338 U.S. at 17-18. “For [such] objective evidence to be accorded substantial weight, its proponent must establish a nexus between the evidence and the merits of the claimed invention.” *In re GPAC Inc.*, 57 F.3d 1573, 1580 (Fed. Cir. 1995); *see Merck & Cie*

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v. Gnosis S.P.A., 808 F.3d 829, 837 (Fed. Cir. 2015). “Where the offered secondary consideration actually results from something other than what is both claimed and novel in the claim, there is no nexus to the merits of the claimed invention.” *In re Huai-Hung Kao*, 639 F.3d 1057, 1068 (Fed. Cir. 2011); *see Apple Inc. v. Samsung Elecs. Co., Ltd.*, 839 F.3d 1034, 1054-1056 (Fed. Cir. 2016).

4. 35 U.S.C. § 112

The prior version of the Patent Act recites:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor of carrying out his invention.

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

35 U.S.C. § 112 (pre-AIA). Under the current version:

(a) IN GENERAL.—The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor or joint inventor of carrying out the invention.

(b) CONCLUSION.—The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the inventor or a joint inventor regards as the invention.

35 U.S.C. § 112 (AIA). Pursuant to section 112, a patent claim is invalid for lack of written description if the patent’s specification fails to “reasonably convey[] to those skilled in the art that the inventor had possession of the claimed subject matter as of the filing date.” *Ariad Pharm., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336, 1351 (Fed. Cir. 2010) (en banc). “[T]he test requires an objective inquiry into the four corners of the specification from the perspective of a person of ordinary skilled in the art” (*id.*), and “the level of detail required to satisfy the written description requirement

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varies depending on the nature and scope of the claims and on the complexity and predictability of the relevant technology” (*id.* (citing *Capon v. Eshar*, 418 F.3d 1349, 1357-58 (Fed. Cir. 2005))).

F. Inequitable Conduct

“Each individual associated with the filing and prosecution of a patent application has a duty of candor and good faith in dealing with the Office, which includes a duty to disclose to the Office all information known to that individual to be material to patentability as defined in this section.” 37 C.F.R. § 1.56(a). Thus, a patent may become unenforceable if “the applicant misrepresented or omitted material information with the specific intent to deceive the PTO.” *Therasense, Inc. v. Becton, Dickinson and Co.*, 649 F.3d 1276, 1287 (Fed. Cir. 2011) (en banc). “Unlike validity defenses, which are claim specific, *see* 35 U.S.C. § 288, inequitable conduct regarding any single claim renders the entire patent unenforceable.” *Id.* at 1288 (citing *Kingsdown Med. Consultants, Ltd. v. Hollister Inc.*, 863 F.2d 867, 877 (Fed. Cir. 1988)).

“Intent and materiality are separate requirements.” *Therasense*, 649 F.3d at 1290 (citing *Hoffman-La Roche, Inc. v. Promega Corp.*, 323 F.3d 1354, 1359 (Fed. Cir. 2003)). With respect to materiality:

[T]he materiality required to establish inequitable conduct is but-for materiality. When an applicant fails to disclose prior art to the PTO, that prior art is but-for material if the PTO would not have allowed a claim had it been aware of the undisclosed prior art. Hence, in assessing the materiality of a withheld reference, the court must determine whether the PTO would have allowed the claim if it had been aware of the undisclosed reference.

Id. at 1291. With respect to intent:

A finding that the misrepresentation or omission amounts to gross negligence or negligence under a “should have known” standard does not satisfy this intent requirement. *Kingsdown*, 863 F.2d at 876. “In a case involving nondisclosure of information, clear and convincing evidence must show that the applicant *made a deliberate decision* to withhold a *known* material reference.” *Molins*, 48 F.3d at 1181 (emphases added). In other words, the accused infringer must prove by clear and convincing evidence that the applicant knew of the reference, knew that it was material, and made a deliberate decision to withhold it.

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Id. at 1290. Further, the evidence of specific intent must “*require* a finding of deceitful intent in the light of all the circumstances” such that “when there are multiple reasonable inferences that may be drawn, intent to deceive cannot be found.” *Id.* at 1290-91 (citations omitted). In the context of withheld prior art, “[p]artial disclosure of material information about the prior art to the PTO cannot absolve a patentee of intent if the disclosure is intentionally selective.” *Am. Calcar, Inc. v. Am. Honda Motor Co.*, 768 F.3d 1185, 1190 (Fed. Cir. 2014) (citing *Aventis Pharma S.A. v. Hospira, Inc.*, 675 F.3d 1324, 1335-36 (Fed. Cir. 2012)); *Semiconductor Energy Lab. Co. v. Samsung Elecs. Co.*, 204 F.3d 1368, 1376 (Fed. Cir. 2000)). It is also true that “[a]n inference of intent to deceive is appropriate where the applicant engages in ‘a pattern of lack of candor,’ including where the applicant repeatedly makes factual representations ‘contrary to the true information he had in his possession.’” *Regeneron Pharm., Inc. v. Merus N.V.*, 864 F.3d 1343, 1351 (Fed. Cir. 2017) (citing *Apotex Inc. v. UCB, Inc.*, 763 F.3d 1354, 1362 (Fed. Cir. 2014)). Nevertheless, “the specific intent to deceive must be ‘the single most reasonable inference able to be drawn from the evidence.’” *Therasense*, 649 F.3d at 1290 (citation omitted).

III. IMPORTATION AND JURISDICTION

As noted above, Google had previously moved for summary determination that the importation requirement was met without opposition from Sonos. The motion was granted on May 8, 2023, via initial determination. Order No. 27. On June 6, 2023, the Commission determined not to review Order No. 27. EDIS Doc. ID 797917. In its post-hearing brief, Sonos states, “Sonos does not contest that the Commission has jurisdiction over this investigation.” RIB at 3.

Accordingly, the importation requirement under 19 U.S.C. § 1337(a)(1)(B) is satisfied, and the Commission has *in rem* jurisdiction over all Accused Products and Redesigned Products.

IV. U.S. PATENT NO. 9,632,748

A. Level of Ordinary Skill in the Art

In Order No. 14, I determined that a person having ordinary skill in the art of the 748 patent at the time of invention:

[W]ould have a B.S. degree in electrical or computer engineering, or a related field, and approximately 2-4 years of experience in the field of voice and/or audio processing, or an equivalent level of skill, knowledge, and experience. . . . [E]xperience may substitute for education and vice versa.

Order No. 14 at 8. The parties do not challenge this definition (*see generally* CIB; CRB; RIB; RRB), and it is applied throughout this initial determination.

B. Claims-at-Issue

Claims 7, 9, and 10 patent are at issue in this investigation, either through allegations of infringement or domestic industry technical prong. *See* CIB at 7-8. They are reproduced below, along with limitation identifiers:

7. [7.0] A first computing device comprising:

[7.0a] at least one processor; and

[7.0b] at least one module operable by the at least one processor to:

[7.1] receive a spoken audio input that is also received by one or more additional computing devices in physical proximity to the first computing device;

[7.2] determine, based at least in part on information received from the one or more additional computing devices, whether the first computing device should perform speech recognition on the spoken audio input; and

[7.3] responsive to determining that the first computing device should perform speech recognition on the spoken audio input:

[7.3a] send, to at least a second computing device from a plurality of computing devices, a command to temporarily refrain from performing speech recognition;

[7.3b] perform speech recognition on the spoken audio input;

[7.3c] determine, based on performing speech recognition on the spoken audio input, whether the spoken audio input includes a predetermined spoken audio command; and

[7.3d] responsive to determining that the spoken audio input includes the predetermined spoken audio command, execute an action associated with the predetermined spoken audio command.

....

9. The computing device of claim 7,

wherein the at least one module is further operable by the at least one processor to determine a current context of the first computing device, and

wherein the at least one module is operable by the at least one processor to determine whether the first computing device should perform speech recognition on the spoken audio input further based on the current context of the first computing device.

10. The computing device of claim 9, wherein the at least one module operable to determine the current context of the first computing device is operable by the at least one processor to determine one or more of: a location of the first computing device, a current time as defined by the first computing device, one or more applications installed at the first computing device, one or more applications currently executing at the first computing device, one or more networks available to the first computing device, one or more other computing devices in proximity to the first computing device, an operating mode of the first computing device, an ambient temperature of the location of the first computing device, an ambient noise level of the location of the first computing device, an ambient light level of the location of the first computing device, a movement of the first computing device, a name of a user of the first computing device, a user identification (UID) of the user of the first computing device, a social media network service account associated with the user of the first computing device, one or more calendars associated with the user of the first computing device, or one or more social relationships of the user of the first computing device.

748 patent at cls. 7 (annotated), 9, 10.

C. Claim Construction

As part of the *Markman* process, the following claim terms of the 748 patent were construed, either as agreed between the parties or determined by Order No. 14:

Claim Term	Construction
“predetermined spoken audio command”	Does not mean “any audio input usable to initiate interaction with a computing device, such as a spoken hotword”
“[perform/performing] speech recognition”	Does not mean “processing spoken audio to determine whether it includes a predetermined spoken audio command”
“[determine/determining] . . . based at least in part on information received from the one or more additional computing devices, whether the first computing device should perform speech recognition on the spoken audio input”	Does not mean “determining whether the first computing device should perform speech recognition on the spoken audio input without any of the plurality of computing devices processing the spoken audio input to determine whether it includes a predetermined audio command”
“a command to temporarily refrain from performing speech recognition”	“a command to temporarily refrain from performing any and all speech recognition”

See Order No. 14 at 24, 27, 28, 31. Within their briefing, the parties identify a number of additional claim construction disputes, discussed below.

1. “spoken audio input”

The parties dispute the meaning of “spoken audio input.” Google argues it should be given its plain and ordinary meaning of “audio input associated with a user’s speech.” CIB at 8-9. As to whether that input can include multiple commands or multiple utterances, Google argues it can: “The ’748 claims and specification—including in the very embodiment on which Sonos and Dr. Johnson rely to teach the ’748 patent—explicitly contemplate that the ‘spoken audio input’ may include multiple commands and is not limited to a single ‘predetermined spoken audio command.’” *Id.* at 9. As an example, Google provides: “The claimed ‘spoken audio input’ begins with an ‘audio trigger’ or ‘hotword’ and continues until completion, which the ’748 patent typically associates with a timeout associated with the user no longer speaking or the invocation

[REDACTED]

of the next audio trigger signifying a new spoken audio input.” *Id.* at 9. To the extent Sonos argues the term means “a single voice utterance processed by a device at one point in time,” Google argues that position is untimely, waived under G.R. 9.2, and otherwise contradicts the intrinsic record. *See* CRB at 2-3 (citing 748 patent at 1:18-25, 2:52-63, 2:36-3:7, 9:57-67, 19:8-14, 24:4-51).

Sonos agrees that Google’s infringement and technical prong domestic industry theories interpret “spoken audio input” “to cover *multiple, distinct voice utterances* that are spoken by a user and processed by a voice device at *different times*.” RIB a 4 (emphasis in original). But Sonos argues this “makes no sense – a POSITA would understand that the singular phrase ‘spoken audio input’ in the ’748 Patent refers to a single voice utterance” and that Google’s construction would vitiate claim limitations 7.2, 7.3, and 7.3b-7.3d. *Id.* at 5 (citing *Bicon, Inc. v. Straumann Co.*, 441 F.3d 945, 951 (Fed. Cir. 2006)). Sonos alleges, “the ’748 specification makes clear that distinct utterances spoken at different times constitute different ‘spoken audio inputs’” (*id.* (citing 748 patent at 1:18-25, 24:31-51); RRB at 2-3 (citing 748 patent at 20:8-14)) and further points to claim 7’s subsequent recitation of “*the* spoken audio input” as antecedent basis evidence of “one discrete voice utterance” (RIB at 5; RRB at 2). Sonos further disputes that this construction was waived, stating that Google’s construction of “audio input associated with a user’s speech” is actually untimely. RRB at 1-2.

No party has argued the patentee acted as its own lexicographer, nor that prosecution disclaimer has occurred. Thus, the plain and ordinary meaning applies. *Kyocera Senco Industrial Tools Inc. v. Int’l Trade Comm’n*, 22 F.4th 1369, 1378 (Fed. Cir. 2022) (citing *Thorner*, 669 F.3d at 1365). Google’s proposal of “audio input associated with a user’s speech” is the plain and ordinary meaning and not inconsistent with how the feature is used in the patent’s specification.



Sonos argues Google has waived any such proposal for failure to include it in its pre-hearing brief. RRB at 1. But this does not mean Sonos’ construction should be automatically adopted, and Google did provide notice that it considers the term to be broad enough to encompass “[t]he user’s speech, including the hotword, initial request, and any follow-on commands.” CPB at 16; *see id.* at 17 (stating the winning device will “perform speech recognition on all follow-up requests in the spoken audio input associated with the original wakeword invocation . . .”).

And restricting “spoken audio input” to a single “utterance,” as Sonos would have it, is not supported in the specification. Sonos’ primary passage reads:

By monitoring for audio input that includes a predetermined audio command, a computing device may allow a user to provide, subsequent to providing the audio input that includes the predetermined audio command, one or more other audio commands without the user having to press a button or otherwise indicate that an audio command is about to be provided.

748 patent at 1:18-25; *see* RIB at 5. But there is nothing here indicating that multiple commands, let alone multiple “utterances” can only be considered as multiple “spoken audio inputs.” The 748 patent otherwise makes no mention of utterances, either singular or plural. *See, e.g.*, 748 patent at 20:8-14, 24:31-51.

How to define an “utterance” is itself unwieldy. For example, one would think a single “utterance” is short spoken content, on the level of a few syllables. But Sonos argues, in response to Google’s vitiation argument, that a single utterance could include multiple commands. RRB at 4 (“Google is wrong – such an embodiment could still meet Sonos’ interpretation of ‘spoken audio input’ as long as the multiple commands were included as part of one distinct voice utterance.”). Yet multiple commands within a single “utterance” would seem to be quite difficult unless Google’s preferred example is accepted as a single utterance. Google states, “‘spoken audio input’ begins with an ‘audio trigger’ or ‘hotword’ and continues until completion, which the ’748 patent

typically associates with a timeout associated with the user no longer speaking or the invocation of the next audio trigger signifying a new spoken audio input.” CIB at 9.

Antecedent-basis principles within claim 7 also do not support a single utterance construction. “*The* spoken audio input” simply refers back to the originally recited “spoken audio input”—whether it be one or more syllables, words, or commands. The term, quite simply, is broad. *See* 748 patent at 1:10-11 (“Computing devices (*e.g.*, mobile phones, tablet computers, etc.) may enable a user to provide audio input.”); *Wasica Finance GmbH v. Cont’l Auto. Sys., Inc.*, 853 F.3d 1272, 1281-2 (Fed. Cir. 2017) (“Therefore, absent a clear disavowal or alternative lexicography by a patentee, he or she ‘is free to choose a broad term and expect to obtain the full scope of its plain and ordinary meaning.’”).

Accordingly, “spoken audio input” is construed broadly as “audio input associated with a user’s speech.”

2. “[perform/performing] speech recognition”

The parties dispute the meaning of “[perform/performing] speech recognition.” Google contends it “should be given the plain and ordinary meaning already ordered by the ALJ—the process of transforming spoken audio into text (*i.e.*, to transcribe) or some other form readable by the claimed computing device.” CIB at 12 (citing Order No. 14 at 26-27). Google particularly emphasizes that “speech recognition” is not broad enough to cover “hotword detection” “because it does not involve identification of the words spoken by a user, nor does it involve transformation of those words into text or any other readable form. Instead, hotword detection involves the output of a binary value that only indicates whether a hotword is in an audio signal.” CRB at 6 (citing Hr’g Tr. (Mahon) at 154:22-156:4, 166:2-167:4, 173:18-174:18, 195:1-196:9). Google clarifies:

[I]t is not possible for a binary value (*e.g.*, a “1” or “0”) to represent the words a user has spoken as a general matter, aside from the presence or absence of a hotword (or any one of a set of supported hotwords). For example, a hotword detector may

[REDACTED]

be capable of detecting multiple different hotwords, but will only indicate that a hotword has been spoken without specifying which one. The hotword detector used in Google's Nest products is such an example because it is capable of detecting the presence of multiple hotwords ("Okay Google" or "Hey Google"), but the binary output does not indicate which one was spoken. Tr. (Gruenstein) 32:19-33:7. As a result, there is no recognition of the particular words spoken by the user, and the binary output of a hotword detector is not the text of the words spoken by the user or any other readable form of those words.

CRB at 6.

As a preliminary matter, Google's position on hotword detection is untenable. Hotword detection is the evaluation of whether a particular word or words have been spoken. *See, e.g.*, CRB at 6; 748 patent at 2:64-67. This is why the words are "hot" and it necessarily involves the system recognizing *which* words were spoken—not just that *any* words were spoken—which in turn keeps the system from acting upon speech the user did not intend. *See* CIB at 3 ("Speech recognition thus consumes more energy and computational resources than hotword detection."); RIB at 2. Google's reference to a binary "1" or "0" output is a red herring in this regard. Obviously, prior to outputting the "1" (*e.g.*, hotword detected) or "0" (*e.g.*, hotword not detected), a determination must be made as to whether the input signal included the particular word or words; *i.e.*, whether particular words are "recognized" within the signal. This is a form of speech recognition in every ordinary sense. Sonos' expert is persuasive in this regard. *See, e.g.*, Hr'g Tr. (Johnson) at 762:23-763:13 ("hotword detection is a low-vocabulary speech recognizer"), 765:22-768:14, 791:12-23, 1365:2-6; RRB at 4.

Beyond this, there does not appear to be much dispute between the parties. RIB at 8 ("[T]he parties' central dispute is whether performing 'keyword spotting' using a 'hotword detector' that outputs a 'binary' signal (rather than text) qualifies as performing 'speech recognition.'"), 9. As noted, Google provides a definition of "the process of transforming spoken audio into text (*i.e.*, to transcribe) or some other form readable by the claimed computing device." CIB at 12. Sonos

[REDACTED]

argues, “[t]he plain and ordinary meaning of the term ‘speech recognition’ encompasses any process for recognizing speech within a detected input, *regardless* of whether that process outputs text or some other signal.” RIB at 8 (emphasis in original). Surely, the breadth of “some other form readable by” a computer would cover “text or some other signal,” and Sonos does not otherwise dispute Google’s proposal. *See generally* RIB at 8-9; RRB at 4-6. This settles the dispute.

3. “command [to temporarily refrain]”

The parties discuss the meaning of “command” in “command to temporarily refrain” within claim 7, but it is not clear there is a real dispute. Google argues that “‘command’ should be given its plain and ordinary meaning” and “[a] ‘command’ is simply an instruction—*i.e.*, information interpreted by the receiving device—to perform an operation.” CIB at 16-17. Sonos argues, “the plain and ordinary meaning of the term ‘command,’ [] requires a *mandatory order* that instructs or compels a recipient to perform an action.” RRB at 6 (emphasis in original). In both constructions the command is transmitted so as to cause a recipient to perform. This is also the plain and ordinary meaning which—absent lexicography or disclaimer—is appropriate. *Kyocera*, 22 F.4th at 1378. As to Sonos’ further requirement that performance be “mandatory,” this is beyond the plain and ordinary meaning and thus would require that lexicography or disclaimer not alleged to be present. *See generally* RRB at 6-7 (citing previous, unrelated, section 337 investigation as extrinsic evidence).

Accordingly, a “command” receives its plain and ordinary meaning of “instruction to perform an operation.”

4. “temporarily”

The parties discuss the meaning of “temporarily” in the limitation “send, to at least a second computing device from a plurality of computing devices, a command to temporarily refrain from

[REDACTED]

performing speech recognition,” but the dispute is effectively over whether the term is indefinite. *See* RIB at 6-7; RRB at 7-8; CIB at 18-20; CRB at 3-4. The standard for indefiniteness is clear and convincing. *i4i Ltd. P'ship*, 564 U.S. at 95.

Google argues that Sonos has waived this theory under Ground Rule 6 for failure to raise it during *Markman* proceedings. CIB at 19 (citing Order No. 2). Yet the purpose of that rule is notice and Google accepts that “Sonos raised the argument in its final contentions and then in Dr. Johnson’s *opening* expert report.” CIB at 19 (citing JX-0101.33; JX-0020C at ¶¶ 882-91) (emphasis in original).¹ So there can only be *de minimis* prejudice and the theory will not be deemed waived.

Even so, Sonos has not presented a clear and convincing case that “send, to at least a second computing device from a plurality of computing devices, a command to temporarily refrain from performing speech recognition” is indefinite. Sonos provides no expert testimony explaining why a POSITA would fail to appreciate when a command has been sent to cause a computing device to temporarily refrain from recognizing speech. RIB at 6-7; RRB at 7-8. And the cited testimony from Google’s expert, Dr. Mahon, simply shows that “temporarily” is broad and can mean any non-zero, non-infinite, amount of time. RIB at 6 (citing Hr’g Tr. (Mahon) at 393:17-395:3, 215:24-217:6, 392:18-25, 396:13-397:20, 414:3-23). But breadth does not necessarily mean indefiniteness. Moreover, the Federal Circuit has instructed that it is not individual words or even limitations that are judged indefinite, but entire claims. *Cox Commc'ns, Inc. v. Sprint Commc'n Co. LP*, 838 F.3d 1224, 1231-2 (Fed. Cir. 2016) (“As *Nautilus* instructs, the dispositive question in an indefiniteness inquiry is whether the ‘claims,’ not particular claim terms, ‘read in light of the specification delineating the patent, and the prosecution history, fail to inform, with reasonable

¹ JX-0020C does not appear to be in the record.

[REDACTED]

certainty, those skilled in the art about the scope of the invention.”). Sonos has not shown that a person of ordinary skill would fail to understand or recognize “a command to temporarily refrain from performing speech recognition” within the overall claimed computing device of claim 7.

Accordingly, claim 7 has not been shown to be indefinite.

D. Infringement

According to Google’s post-hearing briefing, the use, manufacture, or sale of the 748 Accused Products infringe claims 7, 9, 10. CIB at 20. Of these, claim 7 is independent, claim 9 depends from claim 7, and claim 10 depends from claim 9. For the reasons discussed below, Google has not shown infringement of any claim by the 748 Accused Products or Redesigned Products.

1. Claim 7

For reference, claim 7 of the 748 patent requires:

7. [7.0] A first computing device comprising:

[7.0a] at least one processor; and

[7.0b] at least one module operable by the at least one processor to:

[7.1] receive a spoken audio input that is also received by one or more additional computing devices in physical proximity to the first computing device;

[7.2] determine, based at least in part on information received from the one or more additional computing devices, whether the first computing device should perform speech recognition on the spoken audio input; and

[7.3] responsive to determining that the first computing device should perform speech recognition on the spoken audio input:

[7.3a] send, to at least a second computing device from a plurality of computing devices, a command to temporarily refrain from performing speech recognition;

[7.3b] perform speech recognition on the spoken audio input;

[7.3c] determine, based on performing speech recognition on the spoken audio input, whether the spoken audio input includes a predetermined spoken audio command; and

[7.3d] responsive to determining that the spoken audio input includes the predetermined spoken audio command, execute an action associated with the predetermined spoken audio command.

748 patent at cl. 7 (annotated). The parties dispute whether several limitations are found in the 748 Accused Products.

In support of its theory and limitations [7.0]-[7.2], Google describes

Tr. (Mahon) 166:12-167:17; 234:13-20; Tr. (Jones) 117:21-118:24; JX-344C.4-5, 32-41
JX-3, 20:8-14; Tr. (Mahon) 234:13-20.
Tr. (Mahon) 242:14-243:8; CX-155.2 [Control Sonos with SVC].

....

JX-339C.1; Tr. (Mahon) 196:10-198:10; Tr. (Hartung) 1278:21-1280:16; Tr. (Jones) 117:21-118:24.
Tr. (Jones) 118:25-119:17; Tr. (Mahon) 169:13-22, 198:11-199:2; Tr. (Hartung) 1278:21-1280:16; JX-338C.1; JX-341C.1-2.

JX-562C; JX-586C; Tr. (Jones) 119:18-120:11; Tr. (Mahon) 198:11-199:2.
Tr. (Jones) 119:18-120:11; Tr. (Mahon) 199:3-15; Tr. (Hartung) 1278:21-1280:16.

[REDACTED]

[REDACTED] Tr. (Hartung) 1288:22-1289:22. [REDACTED]

[REDACTED] *Id.*

[REDACTED]

[REDACTED] Tr. (Mahon) 199:16-201:1; Tr. (Jones) 119:18-121:1; Tr. (Hartung) 1288:22-1289:4; JX-338.1-2.

[REDACTED] Tr. (Mahon) 212:4-213:7; Tr. (Jones) 121:2-10; JX-341C.1-2.

CIB at 20-22. In support of limitations [7.3] and [7.3a], Google explains [REDACTED]

[REDACTED]

....

[REDACTED] Tr. (Mahon) 238:4-15.
The second WakeWord message generated by the “winning” device includes an

[REDACTED] Tr. (Mahon) 238:4-15; Tr. (Jones) 120:2-11; JX-341C.2.

Id. at 23-24. And as for limitations [7.3b]-[7.3d], Google discusses [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

Id. at 25.

Google has not shown the 748 Accused Products meet this claim, with particular respect to limitation [7.3a], “send, to at least a second computing device from a plurality of computing devices, a command to temporarily refrain from performing speech recognition.” Order No. 14 determined that “temporarily refrain from performing speech recognition” meant “any and all speech recognition” in accordance with the purpose of the invention:

By designating a particular computing device to monitor for audio input and/or process indications of the audio input (*e.g.*, monitor for one or more predetermined audio commands, such as “hotwords” or “audio triggers”) and sending instructions to the other, non-designated computing devices *to temporarily cease monitoring for audio input*, computing devices and/or systems employing the techniques described herein may increase computational efficiency (by, *e.g.*, avoiding redundant processing, avoiding parallel-processing hazards of operating on the same data, and/or improving device battery life). That is, when more than one computing device is operable to monitor for and/or act on audio input that includes a predetermined audio command, designating a single device to do so may ensure that a single device expends energy in the process, and that a single device performs actions responsive to the receipt of predetermined audio command.

748 patent at 2:64-3:13 (emphasis added); *see* Order No. 14 at 30 (citing 748 patent at 3:7-13, 5:31-39, 10:7-12).

[REDACTED]

[REDACTED]

[REDACTED] Hr’g Tr. (Hartung) at 1289:18-22; Hr’g Tr. (Mahon) at 390:23-391:4; Hr’g Tr. (Johnson) at 1339:24-1341:14. Thus, Google has not shown that a command to refrain from any and all speech recognition has been sent from a first, arbitration-winning device, to those arbitration-losing devices.

[REDACTED]

[REDACTED] CIB at 23-24. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

JX-0341C.3; *see* Hr’g Tr. (Hartung) at 1285:1-1291:25. [REDACTED]

[REDACTED]

[REDACTED]

Nevertheless, it has not been adequately shown what exactly happens when a device loses arbitration, which would inform whether limitation [7.3a], “send . . . a command to temporarily refrain from performing speech recognition,” is met. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

This is the opinion of Google's expert. *See, e.g.*, Hr'g Tr. (Mahon) at 387:16-388:8.

Yet Dr. Mahon cites very little evidence in support of his opinion [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

JX-0341C.1 (emphasis in original); *see* CIB at 22 (citing same). Google's source code expert, Mr. Jones, testified that [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

Hr'g Tr. (Jones) at 120:13-22. Google's technical expert, Dr. Mahon, testified to the same. Hr'g Tr. (Mahon) at 390:23-391:4.

[REDACTED]

[REDACTED]

[REDACTED] Hr'g Tr. (Hartung) at

[REDACTED]

1288:22-25; *see id.* at 1291:6-13. [REDACTED]

[REDACTED]

[REDACTED] *See* JX-0024C at 92:11-93:4, 97:3-99:11. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] *Id.* at 103:21-104:24; *see* JX-0344C.5 (Figure 1.1). [REDACTED]

[REDACTED]

[REDACTED]

Id. [REDACTED]

[REDACTED]

Accordingly, a preponderance of the evidence does not show the 748 Accused Products meet “send, to at least a second computing device from a plurality of computing devices, a command to temporarily refrain from performing speech recognition,” and so they do not infringe claim 7.

As for the Redesigned Products, Google contends, “[t]o the extent the NIAs are found to be ripe for adjudication, NIAs #2 and #5 practice the ’748 Asserted Claims for the same reasons

[REDACTED]

as the Accused Voice Products.” CIB at 27 n.6. Thus, no infringement case has been presented for NIAs #1, #3, #4, #6, #7, and Setup, and NIAs #2 and #5 have not been shown to infringe for the same reasons as the 748 Accused Products. Accordingly, claim 7 is not infringed by the Redesigned Products.

2. Claim 9

For reference, claim 9 of the 748 patent requires:

9. The computing device of claim 7,

wherein the at least one module is further operable by the at least one processor to determine a current context of the first computing device, and

wherein the at least one module is operable by the at least one processor to determine whether the first computing device should perform speech recognition on the spoken audio input further based on the current context of the first computing device.

748 patent at cl. 9. Google contends, as testified by Dr. Mahon, that the claim is met because [REDACTED]

[REDACTED]

[REDACTED] CIB at 26; Hr’g Tr. (Mahon) at 246:20-247:2, 247:15-24. Sonos does not dispute infringement of claim 9 apart from its dependency on claim 7. RIB at 19; *see* RRB at 8-13. In light of the cited evidence and opinion, the additional elements of claim 9 are met in the 748 Accused Products, but claim 9 is not infringed in light of non-infringement of claim 7. As for the Redesigned Products, the parties do not offer any additional discussion for claim 9. Accordingly, Google has not shown the Redesigned Products infringe claim 9.

3. Claim 10

For reference, claim 10 of the 748 patent requires:

10. The computing device of claim 9, wherein the at least one module operable to determine the current context of the first computing device is operable by the at least one processor to determine one or more of: a location of the first computing

[REDACTED]

device, a current time as defined by the first computing device, one or more applications installed at the first computing device, one or more applications currently executing at the first computing device, one or more networks available to the first computing device, one or more other computing devices in proximity to the first computing device, an operating mode of the first computing device, an ambient temperature of the location of the first computing device, an ambient noise level of the location of the first computing device, an ambient light level of the location of the first computing device, a movement of the first computing device, a name of a user of the first computing device, a user identification (UID) of the user of the first computing device, a social media network service account associated with the user of the first computing device, one or more calendars associated with the user of the first computing device, or one or more social relationships of the user of the first computing device.

748 patent at cl. 10. Google contends, as testified to by Dr. Mahon, that [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] CIB at 26; Hr’g Tr. (Mahon) at 246:1-248:19. Sonos does not dispute infringement of claim 10 apart from its dependency on claim 7. RIB at 19; *see* RRB at 8-13. In light of the cited evidence and opinion, the additional elements of claim 10 are met in the 748 Accused Products, but claim 10 is not infringed in light of non-infringement of claim 7. As for the Redesigned Products, the parties do not offer any additional discussion for claim 10. Accordingly, Google has not shown the Redesigned Products infringe claim 10.

E. Domestic Industry – Technical Prong

According to Google’s post-hearing briefing, the DI Products practice claims 7, 9, and 10 of the 748 patent. CIB at 27-28. For the reasons discussed below, Google has not shown by a preponderance of the evidence that the DI Products practice these claims.

1. Claim 7

Claim 7 of the 748 patent is presented above in connection with infringement. The parties dispute several limitations. For limitations [7.1]-[7.2], [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] Tr.
(Gruenstein) 22:14-21, 31:20-32:6, 36:2-9; Tr. (Diaconu) 76:15-23, 100:25-101:8;
Tr. (Mahon) 155:5-19, 173:18-174:8; Tr. (Jones); 112:3-23; JX-166.2-3

r. (Mahon) 211:3-9.

r. (Mahon) 220:16-221:24; JX-158.1.

....

[REDACTED] Tr. Diaconu) 78:6-79:12; Tr.
(Mahon) 174:19-175:15; Tr. (Jones) 112:24-113:16; JX-169C [Back. Level Est.].

r. (Diaconu) 78:6-16; Tr. (Mahon) 176:17-23;
Tr. (Jones) 112:24-113:22.

Tr. (Diaconu) 76:25-77:10, 77:20-5; Tr. (Mahon) 176:24-177:21; Tr. (Jones)
112:24-113:16; JX-156C.7

Tr.
(Diaconu) 77:20-78:5; Tr. (Mahon) 176:24-177:21; Tr. (Jones) 112:24-113:16; JX-
156C.7.

[REDACTED] Tr.
(Diaconu) 82:4-22; Tr. (Mahon) 179:7-11; JX-156.7.

Tr. (Mahon) 220:4-
15; Tr. (Jones) 117:2-10; Tr. (Diaconu) 95:22-97:8; JX-165C.6; JX-154C.12-13.

CIB at 28-29. For limitations [7.3] and [7.3a], Google explains [REDACTED]

[REDACTED]

[REDACTED]

Tr. (Mahon) 215:14-23; Tr. (Jones) 115:10-24.

[REDACTED]

Tr. (Mahon) 216:3-6; Tr. (Jones) 115:25-116:13.

Id. at 30. And in support of limitations [7.3b]-[7.3d], Google describes [REDACTED]

[REDACTED]

[REDACTED]

Id. at 30-31.

Google has not shown the DI Products meet this claim. As with infringement, it does not appear the DI Products receive a command to temporarily refrain from any and all speech recognition [REDACTED]

[REDACTED]

[REDACTED] (CRB at 12). This is corroborated by Google's experts, Dr. Mark Mahon and Mr. Nigel Jones. Hr'g Tr. (Mahon) at 215:24-216:6 [REDACTED]; Hr'g Tr. (Jones) at 116:3-13 [REDACTED]. As determined above, hotword detection is a form of "speech recognition." Thus, Google has not shown a command to refrain from any and all speech recognition is sent [REDACTED], and limitation [7.3a] is not met.

Accordingly, it has not been shown that the DI Products practice claim 7 of the 748 patent.

[REDACTED]

2. Claim 9

Claim 9 of the 748 patent is presented above in connection with infringement. Google contends the term is broad, and includes any “facet of a computing device, including ‘the activities in which computing device 2A is currently engaged.’” CIB at 31 (citing 748 patent at 12:66-13:12). Google continues, [REDACTED]

[REDACTED] *See id.* at 32 (citing Hr’g Tr. (Mahon) at 230:5-19; Hr’g Tr. (Diaconu) at 89:8-90:5). [REDACTED]

[REDACTED] *Id.* (citing Hr’g Tr. (Mahon) at 229:2-230:4). Sonos does not dispute practice of claim 9 apart from its dependency on claim 7. RIB at 30. In light of the cited evidence and opinion, the additional elements of claim 9 are met in the DI Products, but claim 9 is not practiced in light of the non-practice of claim 7.

3. Claim 10

Claim 10 of the 748 patent is presented above in connection with infringement. Google contends [REDACTED] qualifies as the “one or more applications currently executing at the first computing device” of claim 10; and that this matches the example in the 748 patent which [REDACTED] CIB at 32-33 (citing Hr’g Tr. (Mahon) at 229:2-230:4, 232:16-18; 748 patent at 12:56-65). Sonos opposes on the ground [REDACTED]

[REDACTED]

RIB at 30 (citing Hr’g Tr. (Johnson) at 1334:18-1335:7).

[REDACTED]

Google has met its burden. A plain and ordinary meaning of “one or more applications currently executing” can refer to almost any software routine, including [REDACTED]

Sonos presents no intrinsic or extrinsic evidence to justify its restrictive meaning. *See* RIB at 30.

Accordingly, the additional elements of claim 10 are met in the DI Products, but claim 10 is not practiced in light of non-practice of claim 7.

F. Validity

Sonos identifies the following invalidity theories for the 748 patent:

Claims	Theory
7, 9, 10	Anticipated under 35 U.S.C. § 102 by Rosenberger (RX-0819)
9, 10	Rendered obvious under 35 U.S.C. § 103 by Rosenberger (RX-0819) in view of Masahide (RX-0269)
7, 9, 10	Anticipated under 35 U.S.C. § 102 by VoicePod
9, 10	Rendered obvious under 35 U.S.C. § 103 by VoicePod in view of Masahide (RX-0269)
7, 9, 10	Lack of written description under 35 U.S.C. § 112

See generally RIB at 30-45. U.S. Patent No. 8,340,975 (“Rosenberger”) issued December 25, 2012, which was more than one year before the June 24, 2014, effective filing date of the 748 patent. *See* RX-0819. Japanese Patent Application No. P2003-223188A (“Masahide”) was published August 8, 2003, which was also more than one year before the filing date of the 748 patent. *See* RX-0269. Both Rosenberger and Masahide are therefore prior art under 35 U.S.C. § 102(a)(1) (AIA). Google does not contend otherwise. *See* CIB at 34-35, 44-56.

Google does, however, contend that the VoicePod system is not prior art. *See* CIB at 40-53; CRB at 16. As Sonos correctly observes, this contention is new. *See* RRB at 18. Whether or

[REDACTED]

not it appeared in Google's contentions (*see* CRB at 16 n.4), it was not presented in Google's prehearing brief (CPB at 54-55) and Google's own expert admitted at the hearing that VoicePod was prior art to both the 748 and 311 patents (Hr'g Tr. (Mahon) at 1162:11-16). So although Google has preserved certain points regarding VoicePod, it did not timely advance the argument that it does not qualify as prior art, and that specific argument is therefore disregarded. *See* Order No. 2 at G.R. 9.2. The evidence in any event shows that VoicePod was publicly demonstrated at a trade show in September 2012 and on sale in May 2013. *See* RX-0811; RX-0815; Hr'g Tr. (Rosenberger) at 665:14-668:6. It is therefore prior art under 35 U.S.C. § 102(a)(1) (AIA).

1. Rosenberg

Rosenberger discloses an "interactive speech recognition control device" in "radio frequency (RF) communication with other similarly configured devices" that includes a "microcontroller 10 having embedded speech recognition circuitry and software 12." RX-0819 at 6:15-16, 6:44-45, 6:64-65. Rosenberg discloses a scenario where multiple such control devices are located in a residence, and "all successfully 'hear' and recognize [a] speech trigger." *Id.* at 9:57-61. Because this may result in "duplicate response[s]," Rosenberg teaches "several different coordination methods" resulting in selection of "a single control device best able to successfully interact with the system user." *Id.* at 9:37, 10:34-38. One such method involves each device calculating a "weighted signal" and transmitting it to the other devices. *Id.* at 11:42-48. If a particular device waits a predetermined time and receives no higher weighted signal from any other device, it "handle[s] the speech command by interacting with the user as needed," as shown in Figure 4:

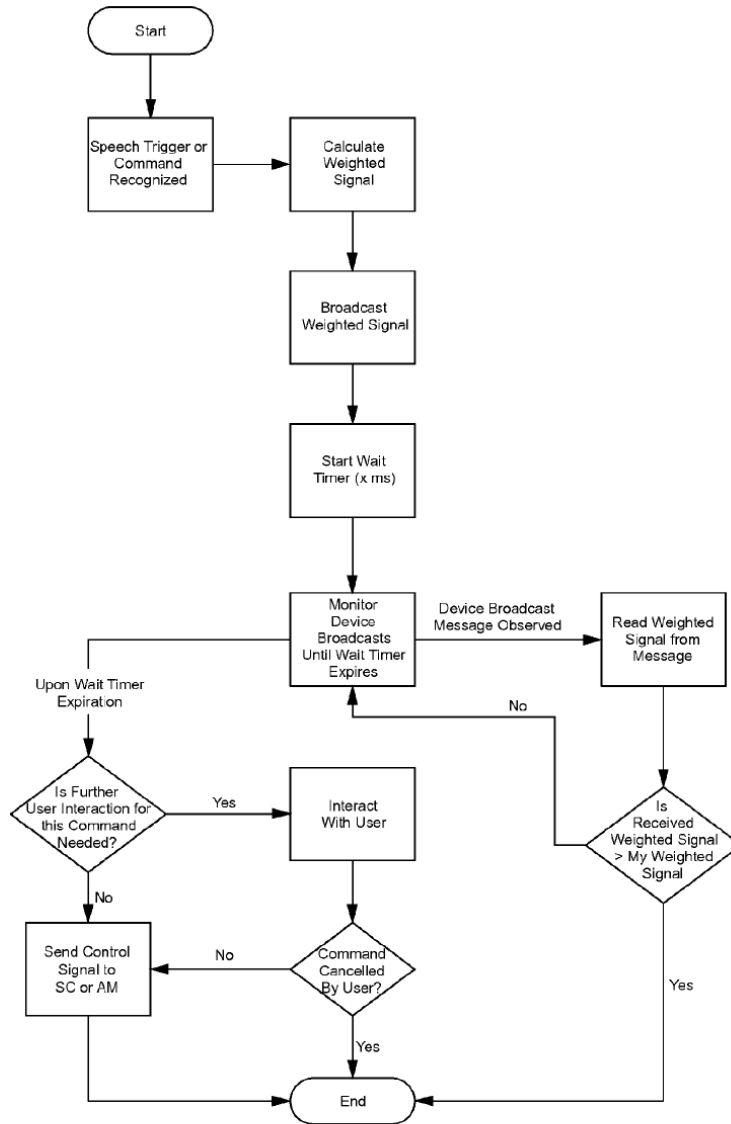


FIG. 4

Id. at 11:66-67, Fig. 4.

a. Claim 7

Rosenberger discloses a device possessing a microcontroller with embedded speech recognition circuitry and software, which qualifies as a computing device with a processor and a module, and with the module operable to receive the spoken audio input. *See* RX-0819 at 6:64-65. The disclosed device is in RF communication with similarly configured devices, and all the devices are close enough to each other to all hear a speech trigger, which meets the requirement of

[REDACTED]

“additional computing devices in physical proximity to the first computing device,” where the additional devices receive the spoken audio input. *See id.* at RX-0819 at 6:44-45, 9:57-61. Dr. Johnson opined that these elements of claim 7 appear in Rosenberger, and Google does not expressly dispute their presence, so these elements are found to be so disclosed. *See Hr’g Tr.* (Johnson) at 838:10-839:19; CIB at 35-39.

The next element requires the first computing device to determine whether to “perform speech recognition on the spoken audio input” based at least in part on information received from the additional computing devices. 748 patent at cl. 7. As explained, “spoken audio input” is construed broadly as “audio input associated with a user’s speech,” and “perform speech recognition” is construed as “the process of transforming spoken audio into text (*i.e.*, to transcribe) or some other form readable by the claimed computing device,” which includes hotword detection. The device in Rosenberger determines the need for “Further User Interaction” based in part on whether other devices send higher “Weighted Signal[s].” RX-0819 at 11:59-12:3, Fig. 4. And that “Further User Interaction” may involve performing speech recognition on a “subsequent speech command,” which qualifies as “spoken audio input” in view of the broad construction of that term. *Id.* at 12:27; *see* RIB at 32 (arguing that the claimed “speech recognition” is of “subsequent commands”).

But in view of the broad construction given to “perform speech recognition,” this element as a whole is not disclosed in Rosenberger. The principal dispute between the parties is over whether Rosenberger’s device “decides” to perform speech recognition, or simply “does so at all times.” *See* RIB at 32; CIB at 36. It is true that Rosenberger’s device “immediately terminates processing” when it receives a higher weighted signal, but it does not terminate all speech recognition processing. RX-0819 at 11:63. Instead, it “resumes listening for a future speech

[REDACTED]

command,” which necessarily requires performing speech recognition on whatever it hears. *Id.* at 11:63-64. Even in the embodiment that uses a “trigger phrase,” followed by a “speech command,” the decision is over which device “handles each discrete speech command,” and not over whether any particular device “perform[s] speech recognition on the spoken audio input.” *Id.* at 9:57-10:14 (describing the trigger phrase “Hello Voice Control,” followed by the speech command “Toggle All Shades”). Dr. Johnson opined, correctly, that “the other devices immediately terminate further processing” to allow the selected device to “handle the subsequent speech command” by itself. Hr’g Tr. (Johnson) at 841:7-15. But “handl[ing]” the speech command refers to the specific processing involved in executing the command, including “interacting with the user as needed and subsequently transmitting the appropriate system control signals,” not speech recognition processing in general. RX-0819 at 11:67-12:2. And Dr. Johnson had no specific response to Google’s contention that speech recognition is continuous in Rosenberger, other than to note that Google had taken inconsistent positions. *See* Hr’g Tr. (Johnson) at 841:19-842:10.

So the “determine” element of claim 7 is not disclosed in Rosenberger. Neither is the entirety of the last group of elements. The responding device in Rosenberger performs speech recognition on the spoken audio input and determines whether the input contains a predetermined spoken audio command:

[the device] prompt[s] the user to say one of the speech commands from a known vocabulary or grammar . . . [and upon] recognizing a particular speech command (and optionally confirming with the user), the device produces and transmits either to a system controller or directly to the automated mechanisms (via its communications circuitry **18**) a corresponding system control signal designed to instruct the appropriate automated mechanisms to carry out the subject of the speech command.

RX-0819 at 8:30-39. The appropriate device then carries out the command. *See id.* at 14:40-45. Dr. Johnson opined that the “perform,” “determine,” and “execute” elements are disclosed by



Rosenberger, and Google does not expressly dispute their presence, so these elements are found to be so disclosed. *See* Hr’g Tr. (Johnson) at 846:12-847:11; CIB at 38-39.

Within the last group of elements, claim 7 also requires that the responding device “send . . . a command to temporarily refrain from performing speech recognition” to at least one other computing device. 748 patent at cl. 7. Even in the embodiment involving a “coordinating controller [that] sends ‘stop’ unicast messages to all triggered control devices except” the responding device, though, the “stop” message merely tells the other devices “not to proceed” with further processing of the spoken audio input, that is, “handling” the input. RX-0819 at 12:52, 13:4-5. Dr. Johnson seemingly opined that the stop command causes termination of all processing of any kind by the other devices, which would necessarily include speech recognition processing. *See* Hr’g Tr. (Johnson) at 845:23-846:7 (the “stop message” causes a “wait state”). By contrast, Dr. Mahon opined that that stop command causes “the other devices [to] be sent back to performing speech recognition.” Hr’g Tr. (Mahon) at 1161:15-21. Dr. Mahon’s testimony is more consistent with Rosenberger; it would make no sense for a “stop” message to cause termination of all processing of any kind, or even just speech recognition, because as explained above, the other devices continuously perform speech recognition on whatever they hear, even after they stop “handl[ing] the speech command.” *See id.* at 11:62-67 (“the device immediately terminates processing and resumes listening for a future speech command”).

So although Rosenberger does teach “send[ing] . . . a command,” that command is not to “temporarily refrain from performing [any and all] speech recognition.” 748 patent at cl. 7. Rosenberger therefore does not disclose either the “determine . . . [to] perform speech recognition” or the “send . . . a command” elements of claim 7, and Rosenberger accordingly does not anticipate it.

b. Claim 9

Dependent claim 9 depends from claim 7 and adds the limitations that the claimed module determines a “current context” of the claimed first computing device, and that the determination to perform speech recognition on the spoken audio input is based on that current context. 748 patent at cl. 9. Sonos identifies the claimed “current context” as “a current time.” RIB at 36. Sonos does not explain, however, how the “current time” influences the determination whether to perform speech recognition. *See id.* at 35-36. Certainly, the length of the “predetermined amount of time” a device waits for a signal affects the determination, but that time interval is set by the “installer” and has nothing to do with the device’s “current context.” RX-0819 at 11:57, 12:11. Dr. Johnson opined that “the current time is used by the wait timer,” but without any explanation or citation to Rosenberger. Hr’g Tr. (Johnson) at 849:23-850:4. And in any event, a timer does not necessarily need to know the current time to measure a time interval, nor does Rosenberger teach that its timer knows the current time. So Sonos has not carried its burden to show that Rosenberger anticipates claim 9, both because it does not disclose the additional elements of that claim, and because it does not disclose the elements of claim 7.

c. Claim 10

Claim 10 depends from claim 9 and recites a list of facts that the claimed module must be operable to determine, including the “current time as defined by the first computing device.” 748 patent at cl. 10; *see* RIB at 36-37. Although it stands to reason that the claimed device overall may possess a clock or other timekeeping device, nothing in Rosenberger expressly discloses a module that determines the current time, much less the “current time as defined by the first computing device.” As explained above, Rosenberger also does not disclose a wait timer that determines the current time, and although Dr. Mahon agreed that “whether a device currently has a timer is a current context,” whether it has a timer does not mean “the current time as defined by the first

computing device” is ever determined by the module. Hr’g Tr. (Mahon) at 1168:2-5. So Sonos has not carried its burden to show that Rosenberger anticipates claim 10, both because it does not disclose the additional elements of that claim, and because it does not disclose the elements of claims 7 and 9.

2. VoicePod

VoicePod was a product developed by HouseLogix, a company founded by Mr. Theodore Rosenberger, who applied for and was issued U.S. Patent No. 8,340,975 as a result of his work on the product:



[REDACTED]

RX-1330; *see* Hr’g Tr. (Rosenberger) at 655:7-18, 662:8-22. The system comprised multiple devices, each of which had processors and a wireless transceiver, and each of which could receive and process spoken audio for “voice recognition” using an “embedded speech recognition chip.” RX-0798C at .00001-2; Hr’g Tr. (Rosenberger) at 670:16-17; *see* RX-0505C at .00001. The system used a default “wake-up phrase” of “hello VoicePod,” but because each device might be placed near enough to each other to hear and respond to the wake-up phrase, it also employed a protocol for “Multi-device coordination.” RX-0798C at .00002; RX-0812 at .00001; *see* Hr’g Tr. (Rosenberger) at 660:11-24. [REDACTED]

[REDACTED] *Id.* at 721:4-11; *see* RX-0819 at 11:37-12:27 (describing “Broadcast and Monitor”).

VoicePod thus possessed many of the elements of claim 7, including the processor, module for receiving audio and performing speech recognition, additional computing devices in physical proximity for receiving spoken audio input, and the ability to determine whether the spoken audio input included a predetermined spoken audio command. *See* 748 patent at cl. 7. Dr. Johnson opined that these elements appear in VoicePod, and as explained below, VoicePod carries out the “determine . . . whether . . . [to] perform speech recognition” step missing from Rosenberger. *See* Hr’g Tr. (Johnson) at 855:3-859:20. Google only expressly contends that it lacked the “send . . . a command to temporarily refrain from performing speech recognition” element, so all the elements other than the “send” and “determine” steps are found to be disclosed. *See* CIB at 53.

Google’s principal contentions regarding VoicePod, in fact, are that Sonos has not sufficiently proven its features and that Mr. Rosenberger was not a credible witness. *See* CIB at 40-53; CRB at 16. For the most part these points were not presented in Google’s prehearing brief.

[REDACTED]

See CPB at 54-55. Google’s prehearing brief instead focused on a lack of source code and, as relevant here, the lack of a “send” element. *See id.* at 54-58.

There may not be any source code for certain VoicePod components obtained from vendors, but there is otherwise no lack of VoicePod source code, because Google’s own expert, Mr. Jones, reviewed it in detail. Hr’g Tr. (Jones) at 1038:22-1042:10. As for the source code for vendor-derived components, Google’s main point is that there is a lack of it for the speech recognition chip. *See* CIB at 43. But VoicePod performed speech recognition, as Google’s own expert confirmed, so it is not clear why the associated source code is needed. *See* Hr’g Tr. (Mahon) at 1134:25-1135:13. And although Google has offered evidence tending to undermine Mr. Rosenberger’s credibility, his testimony is corroborated by extensive documentation, including the patent he obtained after carrying out the VoicePod research and development work. It is entirely reasonable that VoicePod worked generally in the manner disclosed in Rosenberger, although as explained below its source code introduced certain crucial differences, and Mr. Rosenberger admitted he was not the “firmware expert.” Hr’g Tr. (Rosenberger) at 702:17-24. So even considering Google’s credibility evidence, it is not enough to undermine confidence in the general outlines of how VoicePod worked, and inasmuch as Mr. Rosenberger testified as a lay witness about VoicePod source code, his testimony is accorded less weight than that of the expert witnesses. Google’s other criticisms of Sonos’ evidence (except for the “send” element) were not properly disclosed in its prehearing brief and have been disregarded. *See* Order No. 2 at G.R. 9.2.

a. Claim 7

As for the “send” element, the weight of the evidence shows that it was present in VoicePod. [REDACTED]

[REDACTED] Hr’g Tr. (Rosenberger) at 721:4-11;
RX-0819 at 11:45-48, 12:49-52. [REDACTED]

[REDACTED]

to temporarily refrain from performing speech recognition” sent by the first computing device “to at least a second computing device,” responsive to the determination that the first device “should perform speech recognition on the spoken audio input.” 748 patent at cl. 7. Google’s only substantive argument against this conclusion is that its expert, Dr. Mahon, tested VoicePod and “multiple devices would start responding. There was no refraining.” Hr’g Tr. (Mahon) at 1134:25-1135:13; *see* CIB at 53. But VoicePod did not need to work perfectly every time to disclose an apparatus “operable to . . . send” a command to refrain from performing speech recognition, and its source code shows it plainly was so operable. *See Hewlett-Packard Co. v. Mustek Sys., Inc.*, 340 F.3d 1314, 1326 (Fed. Cir. 2003).

The “send” element was therefore present in VoicePod. Although Google does not explicitly dispute the presence of the “determine” element, that issue merits examination in view of the similarity between VoicePod and Rosenberger (which lacks that element). *See* CIB at 53.

[REDACTED]

[REDACTED] Hr’g Tr. (Johnson) at 858:19-859:3. [REDACTED]

[REDACTED]

[REDACTED] *Id.* at 865:24-866:12. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

Accordingly, all the elements of claim 7 were present in VoicePod, and VoicePod anticipates claim 7.

[REDACTED]

b. Claim 9

Sonos contends that the claimed “current context” is met by three features of VoicePod:

[REDACTED]

[REDACTED] *See*
CIB at 54. [REDACTED]

[REDACTED] Hr’g Tr. (Johnson) at 865:14-23 (citing RX-1285C, RX-
1289C). [REDACTED]

[REDACTED] RX-0962C.23; Hr’g Tr.
(Rosenberger) at 720:10-11. [REDACTED]

[REDACTED]

[REDACTED] *See* Hr’g Tr. (Johnson) at 866:22-867:18. [REDACTED]

[REDACTED]

[REDACTED] *E.g.*, Hr’g Tr. (Rosenberger) at 720:10-11.

Therefore, VoicePod was operable to: (1) determine its current time, and then to determine whether to exit the wait state and enter the trigger state; (2) determine its EmberID, and for each device to compare its EmberID to other devices’; and then (3) determine whether to restart performing speech recognition based on current time, or to continue performing speech recognition based on EmberID. *See* Hr’g Tr. (Johnson) at 865:14-867:18. This meets the requirement that the first computing device’s module is operable to determine a current context, and to determine whether to perform speech recognition on the spoken audio input based on that current context. *See* 748 patent at cl. 9.

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] Hr’g Tr. (Johnson) at 865:24-866:12. [REDACTED]

[REDACTED]

[REDACTED] CIB at 54; *see* CPB at 59.

VoicePod accordingly discloses the additional elements of claim 9, and thus anticipates it.

c. Claim 10

Sonos asserts that VoicePod meets the additional limitations of Claim 10 by virtue of using

[REDACTED] *See* RIB at 41-42. Google has no dispute with this beyond its arguments regarding claim 9. *See* CIB at 55. [REDACTED]

[REDACTED]

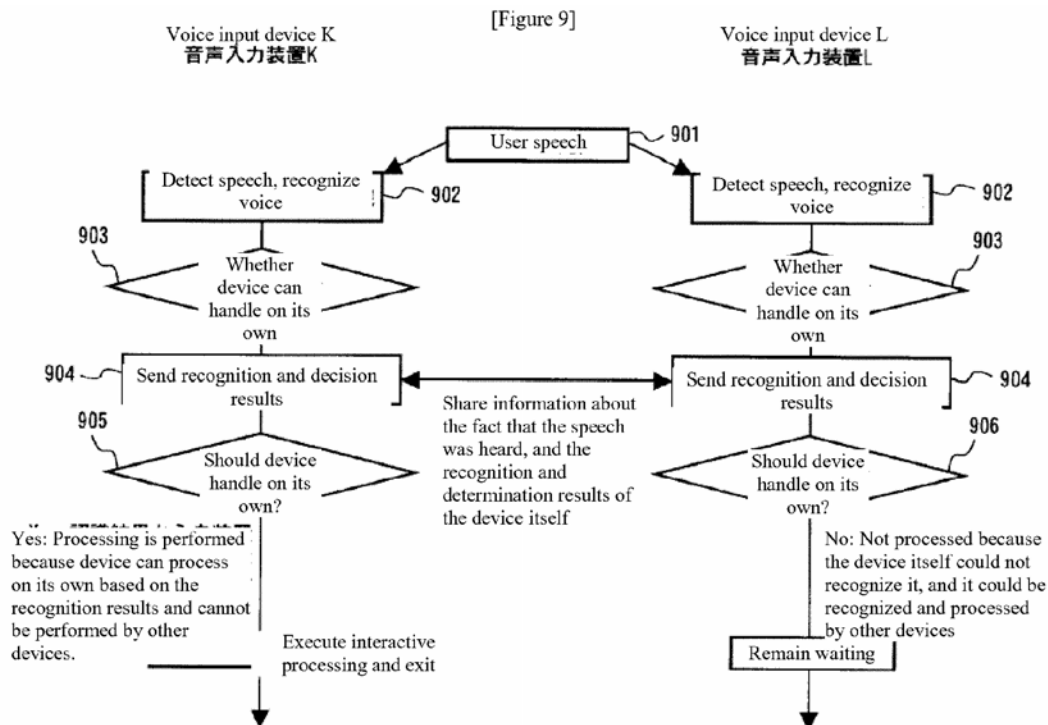
[REDACTED] *See* Hr’g Tr. (Johnson) at 868:2-13. Therefore, VoicePod possesses the additional elements of claim 10, and accordingly anticipates it.

3. Obviousness

For dependent claims 9 and 10, Sonos contends they are disclosed in both Rosenberger and VoicePod (discussed above) and also obvious over the combinations of Rosenberger and Masahide, and VoicePod and Masahide. RIB at 36-37, 42-43. As determined, VoicePod anticipates claims 7, 9, and 10. Because anticipation is “the epitome of obviousness,” there is no need to consider the obviousness of these claims of the 748 patent over the combination of VoicePod and Masahide. *Certain Wearable Electronic Devices with ECG Functionality and Components Thereof*, Inv. No. 337-TA-1266, Comm’n Op. at 45 (Jan. 20, 2023) (“*Wearable Electronic Devices*”) (citations and quotations omitted); *see* RIB at 42-43. Rosenberger, however, fails to anticipate claim 7, so Sonos’ theory that claims 9 and 10 would have been obvious over the combination of Rosenberger and Masahide will be considered. *See Wearable Electronic*

Devices at 46 (considering obviousness, but finding anticipation cannot be found because it was not asserted as a defense).

Masahide discloses “a plurality of voice input devices” networked together, with each device sharing “determinative information” that is used to determine which device will “process[] and execut[e]” the voice input. RX-0269 at [0004]. Each voice input device includes a signal processing unit capable of speech recognition. *Id.* at [0016]. In one embodiment, the “determinative information” used to identify which device will respond to the voice input is the “voice recognition results,” which are used to establish which “input device was spoken to.” *Id.* at [0067]. Masahide provides an example involving the voice command “play,” where one input device is attached to a video player and another device is attached to an air conditioner, and that command is “associated with” the video player:



Id. at [0065]-[0066], Fig. 9.

[REDACTED]

Sonos contends Masahide also discloses making an arbitration decision based on the “current context” of the device, such as the device’s “‘processing status’ or ‘status monitoring’ indicating whether it is in ‘dialogue mode’ (claimed ‘operating mode’) or ‘speech detection time’ (claimed ‘current time’), among other current contexts.” RIB at 36 (citing RX-0269 at [0029]-[0032], [0052]-[0057], [0104]-[0107], Figs. 3, 5). Google does not dispute that these disclosures constitute the limitations of claims 9 and 10. CIB at 55-57; CRB at 16-17. Thus, they are determined to be found in Masahide as alleged.

Google does dispute, however, whether it would have been obvious to incorporate these contexts into Rosenberger’s arbitration decision. CIB at 55-57; CRB at 16-17. Here, Sonos argues Rosenberger and Masahide are within the same field of art and:

A POSITA would have recognized Masahide’s context-based arbitration promotes efficiency by selecting a device already in “dialogue mode” with the user or having better processing performance than others. *Id.* A POSITA would also have recognized, as demonstrated and expressed in Masahide, that current context would supplement and be combined with a coordination technique like Rosenberger’s, so the system selects the control device most appropriate for handling the user’s request. *See, e.g.,* RX-269, ¶¶29, 33-34, 104-07.

RIB at 37. Google argues the combination is the product of impermissible hindsight, and that Sonos’ expert, Dr. Johnson, “does not offer any basis for his assertion or any indication that a person of skill, at the time of the invention of the asserted claims, would have sought to make such alleged improvements separate from the teachings of the ’748 patent itself.” CIB at 57; CRB at 17 (“Sonos has provided no evidence to support this conclusory statement [of promoting efficiency].”).

Google is incorrect. It is black letter law that motivation to combine references need not be explicitly found within the references themselves (*see KSR*, 550 U.S. at 418), but Masahide

[REDACTED]

provides it here in any case. In the paragraph immediately following disclosure of the “dialogue state” context consideration, Masahide states, “[t]his makes it possible for users to easily access only voice input devices that are currently targeted for voice input, even if the voice of the user is detected by multiple voice input devices.” RX-0269 at [0034]. Masahide also teaches that allowing a user to set or program the types of contexts that are considered for arbitration permits “the user to control the above-mentioned determination according to their own preferences, such as when it is currently not possible to process using a given voice input device, or when correcting recognition errors by focusing more on the recognition results of voice input devices with better performance than their own devices.” *Id.* at [0105]. These disclosures are persuasive and match the 748 patent’s stated goal of using contexts to determine which device would be “the best candidate for monitoring environmental audio for audio input that includes the one or more predetermined audio commands.” 748 patent at 2:45-52. Considering that Masahide is prior art to the 748 patent, there can be no hindsight bias here. And no party presents argument on objective indicia of non-obviousness. RIB at 37 n.16.

Accordingly, it has been shown that the limitations of claims 9 and 10 are disclosed in Masahide and would have been obvious to include in the system of Rosenberger; but the claims are not invalid as obvious because of their dependence on claim 7 and its missing limitations.

4. Section 112

Under the written description requirement of Section 112, a patent’s specification must “reasonably convey[] to those skilled in the art that the inventor had possession of the claimed subject matter as of the filing date.” *Ariad Pharm., Inc.*, 598 F.3d at 1351. Sonos argues that the written description of the 748 patent lacks sufficient disclosure of a “spoken audio input” that is both: (1) received by one or more additional computing devices and used to “designate a ‘first computing device’ to perform speech recognition”; and (2) “subsequently processed” by the first

[REDACTED]

computing device to determine whether it includes a predetermined spoken audio command. RIB at 43-45.

Sonos is incorrect because it misreads the claim language. While the recited order of the elements in claim 7 certainly suggests it (“receiving” precedes “determining”), claim 7 does not actually require using the received “spoken audio input” for arbitration. On its face, the “determining” limitation is silent as to the bases on which the determination is made other than “information received from the one or more additional computing devices”; *i.e.*, any information will do: “determining, by the first computing device and based at least in part on information received from the one or more additional computing devices, whether the first computing device should perform speech recognition on the spoken audio input . . .” 748 patent at cl. 7. This is perfectly consistent with the patent’s examples of resolving arbitration based on manually created hierarchies of devices (*id.* at 7:37-43, Fig. 3), the number of commands which may be acted upon by the device (*id.* at 8:14-22), location contexts of the devices (*id.* at 8:26-35), and so on—none of which involve the received “spoken audio input.” Claim 7 is thus distinguishable from, for example, the asserted claims of the 311 patent, which recite arbitration based on values received from each device and where the values are “*associated* with the voice input.” 311 patent at cl. 10 (emphasis added).

In sum, a plain reading of claim 7 does not require using “spoken audio input that is also received by one or more additional computing devices” to “determine[e] . . . whether the first computing device should perform speech recognition on the spoken audio input.” Sonos’ written description argument therefore fails as a matter of law.

V. U.S. PATENT NO. 11,024,311

A. Level of Ordinary Skill in the Art

In Order No. 14, I determined that a person having ordinary skill in the art of the 311 patent at the time of invention:

[W]ould have a B.S. degree in electrical or computer engineering, or a related field, and approximately 2-4 years of experience in the field of voice and/or audio processing, or an equivalent level of skill, knowledge, and experience. . . . [E]xperience may substitute for education and vice versa.

Order No. 14 at 8. The parties do not challenge this definition (*see generally* CIB; CRB; RIB; RRB), and it is applied throughout this initial determination.

B. Claims-at-Issue

Claims 10, 11, and 16-19 of the 311 patent are at issue in this investigation, either through allegations of infringement or domestic industry technical prong. *See* CIB at 7-8. These claims are reproduced below, along with limitation identifiers:

10. [10.0] A first electronic device of a plurality of electronic devices, the first electronic device comprising:

one or more microphones;

one or more processors; and

memory storing one or more programs to be executed by the one or more processors, the one or more programs comprising instructions for:

[10.1] detecting a voice input from a user;

[10.2] determining a first value associated with the voice input;

[10.3] receiving second values associated with the voice input from other electronic devices of the plurality of electronic devices; and

[10.4] in accordance with a determination that the first value is higher than the second values, responding to the detected input.

11. The first electronic device of claim 10, the one or more programs further comprising instructions for:

recognizing a command in the voice input; and

in accordance with a determination that a type of the command is related to the first electronic device, responding to the detected voice input.

....

16. [16.0] A system comprising a plurality of electronic devices, each of the electronic devices including one or more microphones, one or more processors, and memory storing one or more programs for execution by the one or more processors, each of the electronic devices programmed to:

[16.1] detect a voice input;

[16.2] determine a first value associated with the detected voice input;

[16.3] receive respective second values from other electronic devices of the plurality of electronic devices;

[16.4] compare the first value and the respective second values; and

[16.5] in accordance with a determination that the first value is higher than the respective second values, respond to the voice input.

17. The system of claim 16, wherein the first value comprises a first quality score of the voice input.

18. The system of claim 17, wherein the first quality score comprises a confidence level of detection of the voice input.

19. The system of claim 17, wherein the first quality score comprises a signal-to-noise rating of detection of the voice input.

311 patent at cls. 10 (annotated), 11, 16 (annotated), 17-19.

C. Claim Construction

As part of the *Markman* process, the following claim terms of the 311 patent were construed, either as agreed between the parties or determined by Order No. 14:

Claim Term	Construction
“second values . . . from other electronic devices” / “second values from other electronic devices of the plurality of electronic devices”	“other electronic devices” does not mean “two or more” “second values” does not mean “two or more”
“in accordance with a determination that the	Not indefinite for reciting contradictory steps

first value is higher than the second values”	
---	--

See Order No. 14 at 37, 46. Within their briefing, the parties identify a number of additional claim construction disputes, discussed below.

1. “detect[ing] a voice input”

The parties provide extensive discussion of “detecting a voice input” within claims 10 and 16 (CIB at 62-69; CRB at 20-25; RIB at 45-50; RRB at 26-32) although the disputes are not particularly clear. For example, Google’s reply brief states:

The parties have two fundamental disputes regarding the meaning of “detecting a voice input”: (1) whether “detecting a voice input” encompasses all forms of detection, including voice activity detection and hotword/wakeword detection, and (2) whether “detecting a voice input” requires detection of voice, as opposed to noise or other sound. SPostHB 45-50. For both, the answer is yes.

CRB at 20. While Sonos’ reply states, “the plain and ordinary meaning of ‘detecting a voice input’ is perceiving or sensing voice via a microphone, and nothing more.” RRB at 26. It would seem that Sonos’ proposed construction is broad enough to capture both of Google’s scenarios (1) and (2).

Nevertheless, it may be that Sonos intends its definition, “perceiving or sensing voice via a microphone, and nothing more,” as requiring only the mere capture of voice and not an appreciation or awareness that voice has been so captured. Sonos states: “Both passages use the phrase ‘detect the voice input’ in reference to ‘*capturing*’ a ‘voice input sample,’ which is just a synonym for *perceiving or sensing* a voice input and does not say anything about identifying that an audio input includes voice as distinguished from some other type of noise.” RRB at 27 (emphasis in original); see CRB at 24-25.

This is incorrect. The plain and ordinary meaning of “detect[ing] a voice input” is determining that a voice has been heard. Certainly, merely being exposed to a voice input is not

[REDACTED]

enough. Capturing and/or storing that signal without any identification of whether there is a voice within is also insufficient. A metal detector waved over a bottle cap in the sand, without beeping, has not “detected” that metal cap.

This is entirely consistent with the 311 patent, whose aim to is to improve the responsiveness of devices that respond to a user’s voice commands. *See, e.g.*, 311 patent at Abstract, 1:51-59. The patent calls them “voice-activated functions” (*id.* at 1:51-59, 5:20-40) and explains:

Specifically, the voice inputs received at the electronic device can carry instructions and information even if a user's line of sight is obscured and his hands are full. To enable a hands-free and eyes-free experience, the voice-activated electronic device listens to the ambient (*i.e.*, constantly processes audio signals collected from the ambient) constantly or only when triggered. On the other hand, user identities are linked with a user's voice and a language used by the user. To protect the user identities, these voice-activated electronic devices are normally used in non-public places that are protected, controlled and intimate spaces (*e.g.*, home and car).

Id. at 5:28-40. It reasonably and logically follows that voice-activated devices are activated upon identifying voice inputs as opposed to merely being exposed to voice inputs. Otherwise they would be constantly running the claimed processing algorithms to no purpose, contrary to the above excerpt.

Moreover, there is not a single use of “detect,” “detects,” “detecting,” “detected,” or “detection” of voice in the 311 patent where the device that detects is somehow unaware of what it detected, as would be the scenario under Sonos’ construction. Sonos argues there is an example where “the function of ‘detecting a voice input’ is distinct from and precedes the function of ‘processing’ the ‘voice input.’” (RIB at 46 (citing 311 patent at 23:18-32)). But “processing” here must refer to other, undefined, steps because according to the claims “detect[ing] a voice input” is something the device is programmed (*i.e.*, the acts of a processor) to do:

[10.0] . . . memory storing one or more programs to be executed by the one or more processors, the one or more programs comprising instructions for:

[10.1] detecting a voice input from a user;

. . . .

[16.0] A system comprising a plurality of electronic devices, each of the electronic devices including one or more microphones, one or more processors, and memory storing one or more programs for execution by the one or more processors, each of the electronic devices programmed to:

[16.1] detect a voice input;

311 patent at cls. 10, 16 (excerpted). The actual claim language here is instructive. *Interactive Gift Express*, 256 F.3d at 1331 (“In construing claims, the analytical focus must begin and remain centered on the language of the claims themselves, for it is that language that the patentee chose to use to ‘particularly point [] out and distinctly claim [] the subject matter which the patentee regards as his invention.’”).

And indeed, the cited excerpt is altogether vague and does not make the distinction Sonos claims:

In some implementations, the electronic devices 1002 that are not the leader also power down their microphones 516, and thus do not detect further voice inputs from the user; the leader device also is the leader with respect to detection and processing of further voice inputs from the user. In some implementations, the electronic devices 1002 that are not the leader maintain power to their microphones 516 and provide assistance re detection of further voice inputs from the user. For example, the leader device and the non-leader devices receive and record respective samples of a voice input and transmit them to the voice assistance server 112, which may use the multiple samples together to better process the voice input (*e.g.*, aggregate the samples, choose the best sample for processing, compare the samples to get the best parts of each).

311 patent at 23:18-32. The mere capture or reception of voice, without awareness that it was voice, is not meaningful to this invention, and thus not how a person of ordinary skill would understand “detect[ing] a voice input.” *See Edgewell Personal Care Brands, LLC v. Munchkin, Inc.*, 998 F.3d 917, 921-22 (Fed. Cir. 2021) (reversing lower court’s construction of a “clearance”

[REDACTED]

that ignored its disclosed function); *Medrad, Inc. v. MRI Devices Corp.*, 401 F.3d 1313, 1317 (Fed. Cir. 2005) (referencing an MRI imaging patent’s problem statement in construing “region of interest”). Google’s explanation is much more accurate. It “refers to identifying that an audio input includes voice (rather than any type of noise).” CIB at 63.

If there is a remaining dispute it may be Google’s contention that “detect[ing] a voice input” is “separate and distinct from performing speech recognition on the voice input.” CIB at 62-63. Sonos, for instance, argues, “there is nothing in the ’311 Patent that redefines the plain and ordinary meaning of ‘detecting a voice input’ or disclaims ‘speech recognition’ as a means for ‘detecting a voice input.’” RIB at 48 (citing Hr’g Tr. (Mahon) at 1150:19-1151:7).

This is not a question of claim construction, however. Unlike the 748 patent, which involves similar subject matter, “speech recognition” is not a claim term of the 311 patent. In fact, it is not used in the 311 patent at all. Thus, asking whether or not “speech recognition” satisfies “detect[ing] a voice input” is more of an evaluation of practice or disclosure of the patent claim, rather than the meaning of the words selected by the patentee to define the metes and bounds of the invention. *Markman*, 52 F.3d at 976 (“An infringement analysis entails two steps. . . . The second step is comparing the properly construed claims to the device accused of infringing.”); *see* RRB at 28-29 (asserting the dispute arises because of prior art). For this reason, the parties’ question need not be resolved on its own. Suffice it to say, “speech recognition” or any other feature of an accused product, meets “detect[ing] a voice input” if it involves “receiving and identifying a voice input.”

2. “confidence level of detection”

Claim 18 recites, “[t]he system of claim 17, wherein the first quality score comprises a confidence level of detection of the voice input.” 311 patent at cl. 18. For “confidence level of detection,” Sonos proposes a construction of “a measure of the quality or closeness of the match

[REDACTED]

between a voice model and the voice input.” RIB at 51 (citing 311 patent at 24:42-48; Hr’g Tr. (Mahon) at 1166:13-1167:2; Hr’g Tr. (Johnson) at 898:6-24). Google argues that this is too narrow and taken from an unrelated “Multi-User Personalization” embodiment in the specification. CIB at 70; CRB at 25-26 (citing 311 patent at 24:23-48). In its place, Google proposes a plain and ordinary meaning of “a measure of the likelihood that an audio signal includes speech, and indicates a level of confidence that a voice input was detected.” CIB at 70 (citing Hr’g Tr. (Mahon) at 1166:4-12); CRB at 26 (citing 311 patent at 30:44-46).

Google is correct that Sonos’ construction comes *verbatim* from an unrelated embodiment, and for that reason is both unrelated and too narrow. A comparison between a “voice model” and a “voice input” is unique to the stringent requirements of the 311 patent’s user-identification feature, where the voice models had to have been previously trained-in by a user. *See, e.g.*, 311 patent at 2:23-34, 10:20- (“The information requested may be personal (*e.g.*, the user’s emails, the user’s calendar events, the user’s flight information, etc.), non-personal (*e.g.*, sports scores, news stories, etc.) or somewhere in between . . .”). They are also referred to as “voice fingerprints.” *Id.* at 5:45-47. Yet Sonos has not shown that sophisticated voice models are relevant to the initial act of “detect[ing] a voice input from a user.” 311 patent at cl. 16; 30:44-50. Thus, to the extent there is specific meaning to a match involving a “voice model,” it is not adopted.

The remainder of Sonos’ construction, “a measure of the quality or closeness” is synonymous with Google’s “a measure of the likelihood” and also with a plain and ordinary meaning of measuring the strength or weight of a determination. And given that “detect[ing] a voice input” refers to identifying that an audio input includes voice, determined above, it is reasonable to assign a “confidence level of detection” the plain and ordinary meaning, “a measure of the likelihood that an audio input includes voice.”

3. “signal-to-noise rating”

Claim 19 recites, “[t]he system of claim 17, wherein the first quality score comprises a signal-to-noise rating of detection of the voice input.” 311 patent at cl. 19. The parties dispute the meaning of “signal-to-noise rating.” Google proposes that, “a POSITA would understand the phrase ‘signal-to-noise rating’ to refer to a rating that quantifies a ratio or relationship between the level of signal and the level of noise in an application or environment” and argues this construction is consistent with the specification. CIB at 70-71 (citing Hr’g Tr. (Mahon) at 205:9-206:20; 311 patent at 30:47-50). Sonos, on the other hand, emphasizes a difference between a signal-to-noise *rating* and *ratio* and that, correspondingly, “a POSITA would understand that “signal-to-noise rating” refers to “a measure reflecting detected voice signal and noise” and is not limited to “signal-to-noise ratio” – which has a narrower definition that requires a ratio of signal power to noise power.” RIB at 50 (citing Hr’g Tr. (Johnson) at 806:8-807:6; RX-0565.4-5).

Google has the more persuasive position. Sonos warns that imputing any kind of “ratio or relationship” into the “signal-to-noise” metric is impermissibly limiting the claim to the embodiments. Sonos states, “[a] signal-to-noise *ratio*’ is merely disclosed as one possible example of the term ‘signal-to-noise rating.’” RRB at 33 (citing 311 patent at 30:47-50; *Phillips*, 415 F.3d at 1323).

Sonos is correct that “signal-to-noise” is disclosed in one discrete portion of the specification: “In some implementations, the quality score includes a signal-to-noise rating of detection of the voice input; the quality score is a signal-to-noise rating or value (*e.g.*, signal-to-noise ratio) for the voice input sample.” 311 patent at 30:44-50. But at least some kind of relationship between the signal noise is inherent in the hyphenated phrasing “signal-to-noise.” CRB at 26 (citing Hr’g Tr. (Mahon) 205:9-206:20 (“A person of ordinary skill in the art would understand that a ratio is an actual value of a sig/noise rating.”)). Google’s construction captures

[REDACTED]

this comparative concept whereas Sonos’ construction reports measured signal and noise levels without perspective. In this way Sonos vitiates the claim element, which is not preferred. *Merck & Co. v. Teva Pharms. USA, Inc.*, 395 F.3d 1364, 1372 (Fed. Cir. 2005) (“A claim construction that gives meaning to all the terms of the claim is preferred over one that does not do so.”); *see SSI Techs., LLC v. Dongguan Zhengyang Elec. Mech. LTD.*, 59 4th 1328, 1335 (Fed. Cir. 2023) (“The use of the term ‘measured volume’ therefore indicates that claim 1 requires that the volume of the liquid in the tank must be determined and considered as part of the contamination analysis recited in claim 1.”). To the extent Google further seeks to require a “quantification” of that relationship (CIB at 70-71), that would not seem to be the plain meaning of “rating,” which could conceivably be expressed in qualitative as well as quantitative terms. Google offers no expert testimony on this particular point (*see* CIB at 70-71; CRB at 26-27), and it is not adopted.

Accordingly, “signal-to-noise rating” is best construed broadly as meaning “a measure of a relationship between the level of signal and the level of noise.”

D. Infringement

According to Google’s post-hearing briefing, the use, manufacture, or sale of the 311 Accused Products infringe claims 10, 16, 17, 18, and 19. CIB at 71. Of these, claims 10 and 16 are independent, with claims 17-19 all depending from claim 16. For the reasons discussed below, Google has shown infringement of claim 10 by the 311 Accused Products and by Redesigned Products NIAs #5, #7. No other claims are infringed by any Accused or Redesigned Products.

1. Claim 10

For reference, claim 10 of the 311 patent requires:

10. [10.0] A first electronic device of a plurality of electronic devices, the first electronic device comprising:

one or more microphones;

[REDACTED]

one or more processors; and

memory storing one or more programs to be executed by the one or more processors, the one or more programs comprising instructions for:

[10.1] detecting a voice input from a user;

[10.2] determining a first value associated with the voice input;

[10.3] receiving second values associated with the voice input from other electronic devices of the plurality of electronic devices; and

[10.4] in accordance with a determination that the first value is higher than the second values, responding to the detected input.

311 patent at cl. 10 (annotated). In support of infringement, Google relies on [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] Tr. (Mahon) 166:12-167:17; 195:1-196:9; Tr. (Jones) 117:21-118:24; JX-344C.4-5, 32-41

[REDACTED] Tr. (Mahon) 195:24-196:9; CX-224.1

[REDACTED] JX-24C, 71:17-72:19, 78:5-79:4; Tr. (Mahon) 195:1-196:9.

[REDACTED] Tr. (Hartung) 1274:18-1277:2; JX-344C.5.

[REDACTED] *Id.*

[REDACTED] X-339C.1; Tr. (Mahon) 196:10-198:10; Tr. (Hartung) 1278:21-1280:16; Tr. (Jones) 117:21-118:24.

[REDACTED]

[REDACTED]

Tr. (Mahon) 169:13-22, 198:11-199:2; Tr. (Hartung) 1278:21-1280:16; Tr. (Jones) 118:25-119:17; JX-338C.1. [REDACTED]

Tr. (Hartung) 1278:21-1280:16; Tr. (Jones) 118:25-119:17; Tr. (Mahon) 198:11-199:2. [REDACTED]

r. (Hartung) 1278:21-1280:16; Tr. (Jones) 118:25-119:17; Tr. (Mahon) 198:11-199:2.

[REDACTED]

Tr. (Mahon) 199:16-201:1; Tr. (Jones) 119:18-121:1; Tr. (Hartung) 1288:22-1289:4; JX-341C.133.

r. (Hartung) 1288:22-1289:4; Tr. (Jones) 120:19-121:1; Tr. (Mahon) 199:16-201:1.

CIB at 71-74. The 311 Accused Products infringe the limitations of claim 10 as alleged in view of the testimony of Dr. Mahon.

Sonos does not dispute infringement except to assert that direct infringement of claim 10 of the 311 patent requires “evidence that Sonos places an SVC Product into a system along with another SVC Product.” See RIB at 51-52; RRB at 33. Sonos offers a similar argument regarding claim 16, a “system” claim: “[t]o meet its burden of proving direct infringement of claim 16, Google must show that Sonos has committed any act of infringement with respect to ‘the complete invention’ of this ‘system’ claim.” RIB at 52 (citing *Synchronoss Techs., Inc. v. Dropbox, Inc.*, 987 F.3d 1358, 1368-69 (Fed. Cir. 2021)); RRB at 33. Sonos continues:

Google has not done so. In particular, Google has not shown that Sonos “imports,” makes,” “offers for sale,” or “sells” a complete “system” comprising a plurality of

[REDACTED]

SVC Products that have the capability required by claim 16. *Id.* And Google also has not shown that Sonos “uses” a complete “system” comprising a plurality of SVC Products that have the claimed capability, which requires evidence that Sonos “put the invention into service, *i.e.*, control[ed] the system as a whole and obtain[ed] benefit from it.” *Id.* (citation omitted).

RIB at 52; *see* RRB at 33 (“an accused device will not have [the capability recited in claim 10] until it has been placed into a system with that other device”).

Sonos is not persuasive. The need for a plurality of 311 Accused Products to produce infringement comes from the preamble, “[a] first electronic device of a plurality of electronic devices, the first electronic device comprising,” the construction of which the parties have not briefed. 311 patent at cl. 10. Preambles generally are not limiting, but can be if they recite essential structure or steps, or are necessary to give life, meaning, and vitality to the claims. *See TomTom, Inc. v. Adolph*, 790 F.3d 1315, 1323 (Fed. Cir. 2015) (citations omitted); *Am. Med. Sys. V. Biolitec, Inc.*, 618 F.3d 1354, 1358 (Fed. Cir. 2010). For claim 10, the device must have “one or more programs,” meaning that actual operation is unnecessary to satisfy the claim limitations, and both the device hardware (microphones, processors, and memory) and programming are recited. *See* 311 patent at cl. 10. So the body of each claim recites a structurally complete invention, and nothing about the preamble gives life, meaning, or vitality to the claims. Therefore, proof of direct infringement by a 311 Accused Product does not require “evidence that Sonos places an SVC Product into a system along with another SVC Product.” RIB at 52; *see Texas Advanced Optoelectronic Solutions, Inc. v. Renesas Electronics America, Inc.*, 895 F.3d 1304, 1327 (Fed. Cir. 2018) (“infringement of the apparatus claims requires that Intersil's products have the ability to perform in Mode 3, [but] infringement does not require actual use of Intersil's products in Mode 3”). And Google’s expert’s agreement that a single device alone would not infringe claim 7 of the

[REDACTED]

748 patent has little relevance to claim 10 of the 311 patent. *See* RIB at 51 (citing Hr’g Tr. (Mahon) at 417:14-419:21).

Accordingly, Google has shown the 311 Accused Products infringe claim 10.

As for the Redesigned Products, Google contends, “[t]o the extent the NIAs are found to be ripe for adjudication, NIAs #5 and #7 practice the ’311 Asserted Claims for the same reasons as the Accused Voice Products.” CIB at 76 n.17. Sonos does not dispute that NIAs #5 and #7 infringe on any grounds particular to their redesigns. RIB at 53-54 (alleging non-infringement only for NIAs #1-4, #6); RRB at 34.

Accordingly, Google has shown Redesigned Products NIAs #5 and #7 infringe claim 10; but has not shown NIAs #1-4, #6, or Setup infringe.

2. Claim 16

For reference, claim 16 of the 311 patent requires:

16. [16.0] A system comprising a plurality of electronic devices, each of the electronic devices including one or more microphones, one or more processors, and memory storing one or more programs for execution by the one or more processors, each of the electronic devices programmed to:

[16.1] detect a voice input;

[16.2] determine a first value associated with the detected voice input;

[16.3] receive respective second values from other electronic devices of the plurality of electronic devices;

[16.4] compare the first value and the respective second values; and

[16.5] in accordance with a determination that the first value is higher than the respective second values, respond to the voice input.

311 patent at cl. 16.

[REDACTED]

Google addresses claim 16 simultaneously with claim 10, contending that all limitations are effectively the same with the exception of limitation [16.4], “compare the first value and the respective second values.” *See* CIB at 71-74, 73 n.16. As for that limitation, Google explains:

[REDACTED] r. (Jones) 119:18-120:11; Tr. (Mahon) 198:11-199:2.
[REDACTED] Tr. (Jones) 119:18-120:11; Tr. (Mahon) 199:3-15; Tr. (Hartung) 1278:21-1280:16; JX-339C.1.
[REDACTED] Tr. (Hartung) 1288:22-1289:22.
[REDACTED] d.

CIB at 73-74. Google has shown that the elements in the body of claim 16 are met by the 311 Accused Products as alleged in view of the testimony of Dr. Mahon.

As with claim 10, Sonos offers no argument on the particular limitations of claim 16. Rather, it argues claim 16 is a “system” claim requiring a system “comprising a plurality of electronic devices,” where each device includes certain hardware and is programmed in a certain way. *See* RIB at 52 (citing *Synchronoss Techs., Inc. v. Dropbox, Inc.*, 987 F.3d 1358, 1368-69 (Fed. Cir. 2021)); RRB at 33. But these limitations are found in the preamble of the claim, so implicit in Sonos’ argument is the contention that the preamble is limiting. The parties were cautioned at the end of the evidentiary hearing that “there really do appear to be a lot of [unresolved] claim construction disputes” and that they should “[f]ocus on the protocol for handling” such disputes. Hr’g Tr. at 1481:10-25. Neither party, however, has expressly followed that protocol with respect to claim 16. Google characterizes Sonos’ position as “incorrect,” but argues in opposition only that claim 16 covers an apparatus, and that the 311 Accused Products

[REDACTED]

“are used in multi-device systems,” and Sonos apparently just assumes that the term “system” is limiting, with no other analysis of the intrinsic evidence. CRB at 27-28; *see* RIB at 52.

The preamble states, “[a] system comprising a plurality of electronic devices, each of the electronic devices including one or more microphones, one or more processors, and memory storing one or more programs for execution by the one or more processors, each of the electronic devices programmed to.” 311 patent at cl. 16. Although the lack of claim construction briefing makes the task more difficult, it is clear that the preamble of claim 16 is at least partially limiting, for two reasons. First, the preamble’s recitation of “a plurality of electronic devices” provides antecedent basis for the limitation “receive respective second values from other electronic devices of *the* plurality of electronic devices.” 311 patent at cl. 16 (emphasis added). This strongly suggests that part of the preamble is limiting. *See Pacing Techs., LLC v. Garmin Int’l, Inc.*, 778 F.3d 1021, 1024 (Fed. Cir. 2015). Second, the beginning and end clauses of the preamble “are necessary to give life, meaning, and vitality” to the claim, because without them it is unclear what has been invented. *Bio-Rad Labs., Inc. v. 10X Genomics Inc.*, 967 F.3d 1353, 1369 (Fed. Cir. 2020). The body of the claim merely recites a list of steps—“detect,” “determine,” “receive,” “compare,” and “respond”—without any clear indication whether the invention is, say, a method or an apparatus (or a system, or a product by process). 311 patent at cl. 16. But infringement of a method claim requires that each step of the method be performed, while infringement of an apparatus claim does not. *See Texas Advanced*, 895 F.3d at 1327. So a skilled artisan could not ascertain the scope of the claim without considering the words of the preamble, which clarifies that the invention is not a single apparatus, as Google contends, but a “system comprising a plurality of electronic devices . . . each of the electronic devices programmed to” execute the claimed steps. 311 patent at cl. 16.

[REDACTED]

At a minimum, then, the portion of the preamble reciting a “system comprising a plurality of electronic devices . . . each of the electronic devices programmed” in a certain way is limiting. So construed, Google has not shown that Sonos directly infringes claim 16. To be sure, Sonos imports many pluralities of individual 311 Accused Products, and intends and desires users to have multiple devices within their homes. *See, e.g.*, EDIS Doc. ID 789069, Exs. A, B (stipulation regarding importation); JX-0261.2-3 (“Create the sound system you want, and expand it any time. Build out your system whenever and however (up to 32 products).”). But Google points to no evidence that the 311 Accused Products are imported as systems, rather than as individual units that may be configured into systems by users, nor does Google show that Sonos does the configuring itself, or otherwise directly infringes by making, using, or selling a “system comprising a plurality of electronic devices.” *See* CRB at 28. At most, Google cites evidence that Sonos induces infringement by encouraging users to directly infringe. *See id.*; *Niazi Licensing Corp. v. St. Jude Medical S.C., Inc.*, 30 F.4th 1339, 1351 (Fed. Cir. 2022). But Google apparently no longer asserts inducement of infringement of the 311 patent. *Compare* CPB at 91-92 *with* CIB at 71-75.

Accordingly, infringement of claim 16 has not been shown.

As for the Redesigned Products, the parties do not offer any additional discussion apart from what was presented for claim 10. In sum, Google contends NIAs #5 and #7 infringe claim 16 “for the same reasons as the [311 Accused Products],” which have been found not to infringe, and is silent as to NIAs #1-4, #6, and Setup. CIB at 76 n.17. So although Sonos does not dispute infringement by NIAs #5 and #7 on any grounds particular to their redesigns, Google has not carried its burden as to any redesign. *See* RIB at 53-54 (alleging non-infringement only for NIAs #1-4, #6); RRB at 34.

[REDACTED]

Accordingly, Google has not shown that any Redesigned Products infringe.

3. Claim 17

For reference, claim 17 of the 311 patent requires:

17. The system of claim 16, wherein the first value comprises a first quality score of the voice input.

311 patent at cl. 17. Google contends, as testified by Dr. Mahon, that the claim is met because [REDACTED]

[REDACTED]

[REDACTED] CIB at 74-75; Hr'g Tr. (Mahon) at 196:10-198:10, 201:22-202:19. [REDACTED]

[REDACTED] *Id.* at 75 (citing Hr'g Tr. (Mahon) at 203:5-20, 205:17-206:5). Sonos does not dispute infringement of claim 17 apart from its dependency on claim 16. RIB at 52-53; RRB at 33-34. In light of the cited evidence and opinion, the additional elements of claim 17 are met in the 311 Accused Products, but claim 17 is not infringed because claim 16 is not infringed.

As for the Redesigned Products, the parties do not offer any additional discussion for claim 17. Accordingly, Google has not shown that any Redesigned Products infringe.

4. Claim 18

For reference, claim 18 of the 311 patent requires:

18. The system of claim 17, wherein the first quality score comprises a confidence level of detection of the voice input.

311 patent at cl. 19. In support of its claim of infringement, Google explains:

[REDACTED] JX-339C.3-4; Tr. (Mahon) 203:5-19. [REDACTED]

[REDACTED] Tr. (Hartung) 1281:17-1282:7; JX-339C.3-4; Tr. (Mahon) 203:5-20. A [REDACTED]

[REDACTED] JX-339C.3-4; Tr. (Mahon) 203:5-20. [REDACTED]

[REDACTED] Tr. (Johnson) 1348:18-1349:14. [REDACTED]

[REDACTED]

CIB at 75. Google is persuasive, and the 311 Accused Products possess the additional element of claim 18 as alleged.

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] RIB at 53. Yet the need for a voice model is based on a rejected claim construction, above. And the claimed “confidence level” need not be a perfect tool to identify voice from any other possible sound. Rather, as determined above, a “confidence level of detection” need only indicate the *likelihood* that an audio input includes voice. [REDACTED]

[REDACTED]

[REDACTED] (RIB at 53) [REDACTED]

[REDACTED]. *See generally Plastic Omnium Advanced Innovation and Research v. Donghee Am., Inc.*, 943 F.3d 929, 935-6 (Fed. Cir. 2019) (emphasizing infringement analysis is between claim terms and accused product, not feature names used in defendant’s product literature).

Accordingly, Google has shown the additional elements of claim 18 are met by the 311 Accused Products, but claim 18 is not infringed because claims 16 and 17 are not infringed.

As for the Redesigned Products, the parties do not offer any additional discussion for claim 18. Accordingly, Google has not shown any Redesigned Products infringe.

5. Claim 19

For reference, claim 19 of the 311 patent requires:

19. The system of claim 17, wherein the first quality score comprises a signal-to-noise rating of detection of the voice input.

311 patent at cl. 19. Google contends, as testified by Dr. Mahon, that the claim is met because

[REDACTED]

[REDACTED]

[REDACTED] CIB at 75; Hr’g Tr. (Mahon) at 205:17-206:5. Sonos does not dispute infringement of claim 19 apart from its dependency on claim 16. RIB at 52-53; RRB at 33-34. In light of the cited evidence and opinion, the additional elements of claim 19 are met in the 311 Accused Products, but claim 19 is not infringed because claims 16 and 17 are not infringed.

As for the Redesigned Products, the parties do not offer any additional discussion for claim 19. Accordingly, Google has not shown any Redesigned Products infringe.

E. Domestic Industry – Technical Prong

According to Google’s post-hearing briefing, the DI Products practice claims 10, 11, 16, and 17 of the 311 patent. CIB at 76. Google has shown by a preponderance of the evidence that the DI Products practice these claims.

1. Claim 10

Claim 10 of the 311 patent is presented above in connection with infringement. The parties dispute several limitations. In support of limitations [10.0]-[10.2], Google describes hotword-based arbitration as follows:

The DI Products are electronic devices comprising one or more microphones, processors, and memory storing one or more programs for execution by the processors.

....

[REDACTED] Tr.
(Gruenstein) 36:2-9; Tr. (Diaconu) 76:15-23, 100:25-101:8; Tr. (Mahon) 155:5-19,
173:18-174:8; Tr. (Jones) 112:3-23; JX-166.2-3 [REDACTED]. [REDACTED]
[REDACTED] Tr. (Gruenstein) 26:5-20.

....

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] Tr. (Diaconu) 68:22-69:7, 71:3-16, 75:6-18; JX-35C [Diaconu Dep.] 69:16-21. [REDACTED]

[REDACTED] Tr. (Diaconu) 68:22-69:7; 71:3-16.

....

[REDACTED]

CIB at 76-78. For limitations [10.3] and [10.4], Google explains:

[REDACTED]

[REDACTED] r. (Diaconu) 76:25-77:10, 77:20-5; Tr. (Mahon) 176:24-177:21; Tr. (Jones) 112:24-113:16; JX-156C.7 [REDACTED]. [REDACTED]

[REDACTED] Tr. (Diaconu) 77:20-78:5; Tr. (Mahon) 176:24-177:21; Tr. (Jones) 112:24-113:16. [REDACTED]

[REDACTED] Tr. (Mahon)

....

[REDACTED] Tr. (Diaconu) 91:2-92:7; Tr. (Mahon) 178:13-179:3, 181:6-14, 182:22-183:9; Tr. (Jones) 114:7-115:3. [REDACTED]

[REDACTED] Tr. (Diaconu) 94:16-95:9; Tr. (Mahon) 183:10-184:9; Tr. (Jones) 115:10-24. [REDACTED]

[REDACTED]

[REDACTED] Tr. (Diaconu) 94:16-95:9;
Tr. (Gruenstein) 37:19-38:20; Tr. (Mahon) 183:10-184:9; Tr. (Jones) 116:14-117:1.

[REDACTED] Tr. (Diaconu) 95:10-16;
see Tr. (Mahon) 183:10-184:9; Tr. (Jones) 115:25-116:13.

[REDACTED]

CIB at 78-80. Google has met its burden to show practice of claim 10 by the DI Products.

Sonos contends that several limitations are not met and provides the following technical background:

When multiple DI Products are set up in a system,

[REDACTED]

[REDACTED] See Tr. (Mahon) 163:11-164:18.

[REDACTED]

[REDACTED] Tr. (Mahon) 163:11-164:18, 251:1-252:7.

[REDACTED]

[REDACTED] Tr. (Diaconu) 89:20-91:9, (Mahon) 181:6-183:9.

Id.
Id.

[REDACTED]

[REDACTED]

[REDACTED] See Tr. (Mahon) 171:19-187:1, 188:14-189:14, 253:9-263:11; CDX-3C.30-39, 43.

RIB at 57-58.

Sonos first suggests that the DI Products' use of [REDACTED] fails to meet limitation [10.3] "receiving second values associated with the voice input from other electronic devices of the plurality of electronic devices." RIB at 58-59. Sonos argues the "second values" "must each be a singular, numerical value" because of limitation [10.4] which requires a higher/lower determination between them and a "first value." *Id.* (citing 311 patent at 21:11-21). This is not persuasive. In a plain and ordinary sense there are a variety of ways to compare a set of numbers against a different set of numbers and pick the set that is "higher" (*e.g.*, average among the group, single top value, two values subtracted from a first, how many values in the set are above a threshold, etc.). So the practical aspects of limitation [10.4] do not restrict the meaning of "value" in limitation [10.3] as Sonos suggests. The patent itself states, "the quality level may be expressed as a score *or some other value*." 311 patent at 21:9-14 (emphasis added).

[REDACTED]

[REDACTED]

[REDACTED] See CIB at 77-78. [REDACTED]

[REDACTED]

[REDACTED] Accordingly, limitation [10.3] is practiced by the DI Products.

Sonos argues that limitation [10.4] is not met for related reasons. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] RIB at 59-61.

[REDACTED] (see CIB at 79-81)), [REDACTED]

[REDACTED] (RIB at 59-61). [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] *Id.* at 59-60 (citing Hr’g Tr. (Diaconu) at 91:10-94:15; Hr’g Tr. (Mahon) at 259:6-260:14; JX-0035C at 124:24-125:7). According to Sonos, this fails to satisfy the claim language because the claim requires “that the comparison be made using a numerical ‘second value’ that was itself generated by and received from the other device,” [REDACTED]. *See id.* at 60-61. Put another way, “these limitations require an embodiment where each device computes its own ‘second value’ and then sends that ‘second value’ in a form that is compared against the claimed device’s ‘first value’ without further computation or manipulation by the claimed device.” RRB at 36. Sonos finds support for this claim construction in the *Markman* Order, which stated, “[a] plain reading of the claim, in light of the specification, communicates that each device within the plurality generates a quality score or value for itself.” *Id.* (citing Order No. 14 at 36).

A comparison of values “without further computation or manipulation” is not the plain meaning of the claim language and so is not accepted as a requirement. *Kyocera*, 22 F.4th at 1378 (reminding that there only two exceptions to plain and ordinary meaning); *Wasica*, 853 F.3d at 1281-2 (“Therefore, absent a clear disavowal or alternative lexicography by a patentee, he or she ‘is free to choose a broad term and expect to obtain the full scope of its plain and ordinary

[REDACTED]

meaning.”). Sonos cites no intrinsic evidence for support, relying entirely on the single comment from the *Markman* Order. But that statement is inapposite as it concerned the parties’ disputes over the required quantities of “other electronic devices” and “second values,” and merely clarified that the two quantities should be the same as “each device within the plurality generates a quality score or value for itself.” *See* Order No. 14 at 31-36. In addition, the patent discloses consideration of background noise effects in the arbitration process:

In some implementations, the recognition quality module 566 (FIG. 2B) at the electronic device 1002 determines the quality level of the respective captured sample. In some implementations, criteria for evaluating the quality of a voice sample include, for example, loudness or amplitude of the sample, presence or absence of noise (*e.g.*, cross-talk, hissing) and corresponding level, presence or absence of distortion (*e.g.*, echo) and corresponding level, frequency profile of the sample, and so forth.

311 patent at 21:21-30;

When a user 102 makes a voice input, each of the devices 190 either receives the input or does not receive the input (*e.g.*, if the device was too far away from the user). The devices that receive the input receive the input at varying degrees of quality; the quality of the sample of the voice input at a device is based on multiple factors, including but not limited to distance of the user from the device and the noise around the device. The multiple devices 190 negotiate a leader amongst themselves to respond to the user and to receive further voice input from the user 102 based on the quality of the samples of the voice inputs.

Id. at 7:4-14. These passages suggest that further processing of the raw scores, to compensate for noise, distortion, and the like, falls within the scope of the claims.

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] Hr’g Tr. (Diaconu) at 91:16-94:15; RIB at 59-60. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] *See generally* Hr’g Tr. (Diaconu) at 92:25-94:15; Hr’g Tr. (Mahon) at 180:3-181:5, 260:10-14; JX-0035C at 125:5-25, 126:4-127:19; JX-0156C.4 [REDACTED]

[REDACTED]

[REDACTED] [REDACTED]

[REDACTED]

[REDACTED]

Lastly, Sonos challenges limitation [10.4] on the additional ground that “in accordance with a determination . . . responding to the detected input” is not met. RIB at 60-62. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] *Id.* at 61 (citing Hr’g Tr. (Mahon) at 178:2-10, 265:3-13; Hr’g Tr. (Johnson) at 1322:2-18). [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] *Id.* at 61-62 (citing Order No. 14 at 41) (emphasis in original); RRB at 36-37.

[REDACTED]

[REDACTED] The claim requires an electronic device comprising programmed instructions that will respond to the detected input when it determines that its value is higher than

[REDACTED]

the values received by neighboring electronic devices. 311 patent at cl. 10. Google’s theory is that the “electronic device” that practices the claim is the entire 311 DI Product—and not any sub-portion or internal module. CIB at 76 (“The DI Products are electronic devices comprising one or more microphones, processors, and memory storing one or more programs for execution by the processors.”). Thus, when “responding to the detected input” is considered, it must be from the perspective of the entire 311 DI Product. [REDACTED]

[REDACTED]

[REDACTED] Hr’g Tr. (Diaconu) at 94:24-95:9; *see* CRB at 31-32. [REDACTED]

[REDACTED] Accordingly, limitation [10.4] is met in the DI Products, and all of claim 10 is practiced.²

2. Claim 11

For reference, claim 11 of the 311 patent requires:

11. The first electronic device of claim 10, the one or more programs further comprising instructions for:

recognizing a command in the voice input; and

in accordance with a determination that a type of the command is related to the first electronic device, responding to the detected voice input.

311 patent at cl. 11. Google contends, as testified to by Dr. Mahon, that:

[REDACTED]

[REDACTED] Tr. (Gruenstein) 37:6-18; Tr. (Diaconu) 81:11-25; Tr. (Mahon) 190:25-

² The parties additionally discuss doctrine of equivalents (*see, e.g.* CIB at 78, 79, 80; RIB at 62-65), but it is superfluous in light of these findings.

[REDACTED]

191:11. [REDACTED]
[REDACTED] r. (Gruenstein) 37:6-18; Tr. (Diaconu) 81:11-25; Tr. (Mahon)
190:25-191:11; CX-91C.1 [REDACTED]
[REDACTED]
[REDACTED] Tr. (Gruenstein) 37:6-18; Tr. (Diaconu) 81:11-25; Tr. (Mahon) 190:25-
191:11.

[REDACTED] Tr. (Diaconu) 88:17-89:19, 90:1-8; Tr. (Mahon) 181:9-
182:14; Tr. (Jones) 114:7-115:3. [REDACTED]
[REDACTED] Tr. (Diaconu) 87:16-22, 88:17-7; Tr. (Mahon) 181:9-182:14; Tr. (Jones)
114:7-115. [REDACTED]
[REDACTED] Tr. (Diaconu) 88:17-89:19, 90:1-8; Tr. (Mahon) 181:9-
182:14; Tr. (Jones) 114:7-115:3.

[REDACTED]
Tr. (Diaconu) 88:17-89:19; Tr. (Mahon) 191:20-192:23; 192:24-193:7.
[REDACTED] Tr. (Diaconu) 90:14-91:1;
see also Tr. (Mahon) 182:2-11.
Tr. (Mahon) 192:14-193:7.
[REDACTED] Tr. (Mahon) 192:14-193:7; Tr. (Diaconu)
89:8-19; Tr. (Jones) 114:7-115:9.
[REDACTED] *Id.*

CIB at 82-83. Google has met its burden to show practice of claim 11 by the DI Products.

Sonos opposes on two grounds, neither of which is persuasive; and in fact, the second undercuts the first. To begin, Sonos refers to the *Markman* Order which found that the claim language “in accordance with a determination that” conveys the same concept as “if,” “upon determining,” or “in response to determining.” See RIB at 66 (citing Order No. 14 at 45-46). Sonos takes this finding and argues that when a command is “related to the first electronic device” that condition is dispositive of whether the device responds to the voice input:

[REDACTED]

Under this interpretation, limitation 11.2 requires an *if-then* action where “a determination that a type of the command is related” is *determinative* as to which device “respond[s] to the detected voice input.” [REDACTED]

[REDACTED] JX-196C.2;
JX-35C (Diaconu) 149:6-151:17; Tr. (Johnson) 1325:2-23.
[REDACTED]

Id. (emphasis in original); RRB at 39. [REDACTED]

[REDACTED]

[REDACTED] See RIB at 66 (citing JX-0196C.2;
JX-0035C at 149:6-151:17; Hr’g Tr. (Johnson) at 1325:2-23). [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] *Id.* at 66. Sonos’ second ground is related to the first, in that once it is assumed that taking an action “in accordance with a determination that” a condition exists means the condition is dispositive for taking that action, the DI Products cannot practice claim 11 because its condition of “a type of the command is related to the first electronic device” and claim 10’s condition of “the first value is higher than the second values” cannot both be dispositive at the same time in any given device. See RIB at 66; RIB at 39.

Sonos’ interpretation is too narrow. First, it is important to appreciate that dependent claim 11 and independent claim 10 are apparatus claims and require that a device contain certain programming—and not that a device perform in any certain way. Thus, under a plain and ordinary meaning, practice of claim 10 turns on whether the device includes programming to take an action (“respond[] to the detected input”) because of an earlier determination that a certain condition exists (“the first value is higher than the second values”). Similarly, practice of claim 11 turns on

[REDACTED]

whether the device includes programming to take an action (“respond[] to the detected voice input”) because of an earlier determination that a certain condition exists (“a type of the command is related to the first electronic device”). In other words, the limitation simply requires that the condition determined to exist influence or cause the device to take the action. [REDACTED]

[REDACTED]

Several examples illustrate this plain, broad meaning. Software will install “in accordance with a determination that” the user clicked the green “INSTALL” button, but the installation could abort if insufficient disk space is available. Or, an autonomous car will move forward “in accordance with a determination that” the traffic light turned green, but only if there are no immediate obstructions or hazards (hopefully). Similarly, a violation of section 337 is found “in accordance with a determination that” infringement of the asserted patent has occurred, but another condition must also be met—a domestic industry existing or in the process of being established with respect to the articles protected by the patent. 19 U.S.C. § 1337.

With this proper construction in mind, Sonos’ argument is ineffective. And the undisputed evidence otherwise shows that the DI Products [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] No consideration of whether a device actually responds to the input is necessary.

Accordingly, the DI Products have been shown to practice claim 11.

3. Claim 16

Claim 16 of the 311 patent is presented above in connection with infringement. Google addresses claim 16 simultaneously with claim 10, contending that all limitations are the same with

[REDACTED]

the exception of limitation [16.4], “compare the first value and the respective second values.” *See* CIB at 76-81. And as for that limitation, Google explains:

[REDACTED] Tr.
(Diaconu) 82:4-22; Tr. (Mahon) 179:7-11.
[REDACTED]

[REDACTED] Tr. (Diaconu) 91:16-92:7, 92:25-93:9,
105:8-19; Tr. (Mahon) 179:12-180:2.
[REDACTED] r. (Diaconu) 79:13-20, 91:16-
92:7.
[REDACTED] Tr. (Diaconu) 79:13-20, 91:16-92:7.
[REDACTED] Tr.
(Diaconu) 93:2-25; Tr. (Mahon) 180:12-18.
[REDACTED] r. (Diaconu) 94:1-3; Tr. (Mahon) 180:3-24.
[REDACTED] Tr.
(Diaconu) 93:2-7; Tr. (Mahon) 180:12-18.
[REDACTED] Tr. (Diaconu) 91:2-92:7; Tr.
(Mahon) 178:13-179:3, 181:6-14, 182:22-183:9.

[REDACTED] Tr. (Diaconu) 91:2-92:7; Tr.
(Mahon) 178:13-179:3, 181:6-14, 182:22-183:9; Tr. (Jones) 114:7-115:3. [REDACTED]
[REDACTED] *Id.*

CIB at 79-80.

Sonos likewise considers all limitations between claims 10 and 16 to be the same with the exception of limitation [16.4]. RIB at 57-62; RRB at 35-39. And there, Sonos argues the DI Products do not meet “compare the first value and the respective second values” because [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

For the same reasons explained with respect to claim 10 and limitation [10.4] specifically, the limitation is met. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] See RIB at 59 [REDACTED]

[REDACTED]

[REDACTED].

Furthermore, although Sonos does not expressly dispute that the DI Products satisfy the limiting portions of the preamble of claim 16, Dr. Mahon opined that they do. See Hr’g Tr. (Mahon) at 172:2-173:17. The preamble limitations are therefore established.

Accordingly, Google has shown claim 16 is practiced by the DI Products.

4. Claim 17

Claim 17 of the 311 patent is presented above in connection with infringement. Google contends, as testified by Dr. Mahon, that [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] CIB at 83; Hr’g Tr. (Mahon) at 187:14-188:13, 175:6-10. Sonos does not dispute practice of claim 17 apart from its dependency on claim 16. RIB at 67. In light of the cited evidence and opinion, the additional elements of claim 17 are met in the DI Products, and the DI Products practice claim 17.

F. Validity

Sonos identifies the following invalidity theories for the 311 patent:

Claims	Theory
10, 11, 16, 17, 18, 19	Anticipated under 35 U.S.C. § 102 by Rosenberger (RX-0819)
11	Rendered obvious under 35 U.S.C. § 103 by Rosenberger (RX-0819) in view of Jang (RX-0824)
19	Rendered obvious under 35 U.S.C. § 103 by Rosenberger (RX-0819) in view of Masahide (RX-0269)
10, 16, 17, 18	Anticipated under 35 U.S.C. § 102 and/or rendered obvious under 35 U.S.C. § 103 by VoicePod
19	Rendered obvious under 35 U.S.C. § 103 by VoicePod in view of Masahide (RX-0269)
10, 11, 16, 17	Anticipated under 35 U.S.C. § 102 by Jang (RX-0824)
19	Rendered obvious under 35 U.S.C. § 103 by Jang (RX-0824) in view of Masahide (RX-0269)
10, 11, 16, 17, 19	Anticipated under 35 U.S.C. § 102 and/or rendered obvious under 35 U.S.C. § 103 by Masahide (RX-0269)
10, 11, 16-19	Lack of written description under 35 U.S.C. § 112
10, 11, 16-19	Invalid under 35 U.S.C. § 101 for lack of patentable subject matter

See generally RIB at 67-91. The effective filing date of the 311 patent is October 9, 2014, after the effective filing date of the 748 patent, so Rosenberger, VoicePod, and Masahide are all prior art under 35 U.S.C. § 102(a)(1) (AIA). U.S. Patent Application Pub. No. 2013/0073293 (“Jang”) was published March 21, 2013, and so is also prior art under 35 U.S.C. § 102(a)(1) (AIA). *See* RX-0824. Google again contends that VoicePod is not prior art, a contention that has been

[REDACTED]

disregarded as explained above, and notes that Rosenberg was considered during prosecution, but otherwise does not dispute these references' prior art status. *See* CIB at 84-96.

1. Rosenberg

a. Claim 10

Rosenberger discloses a device possessing a microphone and a programmable microcontroller with embedded speech recognition circuitry and software, as well as “persistent internal memory.” *See* RX-0819 at 4:6-11, 6:65. The device is in RF communication with similarly configured devices, and all the devices are close enough to each other to all hear a speech trigger. *See id.* at 6:44-45, 9:57-61. Rosenberg discloses a scenario where multiple such devices are located in a residence, and “all successfully ‘hear’ and recognize [the] speech trigger,” which may result in “duplicate response[s].” *Id.* at 9:37, 9:57-61. To avoid this, each device in Rosenberg calculates a “weighted signal” and transmits it to the other devices. *Id.* at 11:42-48. If a device receives no weighted signal that is higher than its own, it “handle[s] the speech command by interacting with the user.” *Id.* at 11:64-12:3.

Dr. Johnson opined, correctly, that these features correspond to most elements of claim 10: microphone, processor, memory storing a program, determining a first value, receiving second values, and responding if the first value is higher than the second values. *See* Hr’g Tr. (Johnson) at 796:22-797:8. Google only expressly disputes the disclosure of “detecting a voice input from a user,” so the other elements are found to be disclosed. *See* CIB at 85-86.

As for “detecting a voice input,” Dr. Johnson opined that Rosenberg’s disclosure of a “speech recognizer” and “recogniz[ing] . . . when a speech command . . . has likely been spoken” meets the limitation, which it does. RX-0819 at 2:4-5, 4:12-14; *see* Hr’g Tr. (Johnson) at 788:4-21. Google advances two arguments against this conclusion. First, it asserts that speech recognition and detecting a voice input are different processes. *See* CIB at 85; Hr’g Tr. (Mahon)

[REDACTED]

at 1173:13-20 (“detecting” and “recognizing” are both required by claim 11, but only “detecting” is required by claim 10). Speech recognition is certainly more complicated than merely detecting a voice input, because it requires detecting what is spoken rather than simply that a voice spoke. But if speech recognition is successfully performed directly on a voice input, a skilled artisan would understand that the voice input has been detected; speech recognition may not be necessary for detection, but it is sufficient for detection. Dr. Mahon opined, quite reasonably, to this effect. Hr’g Tr. (Mahon) at 1144:14-24 (“If a system can identify the words, then it’s going to know that what’s coming in is voice.”).

Second, Google points to the prosecution of the 311 patent, where the Examiner had considered the Rosenberger reference and concluded that it disclosed “Human vs robot [automated speech recognition]” and “at best . . . a first value unrelated to the voice input . . . to compare to the second values.” CX-0120 at 174-75; *see* CIB at 85-86. But again, the speech recognition here qualifies as detecting a voice input, regardless of how the Examiner viewed Rosenberger’s teachings, and how Rosenberger performs the “determination” step – which Google does not dispute Rosenberger discloses – has nothing to do with how it detects a voice input. Google also points to the prosecution of other patents in the family of the 311 patent, but these are not pertinent because they involved different claim language, and for one patent a different Examiner. *See id.* (citing U.S. Patent Nos. 9,812,128 and 9,318,107).

Therefore, Rosenberger discloses all elements of claim 10, and accordingly anticipates it.

b. Claim 11

Claim 11 adds the requirements that the claimed device recognize a command in the voice input, determine that the command is of a type related to the device, and then respond to the input in accordance with the determination. *See* 311 patent at cl. 11; *id.* at 22:28-40 (“the leadership determination may be updated” or “overridden based on additional criteria,” including “a type of

[REDACTED]

request or command” or “if the request is of particular relevance to an electronic device”). Rosenberg discloses recognizing a command in the voice input (*see* RX-0819 at 7:19-24), but its disclosure of how to select the responding device is limited to the “weighted signal” method (*see id.* at 11:27-31). Dr. Johnson opined that Rosenberg’s teaching of embedding the claimed device in another device, such as a thermostat, and adjusting the claimed device’s speech recognition vocabulary, amounts to a disclosure that the devices can “respond differently” based on “different command vocabularies.” Hr’g Tr. (Johnson) at 801:21-24; *see* RDX-0001C.85-.88 (citing RX-0819 at 7:28-31, 8:42-44, 15:62-16:23). But Google is correct that Rosenberg’s coordination method nevertheless only compares weighted scores; *i.e.*, with no disclosure of using device type or a match between stored vocabulary and command type for coordination, either alone or as a component of the weighted score. *See* CIB at 86; Hr’g Tr. (Mahon) at 1091:22-1093:3. Therefore, the additional elements of claim 11 are not clearly and convincingly taught by Rosenberg, and Rosenberg does not anticipate the claim.

c. Claim 16

Claim 16 differs from claim 10 in that it requires a system of devices, all with the same hardware and software, where each device determines a first value and “compare[s] the first value and the respective second values.” 311 patent at cl. 16. Dr. Johnson opined, correctly, that these elements are all found in Rosenberg. *See* Hr’g Tr. (Johnson) at 787:6-796:21. Google’s arguments are limited to asserting, as with claim 10, that Rosenberg does not disclose “detecting a voice input,” but this assertion has no merit, as explained above. Therefore, the elements of claim 16 are disclosed in Rosenberg, and Rosenberg anticipates claim 16.

d. Claim 17

Dependent claim 17 requires that the “first value” of claim 16 be a “first quality score of the voice input.” 311 patent at cl. 17. Rosenberg’s “weighted signal” represents “the quality of

[REDACTED]

a just-recognized speech command,” which meets this limitation. RX-0819 at 4:15-16; *see* Hr’g Tr. (Johnson) at 804:2-14. Google does not dispute this disclosure beyond its argument that claim 16 is not disclosed. *See* CIB at 87. Therefore, the additional element of claim 17 is disclosed in Rosenberger, and Rosenberger anticipates claim 17.

e. Claim 18

Claim 18 depends from claim 17, and requires the first quality score to comprise “a confidence level of detection of the voice input.” 311 patent at cl. 18. Rosenberger discloses use of “recognition confidence” as one of the main components of its “weighted signal,” and Dr. Johnson opined that such a disclosure meets the limitation. RX-0819 at 10:45; *see* Hr’g Tr. (Johnson) at 805:4-23. But recognition confidence, as disclosed in Rosenberger, means “the probability that a speech command was recognized correctly,” that is, the probability of a correct match between the signal output from the microphone and the “expected speech.” RX-0819 at 10:46-47, 10:59-67. Recognition confidence thus assumes that a voice input has definitely been detected; as Sonos characterizes it, the “likelihood of a correct speech recognition reflects a level of confidence that a voice input was detected,” where that level of confidence is always 100%. RRB at 41 (emphasis omitted). So recognition confidence is a variable that reflects the probability that speech was recognized correctly, not the more basic probability that voice of any kind was detected. Therefore, the additional element of claim 18 is not taught by Rosenberger, and Rosenberger does not anticipate that claim.

f. Claim 19

Claim 19 also depends from claim 17, and requires the first quality score to comprise “a signal-to-noise rating of detection of the voice input.” 311 patent at cl. 18. Rosenberger discloses use of “microphone signal strength (SS)” as one of the components of the weighted signal, and it acknowledges that “background noise” may introduce errors, but it does not disclose noise

[REDACTED]

affecting SS . RX-0819 at 10:25, 10:43. Rather, SS is “directly related to the proximity of the user to the device.” *Id.* at 10:43-45. The testimony of Dr. Johnson and Mr. Rosenberger does not change this conclusion. *See* RIB at 74.

[REDACTED]

[REDACTED]

(Hr’g Tr. (Rosenberger) at 718:6), but that fact is not disclosed in Rosenberger. In fact, Rosenberger is silent as to how RC is calculated. *See generally* RX-0819. Moreover, in Rosenberger, RC is added to the signal strength, rather than compared to it, and so cannot represent background noise alone. *See id.* at 11:4. And Dr. Johnson at best opined that generally, in Rosenberger, “background noise is bad and signal strength is good, and that those factors could be encompassed into the weighted signal value” (Hr’g Tr. (Johnson) at 808:16-18), but not that a “rating” of the two was part of the weighted signal. . Therefore, the additional element of claim 19 is not clearly and convincingly taught by Rosenberger, and Rosenberger does not anticipate that claim.

2. VoicePod

a. Claim 10

VoicePod comprised multiple devices, each of which had processors, a “built-in microphone,” memory, and a wireless transceiver, and each of which could receive and process spoken audio for “voice recognition” using an “embedded speech recognition chip.” RX-0798 at .00001-2; Hr’g Tr. (Rosenberger) at 670:16-17; *see* RX-0505C at .00001. The system used a default “wake-up phrase” of “hello VoicePod,” but because each device might be placed near enough to each other to hear and respond to the wake-up phrase, it also employed a protocol for “Multi-device coordination.” RX-0798 at .00002; RX-0812 at .00001; *see* Hr’g Tr. (Rosenberger) at 660:11-24. [REDACTED]

[REDACTED]

[REDACTED] *Id.* at 721:4-11; *see* RX-0819 at 11:37-12:27 [REDACTED]

[REDACTED]

[REDACTED] RX-0819 at 11:37-12:3.

VoicePod thus possessed many of the elements of claim 10, including the programmable processor, memory, microphone, a plurality of other electronic devices receiving the voice input, determining a first value and second values associated with the voice input, receiving the second values, determining the first value is higher than the second values, and responding to the voice input. *See* 311 patent at cl. 10. Dr. Johnson opined that these elements appear in VoicePod. *See* Hr’g Tr. (Johnson) at 820:10-15. Google disputes this, arguing (as with the 748 patent) that there is a lack of source code, and (as with Rosenberger) that VoicePod did not “detect[] a voice input from a user.” *See* CIB at 89. These arguments are rejected for the reasons given above. [REDACTED]

[REDACTED]

[REDACTED] *See id.* at 90. So all the elements other than that one are found in VoicePod.

As for VoicePod’s version of the claimed “value,” the source code shows that [REDACTED]

[REDACTED] RX-0534C.64; *see* Hr’g Tr. (Johnson) at 817:14-818:5; *see generally* RDX-0001.125. Google complains that the lack of source code for the vendor’s speech recognition chip renders the process a “black box,” but the other evidence is sufficient to clearly establish that [REDACTED] satisfies the limitation. CIB at 90 (citing Hr’g Tr. (Mahon) at 1108:13-25, Hr’g Tr. (Jones) at 1040:8-22).

[REDACTED]

Therefore, VoicePod used first and second “values associated with the voice input,” as claimed, met all the limitations of claim 10, and accordingly anticipates claim 10.

b. Claim 16

Claim 16 differs from claim 10 in that it requires a system of devices, all with the same hardware and software, where each device determines a first value and “compare[s] the first value and the respective second values.” 311 patent at cl. 16. Dr. Johnson opined, correctly, that these elements were all found in VoicePod. *See* Hr’g Tr. (Johnson) at 813:3-820:9. Google’s arguments are limited to asserting, as with claim 10, that VoicePod did not disclose “detecting a voice input” or values “associated with the voice input,” and that there is a lack of needed source code. *See* CIB at 89-90. These assertions have no merit, as explained above, so the elements of claim 16 were present in VoicePod, and VoicePod anticipates claim 16.

c. Claim 17

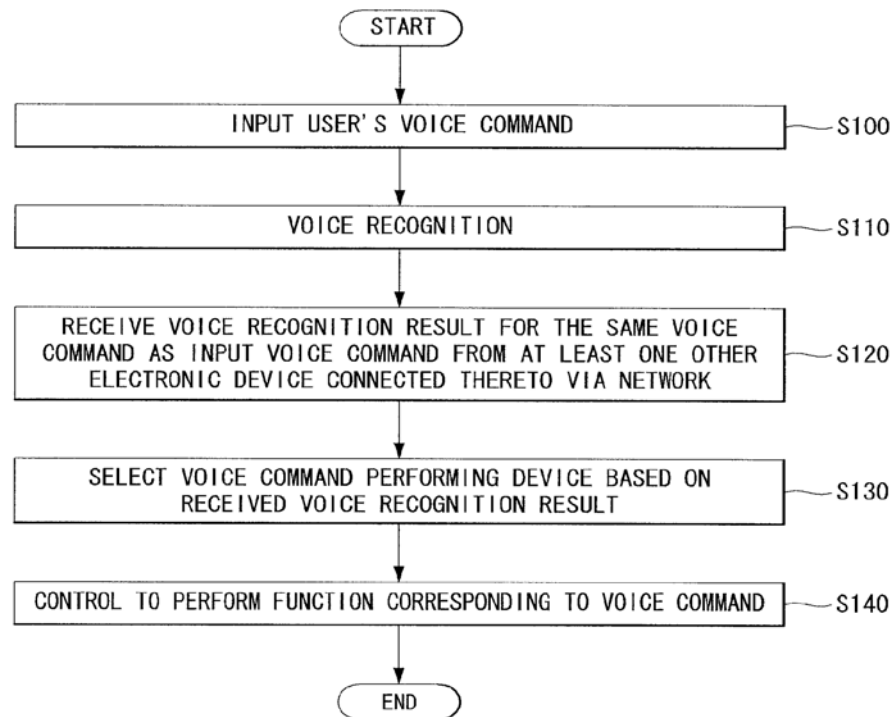
Sonos argues, correctly, [REDACTED]
[REDACTED] meets the otherwise broad “quality score of the voice input” limitation. *See* RIB at 77; Hr’g Tr. (Johnson) at 820:22-821:5. Google has no argument about claim 17 beyond its arguments regarding claim 16. *See* CIB at 90. Therefore, the elements of claim 17 were present in VoicePod, and VoicePod anticipates claim 17.

3. Jang

Jang discloses a “plurality of electronic devices 100 and 10,” where electronic device 100 comprises a programmable controller, microphone, memory, and “voice recognition unit.” *See* RX-0824 at [0058], [0077], [0116], Fig. 5. The voice recognition unit “can recognize the input voice signals by detecting voice activity . . . , carrying out sound analysis thereof, and recognizing the analysis result.” *Id.* at [0110]. The other electronic devices 10 similarly have voice recognition units, and all electronic devices generate a “result” of the voice recognition and share their own

result with the other devices. *Id.* at [0127]-[0132]. The result includes, among other information, the “magnitude (gain value) of the recognized voice signal.” *Id.* at [0135]. Electronic device 100 then “compares” the gains and, in one embodiment, “select[s] electronic device with high gain” to “perform the voice command,” which can be electronic device 100 itself:

Fig 7.



Id. at [0139], [0163], Figs. 7, 11.

a. Claim 10

Jang thus discloses many of the elements of claim 10, including the programmable processor, memory, microphone, a plurality of other electronic devices receiving the voice input, determining a first value and second values associated with the voice input, receiving the second values, determining the first value is higher than the second values, and responding to the voice input. *See* 311 patent at cl. 10. Dr. Johnson opined that these elements all appear in Jang. *See* Hr’g Tr. (Johnson) at 833:10-17. Google challenges the disclosure of the last element, responding

[REDACTED]

“in accordance with a determination that the first value is higher than the second values,” but does not dispute the disclosure of the other elements. *See* CIB at 91-93; CRB at 41-42. So all the elements other than that one are found in Jang.

As for this last element, Google presents two arguments. *See* CIB at 91-93. First, it argues that electronic device 100 “always responds regardless of the outcome of the determination,” and thus does not respond “in accordance with” the determination. *Id.* at 92. To be sure, Jang discloses electronic device 100 “outputs a control signal . . . to perform a function corresponding to the received voice command,” but the claim only covers the case where the first device’s value (here, the “magnitude (gain value)” of electronic device 100) is higher than the other devices’ values. RX-0824 at [0138], [0141]; *see* 311 patent at cl. 10. And the response from electronic device 100 varies depending on whether it has the highest value (in which case it performs the voice command) or not (in which case it sends a control signal to another device). *See* RX-0824 at [0138]-[0139]. So even assuming that a “control signal” qualifies as a “respon[se] to the detected input,” whatever response goes out varies “in accordance with a determination that the first value is higher than the second values,” which satisfies the claim language. 311 patent at cl. 10; *see* RIB at 80 (“if the first device wins arbitration, it performs the voice command, and if it loses arbitration, it sends a command to another device to perform the voice command”). Sonos also accurately points out that Google’s position here is directly at odds with its own technical prong theory and [REDACTED] of the DI Products. RIB at 80 n.37. Google does not dispute the contradiction. CRB at 41-42.

Second, Google argues, in essence, that a response prompted by the “control signal” is not a “respon[se] to the detected input,” and is instead a response “to the controller device’s directive.” *See* CIB at 92. But if the control signal itself qualifies as the claimed response, as Google suggests,

[REDACTED]

then this argument is beside the point, and if performing the voice command qualifies as the claimed response, and it is the claimed first device (here, electronic device 100) performing it, then whatever signals the first device sends itself internally would seem to be irrelevant; either way, the claim language is satisfied. Therefore, Jang discloses responding to the detected input “in accordance with a determination that the first value is higher than the second values,” teaches all the limitations of claim 10, and accordingly anticipates claim 10.

b. Claim 11

Claim 11 adds the requirements that the claimed device recognize a command in the voice input, determine that the command is of a type related to the device, and then respond to the input in accordance with the determination. *See* 311 patent at cl. 11. Jang discloses recognizing a command in the voice input (*see* RX-0824 at [0110]), as well as identifying “whether there is an electronic device executing an application corresponding to an input voice command,” and then selecting that device to perform the command (*id.* at [0176]). This selection process, however, appears to be an alternative to, rather than a supplement to, the process that satisfies claim 10. *Compare id.* at [0174] *with* 311 patent at 22:28-32 (the selection criteria may be “updated” or “overridden”). To wit, claim 10 requires “receiving second values associated with the voice input,” so that must also be required for claim 11. 311 patent at cls. 10, 11. But Jang seemingly does not disclose a device having programming for such receipt in the embodiment involving identifying which applications are executing on which devices. *See* RX-0824 at [0174]-[0178]. And Dr. Johnson entirely glosses over this issue. *See* Hr’g Tr. (Johnson) at 834:12-25. So the elements of claim 11 are not clearly and convincingly disclosed in Jang, and Jang does not anticipate that claim.

c. Claim 16

Claim 16 differs from claim 10 in that it requires a system of devices, all with the same hardware and software, where each device determines a first value and “compare[s] the first value and the respective second values.” 311 patent at cl. 16. Jang discloses that both electronic device 100 and other electronic devices have microphones and voice recognition modules, use the same operating system, are capable of responding to a voice command, and can communicate with each other wirelessly. *See* RX-0824 at [0119]-[0123]. So the presence of the claimed hardware and speech recognition capability in each device is disclosed in Jang, and Google does not dispute this. *See* CIB at 91-93. Google does, however, dispute whether each device “can act as a controller” and thereby perform all the steps needed to practice the claim. *Id.* at 93.

It is true that Jang does not say, in so many words, that each device 10 can be “picked” as a controller, as Dr. Mahon put it. Hr’g Tr. (Mahon) at 1114:3-10. But there are two passages in Jang which a skilled artisan would understand as disclosing that. One embodiment is a system comprising a “first electronic device” and a “second electronic device,” both “configured to receive a user’s voice command” and connected to each other by a network. RX-0824 at [0026]-[0027]. “[A]t least one component of the system” is configured to carry out the operations that controller 180 is elsewhere described as performing: identify a voice recognition result for both devices, select a device to perform the voice command, and then control that device. *Id.* A POSITA would understand from this that in a system with only two electronic devices, either one could be configured to act as electronic device 100.

And in describing controller 180, Jang teaches that it may contain voice recognition unit 182, which “can carry out voice recognition upon voice signals input through the microphone 122 of the electronic device 100 or the remote control 10 and/or the mobile terminal shown in Fig. 1.” *Id.* at [0109]-[0110]. Jang also teaches that “the other electronic devices connected to the first



electronic device 100 . . . may perform the voice recognition process.” *Id.* at [0129]. Contrary to Google’s suggestion (CIB at 93), a skilled artisan would understand from this that voice recognition unit 182 could be in any device 10, and could simultaneously be embedded in controller 180, which would permit any device 10 to interchangeably “act as a controller” and practice claim 16. Therefore, Jang discloses that each claimed electronic device is programmed to carry out the claimed programming steps, teaches all the limitations of claim 16, and accordingly anticipates claim 16.

d. Claim 17

Sonos argues, correctly, that Jang’s “magnitude (gain value) of the recognized voice signal” used for comparison purposes meets the “quality score of the voice input” limitation. *See* RIB at 81; Hr’g Tr. (Johnson) at 835:24-836:19. Google has no argument about claim 17 beyond its arguments regarding claim 16. *See* CIB at 93-94; CRB at 41-42. Therefore, the elements of claim 17 are disclosed in Jang, and Jang anticipates claim 17.

4. Masahide

Masahide discloses “a plurality of voice input devices” networked together, with each device sharing “determinative information” that is used to determine which device will “process[] and execut[e]” the voice input. RX-0269 at [0004]. Each voice input device includes a microphone, a signal processing unit capable of speech recognition, a central processing unit, and a “memory unit.” *Id.* at [0014], [0016], [0021], Fig. 3. In one embodiment, “each voice input device transmits volume information when it detects voice from a user,” that “volume information . . . is compared,” and “if the self-voice input device is the largest, the voice is processed,” and if not then it is not processed. *Id.* at [0050]-[0051].

a. Claim 10

Masahide thus discloses many of the elements of claim 10, including the processor, memory, microphone, a plurality of other electronic devices receiving the voice input, determining a first value and second values associated with the voice input, receiving the second values, determining the first value is higher than the second values, and responding to the voice input. *See* 311 patent at cl. 10. Dr. Johnson opined that these elements all appear in Masahide. *See* Hr’g Tr. (Johnson) at 876:18-25. Google challenges the disclosure of “detecting a voice input from a user,” but does not dispute the disclosure of the other elements. *See* CIB at 94-95. So all the other elements are found in Masahide.

As for “detecting a voice input from a user,” Sonos is correct that Masahide “repeatedly” teaches detecting a user’s voice with a microphone. RIB at 82 (emphasis and citations omitted). Google advances two arguments on this point. First, it argues that Masahide merely “detect[s] sound” rather than voice. CIB at 94. Although Masahide does disclose that “the present invention is not limited to detecting human voice,” it also plainly states that, for example, “voice is detected from a user.” RX-0269 at [0012], [0030]. Second, Google argues that the “voice detection process” disclosed is a “black box.” CIB at 94. This is true, but not clearly relevant; the disclosure of the claim element is clear, a skilled artisan would understand both how to perform voice detection and that Masahide discloses it, and there is otherwise no evidence of a lack of enablement. Therefore, the elements of claim 10 are disclosed in Masahide, and Masahide anticipates claim 10.

b. Claim 11

Claim 11 adds the requirements that the claimed device recognize a command in the voice input, determine that the command is of a type related to the device, and then respond to the input in accordance with the determination. *See* 311 patent at cl. 11. Masahide describes multiple



examples of this; in one embodiment, for instance, the “determinative information” used to identify which device will respond to the voice input is the “voice recognition results,” which are used to establish which “input device was spoken to.” RX-0269 at [0067]. Masahide provides an example involving the voice command “play,” where one input device is attached to a video player and another device is attached to an air conditioner, and that command is “associated with” the video player. *Id.* at [0065]-[0066], Fig. 9. Dr. Johnson opined that Masahide teaches these elements. *See Hr’g Tr.* at 877:1-878:7.

And unlike Rosenberger and Jang, this determination process supplements the process that satisfies claim 10. *See* RX-0269 at [0067]. Sonos cites a section of Masahide which states that “the means for determining input for voice input devices as described conventionally may be combined with those described above.” *Id.* at [0106]; *see* RIB at 84. One example of such “combin[ing]” is using different selection criteria before and after “a certain allowable time.” RX-0269 at [0106]. So Masahide teaches: (1) determining the first value is higher than the second values and responding accordingly; (2) recognizing a command in the voice input, identifying the device spoken to, and responding accordingly; and (3) combining two distinct determination processes such that the device is programmed to perform both depending on the circumstances.

As Google points out, though, Masahide does not disclose the exact configuration required by claim 11. *See* CIB at 95. It comes very close, so much so that it would seemingly be a good candidate for single-reference obviousness, but it simply does not teach both value-based determination and responding accordingly, and device type determination and responding accordingly, both in the same embodiment. So all the elements of claim 11 are not clearly and convincingly disclosed in Masahide, and Masahide does not anticipate that claim.

c. Claim 16

Claim 16 differs from claim 10 in that it requires a system of devices, all with the same hardware and software, where each device determines a first value and “compare[s] the first value and the respective second values.” 311 patent at cl. 16. In Masahide, each voice input device has the same hardware and software, and in one embodiment, “each voice input device transmits volume information when it detects voice from a user” and that “volume information . . . is compared.” RX-0269 at [0014], [0016], [0021] [0050]-[0051]. Google does not dispute the presence of these elements beyond its arguments pertaining to claim 10. CIB at 94-95. Therefore, the elements of claim 16 are disclosed in Masahide, and Masahide anticipates claim 16.

d. Claim 17

Sonos argues, correctly, that one embodiment in Masahide uses “signal-to-noise ratio” for comparison purposes, and that this qualifies as the claimed “quality score of the voice input.” RX-0269 at [0055]; *see* RIB at 85; Hr’g Tr. (Johnson) at 878:8-879:6. Google has no argument about claim 17 beyond its arguments regarding claim 16. *See* CIB at 96. Therefore, the elements of claim 17 are disclosed in Masahide, and Masahide anticipates claim 17.

e. Claim 19

Again, Masahide discloses use of “signal-to-noise ratio” for comparison purposes, which qualifies as the claimed “signal-to-noise rating,” as Dr. Johnson opined. RX-0269 at [0055]; *see* Hr’g Tr. (Johnson) at 878:8-879:6. Google has no argument about claim 19 beyond its arguments regarding claim 17. *See* CIB at 96. Therefore, the elements of claim 19 are disclosed in Masahide, and Masahide anticipates claim 19.

5. Obviousness

For obviousness, Sonos asserts that: (1) claim 11 would have been obvious over the combination of Rosenberger and Jang (*see* RIB at 71-72); (2) claim 18 would have been obvious



in view of VoicePod alone (*see id.* at 77); and (3) claim 19 would have been obvious over the combinations of Rosenberger and Masahide (*see id.* at 74), VoicePod and Masahide (*see id.* at 78), and Jang and Masahide (*see id.* at 81-82). Because anticipation is “the epitome of obviousness,” and every combination asserted against claim 19 includes Masahide, which anticipates it (along with intervening claims 17 and 16), there is no need to consider the obviousness of claim 19. *Wearable Electronic Devices*, Inv. No. 337-TA-1266, Comm’n Op. at 45.

Nevertheless, signal-to-noise ratios are well understood metrics used for the purpose of evaluating signal quality, with a higher ratio indicating a better result. *See generally* Hr’g Tr. (Johnson) at 806:10-19, 810:4-10, 823:24-824:6. And in Masahide, it is used exactly for this purpose, which a POSITA would be familiar with. RX-0269 at [0055]-[0057] (an indicator of “the best recorded voice”). This is nothing more than the use of a well-known feature to overcome a well-known problem according to its established function. So it would clearly have been obvious to use in the systems of Rosenberger, VoicePod, and Jang, which seek efficient and effective voice control over electronic devices. *Intel*, 61 F.4th at 1380; RX-0824 at [0177]; RX-0819 at 3:3-8, 10:14-33; RX-0811; Hr’g Tr. (Johnson) at 823:24-824:6. There is no credible risk of hindsight bias here, contrary to Google’s sole point of opposition. CIB at 97. So even considering the obviousness of claim 19 over Masahide in view of the other references, Sonos has carried its burden.

As for claim 11, Rosenberger’s coordination method is limited to comparing weighted scores, with no disclosure of using device type or command type for coordination, either alone or as a component of the weighted score. *See* Hr’g Tr. (Mahon) at 1091:22-1093:3. But Jang discloses recognizing a command in the voice input (*see* RX-0824 at [0110]), identifying a correspondence between the command and a device, and then selecting that device to perform the

[REDACTED]

command (*id.* at [0176]). Jang further discloses the benefit from implementing such a feature: “when there is any electronic device executing an application relating to messaging or emailing among a plurality of electronic devices, it is most efficient for the corresponding electronic device to perform the voice command.” RX-0824 at [0178]; *see* RRB at 48-49. In this way Jang itself provides the motivation to use “type-based” execution as an override to Rosenberger’s weighing of scores, and the motivation is not solely the say-so of Dr. Johnson, which is Google’s chief point in opposition. *See* CIB at 97. Together, the combination tightly corresponds with the “override” embodiment of the 311 patent:

In some implementations, the leader determination based on quality scores may be overridden based on additional criteria. That is, a device may be determined to be the leader even if it would otherwise not be determined to be the leader based merely on the quality scores. The additional criteria may include, for example, a type of request or command in the voice input and a state of the device.

311 patent at 22:31-37. No party discusses any objective indicia of nonobviousness.

Accordingly, Sonos has shown the additional elements of claim 11 would have been obvious to combine with claim 10, and with independent claim 10 anticipated, claim 11 is invalid.

As to claim 18, Sonos advances a single-reference obviousness case based on VoicePod’s use of [REDACTED]

[REDACTED] *See* Hr’g Tr. (Johnson) at 822:3-25; Hr’g Tr. (Jones) at 1041:15-1042:10. But testimony from Dr. Johnson suggests that [REDACTED]

[REDACTED] which as explained does not qualify as a “confidence level of detection of the voice input.” *See* Hr’g Tr. (Johnson) at 822:3-25 (citing RX-0525C.00002). Therefore, even if a skilled artisan would have been motivated [REDACTED]

[REDACTED] In light of the *Graham* factors,

[REDACTED]

especially the differences between the claimed invention and the prior art, this fatally undermines Sonos' case, because a POSITA would have had to do more than simply [REDACTED]

[REDACTED] A POSITA would instead have had to incorporate a method of measuring "confidence level of detection of the voice input," and then incorporate that measurement [REDACTED] and there is simply no evidence that a POSITA would have been capable of or motivated to do that. Claim 18 accordingly has not been shown to be obvious in view of VoicePod alone.

Therefore, Sonos has proven that claims 11 and 19 of the 311 patent would have been obvious under 35 U.S.C. § 103, but not claim 18.

6. Section 112

Sonos contends that, if Google's proposed construction of the term "detecting a voice input" is accepted, then the claims lack written description support and are invalid. *See* RIB at 85. Google's proposed construction has not been accepted, as explained above, so Sonos' contention is moot.

7. Section 101

Sonos contends that all asserted claims of the 311 patent are invalid under 35 U.S.C. § 101 because they are directed to unpatentable subject matter. *See* RIB at 86-91. Sonos argues specifically that the claims are directed to an abstract idea that "could be (and previously was) performed entirely by a human without a computer." *Id.* at 86.

"Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor." 35 U.S.C. § 101. Implicit in this provision is the principle that "abstract ideas are not patentable." *Alice*, 573 U.S. at 216. The Federal Circuit has made clear that "[e]ven a specification full of technical details about a physical invention may nonetheless conclude with claims that claim



nothing more than the broad law or abstract idea underlying the claims.” *ChargePoint, Inc. v. SemaConnect, Inc.*, 920 F.3d 759, 769 (Fed. Cir. 2019). As a result, even claims directed to extensive structure are invalid as abstract under *Alice* if “what is claimed is simply a generic environment in which to carry out the abstract idea.” *Yu v. Apple Inc.*, 1 F.4th 1040, 1043-44 (Fed. Cir. 2021)) (citing *In re TLI Commc’ns LLC Pat. Litig.*, 823 F.3d 607, 611 (Fed. Cir. 2016)).

Courts apply the two-step *Alice* test to evaluate Section 101, and first “determine whether the claims at issue are directed to a patent-ineligible concept,” and then if so, “examine the elements of [each] claim to determine whether it contains an ‘inventive concept’ sufficient to ‘transform’ the claimed abstract idea into a patent-eligible application.” *Alice*, 573 U.S. at 217-18, 221. The first step inquiry focuses on whether the character of the claims “as a whole is directed to excluded subject matter.” *Enfish*, 822 F.3d at 1335 (citing *Internet Patents Corp. v. Active Network, Inc.*, 790 F.3d 1343, 1346 (Fed. Cir. 2015); *Genetic Techs. Ltd. v. Merial L.L.C.*, 818 F.3d 1369, 1375 (Fed. Cir. 2016)). The second step inquiry focuses on whether the elements of a claim, individually and as an “ordered combination,” involve more than “well-understood, routine, and conventional activities previously known to the industry.” *Berkheimer v. HP Inc.*, 881 F.3d 1360, 1367 (Fed. Cir. 2018).

As for *Alice* step one, the character as a whole of independent claims 10 and 16 are directed to an abstract idea. Claim 10 recites an apparatus comprising one among a plurality of electronic devices, including at least one microphone, at least one processor, and memory storing a program for execution on the processor; claim 16 recites a system with similar features, but with all electronic devices having a microphone, processor, and executable program stored in memory. See 311 patent at cls. 10, 16. The program of claim 10 has four steps: detecting a voice input from a user, determining a first value associated with the input, receiving second values associated with

[REDACTED]

the input from the other devices, and responding to the detected input “in accordance with a determination that the first value is higher than the second values.” *See id.* at cl. 10. The program of claim 16 does not require that the voice input be from a “user,” and adds the requirement that the first and second values be “compare[d],” but is otherwise virtually identical to that of claim 10. *See id.* at cl. 16.

As a whole, such claims cover commonplace electronic devices or systems with processors that execute an algorithm, that is, “a generic environment in which to carry out [an] abstract idea.” *Yu*, 1 F.4th at 1043-44; *see Alice*, 573 U.S. at 222 (“a patent on [an] algorithm itself” is ineligible subject matter) (citations omitted). There is no limit on the nature of the “values” which are at the heart of the invention other than they must be “associated” with a voice input. There is no limit on the manner in which they are “receive[d]” or “compare[d]”; and there is no limit as to how the device “respond[s]” to the voice input. The breadth of these claims is a strong indicator they are directed to the abstract idea of gathering values, comparing them, and choosing a winner so that a human need not do so manually. *ChargePoint*, 920 F.3d at 769 (“The breadth with which this claim is written further indicates that the claim is directed to the abstract idea of communication over a network for device interaction.”). Google acknowledges as much. CIB at 102 (“[T]he ’311 claimed inventions operate to designate a particular electronic device to respond to a detected audio input without human activity controlling such designation . . .”).

Numerous similar claims have been found unpatentable. In *Cisco Systems, Inc. v. Uniloc 2017 LLC*, 813 F.App’x 495, 496 (Fed. Cir. 2020), for instance, the claim recited a method of operating a network of radio stations having the steps of:

determining a master/slave rank of each station in the network representative of the station's suitability for acting as master in the network using antenna performance characteristics of each station in view of the antenna's local environment; and enabling a station with the highest rank to be master.

[REDACTED]

The Federal Circuit affirmed the unpatentability of the claim, noting that it was “directed to the abstract idea of ranking stations using their antenna performance and choosing the best station as the master.” *Id.* at 497. In *Planet Bingo, LLC v. VKGS LLC*, 576 F.App’x 1005, 1007-08 (Fed. Cir. 2014), the Federal Circuit similarly affirmed the unpatentability of a claim covering “the steps of selecting, storing, and retrieving two sets of numbers, assigning a player identifier and a control number, and then comparing a winning set of bingo numbers with a selected set of bingo numbers.” The court observed that “not only can these steps be ‘carried out in existing computers long in use,’ but they also can be ‘done mentally.’” *Id.* at 1008 (citations and internal quotations omitted). And in *PersonalWeb Techs. LLC v. Google LLC*, 8 F.4th 1310, 1315 (Fed. Cir. 2021), the Federal Circuit affirmed the unpatentability of claims directed to “(1) using a content-based identifier generated from a ‘hash or message digest function,’ (2) comparing that content-based identifier against something else, [that is,] another content-based identifier or a request for data; and (3) providing access to, denying access to, or deleting data.” The Federal Circuit characterized the claims as “directed to the use of an algorithm-generated content-based identifier to perform the claimed data-management functions,” and therefore abstract. *Id.* at 1316.

In each of these cases, the claims were found abstract and unpatentable because they covered a computerized implementation of an algorithm, that is, “certain independently abstract ideas that use computers as tools” rather than “an improvement in computers as tools.” *Credit Acceptance Corp. v. Westlake Svcs.*, 859 F.3d 1044, 1055 (Fed. Cir. 2017) (citation omitted). The same is true of the claims of the 311 patent. The character as a whole of claims 10 and 16 are indeed a computerized implementation of the scenario Dr. Johnson posited:

Imagine you have a teacher, and there's a speech output. Students, what is the answer to problem 3? You could have the students detecting that speech, and you

[REDACTED]

could have them all responding at the same time, right, because there's no coordination.

...

So the students here have a value they identify that is kind of how confident they are. And then each of the students shares this value. In this case, they're just talking to each other. So they're communicating how confident they are.

Then they internally sort of compare their number to the other students, and the ones that have a lower number don't respond, and the one that has the highest number does respond.

Hr'g Tr. (Johnson) at 768:25-771:16. The algorithms of claims 10 and 16 “can be performed in the human mind” by, in this scenario, students responding to a teacher’s question. *PersonalWeb*, 8 F.4th at 1316. This is “a telltale sign of abstraction,” and there is thus no principled distinction between the claims of the 311 patent and the claims found unpatentable in *Cisco*, *Planet Bingo*, and *PersonalWeb*. *Id.*

Google nonetheless argues that *Cisco*, *Planet Bingo*, and *PersonalWeb*, among other cases, are distinguishable because their claims were directed to “‘performing a human activity using a computer.’” CIB at 101-02. But as Dr. Johnson’s scenario illustrates, the claims of the 311 patent are also directed to performing a human activity (deciding whether to respond to an “input”) by programming a computer to do it. The claims are thus addressed not to improving “computer functionality,” as Google suggests, but to enhancing the user’s experience. *Id.* at 100 (citing *Enfish*, 822 F.3d at 1335); *Credit Acceptance*, 859 F.3d at 1055 (“CAC suggests that the claims are not abstract because they ‘improve[] the functionality of the general purpose computer by programming fundamentally new features.’ But this is so only in the sense that the claims permit automation of previously manual processing of loan applications.”). Google makes this point itself: designating one device to respond to a given command “can reduce user confusion.” CIB at 100 (citing 311 patent at 1:62-2:5, 2:17-19). Google also claims conserving energy and battery

[REDACTED]

life are advantages of the claimed inventions, but (unlike claim 7 of the 748 patent) there are no claim limitations related to these benefits. *See* CIB at 100. And they are otherwise achieved merely by programming a particular algorithm that humans could otherwise perform, not by improving the hardware itself.

The dependent claims simply add programming steps or specify the nature of the claimed “first value” using well-known approaches (*e.g.*, quality, confidence, signal-to-noise) and so are similarly directed to programming a particular algorithm that humans could perform. *See* CIB at 101. Claim 11 adds two additional programming steps to independent claim 10, “recognizing a command in the voice input” and responding to the input in accordance with a determination that the type of command is related to the claimed first device. 311 patent at cl. 11. In Dr. Johnson’s scenario, this would be equivalent to the teacher asking a first question about India, the most confident student answering, the teacher repeating the question including a direction that, say, the student who has been to India should answer, and then the student who has so visited answering. Claims 17, 18, and 19 specify that the first value must be a quality score, a confidence level, or a “signal-to-noise rating,” respectively. *Id.* at cls. 17, 18, 19. These specifics change the nature of the determination – or, using Dr. Johnson’s scenario, the criteria used to determine which student should respond – but do not transform the claims from an abstract concept programmed to be performed by a computer into improvements to functionality of the computer itself. *See* RIB at 90.

So under *Alice* step one, the claims are abstract and directed to a patent-ineligible concept. Under *Alice* step two, the claimed program is simply the abstract algorithm, which “cannot supply the inventive concept that renders the invention significantly more than that ineligible concept,” and the claimed hardware (microphone, processor, and memory) is indisputably generic. *Simio*,

[REDACTED]

LLC v. FlexSim Software Products, Inc., 983 F.3d 1353, 1363 (Fed. Cir. 2020) (citations and quotations omitted). The elements of the claims, taken both individually and as an ordered combination, recite only well-understood, routine, and conventional features. *See* Hr’g Tr. (Johnson) at 771:17-772:14. Google barely attempts to defend against this finding; at best it argues that the claimed inventions “help[] conserve battery power and reduce redundant processing, [and] avoid[] user confusion.” RIB at 103. But, again, these are results, not elements of the claims themselves; and the claims themselves, both independent and dependent, lack anything significant beyond “the ineligible concept itself.” *Alice*, 573 U.S. at 218.

All claims of the 311 patent are therefore clearly and convincingly directed to ineligible subject matter and are invalid under 35 U.S.C. § 101.

VI. U.S. PATENT NO. 11,050,615

A. Level of Ordinary Skill in the Art

In Order No. 14, I determined that a person having ordinary skill in the art of the 615 patent at the time of invention:

[W]ould have a B.S. degree in electrical or computer engineering, computer science, or a related field, and approximately 2-4 years of experience in networking and network-based systems or applications or an equivalent level of skill, knowledge, and experience. . . . [E]xperience may substitute for education and vice versa.

Order No. 14 at 8. The parties do not challenge this definition (*see generally* CIB; CRB; RIB; RRB), and it is applied throughout this initial determination.

B. Claims-at-Issue

Claims 1, 5, 6, 9, 16, 17, and 19 of the 615 patent are at issue in this investigation, either through allegations of infringement or domestic industry technical prong. *See* CIB at 7-8. They are reproduced below, along with limitation identifiers:



1. [1.0] A method for commissioning a target device onto a communication network, comprising:

[1.1] at the target device including a microprocessor, a wireless radio, and commissioning logic:

[1.1.1] receiving a request to initiate a commissioning process with the target device;

[1.1.2] establishing a short-range signal transmission path with a wireless device independently of the communication network;

[1.1.3] in response to receiving the request, receiving one or more network configuration packets from the wireless device via the short-range signal transmission path, wherein the one or more network configuration packets convey network configuration data associated with the communication network according to a predetermined data format, the network configuration data including at least a security passphrase for accessing the communication network;

[1.1.4] executing an application on the target device to decode and process the one or more network configuration packets and recover the network configuration data; and

[1.1.5] after receiving the network configuration packets, employing via the wireless radio the network configuration data conveyed in the one or more network configuration packets to enable the target device to join the communication network.

....

5. The method of claim 1, wherein the short-range signal transmission path is associated with a communication channel based on one of Bluetooth communication, radio frequency identification (RFID), Zigbee, radio frequency for consumer electronics (RF4CE), Z-Wave, and near field communication.

6. The method of claim 1, further comprising:

contacting the wireless device via the communication network to indicate that the target device has successfully entered the communication network.

....

9. The method of claim 1, further comprising:

generating one of a visual indication and an audio indication to a user about a status of the commissioning process.

....



16. [16.0.1] A non-transitory computer readable storage medium storing one or more programs configured for execution by a target device for commissioning the target device onto a communication network,

[16.0.2] the target device including a microprocessor, a wireless radio, and commissioning logic, the one or more programs comprising instructions for:

[16.1] receiving a request to initiate a commissioning process with the target device;

[16.2] establishing a short-range signal transmission path with a wireless device independently of the communication network;

[16.3] in response to receiving the request, receiving one or more network configuration packets from the wireless device via the short-range signal transmission path, wherein the one or more network configuration packets convey network configuration data associated with the communication network according to a predetermined data format, the network configuration data including at least a security passphrase for accessing the communication network;

[16.4] executing an application on the target device to decode and process the one or more network configuration packets and recover the network configuration data; and

[16.5] after receiving the network configuration packets, employing via the wireless radio the network configuration data conveyed in the one or more network configuration packets to enable the target device to join the communication network.

17. The non-transitory computer readable storage medium of claim 16, wherein the one or more programs further comprise instructions for:

generating one of a visual indication and an audio indication to a user about a status of the commissioning process.

. . . .

19. The non-transitory computer readable storage medium of claim 16, wherein the one or more programs further comprise instructions for:

contacting the wireless device via the communication network to indicate that the target device has successfully entered the communication network.

615 patent at cls. 1 (annotated), 5, 6, 9, 16 (annotated), 17, 19.

C. Claim Construction

As part of the *Markman* process, the following claim terms of the 615 patent were construed, either as agreed between the parties or determined by Order No. 14:

Claim Term	Construction
“short-range signal transmission path”	Not indefinite
“in response to receiving the request, receiving one or more network configuration packets”	Not indefinite

See Order No. 14 at 54, 56. Within their briefing, the parties identify a number of additional claim construction disputes, discussed below.

1. “receiving a request to initiate a commissioning process”

For the phrase “receiving a request to initiate a commissioning process,” Google finds a dispute based on seemingly contradictory statements made by Sonos’ expert, Dr. Douglas Schmidt, at the evidentiary hearing. CIB at 104. Specifically, Google argues that Dr. Schmidt testified, “the claim covers certain user actions, such as ‘pushing one or more buttons on the device’ or ‘using a remote control,’ if that user action ‘then initiates the commissioning process’ . . . but also asserted that the claim excludes a user plugging in a device to initiate an automatic commissioning process on boot.” *Id.* (citing Hr’g Tr. (Schmidt) at 1018:13-1019:2, 1467:23-1468:12). Google adds, “[t]he intrinsic evidence thus does not support limiting this claim term to exclude some user interactions with the device, including plugging in a device to initiate the boot sequence, while still capturing other user interactions with the device, such as pressing buttons on the device,” without offering an alternative construction or interpretation. See *id.* at 105-107 (“The intrinsic evidence—which Dr. Schmidt admits does not support including some user actions (like pushing

[REDACTED]

a button) but excluding other user actions (like plugging in a device)—dictates the resolution of the parties’ dispute.”); *see* CRB at 44-45.

On this particular question, Sonos argues it is not one of claim construction—“any dispute is about whether various things that might happen to a device would satisfy the limitation, not about what the limitation means. Indeed not every dispute about whether a limitation is satisfied is a dispute about the proper *construction* of the limitation.” RRB at 51 (emphasis in original) (citing *Summit 6, LLC v. Samsung Elecs. Co.*, 802 F.3d 1283, 1291 (Fed. Cir. 2015)). Regardless, Sonos contends the entire issue is a strawman—as it was already settled at the evidentiary hearing that Dr. Schmidt no longer holds the view or offers an opinion that plugging in a device to initiate a boot sequence is not “receiving a request to initiate a commissioning process.” *See id.* at 51-52 (citing, *inter alia*, Hr’g Tr. (Schmidt) at 1477:17-1478:4). Sonos argues the issue is additionally moot “because Google never presented either an infringement or a technical DI theory that relied on plugging in its device to satisfy this claim limitation.” *Id.* at 52-53 (emphasis removed). As far as its own construction, Sonos offers:

Among other things, the plain language of the text (informed by the ’615 Patent itself) indicates that: (i) the “request” can have any form or format; (ii) the request must be to initiate (*i.e.*, to begin) the commissioning process; (iii) because the request is “received” by the target device it must come from outside the device; and (iv) the commissioning process must include (*i.e.*, be “with”) the target device.

RIB at 91 (citing 615 patent; Hr’g Tr. (Schmidt) at 909:2-13).

Sonos is persuasive that there is no discernible dispute over the meaning of “receiving a request to initiate a commissioning process” and thus no claim construction to resolve. Whether pressing a hypothetical button, or plugging in a hypothetical device, satisfies “receiving a request” is more of an infringement inquiry. *Markman*, 52 F.3d at 976 (“An infringement analysis entails two steps. . . . The second step is comparing the properly construed claims to the device accused

[REDACTED]

of infringing.”). And as for the only actual construction proffered (by Sonos), Google openly acknowledges it and offers no opposition. *See* CRB at 44. Accordingly, there is no dispute to resolve over “receiving a request to initiate a commissioning process.”

2. “in response to receiving the request, receiving . . .”

As with the prior term, Google identifies “in response to receiving the request, receiving one or more network configuration packets from the wireless device via the short-range signal transmission path” as needing construction because of positions Sonos took at the evidentiary hearing. CIB at 107. Specifically, Google argues:

Sonos’s expert Dr. Schmidt asserted that Order No. 14 held the claim should be interpreted to require that “receiving network configuration packets” is the “direct result of” “receiving a request to initiate commissioning.” Tr. (Schmidt) 1446:8-20. But the claim language, and Order No. 14, require no such thing. In fact, Order No. 14 already addressed this dispute and rejected Sonos’s attempt to limit this term to a “direct result” with no intervening steps. Order No. 14 at 56-58.

Id. Sonos, however, denies that it seeks to require a “direct result” for “in response.” RRB at 54. Rather, it explains, “the plain and ordinary meaning of the phrase ‘in response to’ connotes a greater causal link than a mere precondition.” *Id.* (emphasis removed).³ Google’s briefing does not suggest or imply a dispute with this construction—where a “causal link” is more than a mere precondition but less than a direct result. *See* CIB at 107-108; CRB at 43-44. Accordingly, there is no identifiable dispute to resolve over “in response to receiving the request, receiving . . .”

D. Infringement

According to Google’s post-hearing briefing, the use, manufacture, or sale of the 615 Accused Products infringe claims 1, 5, 6, 9, 16, 17, and 19. CIB at 109. Of these, claims 1 and

³ Google views Sonos as having waived any argument on this term for failure to include it in its opening post-hearing brief under Ground Rule 13.1. CRB at 43-44 (citing Order No. 2 at G.R. 13.1). But Sonos adequately presented its position within the topic of technical prong domestic industry. RIB at 106-107; *see* RRB at 54.

[REDACTED]

16 are independent; claims 5, 6, and 9 depend directly from claim 1; and claims 17 and 19 depend directly from claim 16. For the reasons discussed below, Google has shown infringement of these claims by the 615 Accused Products but not by any of the Redesigned Products.

1. Claim 1

For reference, claim 1 of the 615 patent requires:

1. [1.0] A method for commissioning a target device onto a communication network, comprising:

[1.1] at the target device including a microprocessor, a wireless radio, and commissioning logic:

[1.1.1] receiving a request to initiate a commissioning process with the target device;

[1.1.2] establishing a short-range signal transmission path with a wireless device independently of the communication network;

[1.1.3] in response to receiving the request, receiving one or more network configuration packets from the wireless device via the short-range signal transmission path, wherein the one or more network configuration packets convey network configuration data associated with the communication network according to a predetermined data format, the network configuration data including at least a security passphrase for accessing the communication network;

[1.1.4] executing an application on the target device to decode and process the one or more network configuration packets and recover the network configuration data; and

[1.1.5] after receiving the network configuration packets, employing via the wireless radio the network configuration data conveyed in the one or more network configuration packets to enable the target device to join the communication network.

615 patent at cl. 1 (annotated).

In support of limitations [1.0]-[1.1.2], Google explains the relevant functionality as a Bluetooth low-energy (BLE) protocol between an app on a user's mobile device and the 615 Accused Products:

The '615 Accused Products perform a method for commissioning onto a communication network.

[REDACTED]

....

The '615 Accused Products include a CPU, a WiFi radio, a BLE radio, and memory storing commissioning logic. *See* JX-325C.1-2; JX-299C.5-6; JX-23 [Hutchings Dep.] 38:19-39:3; Tr. (Min) 536:21-537:12. The '615 Accused Products each include logic to commission the device onto a network, by performing the elements of claims 1, 11, and 16 using the CPU, WiFi radio, BLE radio, memory, and software instructions discussed herein (Section V.B.1(a)-(g) *infra*).

....

The '615 Accused Products receive [REDACTED] from a mobile device running the Sonos S2 App to initiate commissioning. Tr. (Jones) 129:19-130:1; Tr. (Min) 537:13-538:16; JX-611C ([REDACTED]), JX-610C; JX-303C.4 ([REDACTED]); JX-333C.3-4 ([REDACTED] Sonos S2 App to the Sonos One); JX-25C [Millington Dep.] 107:11-16. The [REDACTED] initiates the Sonos One's commissioning process. JX-303C.4; Tr. (Min) 538:7-21 [REDACTED].

....

[B]efore the user selects a Sonos device from the Sonos app, no setup steps are occurring, and no [REDACTED] even exists. Tr. (Millington) 1267:17-24; JX-333.2. [REDACTED] are transmitted so that devices running the Sonos app can discover the '615 Accused Products. Tr. (Millington) 1267:6-24; Tr. (Min) 538:22-539:2. Commissioning may then begin if, and only if, the user selects the '615 Accused Product for commissioning. *Id.*; JX-333.2. But commissioning may not initiate even though a device is discoverable and has been discovered—many devices may discover the '615 Accused Product and not commission that device. Tr. (Min) 538:22-539:2; Tr. (Millington) 1267:17-24; JX-333.2.

....

The BLE connection between the '615 Accused Products and the mobile device running the Sonos app is independent of the WiFi network to which the '615 Accused Product will be commissioned. Specifically, the '615 Accused Product transmits [REDACTED] received by the mobile device running the Sonos app. JX.332.2-4; JX-333C.2. After BLE discovery, the Sonos app presents a "Set up this Speaker" option to the user. JX.332.10. The user then requests to commission the Sonos device to the user's WiFi network. JX.332.10. Once the user

[REDACTED]

selects “Set up this Speaker,” a BLE connection is established between the mobile device running the Sonos app and the ’615 Accused Product. JX.332.11 (illustrating the “[c]onnecting to your speaker” page on the Sonos S2 App); CX-187C.1 (“[REDACTED]”); Tr. (Millington) 1268:13-20; Tr. (Min) 540:4-541:1; RX-0829. [REDACTED], are sent to the ’615 Accused Product from the mobile device running the Sonos app over the BLE connection. CX-198.1; JX-300C.1; JX-25C [Millington Dep.] 50:18-21, 56:8-12; CX-191C.1; CX-192C.1; JX-333C.1; Tr. (Min) 540:4-6.

The BLE connection between the mobile device and the ’615 Accused Product is independent of the communication network (user’s WiFi network) because the BLE connection between the mobile device and the ’615 Accused Product is based on BLE, and the WiFi network is based on IEEE 802.11. Tr. (Min) 540:7-17; CX-187C.1. BLE signals cannot be transmitted over an IEEE 802.11 transmission path and are only transmitted over BLE paths. Tr. (Millington) 630:11-13; Tr. (Min) 540:7-17.

CIB at 109-112. In support of limitation [1.1.3], Google describes intermediate steps in the process:

Each ’615 Accused Product, in response to receiving [REDACTED], receives network configuration packets from the wireless device via the BLE transmission path. The ’615 Accused Product receives [REDACTED] Hr. Tr. (Min) 542:13-16 [REDACTED] JX-333.3-4 (Sonos One receives from the Sonos app); JX-303C.17-18 ([REDACTED]); JX-611C ([REDACTED]); JX-629C, [REDACTED] -610C, [REDACTED] JX-333.4 (Sonos One receives JX-303C.17-18 ([REDACTED]); Tr. (Jones) 130:2-9; Tr. (Min) 542:2-12. This message is communicated over the BLE connection between the mobile device running the Sonos app and the ’615 Accused Product. CX-187C.1 (BLE is used for [REDACTED]); JX-300C.1 [REDACTED]; Tr. (Jones) 129:6-14, 130:2-9; Tr. (Min) 540:4-541:6.

The [REDACTED] without receiving and responding to [REDACTED]

[REDACTED]

[REDACTED] the Sonos device would not subsequently receive [REDACTED] JX-611C; JX-629C; JX-610C; JX-613C; JX-614C; JX-629C; Tr. (Min) 542:17-543:5; Tr. (Millington) 1267:1-1267:5 (“Q. You would agree with me that if [REDACTED]

[REDACTED] right? A. Yes, that’s correct.”). Thus, the [REDACTED]

[REDACTED] *Id.*

....

[T]he network configuration packets ([REDACTED] JX-333C.3-4 (illustrating the fields of [REDACTED]); JX-303C.17-18 (identifying fields of [REDACTED] Tr. (Jones) 130:2-9 (explaining that [REDACTED] Tr. (Min) 542:6-12 (explaining that [REDACTED] JX-611C ([REDACTED])).

The [REDACTED] JX-303C.17-18 (identifying fields of the [REDACTED] as including [REDACTED]). A POSITA would understand the network configuration data is in a predetermined format; the fields are predefined and must be included in a specific format for the Sonos One to recognize the data. Tr. (Min) 543:14-544:8; JX-611C ([REDACTED]).

....

[REDACTED] JX-333C.3-4 (illustrating the fields of the [REDACTED] JX-303C.17-18 (identifying fields of the [REDACTED] as including [REDACTED]); Tr. (Jones) 130:2-9 (explaining that [REDACTED] Tr. (Min) 542:6-12 (explaining that [REDACTED] The WiFi password is a security passphrase for accessing the communication network. Tr. (Min) 544:15-22.

[REDACTED]

CIB at 113-115. And in support of limitations [1.1.4] and [1.1.5], Google adds the end result wherein the 615 Accused Products use received credentials to join the network:

The '615 Accused Products meet this element by executing [REDACTED]
[REDACTED] Tr. (Min) 545:3-11, 545:22-24; JX-27C
[Stefani Dep.] 18:20-22, 57:5-10; JX-295C; JX-301C; JX-305C. [REDACTED]
[REDACTED]
[REDACTED] Tr. (Min) 545:3-21; JX-613C
([REDACTED]).

....

The '615 Accused Products employ the SSID and password contained in the
" [REDACTED] [REDACTED] to join the
user's WiFi network (communication network). Tr. (Min) 546:14-20; JX-332.12-
13; CX-228C.1-2; CX-185C.1-2; JX-614C, -615C; Tr. (Jones) 130:10-16; Tr.
(Min) 546:4-547:11.

CIB at 115-116. Google has shown the 615 Accused Products infringe this claim.

Sonos offers three points in opposition, none of which are persuasive. First, Sonos argues

[REDACTED]
[REDACTED] cannot satisfy "receiving a request to initiate a
commissioning process with the target device" because at that point the Sonos commissioning
process has actually already begun; *i.e.*, another component or event is the "initiator." *See* RIB at
91-93; RRB at 55-57. According to Sonos, the commissioning process begins [REDACTED]

[REDACTED]
[REDACTED]
[REDACTED] RIB at 92 (citing Hr'g Tr. (Millington) at
1257:22-1258:5; Hr'g Tr. (Schmidt) at 1432:11-1433:2); *see* JX-0333C.2, 3; RRB at 55
("commissioning begins when the Sonos One starts [REDACTED]

[REDACTED] Sonos contends:

[REDACTED]

Google similarly uses the unfounded assumption equating [REDACTED] [REDACTED]
[REDACTED] CPoHB 110-11. Google cites [REDACTED]
[REDACTED] *Id.* (citing JX-333C.2). This is wrong. Whether the Sonos One practices this limitation depends on what the speaker does, not how documentation describes it. Google needed to have analyzed the actual steps required to configure a Sonos One in the context of the stated definition of “commissioning.” It chose not to. Instead, it relies on the bare, unsupported assertion that [REDACTED] [REDACTED] consequently, Google cannot carry its burden on this limitation.

RRB at 56-57.

The argument misses the point. It does not matter when the Sonos commissioning process begins. The question is whether the steps that follow the reception of “[REDACTED]” by an Accused Product constitute a “commissioning process” as a POSITA would understand the term. If so, then “[REDACTED]” initiates that process—whatever it may be. And Sonos itself takes the position that “commissioning process” has a broad meaning:

Google’s attempt to narrowly define what is part of the “commissioning process” is inconsistent with the ’615 Patent. The ’615 Patent does not talk about “discovery” or “pre-setup” much less distinguish those terms from the commissioning process. And it expressly construes “commissioning” broadly to mean “configuration of the other device [] and the system [] as a whole such that the other device [] is enabled to function properly over the WLAN.” JX-4, 5:2-7; *see also* Tr. (Min) 508:12-509:2 (Dr. Min acknowledging this construction of “commissioning”), (Schmidt) 1409:25-1410:9 (Dr. Schmidt agreeing with this construction). This is consistent with the plain and ordinary meaning of the term “commissioning.” Tr. (Schmidt) 967:16-968:3, 1409:25-1410:9.

RIB at 92. There is no further dispute that [REDACTED]
[REDACTED], has the purpose or effect of commissioning a target device to an existing network. *See, e.g.,* RRB at 56 (alleging only that Dr. Min “never compares [REDACTED] to the ‘commissioning’ definition he concedes applies.”) This is described squarely in its documentation:

[REDACTED]

[REDACTED]

JX-0333C.2. Thus, “[REDACTED] fairly begins, or initiates, “a commissioning process.”

The limitation is met.

Moreover, the obvious thrust of the 615 patent is a process to enable a user or other authorized device to choose when and if another device is to join a network. As the patent explains:

But as one skilled in the art will appreciate, wireless electronic devices do not merely connect themselves to the nearest wireless network. Rather, they must be “commissioned” onto a desired network. That is, the particular devices must be provided with configuration data to enable them to join the desired wireless network so that they can function according to specification by utilizing the communication properties of the network.

....

Accordingly, what is needed is a technique for commissioning a wireless device onto a wireless network that the average consumer can employ without undue distress.

In addition, what is needed is a mechanism for commissioning wireless devices that utilizes common, user friendly steps and equipment.

615 patent at 1:62-2:2, 2:17-22. If an [REDACTED] is the beginning of a commissioning process, then the target device chooses or decides when to initiate commissioning itself to a network. This contradicts the spirit of the patent. It is more reasonable to view an [REDACTED] as a message that a device is *available* for commissioning or, as Sonos puts it, “indicating the device is in need of configuration” (RIB at 92), should a user or other device subsequently select it.

[REDACTED]

Moreover, the 615 patent suggests that “commissioning” is a multi-stage process, such that multiple requests to initiate commissioning are possible: “‘commissioning’ is construed to mean configuration of the other device 107 and the system 100 as a whole such that the other device 107 is enabled to function properly over the WLAN 104 including, if required, access to the Internet 102.” 615 patent at 5:3-7. So there could be a commissioning for the target device (involving its configuration), another commissioning for the system as a whole (involving its configuration), and a third commissioning for Internet access. Thus, even if an [REDACTED]

[REDACTED]

[REDACTED]

Second, Sonos challenges whether “[REDACTED]” properly qualifies as a “request” as opposed to some other type of message:

Google has not shown nor explained how [REDACTED] is a “request to initiate a commissioning process.” Indeed, Dr. Min made no attempt to argue that the content of [REDACTED] constitutes a request nor to analyze what the Sonos One does in response to receiving this message. *See* Tr. (Min) 538:7-21. Instead, he simply focuses on when the Sonos One receives that message and assumes that it constitutes a request to initiate commissioning because some of the commissioning steps happen after that message is received. *Id.* At most, [REDACTED] provides information used in the (at that point) already ongoing commissioning process. Tr. (Min) 580:2-10, (Schmidt) 1433:21-1434:16; RDX-4C.55.

RIB at 93. Google does not address this specific point in either of its briefs (CIB at 110-111; CRB at 45-46), but it is not persuasive. No party argues “request” deserves anything other than its plain and ordinary meaning (*Kyocera*, 22 F.4th at 1378 (reminding there are only two exceptions to plain and ordinary meaning)), and the plain meaning of “request” is a message asking the recipient to do something, not unlike “command” in the 748 patent. And [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

....

[REDACTED]

JX-0333C.3-4; Hr’g Tr. (Min) at 542:25-543:5. Sonos also acknowledges that after

“ [REDACTED] [REDACTED]

[REDACTED] RIB at 95 (citing Hr’g Tr. (Schmidt) at 1436:13-1437:5; Hr’g Tr. (Millington) at 1259:12-1260:10). Thus, the limitation is met.

Lastly, Sonos argues “in response to receiving the request, receiving one or more network configuration packets from the wireless device via the short-range signal transmission path” is not

[REDACTED]

met because t [REDACTED]

[REDACTED] Sonos emphasizes that Order No. 14 already “construed this term to mean that ‘network configuration packets are received as a result of, and because of, the request to initiate commissioning’” and this requires “a causal relationship between the two messages – and that causal relationship must be more than the former being a necessary precondition to the latter.” RIB at 94 (citing Order No. 14 at 55). More specifically, Sonos alleges “the initiating message must be a proximate or sufficient cause and not merely a precondition” and that Google itself argues for this construction in its response to invalidity. *See id.* at 107, 112; RRB at 57 (“Google argues that ‘[REDACTED] [REDACTED] which is insufficient.”). With this construction in mind, Sonos finds the limitation unmet in the 615 Accused Products because in t [REDACTED]

[REDACTED]

Indeed, after the Sonos One [REDACTED] Tr. (Schmidt) 1436:13-1437:5 (discussing RDX-4C.60 (citing JX-333C.4)); *see also* Tr. (Millington) 1259:12-1260:10. [REDACTED]

[REDACTED] Tr. (Millington) 1260:11-22, (Schmidt) 1436:13-1437:5. As Dr. Schmidt explained, because this is not a “deterministic process,” [REDACTED]

Tr. (Schmidt) 1435:3-21. Google’s expert Dr. Min acknowledges that [REDACTED]

[REDACTED] Tr. (Min) 541:16-542:16 (discussing CDX-4C.63 (citing JX-333C.4)). That is factually wrong. As Sonos’s Chief Innovation Officer Nick Millington testified, [REDACTED]

[REDACTED] Tr. (Millington) 1259:12-1260:10 (discussing JX-333C.3); *see also* Tr. (Schmidt) 1436:13-1437:5 (testimony concerning same). On this point, the ALJ simply must decide whether to accept Dr. Min’s assertion (made without substantive analysis) that [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

RIB at 95.

Sonos' position hinges on reading "in response to receiving the request" as requiring proximate causation. To be clear, this was not explicitly or implicitly established by Order No. 14. That order merely agreed "the claim means what it says: network configuration packets are received as a result of, and because of, the request to initiate commissioning" and rejected Sonos' contention that the term was indefinite. Order No. 14 at 55-56. And proximate causation between these messages is not a concept otherwise found in the intrinsic evidence; indeed, Sonos cites none in its briefing. *See* RIB at 93-95; RRB at 57-58. Quite the contrary, the idea that security or other capability checks may need to run before secret network credentials are conveyed would have been appreciated by those of ordinary skill in the art:

As one skilled in the art will appreciate, there are a number of varying techniques that may be employed to commission present day devices onto a WLAN 104. Some of these techniques require operator intervention, some require the use of special purpose commissioning equipment 108, and some require the creation of temporary (or ad hoc) wireless networks 109. And the present inventors have noted that as wireless device usage proliferates in the office and the home, this cornucopia of commissioning techniques poses challenges to those in the art, because each individual technique is limited with regard to one system attribute or another. A more detailed discussion of the limitations associated with present day commissioning techniques will now be presented with reference to FIG. 2.

. . . .

Another well known present day commissioning technique provides for the direct entry of device configuration data utilizing integral or directly coupled controls and displays. For instance, consider a scenario under which an operator may commission the printer 205 onto the WLAN 204 by performing a series of data entry steps via the keypad 216 and display 217. The operator may select from a menu of WLAN types and then the printer 205 will monitor for available networks of that type, thus allowing the operator to select from a menu of available networks. The operator may then be required to enter secure access information (*e.g.*, passwords, etc.) to enable the printer to join the WLAN.

[REDACTED]

Or consider a more intelligent commissioning technique where, say, the digital media receiver 206 possesses the capabilities to determine the appropriate WLAN 204 to join, and all that is needed is for the operator to enter a personal identification number (PIN) via the remote controller 213 and verify configuration setup via the video display 214.

The above commissioning techniques may be categorized in general as Wi-Fi protected setup techniques, and are well known to those in the art.

....

In addition, for those techniques that temporarily open a network in order to commission as device, such an action is both observable and sniffable, thus providing a pathway for exploitation of the compromised parameter that allow unauthorized users and devices to join the network at a later time. Consequently, the wide range of complex commissioning techniques are challenging those in the art to develop more user-friendly, secure, and effective mechanisms for device commissioning than have heretofore been provided. More specifically, with the exponential increase in the deployment of wireless devices in the marketplace, those in the art are motivated to provide commissioning techniques that a typical user can perform without problems.

615 patent at 5:8-21, 5:66-6:20, 6:50-63.

On the whole then, there is little reason to adopt Sonos' proximate cause reading of the claim, which would exclude intervening activities such as security checks. And even if proximate cause were a requirement, the 615 Accused Products running [REDACTED] would likely meet it. As the patent communicates, the purpose of the invention is to simplify the user experience with "automatic[]" delivery of configuration information:

Accordingly, what is needed is a technique for commissioning a wireless device onto a wireless network that the average consumer can employ without undue distress.

In addition, what is needed is a mechanism for commissioning wireless devices that utilizes common, user friendly steps and equipment.

....

Furthermore, since a smart wireless device is employed as a commissioning device, it already possesses the ability to automatically discover WLAN configuration, thus simplifying user experience.

[REDACTED]

615 patent at 2:17-22, 12:36-40. There is no assertion from any party that the process [REDACTED]

[REDACTED]

[REDACTED]. See RIB at 94-95 (mentioning only that a user could cancel or abort the process). And it is more than likely that the entire process takes only a few moments given the speed of today's computers and expectations of today's consumers, thereby qualifying as proximate in the ordinary sense.

This is entirely unlike Sonos' hypothetical where getting a Ph.D is not "in response to" an individual graduating high school because of years of intervening events. RIB at 107. A better example would be a user clicking "download" on a software webpage, and the system automatically checking if sufficient disk space is available before the download begins. No one could plausibly argue the download was not "in response to" clicking the "download" button, despite the potential for, as Sonos puts it, an insufficient disk space "offramp."

Accordingly, the limitation is met as alleged, and the 615 Accused Products have been shown to infringe claim 1.

Turning to the Redesigned Products, Google does not address them in the particular context of the 615 patent. See CIB at 119. Accordingly, Google has not shown infringement of the 615 patent by any Redesigned Product.

2. Claim 5

For reference, claim 5 of the 615 patent requires:

5. The method of claim 1, wherein the short-range signal transmission path is associated with a communication channel based on one of Bluetooth communication, radio frequency identification (RFID), Zigbee, radio frequency for consumer electronics (RF4CE), Z-Wave, and near field communication.

615 patent at cl. 5. Google contends, as testified by Dr. Min, that the claim is met because "[t]he short-range signal transmission path is a BLE connection between the mobile device running the

[REDACTED]

Sonos S2 App and the '615 Accused product.” CIB at 116; Hr’g Tr. (Min) at 547:12-548:2. Sonos does not dispute infringement of claim 5 apart from its dependency on claim 1. RIB at 96; RRB at 58. In light of the cited evidence and opinion, the additional elements of claim 5 are met in the 615 Accused Products. As for the Redesigned Products, Google does not accuse them of infringement, so they do not infringe claim 5. *See* CIB at 119.

3. Claim 6

For reference, claim 6 of the 615 patent requires:

6. The method of claim 1, further comprising:

contacting the wireless device via the communication network to indicate that the target device has successfully entered the communication network.

615 patent at cl. 6. Google contends, as testified by Dr. Min, that the claim is met because:

Sonos’s corporate witness, Mr. Millington, confirmed that the Sonos One satisfies this element. . . . [REDACTED]

CIB at 116-117; Hr’g Tr. (Min) at 548:3-548:18. Sonos does not dispute infringement of claim 6 apart from its dependency on claim 1. RIB at 96; RRB at 58. In light of the cited evidence and opinion, the additional elements of claim 6 are met in the 615 Accused Products. As for the Redesigned Products, Google does not accuse them of infringement, so they do not infringe claim 6. *See* CIB at 119.

4. Claim 9

For reference, claim 9 of the 615 patent requires:

9. The method of claim 1, further comprising:

[REDACTED]

generating one of a visual indication and an audio indication to a user about a status of the commissioning process.

615 patent at cl. 9. Google contends, as testified by Dr. Min, that the claim is met because:

The '615 Accused Products generate a visual indication and an audio indication to

[REDACTED]

CIB at 117-118; Hr'g Tr. (Min) at 548:19-549:9. Sonos does not dispute infringement of claim 9 apart from its dependency on claim 1. RIB at 96; RRB at 58. In light of the cited evidence and opinion, the additional elements of claim 9 are met in the 615 Accused Products. As for the Redesigned Products, Google does not accuse them of infringement, so they do not infringe claim 9. *See* CIB at 119.

5. Claim 16

For reference, claim 16 of the 615 patent requires:

16. [16.0.1] A non-transitory computer readable storage medium storing one or more programs configured for execution by a target device for commissioning the target device onto a communication network,

[16.0.2] the target device including a microprocessor, a wireless radio, and commissioning logic, the one or more programs comprising instructions for:

[16.1] receiving a request to initiate a commissioning process with the target device;

[16.2] establishing a short-range signal transmission path with a wireless device independently of the communication network;

[16.3] in response to receiving the request, receiving one or more network configuration packets from the wireless device via the short-range signal transmission path, wherein the one or more network configuration packets convey network configuration data associated with the communication network according to a predetermined data format, the network configuration data including at least a security passphrase for accessing the communication network;

[16.4] executing an application on the target device to decode and process the one or more network configuration packets and recover the network configuration data; and

[16.5] after receiving the network configuration packets, employing via the wireless radio the network configuration data conveyed in the one or more network configuration packets to enable the target device to join the communication network.

615 patent at cl. 16 (annotated). Google addresses claim 16 with identical evidence and argument as for claim 1. *See* CIB at 109-116; CRB at 45-47. Sonos does as well. RIB at 91-95; RRB at 56-58. As determined above, the 615 Accused Products have been shown to infringe claim 1 and thus also infringe claim 16. As for the Redesigned Products, Google does not accuse them of infringement, so they do not infringe claim 16. *See* CIB at 119.

6. Claim 17

For reference, claim 17 of the 615 patent requires:

17. The non-transitory computer readable storage medium of claim 16, wherein the one or more programs further comprise instructions for:

generating one of a visual indication and an audio indication to a user about a status of the commissioning process.

615 patent at cl. 17. Google addresses claim 17 with identical evidence and argument as for claim 9. *See* CIB at 117-118. Sonos does not dispute infringement of claim 17 apart from its dependency on claim 16. RIB at 96; RRB at 58. In light of the cited evidence and opinion, the additional elements of claim 17 are met in the 615 Accused Products. As for the Redesigned Products, Google does not accuse them of infringement, so they do not infringe claim 17. *See* CIB at 119.

7. Claim 19

For reference, claim 19 of the 615 patent requires:

19. The non-transitory computer readable storage medium of claim 16, wherein the one or more programs further comprise instructions for:

[REDACTED]

contacting the wireless device via the communication network to indicate that the target device has successfully entered the communication network.

615 patent at cl. 19. Google addresses claim 19 with identical evidence and argument as for claim 6. *See* CIB at 116-117. Sonos does not dispute infringement of claim 19 apart from its dependency on claim 16. RIB at 96; RRB at 58. In light of the cited evidence and opinion, the additional elements of claim 19 are met in the 615 Accused Products. As for the Redesigned Products, Google does not accuse them of infringement, so they do not infringe claim 19. *See* CIB at 119.

8. Indirect Infringement

In addition to direct infringement, Google contends Sonos induces and contributes to infringement of the 615 patent by others. CIB at 118-119. For inducement, Google argues that Sonos knew of the patent no later than August 8, 2022, when Google filed suit over the 615 patent in district court; and following this notice, Sonos actively encourages users of the 615 Accused Products to infringe through BLE device setup instructions found on the Sonos Website. *See* CIB at 118 (citing, *inter alia*, Hr’g Tr. (Min) at 551:11-553:20; JX-0326.4; JX-0335.6; JX-0330.4); CRB at 49 (“Sonos has continued to make these materials available to customers to induce them to infringe.”). Google views the existence of Sonos’ Redesigned Products as further “demonstrat[ing] Sonos’s knowledge that continuing to import the Accused ’615 Products is continued infringement.” CRB at 49.

Sonos opposes, largely on the basis that “Google has failed to identify *any* specific intent on Sonos’s part to induce infringement.” RIB at 96 (emphasis in original). It explains:

First, Google cannot demonstrate that Sonos had knowledge that it induced acts that would infringe the ’615 Patent. In particular, Google has not demonstrated that any of the purported “setup” materials it recites describe any specific intent on Sonos’s part to induce infringement. Further, Google does not describe how these “setup” materials would induce a customer to do anything, much less perform the specific setup operations that are accused. Nor does Google identify or describe even a single instance of such infringement by a customer.

[REDACTED]

Second, Google alleges “knowledge of the ’615 patent” as of August 8, 2022. Yet much of the documentation it relies upon is dated prior to August 2022. *See* JX-324 (last modified by Larry Stefani on Jan. 07, 2016); JX-326 (dated June 2020); JX-335 (dated June 2020); JX-330 (dated Mar. 2022). These pre-knowledge statements cannot form the basis for an induced infringement claim. *See, e.g.,* *Insituform Techs., Inc. v. Cat Contracting, Inc.*, 161 F.3d 688, 695 (Fed. Cir. 1998) (finding no inducement “because all accused acts by [defendant] occurred before [it] knew of the patent.”).

Id. at 96-97. Sonos additionally argues that “Google is estopped from making this argument because it successfully argued (also in N.D. Cal.) that a complaint cannot provide the knowledge necessary to support a claim for indirect infringement. *See* Order re Mot. to Dismiss, *Sonos, Inc. v. Google LLC*, No. 3:21-cv-07559-WHA (N.D. Cal. Mar. 16, 2022), Dkt. 156 at 10-11.” RIB at 96; RRB at 58.

Google has met its burden to show induced infringement of the 615 patent asserted claims. Inducement requires knowledge of the patent, knowledge that the induced acts constitute infringement of that patent, and specific intent. *Commil*, 575 U.S. 639. The Commission has held that for section 337 investigations, service of the complaint provides knowledge of the asserted patents. *Certain Beverage Brewing Capsules, Components Thereof, and Products Containing the Same*, Inv. No. 337-TA-929, Comm’n Op. at 18-19 (April 5, 2016) (“*Beverage Brewing*”); *Certain Smart Thermostats, Smart HVAC Systems, and Components Thereof*, Inv. No. 337-TA-1185, Comm’n Op. at 19, 25, 27 (May 24, 2023) (“*Smart Thermostats*”). Thus, regardless of whether Google is estopped from pointing back to its district court complaint as providing knowledge of the 615 patent, that knowledge was at least gained through the filing of the complaint underlying the present investigation.

The record also shows Sonos possesses the requisite knowledge that the induced acts constitute infringement of the 615 patent. Unlike district courts, a section 337 complaint must

[REDACTED]

identify with particularity how the identified respondent infringes the subject intellectual property, often via claim charts:

(a) Contents of the complaint. . . .

(9) Include, when a complaint is based upon the infringement of a valid and enforceable U.S. patent—

. . . .

(viii) A showing that each person named as violating section 337 of the Tariff Act of 1930 is importing or selling the article covered by, or produced under the involved process covered by, the above specific claims of each involved U.S. patent. The complainant shall make such showing by appropriate allegations, and when practicable, by a chart that applies each asserted independent claim of each involved U.S. patent to a representative involved article of each person named as violating section 337 of the Tariff Act or to the process under which such article was produced.

19 C.F.R. § 210.12(a)(9)(viii). And this is exactly what Google provided in the present investigation, in the form of a claim chart comparing Sonos' BLE setup process to claim 1. EDIS Doc. ID 777545, Ex. 35. Thus, Sonos either knew or should have known how its BLE setup process infringed the 615 patent upon receipt of the complaint and notice of investigation.

This leaves the question as to whether Sonos committed acts to induce others to infringe the 615 patent while armed with this knowledge. The record shows that Sonos continued to promote the 615 Accused Products and infringing features to potential customers, and instruct existing users on how to perform the infringing setup via instructions and guides provided on its website and through the Sonos mobile device app. JX-0326.4, 8; JX-0261.2-4 ("Download the Sonos app and plug in your speaker(s). The app will guide you through setup."), 7 ("It's easy to expand your Sonos system anytime. Just plug in the new speaker, open the Sonos app, and tap Add when it appears, or go to Settings > System > Add Product."), 8 ("New Router"). Google's expert, Dr. Min, provided un rebutted testimony that these materials were available online, and he

[REDACTED]

used the Sonos app to commission a Sonos device to a network using the app during this investigation's discovery period (*i.e.*, after service of the complaint). Hr'g Tr. (Min) at 552:4-24. Sonos' argument that these materials fail to show "how these 'setup' materials would induce a customer to do anything, much less perform the specific setup operations that are accused" (RIB at 97) is not credible, nor is its suggestion that no customer has used the setup process (*id.* ("Nor does Google identify or describe even a single instance of such infringement by a customer.)). And Google correctly notes that the early dates in which these materials may have been authored is irrelevant in light of their current availability and promotion on Sonos' website. *See* CRB at 49 (citing *GlaxoSmithKline LLC v. Teva Pharms. USA, Inc.*, 7 F.4th 1320, 1337-8 (Fed. Cir. 2021)). Sonos does not otherwise argue it had a good faith belief in noninfringement. *See generally* RIB at 96-98; RRB at 58. Thus, the requisite specific intent has been shown.

Accordingly, Google has shown Sonos induces others to infringe the 615 patent.

For contributory infringement, Google contends:

Sonos contributorily infringes the Asserted Claims of the '615 patent by importing and supplying software components, which are a material component of the '615 Accused Products and have no substantial non-infringing use, to users of the '615 Accused Products with knowledge that those software components were made or adapted specifically for use in the '615 Accused Products and that the installation and/or use of those software components would result in direct infringement.

CIB at 118-119. Google adds:

The accused software is a material component of the Accused '615 Products and is required for these products to operate. *Id.* Additionally, the accused functionality that infringes the '615 patent is the default for setting up the Accused '615 Products and the devices will not work without this software. Tr. (Min) 551:11-553:20. Sonos's argument that the accused software running on the Accused '615 Products has other purposes, like audio playback, is irrelevant. SPostHB 97-98. The software and the Accused '615 Products cannot work without first setting them up using the accused functionality that infringes the '615 patent. Tr. (Min) 553:7-553:20. The accused functionality of setting up the device by using BLE is a "separate and distinct" feature of the Accused '615 Products compared to the alleged noninfringing audio or other functionalities identified by Sonos. *Koninklijke Philips*

[REDACTED]

N.V. v. Zoll Med. Corp., 656 F. App'x 504, 524 (Fed. Cir. 2016) (rejecting accused infringer's contention that because accused feature could be turned off, the accused product had substantial noninfringing uses as accused feature was "separate and distinct" feature).

CRB at 50.

Sonos opposes on the grounds that Google has not shown sufficient knowledge of the patent and that the 615 Accused Products' software has non-infringing uses:

Here, for example, the '615 Accused Products' software relates to a device's audio capabilities that has nothing to do with the specific commissioning process claimed in the '615 Patent. *See, e.g.*, Tr. (Millington) 598:2-599:20. In addition, customers can use one of the Accused Products' alternative commissioning processes that Google has not accused of infringement. Tr. (Schmidt) 1438:7-18; *see also* Tr. (Millington) 599:21-600:15, 1256:25-1257:12.

RIB at 98. As with inducement, Sonos further complains that "Google does not describe even one instance of a customer directly infringing the '615 Patent." *Id.*

Google has met its burden to show contributory infringement by Sonos. As determined above, Sonos possessed knowledge of the patent and its infringement via use of the BLE setup process. And it is further much more likely than not that a customer has downloaded the app and used this process since the filing of the complaint. Further, while Google's initial brief only refers to Sonos supplying general "software components" in support of its contributory infringement theory, its reply brief clarifies that the supplied software means the "accused functionality that infringes the '615 patent"; *i.e.*, the software behind the BLE setup process. CRB at 50; *Lucent Techs., Inc. v. Gateway, Inc.*, 580 F.3d 1301, 1321 (Fed. Cir. 2009) (finding contributory infringement for a date-picker tool within a supplied overall Microsoft Outlook software package). It is difficult to see, and indeed Sonos does not argue, how the exact software for the BLE setup process could have any non-infringing use. The mere fact that the products can be setup, or commissioned, onto a network by other means that Sonos does not promote (*see, e.g.*, JX-0326.4

[REDACTED]

(“You can switch between wired and wireless setup”); JX-0261.4 (same); Hr’g Tr. (Millington) at 1257:2-12 (detailing WiFi hotspot setup)) does not demonstrate a substantial non-infringing use.

Accordingly, Google has shown Sonos contributes to others’ infringement of the 615 patent.

E. Domestic Industry – Technical Prong

According to Google’s post-hearing briefing, the DI Products practice claims 1, 5, 6, 9, 16, 17, and 19 of the 615 patent. CIB at 119. For the reasons discussed below, Google has not shown by a preponderance of the evidence that the DI Products practice these claims.

1. Claim 1

Claim 1 of the 615 patent is presented above in connection with infringement. Google describes the relevant commissioning process for limitations [1.0] and [1.1] as follows:

Google documentation illustrates the process for commissioning Nest DI Products onto WiFi networks, JX-161C, [REDACTED]
[REDACTED] JX-161C [REDACTED]; Tr. (MacLellan) 437:20-438:12
[REDACTED], 439:1-12 [REDACTED]
[REDACTED]; Tr. (Min) 513:18-514:19
[REDACTED] JX-195.20 [REDACTED]
[REDACTED]

....

[REDACTED]
[REDACTED] . Tr. (Min) 516:3-19
[REDACTED], 516:20-517:6
[REDACTED] CX-87C.6 [REDACTED]
[REDACTED]

CIB at 119-120.

The parties strongly dispute limitation [1.1.1]. Google argues the limitation is met in two ways. CIB at 120. The first practicing functionality is described as:

[T]he Home app requests that a Nest device initiate the setup process using [REDACTED]
[REDACTED] JX-194C.3. [REDACTED]
[REDACTED] (JX-40C, 88:15-89:14, 145:18-

[REDACTED]

146:9), [REDACTED] JX-405C; JX-434C; JX-414C.

[REDACTED] Tr. (MacLellan) 427:11-

428:16, 467:11-471:15; CDX-5.1 (

).

JX-405C

. *Id.*

....

JX-161C,
JX-161C)

Tr. (MacLellan) 426:12-427-6, 428:12-429:5; Tr. (Min)

517:7-517:19

), 518:7-519:1

, 581:25-582:14

CX-1529C

).

Id. at 120-121. Google adds:

The evidence indisputably demonstrated that the setup process begins only if a user requests to set up the Nest device using the Home app, and only when the Nest device receives the user's request to set up that device, by way of the Home app's initial request to begin setup. Tr. (MacLellan) 469:11-22

[REDACTED] Tr. (Min) 517:7-517:19, 518:7-519:1, 519:6-519:16, 580:20-581:7, 581:25-582:14 (same). Dr. Schmidt confirmed that, when he tested the Nest DI Product, the Home app showed the Nest DI Product for setting up and he "clicked that yes button to select this Nest Hub Max for setup." Tr. (Schmidt) 1459:14-1460:10. Dr. Schmidt confirmed that a button press, like the pressing yes on the Home app, meets the claimed "request" as "[w]hen the user presses the button ... that's generating a request, and that request is then received ... then takes an action, it responds to what it's been asked to do. In this case, it's been asked to begin the commissioning process." Tr. (Schmidt) 956:1-956:10. Dr. Schmidt also testified "using a remote control" is "[r]eceiving an instruction from a user at a device, if that instruction from the user tells the device to do something and enter a state where the device can be set up to operate within a new network," and that this

[REDACTED]

would be “receiving a request to initiate a commissioning process” under claim element 1.b if it “then initiates the commissioning process.” Tr. (Schmidt) 1018:13-1019:2. This functionality was clearly demonstrated at the hearing, including using the Home app to initiate setup and triggering instructions from the Home app that result in [REDACTED]

[REDACTED] Tr. (MacLellan) 426:12-427:6, 428:12-429:5, 441:21-442:13; Tr. (Min) 517:7-517:19, 518:7-519:1, 519:6-519:16, 580:20-581:7, 581:25-582:14.

Id. at 122-123. The second alleged functionality for limitation [1.1.1] is simpler. According to Google, if “receiving a request to initiate a commissioning process” encompasses “user actions,” then the user plugging in the device is the request because “when users plug in the Nest DI Products, those products begin to transmit beacons for discovery automatically during the boot sequence.” *Id.* at 124 (citing Hr’g Tr. (Schmidt) at 1411:9-1413:4). For the reasons discussed above in connection with infringement, an automatic beacon would not be understood as initiating a commissioning process, and in any event merely providing power to the device is not a “request,” so this theory fails.

Moving on, for limitation [1.1.2], Google explains [REDACTED]:

[REDACTED]

[REDACTED] JX-161C; JX-194C.12; JX164C.6-7; Tr. (MacLellan) 427:11-20.

[REDACTED] Tr. (MacLellan) 428:3-11.

[REDACTED] Tr. (Min) 520:7-18; Tr. (MacLellan) 500:21-501:4; JX-252C.2-3.

[REDACTED] Tr. (Min) 521:2-15; JX-252C.2-3

[REDACTED] CPX-12C.

CIB at 124. And for limitation [1.1.3], which the parties dispute, Google states:

[REDACTED]

[REDACTED]

[REDACTED] X-194C.16-17 [REDACTED]

Tr. (Jones) 126:14-127:1; Tr. (MacLellan) 430:4-7, 462:24-463:22, 471:25-472:5; Tr. (Min) 523:15-524:10, 524:11-525:1; JX-428C, -528C, -522C, -382C, -419C, -529C, CX-1523, -1529C; JX-161C.

[REDACTED]

[REDACTED] Tr. (MacLellan) 464:6-18; Tr. (Min)

523:15-524:2. . . .

[REDACTED]

[REDACTED] r. (MacLellan)

464:6-18.

. . . .

[REDACTED]

[REDACTED] JX-194C.16-

17 ([REDACTED] Tr.
(MacLellan) 463:23-464:5
[REDACTED]; Tr. (Min) 525:10-25, 526:7-527:4, 583:6-584:18; JX--522C, -521C, -528C, -529C.

. . . .

[REDACTED]

[REDACTED] JX-194C.16-17

[REDACTED] Tr. (MacLellan) 429:21-430:10, 462:24-463:22; Tr. (Min) 527:16-22; JX-429C, -529C.

CIB at 125-126. And for limitations [1.1.4] and [1.1.5], for which there is no dispute, Google states:

[REDACTED]

[REDACTED] JX-520C, -389C, -387C, -522C, -391C, -393C, -394C; CX-1527C, -1523, -1526C; Tr. (Jones) 127:2-7; Tr. (Min) 527:23-528:15. . . .

[REDACTED] JX-161C; Tr. (Jones) 127:8-14, 128:8-17; Tr. (MacLellan) 437:6-19, 466:10-24; Tr. (Min) 529:2-4; JX-381C.

[REDACTED]

Id. at 126-127.

Google has not shown practice of claim 1. Sonos' chief dispute concerns limitation [1.1.1], "receiving a request to initiate a commissioning process with the target device." Sonos argues "Google's contentions regarding this limitation have been a moving target since the close of discovery." RIB at 99. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] *See id.* (citing CPB at 158-159); RRB at 59. This caused Sonos to file its Motion *in Limine* No. 5, which sought to strike Google's reliance on [REDACTED] under Ground Rule 4.4.2.

Order No. 41 deferred resolution of Sonos' Motion *in Limine* No. 5 until the evidentiary hearing based on Google's representation that [REDACTED]

[REDACTED]

In its MIL 5 Sonos seeks to strike the discussion of [REDACTED] as exceeding the scope of Google's contentions. *See* MIL 5 at 8-9 (citing CPB at 158-59). Google does not dispute that [REDACTED] does not appear within its contentions, its expert's report, or its expert's deposition. *See generally* Opp'n 5; MIL 5 at 9. Instead, as Sonos notes, Google contends there is a factual issue as to whether "[REDACTED] and [REDACTED] are "the same request." Opp'n 5 at 6 (emphasis in original).

Google is correct that its position presents a factual issue that should be developed during the evidentiary hearing. Google bears the burden of proving that its Nest products practice the "receiv[e] a request" limitation. [REDACTED]

[REDACTED]

[REDACTED] See MIL 5 at 8-9 (collecting citations).

Importantly, though, Google will not otherwise be permitted to exceed the scope of its contentions or of its expert's opinion. [REDACTED]

[REDACTED] See MIL 5, Ex. 3 at ¶ 99; *id.*, Ex. 4 at 166:8-23.

Order No. 41 at 4. Testimony from various witnesses confirmed that [REDACTED]

[REDACTED] Hr'g Tr. (MacLellan) at 457:16-20, 494:7-12, 497:12-17, 498:17-21; Hr'g Tr. (Schmidt) at 1464:11-1465:8

[REDACTED] See CIB at 120-124; CRB at 45-46. [REDACTED]

[REDACTED], is waived and not considered.

More importantly, [REDACTED] cannot meet the claimed "request" as it is not a request received by the target device in the BLE-based setup process. BLE is identified as the transmission protocol because, as a transmission path "independent[] of the communication network," it meets limitation [1.1.2]. 615 patent at cl. 1. But the Nest DI Product is also capable of being commissioned on the network using a "hotspot" protocol, which Google does not assert falls within the scope of the claim. See Hr'g Tr. (Min) at 562:2-22. And the only Google document on which Dr. Min relied in support of his opinion that the Nest DI Product receives a [REDACTED] hotspot commissioning, not BLE commissioning. See *id.* at 562:23-563:15 (citing JX-0161C). It is true that Google witness Mr. Tavis Maclellan testified that [REDACTED] but he also

[REDACTED]

testified that there is [REDACTED]

[REDACTED] Hr'g Tr. (MacLellan) at 439:1-8, 494:7-12. [REDACTED]

[REDACTED] See RIB

at 120-21.

[REDACTED]

[REDACTED]

[REDACTED] CIB at 122. But as Sonos rightly complains, if this assertion is accepted at this point in the investigation, then the “burden contentions (and the Ground Rules) [are] meaningless.” RRB at 61. Ground Rule 4.4.2 states: “In general, a party may not introduce theories or evidence at the hearing that are outside the scope of its responses to contention interrogatories.” And after Sonos’ counsel predicted that Google would “try to change the theory in this case,” the parties were advised that “if you think the other side has said something outside the scope of, say, their prehearing briefs,” then “make that an issue in your Reply.” Hr’g Tr. at 1475:14, 1480:25-1481:9. As it happened, Google did try to change its theory of infringement, and Sonos properly made that an issue in its reply brief. See RRB at 58-62. So Google has not shown the presence of limitation [1.1.1] in the Nest DI Products in a manner consistent with its contentions and prehearing brief, and its new positions are therefore disregarded.

Accordingly, Google has not shown that limitation [1.1.1] is met in the DI Products.

Sonos also disputes limitation [1.1.3], “in response to receiving the request, receiving one or more network configuration packets from the wireless device via the short-range signal transmission path.” RIB at 104-107. Specifically, as with infringement, Sonos argues it is not met in the DI Products for want of proximate cause:

[REDACTED]

To put it simply, the Nest Hub Max will not necessarily receive configuration parameters even if it receives what Google claims is the request. For example, if the Google Home app does not receive [REDACTED]

[REDACTED] Tr.
(Maclellan) 464:6-18.

[REDACTED] Tr. (Schmidt) 1418:2-1419:18; JX-161C; CDX-5; RX-748;
RX-749; RDX-4C.35.

....

Intervening actions or “offramps” can result in no network configuration parameters being received even when an alleged request is received. Tr. (Schmidt) 1418:2-1419:18. Dr. Min cannot dispute this because he did not even perform the analysis. Tr. (Min) 577:11-15, 577:16-579:3; RDX-32C.1.

....

The point is simply that, for one thing to happen *in response to* another the second must happen ‘*because of*’ the first—*i.e.*, the initiating message must be a proximate or sufficient *cause* and not merely a precondition.

From this perspective, Google’s theory doesn’t work. The fact that there are off ramps in the process means that the first message does not cause the receipt of the second message.

Id. at 105-107 (emphasis in original). As discussed above, proximate cause is not a requirement of the claims, and so Sonos’ argument is unpersuasive. Limitation [1.1.3] is met in the DI Products.

Accordingly, the DI Products have not been shown to practice claim 1 of the 615 patent.

2. Claim 5

Claim 5 of the 615 patent is presented above in connection with infringement. Google contends, as testified to by Dr. Min, that “[i]n the Nest DI Products, the ‘short-range signal transmission path’ is a BLE connection between the mobile device and the Nest DI Product.” CIB at 127; Hr’g Tr. (Min) at 529:14-530:8. Sonos does not dispute practice of claim 5 apart from its dependency on claim 1. RIB at 107. In light of the cited evidence and opinion, the additional elements of claim 5 are met in the DI Products, but they do not practice claim 5 because they do not practice claim 1.

[REDACTED]

3. Claim 6

Claim 6 of the 615 patent is presented above in connection with infringement. In support of its theory, Google explains:

[REDACTED] Tr. (Min) 530:14-19; Tr. (MacLellan) 429:11-24-430:9, 464:19-466:8, 502:2-11

[REDACTED] Tr. (Jones) 127:18-128:4.

[REDACTED] Tr. (Min) 531:20-24, 502:9-11; Tr. (Jones) 128:1-7; JX-435C, -436C, -437C, -438C.

[REDACTED] Tr. (MacLellan) 472:18-473:13

[REDACTED] Tr. (Jones) 127:15-128:7; Tr. (MacLellan) 530:9-532:7; CDX-4.44.

[REDACTED] Tr. (Min) 530:14-24.

CIB at 127-128. Google has shown the additional limitations of claim 6 are met in the DI Products.

Sonos contends the claim is not met because [REDACTED]

[REDACTED]

[REDACTED] RIB at 108 (citing, *inter alia*, Hr’g Tr. (Schmidt) at 1420:20-1423:19; Hr’g Tr. (Maclellan) at 485:8-22; JX-0040C at 168:2-17). Sonos avers this [REDACTED]

[REDACTED] RIB at 108 (citing Hr’g Tr. (Schmidt) at 1423:20-1424:18).

Sonos’ argument is not persuasive. The claim limitation reads “contacting the wireless device via the communication network to indicate that the target device has successfully entered the communication network.” 615 patent at cl. 6. It does not say “learn” or “first to indicate.”

[REDACTED]

And there is nothing in the specification to suggest any importance to confirming the commissioning over the wireless network *before* confirmation over any other path, such as the short-range signal transmission path used to communicate configuration data. Moreover, Google's witness, Mr. Maclellan, offers credible testimony that confirmation in the Nest DI Product is

[REDACTED]

[REDACTED]

[REDACTED]

Hr'g Tr. (Maclellan) at 430:11-431:9; *see id.* at 464:21-466:5 [REDACTED]

[REDACTED] Mr.

Maclellan then explained that [REDACTED]

[REDACTED] *Id.* at 466:10-21;

see JX-0161. [REDACTED]

[REDACTED]

[REDACTED] Sonos does not dispute any of this operation. RIB at 108; RRB at 63-64. And Mr. Maclellan's testimony remains credible regardless of any possible source code deficiencies of Dr. Min. *See, e.g.,* Hr'g Tr. (Schmidt) at 1423:20-1424:18.

Accordingly, it has been shown that the DI Products satisfy the additional elements of claim 6, but they do not practice claim 6 because they do not practice claim 1.

4. Claim 9

Claim 9 of the 615 patent is presented above in connection with infringement. Google contends the additional elements are satisfied by “the [DI Product] changing the user interface from ‘connecting[‘] to ‘connected’ when it successfully joins the network” (CIB at 128 (citing Hr’g Tr. (MacLellan) at 472:6-12); Hr’g Tr. (Min) at 532:4-532:16) or because the DI Product “changes colors to indicate a successful connection to the WiFi” (*id.* at 128 n.29 (citing JX-0040C at 133:3-11; Hr’g Tr. (MacLellan) at 472:6-12); Hr’g Tr. (Min) at 532:8-532:16). Sonos does not dispute practice of claim 9 apart from its dependency on claim 1. RIB at 109. In light of the cited evidence and opinion, the additional elements of claim 9 are met in the DI Products, but they do not practice claim 9 because they do not practice claim 1.

5. Claim 16

Claim 16 of the 615 patent is presented above in connection with infringement. Google addresses claim 16 with identical evidence and argument as for claim 1. *See* CIB at 119-127; CRB at 51-54. Sonos does as well. RIB at 99-107; RRB at 58-63. As determined above, the DI Products have not been shown to practice claim 1, and so they also have not been shown to practice claim 16.

6. Claim 17

Claim 17 of the 615 patent is presented above in connection with infringement. Google addresses claim 17 with identical evidence and argument as for claim 9. *See* CIB at 128. Sonos does not dispute practice of claim 17 apart from its dependency on claim 16. RIB at 109. In light of the cited evidence and opinion, the additional elements of claim 17 are met in the DI Products, but they do not practice claim 17 because they do not practice claim 16.

7. Claim 19

Claim 19 of the 615 patent is presented above in connection with infringement. Google addresses claim 19 with identical evidence and argument as for claim 6. *See* CIB at 127-128; CRB at 54. Sonos does as well. RIB at 108; *see* RRB at 63-64. As determined above, the DI Products have been shown to satisfy the additional elements of claim 6, so they also satisfy the additional elements of claim 19, but they do not practice claim 19 because they do not practice claim 16.

F. Validity

Respondents identify the following invalidity theories for the 615 patent:

Claims	Theory
1, 5, 6, 9, 16, 17, 19	Anticipated under 35 U.S.C. § 102 by Roberts (RX-0623)
1, 5, 6, 9, 16, 17, 19	Rendered obvious under 35 U.S.C. § 103 by Roberts (RX-0623)
1, 6, 9, 16, 17, 19	Anticipated under 35 U.S.C. § 102 by Sonos v1.0
1, 5, 6, 9, 16, 17, 19	Rendered obvious under 35 U.S.C. § 103 by Sonos v1.0 in view of Asokan (RX-0620)
1, 9, 16, 17	Anticipated under 35 U.S.C. § 102 by Millington (JX-0331)
1, 5, 6, 9, 16, 17, 19	Rendered obvious under 35 U.S.C. § 103 by Millington (JX-0331) in view of Asokan (RX-0620) and/or Sonos v1.0
1, 5, 6, 9, 16, 17, 19	Invalid under 35 U.S.C. § 112 for lack of written description

See generally RIB at 109-141. The earliest potential priority date for the 615 patent is April 11, 2012, the filing date of its provisional application. RIB at 109; 615 patent. U.S. Patent No. 7,616,594 (“Roberts”) issued on November 10, 2009, and so is prior art under 35 U.S.C. § 102(a)

[REDACTED]

and (b) (pre-AIA). *See* RX-0623. U.S. Patent Publication No. 2006/0251256 (“Asokan”) published on November 9, 2006, and like Roberts is prior art under 35 U.S.C. § 102(a) and (b) (pre-AIA). *See* RX-0620. U.S. Patent No. 8,326,951 (“Millington”) issued on December 4, 2012, based on an application filed June 6, 2005, and so is prior art under 35 U.S.C. § 102(e) (pre-AIA). *See* JX-0331. Google does not contest the prior art statuses of Roberts, Asokan, or Millington. RIB at 109, 115 n.48, 125; *see generally* CIB at 129-139.

Sonos also applies as prior art an early collection of its own products identified as “the Sonos v1.0 system.” RIB at 115. Sonos explains its constituent parts and prior art basis as follows:

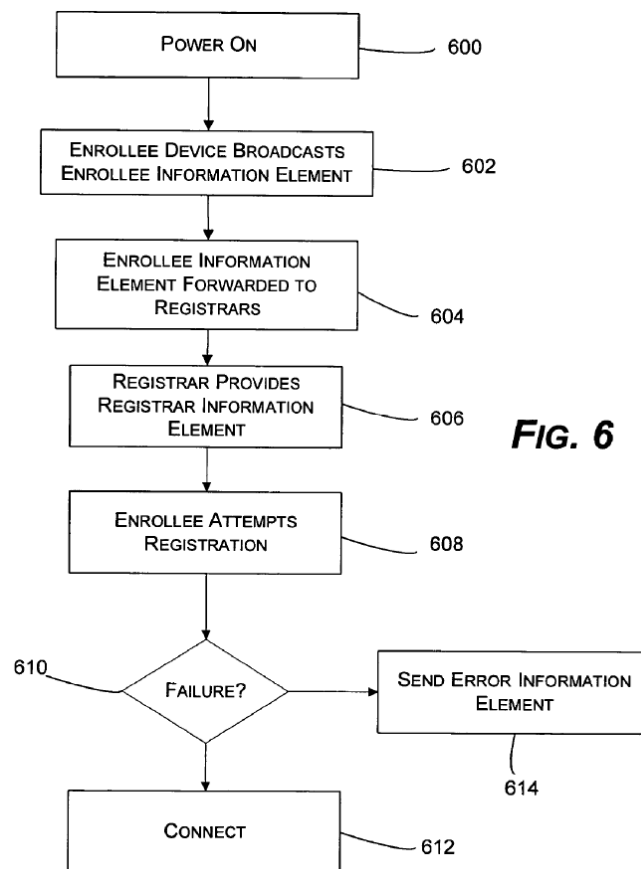
The Sonos v1.0 system, publicly released in 2005, is comprised of one or more “ZP100” players and a “CR100” controller. RX-641 (Sonos Website, Products page, captured Jan. 24, 2005); RX-638, RX-639 (Sonos Website, Store page, captured Jan. 23, 2005; showing Sonos Digital Music System shipping in January 2005). Accordingly, Sonos v1.0 qualifies as prior art to the ’615 Patent under pre-AIA 35 U.S.C. §102(a), (b), and (f). Tr. (Schmidt) 941:10-14. Further, the Sonos User Guide (JX-294) describes the Sonos v1.0 system and is a prior art printed publication under pre-AIA 35 U.S.C. §102(a) and (b); the disclosures from the Sonos User Guide cited below apply equally to Sonos v1.0 and the Sonos User Guide individually and demonstrate that each of Sonos v1.0 and the Sonos User Guide are prior art under 35 U.S.C. §102 and the single work of a related prior artist.

Id. Google does not contest Sonos’ representations on the prior art status of the Sonos v1.0 system, and so they are accepted for the purposes of this investigation. *See generally* CIB at 129-139.

1. Roberts

Roberts teaches a method wherein “[a] wireless device that desires to be connected to a wireless network broadcasts itself and its capabilities to a network using an information element” in order to accommodate the problem of “connection of a typical Wi-Fi device requires a user to manually enter the configuration in the device, which can be a very confusing process.” RX-0623 at Abstract, 1:32-35. The information element is received by a “registrar device” that is already connected to the network and which subsequently provides “configuration information” back to

the wireless, or “enrollee,” device. *Id.* at 1:52-55, 1:66-2:2. The configuration information may include “registrar information,” and “may be passed out of band, or may be passed in band with encryption, for example via the same channel through which the enrollee information element 514 was broadcast, or may establish a temporary direct data connection with the enrollee for passing the configuration, in accordance with an option provided in the configuration options 706.” *Id.* at 7:46-52. “Once the enrollee device 300 has received the registrar information element 518, at step 608, the enrollee device 300 attempts registration with the wireless network using the configuration information within the registrar information element 518.” *Id.* at 8:39-43. The general flow of communications is shown in Figure 6:



Id. at Fig. 6.

a. Claim 1

Roberts discloses a method for commissioning a new, “enrollee” device onto a network, where the device includes a microprocessor, a wireless radio, and programming to carry out the commissioning process. RX-0623 at 1:12-14, 1:47-55, 3:54-67, 4:18-32, Fig. 2. Roberts also discloses that the enrollee device broadcasts information about itself upon power startup, and a request to begin the process is sent to the enrollee device from a second device controlled by a user. *Id.* at 5:44-43, 7:21-31. The request can be sent “out of band (OOB)” meaning “other than Wi-Fi (including but not limited to USB flash, USC cable, Ethernet cable, and a Bluetooth™ connection).” *Id.* at 2:6-19, 7:46-52. And the request contains configuration information in a proper format for the enrollee device to extract and use to join a secured Wi-Fi network. *Id.* at 2:11-19, 3:54-60, 8:39-43, 7:35-42, 12:64-13:24, Fig. 8.

Dr. Schmidt opined, correctly, that these features correspond to most elements of claim 1 including limitations [1.0]-[1.1.2], most of [1.1.3], and [1.1.4]-[1.1.5]. Hr’g Tr. (Schmidt) at 912:5-919:8, 927:1-930:17. Google only expressly disputes the first portion of limitation [1.1.3], “in response to receiving the request, receiving one or more network configuration packets from the wireless device via the short-range signal transmission path.” CIB at 130-132; CRB at 55-56.

This dispute, however, is based on the assumption that Sonos’ argument against the Accused Products for infringement and DI Products for technical prong is meritorious; specifically, that “in response to receiving” must be shown as “‘direct’ causation” without the possibility of “off-ramps” that would inhibit the reception of network configuration packets by the target (*i.e.*, enrollee) device. CIB at 131; CRB at 56. As determined above, it does not. “In response to receiving” does not require direct or proximate causation. Rather, “the claim means what it says: network configuration packets are received as a result of, and because of, the request to initiate commissioning.” Order No. 14 at 55-56. And Dr. Schmidt persuasively explained how

[REDACTED]

a user's decision to first select the enrollee device for commissioning acts as a "condition precedent" for the registrar device to later send the enrollee device "registrar information element 518" which are the claimed "network configuration packets." RIB at 111 (citing Hr'g Tr. (Schmidt) at 919:19-920:10, 925:24-926:24; RX-0623 at 1:66-2:2, 7:11-33, Fig. 6); *see* RX-0623 at Fig. 10. Google offers no dispute on this technical operation. *See* CRB at 56 (contesting only an embodiment where no "off-ramps" allegedly occur).

Therefore, Roberts discloses all elements of claim 1, and accordingly anticipates it.

b. Claim 5

Dependent claim 5 requires that the "short-range signal transmission path" of claim 1 be one of "Bluetooth communication, radio frequency identification (RFID), Zigbee, radio frequency for consumer electronics (RF4CE), Z-Wave, and near field communication." 615 patent at cl. 5. Roberts teaches that the OOB connection can be "BluetoothTM," which meets this limitation. RX-0623 at 2:6-10; *see* Hr'g Tr. (Schmidt) at 931:9-23. Google does not dispute this disclosure beyond its argument that claim 1 is not disclosed. *See* CIB at 131-132; CRB at 55-56. Therefore, the additional element of claim 5 is disclosed in Roberts, and Roberts anticipates claim 5.

c. Claim 6

Dependent claim 6 requires an additional step to the method of claim 1 wherein the wireless device is contacted via the commissioned communication network to indicate the commissioning of the target device was successful. 615 patent at cl. 6. Sonos looks to claim 10 of Roberts which recites, "[t]he computer storage medium of claim 1, having further instructions comprising reporting failure conditions or successful results after attempting to connect to the wireless network." RIB at 114 (citing RX-0623 at cl.10). Sonos then references those passages which teach communication of "enrollee information element" and "registrar information element" over in-band or OOB paths (RIB at 114 (citing RX-0623 at 2:6-25, 7:43-52)), and the reporting of

[REDACTED]

wireless network connection failures “which may be broadcast in a manner similar to the enrollee information element” (*id.* (citing RX-0623 at 8:39-46)). Sonos reasons, “a person of ordinary skill in the art would understand Roberts claim 10 to teach both ways of doing it,” thus meeting claim 6 of the 615 patent. *See id.* Google opposes on the ground that the only error reporting path disclosed in Roberts is the “L2 data port,” but Google does not explain how this fails to meet the claim. *See* CIB at 132; CRB at 57.

Sonos has not met its burden. The cited passage from the specification teaches enrollee device broadcasting a failure in network connection (RX-0623 at 8:39-56), but it does not mention broadcasting a success, and certainly not as a message back to the registrar device (“wireless device”) as the claim requires. Roberts’ claim 10, on the other hand, mentions the reporting of a successful connection, but, again, not necessarily to the registrar device and not necessarily over the Wi-Fi network (“via the communication network”) as the claim requires. RX-0623 at cl. 10; 615 patent at cl. 6. So the limitation has not been clearly and convincingly shown.

Accordingly, Roberts does not anticipate claim 6.

d. Claim 9

Dependent claim 9 requires that a visual or audio “indication” occur to notify the user “about a status of the commissioning process.” 615 patent at cl. 9. Roberts teaches that messages can appear on the registrar device indicating that enrollee information has been received and the enrollee is requesting configuration information. RX-0623 at 8:13-30, Figs. 9, 10; *see* Hr’g Tr. (Schmidt) at 937:14-938:8. Google does not dispute this disclosure beyond its argument that claim 1 is not disclosed. *See* CIB at 131-132; CRB at 55-56. Therefore, the additional element of claim 9 is disclosed in Roberts, and Roberts anticipates claim 9.

e. Claim 16

Claim 16 differs from claim 1 in that it requires a non-transitory computer readable storage medium containing instructions instead of a method. 615 patent at cl. 16. The limitations contained within the body of the claim are otherwise identical to the limitations of claim 1, and both parties address both claims simultaneously. *See* RIB at 109-113; CIB at 130-132. Dr. Schmidt opined, correctly, that all limitations of claims 1 and 16 are found in Roberts. *See* Hr’g Tr. (Johnson) at 906:22-907:5, 930:8-931:8. Google’s sole point in opposition has been addressed above. Therefore, the elements of claim 16 are disclosed in Roberts, and Roberts anticipates claim 16.

f. Claim 17

Like claim 9, dependent claim 17 requires that a visual or audio “indication” occur to notify the user “about a status of the commissioning process.” 615 patent at cl. 17. As determined above, Roberts teaches that messages can appear on the registrar device indicating that enrollee information has been received and the enrollee is requesting configuration information. RX-0623 at 8:13-30, Figs. 9, 10; *see* Hr’g Tr. (Schmidt) at 937:14-938:8. Google does not dispute this disclosure beyond its argument that claim 16 is not disclosed. *See* CIB at 131-132; CRB at 55-56. Therefore, the additional element of claim 17 is disclosed in Roberts, and Roberts anticipates claim 17.

g. Claim 19

Like claim 6, dependent claim 19 requires an additional programmed instruction wherein the wireless device is contacted via the commissioned communication network to indicate the commissioning of the target device was successful. 615 patent at cl. 19. As determined above, Roberts does not clearly and convincingly disclose a report of successful connection to the Wi-Fi

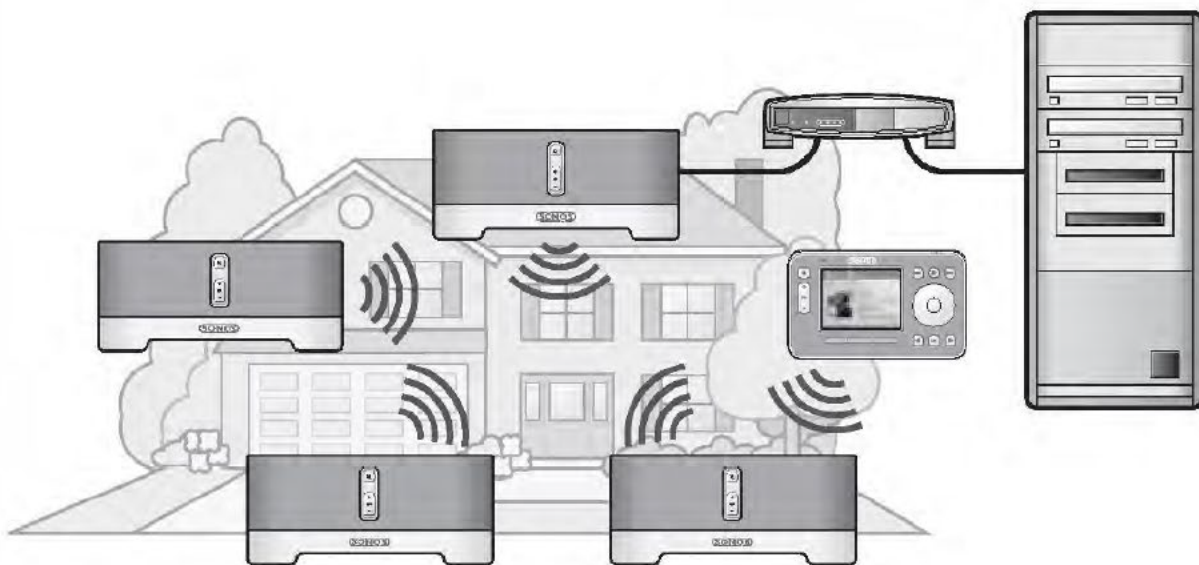
[REDACTED]

network sent from the enrollee device to the registrar device over the Wi-Fi network, as required by claims 6 and 19.

Accordingly, Roberts does not anticipate claim 19.

2. Sonos v1.0

As explained above, the Sonos v1.0 system is comprised of one or more “ZP100” players and one “CR100” controller. RIB at 115; Hr’g Tr. (Schmidt) at 940:25-941:9. Sonos’ expert, Dr. Schmidt, considered source code as well as product documentation to show the salient features. *Id.* at 941:16-25. The Sonos ZP100 User Guide shows an example setup below, with multiple players and one CR100 controller:



JX-0294.0006. The functionality within the ZP100 and CR100 devices that is relevant to the claims of the 615 patent is the [REDACTED]

[REDACTED] JX-0293C.0002; JX-0291C.0001; Hr’g Tr. (Schmidt) at 961:6-18, 972:1-973:2-17; RIB at 116. Sonos particularly relies on the [REDACTED]

[REDACTED]
[REDACTED]

[REDACTED]

JX-0291C.0004; *see* RDX-0003C.68, 85.

a. Claim 1

The ZP100 players of the Sonos v1.0 system included a microprocessor, a transceiver antenna, and programmed instructions to conduct a commissioning process onto an existing Sonosnet network. JX-0294.0012, 16-17, 104; JX-0293C.0005-6. When a ZP100 is powered on and a user presses the Volume Up and Mute buttons simultaneously, the ZP100 begins the commissioning process of [REDACTED]. JX-0291C.0004; RX-1339C.114, 121-123. [REDACTED]

[REDACTED]

[REDACTED] JX-0291C.0004; RX-1339C.1100-1, 108-9, 112-14, 115-16. [REDACTED]

[REDACTED]

RX-1339C.55, 61, 97, 100-1, 104-5, 112-13, 115, 121; JX-0291C.0007 ([REDACTED]
[REDACTED]), 9
(discussing “Use-Cases”).

[REDACTED]

[REDACTED] JX-

[REDACTED]

0291C.4; RX-1339C.55, 57-59, 61-62, 66-67, 80-82, 102-103, 110-16. [REDACTED]

[REDACTED]

[REDACTED] RX-1339C.102, 110, 112-115, RX-0659.50. [REDACTED]

[REDACTED]

[REDACTED] RX-1339C.102-4, 106, 108-111, 112-116; JX-0291C.

Dr. Schmidt opined, correctly, that these features correspond to most elements of claim 1 including limitations [1.0]-[1.1.1], and [1.1.3]-[1.1.5]. Hr’g Tr. (Schmidt) at 953:12-23, 954:20-955:8, 958:16-962:22, 982:3-983:22, 984:20-985:25, 987:7-18, 988:15-989:3. Google only expressly disputes limitation [1.1.2], “establishing a short-range signal transmission path with a wireless device independently of the communication network.” CIB at 136-137; CRB at 60-62. Google contends Sonos and Dr. Schmidt never addressed the “short-range” aspect of the transmission path and the [REDACTED] is not “independent” of the Sonosnet to which the ZP100 seeks to connect. CIB at 136-137; CRB at 60-62.

Google’s first point is persuasive, at least enough to dispel the clear and convincing case of anticipation which is Sonos’ burden. Sonos has left unaddressed how the [REDACTED] [REDACTED] are “short-range.” In its rebuttal brief, Sonos calls this criticism “incorrect” and cites to the testimony of Dr. Schmidt. RRB at 70 (citing Hr’g Tr. (Schmidt) at 973:18-974:9). But the cited testimony contains no explanation. *See* Hr’g Tr. (Schmidt) at 973:18-974:9. And while the 615 patent specification never mentions “short-range,” if it is carried on the same frequencies, using the same 802.11 protocol as the Wi-Fi network which the target device is attempting to join, there is reason to find the Sonos v1.0 [REDACTED] are not “short-range”; or, at least, it is unclear. Sonos views this as a new argument (RRB at 70 n.51), but it was fairly disclosed before the hearing (CPB at 176) and regardless, the issue is Sonos’ burden and the claim element has

[REDACTED]

simply gone completely unaddressed. “In construing claims . . . we must give each claim term the respect that it is due.” *Pause Tech., LLC v. TiVo, Inc.*, 419 F.3d 1326, 1334 (Fed. Cir. 2006) (citing *Merck*, 395 F.3d at 1372).

As to whether the [REDACTED] are “independent” of the 802.11 Sonosnet, this is sufficiently clear. While the 615 patent specification sheds little light on the meaning of the term, as it is only used twice in an unrelated context (615 patent at 9:31-35, 10:28-33), in a plain and ordinary sense a communication path that is “independent” of a network would seem to include any path that functions without membership or connection to that network; *i.e.*, no dependency. This fits with the basic premise of the invention, which is to place a newly activated device onto a controlled network from a position of having no network access of any kind:

But as one skilled in the art will appreciate, wireless electronic devices do not merely connect themselves to the nearest wireless network. Rather, they must be “commissioned” onto a desired network. That is, the particular devices must be provided with configuration data to enable them to join the desired wireless network so that they can function according to specification by utilizing the communication properties of the network.

....

The present invention overcomes limitations of present day device commissioning techniques by providing apparatus and methods that enable devices to be commissioned into a wireless network without requiring special purpose commissioning hardware, administrative access to network equipment, the creation of ad hoc networks, or compromises to operational security.

615 patent at 1:62-65, 4:24-30. Dr. Schmidt provides persuasive testimony to the same effect, describing the features of an “independent” path, albeit in the context of the Millington prior art reference:

One of the interesting properties of a probe datagram is that it's not limited to a particular wireless network. It can cross wireless network boundaries, so it's independent of a given wireless network. Moreover, it can be received by other parties, and it doesn't require other information that the users of the wireless

[REDACTED]

network have to have been provided, such as the service set ID or the so-called SSID.

(Hr’g Tr. (Schmidt) at 970:13-20), as does Mr. Millington:

So the 802.11 standard is the standard behind most home and office wireless networks. Normally, the way those networks work is that in order to exchange data, you have to have joined the network, which means that you have to know about the ID of the network, you have to know about the encryption key of the network. And generally, you can't address things that are outside of the network. Code messages work quite differently. First of all, the packets are in a different format. But more importantly, the packets don't contain any ID of the established network or, indeed, any network at all. So you can send and receive probe messages without being a member of any particular 802.11 network.

[REDACTED]

Hr’g Tr. (Millington) at 602:24-603:15.

Dr. Min, on the other hand, opines simply that having the same 802.11 protocol and use of the same chipset hardware means the path and the network are not independent. Hr’g Tr. (Min) at 1191:17-1193:12. It is not unreasonable to consider the 802.11 protocol as what would be the “path,” and if it is shared, the limitation would not be met. In fact, this is what Google argues in the final sentence of its rebuttal brief. CRB at 62 (“That path is clearly not established independently where it uses the same radio and same protocol.”). The theory needs more explanation if it is to be accorded any meaningful weight, and Dr. Min only provides a surface-level opinion. Hr’g Tr. (Min) at 1191:17-1193:12, 1220:6-1221:12. For instance, use of the same hardware for the path and network would not seem to be pertinent as it is not uncommon for a single hardware chipset to handle both Wi-Fi and other radio technologies, as in the DI Products. Hr’g Tr. (MacLellan) at 425:5-12 (“Almost every phone that exists today has a Bluetooth chip, and most WiFi chips – or sorry, most hardware chips that we would use in consumer electronic devices, such as the Nest Hub, also has Bluetooth support.”); Hr’g Tr. (Min) at 516:7-19 (“identified here is a [REDACTED] chip that actually performs – containing the WiFi and the Bluetooth features, and

[REDACTED]

that is what – reason wireless radio as a part of claim element 1.1.”). And while Dr. Min did state that Bluetooth and 802.11 “do not interfere with each other, and they are independent submodules within the chip” to find the limitation met in the DI Products, he fails to allege any interference between the [REDACTED] and Sonosnet. *See* CRB at 62 (Google offering attorney argument of interference). Further, the concept that discrete submodules have importance to the meaning of “independent” finds no support in the patent, and Google cites none. *See* CIB at 136-137; CRB at 60-62.

Nevertheless, Sonos has not shown the “short-range” limitation of claim 1 in Sonos v1.0, and so Sonos v1.0 does not anticipate claim 1.

b. Claim 6

Claim 6 further requires contacting the wireless device via the communication network to indicate the target device has successfully joined that network. 615 patent at cl. 6. Both parties acknowledge [REDACTED]

[REDACTED]

Sonos argues for the former, citing the testimony of Dr. Schmidt who “looked at the actual source code.” RIB at 122 (citing Hr’g Tr. (Schmidt) at 991:12-994:3). Google and its experts, Dr. Min and Dr. Jones, argue [REDACTED]

[REDACTED] CRB at 63 (citing Hr’g Tr. (Min) at 1194:15-23; Hr’g Tr. (Jones) at 1046:7-17).

Sonos has the more persuasive position. Google leans on [REDACTED] [REDACTED]

[REDACTED] (CIB at 137 (emphasis added)), [REDACTED]

[REDACTED] RIB at 122; Hr’g Tr. (Schmidt) at 993:17-24. Dr. Min does not identify one. Neither does Mr. Jones, who refers instead to [REDACTED]

[REDACTED] Hr’g Tr. (Jones) at 1046:7-17 (emphasis added). This is

[REDACTED]

anomalous, as no party has argued that the entire 802.11 protocol is a network in and of itself. And the approach generally contradicts Google’s position on claim 1, where it argues that [REDACTED]

[REDACTED] Mr. Jones also does not provide a source code analysis to match Dr. Schmidt’s. *Compare* Hr’g Tr. (Jones) at 1046:7-17 *with* Hr’g Tr. (Schmidt) at 991:9-994:3.

Accordingly, Sonos has shown the elements of claim 6 are present within Sonos v1.0, but claim 6 is not anticipated by Sonos v1.0 due to its dependence on claim 1.

c. Claim 9

Dependent claim 9 requires that a visual or audio “indication” occur to notify the user “about a status of the commissioning process.” 615 patent at cl. 9. According to Sonos, the Status and Mute buttons on the ZP100 players “blink and change colors in accordance with the state of device setup” RIB at 123 (citing JX-0294.0012, 18, 95, 104); Hr’g Tr. (Schmidt) at 998:2-24. Google does not dispute this disclosure beyond its argument that claim 1 is not disclosed. *See* CIB at 137-138; CRB at 63. Therefore, the additional element of claim 9 is disclosed in Sonos v1.0, but claim 9 is not anticipated by Sonos v1.0 due to its dependence on claim 1.

d. Claim 16

Claim 16 differs from claim 1 in that it requires a non-transitory computer readable storage medium containing instructions, instead of a method. 615 patent at cl. 16. The limitations contained within the body of the claim are otherwise identical to the limitations of claim 1, and both parties address both claims simultaneously. *See* RIB at 115-121; CIB at 136-137. As determined above, Sonos has not adequately shown the Sonos v1.0 implements a “short-range” independent communication path. Therefore, the elements of claim 16 are not fully disclosed in Sonos v1.0, and Sonos v1.0 does not anticipate claim 16.

e. Claim 17

Like claim 9, dependent claim 17 requires that a visual or audio “indication” occur to notify the user “about a status of the commissioning process.” 615 patent at cl. 17. As determined above, the buttons of Sonos v1.0 blink in accordance with network connection status. RIB at 123 (citing JX-0294.0012, 18, 95, 104); Hr’g Tr. (Schmidt) at 998:2-24. Google does not dispute this disclosure beyond its argument that claim 16 is not disclosed. *See* CIB at 137-138; CRB at 63. Therefore, the additional element of claim 17 is disclosed in Sonos v1.0, but claim 17 is not anticipated by Sonos v1.0 due to its dependence on claim 16.

f. Claim 19

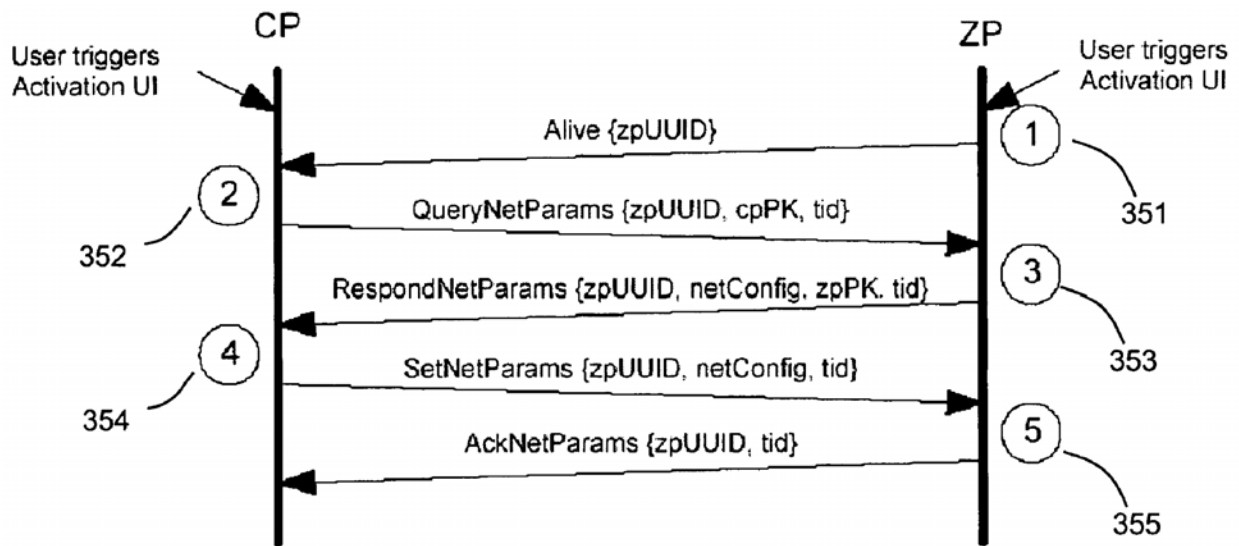
Like claim 6, dependent claim 19 requires an additional programmed instruction wherein the wireless device is contacted via the commissioned communication network to indicate the commissioning of the target device was successful. 615 patent at cl. 19. As determined above, [REDACTED] as required by claims 6 and 19. Therefore, the additional element of claim 19 is disclosed in Sonos v1.0, but claim 19 is not anticipated by Sonos v1.0 due to its dependence on claim 16.

3. Millington

Millington is an issued U.S. Patent originally assigned to Sonos, Inc. and discloses techniques for commissioning a new device onto a network in similar fashion to the Sonos v1.0 system. JX-0331. Indeed Sonos’ expert, Dr. Schmidt, discussed them at the same time. Hr’g Tr. (Schmidt) at 938:17-999:8.

The Millington network is described as a “wired and/or wireless Ad-hoc network” to facilitate communication between a group of music players and controllers and the means for delivering the necessary credentials or login parameters to the new device is “a rudimentary

communication path established between one of the devices [already] in the network and the new device.” *Id.* at Abstract. The sequence of messages sent within this path between a control point (CP) (existing in the network) and a zone player (ZP) (not yet in the network) is shown in Figure 3B:



JX-0331 at Fig. 3B, 9:20-34 (describing purposes of CP and ZP). Altogether, and as with the Sonos v1.0, the devices in the Ad-hoc network are collectively known as a “HOUSEHOLD.” *Id.* at 8:61-9:6.

a. Claim 1

As noted, Millington discloses a method for configuring ZPs to join an existing “Ad-hoc” network via communications with a CP. Each ZP includes a “processor 204,” “memory 206,” and “wireless interface 216” which, according to Sonos, “provides network interface functions by a wireless means for the zone player 200 to communicate with other devices in accordance with a communication protocol (such as the wireless standard IEEE 802.11a, 802.11b or 802.11g).” RIB at 125-126 (citing, *inter alia*, JX-0331 at 6:34-40, Fig. 2A). The configuration process begins by a user pressing a “VOL” button and “Mute” buttons at the same time, and when pressed, the ZP

[REDACTED]

sends out an “Alive” message to the CP. JX-0331 at 16:61-65, Fig. 3B. Thereafter, the ZP receives a “setNetParams” message which include “network parameters” from the CP. *Id.* at 2:6-3:13, 13:1-9. The “setNetParams” includes packets in a predetermined 802.11 format, and the ZP uses the network parameters, including WEP keys, contained therein to join the Ad-hoc wireless network. *Id.* at 6:34-40, 14:4-7, 17:3-6.

The configuration process takes place over a “rudimentary connection path” initially established between the CP and ZP. *See* JX-0331 at 2:6-12, 12:37-40. Millington describes the path as involving “probing datagrams” sent from the CP (claimed “wireless device”) to the ZP (claimed “target device”): “[A] first device that may be or may not be the device in the network broadcasts a message including probing datagrams in compliance with the standard IP broadcast. The rudimentary communication path may be established after the second device responds to the message from the first device.” *Id.* at 2:15-20; *see id.* at 9:52-11:59.

Although Sonos does not expressly contend that Millington anticipates claims 1 or 16 (*see* RIB at 125), in substance its discussion is one of anticipation (*see id.* at 125-130); and Dr. Schmidt opined, correctly, that the above features of Millington correspond to most elements of claim 1 including limitations [1.0]-[1.1.1], and [1.1.3]-[1.1.5]. Hr’g Tr. (Schmidt) at 952:21-953:11, 953:24-954:19, 955:9-958:2-15, 981:2-982:2, 983:23-984:19, 986:5-987:6, 987:18-988:15. Google only expressly disputes limitation [1.1.2], “establishing a short-range signal transmission path with a wireless device independently of the communication network.” CIB at 133-134; CRB at 57-59. Google contends Sonos and Dr. Schmidt never addressed the “short-range” aspect of the transmission path and the rudimentary path and Ad-hoc network are both based on 802.11 protocol and so the path is not “independent” of the network. CIB at 133-134; CRB at 57-59.

[REDACTED]

As with *Sonos v1.0*, Google’s first point is persuasive. *Sonos* leaves unaddressed how the “rudimentary path” of Millington is “short-range.” In rebuttal, *Sonos* declares Google’s characterization to be “[w]rong” and cites the testimony of Dr. Schmidt. RRB at 66 (citing Hr’g Tr. (Schmidt) at 969:24-970:12. But the cited testimony contains no explanation. *See* Hr’g Tr. (Schmidt) at 969:24-970:12. As determined above, a basic disclosure of 802.11 being used is insufficient to show “short-range” is met. And while *Sonos* suggests this is a new argument from Google (RRB at 67 n.50), it was fairly disclosed before the hearing (CPB at 181), and regardless the issue is *Sonos*’ burden and the claim element has gone completely unaddressed. *Pause Tech.*, 419 F.3d at 1334.

Additionally, as with *Sonos v1.0*, Google’s second point regarding a path not “independently” established is not persuasive. No party has argued that inventor lexicography or prosecution disclaimer has occurred, and so the plain and ordinary meaning controls. *Kyocera*, 22 F.4th at 1378 (citing *Thorner*, 669 F.3d at 1365). A plain and ordinary meaning of a path that is “independent” of a network would be any path that functions without membership or connection to that network; *i.e.*, no dependency. *See, e.g.*, 615 patent at 1:62-65, 4:24-30; Hr’g Tr. (Schmidt) at 970:13-20; Hr’g Tr. (Millington) at 602:24-603:15. Google, on the other hand, appears to treat any and all 802.11 activity as being of one “network.” CIB at 133 (stating Millington uses quiet channels within the 802.11 protocol and “thus selects channels *in* the communication network—not *independent of* the network—to transmit 802.11 probe datagrams” (emphasis in original)); CRB at 59 (“Millington only describes selecting a channel *of the communication network the Zone Player is joining.*” (emphasis in original)). As noted with respect to *Sonos v1.0* and claim 6, this is anomalous, as no party has argued that the entire 802.11 protocol can be considered a “network” in and of itself; and neither Dr. Min nor Millington explain it, despite Google’s suggestions to the

[REDACTED]

contrary. *Compare* CRB at 59 (asserting Millington at 10:1-29 “explain[s] the rudimentary communication path requires channel selection of the communication network”) *with* JX-0331 at 10:1-29 (no mention of network); *see* Hr’g Tr. (Min) at 1201:2-1206:9 (failing to opine that any and all 802.11 activity is one “network”).

Nevertheless, Sonos has not shown the “short-range” limitation of claim 1 in Millington, and so Millington does not anticipate claim 1.

b. Claim 9

Dependent claim 9 requires that a visual or audio “indication” occur to notify the user “about a status of the commissioning process.” 615 patent at cl. 9. According to Sonos, Millington discloses that “LED indicators display various colors in accordance with the status of a ‘zone player’s’ commissioning (*i.e.*, ‘registered’ (solid white)).” RIB at 132 (citing JX-0331 at Fig. 4B, 16:51-60; Hr’g Tr. (Schmidt) at 997:13-998:1). Google does not dispute this disclosure beyond its argument that claim 1 is not disclosed. *See* CIB at 132-136; CRB at 57-60. Therefore, the additional element of claim 9 is disclosed in Millington, but claim 9 is not anticipated by Millington due to its dependence on claim 1.

c. Claim 16

Claim 16 differs from claim 1 in that it requires a non-transitory computer readable storage medium containing instructions, instead of a method. 615 patent at cl. 16. The limitations contained within the body of the claim are otherwise identical to the limitations of claim 1, and both parties address both claims simultaneously. *See* RIB at 125-130; CIB at 133-134. As determined above, Sonos has not adequately shown Millington discloses a “short-range” independent communication path. Therefore, the elements of claim 16 are not fully disclosed in Millington, and Millington does not anticipate claim 16.

d. Claim 17

Like claim 9, dependent claim 17 requires that a visual or audio “indication” occur to notify the user “about a status of the commissioning process.” 615 patent at cl. 17. As determined above, the ZP of Millington has an LED that illuminates in accordance with network connection status. RIB at 132 (citing JX-0331 at Fig. 4B, 16:51-60); Hr’g Tr. (Schmidt) at 997:13-998:1. Google does not dispute this disclosure beyond its argument that claim 16 is not disclosed. *See* CIB at 132-136; CRB at 57-60. Therefore, the additional element of claim 17 is disclosed in Millington, but claim 17 is not anticipated by Millington due to its dependence on claim 16.

4. Obviousness

As for the obviousness of limitations not already shown to be disclosed in each reference, Sonos asserts that: (1) claims 6 and 19 would have been obvious over the single reference Roberts (*see* RIB at 114); (2) claims 1, 5, and 16 would have been obvious over the combination of Sonos v1.0 and Asokan (*see* RIB at 119-120, 121, 123-125); (3) claims 1, 5, and 16 would have been obvious over the combination of Millington and Asokan (*see* RIB at 128-129, 130-131, 132-134); (4) claims 6 and 19 would have been obvious over Millington (with or without Asokan) itself (*see* RIB at 131-132); and (5) claims 6 and 19 would have been obvious over the combination of Millington (with or without Asokan) and Sonos v1.0 (*see* RIB at 132). Google opposes each of these combinations on the ground that a POSITA would not have made them. *See* CIB at 132, 134-136, 137-138, 139-140; CRB at 56-57, 59-60, 63-65.

As for Roberts, Sonos has not met its burden. Sonos relies entirely on Roberts’ claim 10 for a disclosure of reporting network connection successes (as opposed to failures). RIB at 113-114. Yet claim 10 merely states, “having . . . instructions comprising reporting failure conditions or successful results after attempting to connect to the wireless network.” RX-0623 at cl.10. There is no teaching here of which device receives the report. This is critical, because claims 6 and 19

[REDACTED]

of the 615 patent explicitly require “contacting” the same wireless device involved in the commissioning. 615 patent at cl. 10. Sonos’ theory fails to appreciate this omission, however, and so provides no argument on its obviousness, focusing instead on whether it is the in-band or out-of-band path which is used. *See* RIB at 113-114; RRB at 66.

Accordingly, claims 6 and 19 have not been shown to be obvious over the single reference Roberts.

As for the combinations of Sonos v1.0 and Asokan, or Millington, Asokan, and Sonos v1.0, the record clearly and convincingly shows these would have been obvious as alleged. With respect to claims 1 and 16, the only limitation not expressly taught in Sonos v1.0 and Millington is an independent communication path which is “short-range”; and for claim 5, a specified path of Bluetooth or NFC (as examples).

Asokan fills the gap. It is analogous art concerned with “methods and systems for managing access to a wireless local area network” and expressly teaches the use of “an out-of-band channel to communicate authentication key and network address information to a guest device.” RX-0620 at Abstract. It further teaches examples of OOB channels including “NFC, short range wireless communication, infrared, [and] Bluetooth.” *Id.* at [0025]. Google does not dispute that these passages qualify as “a short-range signal transmission path with a wireless device independently of the communication network” per claims 1 and 16. It only challenges whether a POSITA would have been motivated to make the combination.

The motivation is evident from Asokan itself. One need look no further than its Abstract, where it is stated the OOB communications used to transmit network credentials provide increased security and usability:

Methods and systems for managing access to a wireless local area network are provided. A wireless access point (AP) may use a unified approach that utilizes an

[REDACTED]

out-of-band channel to communicate authentication key and network address information to a guest device, and utilizes an in-band channel to establish communications with the guest device, and also provides support for in-band setup on all devices. *The ability to use out-of-band where possible provides for an increase to security and usability, and the possibility of delegating access from one device to another.* The unified approach thereby also provides easy management of guest access to the WLAN.

RX-0620 at Abstract (emphasis added). And the specification is replete with the purported benefits of an OOB transmission that is also within “physical proximity”; benefits which a POSITA would in all likelihood have appreciated:

Existing proposals for solving the network setup problem attempt to exploit proximity. For example, one known approach exploits physical proximity by using a physically secure “out-of-band” (OOB) channel. The OOB channel can be based on NFC (Near Field Communication), infrared, portable USB memory stick or any other communication technology that is based on physical proximity. The OOB is used to transfer the network identifier (*e.g.*, a SSID) and a shared key from one device to another. Because the transferred key is used directly as the PSK, no additional protocols are needed.

....

The OOB and in-band approaches have advantages and disadvantages. The OOB approach is more intuitive and secure, but because of the extra hardware required, it is unreasonable to expect that all devices will have suitable out-of-band channels available. The in-band approach does not allow delegation of access and is less secure, but it is less expensive and is more likely to start appearing in commercial APs and client devices. Neither approach supports easy guest access management.

....

The ability to use out-of-band where possible provides for an increase to security and usability, and the possibility of delegating access from one device to another. The unified approach thereby also provides easy management of guest access to the WLAN.

....

According to an aspect of the invention, a unified approach may be used that utilizes aspects of both the OOB and in-band approaches, thereby allowing support for the in-band approach on all devices, but also the ability to use out-of-band where possible to increase security and usability, and the possibility of delegating access

[REDACTED]

from one device to another. The unified approach thereby also provides easy management of guest access to the WLAN.

Id. at [0005], [0007], [0010], [0025]. Asokan also specifically lists Bluetooth as an acceptable OOB channel used when the devices are “physically close to each other”:

The above scenario is illustrative for purposes of describing aspects of the invention and is not limiting in any way. As used herein, “touching” refers to a proximity based interaction between two devices wherein setup and/or security information is transferred or granted from one device to the other. In one example, “touching” refers to moving the devices physically close to each other so that the OOB channel (NFC, short range wireless communication, infrared, Bluetooth, UWB, WiFi, RFID, USB memory stick, etc.) can be established and needed data exchanged over the OOB channel. According to an aspect of the invention, a unified approach may be used that utilizes aspects of both the OOB and in-band approaches, thereby allowing support for the in-band approach on all devices, but also the ability to use out-of-band where possible to increase security and usability, and the possibility of delegating access from one device to another. The unified approach thereby also provides easy management of guest access to the WLAN.

Id. at [0025]; *see id.* at [0041]. Sonos and Dr. Schmidt persuasively argue that these objectives align with the goals of Sonos v1.0 and Millington (RIB at 123-124 (citing, *inter alia*, Hr’g Tr. (Schmidt) at 979:981:1, 975:16-19), 132-133 (citing, *inter alia*, Hr’g Tr. (Schmidt) at 990:22-991:5, 979:16-981:1)); and even the 615 patent acknowledges Bluetooth (the alleged short-range independent path in the Accused and DI Products), was common at the time of its invention (615 patent at 8:46-67). The clear inference to draw is that a POSITA would have been familiar with these technologies and would have been motivated to use them to replace the [REDACTED] in Sonos v1.0 and Millington to achieve the benefits touted by Asokan. RIB at 124, 133.

So the first three *Graham* factors establish a *prima facie* case of obviousness. As for objective indicia of non-obviousness, Google offers evidence of failure by others—specifically, Sonos and its efforts in 2017-2018 to modernize the setup experience and reduce setup time, as reported through user surveys, by switching from WiFi-based commissioning techniques to BLE. *See* CIB at 139 (citing JX-0297C; JX-0298C). But all this shows is that Sonos itself was late to

[REDACTED]

the game. Asokan makes clear that the advantages of using OOB paths to transmit network credentials between devices in close physical proximity were known at least as early as 2006. RX-0620. It is fair to assume that between 2006 and 2012 (earliest 615 patent priority date), that knowledge would have only grown amongst POSITAs and become more sophisticated. In this way, Google’s suggestion of non-obviousness is outweighed by the explicit teachings of the prior art.

Google’s additional indicia of long-felt but unmet need is similarly overridden at least in part because the only supporting evidence is the testimony of Dr. Min; and that testimony is limited to a summary of the evidence mentioned above along with one Google-internal document that appears to have been created almost three years after the 615 patent was filed. CIB at 139-140 (citing Hr’g Tr. (Min) at 1215:24-1216:6; JX-0252C.00001 [REDACTED])

Google’s remaining arguments are even less persuasive and, tellingly, fail to address or even acknowledge the particularly salient teachings in Asokan. Instead, Google generally contends a POSITA would not combine Sonos v1.0 or Millington with Asokan because they “address different problems”:

Millington address[es] commissioning techniques for permanent access to a network—specifically, for in building a home speaker network, RX-618, 1:20-22; Tr. (Min) 1206:24-1207:11, whereas Asokan addresses temporary visitor access to the home network with the goal of eliminating that access easily.

....

Sonos v1.0 is related to commissioning a device onto a network to build a home speaker system, whereas Asokan is related to visitors and temporary network access for visitors.

CIB at 134, 138. Google paints distinctions without a difference. Given the breadth of the POSITA definition, above, and that the 615 patent claims are agnostic to any notion of permanent/temporary access or speaker systems, it is irrelevant that the access otherwise controlled

[REDACTED]

is permanent or temporary, or applies to a network of speakers or PCs. *See* 615 patent at cls. 1-20 (reciting “devices” without application or field of art and “enter[ing]” networks without restrictions). There can be no real dispute that all references concern the commissioning of a first device onto a network via communication with a second device already on the network. Hr’g Tr. (Schmidt) at 975:6-11 (“Asokan discloses what Millington discloses, what the Sonos v1 discloses, what Roberts discloses, what the '615 Patent discloses. It discloses using one device, which is already on a network, to commission another device, which wants to join that network.”). Google also contends Sonos v1.0 would not be combined with Asokan because “even though NFC and Bluetooth were well known, Sonos v1.0 decided to use a very different solution instead of NFC and Bluetooth.” CIB at 138. To the extent this is intended to invoke teaching away principles, it is insufficient. “[A] reference does not teach away if it ‘merely expresses a general preference for an alternative invention but does not ‘criticize, discredit or otherwise discourage’ investigation into the invention claims.” *UCB, Inc. v. Actavis Labs. UT, Inc.*, 65 F.4th 679, 692 (Fed. Cir. 2023) (citing *DePuy Spine, Inc. v. Medtronic Sofamor Danek, Inc.*, 567 F.3d 1314, 1327 (Fed. Cir. 2009)).

Google also asserts that modifying Sonos v1.0 or Millington to use Asokan’s OOB channel for communications would take “substantial” or “significant” modification. *See* CIB at 135, 138. If true, this would weigh in favor of non-obviousness, but Dr. Min gave no corroborating details on the modifications. Hr’g Tr. (Min) at 1208:23-1209:7, 1199:18-1200:14. And it is more than likely not true given the lack of any discussion of how to practically implement Wi-Fi and Bluetooth, “or other proprietary standards,” for the same purpose in the 615 patent. Rather, the 615 patent assumes the skill and knowledge of a POSITA enable them to be up to the task (*see* 615 patent 8:42-65), and it would be so for the prior art as well.



In sum, three of the four *Graham* factors strongly favor a finding of obviousness for the Sonos v1.0/Millington with Asokan combination as proposed by Sonos (scope and content of the prior art, the level of ordinary skill in the art, the differences between the claimed invention and the prior art), with only one providing minimal counterweight (indicia of non-obviousness). *Graham*, 383 U.S. at 17-18. Thus, claims 1, 5, and 16 are invalid as obvious. In addition, because their elements are met in Sonos v1.0 alone, claims 6, 9, 17 and 19 are also invalid as obvious. Claims 9 and 17 are further obvious for the same reason in light of Millington, which alone discloses their elements.

This leaves the obviousness of claims 6 and 19 as viewed against Millington and Asokan, or Millington, Asokan, and Sonos v1.0. As for Millington and Asokan, the theory is ineffective. Sonos points to Millington's "AckNetPharms" message as one that reports success back to the CP and, while left ambiguous in Millington, could only possibly travel in the finite choices of: "(1) over the existing communication network, or (2) over the rudimentary communication path." RIB at 131-132 (citing JX-0331 at 13:10-15). This could be persuasive, but the nature of "AckNetPharms" makes it unlikely to be sent over Millington's Ad-hoc network. Contrary to Sonos' suggestion, it is not an indicator that the ZP has successfully entered the network. Rather it "indicates that the [prior] SetNetParams message was received and that the network configuration therein has successfully been applied." *See* JX-0331 at 13:10-15; *id.* at 13:56-58 ("At 355, when the ZP receives a SetNetParams message, it reconfigures its own HHID and WEP key to match those contained in the network packet."). Actual entrance to the network comes later. *Id.* at 14:4-9 ("Subsequent to the activation process, any devices that have been reconfigured will attempt to establish normal network communications using their new network configuration parameters. In all of the above steps, if the CP or ZP is not already in the activation state, receipt

[REDACTED]

of any messages is ignored.”). So the meaning and purpose of “AckNetPharms” makes it far more suited for the rudimentary pathway than the Ad-hoc network, and the theory is not convincing.

Claims 6 and 19 have not been shown to be obvious over Millington and Asokan.

As for Millington and Asokan further combined with Sonos v1.0, Sonos has presented a clear and convincing case—specifically that it would have been obvious to implement the [REDACTED] [REDACTED] from Sonos v1.0 with Millington’s embodiments. Sonos reasonably infers that a POSITA would be highly motivated to combine Millington and Sonos v1.0 because they “(i) come from the same company, (ii) describe the same products (and product names), and (iii) reflect the work of the same individual.” RIB at 133-134 (citing Hr’g Tr. (Schmidt) at 995:17-996:9). Sonos additionally argues, correctly, that there would be a reasonable expectation of success given that the Sonos v1.0 products were operable. *Id.* at 134. And lastly, Dr. Schmidt persuasively testified that a POSITA would be motivated to send [REDACTED] over the Ad-hoc network in Millington ([REDACTED]) because doing so indicates successful network entrance with high reliability (*e.g.*, self-evident):

Q. Why would you have been motivated, if you were reading Millington, to look to any other reference for options as to how to implement the Millington teachings in going about implementation?

A. Well, I think the motivation here might be just to make doubly, triply sure that the ZonePlayer, the target device, had, in fact, joined the communication network. And so, sending things over the communication network to the wireless device makes it very clear that that ZonePlayer has, in fact, joined the communication network.

Q. If you send the acknowledgement over the temporary data path, the IP datagram, is there a possibility for error?

A. It's possible that if the -- if the message was sent over the rudimentary communication path, that between the point when that was received by the controller and when it tried to establish contact back with the ZonePlayer it thought was on the communication network, something could have gone awry.

[REDACTED]

Q. Would that be eliminated by moving to the teachings of the Sonos v1 system?

A. That's correct.

Hr'g Tr. (Schmidt) at 996:10-997:7.

On the other hand, neither of Google's indicia of non-obviousness have particular nexus to claims 6 and 19, as the "contacting" claim limitation is indisputably distinct from the commissioning techniques at issue there. *See* CIB at 139-140. And Dr. Min's testimony is unhelpfully limited to the incorrect assertions that [REDACTED] and that a POSITA would not be inclined to combine different pieces of Sonos-produced art. Hr'g Tr. (Min) at 1210:2-1212:4.

In sum, three of the four *Graham* factors strongly favor a finding of obviousness for the Sonos v1.0/Millington/Asokan combination as proposed by Sonos (scope and content of the prior art, the level of ordinary skill in the art, the differences between the claimed invention and the prior art), and the fourth is neutral (indicia of non-obviousness). *Graham*, 383 U.S. at 17-18. Thus, claims 6 and 19 are further invalid as obvious on this ground.

5. Section 112

Sonos contends that all claims are invalid for lack of written description because there is inadequate "support for the 'in response to receiving a request . . .' limitation." RIB at 139-41. Sonos specifically argues that "[t]he specification does not disclose receiving network configuration packets in response to receiving a request to initiate a commissioning process" as in claims 1 and 16. *Id.* at 139.

The specification indeed has little discussion of how the target device receives a request to initiate a commissioning process, or what happens between receiving the request and receiving network configuration packets. In discussing the prior art, however, the specification states that "the device to be commissioned may be required to monitor . . . beacon request messages." 615

[REDACTED]

patent at 6:30-32. And in summarizing the claimed invention the specification states that the commissioning device may transmit “one or more [network] configuration packets over a transmission path,” which are received by the target device, which then recovers the configuration data so that it may join the network. *Id.* at 3:2-13. Combining these two disclosures, a POSITA would understand that the target device receives a request to join the network (*i.e.*, “a request to initiate a commissioning process”), and thereafter receives network configuration packets which are necessary to join the communication network. *Id.* at cl. 1.

There is, however, no express disclosure of the target device receiving the network configuration packets “in response to receiving the request.” But as Dr. Min explained, the specification discloses various network communication protocols:

These embodiments may use radio frequency (RF) communication standards such as, but not limited to, near field communication (NFC), RF identification (ID), BLUETOOTH LOW ENERGY®, Zigbee®, radio frequency for consumer electronics (RF4CE®), Z-Wave®, or other proprietary standards.

615 patent at 8:62-67; *see* Hr’g Tr. (Min) at 1217:15-24. At least with “NFC, Bluetooth, Z-Wave and Zigbee,” the commissioning device “first send[s] the request to initiate,” then the target device “explicitly acknowledge[es]” receipt of that request, and “only when that acknowledgement is received, the next data can go out.” Hr’g Tr. (Min) at 1218:12-1219:4. Most importantly, a skilled artisan would have known that these protocols each use “acknowledgement or ACK features.” *Id.* at 1219:5-9. Sonos offers no expert opinion to the contrary. RIB at 139-141; RRB at 73.

So a POSITA would have recognized that when using NFC, Bluetooth, Z-Wave, or Zigbee, there is a causal connection between receiving a request and later receiving network configuration packets: the commissioning device sends, and the target device receives, network configuration packets only as a result of the commissioning device receiving an acknowledgement message; and the target device sends, and the commissioning device receives, an acknowledgement message

[REDACTED]

only as a result of the target device receiving the request to initiate commissioning. The disclosure of these specific network communication protocols therefore “reasonably conveys to those skilled in the art that the inventor had possession of the [disputed claim term] as of the filing date.” *Ariad Pharm.*, 598 F.3d at 1351.

Sonos disputes this conclusion, arguing that “at best” this disclosure is of “a target device sending an acknowledgement upon receipt” of a request. RRB at 73 (emphasis omitted). But this ignores the fact that when using the disclosed protocols, the acknowledgement itself triggers subsequent transmission of network configuration packets, which are then received by the target device. On balance, therefore, a skilled artisan would have recognized that the inventors invented what they claimed, and Sonos has not met its burden to prove invalidity for lack of written description.

G. Unenforceability

Sonos asserts the defense of unenforceability due to inequitable conduct, on the ground that Google attorney Mr. Bradley Riel withheld the Millington patents from the PTO during prosecution of the 615 patent. *See* RIB at 141-45. Proof of inequitable conduct in such a situation requires clear and convincing evidence that Mr. Riel “knew of the reference[s], knew that [they were] material, and made a deliberate decision to withhold [them].” *Therasense, Inc. v. Becton, Dickinson and Co.*, 649 F.3d 1276, 1290 (Fed. Cir. 2011) (en banc). That “deliberate decision” must involve specific intent to deceive the PTO, which can be proven with circumstantial evidence. *See id.* Nonetheless, mere proof “that the applicant knew of a reference, should have known of its materiality, and decided not to submit it to the PTO does not prove specific intent to deceive.” *Id.*

Sonos cites evidence tending to show that Mr. Riel knew of the Millington patents, should have known of their materiality, and failed to submit them to the PTO during the small window of

[REDACTED]

time he was responsible for prosecuting the 615 patent. *See* RIB at 141-145; RRB at 73-74. But Mr. Riel did not testify at the hearing, and his deposition transcript (JX-0044C) was entered into evidence instead. His deposition testimony shows that: he became responsible for prosecution of the 615 patent only after the first notice of allowance issued (*see* JX-0044C at 132:12-20; *but see* EDIS Doc. ID 777545, Complaint, App’x D at 220 (subsequent Notice of Allowance mailed 3/2/2021)); it was among “thousands” of matters for which he assumed responsibility at about the same time (*id.* at 133:6-20); and “generally speaking” he did not review any claim charts furnished by Sonos that cited Millington as prior art (*id.* at 186:3-7). Most importantly, when asked if he made an “affirmative decision not to cite” the Millington patents in connection with the 615 patent, he responded that he did not: “it just never occurred to me . . . the relevance between these two patent families never occurred to me.” *Id.* at 246:24-247:12. Such evidence does not show, clearly and convincingly, that Mr. Riel made a deliberate decision to withhold the Millington patents with the specific intent to defraud the PTO. Sonos has therefore failed to prove inequitable conduct.

VII. DOMESTIC INDUSTRY - ECONOMIC PRONG

In a patent-based complaint, a violation of Section 337 can be found “only if an industry in the United States, relating to the articles protected by the patent ... concerned, exists or is in the process of being established.” 19 U.S.C. § 1337(a)(2). Under Commission precedent, this “domestic industry requirement” of Section 337 consists of an economic prong and a technical prong. *Stringed Instruments*, Inv. No. 337-TA-586, Comm’n Op. at 12-14. The complainant bears the burden of establishing that the domestic industry requirement is satisfied. *See Certain Set-Top Boxes and Components Thereof*, Inv. No. 337-TA-454, Initial Determination at 294 (June 21, 2002) (not reviewed in relevant part).

The economic prong of the domestic industry requirement is defined in subsection (a)(3) of Section 337 as follows:

[REDACTED]

(3) For purposes of paragraph (2), an industry in the United States shall be considered to exist if there is in the United States, with respect to the articles protected by the patent, copyright, trademark or mask work concerned --

(A) Significant investment in plant and equipment;

(B) Significant employment of labor or capital; or

(C) Substantial investment in its exploitation, including engineering, research and development, or licensing.

19 U.S.C. § 1337(a)(3). The economic prong of the domestic industry requirement is satisfied by meeting the criteria of any one of the three factors listed above. Importantly, the Commission has clarified that investments in plant and equipment, labor, and capital that may fairly be considered investments in research and development are eligible for consideration under subsections (A) and (B), in addition to subsection (C). *See Certain Solid State Storage Drives, Stacked Electronics Components, and Products Containing Same*, Inv. No. 337-TA-1097, Comm’n Op. at 14 (June 29, 2018) (“*Solid State Storage*”).

Google had previously moved for summary determination that the economic prong was met, without opposition from Sonos. As noted above, the motion was granted on May 26, 2023, via initial determination. Order No. 31. On June 28, 2023, the Commission determined to review and, upon review, affirmed Order No. 31 in relevant part. EDIS Doc. ID 799529. No further economic prong argument was presented by the parties. *See, e.g.*, CIB at 145.

Accordingly, for the purposes of this investigation, Google has satisfied the economic prong of the domestic industry requirement for the 748, 311, and 615 patents.

VIII. CONCLUSIONS OF LAW

1. Google has not proven infringement of any asserted claim of U.S. Patent No. 9,632,748.
2. Google has proven infringement of claim 10 of U.S. Patent No. 11,024,311, but not claims 16-19.

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3. Google has proven infringement of claims 1, 5, 6, 9, 16, 17, and 19 of U.S. Patent No. 11,050,615.
 4. Sonos has proven the invalidity of claims 7, 9, and 10 of U.S. Patent No. 9,632,748.
 5. Sonos has proven the invalidity of claims 10, 11, and 16-19 of U.S. Patent No. 11,024,311.
 6. Sonos has proven the invalidity of claims 1, 5, 6, 9, 16, 17, and 19 of U.S. Patent No. 11,050,615.
 7. Sonos has not proven the unenforceability of U.S. Patent No. 11,050,615.
 8. Google has not proven the existence of articles protected by any claim of U.S. Patent No. 9,632,748.
 9. Google has proven the existence of articles protected by claims 10, 11, 16, and 17 of U.S. Patent No. 11,024,311, except that claims 10, 11, 16, and 17 are invalid.
 10. Google has not proven the existence of articles protected by any claim of U.S. Patent No. 11,050,615.
 11. Google has proven the existence of an economic domestic industry as required by 19 U.S.C. § 1337(a)(2) for U.S. Patent No. 9,632,748, U.S. Patent No. 11,024,311, and U.S. Patent No. 11,050,615.
 12. There is no violation of section 337 with respect to U.S. Patent No. 9,632,748.
 13. There is no violation of section 337 with respect to U.S. Patent No. 11,024,311.
 14. There is no violation of section 337 with respect to U.S. Patent No. 11,050,615.

IX. RECOMMENDED DETERMINATION ON REMEDY AND BOND

The Commission's Rules provide that subsequent to an initial determination on the question of violation of section 337 of the Tariff Act of 1930, as amended, 19 U.S.C. § 1337, the administrative law judge shall issue a recommended determination concerning the appropriate remedy in the event that the Commission finds a violation of section 337, and the amount of bond to be posted by respondent during Presidential review of the Commission action under section 337(j). *See* 19 C.F.R. § 210.42(a)(1)(ii).

The Commission has broad discretion in selecting the form, scope, and extent of the remedy in a section 337 proceeding. *Viscofan, S.A. v. Int'l Trade Comm'n*, 787 F.2d 544, 548 (Fed. Cir. 1986). Under Section 337(d)(1), if the Commission determines as a result of an investigation that there is a violation of section 337, the Commission is authorized to enter either a limited or a general exclusion order. 19 U.S.C. § 1337(d)(1). A limited exclusion order instructs the U.S. Customs and Border Protection ("CBP") to exclude from entry all articles that are covered by the patent at issue and that originate from a named respondent in the investigation. A general exclusion order instructs the CBP to exclude from entry all articles that are covered by the patent at issue, without regard to source. *Certain Purple Protective Gloves*, Inv. No. 337-TA-500, Comm'n Op. at 5 (Dec. 22, 2004). Under section 337(f)(1), the Commission may issue a cease and desist order in addition to, or instead of, an exclusion order. 19 U.S.C. § 1337(f)(1). The Commission generally issues a cease and desist order directed to a domestic respondent when there is a "commercially significant" amount of infringing, imported product in the United States that could be sold, thereby undercutting the remedy provided by an exclusion order. *See Certain Crystalline Cefadroxil Monohydrate*, Inv. No. 337-TA-293, USITC Pub. 2391, Comm'n Op. on Remedy, the Public Interest and Bonding at 37-42 (June 1991); *Certain Condensers, Parts Thereof*

[REDACTED]

and Prods. Containing Same, Including Air Conditioners for Automobiles, Inv. No. 337-TA-334 (Remand), Comm’n Op. at 26-28 (Sept. 10, 1997).

Additionally, during the 60-day period of Presidential review under 19 U.S.C. § 1337(j), “articles directed to be excluded from entry under subsection (d) . . . shall . . . be entitled to entry under bond prescribed by the Secretary in an amount determined by the Commission to be sufficient to protect the complainant from any injury.” *See* 19 U.S.C. § 1337(j)(3). “The Commission typically sets the bond based on the price differential between the imported infringing product and the domestic industry article or based on a reasonable royalty. However, where the available pricing or royalty information is inadequate, the bond may be set at one hundred (100) percent of the entered value of the infringing product.” *Certain Industrial Automation Systems and Components Thereof Including Control Systems, Controllers, Visualization Hardware, Motion and Motor Control Systems, Networking Equipment, Safety Devices, and Power Supplies*, Inv. No. 337-TA-1074, Comm’n Op. at 13 (Apr. 23, 2019) (“*Automation Systems*”) (public version) (citation omitted).

A. Limited Exclusion Order

Should a violation be found, there is no dispute that a limited exclusion order (“LEO”) should issue against Sonos. *See* CIB at 145; *see* RIB at 146-147. But the parties do dispute a number of carve-outs and other limitations proposed by Sonos, including:

Any LEO should be tailored to the patent(s) found to be infringed. For example, if one or more Voice Patents are found to be infringed, but the Setup Patent is not found to be infringed, any limited exclusion order should be directed only to SVC Products.

Any LEO should exempt Sonos’s Redesigned Products that are adjudicated in this investigation and found to be non-infringing. *See, e.g., Certain Audio Players & Controllers*, Inv. No. 337-TA-1191, Comm’n Op. at 23 (Feb. 1, 2022).

[REDACTED]

Any LEO should include a certification provision permitting CBP to allow the importation of articles not excluded from entry by any LEO, including because they incorporate the features or functionalities of a Redesigned Product found not to infringe. *See id.* at 24.

Any LEO should contain an exemption for warranty, repair, and replacement of any infringing products sold prior to the expiration date of the presidential review period.

....

Any LEO should also exempt products that are licensed to the Asserted Patents.

RIB at 146-147; *see* CIB at 145-145; CRB at 69-70.

Sonos' first proposal is either unnecessary or inappropriate. If a patent is found not infringed, no limited exclusion order will issue against it. This is inherent in the process. *See, e.g., Wearable Electronic Devices*, Inv. No. 337-TA-1266, Notice (Dec. 22, 2022) (affirming no violation for 499 patent); *Wearable Electronic Devices*, Inv. No. 337-TA-1266, Limited Exclusion Order (Dec. 22, 2022) (issuing exclusion orders for patents other than the 499 patent). Correspondingly, if a patent is found infringed, a limited exclusion order will issue against any and all products which infringe. *Id.* The exclusion order will not "be directed only" to the products which were at issue in the investigation (*e.g.*, "directed only to SVC Products"), as Sonos would prefer.

Individual products found not to be infringed as part of the investigation, or otherwise not infringing due to a license, also need not be explicitly listed in the limited exclusion order. Addressing these circumstances is the purpose of the Commission's standard certification provision which are used to "aid U.S. Customs and Border Protection ('CBP') in enforcing Commission orders but 'do not mandate that CBP accept certification as proof that the articles in question are not covered' by the limited exclusion order." *Certain Robotic Vacuum Cleaning Devices and Components Thereof Such as Spare Parts*, Inv. No. 337-TA-1057, Comm'n Op. at 55

[REDACTED]

(Feb. 1, 2019); *see, e.g., Wearable Electronic Devices*, Inv. No. 337-TA-1266, Limited Exclusion Order at ¶ 5 (Dec. 22, 2022). As “it has been Commission practice for the past several years to include certification provisions in its exclusion orders to aid CBP” (*see Certain Road Milling Machines and Components Thereof*, Inv. No. 337-TA-1067, Comm’n Op. at 15, 15 n. 5 (Aug. 7, 2019) (citations omitted)), it is my recommendation that any issuing limited exclusion order should include the Commission’s standard certification provision. This resolves Sonos’ third and fifth proposed carve-outs. And as for “an exemption for warranty, repair, and replacement of any infringing products,” the request is noted but turns on public interest concerns which were not instituted for this stage of the investigation. *See* 87 Fed. Reg. 56701 (September 15, 2022)); RIB at 146 (“there is no reason to punish Sonos’s consumers by depriving them of the warranty service”).

B. Cease and Desist Order

Should a violation be found, Google argues a cease and desist order (“CDO”) should issue against Sonos. CIB at 146. Google contends, “Sonos does not dispute that it maintains a commercially significant domestic inventory,” and points to Sonos “having over 600,000 units of Accused Products worth over \$100 million in domestic commercial inventory as of December 31, 2022, at distribution centers located in Rancho Cucamonga, CA and Harrisburg, PA,” pursuant to a stipulation filed earlier in the investigation. *Id.* (citing JX-0081C at ¶¶ 10-11, Ex. C); CRB at 70. Google adds that, similar to the LEO, none of Sonos’ proposed carve-outs should be accepted. *Id.* at 146-147.

Complainants bear the burden on the issue of cease and desist orders. *Certain Microfluidic Devices*, Inv. No. 337-TA-1068, Comm’n Op. at 23 (Jan. 10, 2020). Such orders “are generally issued when, with respect to the imported infringing products, respondents maintain commercially

[REDACTED]

significant inventories in the United States or have significant domestic operations that could undercut the remedy provided by an exclusion order.” *Id.* at 22-23 (citations omitted). Google has shown, through stipulation, that the volume and dollar value of Sonos’ domestic inventory is commercially significant. Accordingly, it is recommended that a CDO issue against Sonos should a violation be found. Sonos opposes on the ground that Google “offers no contentions regarding Sonos’ domestic operations and how they could be used to undercut the remedy provided by an LEO.” RIB at 147. This is irrelevant in light of the commercial significance found above. Even then, the fact that the units are held in “distribution centers” demonstrates the units are meant for and capable of being distributed to consumers throughout the United States thereby harming Google. The carve-outs proposed by Sonos (*id.* (requesting listing of products found not to be infringed and warranty/donation public interest considerations)) are also rejected for the reasons previously discussed in the context of LEOs.

C. Bond

The Commission has held that “[t]he complainant bears the burden of establishing the need for a bond” during the Presidential Review period. *See Robotic Vacuums*, Inv. No. 337-TA-1057, Comm’n Op. at 68. The amount of the bond is, generally, set “to be sufficient to protect the complainant from any injury.” 19 U.S.C. § 1337(e)(1), (j3). Google argues it and Sonos are in direct competition in the smart speaker space, specifically involving the Accused Products, and notes that it and Sonos have stipulated to a 50% bond rate. CIB at 147-148 (citing JX-0633C at ¶¶ 21-23). There is no dispute from Sonos on these points. RIB at 147 (citing EDIS Doc. ID 796876). Accordingly, it is therefore recommended that a 50% bond issue in the event of a violation.

X. INITIAL DETERMINATION AND ORDER

Based on the foregoing,⁴ it is my Initial Determination that there is no violation of Section 337 of the Tariff Act of 1930, as amended, 19 U.S.C. § 1337, in the importation into the United States, the sale for importation, or the sale within the United States after importation of certain audio players and components thereof in connection with the asserted claims of U.S. Patent Nos. 9,632,748, 11,024,311, and 11,050,615.

The undersigned hereby certifies to the Commission this Initial Determination, together with the Record of the hearing in this investigation consisting of the following: the transcript of the evidentiary hearing, with appropriate corrections as may hereafter be ordered; and the exhibits accepted into evidence in this investigation.⁵

Pursuant to 19 C.F.R. § 210.42(h), this Initial Determination shall become the determination of the Commission sixty (60) days after the date of service of the Initial Determination, unless a party files a petition for review of the Initial Determination within twelve (12) business days after service of the Initial Determination pursuant to 19 C.F.R. § 210.43(a) or the Commission, pursuant to 19 C.F.R. § 210.44, orders on its own motion, a review of the Initial Determination or certain issues therein. Any issue or argument not raised in a petition for review, or response thereto, will be deemed to have been abandoned and may be disregarded by the Commission in reviewing the Initial Determination pursuant to 19 C.F.R. § 210.43(b) and (c).

⁴ The failure to discuss any matter raised by the parties or any portion of the Record herein does not indicate that said matter was not considered. Rather, any such matter(s) or portion(s) of the Record has/have been determined to be irrelevant, immaterial or meritless. Arguments made on brief which were otherwise unsupported by Record evidence or legal precedent have been accorded no weight.

⁵ The pleadings of the parties filed with the Secretary need not be certified as they are already in the Commission's possession in accordance with Commission rules.

[REDACTED]

Confidentiality Notice:

This Initial Determination is being issued as confidential, and a public version will be issued pursuant to Commission Rule 210.5(f). Within seven (7) days of the date of this Initial Determination, the parties shall jointly submit: (1) a proposed public version of this opinion with any proposed redactions bracketed in red; and (2) a written justification for any proposed redactions specifically explaining why the piece of information sought to be redacted is confidential and why disclosure of the information would be likely to cause substantial harm or likely to have the effect of impairing the Commission's ability to obtain such information as is necessary to perform its statutory functions.⁶

SO ORDERED.



Cameron Elliot
Administrative Law Judge

⁶ Under Commission Rules 210.5 and 201.6(a), confidential business information includes: information which concerns or relates to the trade secrets, processes, operations, style of works, or apparatus, or to the production, sales, shipments, purchases, transfers, identification of customers, inventories, or amount or source of any income, profits, losses, or expenditures of any person, firm, partnership, corporation, or other organization, or other information of commercial value, the disclosure of which is likely to have the effect of either impairing the Commission's ability to obtain such information as is necessary to perform its statutory functions, or causing substantial harm to the competitive position of the person, firm, partnership, corporation, or other organization from which the information was obtained, unless the Commission is required by law to disclose such information. *See* 19 C.F.R. § 201.6(a). Thus, to constitute confidential business information the disclosure of the information sought to be designated confidential must likely have the effect of either: (1) impairing the Commission's ability to obtain such information as is necessary to perform its statutory functions; or (2) causing substantial harm to the competitive position of the person, firm, partnership, corporation, or other organization from which the information was obtained.