

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

ROKU, INC.,
Petitioner,

v.

UNIVERSAL ELECTRONICS INC.,
Patent Owner.

Case No. IPR2022-01289
Patent No. 9,847,083

PETITIONER'S NOTICE OF CROSS-APPEAL

Pursuant to 35 U.S.C. §§ 141(c), 142, and 319; 37 C.F.R. §§ 90.2 and 90.3; Federal Rule of Appellate Procedure 4(a)(3); and Federal Circuit Rule 15(a)(1), Petitioner Roku, Inc. hereby provides notice that it cross-appeals to the United States Court of Appeals for the Federal Circuit from the Final Written Decision in Case No. IPR2022-01289 (Paper 28, attached as Exhibit A) entered on March 20, 2024 by the Patent Trial and Appeal Board (“the Board”), and from all orders, decisions, rulings, and opinions underlying the Final Written Decision.

In accordance with 37 C.F.R. § 90.2(a)(3)(ii), Petitioner indicates that the expected issues on cross-appeal include, but are not limited to:

- the Board’s error(s) in its determination that claims 7–11, 13–14, and 19 of U.S. Patent No. 9,847,083 were not proven unpatentable.

Pursuant to Federal Rule of Appellate Procedure 4(a)(3), this Notice of Cross-Appeal is timely, having been filed within 14 days after the date when Patent Owner filed its notice of appeal of the Final Written Decision. Paper 29 (filed May 22, 2024).

Pursuant to 35 U.S.C. § 142 and 37 C.F.R. § 90.2(a), a copy of this Notice of Cross-Appeal is being filed simultaneously with the Patent Trial and Appeal Board, the Clerk’s Office for the United States Court of Appeals for the Federal Circuit (with the required docketing fee), and the Director of the United States Patent and Trademark Office.

Respectfully submitted,
Roku, Inc.

Date: June 5, 2024

/Scott A. McKeown/

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CERTIFICATE OF FILING

I hereby certify that, pursuant to 37 C.F.R. §§ 90.2(a)(1) and 104.2(a), in addition to being filed electronically through the Board's P-TACTS system, the original version of the foregoing Notice of Cross-Appeal (including Exhibit A) is being served on the Director of the United States Patent and Trademark Office, via e-mail at the following:

Office of the General Counsel
U.S. Patent and Trademark Office
efileSO@uspto.gov

CERTIFICATE OF FILING

I hereby certify that, pursuant to 37 C.F.R. § 90.2(a)(2) and Federal Circuit Rule 15(a)(1), a true and correct copy of the foregoing Notice of Cross-Appeal (including Exhibit A) is being filed with the Clerk's Office of the United States Court of Appeals for the Federal Circuit through the federal courts' Case Management and Electronic Case Files (CM/ECF) system on this 5th day of June, 2024, along with the requisite fee which is being paid electronically using pay.gov.

CERTIFICATE OF SERVICE UNDER 37 C.F.R. § 42.6 (E)(4)

I certify that on June 5, 2024, I will cause a copy of the foregoing document, including any exhibits filed therewith, to be served via electronic mail, as previously consented to by Patent Owner, upon the following:

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EXHIBIT A

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

ROKU INC.,
Petitioner,

v.

UNIVERSAL ELECTRONICS INC.,
Patent Owner.

IPR2022-01289
Patent 9,847,083 B2

Before AMBER L. HAGY, SHARON FENICK, and RUSSELL E. CASS,
Administrative Patent Judges.

CASS, *Administrative Patent Judge.*

JUDGMENT
Final Written Decision
Determining Some Challenged Claims Unpatentable
35 U.S.C. § 318(a)

I. INTRODUCTION

A. *Background*

In this *inter partes* review, Roku Inc. (“Petitioner”) challenges the patentability of claims 1–19 (the “challenged claims”) of U.S. Patent No. 9,847,083 B2 (Ex. 1001, “the ’083 patent”), which is assigned to Universal Electronics Inc. (“Patent Owner”).

We have jurisdiction under 35 U.S.C. § 6. This Final Written Decision, issued pursuant to 35 U.S.C. § 318(a), addresses issues and arguments raised during the trial in this *inter partes* review. For the reasons discussed below, Petitioner has proven by a preponderance of the evidence that claims 1–6, 12, and 15–18 are unpatentable. Petitioner has not proven by a preponderance of the evidence that any of claims 7–11, 13, 14, or 19 are unpatentable.

B. *Procedural History*

In this proceeding, Petitioner relies upon the following references:

Aginsky, US 8,995,981 B1, issued March 31, 2015
(Ex. 1004, “Aginsky”);

Stammler, US 6,839,670 B1, issued January 4, 2005
(Ex. 1005, “Stammler”);

Hanson, US 2012/0271639 A1, published October 25,
2012 (Ex. 1006, “Hanson”); and

Dresti, US 2003/0103088 A1, published June 5, 2003
(Ex. 1007, “Dresti”).

Petition (Paper 2, “Pet.”) ii, 5–6. Petitioner submits the Declaration of Bruce McNair (Ex. 1003), as well as declarations from Gordon MacPherson (Ex. 1039), Nathaniel E. Frank-White (Ex. 1040), and Gretchen Hoffman (Ex. 1041) addressing issues relating to the public availability of various

references. Patent Owner submits the Declaration of Dr. Michael S. Scordilis (Ex. 2001).

Petitioner challenges the patentability of claims 1–19 of the '083 patent based on the following grounds:

Claim(s) Challenged	35 U.S.C. §	Reference(s)/Basis
1–6, 8–10, 12–18	103	Aginsky, Stammmler
7, 11, 19	103	Aginsky, Stammmler, Dresti
1–6, 8–10, 12–18	103	Aginsky, Hanson
7, 11, 19	103	Aginsky, Hanson, Dresti

Pet. 6.

Prior to institution, Patent Owner filed a Preliminary Response (Paper 9). During the trial, Patent Owner filed a Response (Paper 15, “PO Resp.”), Petitioner filed a Reply (Paper 18, “Pet. Reply”), and Patent Owner filed a Sur-reply (Paper 22, “PO Sur-reply”).

An oral hearing was held on January 17, 2024, a transcript of which appears in the record. Paper 27 (“Tr.”).

C. Real Parties in Interest

Petitioner states that the real party in interest is Roku, Inc. Pet. 3. Patent Owner states that Universal Electronics, Inc., is the real party in interest. Paper 4, 1.

D. Related Proceedings

Petitioner states that it is not aware of any related matters. Pet. 3. Patent Owner lists numerous district court litigations and *inter partes* review proceedings, but does not identify any of them as involving the '083 patent. Paper 4, 1–3.

E. The '083 Patent (Ex. 1001)

The '083 patent “generally relates to a remote control systems and, more particularly, to a system and method for setting up and configuring a controlling device such as a universal remote control to command functions of one or more types of remotely controllable appliances of one or more manufacturers.” Ex. 1001, 1:7–12. Examples of appliances include “televisions, AV receivers, cable or satellite set top boxes (STBs), DVD players, digital video recorders (DVRs), thermostats, [and] game consoles.” *Id.* at 1:12–15. According to the '083 patent, “the process of setting up and configuring a controlling device such as a universal remote control [is] demanding, exacting, and generally frustrating for many users” because, for example, “user manuals or other documents containing setup codes and entry instructions may be lost or misplaced, or may be superseded as brand and/or model names evolve or controllable functions are added,” and “a personal computer and/or Internet access may not be readily available at the location of the appliances to be controlled.” *Id.* at 2:14–23. “Accordingly,” the '083 patent states, “a need exists for a simplified and more user friendly system and method for conveniently setting up and configuring a controlling device.” *Id.* at 2:23–25.

To address this perceived need, the '083 patent describes “a controlling device . . . provisioned with means to receive voice input from a user, e.g., a microphone, such that when placed in a setup mode the controlling device may solicit spoken appliance descriptive information, for example brand and model number, to be processed by a speech recognition system in order to identify the appliance to be controlled and the command data to which it is responsive.” Ex. 1001, 2:34–41. The speech recognition capability “may be extended to allow a user to further refine the controlling

device configuration,” for example by “assigning extended functionality to certain keys,” “verbally accessing infrequently used functions,” or “defining activities.” *Id.* at 2:47–51.

The ’083 patent also discloses an appliance command-code database for use with the controlling device that may include brand records, each of which points to a group of model records specific to each brand, and each model record in turn pointing to a codeset record including data applicable to that specific brand and model of appliance. Ex. 1001, 9:55–62. The ’083 patent shows codeset records to be used with the controlling device in Figure 7b, reproduced below.

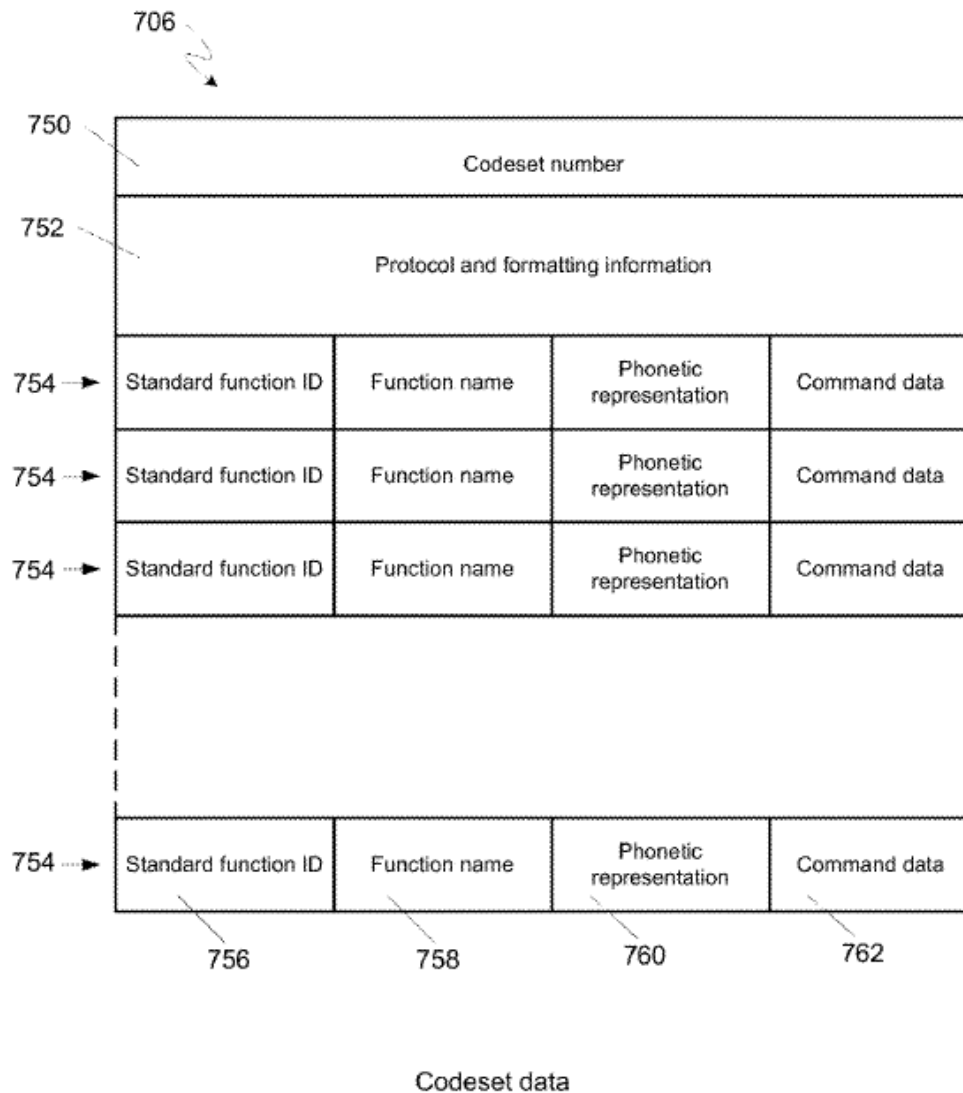


Figure 7b

Figure 7b of the '083 patent discloses codeset records to be used with the controlling device. Ex. 1001, Fig. 7b, 10:47–48.

As shown in Figure 7b, “each code set record 706 may comprise a unique codeset identity number” and “a block of protocol and formatting information 752 which may describe the physical protocol requirements for transmitting the command data elements which comprise this codeset.” Ex. 1001, 10:47–51. These physical protocol requirements may include

“items such as carrier frequency, bit encoding, data frame size and structure, appliance address, parity or CRC requirements.” *Id.* at 10:52–54.

“Following block 752 may be a series of individual command function entries 754,” each of which may include “standard function ID 756,” “function name 758,” “phonetic representation 760,” and “command data 762.” *Id.* at 10:54–65. Standard function ID 756 “may be a normalized tag indicative of the function or operation invoked by this command (i.e. so that within a universal remote control system the same functionality may be mapped to a key regardless of any variations in appliance manufacturer-specific nomenclature.” *Id.* at 10:56–61. Function name 758 “correspond[s] to the name by which that function is commonly referenced by th[e] appliance’s manufacturer” and is stored “together with its phonetic representation 760.” *Id.* at 10:62–65. Command data 762, “when transmitted using the protocol specifications of block 752, will command the appliance to perform the indicated action.” *Id.* at 10:65–67.

The ’083 patent also explains that “all or part of the information contained in the identified codeset record may be transferred to the controlling device being configured.” Ex. 1001, 11:4–7. Additionally, “in order to identify user-requested extended command functions,” a speech recognition means may search “the phonetic representations . . . corresponding to the command function entries of the codeset number corresponding to the currently configured appliance” and return “the matching command data” to “the requesting controlling device.” *Id.* at 11:13–20.

F. Illustrative Claims

Of challenged claims 1–19, claims 1 and 12 are independent. For purposes of the issues raised, claim 1 is illustrative and is reproduced below.

1. [pre] A method for configuring a controlling device to command functional operations of a target appliance, the method comprising:

- [a.1] causing a codeset record to be provisioned to the controlling device for use in commanding functional operations of the target appliance,
- [a.2] the provisioned codeset record comprising protocol and formatting information
- [a.3] and a plurality of individual command function entries
- [a.4] wherein each of the plurality of individual function entries within the codeset record comprises command data,
- [a.5] a standard function identifier,
- [a.6] data which comprises a phonetic representation of a function name corresponding to the standard function identifier,
- [a.7] and a plurality of data each of which comprises a phonetic representation of a unique one of a plurality of synonyms of the function name;
- [b.1] causing less than all of the individual command function entries from within the provisioned codeset record to each be matched to one or more of a plurality of user input elements of the controlling device
- [b.2] whereupon a subsequent activation of a one of the plurality of user input elements will cause the controlling device to transmit a command communication by using the protocol and formatting information and the command data of a one or more of the plurality of individual command function entries from within the provisioned codeset record that was mapped to the one of the plurality of user input element activated; and

[c] causing the controlling device to transmit a command communication by using the protocol and formatting information and the command data of a one of the one or more of the plurality of individual command function entries from within the provisioned codeset record having a phonetic representation of the function name or a synonym of the function name which corresponds to voice data provided to a speech recognition engine.

Ex. 1001, 11:54–12:22 (indents and bracketed paragraph identifiers added).

II. DISCUSSION

A. *Claim Construction*

A claim “shall be construed using the same claim construction standard that would be used to construe the claim in a civil action under 35 U.S.C. § 282(b).” 37 C.F.R. § 42.100(b). The parties dispute the construction of the term “protocol and formatting information” in claims 1 and 12. PO Resp. 12–21; Pet. Reply 2–14; PO Sur-reply 1–7. Specifically, the parties dispute: (1) whether the “protocol and formatting information” is separate and distinct from the claimed “plurality of individual command function entries” and the data contained therein; and (2) what the proper construction is of “protocol and formatting information.”¹ *Id.*

¹ Patent Owner also asserts that “the Board should construe the Challenged Claims to require that the claimed ‘protocol and formatting information’ be included in the claimed ‘provisioned code record’ itself.” PO Resp. 17–18. Petitioner, however, does not appear to dispute this assertion, which is consistent with the claim language reciting “the provisioned codeset record comprising protocol and formatting information.” Pet. Reply 2–14; Ex. 1001, 11:59–60, 13:4–5.

1. *Whether the “Protocol and Formatting Information” Is Separate and Distinct From the Claimed “Plurality of Individual Command Function Entries” and the Data Contained Therein.*

Patent Owner argues that “the Board should construe the Challenged Claims to clarify that the claimed ‘protocol and formatting information’ is separate and distinct from the claimed ‘plurality of individual command function entries’ and the data contained in the command function entries.” PO Resp. 12–13 (citing Ex. 2001 ¶ 50). Patent Owner asserts that this construction flows from the language of claim 1 reciting “the provisioned codeset record comprising protocol and formatting information and a plurality of individual command function entries” (and similar language in claim 12), because that language recites the “protocol and formatting information” and the “plurality of individual command function entries” as “separate and distinct elements” of the codeset record. *Id.* at 13 (citing Ex. 1001, claim 1; Ex. 2001 ¶ 52). Patent Owner also points to the language in the claims stating that each of the “plurality of individual command function entries” comprises data such as “command data” and “a standard function identifier,” without including “protocol and formatting information” as part of the individual command function entries. *Id.* at 13–14 (citing Ex. 2001 ¶ 53).

Patent Owner further points to the claim language reciting that the controlling device transmits a command communication using the “protocol and formatting information” as well as “command data” from one or more of the “plurality of individual command function entries.” PO Resp. 14 (citing Ex. 1001, claims 1, 12). According to Patent Owner, this claim language specifies that “the same ‘protocol and formatting information’ is used to transmit a command communication regardless of which individual

command function entries and their corresponding command data are used therewith.” *Id.* (citing Ex. 1001, claims 1, 12; Ex. 2001 ¶ 54). Patent Owner argues that this further confirms that the “protocol and formatting information” is separate and distinct from the individual command function entries and the data contained therein. *Id.*

Turning to the ’083 patent Specification, Patent Owner argues that Figure 7b supports its argument by showing protocol and formatting information 752 as being distinct from individual command function entries 754. PO Resp. 15–16 (citing Ex. 1001, 10:47–51, 10:54–55, Fig. 7b; Ex. 2001 ¶ 57). According to Patent Owner, the Specification never discloses that the “protocol and formatting information” can be part of the “plurality of individual command function entries.” *Id.* at 16 (citing Ex. 1001, 10:47–11:3, Fig. 7b; Ex. 2001 ¶ 58). Patent Owner also argues that, during prosecution, the applicant added the language, stating “the provisioned codeset record comprising protocol and formatting information and a series of individual command function entries” to overcome a prior art obviousness rejection, and argued that the prior art “does not disclose providing *individual command function entries* within a codeset record, i.e., a data structure that also provides protocol and formatting information. . . .” *Id.* at 16–17 (citing Ex. 1002, 165–173, 255; Ex. 2001 ¶ 60). Finally, Patent Owner contends that Mr. McNair confirmed during his deposition that the claimed “protocol and formatting information” and “plurality of individual command entries” are separate and distinct. *Id.* (citing Ex. 2002, 15:1–8, 15:17–20).

Petitioner responds that the fact that the claims separately recite “protocol and formatting information” and “a plurality of individual

command function entries” does not convey “separate and distinct” storage structures. Pet. Reply 8–9. Petitioner also asserts that “[c]laims 1 and 12 use the open transition ‘comprises’ before enumerating required data types, meaning the individual command function entries may include other information, including protocol and formatting information.” *Id.* at 9. Additionally, according to Petitioner, the limitation “causing the controlling device to transmit a command communication by using the protocol and formatting information and the command data” also does not “impl[y] separate and distinct structural storage of the underlying content.” *Id.* at 10.

Next, Petitioner argues that Patent Owner is improperly attempting to read limitations from Figure 7b of the ’083 patent into claims 1 and 12. Pet. Reply 10–11. Petitioner acknowledges that Figure 7b “shows protocol and formatting information 752 and individual command function entries 754 as separate blocks,” but argues that Patent Owner “identifies no intention or guidance in the specification limiting claims that do not recite storage structure to somehow require separate and distinct storage of protocol and formatting information.” *Id.* Instead, according to Petitioner, “the ’083 specification provides that blocks of block diagram 7b can be combined” by explaining that “one or more of the described functions and/or features may be integrated in a single physical device and/or a software module.” *Id.* at 11 (citing Ex. 1001, 11:30–34). Petitioner further argues that Figure 7b shows the individual function entries 754 as “a specific sequence of sub-blocks (standard function ID, function name, phonetic representation, and command data),” but neither Patent Owner or its expert suggests incorporating this sequence into claims 1 and 12. *Id.* at 11, 12–14 (citing Ex. 1043, 17:25–18:9, 18:19–19:4; Ex. 1001, 11:30–34).

Finally, Petitioner argues that Patent Owner's "separate and distinct" theory "finds no support in the prosecution history." Pet. Reply 11–12. According to Petitioner, after the "protocol and formatting" limitation was added by amendment, the Examiner relied on US 2009/0254778 to Huang ("Huang") to teach coded IR, and Patent Owner never disputed that this disclosure of coded IR signals constitutes protocol and formatting information. *Id.* (citing Ex. 1002, 164–173, 185, 217–225, 253–256, 265–268, 277–284, 363–367; Ex. 1027 ¶ 152). Petitioner further argues that "[t]he case was subsequently allowed based on voice command mapping arguments unrelated to the 'protocol and formatting' limitation." *Id.* at 12. Thus, according to Petitioner, "the prosecution history nowhere supports [Patent Owner's] argument that protocol and formatting information must be read to include separate and distinct storage structure." *Id.*

Patent Owner responds that Petitioner's reliance on the "comprising" language in the claims is "without merit" because "the term 'comprising' creates a presumption 'that the claim does not exclude additional, *unrecited* elements,'" but "[t]he term 'protocol and formatting information' *is recited*." PO Sur-reply 2–3. Thus, according to Patent Owner, although "the 'plurality of individual command function entries' can include additional *unrecited* information, they cannot include the recited 'protocol and formatting information,' which is separate and distinct from the 'plurality of command function entries.'" *Id.* at 3. With respect to Figure 7b, Patent Owner asserts that the specification never "state[s] that the blocks of diagram 7b—which illustrate the content of a codeset record—can be combined," but rather "describes protocol and formatting information as

only being separate and distinct from command function entries.” *Id.* (citing Ex. 2001 ¶¶ 55–57; Ex. 1001, 10:47–55, Fig. 7b).

Based on the full trial record, we do not agree with Patent Owner that the claim language should be construed by adding the words “separate and distinct” to the construction. The first portion of the relevant language from claim 1 recites

the provisioned codeset record comprising protocol and formatting information and a plurality of individual command function entries wherein each of the plurality of individual function entries within the codeset record comprises command data, a standard function identifier, data which comprises a phonetic representation of a function name corresponding [to] the standard function identifier, and a plurality of data each of which comprises a phonetic representation of a unique one of a plurality of synonyms of the function name.

Ex. 1001, 11:59–12:2. This language requires that the codeset record comprises: (1) “protocol and formatting information” and (2) a plurality of individual function entries within the codeset record comprising particular data and identifiers, but does not include any language stating that these items must be “separate and distinct.” We also agree with Petitioner that this claim language does not include any requirements on where the “protocol and formatting information” is stored in the codeset record, and does not limit the information that can be stored in the “plurality of individual function entries.” As long as the codeset record includes both “protocol and formatting information” and “the plurality of individual function entries,” we see no limitation on where or how the protocol and formatting information is stored as long as it is stored somewhere in the codeset record. Thus, we find that claims 1 and 12 encompass storing the “protocol and formatting information” separately from the “individual

function entries,” as well as storing some or all of the “protocol and formatting information” along with the other data recited in the “individual function entries.”

The second portion of the relevant language from claim 1 recites whereupon a subsequent activation of a one of the plurality of user input elements will cause the controlling device to transmit a command communication by using the protocol and formatting information and the command data of a one or more of the plurality of individual command function entries from within the provisioned codeset record that was mapped to the one of the plurality of user input element activated.

Ex. 1001, 12:6–14. This language requires that the transmission of a command communication uses the “protocol and formatting information” and the command data of one of the individual command function entries, but does not require that those elements be “separate and distinct.” Nor does it place any requirements on where the “protocol and formatting information” is stored in the codeset record, or prevent some or all of the “protocol and formatting information” from being stored in a common memory area as the “plurality of individual function entries.”

We also do not find that the ’083 patent Specification supports reading “separate and distinct” into the claim language or requiring any particular storage separation between the “protocol and formatting information” and the individual command function entries. It is true that Figure 7b, as Patent Owner points out, includes different blocks for protocol and formatting information 752 and individual command function entries 754. Ex. 1001, Fig. 7b; PO Resp. 14–16. However, Patent Owner does not point to anything in the ’083 patent Specification that indicates that this particular arrangement is essential to the invention. PO Resp. 14–16. Indeed, the Specification describes Figures 7a and 7b as illustrating “the

structure of a brand name, model number, and command code database suitable for use in conjunction with the methods of FIGS. 4 and 6,” which are described as “*exemplary* method[s].” Ex. 1001, 3:5–16 (emphasis added); *see id.* at 9:55–56 (referring to Fig. 7a as showing “the structure of an exemplary appliance command code database”), 10:47–67 (stating that the codeset record “may comprise” the information shown in Figure 7b). Moreover, the Specification teaches that the specific arrangement of functions and features can be modified, explaining that “one or more of the described functions and/or features may be integrated in a single physical device and/or a software module” or “separate physical devices and software modules.” *Id.* at 11:29–36.

We also do not agree with Patent Owner’s arguments based on the prosecution history. Patent Owner relies primarily on the applicant’s arguments on page 255 of the prosecution history, which states as follows:

Considering now Comerford, it is respectfully submitted that Comerford discloses a system in which a data structure, namely a “vocabulary data structure,” stores a set of strings and a system in which the list of strings stored in the “vocabulary data structure” is searched by successively comparing a “spoken command” with the strings stored within the “vocabulary data structure.” When a match is found between the “spoken command” and a string stored in the “vocabulary data structure,” the system of Comerford then uses the index of the matched string within the “vocabulary data structure,” i.e., its position in the array, *to find a corresponding command and data element in a command string and data string array, respectively.* (Col. 16, lines 16-43).

From the foregoing it will be appreciated that Comerford does not disclose providing *individual command function entries* within a codeset record, i.e., a data structure that also provides protocol and formatting information as well as command data as claimed, with a phonetic representation of a unique one of a

plurality of function name synonyms *by which each of the one or more of the series of individual command function entries is to be referenced*. Rather, Comerford discloses the use of a general and all encompassing “vocabulary data structure,” which, as a result, requires the further use of the index position of a matched word within the “vocabulary data structure” to locate a correspond command and data element in a command string and data string array, respectively. As will be appreciated, the extra processing that is required by the Comerford described system is eliminated by the claimed invention because within the claimed invention *the individual command function entries within the codeset record* are themselves provided with the phonetic representations of the function synonyms.

Because Comerford does not disclose, teach, or suggest the claimed element of *individual command function entries* within a codeset record having a phonetic representation of a unique one of a plurality of function name synonyms by which each of the one or more of the series of individual command function entries is to be referenced (with Comerford, in fact, disclosing a completely different system) and because it has been acknowledged that this claimed element is also missing from Huang and Huang ’193, it is respectfully submitted that the combination of Huang, Huang ’193, and Comerford cannot be said to present a *prima facie* case of obviousness, e.g., it cannot be said that all of the claimed elements were known in the art for combination thereof. For at least this reason, it is respectfully submitted that the rejection of the claims under 35 U.S.C. § 103 based upon the combination of Huang, Huang ’193, and Comerford must be withdrawn.

Ex. 1002, 255–256 (emphases in original). Based on these arguments, the applicant was distinguishing Comerford on the basis that Comerford discloses “the use of a general and all encompassing ‘vocabulary data structure’” rather than “individual command function entries within a codeset record.” *Id.* at 255. The applicant did not distinguish Comerford on the basis that it did not disclose “protocol and formatting information”

separate from the “individual command function entries.” *Id.* at 255–256. Additionally, we agree with Petitioner that, after the “protocol and formatting” limitation was added by amendment, the Examiner relied on Huang to teach coded IR, and the applicant never disputed that this disclosure of coded IR signals constitutes protocol and formatting information. Pet. 11–12; Ex. 1002, 164–173, 185, 217–225, 253–256, 265–268, 277–284, 363–367; Ex. 1027 ¶ 152. We also agree with Petitioner that the application was ultimately allowed based on voice command mapping arguments unrelated to the “protocol and formatting” limitation. Pet. Reply 12; Ex. 1002, 425–427.

Finally, we do not agree that Mr. McNair’s deposition testimony supports Patent Owner’s position. Although Mr. McNair testified that the claimed “protocol and formatting information” and the “plurality of individual command entries” are “separately recit[ed]” and “appear to be distinct,” he did not suggest that they had to be stored separately or that some or all of the “protocol and formatting information” could not be stored with the individual command function entries. Ex. 2002, 15:1–8, 15:17–20. And, in any event, Mr. McNair’s testimony is extrinsic evidence, which does not change the meaning of the claim that flows from the intrinsic evidence.

For the foregoing reasons, we decline to read the words “separate and distinct” into the claim, and we do not construe the claim to require “protocol and formatting information” be stored separately from the “individual command function entries.”²

² Additionally, as discussed in Section II.D.4(c) below, we find that this limitation is taught by the combination of Aginsky and Stammer even if we were to adopt Patent Owner’s argument that the “protocol and formatting

2. *Construction of “Protocol and Formatting Information”*

Patent Owner argues that we should construe the term “protocol and formatting information” as “the set of procedures needed to transmit commands from one device to another in a way that the receiving device can make sense of and use the commands.” PO Resp. 19 (citing Ex. 2001 ¶ 66). Patent Owner relies on the testimony of Mr. McNair for this construction. *Id.* at 19–20 (citing Ex. 2002, 32:19–33:3, 33:22–34:9, 36:5–21). Patent Owner also asserts that its construction is consistent with the claim language, which “specif[ies] that the claimed protocol and formatting information is information that is used, along with command data, to transmit a command communication from the controlling device.” *Id.* at 20 (citing Ex. 1001, claims 1, 12). Patent Owner further contends that its construction is consistent with the ’083 patent Specification, which “teaches that protocol and formatting information describes the physical protocol requirements for transmitting the command data elements (*e.g.*, command codes or code sequences) in the codeset record” and that “the claimed protocol and formatting information may include ‘items such as carrier frequency, bit encoding, data frame size and structure, appliance address, parity or CRC requirements, etc.’” *Id.* at 20–21 (citing Ex. 1001, 10:47–54).

Petitioner responds that Patent Owner’s construction diverges from the ordinary and customary meaning of “protocol and formatting information” and “is derived exclusively from Petitioner’s expert’s deposition statements.” Pet. Reply 3–4 (emphasis omitted) (citing PO Resp. 19–21). Petitioner also contends “Petitioner’s expert, Mr. McNair, was not

information” must be “separate and distinct” from the individual command function entries.

asked to perform claim construction and did not testify on claim construction” and was speaking “technically” and “in the abstract, not necessarily in the context of this patent.” *Id.* at 4 (citing Ex. 2002, 34:5–20). Petitioner further argues that the examples of “protocol and formatting information” in the ’083 patent Specification are not limiting because they state that such information “may” describe the physical protocol requirements for transmitting the command data elements, and the remaining examples are introduced with the language “for example.” *Id.* at 5 (citing Ex. 1001, 10:47–54). Additionally, Petitioner contends that there is no rational basis “to replace broadly recited ‘information’ with the narrowed ‘set of procedures.’” *Id.*

At the hearing, Petitioner’s counsel clarified that it takes issue with Patent Owner’s use of the term “set of procedures” in its construction, and the requirement that the information can “make sense of and use the commands.” Tr. 14:20–17:14. Petitioner’s counsel also agreed that “protocol and formatting information would be information that the system would use to make sense of and receive the signal that’s coming in.” *Id.* at 17:7–10.

Based on the intrinsic record, we see no basis to replace the term “information” in “protocol and formatting information” with “a set of procedures.” We also see no basis to require that “protocol and formatting information” be used by the receiving device to “make sense of and use the **commands**,” rather than simply being used to make sense of the signal received. Additionally, we are not persuaded by the testimony of Mr. McNair, which is extrinsic evidence, particularly because he did not purport to have performed a claim construction analysis, but rather he

explained that he could only speak “technically” and “in the abstract, not necessarily in the context of [the ’083] patent.” Ex. 2002, 34:5, 34:19–20. Consequently, we construe “protocol and formatting information” to mean “information needed to transmit a signal from one device to another in a way that the receiving device can make sense of and use the signal.”

3. *Other Terms*

During the trial, neither party presented any other claim terms for construction. Pet. 20; PO Resp. 12–21. Based on the full trial record, we determine that it is not necessary to provide an express interpretation of any other claim terms for purposes of this Decision. *See Realtime Data, LLC v. Iancu*, 912 F.3d 1368, 1374 (Fed. Cir. 2019) (“The Board is required to construe ‘only those terms . . . that are in controversy, and only to the extent necessary to resolve the controversy.’”) (quoting *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999)).

B. *Principles of Law*

A claim is unpatentable under 35 U.S.C. § 103 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.” *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations, including (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of skill in the art; and (4) where in evidence, objective evidence

of non-obviousness.³ *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966). When evaluating a combination of teachings, we must also “determine whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue.” *KSR*, 550 U.S. at 418 (citing *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006)). Whether a combination of prior art elements would have produced a predictable result weighs in the ultimate determination of obviousness. *Id.* at 416–417.

In an *inter partes* review, the petitioner must show with particularity why each challenged claim is unpatentable. *Harmonic, Inc. v. Avid Technology, Inc.*, 815 F.3d 1356, 1363 (Fed. Cir. 2016); 37 C.F.R. § 42.104(b) (2020). The burden of persuasion never shifts to Patent Owner. *Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015).

We analyze the challenges presented in the Petition in accordance with the above-stated principles.

C. Level of Ordinary Skill in the Art

Petitioner contends that a person of ordinary skill in the art at the time of the alleged invention would have had “a bachelor’s degree in computer science, in electrical engineering, or a related field, and approximately three years of experience or equivalent study in voice-controlled devices in universal remote controlled systems.” Pet. 19. Petitioner further states that “[a]dditional graduate education could substitute for professional experience, or significant experience in the field could substitute for formal education.” *Id.* (citing Ex. 1003 ¶¶ 24–30). Patent Owner states that “[f]or

³ Patent Owner has not presented objective evidence of non-obviousness.

the purposes of this proceeding only,” it “adopts Petitioner’s proposed level of ordinary skill in the art.” PO Resp. 8.

For purposes of this Decision, we adopt the assessment of the level of ordinary skill in the art proposed by Petitioner and adopted by Patent Owner, which is consistent with the ’083 patent and the prior art.

D. Ground 1:⁴ Asserted Obviousness of Claims 1–6, 8–10, and 12–18 Based on Aginsky in view of Stammler

Petitioner contends that claims 1–6, 8–10, and 12–18 would have been obvious over Aginsky in view of Stammler. Pet. 20–60; Pet. Reply 14–30. Patent Owner disagrees, arguing that Petitioner has failed to establish that these claims would have been obvious based on Aginsky and Stammler. PO Resp. 21–46; PO Sur-reply 8–28.

1. Overview of Aginsky (Ex. 1004)

Aginsky is directed to systems and methods for configuring a remote control device. Ex. 1004, codes (54), (57). More specifically, “a controllable device (controlled device) is responsible for specifying functions available for control by a remote device (controlling device), while the remote device is responsible for creating a graphical representation and applying visual effects that will be presented to the user at the remote device.” *Id.* at 2:18–24. To carry out these functions, the controllable device transfers to the remote device “a data structure identifying various functions that can be controlled by [the] remote device, together with the identity of the signal type that will achieve the desired operation.” *Id.* at

⁴ Here, and elsewhere in the Decision, the identification of the grounds using designations such as “Ground 1” and “Ground 2” refers to the designation of the grounds as presented in the Petition.

2:31–36. Upon receiving input, the remote device can allow the user “to select how controls of the various functions are to be configured and presented to” the user. *Id.* at 2:36–40.

An overview of Aginsky’s system is shown in Figure 1, reproduced below:

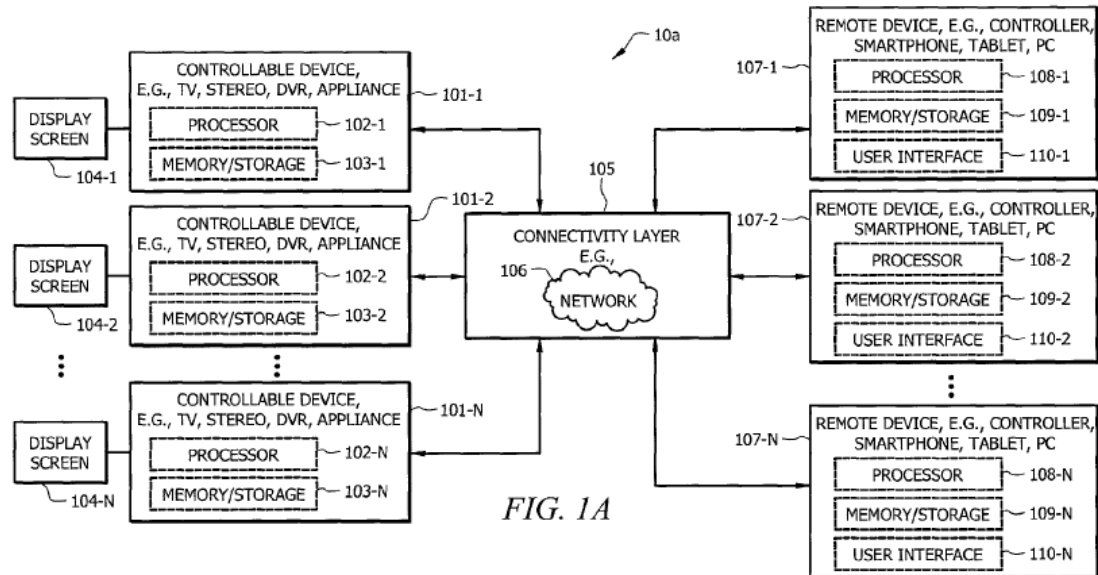


Figure 1A shows an embodiment of Aginsky’s system.

Ex. 1004, 3:64–65, Fig. 1A.

As shown in Figure 1A, system 10a includes one or more controllable devices 101-1 to 101-N that are capable of being paired with one or more remote devices 107-1 to 107-N via connectivity layer 105, “such that a remote device may be used to control specific operations and functions of the controllable device during a paired session.” Ex. 1004, 3:64–4:4.

Controllable devices 101-1 to 101-N may be a variety of processor controlled programmable devices including, for example, set-top boxes, cable boxes, televisions, digital video recorders, appliances, and vehicles. *Id.* at 4:12–16. Controllable devices 101-1 to 101-N include memory/storage 103-1 to 103-N (respectively), which may store “data

structures that are available for communication to one or more remote devices 107-1 to 107-N.” *Id.* at 4:65–5:1. Remote devices 107-1 to 107-N may be, for example, a smart clicker, smartphone, tablet computer, tablet computer, or other programmable processor-based device, and include user interfaces “that allow a user to control operation of a paired controllable device by various methods, including buttons (via touch screen or mechanical), voice, and motion.” *Id.* at 5:46–49, 6:2–6.

An embodiment of a portion of memory of a remote device that has been “programmed” with the data structure from two controllable devices is shown in Figure 1B, reproduced below.

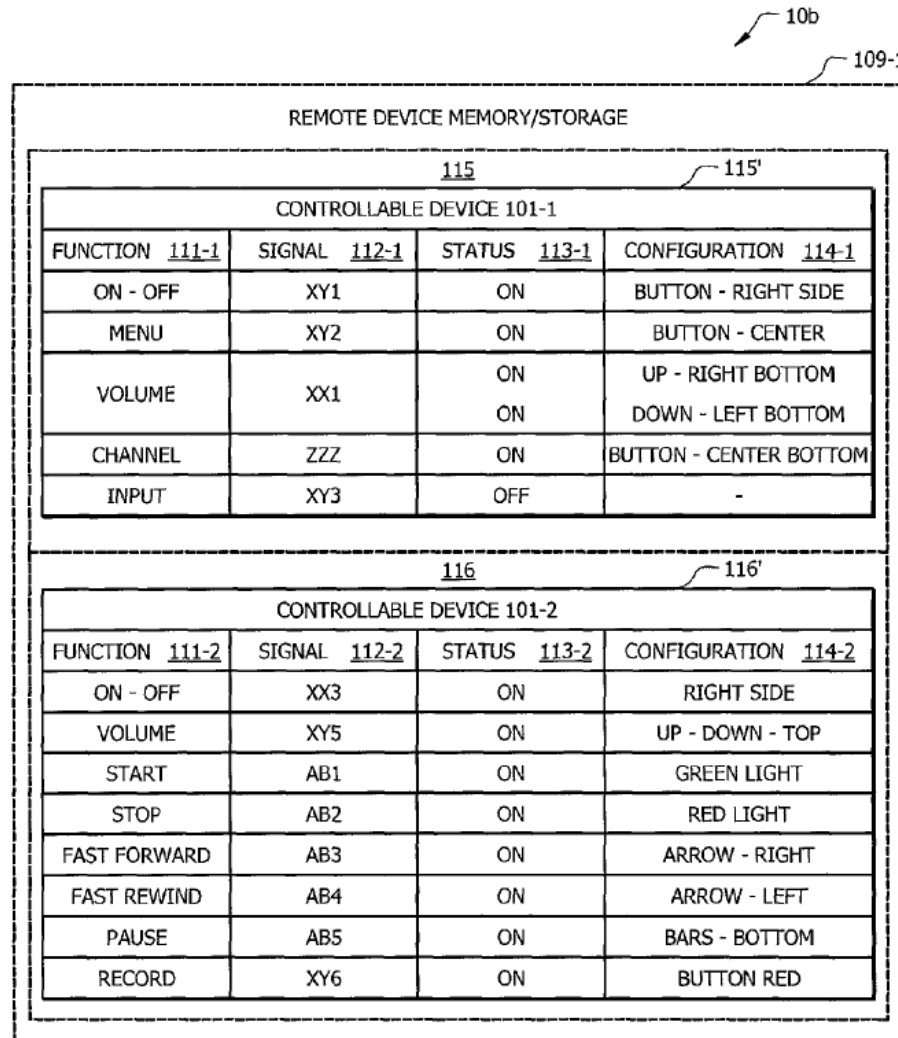


FIG. 1B

Figure 1B shows an embodiment of a portion of memory of Aginsky's remote device that has been "programmed" with data structures from two controllable devices. Ex. 1004, 3:32–35, Fig. 1B.

As shown in Figure 1B, two portions of memory/storage 109-1 of remote device 107-1 have been programmed with data structures of two controllable devices. Ex. 1004, 7:58–61. Memory portion 115 has been programmed with table 115' containing a data structure for controllable device 101-1, and memory portion 116 has been programmed with table 116' containing a data structure for controllable device 101-2. *Id.* at 7:61–63. When a remote device controls multiple controllable devices, a user will

typically be presented with an option, via a user interface “to select (e.g., by touch, voice, and/or motion) the controllable device to be controlled.” *Id.* at 8:8–12.

As further shown in Figure 1B, “FUNCTION columns 111-1 and 111-2 and SIGNAL columns 112-1 and 112-2 contain the data structures delivered from their respective controllable devices 101-1 and 101-2.” Ex. 1004, 8:21–24. The data structure in table 115’ “identifies a plurality of exemplary functions or commands (e.g., on-off, menu, volume, channel, input) associated with a plurality of exemplary command signals (e.g., XY1, XY2, XX1, ZZZ, XY3) that[,] when sent from remote device 107-1 to controllable device 101-1,” carry out the function or command. *Id.* at 8:24–30. Similarly, the data structure in table 116’ identifies exemplary functions or commands that, when sent from remote device 107-2 to controllable device 101-2, carry out the function or command. *Id.* at 8:30–37. For example, a user may enter a command to turn a TV on by pressing a button on remote device 107-1, which will be converted to command signal XY1 and sent to the TV (controllable device 101-1), causing the TV to turn on. *Id.* at 8:38–45.

Command signals “can be any type of signal required for control purposes,” including “a frequency set or a coded IR signal generated in the well-known manner by, for example, remote device 107-1.” Ex. 1004, 8:63–9:1. “Alternatively, the data structure can be a new or proprietary structure known only to a specific controllable device or to a family of controllable devices,” such as “a Bluetooth signal.” *Id.* at 9:3–7. The “notation used in SIGNAL columns 112-1 and 112-2 denote the type of signal as well as the code or code sequence of the signal.” *Id.* at 9:8–10.

Additionally, “[a]lthough CONFIGURATION columns 114-1 and 114-2 shown in FIG. 1B assume buttons, bars and arrows” that “are physically pushed or touched by the user,” “[a]ny type of input from the user can be utilized,” including “voice commands” for performing “one or more of the functions performed by the remote device.” *Id.* at 9:56–65.

2. *Overview of Stammer (Ex. 1005)*

Stammer is directed to a “[p]rocess for automatic control of one or more devices by voice commands or by real-time voice dialog.” Ex. 1005, code (54). More specifically, Stammer discloses a speech dialog system characterized by “fixed syntax structure and a fixed command structure as well as by a combination of fixed vocabulary” and “freely definable vocabulary,” which “is a precondition for a high recognition capacity with an extensive vocabulary.” *Id.* at 5:65–6:5. This “extensive vocabulary is used to increase the user friendliness by using synonymous words or different variations in pronunciation.” *Id.* at 6:8–10. Stammer further discloses that “[p]redetermined synonymous words can be used,” and “[t]he same function can be realized through commands with a different number of words.” *Id.* at 16:17–20.

Stammer explains that, due to its “larger vocabulary,” the system is based on “phonetic word subunits” such as phonemes, diphones (double phonemes), or phoneme transitions, and “[a] word to be recognized” is “represented by the linking of the respective models for word subunits.” *Id.* at 8:53–59. Additionally, “owing to [its] vocabulary of, for example, up to several hundred words, a plurality of functions for each language can be operated.” *Id.* at 6:33–35.

3. *Motivation to Combine Aginsky and Stammmler*

Petitioner argues that Aginsky broadly discloses having a controllable device transfer to a remote device a data structure identifying various functions that can be controlled by the remote device, and that the data structure can include information such as the names of functions (commands) and signals related to the transmission of each function, among others. Pet. 31. Petitioner also asserts that Aginsky discloses that “voice commands . . . can be used for one or more of the functions performed by the remote device” using an interface “that allow[s] a user to control operations of a paired controllable device by various methods, including . . . voice.” *Id.* at 31–32 (citing Ex. 1004, 6:2–6, 8:8–12, 9:60–65). However, according to Petitioner, “Aginsky left it to a [person of ordinary skill in the art] to implement a data structure to execute its disclosed voice-control, and in the same field of endeavor, Stammmler specifically teaches data structure inputs that would allow Aginsky’s system and methods to advantageously implement voice control.” *Id.* at 32 (citing Ex. 1003 ¶ 114).

Petitioner argues that “Stammmler teaches that it is advantageous for a voice command system to have a large vocabulary” and, to that end, “teaches a cost-effective system which uses ‘phonetic word subunits,’ such as phonemes, to understand an ‘extensive vocabulary of admissible commands.’” Pet. 32 (citing Ex. 1005, 2:56–67, 5:65–6:10, 8:53–57). “As such,” Petitioner asserts, a person of ordinary skill “would have been motivated to modify Aginsky with the teachings of Stammmler to include phonetic representations and synonyms as elements of Aginsky’s dataset to facilitate an extensive range of voice commands and map them to the correct remote command functionality.” *Id.* (citing Ex. 1003 ¶ 115). According to Petitioner, “[t]his is because Stammmler teaches that prior speech dialog

systems suffered from limited vocabularies resulting in higher user dissatisfaction[,] and modifying Aginsky with Stammmler would better improve upon Aginsky's goal of providing a more flexible and customizable universal remote programming method." *Id.* "In fact," Petitioner contends, "the advantages of voice control were well-known," and a person of ordinary skill "would have understood that voice control was becoming increasingly expected in consumer devices to replace the known drawbacks suffered by awkward, user-unfriendly interfaces." *Id.* at 32–33 (citing Ex. 1003 ¶ 115).

Petitioner further argues that "[m]odifying Aginsky's data structure with voice command function in mind with the teachings of Stammmler would have been well within the ability of a [person of ordinary skill in the art] given Stammmler's guidance, and Aginsky's open data structure design that specifically contemplates a 'data structure [with] any desired function, signal, and/or other structure.'" *Id.* at 33 (citing Ex. 1004, 13:34–35). "[I]ndeed," Petitioner contends, one of ordinary skill "would have had a reasonable expectation of success in so applying Stammmler's teachings to Aginsky's flexible data structure." *Id.* (citing Ex. 1003 ¶ 116). According to Petitioner, "[a]pplying the teachings of Stammmler to Aginsky would yield the predictable result of enabling Aginsky's universal remote to control the function of a variety of devices manufactured by various brands through the use of numerous different voice commands." *Id.* (citing Ex. 1003 ¶ 116).

Patent Owner argues that Petitioner has failed to show that one of ordinary skill would have been motivated to combine Aginsky with Stammmler in order to arrive at certain claim limitations, specifically a

“speech recognition engine,” and the “phonetic representations limitation.”
PO Resp. 33–40.

Based on the present record, Petitioner has sufficiently proven that it would have been obvious for one of ordinary skill to combine Aginsky and Stammler as a general matter. We will address Patent Owner’s motivation to combine arguments concerning specific claim limitations in our discussions relating to those limitations. *See infra* §§ II.D.4(g), II.D.4(j).

4. *Analysis of Independent Claim 1*

- a) 1[pre]: “[a] method for configuring a controlling device to command functional operations of a target appliance, the method comprising:”

Petitioner argues that, “[t]o the extent the preamble is limiting, Aginsky discloses a method for configuring a controlling device (*e.g.*, ‘a remote device’) to command functional operations of a target appliance (*e.g.*, ‘methods in which a controllable device transfers to the remote device . . . a data structure identifying various functions that can be controlled by a remote device’).” Pet. 33–34 (emphasis omitted). According to Petitioner, “Aginsky discloses systems and methods in which controllable device 101-1 is paired with remote device 107-1 such that remote device 107-1 may control specific operations and functions of one or more controllable device 101-N.” *Id.* at 34 (citing Ex. 1004, 3:66–4:4, Fig. 1A; Ex. 1003 ¶¶ 118–119) (emphasis omitted).

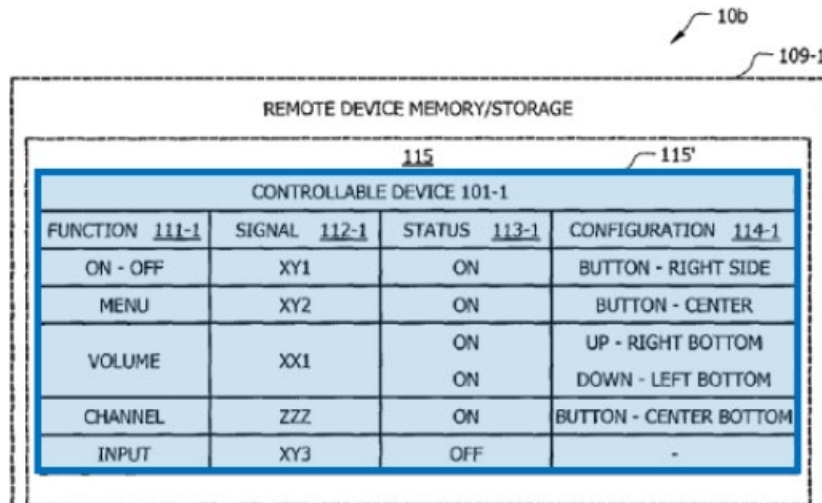
Patent Owner does not present arguments regarding the preamble. *See* PO Resp. 21–40.

Based on the full trial record, Petitioner has sufficiently proven that the prior art discloses the preamble.⁵

b) 1[a.1]: “causing a codeset record to be provisioned to the controlling device for use in commanding functional operations of the target appliance,”

Petitioner argues that “Aginsky discloses causing a codeset record (e.g. ‘a data structure’) to be provisioned to the controlling device for use in commanding functional operations of the target appliance (e.g. ‘data structures that are available for communication to one or more remote devices’ ‘such that a remote device may be used to control specific operations and functions of the controllable device’).” Pet. 34–35. More specifically, Petitioner asserts that “Aginsky discloses pairing controllable device 101-1 to remote device 107-1 such that remote device 107-1 may control specific operations and functions of controllable device 101-1.” *Id.* at 35 (citing Ex. 1004, 3:66–4:4). According to Petitioner, Aginsky “discloses that controllable device 101-1 can be a TV, DVR, computer, kitchen appliance, or automobile, among other devices.” *Id.* (citing Ex. 1004, 2:59–61, Fig. 1A). Petitioner also contends that Aginsky “discloses that controllable device 101-1 store[s] ‘data structures,’ in the form of tables 115’–116’ in memory/storage,” as shown in blue in Petitioner’s annotated version of Aginsky’s Figure 1B, reproduced below. *Id.* (citing Ex. 1004, 4:65–5:1; Ex. 1003 ¶ 121).

⁵ Because we are persuaded that Petitioner has sufficiently shown that Aginsky teaches the subject matter recited in the preamble, we need not decide whether the preamble is limiting.



Aginsky, Fig. 1B (partial).

Petitioner’s annotated version of a portion of Aginsky’s Figure 1B showing a “data structure” in the form of table 115' colored in blue. Pet. 35.

Petitioner argues that “Aginsky further discloses a process by which a data structure is provisioned to remote device 107-1,” in which “controllable device 101-1 selects a data structure based upon the brand, model, etc. of remote device 107-1, and delivers the data structures to remote device 107-1 through connectivity layer 105.” Pet. 35–36 (citing Ex. 1004, 5:22–38, 8:57–65, 12:26–27, Fig. 3; Ex. 1003 ¶ 122). According to Petitioner, “[t]he data structures may be provisioned on an as-needed basis from controllable device 101-1 (e.g., Aginsky 2:41–44), or they can be ‘programmed’ to remote device 107-1 and provisioned from local memory/storage 109-1 (e.g., Aginsky, 7:58–63).” *Id.* (citing Ex. 1004, Fig. 1A; Ex. 1003 ¶¶ 57–78, 120–122).

Patent Owner does not present arguments directed to this limitation. *See* PO Resp. 21–40.

Based on the full trial record, Petitioner has sufficiently proven that the prior art teaches this limitation.

c) 1[a.2]: “the provisioned codeset record comprising protocol and formatting information”

Petitioner argues that “Aginsky discloses the provisioned codeset record comprising protocol and formatting information (e.g. ‘*SIGNAL* columns 112-1 and 112-2’ ‘denote the type of signal’).” Pet. 36. More specifically, Petitioner asserts that “Aginsky teaches that ‘*SIGNAL* columns 112-1 and 112-2’ ‘can be any type of signal required for control purposes’ such as a frequency set, a coded IR signal, or a Bluetooth signal.” *Id.* at 37 (citing Ex. 1004, 8:63–9:7). According to Petitioner, “Aginsky further discloses that the ‘*SIGNAL* columns 112-1 and 112-2’ of the data structures ‘denote the type of signal as well as the code or code sequence of the [command] signal.’” *Id.* (citing Ex. 1004, Fig. 1B; Ex. 1003 ¶ 124). Additionally, Petitioner contends, Aginsky “explains that *SIGNAL* 112-1 may typically be a coded IR signal, which includes a coded (format) protocol (IR),” and that one of ordinary skill “would have recognized that Bluetooth also includes a protocol and format as defined in the ’083 patent.” *Id.* (citing Ex. 1004, 8:63–9:3; Ex. 1003 ¶ 124). “Accordingly,” Petitioner argues, one of ordinary skill “would have understood that Aginsky’s examples—frequency set, IR and Bluetooth—require protocol and formatting information” as defined in the ’083 patent.” *Id.* (citing Ex. 1001, 10:47–54; Ex. 1003 ¶¶ 64–65, 123–124).

Patent Owner responds that Petitioner fails to show that Aginsky teaches “the provisioned codeset record comprising protocol and formatting information.” PO Resp. 21–27; PO Sur-reply 8–17. First, Patent Owner argues that Petitioner does not show that Aginsky teaches “protocol and formatting information” that is “separate and distinct from Aginsky’s alleged ‘plurality of individual command function entries’” under Patent Owner’s

construction. PO Resp. 21–23. More specifically, Patent Owner contends, Aginsky’s “protocol and formatting information” is part of the “individual command function entries” and are therefore not “separate and distinct” from them. *Id.* at 22.

Second, Patent Owner argues that Petitioner has failed to show that Aginsky teaches “the provisioned codeset record comprising protocol and formatting information” under any construction. PO Resp. 23–27. Patent Owner asserts that Petitioner relies on Aginsky’s SIGNAL columns 112-1 and 112-2 that “denote the type of signal,” but fails to show that this “type of signal” discloses “both protocol and formatting information stored in the alleged codeset record itself.” *Id.* at 24–25. Patent Owner acknowledges that the “type of signal” in columns 112-1 and 112-2 “may be a frequency set, a coded IR signal, or a Bluetooth signal,” but that this indication “is *not* itself the set of procedures needed to transmit commands from one device to another via the indicated signal type (*i.e.*, protocol and formatting information).” *Id.* at 25 (citing Ex. 2001 ¶¶ 83–84). Rather, Patent Owner contends, “[t]he actual set of procedures must still be received, obtained, looked up, etc.” outside the codeset record. *Id.* Thus, according to Patent Owner, the “protocol and formatting information” is not “stored in the claimed codeset record itself,” as required by claim 1. *Id.* at 25–26 (citing Ex. 1001, claims 1, 12; Ex. 2001 ¶ 85).

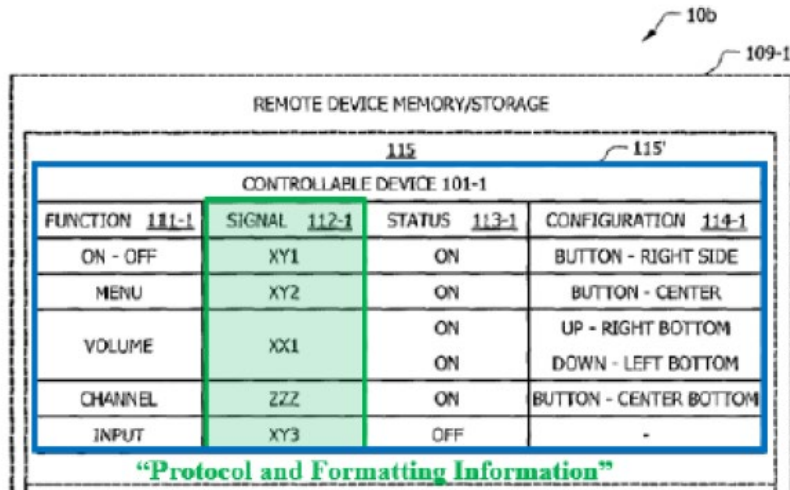
Patent Owner also argues that Aginsky’s disclosure of “protocols, rules, or other information useful to carrying out remote control of the controllable device” in column 14 does not help Petitioner because these “protocols” and “rules” refer to “(i) user/device permissions and restrictions (*e.g.*, password requirements, child permissions, etc.); and (ii) customized

control layouts for devices (*e.g.*, how the buttons are arranged).” PO Resp. 26 (citing Ex. 1004, 7:7–16, 9:15–28, 10:27–50, 11:49–54; Ex. 2001 ¶ 87). Thus, according to Patent Owner, “[t]hese ‘protocols’ and ‘rules’ are in no way related to the claimed protocol and formatting information, which again is the set of procedures needed to transmit commands from one device to another.” *Id.* at 26–27 (citing Ex. 2001 ¶ 87).

Petitioner responds that Aginsky discloses the protocol and formatting information in three ways: (1) in the command itself; (2) in SIGNAL columns 112-1 and 112-2 of the data structure; and (3) the “protocols, rules, or other information useful to carrying out remote control of the controllable device” in column 13. Pet. Reply 14–18.

With respect to the first argument, Petitioner asserts that the command signals of SIGNAL columns 112-1 and 112-2 “‘can be any type of signal required for control purposes’ such as a frequency set, a coded IR signal, or a Bluetooth signal.” Pet. Reply 14 (citing Pet. 25 (citing Ex. 1004, 8:63–9:7)). According to Petitioner, “[c]oded IR includes within the signal all formatting and protocols necessary for an appropriately configured device to recognize the signal.” *Id.* at 15 (citing Pet. 37).

With respect to the second argument, Petitioner contends that SIGNAL columns 112-1 and 112-2 of the data structures “denote the type of signal as well as the code or code sequence of the [command] signal.” Pet. Reply 15 (citing Ex. 1004, 9:7–10; Ex. 1003 ¶ 124). Petitioner illustrates this information in green in its annotated version of Aginsky’s Figure 1B, reproduced below.



The diagram shows a hierarchical structure for remote device memory/storage. At the top is a box labeled 'REMOTE DEVICE MEMORY/STORAGE' with reference numeral 109-1. Inside this box is a table labeled 'CONTROLLABLE DEVICE 101-1' with reference numeral 115. The table has four columns: 'FUNCTION 111-1', 'SIGNAL 112-1', 'STATUS 113-1', and 'CONFIGURATION 114-1'. The 'SIGNAL 112-1' column is highlighted in green. Below the table, the text '“Protocol and Formatting Information”' is written in green. Reference numeral 10b points to the top right corner of the diagram.

FUNCTION 111-1	SIGNAL 112-1	STATUS 113-1	CONFIGURATION 114-1
ON - OFF	XY1	ON	BUTTON - RIGHT SIDE
MENU	XY2	ON	BUTTON - CENTER
VOLUME	XX1	ON	UP - RIGHT BOTTOM DOWN - LEFT BOTTOM
CHANNEL	ZZZ	ON	BUTTON - CENTER BOTTOM
INPUT	XY3	OFF	-

“Protocol and Formatting Information”

Petitioner’s annotated version of Aginsky’s Figure 1B showing SIGNAL column 112-1 highlighted in green. Pet. Reply 15.

Relying on Mr. McNair, Petitioner argues that “denoting ‘Bluetooth’ or ‘coded IR’” as the type of signal “conveys protocol and formatting to a [person of ordinary skill in the art] as these are well-known standards.” Pet. Reply 16 (citing Ex. 1001, 10:47–54; Ex. 1003 ¶ 124). Petitioner also contends that Dr. Scordilis agreed at his deposition that Bluetooth is a standard protocol. *Id.* (citing Ex. 1043, 21:24–22:13).

With respect to Petitioner’s third argument, Petitioner asserts that even if command entries and protocol and formatting information were required to be separate and distinct, “Aginsky also teaches additional protocols used in transmission as a transmission security protocol” when it discloses in column 13 “protocols, rules, or other information useful to carrying out remote control of the controllable device.” Pet. Reply 16 (citing Pet. 26 (citing Ex. 1004, 13:32–43)). Petitioner contests Patent Owner’s assertion that these “protocols, rules, or other information” are “user/device permissions or customized control layouts, and therefore not protocol and formatting information, as claimed.” *Id.* at 17 (citing PO Resp. 26). To the contrary, according to Petitioner, Aginsky’s ““protocols, rules,

or other information’ are used in transmission and nothing more is required.” *Id.* Indeed, Petitioner contends, Aginsky specifically teaches the “command signal is checked by process 307 to determine if it is ‘legal’” and then “[i]f the received signal corresponds to a proper command then process 309 performs the command.” *Id.* (citing Ex. 1004, 12:31–40). Thus, Petitioner argues, even under Patent Owner’s construction, “Aginsky’s procedures for determining whether a command signal is ‘legal’ constitutes a ‘set of procedures needed to transmit command from one device to another ***in a way that the receiving device can make sense of and use the commands***’ at least because it is used by process 307 to determine if the command is legal.” *Id.* at 17–18 (emphasis in original).

Finally, Petitioner argues that even if the claims required “separate and distinct” storage, claim 1 would have been obvious because Aginsky’s “protocols, rules, or other information” in column 13 are separate and distinct from Aginsky’s commands. Pet. Reply 18. Petitioner argues that “[i]n a codeset having command entries and protocol and formatting information,” there are only two options for storing the protocol and formatting information, either inside or outside of the command entries. *Id.* at 18–19. And, according to Petitioner, the option of storing the protocol and formatting information was already well-known, as discussed in U.S. Patent No. 7,259,710 to Kisliakov (Ex. 1036, “Kisliakov”). Petitioner contends that Kisliakov discloses a remote control device “configured to communicate ‘protocol data and an associate format function,’” and includes Figure 27 showing protocol properties 2701 and format functions 2707 in separate diagram blocks. *Id.* at 19–20 (citing Ex. 1003 ¶ 65 (quoting Ex. 1036, 6:20–30, 41:29–48, Fig. 27); Ex. 1036, 41:29–49:45, Fig. 27).

Thus, Petitioner argues, “Kisliakov’s protocol properties are separate and distinct at least for the same reasons [Patent Owner] argues the ’083 discloses separate and distinct protocol and formatting information.” *Id.* at 20.

Based on the full trial record, we find that Petitioner has sufficiently shown that Aginsky discloses that the provisioned codeset record comprises “protocol and formatting information” as claimed. First, on the present record, we agree with Petitioner and Mr. McNair that Aginsky teaches protocol and formatting information by disclosing that the command signals of SIGNAL columns 112-1 and 112-2 of the data structure can be a coded IR signal. Ex. 1004, 8:63–9:7; Pet. 25, 37; Pet. Reply 13, 15; Ex. 1003 ¶ 124. In this regard, we credit Mr. McNair’s testimony that a coded IR signal “includes a coded (format) protocol (IR),” and that one of ordinary skill would have understood that coded IR “require[s] protocol and formatting information.” Ex. 1003 ¶ 124.

Similarly, Aginsky discloses that “the notations in SIGNAL columns 112-1 and 112-2 denote the type of signal,” such as a coded IR signal or a Bluetooth signal. Ex. 1004, 8:63–9:10. We agree with and find credible Mr. McNair’s testimony that coded IR and Bluetooth signals require protocol and formatting information, and thus denoting “Bluetooth” or “coded IR” as the type of signal provides “information” about the “protocol and formatting” needed for the signal. Ex. 1003 ¶ 124. In this regard, we note that claim 1 only requires that the codeset record comprises protocol and formatting information, and does not require that *all* of the protocol and formatting needed for the signal must be included in the codeset record itself. Thus, we find that claim 1 is satisfied by Aginsky’s teaching of

storing some information about protocol and formatting in the codeset record (such as a code denoting the type of signal), and storing other information about protocol and formatting elsewhere, where it could be re-used across different devices and data structures.

We do not agree with Patent Owner's and Dr. Scordilis's assertions that the information in columns 112-1 and 112-2 is not "protocol and formatting information" because "an indication of a type of signal that is transmitted (*e.g.*, coded IR, Bluetooth, etc.) is not itself the set of procedures needed to transmit commands from one device to another via the indicated signal type," and that "[t]he actual set of procedures must still be received, obtained, looked up, etc." Ex. 2001 ¶ 83; PO Resp. 25. As noted above, the claims do not require that all of the protocol and formatting be included in the codeset record, but only require that at least some information about protocol and formatting be included. The notations in columns 112-1 and 112-2 indicating the type of signal (such as coded IR or Bluetooth) provide information about the protocol and formatting needed to transmit and receive that signal. And, as discussed in Section II.A.2 above, we do not adopt Patent Owner's proposed construction requiring that the "set of procedures" for using the protocol and formatting information must be in the codeset record itself.

Furthermore, we find that Aginsky teaches "the provisioned codeset record comprising protocol and formatting information" in column 13 when it discloses that "the exchanged data structure may . . . include protocols, rules, or other information useful to carrying out remote control of the controllable device." Ex. 1004, 13:40–43. We disagree with Patent Owner's and Dr. Scordilis's assertion that these "protocols" and "rules" are

limited to “user/device permissions and restrictions” (such as password requirements and child permissions) and “customized control layouts for devices (*e.g.*, how the buttons are arranged).” *See* PO Resp. 26; Ex. 2001 ¶ 87. Aginsky broadly discloses that protocols or rules “may apply to all functions or selected functions” of a remote device, and then lists a variety of examples, which include, but are not limited to, user/device permissions and restrictions and customized control layouts. Ex. 1004, 6:7–26. Indeed, Aginsky specifically uses non-limiting language for these examples, explaining that “[o]ne such protocol may require an ID, password, and/or other credentials” to “authorize control of the controllable device,” and “[i]n the embodiment shown” protocols are configurations that define the appearance, arrangement, and/or assignment of function controls. *Id.* at 6:27–30, 9:22–28. Thus, we find that Aginsky’s disclosure of “protocols, rules, and other information” in the exchanged data structure is broad enough to qualify as “information needed to transmit a signal from one device to another in a way that the receiving device can make sense of and use the signal,” as we have construed “protocol and formatting information.”

Additionally, we agree with Petitioner that Aginsky discloses protocol and formatting information even under Patent Owner’s proposed construction requiring that the “protocol and formatting information” be “separate and distinct” from the “plurality of individual command function entries.” As noted above, Aginsky discloses in column 13 that “the exchanged data structure may . . . include protocols, rules, or other information useful to carrying out remote control of the controllable device,” and does not limit these protocols and rules to being stored in the individual command function entries. Ex. 1004, 13:40–43. We find that one of

ordinary skill would have understood this disclosure to encompass storing the “protocols rules and other information” anywhere within the data structure, including separately and distinctly from the individual command function entries.

Consequently, we find that Petitioner has sufficiently proven that Aginsky discloses this limitation.

d) 1[a.3]: “and a plurality of individual command function entries”

Petitioner argues that “Aginsky discloses a plurality of individual command function entries (e.g., ‘a plurality of exemplary functions or commands’ and corresponding signals, statuses, and configurations).” Pet. 37. Petitioner illustrates Aginsky’s disclosure of this limitation using a colored and annotated version of Figure 1B, reproduced below.

116				116'
CONTROLLABLE DEVICE 101-2				
FUNCTION 111-2	SIGNAL 112-2	STATUS 113-2	CONFIGURATION 114-2	
ON - OFF	XX3	ON	RIGHT SIDE	
VOLUME	XY5	ON	UP - DOWN - TOP	
START	AB1	ON	GREEN LIGHT	
STOP	AB2	ON	RED LIGHT	
FAST FORWARD	AB3	ON	ARROW - RIGHT	“Individual Command Function Entries”
FAST REWIND	AB4	ON	ARROW - LEFT	
PAUSE	AB5	ON	BARS - BOTTOM	
RECORD	XY6	ON	BUTTON RED	

“Codeset Record” FIG. 1B

Aginsky, Fig. 1B (partial).

Petitioner’s annotated version of a portion of Aginsky’s Figure 1B showing a “codeset record” in blue and an “individual command function entry” in red. Pet. 38.

Referring to Aginsky’s Figure 1B, Petitioner asserts that “Aginsky discloses data structures in tables 115' and 116',” where each row “represents

an individual command function entry, which includes information such as function or command, signal, status, and configuration—all information related to a particular command.” *Id.* at 37–38 (citing Ex. 1004, 8:21–37, Fig. 1B; Ex. 1003 ¶ 126). “For example,” Petitioner continues, “Aginsky discloses that ‘the data structure in table 115’ identifies a plurality of exemplary functions or commands . . . associated with a plurality of exemplary command signals . . . that when sent from remote device 107-1 to controllable device 101-1, the function/command is carried out.” *Id.* at 38 (citing Ex. 1004, 8:21–37). According to Petitioner, this disclosure “mirrors [the] ’083’s disclosure that individual command function entries 754 simply includes a row of information related to a command.” *Id.* (citing Ex. 1001, 10:47–11:3; Ex. 1003 ¶¶ 66–78, 125–127).

Patent Owner does not present arguments directed to this limitation. *See* PO Resp. 21–40.

Based on the full trial record, Petitioner has sufficiently proven that the prior art teaches this limitation.

e) 1[a.4]: “wherein each of the plurality of individual function entries within the codeset record comprises command data,”

Petitioner argues that “Aginsky discloses [‘]wherein each of the plurality of individual function entries within the codeset record comprises command data[’] (e.g., native command data underlying ‘SIGNAL 112-1’).” Pet. 38. More specifically, Petitioner contends that Aginsky discloses a “‘data structure in table 115’ [that] identifies a plurality of exemplary functions or commands . . . associated with a plurality of exemplary command signals.’” *Id.* (citing Ex. 1004, 8:21–30). According to Petitioner, “[w]hen these command signals are sent from the remote device to the

controllable device, the function/command is carried out.” *Id.* (citing Ex. 1004, 8:21–30; Ex. 1003 ¶ 129).

Petitioner also argues that Aginsky teaches that a user’s command, “such as ‘FAST FORWARD,’” is converted by remote device 107-1 to a command signal based on the data structure of the controllable device, which, in the case of the exemplary data structure 116’ is command signal AB3. Pet. 39 (citing Ex. 1004, 8:38–45, Fig. 1B). Petitioner asserts that one of ordinary skill “would have recognized that the signal AB3 must contain underlying native command data that commands controllable device 101-1 to execute a fast forward function,” which “tracks [the ’083 patent’s] definition of ‘command data.’” *Id.* (citing Ex. 1004, 8:32–42; Ex. 1001, 10:65–67; Ex. 1003 ¶ 130). Therefore, Petitioner contends, command signal AB3 is “sent to the applicable controllable device and the underlying native command data causes the controllable device to fast forward.” *Id.*

Patent Owner does not present arguments directed to this limitation. *See* PO Resp. 21–40.

Based on the full trial record, Petitioner has sufficiently proven that the prior art teaches this limitation.

f) 1[a.5]: “a standard function identifier,”

Petitioner argues that “Aginsky discloses [‘]wherein each of the plurality of individual function entries within the codeset record comprises . . . a standard function identifier[’] (*e.g.* ‘each function could further include a code or other identification marker related to the operation of that function control.’).” Pet. 39. More specifically, Petitioner asserts that “Aginsky discloses that the configuration for each function could include an ‘identification marker related to the operation of that function

control.” *Id.* at 39–40 (citing Ex. 1004, 9:34–35). “For example,” Petitioner argues, “Aginsky discloses that for a fast-forward function, a tag such as ‘FF’ would be associated with the fast-forward function across controllable devices.” *Id.* (citing Ex. 1004, 9:39–47). According to Petitioner, one of ordinary skill “would have understood that Aginsky broadly teaches use of an identification marker for managing similar functionality across codesets.” *Id.* (citing Ex. 1004, 9:34–47; Ex. 1001, 10:56–58; Ex. 1003 ¶ 132).

Patent Owner does not present arguments directed to this limitation. *See* PO Resp. 21–40.

Based on the full trial record, Petitioner has sufficiently proven that the prior art teaches this limitation.

g) 1[a.6]: “data which comprises a phonetic representation of a function name corresponding to the standard function identifier,”

1[a.7] “and a plurality of data each of which comprises a phonetic representation of a unique one of a plurality of synonyms of the function name;”

Petitioner argues that the Aginsky-Stammler combination teaches these limitations, which Patent Owner refers to collectively as the “phonetic representations limitation.” Pet. 40–43. Referencing its argument for limitation 1[a.5], Petitioner argues that “Aginsky discloses that data structures include FUNCTION columns 111-1 and 111-2 identifying various exemplary functions,” each having a name, such as “FAST FORWARD” which “may correspond to an identification marker (*i.e.*, standard function identifier), such as ‘FF.’” Pet. 40 (citing Ex. 1004, 4:6–10, 8:21–62, Fig. 1B; Ex. 1003 ¶ 134). Petitioner also contends that “Aginsky teaches that ‘voice commands . . . can be used for one or more of the functions

performed by the remote device.” *Id.* (citing Ex. 1004, 6:2–6, 8:8–12, 9:60–65). Petitioner acknowledges that “Aginsky does not explicitly disclose that its data tables include information related to voice commands,” but argues that “Aginsky broadly teaches that any desirable information may be included within the data structures.” *Id.* (citing Ex. 1004, 9:30–33, 13:34–36; Ex. 1003 ¶ 135). Thus, Petitioner contends, “Aginsky at least teaches a data structure with voice command function in mind, and it would have been obvious to modify the data structure to include phonetic representations of each command such that voice command is enabled.” *Id.* (citing Ex. 1003 ¶ 136).

Petitioner also argues that “modifying Aginsky’s data structure with the teachings of Stammler would have been well within the ability of a [person of ordinary skill in the art] given Stammler’s guidance, and its applicability to Aginsky’s design.” Pet. 40–41 (citing Ex. 1003 ¶ 136). Petitioner asserts that “Stammler teaches that ‘reliable control or operation of devices by speech command or real-time speech dialog is possible with relatively low expenditure,’” and that this is an “essential advantage of the [Stammler] invention.” *Id.* at 41 (citing Ex. 1005, 2:56–59; Ex. 1003 ¶ 137). According to Petitioner, “Stammler explicitly discloses storing phonetic representations in memory by which it may recognize voice commands,” and one of ordinary skill “would have been motivated to apply Stammler’s teachings in implementing Aginsky’s data structure(s) to enable voice commands.” *Id.* (citing Ex. 1005, 12:19–27; Ex. 1003 ¶ 137). “Indeed,” Petitioner contends, “Stammler discloses a speech dialog system for automatic control of one or more devices by voice commands that may be

recognized according to ‘phonetic word subunits’ such as phonemes.” *Id.* (citing Ex. 1005, 1:1–5, 3:9–16, 8:53–57, Fig. 1; Ex. 1003 ¶ 137).

Petitioner argues that “Stammler specifically teaches advantageous methods for speech recognition systems for voice-activated control of various devices, such as using phonetic word subunits, including phonemes, to realize speech recognition,” and one of ordinary skill “would have been motivated to apply Stammler’s teachings in implementing Aginsky’s data structure because doing so would allow Aginsky to enable its disclosed voice control over multiple devices responsive to a variety of command inputs.” Pet. 41. “This in turn,” Petitioner contends, “would further Aginsky’s goal of providing a more flexible and customizable universal remote programming method.” *Id.* (citing Ex. 1004, 1:43–45, 2:15–30, 3:50–63).

Specifically with respect to limitation 1[a.7], Petitioner acknowledges that Aginsky does not “expressly teach or suggest using a unique one of a plurality of synonyms of the function name,” but argues that it would have been obvious to a person of ordinary skill “to apply Stammler’s teachings of using synonyms, and phonetic representations thereof, in Aginsky’s systems and methods in order to allow a user to use alternate words or phrases to activate a particular command.” Pet. 42 (citing Ex. 1003 ¶ 140). In particular, Petitioner argues that Stammler teaches the use of an “extensive vocabulary of admissible commands” to “increase the user friendliness by using synonym words or different variations in pronunciation.” *Id.* (citing Ex. 1005, 2:60–65, 5:65–6:10). Petitioner also points to Stammler’s disclosure that “[p]redetermined synonymous words can be used” and “[t]he same function can be realized through commands with a different number of

words,” an approach that is “advantageous.” *Id.* (citing Ex. 1005, 6:18–19, 16:17–20; Ex. 1003 ¶ 141). Petitioner further argues that one of ordinary skill “would have been motivated to apply Stammler’s speech dialog system utilizing synonyms in implementing Aginsky’s data structure in order to improve command recognition accuracy and user friendliness.” *Id.* (citing Ex. 1005, 6:8–10; Ex. 1003 ¶ 142).

Patent Owner argues that Petitioner fails to show that the Aginsky-Stammler combination teaches limitations 1[a.6] and 1[a.7], and fails to show that it would have been obvious to combine the references to arrive at these limitations. PO Resp. 27–30, 34–39; PO Sur-reply 17–18, 20–24. Specifically, Patent Owner asserts that “neither Aginsky nor Stammler discloses, teaches, or suggests phonetic representations of function names (or synonyms of function names) stored in a codeset record (or in command function entries within a codeset record), as the Challenged Claims require.” PO Resp. 29. “With respect to Aginsky,” Patent Owner contends, “Petitioner concedes that Aginsky does not disclose, teach or suggest that its alleged codeset records include any information related to voice commands” or “phonetic representatives of function names (or synonyms of function names).” *Id.* at 29–30 (citing Pet. 20–29, 40–42; Ex. 1004, 7:58–10:2). With respect to Stammler, Patent Owner argues that Stammler does not “explicitly disclose[] storing phonetic representations in memory,” but rather “merely discloses that a memory may be connected to Stammler’s digital signal processor.” PO Resp. 30 (citing Pet. 41; Ex. 1005, 12:19–27). “In any case,” according to Patent Owner, “Stammler does not disclose, teach, or suggest storing phonetic representations in a codeset record (or in

command function entries within a codeset record),” or “suggest a codeset record.” *Id.* (citing Ex. 2001 ¶ 101).

Patent Owner also argues that “Petitioner fails to explain why a [person of ordinary skill in the art] would have added phonetic representations to the specific data structures on Aginsky’s controlling device that Petitioner relies on in its obviousness analysis (*i.e.*, either of the data structures in tables 115’–116’),” as opposed to “different data structures in the controlling device’s memory, some construct in the controlling device’s memory other than a data structure, or to a different device altogether (*e.g.*, to a remote server).” PO Resp. 35 (citing Pet. 31–33, 40–42). “Similarly,” Patent Owner contends, “Petitioner fails to explain why a [person of ordinary skill in the art] would have specifically added phonetic representations to each of the alleged command function entries in these data structures, as opposed to some other location in the data structures, to only a subset of the alleged command function entries, etc.” *Id.* Patent Owner also argues that adding voice control support to Aginsky is a legally insufficient reason to combine it with Stammler because Aginsky already discloses voice control support and one of ordinary skill “would not be motivated to modify a prior art reference to add a feature the reference already has.” *Id.* at 36.

Patent Owner further argues that one of ordinary skill “would not have used Stammler’s alleged phonetic representations in the data structures provisioned to Aginsky’s controlling device” because Aginsky’s vocabulary “is limited to a small, pre-defined collection of individually-spoken words (*e.g.*, ‘on,’ ‘off,’ ‘menu,’ etc.).” PO Resp. 37–38 (citing Ex. 1004, Figs. 1B–1C; Ex. 2001 ¶ 118). According to Patent Owner, these “whole-word models are particularly useful for remote-control applications such as

Aginsky's" because "such models (i) have relatively simple and fast computational requirements, making them very efficient; (ii) have a relatively short development time, resulting in efficiencies in development cost; (iii) have relatively small memory requirements; and (iv) can be implemented on simpler and less expensive hardware platforms." *Id.* at 38 (citing Ex. 2001 ¶¶ 116, 117). On the other hand, Patent Owner contends, "Stammler's phoneme-based system incorporates a large vocabulary and is designed to process conversational speech," which "is undesirable when it comes to handling a limited vocabulary of individually spoken commands," as in Aginsky, "because the efficiencies in development cost, computational load, and memory use that a whole-word model provides cannot similarly be achieved with Stammler's phoneme-based model." *Id.* (citing Ex. 2001 ¶ 119). Thus, according to Patent Owner, "in a remote-control application such as Aginsky, Stammler's phoneme-based approach would have been considered unsuitable and unnecessary." *Id.* at 39 (citing Ex. 2001 ¶ 120).

Petitioner responds that Patent Owner attacks the references in isolation by "first arguing that Aginsky does not recite voice commands within a data structure and then arguing that Stammler does not disclose a codeset record as claimed." Pet. Reply 21. Petitioner argues that it is relying on Aginsky to teach data structures with function columns and the use of voice commands for one or more functions of the remote device, and on Stammler to teach a voice command system that stores phonetic representations in memory. *Id.* Petitioner further contends that Patent Owner's argument that one of ordinary skill would not have been motivated to use Stammler's phoneme-based system because they would instead favor a whole-word model for efficiency and cost savings is "beside the point"

because the Petition does not propose bodily incorporating Stammner's device into Aginsky's device, but instead argues that one of ordinary skill "would have been motivated to *modify* Aginsky with the teachings of Stammner to include phonetic representations and synonym[s] as elements of Aginsky's dataset." *Id.* at 25 (citing Pet. 32, 41; PO Resp. 38–39).

Based on the full trial record, we find that Petitioner has sufficiently proven that the combination of Aginsky and Stammner teaches this limitation, and that it would have been obvious to combine the references as Petitioner proposes. We agree with Petitioner that Aginsky discloses data structures including FUNCTION columns 111-1 and 111-2 identifying functions each having a name (such as "FAST FORWARD") which may correspond to a standard function identifier. Ex. 1004, 4:6–10, 8:21–62, Fig. 1B; Ex. 1003 ¶ 134. Aginsky also teaches that voice commands can be used for these functions. Ex. 1004, 6:2–6 ("Remote devices 107-1 to 107-N also include user interface 110-1 to 110-N that allow a user to control operation of a paired controllable device by various methods including . . . voice . . ."), 9:60–65 ("voice commands . . . can be used for one or more of the functions performed by the remote device"). We agree with and find credible Mr. McNair's testimony that, although "Aginsky does not explicitly disclose that its data tables include information related to voice commands, Aginsky broadly teaches that any desirable information may be included within the data structures." Ex. 1003 ¶ 135; Ex. 1004, 9:30–33 ("It should be understood by those skilled in the art that any number of rows and columns can be used to store specialized information, preferences, associations, and/or restrictions."), 13:34–36 ("The data structure can be any desired function, signal, and/or other structure as discussed above with

reference to FIGS. 1B and 1C.”). Based on this evidence, we agree with Mr. McNair’s testimony that Aginsky “teaches a data structure with voice command function in mind,” and that “it would have been obvious to modify the data structure to include phonetic representations of each command such that voice command is enabled,” particularly because “it had been well-known in the art for decades to use phonetic representations, such as phonemes, to effectuate voice recognition systems.” Ex. 1003 ¶ 136; *see id.* ¶¶ 39–50, 71–73.

We also agree with Mr. McNair that Stammler discloses storing in memory phonetic representations enabling the system to recognize voice commands using an “extensive vocabulary” up to “several hundred words.” Ex. 1005, 5:65–6:8; Ex. 1003 ¶¶ 113, 115, 137. Stammler also teaches that the use of synonymous words in speech recognition increases the user friendliness of the system. Ex. 1005, 6:8–10 (Stammler’s vocabulary “increase[s] the user friendliness by using synonymous words or different variations in pronunciation.”), 16:17–20 (disclosing automatic control and/or operation of one or more devices by voice command in which “[p]redetermined synonymous words can be used”); Ex. 1003 ¶¶ 141–142; *see* Ex. 1003 ¶ 113. Stammler further teaches that, using its system, “a reliable control or operation of devices by speech command or real-time speech dialog is possible with relatively low expenditure.” Ex. 1005, 2:56–59.

We agree with and find credible Mr. McNair’s testimony that one of ordinary skill “would have been motivated to modify Aginsky’s data structure with the teachings of Stammler to include phonetic representations and synonyms as elements of Aginsky’s data structure to facilitate an

extensive range of voice commands and map them to the correct remote command functionality” because “Stammler teaches that prior speech dialog systems suffered from limited vocabularies resulting in higher user dissatisfaction and modifying Aginsky with Stammler’s teachings would better improve upon Aginsky’s goal of providing a more flexible and customizable universal remote programming method.” Ex. 1003 ¶ 115; *see id.* ¶¶ 138, 142. We also credit Mr. McNair’s testimony that modifying Aginsky’s data structure to include Stammler’s teachings would have been within the ability of a person of ordinary skill, and such a person would have had a reasonable expectation of success in doing so. *Id.* ¶ 116.

We do not agree with Patent Owner’s argument that “Petitioner concedes that Aginsky does not disclose, teach, or suggest that its alleged codeset records include any information related to voice commands” or “phonetic representations of function names (or synonyms of function names).” PO Resp. 29–30. Petitioner relies on obviousness for this contention—either that it would have been obvious based on Aginsky to include phonetic representations of function names in the codeset records, or that it would have been obvious to include Stammler’s phonetic representations in Aginsky’s codeset records along with the function corresponding to that representation. PO Resp. 29–30; Pet. 31–33, 40–41; Pet. Reply 21–22, 26; Ex. 1003 ¶¶ 135–137. Therefore, the fact that Aginsky does not expressly disclose including information relating to voice commands in the codeset record does not fairly meet Petitioner’s argument. Similarly, we do not agree with Patent Owner’s argument that Stammler does not teach or suggest a codeset record or storing phonetic representations in a codeset record, because Petitioner relies on Aginsky for

that disclosure. *Id.* Thus, we agree with Petitioner that Patent Owner is attacking the references in isolation instead of addressing the combination proposed by Petitioner. *See* Pet. Reply 21, 25; *In re Keller*, 642 F.2d 413, 426 (CCPA 1981) (“[O]ne cannot show non-obviousness by attacking references individually where, as here, the rejections are based on combinations of references.”).

We also do not agree with Patent Owner’s argument that Petitioner fails to explain why one of ordinary skill would have added phonetic representations to the command function entries in the codeset record. *See* PO Resp. 35. To the contrary, Petitioner introduces the testimony of Mr. McNair that one of ordinary skill “would have been motivated to modify Aginsky’s data structure with the teachings of Stammler to include phonetic representations and synonyms *as elements of Aginsky’s data structure* to facilitate an extensive range of voice commands and *map them to the correct remote command functionality.*” Ex. 1003 ¶ 115 (emphasis added); *see* Pet. 32. Mr. McNair also testifies that “[m]odifying Aginsky’s data structure with voice command function in mind with the teachings of Stammler would have been well within the ability of a person of ordinary skill in the art given Stammler’s guidance, and *Aginsky’s open data structure design that specifically contemplates a ‘data structure [with] any desired function, signal, and/or other structure.’*” Ex. 1003 ¶ 116; *see* Pet. 33. Based on this evidence, we find that Petitioner has sufficiently shown that one of ordinary skill would have been motivated to include the phonetic representations within Aginsky’s data structure mapped to the functions that correspond to those representations because it would have

been logical to include the phonetic representations with their corresponding functions in the data structure.

Finally, we do not agree with Patent Owner's and Dr. Scordilis's argument that one of ordinary skill would not have been motivated to use Stammler's phonetic representations with Aginsky's remote device because it would involve greater development cost, computational load, and memory use as compared to Aginsky's "whole-word" model. PO Resp. 37–39; Ex. 2001 ¶¶ 116–120. To the contrary, we find more credible Mr. McNair's testimony that one of ordinary skill "would have been motivated to modify Aginsky's data structure with the teachings of Stammler to include phonetic representations and synonyms as elements of Aginsky's data structure to facilitate an extensive range of voice commands" because "Stammler teaches that prior speech dialog systems suffered from limited vocabularies resulting in higher user dissatisfaction and modifying Aginsky with Stammler's teachings would better improve upon Aginsky's goal of providing a more flexible and customizable universal remote programming method." Ex. 1003 ¶ 115. In this regard, we find that Mr. McNair's testimony is consistent with Stammler's disclosure that it provides "for a high recognition capacity with an extensive vocabulary" which "increase[s] the user friendliness" of the device and "permits the rearranging of words in the speech command" as well as the use of "a plurality of functions for each language." Ex. 1005, 6:3–12, 6:33–36. We also find that Patent Owner's and Dr. Scordilis's assertion that Stammler's approach would involve too great of a development cost, computational load, and memory use is undermined by Stammler's disclosure that it can provide a vocabulary of "up to several hundred words" with "relatively low expenditure." Ex. 1005,

2:55–59, 6:5–6; *see id.* at 2:18–22 (explaining that an object of the invention is to provide speech control “at the lowest possible expenditure”). Finally, Aginsky discloses that its “remote device” can include devices with substantial memory and processing power, such as a “smartphone, tablet computer, personal computer, or any other programmable processor-based device,” which could accommodate Stammer’s phonetic representations, and claim 1 of the ’083 patent broadly recites a “controlling device” without limiting the processing power or memory of such a device. Ex. 1004, 5:46–49, Fig. 1A; Ex. 1001, claim 1.

Consequently, we find that Petitioner has sufficiently proven that the combination of Aginsky and Stammer discloses limitations 1[a.6] and 1[a.7].

- h) 1[b.1]: “causing less than all of the individual command function entries from within the provisioned codeset record to each be matched to one or more of a plurality of user input elements of the controlling device”*

Petitioner argues that “Aginsky teaches causing less than all of the individual command function entries from within the provisioned codeset record (*e.g.* ‘the data structure . . . may include only a subset of all possible functions’ or be ‘restricted by a protocol’) to each be matched (*e.g.* ‘a plurality of exemplary functions or commands associated with a plurality of exemplary command signals’) to one or more of a plurality of user input elements of the controlling device (*e.g.* ‘buttons, bars, and arrows, whether hard or programmable, that are physically pushed or touched by the user,’ ‘voice commands,’ or ‘[a]ny type of input from the user’).” Pet. 43.

Specifically, Petitioner argues that, as discussed in connection with limitation 1[a.3], “Aginsky discloses a plurality of individual command

function entries in each row of a data structure.” Pet. 43 (citing Ex. 1003 ¶ 144). According to Petitioner, “Aginsky further discloses that ‘function controls (for inputting commands)’ are illustrated in the data structure tables by way of ‘CONFIGURATION columns 114-1 and 114-2 of FIG. 1B,’” and that these configuration columns “represent the user input, which could be ‘buttons, bars, and arrows, whether hard or programmable, that are physically pushed or touched by the user,’ ‘voice commands,’ or ‘[a]ny type of input from the user.’” *Id.* (citing Ex. 1004, 6:16–17, 9:56–65, 8:38–41).

Petitioner further argues that “[a]s shown in Fig. 1B, CONFIGURATION 114-1 includes entries for several functions that correlate to buttons,” but “the ‘INPUT’ row of Table 115’ does not have a corresponding CONFIGURATION column 114-1 entry, indicating that there is not a physically pushed or touched button (*i.e.*, ‘input elements of the controlling device’) related to the ‘INPUT’ function,” and motion or voice commands may be used instead. Pet. 44 (citing Ex. 1004, 9:56–10:2; Ex. 1003 ¶¶ 144–146. “Accordingly,” Petitioner argues, one of ordinary skill “would have understood that the ‘INPUT’ function is not matched to a physical user input element such as a button, located on remote device 107-1, and therefore, less than all of the individual command functions are matched to a user input.” *Id.* (citing Ex. 1003 ¶ 146).

Patent Owner does not present arguments directed to this limitation. *See* PO Resp. 21–40.

Based on the full trial record, Petitioner has sufficiently proven that the prior art teaches this limitation.

- i) 1[b.2]: “whereupon a subsequent activation of a one of the plurality of user input elements will cause the controlling device to transmit a command communication by using the

protocol and formatting information and the command data of a one or more of the plurality of individual command function entries from within the provisioned codeset record that was mapped to the one of the plurality of user input element activated; and”

Petitioner argues that “Aginsky discloses whereupon a subsequent activation of a one of the plurality of user input elements (*e.g.* ‘pressing a . . . button’) will cause the controlling device to transmit a command communication” by “using the protocol and formatting information and the command data (*e.g.* ‘command will be converted to a command signal’ and ‘sent to the TV’) of a one or more of the plurality of individual command function entries from within the provisioned codeset record that was mapped to the one of the plurality of user input element activated (*e.g.* ‘data structures’ containing ‘a plurality of exemplary functions or commands associated with a plurality of exemplary command signals’).” Pet. 44.

Referencing its arguments for limitations 1[a.2], 1[a.3], 1[a.4], and 1[b.1], Petitioner argues that “Aginsky discloses that activation of a user input element will cause remote device 107-1 to transmit a command communication by using protocol and formatting information and command data.” Pet. 44 (citing Ex. 1004, 8:21–62). Petitioner also asserts that “Aginsky discloses that a user may use remote device 107-1 to enter a command, such as ‘turn TV on,’ by pressing or touching a button on the smartphone’s user interface.” *Id.* (citing Ex. 1004, 8:38–45). “Further,” Petitioner continues, “Aginsky broadly teaches user input elements may be ‘buttons, bars, and arrows, whether hard or programmable, that are physically pushed or touched by the user,’ ‘voice commands,’ or ‘[a]ny type of input from the user.’” *Id.* at 44–45 (citing Ex. 1004, 9:56–65; Ex. 1003 ¶ 148). “Once such a user input is activated,” Petitioner contends, “a

command correlated to the user input is converted to the proper command signal based on the data structure and sent to controllable device 101-1, causing the controllable device 101-1 to execute the command.” *Id.* at 45 (citing Ex. 1004, 8:38–62, 9:61–65; Ex. 1003 ¶ 148).

Additionally, Petitioner argues, “Aginsky discloses that it uses the information in SIGNAL columns 112-1 and 112-1 (*i.e.*, ‘protocol and formatting information’),” as discussed with respect to limitation 1[a.2], “and data transmitted with a SIGNAL (*i.e.*, ‘command data’),” as discussed with respect to limitation 1[a.4]), “related to an activated input element to transmit a command to controllable device 101-1.” Pet. 45 (citing Ex. 1003 ¶ 148).

Patent Owner does not present arguments directed to this limitation. *See* PO Resp. 21–40.

Based on the full trial record, Petitioner has sufficiently proven that the prior art teaches this limitation.

- j) *1[c]: “causing the controlling device to transmit a command communication by using the protocol and formatting information and the command data of a one of the one or more of the plurality of individual command function entries from within the provisioned codeset record having a phonetic representation of the function name or a synonym of the function name which corresponds to voice data provided to a speech recognition engine.”*

Petitioner argues that Aginsky as modified by Stammmler teaches this limitation. Pet. 45. Referencing its arguments for limitations 1[a.6] and 1[a.7], Petitioner asserts that “Stammmler discloses a speech dialog system for automatic control of one or more devices by voice commands which utilizes phonetic representations and synonyms.” *Id.* (citing Ex. 1005, 1:1–20, 2:25–33, 5:65–6:10, 8:53–55, 15:19–16:26; Ex. 1003 ¶ 150). “As part of that

system,” according to Petitioner, “Stammler discloses a microphone . . . that receives voice commands that are converted into digital signals (via an analog/digital, or A/D, converter) with underlying speech data (*i.e.*, ‘voice data’).” *Id.* (citing Ex. 1005, 3:56–58, 11:49–58; Ex. 1003 ¶ 151).

Petitioner contends that “[t]he speech data are then transmitted to a ‘speech recognizer’ (*i.e.*, ‘speech recognition engine’).” *Id.* at 45–46 (citing Ex. 1005, 2:26–54, 11:44–58, 15:15–16:25, Figs. 1–2, claim 1). According to Petitioner, “[t]his allows Stammler’s disclosed system to correlate and recognize speech commands.” *Id.* at 46 (citing Ex. 1005, 2:29–33, Fig. 2; Ex. 1003 ¶ 151).

Patent Owner argues that Petitioner has failed to show that Aginsky in combination with Stammler discloses or suggests a “speech recognition engine.” PO Resp. 31–32, 39–40. Patent Owner acknowledges that “Petitioner asserts that Stammler discloses a ‘speech recognition engine,’” but contends that “Petitioner does not propose modifying Aginsky to have a ‘speech recognition engine.’” *Id.* at 31 (citing Pet. 32, 45–46). Patent Owner further contends that Petitioner has failed “to identify any reason why a [person of ordinary skill in the art] would have modified Aginsky to have a ‘speech recognition engine,’” and that this failure “further confirms that Petitioner has not proposed modifying Aginsky to have a ‘speech recognition engine.’” *Id.* at 31 (citing Pet. 45–46; Ex. 1003 ¶¶ 149–151).

Petitioner responds that “[t]he ’083 specification provides that the speech recognition engine is an appropriately programmed processor” without further explanation, and that “[t]he ’083 claims do not require the speech recognition engine to have any particular components.” Pet. Reply 22 (citing Ex. 1001, 6:24–31). Petitioner argues that Aginsky discloses a

processor with voice processing capacity at the same level of detail as the '083 patent, and Stammer provides more detail by disclosing a “speech recognizer” to correlate and recognize speech commands. *Id.* at 23 (citing Pet. 29–33). Finally, Petitioner also argues that Patent Owner is incorrect when it argues that Petitioner failed to identify when one of ordinary skill would modify Aginsky to include a speech recognition engine because “Aginsky already teaches voice functionality, including the processor and instructions, and explicitly discloses that remote device 107-1 allows for voice command of controllable devices,” and “[t]here need be no motivation to do what is expressly taught.” *Id.* at 26 (citing Pet. 25; PO Resp. 39–40).

Based on the full trial record, we find that Petitioner has sufficiently shown that the combination of Aginsky and Stammer teaches a “speech recognition engine” as claimed. With respect to the “speech recognition engine,” the '083 patent specification discloses that spoken syllables “may be digitized and presented to a speech recognition means for processing and comparison to a phonetic database,” and “all or part of said speech recognition processing may be performed by programming on the controlling device itself.” Ex. 1001, 6:24–31. Based on this disclosure, we agree with Petitioner that the “speech recognition engine” can be satisfied with an appropriately programmed processor for recognizing speech. *See* Pet. Reply 22.

As discussed above, Aginsky discloses having the remote device recognize speech (Ex. 1001, 6:2–6, 9:61–65), and we find that one of ordinary skill would have understood that a suitable means for recognizing the speech, such as an appropriately programmed processor, would have been required. Thus, we find that one of ordinary skill would have found the

use of a “speech recognition engine” to be obvious based on Aginsky. We also find that Stammler teaches a “speech recognition engine” by disclosing that speech data is transmitted to a “speech recognizer” which recognizes speech commands. Ex. 1005, 1, 16–17, 2:30–34, 2:47–52, 3:60–62, 4:14–39, 4:55–5:57, 5:65–6:2; Ex. 1003 ¶ 151. As discussed previously, we find that one of ordinary skill would have been motivated to combine Aginsky and Stammler, and in the resulting combination Stammler’s disclosure of a “speech recognizer” provides further detail concerning the claimed “speech recognition engine.”

Consequently, based on the full trial record, Petitioner has sufficiently shown that the combination of Aginsky and Stammler teaches this limitation.

k) Summary for Claim 1

For the foregoing reasons, Petitioner has proven by a preponderance of the evidence that claim 1 would have been obvious over the combination of Aginsky and Stammler.

5. Claim 12

Claim 12 is similar to claim 1 in many respects, and Petitioner and Patent Owner largely rely on their arguments directed to claim 1 for claim 12. Pet. 46–50; PO Response 32–33. However, claim 12 also recites “a processing device having associated instructions stored on a non-transient readable media which instructions, when executed by the processing device, cause a codeset record to be provisioned to the controlling device for use in commanding functional operations of the target appliance.” Ex. 1001, 12:66–13:4. Petitioner argues that “Aginsky discloses that controllable device 101-1 provisions a codeset record to remote device 107-1, and that

such instructions are used to command the operation of controllable device 101-1.” Pet. 47. According to Petitioner, “Aginsky further discloses that controllable device 101-1 ‘may be any one or combination of various types of processor-controlled programmable electronic devices,’” and “includes processor 102-1 and memory/storage 103-1.” *Id.* (citing Ex. 1004, 4:12–38). Petitioner further contends that “[p]rocessors execute various logical operations of controllable devices and are well-known to operate on an instruction set.” *Id.* (citing Ex. 1004, Fig. 1A; Ex. 1003 ¶¶ 120–151, 183–184).

Patent Owner argues that Petitioner does not address the claim requirement that “a processing device must execute stored instructions that cause a codeset record to be provisioned to a controlling device.” PO Resp. 32–33; PO Sur-reply 19–20. Petitioner responds that “the Petition explains that ‘Aginsky discloses that controllable device 101-1 provisions a codeset record to remote device 107-1’” and “also references sections [1.a]–[1.c], in which the ‘to be provisioned’ limitation is discussed.” Pet. Reply 23 (citing Pet. 47). In these sections, according to Petitioner, “the Petition explains specifically that ‘Aginsky teaches that controllable device 101-1 selects a data structure based upon the brand, model, etc of remote device 107-1, and delivers the data structures to remote device 107-1 through connectivity layer 105.’” *Id.* at 23–24 (citing Pet. 35–36 (citing Ex. 1004, 5:22–38, 8:57–65; Ex. 1003 ¶ 122)).

Based on the full trial record, we find that Petitioner has sufficiently shown that this additional limitation of claim 12 is taught by Aginsky. For these reasons, as well as the reasons previously discussed with respect to claim 1, we find that Petitioner has proven by a preponderance of the

evidence that claim 12 would have been obvious over the combination of Aginsky and Stammeler.

6. Claims 6 and 18

Claims 6 and 18 depend from claims 1 and 12, and further recite “receiving at the speech recognition engine voice data for mapping each of the less than all of the individual command function entries from within the provisioned codeset record to the one or more of the plurality of user input elements of the controlling device.” Ex. 1001, 12:35–40, 14:21–26.

In the Petition, Petitioner relies on its arguments for elements [1.b.1], and [1.c] for this limitation. Pet. 55–56, 59–60. Patent Owner responds that Petitioner “has failed to explain how any received voice data is used for mapping anything, let alone mapping command function entries to user input elements as claimed.” PO Resp. 41. Petitioner responds that the portions of the Petition addressing elements [1.b.1] and [1.c] explain that “Aginsky discloses a plurality of individual command function entries in each row of a data structure,” and that Aginsky’s Figure 1B “shows individual command function entries mapped to user input elements, i.e., buttons listed under ‘CONFIGURATION.’” Pet. Reply 26–27 (citing Pet. 43–44; Ex. 1003 ¶ 144). Petitioner also argues that “Stammeler discloses a system to correlate and recognize speech commands, such as commands corresponding to Aginsky’s ‘CONFIGURATION’ data.” *Id.* at 27 (citing Pet. 45–46).

As discussed with respect to limitation 1[b.1] above, Petitioner has sufficiently shown that the combination of Aginsky and Stammeler discloses “causing less than all of the individual command function entries from within the provisioned codeset record to each be matched to one or more of a plurality of user input elements of the controlling device.” *See* § II.D.4(h),

supra. As discussed with respect to limitation 1[c] above, the Aginsky-Stammler combination also discloses providing “voice data” to “a speech recognition engine” to “caus[e] the controlling device to transmit a command communication by using . . . the command data or a one or more of the plurality of individual command function entries from within the provisioned codeset record having a phonetic representation of the function name or a synonym of the function name.” *See* § II.D.4(j), *supra*. We agree with Petitioner that these operations would include “receiving at the speech recognition voice data,” and that this voice data would be used for mapping the appropriate individual command function entry in the codeset record to the corresponding user input element of the controlling device.

Consequently, Petitioner has proven by a preponderance of the evidence that claims 6 and 18 would have been obvious over the combination of Aginsky and Stammler.

7. *Claims 8–10*

Claim 8 depends from claim 1, and further recites “receiving at a speech recognition engine voice data indicative of at least a brand of the target appliance whereupon the speech recognition engine uses the voice data indicative of at least a brand of the target appliance to identify within a library of codeset records the codeset record that is caused to be provisioned to the controlling device.” Ex. 1001, 12:44–50.

Referencing its argument for limitation 1[c], Petitioner asserts that Aginsky teaches using voice commands to control devices, and Stammler provides the implementation details of receiving a voice command via a microphone, digitizing the voice command, and transmitting a digital signal containing voice data to a speech recognition engine. Pet. 56 (citing

Ex. 1003 ¶¶ 149–151, 173). Petitioner further argues that “Aginsky discloses that remote device 107-1 may control one or more controllable devices 101-1 in the same home entertainment environment,” and that “one well-known way to identify a controllable device is by brand and model.” *Id.* (citing Ex. 1004, 1:26–29, 3:64–4:4, Fig. 1A; Ex. 1003 ¶ 174).

Therefore, according to Petitioner, it would have been obvious to one of ordinary skill “to use voice data associated with at least a brand name of a controllable device 101-1 to identify the controllable device 101-1” and, accordingly, to provision a data structure associated with controllable device 101-1 to remote device 107-1. *Id.* (citing Ex. 1003 ¶ 174).

Petitioner also argues that Aginsky explains that “each controllable device 101-1 may contain multiple data structures (*i.e.*, ‘a library’ of data structures) specialized for “a specific brand, model, or category of remote devices 107-1 to 107-N,”” and that, “[g]iven the existence of voice controls on the remote device, the most straightforward form of selection would be done via voice control.” Pet. 56–57 (citing Ex. 1003 ¶ 175).

“Alternatively,” Petitioner contends, “Aginsky discloses that multiple data structures for different controllable devices 101-1 (*i.e.*, ‘a library’ of data structures) may be transmitted, ‘programmed’ to remote device 107-1, and stored in memory 109-1.” *Id.* at 57 (citing Ex. 1004, 7:58–63; Ex. 1003 ¶ 176). “Where remote device 107-1 is ‘programmed’ with a library of the applicable data structures,” according to Petitioner, it would have been obvious to one of ordinary skill “to use a brand identification to identify the appropriate data structure entry within memory 109-1.” *Id.* (citing Ex. 1003 ¶ 176); *see* Pet. Reply 28–29.

Patent Owner responds that “Aginsky *does not disclose* that controllable device 101-1 (*i.e.*, the alleged ‘target appliance’) stores data structures related to other controllable devices,” but instead “discloses that controllable device 101-1 stores data structures specific to remote devices 107-1 to 107-N and/or to specific users.” PO Resp. 42 (citing Ex. 1004, 5:18–45, Fig. 1C; Ex. 2001 ¶ 133). Patent Owner also argues that “[i]f a user were to provide voice data indicative of a brand of controllable device 101-1, such voice data would not identify a specific data structure within the plurality of data structures stored in controllable device 101-1 because every data structure stored in controllable device 101-1 is related to controllable device 101-1.” *Id.* at 43 (citing Ex. 2001 ¶ 134). “Instead,” according to Patent Owner, “only an indication of a specific remote device or user would identify a data structure within the plurality of stored data structures because the data structures in controllable device 101-1 are specific to remote devices 107-1 to 107-N and/or to specific users.” *Id.* (citing Ex. 2001 ¶ 134; Ex. 1004, 5:18–45, Fig. 1C). “Thus,” Patent Owner contends, “it would not have been obvious to use voice data *indicative of a brand of controllable device 101-1* (*i.e.*, the alleged ‘target appliance’) to identify a data structure within the plurality of data structures stored in controllable device 101-1 to be provisioned to remote device 107-1 (*i.e.*, the alleged ‘controlling device’), as claimed.” *Id.* at 43–44 (citing Ex. 2001 ¶ 134).

Patent Owner further asserts that, “[w]hile Petitioner argues that it would have been obvious ‘to use a brand identification to identify the appropriate data structure entry within memory 109-1,’ Petitioner does not identify any subsequent provisioning of a ‘data structure’ to a controlling device.” PO Resp. 44. “In Petitioner’s example,” according to Patent

Owner, “the data structures (*i.e.*, the alleged ‘codeset records’) have already been provisioned to memory 109-1 of remote device 107-1 (*i.e.*, the alleged ‘controlling device’).” *Id.* (citing Pet. 57; Ex. 2001 ¶¶ 137–138). Finally, Patent Owner contends that “Petitioner does not explain *why* it allegedly would have been obvious to use a brand identification to identify a data structure in memory.” *Id.* at 45 (citing Pet. 57).

Based on the full trial record, we find that Petitioner has not sufficiently shown that the Aginsky-Stammler combination teaches using voice data indicating a brand of the target appliance to identify within a library of codeset records the codeset record that is caused to be provisioned to the controlling device. Petitioner and Mr. McNair assert that Aginsky’s remote device may control one or more controllable devices in the same home entertainment environment, and that one way of identifying a controllable device is by brand and model. Pet. 56; Ex. 1003 ¶ 174. Petitioner and Mr. McNair also assert that Aginsky discloses that multiple data structures may be transmitted to remote device 107-1 and stored in memory. Pet. 56–57; Ex. 1003 ¶ 176. However, neither Petitioner nor Mr. McNair explain with sufficient specificity how, in the proposed combination, the voice data indicative of at least a brand of the target appliance is used to identify the codeset record “that is caused to be provisioned to the controlling device,” or what the motivation would be to make a combination that would achieve this claim element. Pet. 56–57; Pet. Reply 28–29; Ex. 1003 ¶¶ 172–176. Consequently, Petitioner has failed to prove by a preponderance of the evidence that claim 8 would have been obvious over the Aginsky-Stammler combination. Because claims 9 and 10

depend on claim 8, Petitioner also has failed to prove that claims 9 and 10 would have been obvious over this combination as well.

8. *Claims 13–14*

Claim 13 depends from claim 12, and further recites that “the instructions are downloaded to the controlling device in a downloadable app.” Ex. 1001, 14:3–5.

Petitioner argues that Aginsky discloses transferring the data structure to “a remote control application (‘app’).” Pet. 58 (citing Ex. 1004, code (57), 2:31–36, 7:36–57; Ex. 1004 ¶ 204). Petitioner also points to Aginsky’s disclosure that the user of the remote device may “download from a third party (typically an ‘app store’) a control application that is designed to control controllable devices,” and that this app “is stored in a memory . . . on remote device 107-1 and runs on a processor . . . also contained on [the] remote device.” *Id.* (citing Ex. 1004, 7:36–43; Ex. 1003 ¶ 205).

Patent Owner responds that the claim requires that “instructions” are “downloaded to the controlling device in a downloadable app,” and that these instructions must, when “executed by the processing device, cause a codeset record to be provisioned to the controlling device.” PO Resp. 45. According to Patent Owner, “Petitioner does not assert—and provides no evidence to demonstrate—that the claimed ‘instructions’ are ‘downloaded to the controlling device in a downloadable app.’” *Id.* at 45–46 (citing Pet. 48; Ex. 1003 ¶¶ 203–206). Petitioner responds that Patent Owner fails to explain why “Aginsky’s disclosure of downloading the *application* is distinct from the ’083’s downloading *instructions*.” Pet. Reply 29 (emphasis in original).

As Patent Owner points out, claim 13 requires that what is downloaded to the controlling device in a downloadable app are the “instructions” referenced in claim 12. Ex. 1001, 14:3–5. Claim 12 states that these “instructions, when executed by the processing device, cause a codeset record to be provisioned to the controlling device.” *Id.* at 12:66–13:2. Aginsky discloses that the controllable device transfers to a remote control application (“app”) on the remote device “a data structure identifying various functions that can be controlled by a remote device, together with the identity of the signal type that will achieve the desired operation.” Ex. 1004, code (57); *see id.* at 2:31–36, 7:36–57. As discussed above, Petitioner’s argument is that Aginsky’s controllable device selects and delivers a data structure to an app on the remote (controlling) device, and thus the instructions for provisioning the data structure to the app would presumably reside on the controllable device. Pet. 35–36. But claim 13 requires that the instructions for provisioning the data structure are downloaded to the controlling device and not to the controllable device. Petitioner does not explain how Aginsky teaches downloading to an app on the controlling device instructions that “cause a codeset record to be provisioned to the controlling device.” Pet. 58; Pet. Reply 29–30; Ex. 1003 ¶¶ 203–206.

Consequently, Petitioner has failed to prove by a preponderance of the evidence that claim 13 would have been obvious over the Aginsky-Stammler combination. Because claim 14 depends on claim 13, Petitioner also has failed to prove that claim 14 would have been obvious over this combination as well.

9. Claims 2–5 and 15–17

Petitioner contends that claims 2–5 and 15–17 are unpatentable over Aginsky in view of Stammler. Pet. 46–60. Patent Owner relies on its arguments concerning claims 1 and 12 for these claims. *See* PO Resp. 21–46. Based on the full trial record, we agree with and adopt Petitioner’s arguments concerning these claims. Based on these arguments, and the supporting evidence, we find that Petitioner has proven by a preponderance of the evidence that claims 2–5 and 15–17 are unpatentable over Aginsky in view of Stammler.

E. Ground 2: Obviousness of Claims 7, 11, and 19 Based on Aginsky, Stammler, and Dresti

Petitioner contends that dependent claims 7, 11, and 19 would have been obvious over Aginsky in view of Stammler and Dresti. Pet. 60–66; Pet. Reply 28. Patent Owner disagrees. PO Resp. 46–48; PO Sur-reply 25–26.

1. Overview of Dresti (Ex. 1007)

Dresti discloses a universal remote control application resident on a handheld electronic device. Ex. 1007 ¶ 2. Dresti also discloses providing a remote control with a world-wide IR code database that may be used in many international locations. *Id.* ¶ 321. As shown in Figures 23a and 23b, the device may present a drop-down list 230 from which various regions may be selected and, based on this input, the behavior of the remote control application may be adjusted to more closely match the region in which it is being used. *Id.* ¶ 321, Figs. 23a, 23b.

2. *Claims 7, 11, and 19*

Claim 7 depends from claim 1, and recites “using at least location data to identify the codeset record that is caused to be provisioned to the controlling device.” Ex. 1001, 12:41–43. Claims 11 and 19 include similar limitations. *Id.* at 12:59–62, 14:27–29.

Petitioner argues that Stammler discloses that “a plurality of functions for each language can be operated.” Pet. 64 (citing Ex. 1005, 6:33–35; Ex. 1003 ¶ 224). Petitioner acknowledges that “neither Aginsky nor Stammler explicitly disclose using location data to identify the codeset record,” but asserts that Dresti “teaches a universal remote provisioned with particular code sets after a user selects an appropriate region (*i.e.*, indicates the ‘location data’).” *Id.* (citing Ex. 1005, 6:33–35; Ex. 1007 ¶ 321; Ex. 1003 ¶¶ 224–225). Petitioner also contends that “Dresti teaches the general proposition that it was advantageous and well-known for location data to be used when selecting universal remote control codesets,” and that it would have been obvious to a person of ordinary skill “to implement Aginsky’s methods and systems as modified by Stammler to thus include location data—either as a threshold selection on its own GUI, or implemented as a component of the brand selection process.” *Id.* at 65–66 (citing Ex. 1004, 1:15–2:15; Ex. 1005, 2:18–25; Ex. 1003 ¶ 226).

Patent Owner responds that “Dresti does not teach provisioning code sets to the remote control application based on the selection of a region.” PO Resp. 47 (citing Ex. 2001 ¶ 148). To the contrary, Patent Owner asserts, “Dresti’s remote control application is *shipped* with a comprehensive ‘world-wide IR code database,’” and “[t]he selection of a region does not cause additional code sets or code databases to be provisioned to the remote control application.” *Id.* Patent Owner further contends that Petitioner fails

to explain how Aginsky would be combined with Stammler and Dresti to arrive at the claimed invention, and does not explain how “location data” would be used in the Aginsky-Stammler combination to identify a codeset record that is caused to be provisioned to a controlling device. *Id.* at 47–48 (citing Pet. 65). Indeed, according to Patent Owner, Aginsky’s codeset records “are specific to remote devices 107-1 to 107-N and/or to specific users” and “[l]ocation data’ would not identify any of these alleged codeset records” because “only an indication of a specific remote device or user would.” *Id.* (citing Ex. 1004, 5:18–45, Fig. 1C; Ex. 2001 ¶ 149).

Petitioner responds that Patent Owner is attacking the references individually rather than Petitioner’s combination because Petitioner relies on Aginsky to disclose provisioning the data structure to the remote device, and Dresti for teaching location data for selecting universal remote control presets. Pet. Reply 28 (citing PO Resp. 46–48, 57; Pet. 35–36, 64–65). Petitioner also asserts that “provisioning” does not require a particular process, and “may comprise downloading the data itself, supply of a pointer to an entry in a local database, etc.” *Id.* (citing Pet. 35 n.6). Patent Owner responds that Dresti does not teach using location data to select codesets, but rather teaches using location data to select remote “presets,” such as language or key layout. PO Resp. 25–26 (citing Pet. 65; Ex. 1007 ¶ 321; Ex. 2001 ¶¶ 147–148).

Based on the full trial record, we find that Petitioner has not sufficiently shown that the combination of Aginsky, Stammler, and Dresti teaches this limitation. Petitioner acknowledges that neither Aginsky nor Stammler explicitly disclose using location data to identify a codeset record. Pet. 64; Ex. 1003 ¶ 224. Petitioner argues that paragraph 321 of Dresti

“teaches a universal remote provisioned with particular code sets after a user selects an appropriate region (*i.e.*, indicates the ‘location data’),” but Dresti does not contain this teaching. Paragraph 321 of Dresti discloses that “[t]he remote control application may be shipped with a world-wide IR code database” and “may thus support localization, for both language as well as key layout variations to support regional settings.” Ex. 1007 ¶ 321. Based on the user’s selection of a region, Dresti explains, “the behavior of the remote control application may be adjusted to more closely match the region in which it is being used.” *Id.* “For example,” Dresti discloses, “the order in which IR device codes are presented to the user for testing . . . during device setup may be varied from region to region in order to place the most likely (*i.e.*, most popular in that country or region) codes at the top of the list.” *Id.* “Furthermore,” according to Dresti, “even within the same IR code set, functionality and key assignments may also vary by region and may be automatically adjusted based upon the region selected.” *Id.*

Based on these disclosures, we agree with Patent Owner and Dr. Scordilis that paragraph 321 of Dresti discloses that the remote is shipped with the world-wide IR database (which, presumably, would correspond to the codeset record), and the user’s selection of a region merely adjusts the behavior of the device, such as the way the codes are displayed and the functionality and key assignments. Ex. 1007 ¶ 321; Ex. 2001 ¶ 148. Paragraph 321 of Dresti does not disclose or suggest that a particular codeset to be provisioned is identified using the data resulting from the user selection of a region. *Id.*

We also do not agree with Petitioner that Patent Owner’s argument in this regard amounts to an improper attack on the individual references rather

than the combination. Pet. Reply 28. In its Reply, Petitioner argues that “Aginsky discloses provisioning the data structure to the remote device, while Dresti teaches location data for selecting universal control presets.” *Id.* Petitioner cites back to pages 64–65 of the Petition, but those pages rely on Petitioner’s unsupported argument that paragraph 321 of Dresti teaches a universal remote provisioned with particular code sets after a user selects an appropriate region. *See* Pet. 64 (Dresti “further teaches a universal remote provisioned with particular code sets after a user selects an appropriate region (*i.e.*, indicates the ‘location data’).”), 65 (“Dresti teaches the general proposition that it was advantageous and well-known for location data to be used when selecting universal remote control codesets.”). Petitioner also cites to pages 35–36 of the Petition, but those pages merely discuss Aginsky’s disclosures of causing a codeset to be provisioned to the controlling device for use in commanding functional operations of the target appliance and, as Petitioner acknowledges, say nothing about the provisioning of a codeset based on selection of a region or other location information. Pet. 35–36; Pet. Reply 28. Furthermore, neither Petitioner nor Mr. McNair explains with any specificity how one of ordinary skill would have combined Dresti’s teaching that a user’s selection of a region adjusts the behavior of the device (such as the way the codes are displayed and the functionality and key assignments), with the disclosures of Aginsky and Stammler to teach that a particular codeset to be provisioned is identified using the data resulting from the user selection of a region. *See* Pet. 35–36, 64–66; Pet. Reply 28; Ex. 1003 ¶¶ 223–226.

Consequently, Petitioner has failed to prove by a preponderance of the evidence that claims 7, 11, and 19 would have been obvious over the combination of Aginsky, Stammler, and Dresti.

F. Ground 3 (Obviousness of Claims 1–6, 8–10, and 12–18 Based on Aginsky in View of Hanson) and Ground 4 (Obviousness of Claims 7, 11, and 19 Based on Aginsky in view of Hanson and Dresti)

Petitioner contends that claims 1–6, 8–10, and 12–18 would have been obvious over Aginsky in view of Hanson, and that claims 7, 11, and 19 would have been obvious based on Aginsky in view of Hanson and Dresti. Pet. 66–80.

With respect to claims 1–6 and 12, and 15–17, we have found that these claims have been proven to be unpatentable based on the combination of Aginsky and Stammler, as discussed above. We therefore need not address whether these claims are also unpatentable over Aginsky in view of Hanson.

With respect to claims 8–10, Petitioner relies on Aginsky rather than Stammler in Ground 1 to teach using voice data indicating a brand of the target appliance to identify within a library of codeset records the codeset record that is caused to be provisioned to the controlling device. Pet. 56–57. As explained above, we are not persuaded by these arguments. *See* § II.D.7, *supra*. Petitioner relies on these same arguments for claims 8–10 in Ground 3, and does not point to any disclosure from Hanson for the limitations of these claims. Pet. 79–80. For the reasons discussed above for Ground 1, we find that Petitioner has failed to prove by a preponderance of the evidence that the proposed combination teaches the limitations of claims 8–10. *See* § II.D.7, *supra*.

With respect to claims 13–14, Petitioner similarly relies on Aginsky rather than Stammler in Ground 1. Pet. 58–59. As discussed above, we are not persuaded by these arguments. *See* § II.D.8, *supra*. Petitioner relies on these same arguments for claims 13–14 in Ground 2 and does not point to any disclosure from Hanson for the limitations of these claims. For the reasons discussed above for Ground 1, we find that Petitioner has failed to prove by a preponderance of the evidence that the proposed combination teaches the limitations of these claims. *See* § II.D.8, *supra*.

For Ground 4, Petitioner relies on the same arguments as for Ground 2 that Dresti teaches using location data to identify the codeset record, and the same reasons for combining Dresti with the other references. Pet. 80. Petitioner does not point to any disclosure from Hanson for these claims. *Id.* For the reasons discussed above for Ground 1, we find that Petitioner has failed to prove by a preponderance of the evidence that the proposed combination teaches the limitations of these claims. *See* § II.E.2, *supra*.

G. Petitioner’s Argument That Dr. Scordilis’s Declaration Lacks Supporting Detail

Citing *Xerox Corp. v. Bytemark, Inc.*, IPR2022-00624, Paper 9, 15 (PTAB, Aug. 24, 2022), Petitioner argues that Dr. Scordilis’s declaration should be given little weight because it “essentially parrots [Patent Owner’s] brief” and “is little more than a verbatim repetition” of the Patent Owner Response. Pet. Reply 30 (citing Ex. 1045). Patent Owner disagrees, arguing that Dr. Scordilis “provides an in-depth, technical analysis of the asserted prior art references and Petitioner’s arguments regarding the same.” PO Sur-reply 28 (citing Ex. 2001). Patent Owner also argues that Petitioner’s argument “is belied by the sheer volume of redlines throughout the comparison document.” *Id.* (citing Ex. 1045).

Xerox v. Bytemark states that assertions in an expert declaration that are “conclusory and unsupported” are “entitled to little weight.” *Xerox* at 15. Based on that decision, we understand the weight to be given to an expert’s opinions focuses on the degree to which those opinions are supported by technical reasoning and evidence, rather than focusing on a word-by-word comparison of the declaration with the accompanying brief to determine how many words overlap. *Id.* In evaluating the declaration of Dr. Scordilis, we have considered each of Dr. Scordilis’s opinions and given them the amount of weight that we deem appropriate based on their level of detail, technical reasoning, evidentiary support, and consistency with the trial record, among other factors.

III. CONCLUSION

For the reasons discussed above, Petitioner has proven, by a preponderance of the evidence, that the challenged claims are unpatentable, as summarized in the following table:⁶

Claim(s)	35 U.S.C. §	Reference(s)/Basis	Claims Shown Unpatentable	Claims Not Shown Unpatentable
1–6, 8– 10, 12– 18	103	Aginsky, Stammeler	1–6, 12, 15– 18	8–10, 13–14
7, 11, 19	103	Aginsky, Stammeler, Dresti		7, 11, 19
1–6, 8– 10, 12– 18 ⁷	103	Aginsky, Hanson		8–10, 13–14
7, 11, 19	103	Aginsky, Hanson, Dresti		7, 11, 19
Overall Outcome			1–6, 12, 15– 18	7–11, 13–14, 19

⁶ Should Patent Owner wish to pursue amendment of the challenged claims in a reissue or reexamination proceeding subsequent to the issuance of this decision, we draw Patent Owner’s attention to the April 2019 *Notice Regarding Options for Amendments by Patent Owner Through Reissue or Reexamination During a Pending AIA Trial Proceeding*. See 84 Fed. Reg. 16,654 (Apr. 22, 2019). If Patent Owner chooses to file a reissue application or a request for reexamination of the challenged patent, we remind Patent Owner of its continuing obligation to notify the Board of any such related matters in updated mandatory notices. See 37 C.F.R. § 42.8(a)(3), (b)(2).

⁷ Because we determine that Petitioner has proven that claims 1–6, 12, and 15–18 are unpatentable over Aginsky and Stammeler, we need not consider whether these claims are also unpatentable over Aginsky and Hanson.

IV. ORDER

Accordingly, it is

ORDERED that claims 1–6, 12, and 15–18 of the '083 patent have been proven by a preponderance of the evidence to be unpatentable;

FURTHER ORDERED that claims 7–11, 13–14, and 19 have not been proven by a preponderance of the evidence to be unpatentable; and

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

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