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Paper 11
Date: December 11, 2024

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SAMSUNG ELECTRONICS CO., LTD. and
SAMSUNG ELECTRONICS AMERICA, INC.,
Petitioner,

v.

MAXELL, LTD.,
Patent Owner.

IPR2024-00907
Patent 10,129,590 C1

Before KEVIN C. TROCK, JASON W. MELVIN, and FREDERICK C. LANEY, *Administrative Patent Judges*.

LANEY, *Administrative Patent Judge*.

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

I. INTRODUCTION

Samsung Electronics Co. Ltd. and Samsung Electronics America, Inc. (collectively, "Petitioner") filed a Petition, Paper 3 ("Pet." or "Petition"), to institute an *inter partes* review of claims 1, 4, 5, 8–12, and 14–25 (the "challenged claims") of U.S. Patent No. 10,129,590 C1 (Ex. 1004, "the '590 patent"). Maxell, Ltd. ("Patent Owner") timely filed a Preliminary Response, Paper 7 ("Prelim. Resp."). With our authorization (Ex. 3002), Petitioner filed a Preliminary Reply, Paper 9 ("Prelim. Reply"), and Patent Owner filed a Preliminary Sur-reply, Paper 10 ("Prelim. Sur-reply").

An *inter partes* review may not be instituted "unless . . . there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition." 35 U.S.C. § 314(a). Upon consideration of the Petition, the Preliminary Response, and the evidence of record, we determine that Petitioner has shown a reasonable likelihood that it would prevail in showing the unpatentability of at least one of the challenged claims. Accordingly, we institute an *inter partes* review.

II. BACKGROUND

A. Real Party in Interest

Petitioner identifies Samsung Electronics Co. Ltd. and Samsung Electronics America, Inc. as the real parties in interest. Pet. 74. Patent Owner identifies itself as the real party in interest. Paper 5, 1.

B. Related Proceedings

According to the parties, the '590 patent is the subject of the following action: *Maxell, Ltd. v. Samsung Electronics Co. Ltd. and Samsung Electronics America, Inc.*, No. 5:23-cv-00092-RWS (E.D. Tex.) (the "District Court Litigation"). Pet. 75; Paper 5, 1. The parties also identify

the IPR petition in IPR2024-00906 that Petitioner has filed against U.S. Patent No. 11,445,241, which is related to the '590 patent. *Id.*

C. The '590 Patent (Ex. 1004)

The '590 patent relates to "a technique to establish connections between a plurality of apparatuses and networks by radio." Ex. 1004, 1:15–17.[1] According to the '590 patent, "it is possible to communicate with a network while displaying videos of high picture quality obtained by a video processing apparatus." *Id.* at 2:39–42.

Figure 10 of the '590 patent is reproduced below.

FIG. 10

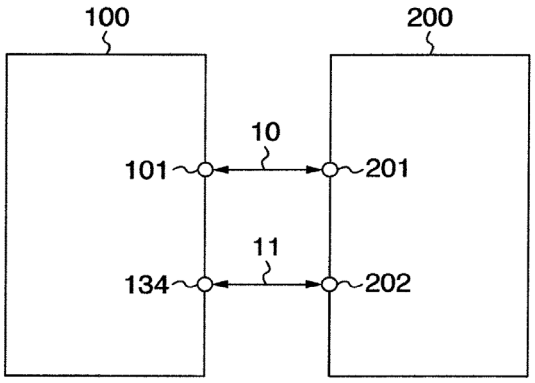


Figure 10 depicts connections between video processing apparatus 100 and video display apparatus 200. Ex. 1004, 3:7–9. For example, video processing apparatus 100 is a portable video processing apparatus, such as "a digital camera, a video camera, a cellular phone, a game machine, or a personal media player." *Id.* at 3:24–25, 3:44–46. According to the '590 patent, video processing apparatus 100 and video display apparatus 200 are

[1] Citations to the Specification refer to the original column and line numbers of the '590 patent; whereas the citations to the claims that resulted from reexamination of the '590 patent refer to the column and line numbers of the reexamination certificate.

connected via bidirectional interface 10 and "a video signal of high picture quality and other information items and signals can be bidirectionally communicated therebetween." *Id*. at 3:22–34. The '590 patent further describes that "between a terminal 134 of the video processing apparatus 100 and a terminal 202 of the video display apparatus 200, signals from the internet and a home network are communicated by radio." *Id*. at 3:34–38. According to the '590 patent, "[t]he frequency bands used for the transmission between the terminals 134 and 202 are limited to predetermined frequency bands" in order to "increase[] the radio wave resource efficiency and prevent[] the problem of interference with other apparatuses." *Id*. at 3:38–42.

Figure 1 of the '590 patent is reproduced below.

FIG. 1

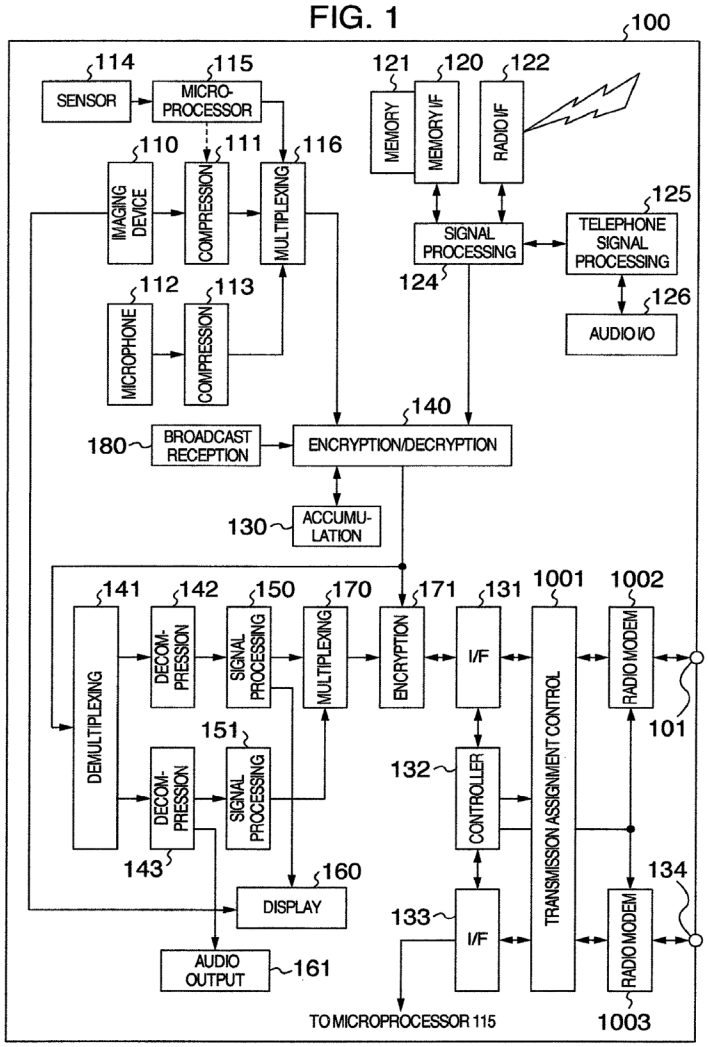


Figure 1 depicts an example of video processing apparatus 100. Ex. 1004, 3:47–49. According to the '590 patent, radio modem circuit 1002 "is a first radio communication unit which wirelessly sends video information and audio information to the external video display apparatus 200 and which receives data and information by radio therefrom." *Id.* at 7:48–52. Radio modem circuit 1003 "is a second radio communication unit which connects to (accesses) a network, e.g., the Internet or a home network to wirelessly communicate various information including video signals, audio signals, and data therewith." *Id.* at 7:55–59. The '590 patent explains that "controller 132 controls distribution of the radio transmission rate of each modem by

controlling the transmission rate assignment controller 1001," which "variably set[] the modulation/demodulation methods, the frequency bands, and the number of carriers respectively for the modems 1002 and 1003." *Id.* at 7:59–8:2.

According to the '590 patent, "controller 132 and the transmission rate assignment controller 1001 control the radio transmission assignment such that the radio transmission rate of the modem 1002 to send the video information of high picture quality by radio to the video display apparatus 200 takes precedence over the radio transmission rate of the modem 1003 to connect to a network for communication," such that "the radio transmission rate of the modem 1002 is more than that of the modem 1003." Ex. 1004, 8:7–15.

Figure 9 of the '590 patent is reproduced below.

FIG. 9

SCHEME	SCHEME 1	SCHEME 2
BANDWIDTH	6MHz	6MHz
CARRIER MODULATION SCHEME	64QAM	QPSK
CONVOLUTION CODE	3/4	2/3
GUARD INTERVAL	1/8	1/8
TRANSMISSION CAPACITY	17Mbps	5Mbps

Figure 9 shows an example of different transmission parameters of a radio modem. Ex. 1004, 3:5–6. For example, controller 132 sets the transmission scheme of modem 1002 to "scheme 1" and the transmission scheme of modem 1003 to "scheme 2" as shown in Figure 9 "in a situation wherein the modem 1002 transmits video information to the display apparatus 200 and the modem 1003 simultaneously connects to the Internet to receive Internet

information." *Id.* at 8:15–19. In this way, a higher transmission rate is assigned to the communication with the display apparatus 200 and the user continuously views videos with high picture quality on the display apparatus. *Id.* at 8:24–32.

Figure 4 of the '590 patent is reproduced below.

FIG. 4

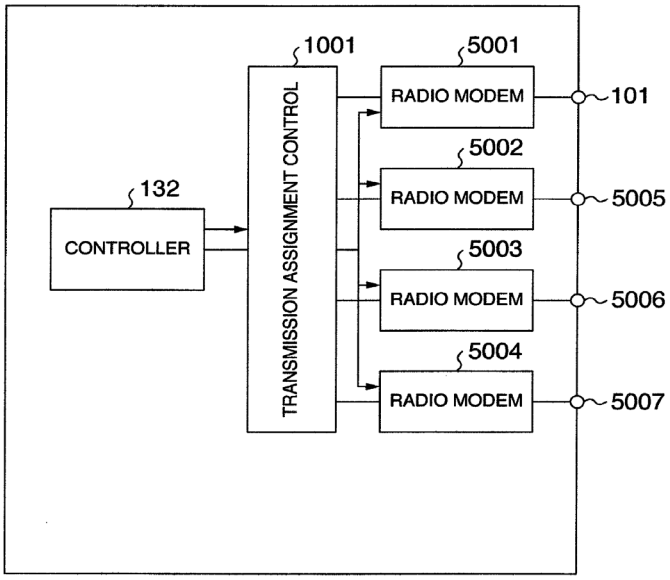


Figure 4 depicts a part of the system associated with the transmission rate assignment control in another example of the transmission rate assignment controller and the radio modem. Ex. 1004, 8:62–65. In Figure 4, "radio modem circuits 5001 to 5004 are modems having respective fixed transmission capacity values and differ from each other only in the frequency band for transmission." *Id.* at 9:1–4. According to the '590 patent, modems 5001 to 5004 may be appropriately combined in operation. *Id.* at 9:7–9. For example, when "a wide band is required to transmit video information of high picture quality (e.g., video information of HD resolution), the modems 5001 to 5003 are assigned to send video information and only the modem 5004 is assigned to communicate with the

network such as the Internet," such that "interface circuit 131 transmits video and audio information by radio via the modems 5001 to 5003 to the display apparatus 200, and the interface circuit 133 communicates with the network via the modem 5004." *Id*. at 9:18–27. As a result, the '590 patent explains, "video information of high picture quality can be continuously transmitted and it is also possible to communicate with the Internet." *Id*. at 9:28–30.

D. Challenged Claims

Petitioner challenges claims 1, 4, 5, 8–12, and 14–25 of the '590 patent. Pet. 1. Claims 1, 5, 9, 10, and 23 are independent. Claim 1 is directed to "[a] video processing apparatus"; claim 5 is directed to "[a] display apparatus"; claim 9 is directed to "[a] method for video processing"; claim 10 is directed to "[a] method"; and claim 23 is directed to "[a] cellular phone." Ex. 1004, 1:23, 2:16, 3:1, 3:50, 5:18. Claim 1 is generally illustrative and reproduced below.

[1pre][2] A video processing apparatus, comprising:

[1a] a first radio communication circuit implementing a first transmission scheme having a first modulation scheme and a first transmission frequency band, the first radio communication circuit capable of transmitting video information by radio or receiving information by radio using the first transmission frequency band;

[1b] a second radio communication circuit implementing a second transmission scheme having a second modulation scheme different from the first modulation scheme and a second transmission frequency band different from the first transmission frequency band, the second radio communication circuit capable of connecting by radio to an internet or a home network to transmit and receive

[2] Alpha-numerical designation adopted by Petitioner. *See* Pet. vi–xii.

information using the second transmission frequency band;

[1c] a third radio communication circuit capable of transmitting information and using a third transmission frequency band;

[1d] an imaging circuit capable of receiving video information and still picture information via an optical system;

[1e] a compression circuit compressing the still picture information using a first type of compression method and the video information using a second type of compression method;

[1f] an input device capable of receiving a user indication;

[1g] an accumulation circuit capable of accumulating video information received by the imaging circuit after the video information is compressed by the compression circuit; and

[1h] a controller controlling assignment of connection of each of the first, second, and third radio communication circuits,

[1i] wherein the first radio communication circuit can transmit video information accumulated in the accumulation circuit to an external device by radio,

[1j] wherein the controller controls assignment of connection for each of the first and second radio communication circuit in response to receiving an indication from a user such that when an indication from a user indicates to transmit video information using the first radio communication circuit, the controller assigns a connection to the first radio communication circuit for transmitting the video information,

[1k] wherein the controller controls each of the first and second radio communication circuit so that the first radio communication circuit transmits video information and the second radio communication circuit connects to the internet or the home network simultaneously, and

> [1l] wherein the first or third radio communication circuits receives a signal from the internet indicating that an update for an operating system of the video processing apparatus is available, and the video processing apparatus executes an update process such that an updated operating system of the video processing apparatus is stored in the video processing apparatus after execution of the update process.

Ex. 1004, 1:23–2:14.

E. Evidence

Petitioner relies upon the following evidence:

(1) U.S. Patent Application Publication No. US 2006/0258289 A1, published November 16, 2006 ("Dua") (Ex. 1008);

(2) U.S. Patent No. 7,149,508 B2, issued December 12, 2006 ("Herle") (Ex. 1009);

(3) Nokia N93 User Guide ("N93") (Ex. 1010);

(4) U.S. Patent Application Publication No. US 2006/0128332 A1, published June 15, 2006 ("Rooyen") (Ex. 1011);

(5) U.S. Patent Application Publication No. US 2006/0274704 A1, published December 7, 2006 ("Desai") (Ex. 1012);

(6) Specification of the Bluetooth System, Master Table of Contents & Compliance Requirements, Covered Core Package version: 2.0 + EDR, Current Master TOC issued: November 4, 2004 ("BT-Spec") (Ex. 1014);

(7) 3GPP TS 36.211 V0.2.1 (2006-11) Technical Specification ("3GPP-Spec") (Ex. 1015);

(8) U.S. Patent Application Publication No. US 2004/0264600 A1, published December 30, 2004 ("Kao") (Ex. 1013); and

(9) Declaration of Dr. Charles D. Creusere (Ex. 1002).

In the Preliminary Response, Patent Owner relies on the Declaration

of Mr. Bruce McNair (Ex. 2009).

F. Asserted Grounds of Unpatentability

Claims Challenged	35 U.S.C. §	References
1, 4, 5, 8–12, 14–25	103(a)[3]	N93, Dua, Herle
1, 4, 5, 8–12, 14–25	103(a)	N93, Dua, Herle, Rooyen, Desai, BT-Spec, 3GPP-Spec, Kao
1, 4, 5, 8–12, 14–25	103(a)	Dua, Herle
1, 4, 5, 8–12, 14–25	103(a)	Dua, Herle, N93
1, 4, 5, 8–12, 14–25	103(a)	Dua, Herle, N93, Rooyen, Desai, BT-Spec, 3GPP-Spec, Kao

Pet. 1.

III. ANALYSIS

A. 35 U.S.C § 325(d)

Patent Owner contends that "[t]he Petition should be denied pursuant to 35 U.S.C. § 325(d) because the petition argues the 'same or substantially the same art previously [] presented to the Office' and fails to demonstrate 'that the Office erred in a manner material to the patentability of the challenged claims.'" Prelim. Resp. 2 (quoting *Advanced Bionics, LLC v. MED-EL Elektromedizinische Geräte GmbH*, IPR2019-01469, Paper 6, 8 (PTAB Feb. 3, 2020) (precedential)). In particular, Patent Owner argues that

> Dua—was previously considered by the Office during the reexamination of the '590 Patent, and considered during proceedings related to the '590 Patent. BT-Spec was also

[3] The '590 patent claims priority to several applications filed before the March 16, 2013 effective date of the §103 provisions in the Leahy-Smith America Invents Act ("AIA"), Pub. L. No. 112-29. Ex. 1004, code (63). Accordingly, we cite to pre-AIA § 103(a).

> considered during reexamination of the '590 Patent and considered during applications related to the '590 Patent through multiple disclosures of Bluetooth technology. The remaining main reference, N93, is cumulative to references considered by the Office.

Prelim. Resp. 3–4, *see also id.* at 4–11. Patent Owner also argues that Petitioner fails to demonstrate a material error by the office. *Id.* at 11–12.

Petitioner argues that "the combinations of N93, Dua, and Herle was not previously considered." Pet. 74. Petitioner also argues that "the examiner erred in allowing the claims during reexamination without performing a proper prior art search for the added 'software update' limitation." *Id.* (citing Ex. 1006, 33–39).

1. Legal Standard

Under § 325(d), we have discretion to deny a petition that presents the same or substantially the same prior art or arguments as previously presented to the Office. In evaluating whether the factual predicate under § 325(d) is met, we consider a number of non-exclusive factors, as set forth in *Becton, Dickinson & Co. v. B. Braun Melsungen AG*, IPR2017-01586, Paper 8 at 17–18 (PTAB Dec. 15, 2017) (Institution Decision) (precedential as to Section III.C.5, first paragraph) ("*Becton Dickinson* factors"):

> (a) the similarities and material differences between the asserted art and the prior art involved during examination;
>
> (b) the cumulative nature of the asserted art and the prior art evaluated during examination;
>
> (c) the extent to which the asserted art was evaluated during examination, including whether the prior art was the basis for rejection;
>
> (d) the extent of the overlap between the arguments made during examination and the manner in which Petitioner relies on the prior art or Patent Owner distinguishes the prior art;

> (e) whether Petitioner has pointed out sufficiently how the Examiner erred in its evaluation of the asserted prior art; and
>
> (f) the extent to which additional evidence and facts presented in the Petition warrant reconsideration of the prior art or arguments.

Becton, Dickinson, IPR2017-01586, Paper 8 at 17–18.

In performing an analysis under § 325(d), the Board uses the following two-part framework:

> (1) whether the same or substantially the same art previously was presented to the Office or whether the same or substantially the same arguments previously were presented to the Office; and (2) if either condition of first part of the framework is satisfied, whether the petitioner has demonstrated that the Office erred in a manner material to the patentability of challenged claims. . . . If, after review of [*Becton Dickinson*] factors (a), (b), and (d), it is determined that the same or substantially the same art or arguments previously were presented to the Office, then factors (c), (e), and (f) relate to whether the petitioner has demonstrated a material error by the Office.

Advanced Bionics, LLC v. MED-EL Elektromedizinische Geräte GmbH, IPR2019-01469, Paper 6 at 8, 10 (PTAB Feb. 13, 2020) (Institution Decision) (precedential) (footnote omitted). Consequently, we first turn to an analysis of *Becton Dickinson* factors (a), (b), and (d) to determine whether the same or substantially the same art previously was presented to the Office or whether the same or substantially the same arguments previously were presented to the Office.

2. Advanced Bionics – Part One

Becton Dickinson factors (a), (b), and (d) require us to determine, respectively: (a) "the similarities and material differences between the asserted art and the prior art involved during examination;" (b) "the

cumulative nature of the asserted art and the prior art evaluated during examination," and (d) "the extent of the overlap between the arguments made during examination and the manner in which Petitioner relies on the prior art or Patent Owner distinguishes the prior art." *Becton, Dickinson*, IPR2017-01586, Paper 8 at 17.

Patent Owner argues that "Dua . . . was extensively considered during reexamination of the '590 Patent." Prelim. Resp. 5 (citing Ex. 1006, 320, 361, 375). Patent Owner also argues that Petitioner's declarant, Dr. Creusere, "submitted a similar declaration on behalf of the third-party requestor supporting the '590 Patent reexamination," and that "the Examiner considered Dr. Creusere's declaration and presentation of Dua to the Office as relevant prior art." Prelim. Resp. 5 (citing Ex. 1006, 361, 375, 390). Patent Owner argues that "[t]he Examiner further considered Dr. Creusere's opinions that WCDs such as described in Dua purportedly included multiple radio transceivers in a single unit," and that "Dua was extensively considered by the Examiner during the reexamination of the '590 Patent." Prelim. Resp. 5–6 (citing Ex. 1006, 375–376).

The record indicates, however, that the request for *ex parte* reexamination of the '590 patent was based on the Tee (Ex. 2005) and Honkanen (Ex. 2006) references, not Dua. *See* Ex. 1006, 1010. Dr. Creusere simply listed Dua along with 22 other references (*see* Ex. 1006, 361–362) and string cited Dua when describing wireless communication devices (WCDs) at the time having multiple radio transceivers and being capable of processing and communicating digital media content to other devices (*see* Ex. 1006, 375). Indeed, the Examiner expressly indicates that Tee and Honkanen were relied upon during reexamintion (*see* Ex. 1006, 31),

but Dua is not mentioned or relied upon by the Examiner in the Notice of Intent to Issue *Ex Parte* Reexamination Certificate. *See* Ex. 1006, 14–40.

Patent Owner also argues that N93 "is cumulative to the art and arguments presented to the Office during reexamination of the '590 Patent, particularly Dua." Prelim. Resp. 6. Patent Owner asserts that "Petitioner highlights the cumulativeness of N93 to Dua by repeatedly citing to Dua and N93 for each element with the exact same descriptions." *Id.* at 7. Patent Owner also asserts that N93 is cumulative to Tee and Honkanen, arguing that "Petitioner also contends that Tee and Honkanen disclose an imaging circuit capable of receiving video information and still picture information via an optical system" in the District Court Litigation. Prelim. Resp. 7 (citing Exs. 2007, 2008).

We do not agree with Patent Owner's assertion that similarities between references render them cumulative for all that they teach and are relied upon. Here, for example, Petitioner explains that while "Dua also teaches a multi-radio, multimedia cellular phone," "Dua additionally teaches a) internal hardware implementation details for a cellular phone like N93 and b) an NFC radio for improved user indications and other functionality." Pet. 10. Moreover, merely because Tee and Honkanen may teach an imaging circuit capable of receiving video information and still picture information via an optical system does not mean that N93 is cumulative to those references. For example, here Petitioner relies on N93 because it "teaches Bluetooth, Wi-Fi, UMTS and GSM radios, user interfaces (display, buttons, camera, speaker, microphone), and multimedia capabilities (video/audio recording via microphone and camera, playback on display, transmission and receipt of video over each of the four radios)," in addition to a "cellular phone [that] contains memories and integrated circuits and runs

an operating system and applications for performing the disclosed functionalities." Pet. 9 (citing Ex. 1002 ¶ 67).

Similarly, Patent Owner's arguments with respect to the alleged cumulative nature of Herle, BT-Spec, 3GPP-Spec, Kao, Rooyen, and Desai are also unavailing. *See* Prelim. Resp. 8–11. For example, Patent Owner provides certain figures from Herle, Tee and Honkanen, arguing that these figures "are remarkably similar" (*id.* at 8), but merely comparing certain figures from three references does not demonstrate sufficient similarity between the references teachings for us to make a determination that the references are cumulative for all that they teach and are relied upon in the Petition. Patent Owner makes equally unavailing arguments with respect to BT-Spec, 3GPP-Spec, Kao, Rooyen, and Desai. *See* Prelim. Resp. 9–11. None of Patent Owner's arguments with respect to these references persuade us that art substantially the same as Petitioner's grounds were previously presented to the Office.

Based on the current record, the weight of the evidence before us does not support a finding that that the same or substantially the same art or arguments were previously presented to the Office.

3. Advanced Bionics – Part Two

Nonetheless, even if we were to conclude that the first part of the *Advanced Bionics* framework is satisfied, which we do not, Petitioner has demonstrated that the Office erred in a manner material to the patentability of the challenged claims in the second part of the framework.

We find that *Becton, Dickinson* factor (c)—the extent to which the asserted art was evaluated during examination—does not favor denying the Petition under Section 325(d) because the record does not indicate that the Examiner considered Dua in a meaningful way. During prosecution of the

'421 patent the Examiner did not cite Dua in any rejection and did not address Dua in any correspondence, other than to indicate at the bottom of the IDS that "All [114] References Considered Except Where Lined Through," even though none of the 114 references were lined through. *See* Ex. 1003, 76–87.

For factors (e) and (f), we find that Petitioner has explained sufficiently how the Examiner allegedly erred in evaluating Dua, by pointing to the proposed grounds, which detail how the challenged claims read on this reference over the combination of N93, Dua, and Herle. *See* Pet. 9–53. We find this sufficient to identify the "specific teachings" that were overlooked, as contemplated in *Advanced Bionics*, and we agree with Petitioner that the facts and discussion of Dua, in combination with N93 and Herle as presented in the Petition, warrant reconsideration of the challenged claims in view of these references. We thus find that Petitioner has satisfied the second part of the *Advanced Bionics* framework by demonstrating that the Examiner may have erred by not appreciating how Dua teaches or suggests the features of the claimed invention.

For these reasons, we decline to exercise our discretion to deny institution under 35 U.S.C. § 325(d).

B. 35 U.S.C § 314(a)

Patent Owner contends that the Petition should be denied pursuant to 35 U.S.C. § 314(a) and the factors set forth in *Apple Inc. v. Fintiv, Inc.*, IPR2020-00019, Paper 11 (PTAB Mar. 20, 2020) (precedential) ("Fintiv"). Prelim. Resp. 2, 12–17. Petitioner argues that "[d]iscretionary denial is not warranted here as the 'compelling merits' standard set forth in the June 21, 2022 Interim Guidance weighs against discretionary denial." Pet. 73–74.

The Board's precedential *Fintiv* decision identifies a non-exclusive list of factors the Board considers when addressing whether a related, parallel district court action provides a basis for discretionary denial under 35 U.S.C. § 314(a). *Fintiv*, Paper 11 at 5–16. Those factors include:

> 1. whether the court granted a stay or evidence exists that one may be granted if a proceeding is instituted;
>
> 2. proximity of the court's trial date to the Board's projected statutory deadline for a final written decision;
>
> 3. investment in the parallel proceeding by the court and the parties;
>
> 4. overlap between issues raised in the petition and in the parallel proceeding;
>
> 5. whether the petitioner and the defendant in the parallel proceeding are the same party; and
>
> 6. other circumstances that impact the Board's exercise of discretion, including the merits.

Id. at 5–6.

On June 21, 2022, the Director of the United States Patent and Trademark Office issued an *Interim Procedure for Discretionary Denials in AIA Post-Grant Proceedings with Parallel District Court Litigation* ("Guidance Memo")[4] to clarify "the [Board's] current application of *Fintiv* to discretionary institutions where there is parallel litigation" and to "confirm[] that the precedential import of *Fintiv* is limited to the facts of that case." Guidance Memo 2. In particular, the Memorandum states that the Board

> will not deny institution of an IPR or PGR under *Fintiv* (i) when a petition presents compelling evidence of

[4] *Available at: https://www.uspto.gov/sites/default/files/documents/interim_proc_discretionary_denials_aia_parallel_district_court_litigation_memo_20220621_.pdf*

> unpatentability; (ii) when a request for denial under *Fintiv* is based on a parallel ITC proceeding; **or (iii) where a petitioner stipulates not to pursue in a parallel district court proceeding the same grounds as in the petition or any grounds that could have reasonably been raised in the petition.**

Id. at 9 (emphasis added).

On October 24, 2024, with the Board's authorization (Ex. 3001), Petitioner filed a *Sotera* Stipulation. Paper 8. The Stipulation reads in relevant part:

> In accordance with the Board's precedential decision in *Sotera Wireless, Inc. v. Masimo Corp.*, IPR2020-01019, Paper 12 at 18-19 (PTAB Dec. 1, 2020), Samsung Electronics Co., Ltd. and Samsung Electronics America, Inc. (Petitioners) stipulate that if the Board institutes *inter partes* review in this proceeding, IPR2024-00907, then Petitioners will not pursue in the parallel district court proceeding, *Maxell Ltd. v. Samsung Electronics Co., Ltd. and Samsung Electronics America, Inc.*, Case No. 5:23-cv-00092-RWS, the same grounds as in the petition or any grounds that could have reasonably been raised in the petition.

Id.

Given Petitioner's Stipulation, and pursuant to the Guidance Memo, we decline to exercise discretion under 35 U.S.C. § 314(a) to deny institution.

C. Level of Ordinary Skill

In determining whether an invention would have been obvious at the time it was made, we consider the level of ordinary skill in the pertinent art at the time of the invention. *Graham v. John Deere Co.*, 383 U.S. 1, 17 (1966). "The importance of resolving the level of ordinary skill in the art lies in the necessity of maintaining objectivity in the obviousness inquiry." *Ryko Mfg. Co. v. Nu-Star, Inc.*, 950 F.2d 714, 718 (Fed. Cir. 1991).

Petitioner describes a person of ordinary skill in the art as a person having "a bachelor's degree in electrical engineering or equivalent with at least one year of experience in the field of wireless communications," wherein "[a]dditional education or experience might substitute for the above requirements." Pet. 3 (citing Ex. 1002 ¶ 28). Patent Owner does not contest Petitioner's description of a person of ordinary skill in the art at this stage of the proceeding. Prelim. Resp. 19.

Petitioner's description of a person of ordinary skill appears to be consistent with the subject matter of the '590 patent. This is supported by the testimony of Petitioner's declarant, Dr. Creusere. *See* Ex. 1002 ¶ 28. We, therefore, adopt Petitioner's assessment of a person of ordinary skill for purposes of this Decision.

D. Claim Construction

For petitions filed on or after November 13, 2018, 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), including construing the claim in accordance with the ordinary and customary meaning of such claim as understood by one of ordinary skill in the art and the prosecution history pertaining to the patent. 37 C.F.R. § 42.100 (2019). The Petition was accorded a filing date of April 19, 2024. Paper 6. Thus, we apply the claim construction standard as set forth in *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc).

Under *Phillips,* claim terms are generally given their ordinary and customary meaning as would be understood by one with ordinary skill in the art in the context of the specification, the prosecution history, other claims, and even extrinsic evidence including expert and inventor testimony,

dictionaries, and learned treatises, although extrinsic evidence is less significant than the intrinsic record. *Phillips*, 415 F.3d at 1312–17. Usually, the specification is dispositive, and it is the single best guide to the meaning of a disputed term. *Id.* at 1315.

Only terms that are in controversy need to be construed, and then only to the extent necessary to resolve the controversy. *Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co. Matal*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (in the context of an *inter partes* review, applying *Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999)).

Petitioner argues that "[b]ecause the prior art asserted herein discloses subject matter within the indisputable scope of the claims, the Board need not construe the outer bounds of the claims as part of these proceedings." Pet. 3.

Nonetheless, Petitioner asserts that the term "'[c]ircuit' should be interpreted broadly as any circuitry," and that the term "'[v]ideo' is not limited to video of any quality, resolution, size, or transfer rate (e.g., real time)." Pet. 3.

As for the phrase "when an indication from a user indicates to transmit video information using the first radio communication circuit [or 'indicates to use the first radio communication circuit'], the controller assigns a connection to the first radio communication circuit for transmitting [or 'for receiving'] the video information," Petitioner asserts that "[t]he prior art discloses each of [Patent Owner's] interpretations, making construction unnecessary." Pet. 4.

In its Preliminary Response, Patent Owner "simply applies Petitioner's own constructions to show how the Petitioner has not met its burden under 37 CFR § 42.104(b)(4)." Prelim. Resp. 20.

In its Preliminary Reply, Petitioner advises that in the District Court Litigation "the Court preliminarily construed limitation [1j] as 'plain and ordinary meaning, where the user is not required to select the particular radio.'" Prelim. Reply 1 (citing Ex. 1031, 3; Ex. 1030, 1–5). According to Petitioner, Patent Owner "agreed with the Court's preliminary construction." *Id.* (citing Ex. 1029, 70:3–4). Petitioner argues that

> [Patent Owner's] broad interpretation and the Court's preliminary construction mean the user need not select (choose) the first radio—the user can instead indicate the controller should select between radios. This reads directly on Dua's "improved" user indications, wherein a user indicates the controller should run a program to select between radios. Pet., 61 (user indicates the controller should use the NFC process), 62 (user indicates the controller should use the stored profile process). In each case, it is the controller that selects (chooses) between the radios.

Id. at 2 (citing Pet. 62–63).

Petitioner goes on to explain that

> While other grounds in the Petition apply a construction that requires the controller assign the radio indicated by the user, *see, e.g.*, Pet., 4; EX1025, 21-22, Ground 3 relies on Dua's "improved" method and establishes unpatentability under PO's interpretation and the Court's preliminary construction. Thus, the Board should institute this IPR under either construction.

Id.

In its Preliminary Sur-reply, Patent Owner asserts with respect to limitation [1j] that "this claim term does not need any construction and plain and ordinary meaning applies." Prelim. Sur-reply 1. Patent Owner argues that "[u]nder this position, the plain claim language requires two things: (1) a user indication and (2) that the controller needs to assign a connection based on the user indication being received." *Id.* Patent Owner

asserts that "[b]ecause PO's arguments are based on a position that is consistent across both PO's and Petitioner's interpretations, no construction is necessary." *Id.* at 2.

For purposes of this Decision and based on this preliminary record, we determine that no claim term requires express construction at this stage of the proceeding and that the ordinary and customary meaning of the claim terms should apply. However, should the parties disagree with this preliminary assessment, they are encouraged to fully address any claim construction issues in their subsequent briefing in this proceeding.

E. Patentability Challenges

As indicated above, Petitioner presents five grounds challenging the patentability of claims 1, 4, 5, 8–12, and 14–25 of the '590 patent under 35 U.S.C. § 103. Petitioner challenges claims 1, 4, 5, 8–12, and 14–25 based on (1) the combined teachings of N93, Dua, and Herle; (2) the combined teachings of N93, Dua, Herle, Rooyen, Desai, BT-Spec, 3GPP-Spec, and Kao; (3) the combined teachings of Dua and Herle; (4) the combined teachings of Dua, Herle, and N93; and (5) the combined teachings of Dua, Herle, N93, Rooyen, Desai, BT-Spec, 3GPP-Spec, and Kao. Pet. 1.

1. Principles of Law

A claim is unpatentable under 35 U.S.C. § 103(a) 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) objective evidence of nonobviousness, i.e., secondary considerations. *See Graham*, 383 U.S. at 17–18. At this stage, neither party has presented evidence on the fourth *Graham* factor.

The Supreme Court has made clear that we apply "an expansive and flexible approach" to the question of obviousness. *KSR*, 550 U.S. at 415. Whether a patent claiming the combination of prior art elements would have been obvious is determined by whether the improvement is more than the predictable use of prior art elements according to their established functions. *Id.* at 417. Reaching this conclusion, however, requires more than a mere showing that the prior art includes separate references covering each separate limitation in a claim under examination. *Unigene Labs., Inc. v. Apotex, Inc.*, 655 F.3d 1352, 1360 (Fed. Cir. 2011). Rather, obviousness requires the additional showing that a person of ordinary skill at the time of the invention would have selected and combined those prior art elements in the normal course of research and development to yield the claimed invention. *Id.*

2. Prior Art Status of N93, BT-Spec, and 3GPP-Spec

Petitioner asserts that N93 "was publicly available on Nokia's website at least as of 4/23/2007 when it was archived" and "is prior art under pre-AIA 35 U.S.C. §§ 102(a), 102(b)." Pet. 5 (citing Ex. 1007, 1–2). Petitioner also asserts that BT-Spec "was publicly available on the Bluetooth website at least as of 2/24/2006 when it was archived" and "is prior art under pre-AIA 35 U.S.C. §§ 102(a), 102(b)." *Id.* (citing Ex. 1007, 1–2). Petitioner further asserts that 3GPP-Spec "was publicly available on the 3GPP website at least as of 1/7/2007 when it was archived" and "is prior art under pre-AIA 35 U.S.C. §§ 102(a), 102(b)." *Id.* at 5–6 (citing Ex. 1007, 1–2).

In response, Patent Owner contends that "Petitioner provides no evidence that N93, BT-Spec, or 3GPP-Spec were disseminated to the interested public before the critical date." Prelim. Resp. 20; *see id*. at 20–23.

It has long been recognized that the touchstone as to whether an asserted reference qualifies as prior art is public accessibility. *See In re Hall*, 781 F.2d 897, 899 (Fed. Cir. 1986). "[A]t the institution stage, the petition must identify, with particularity, evidence sufficient to establish a reasonable likelihood that the reference was publicly accessible before the critical date of the challenged patent and therefore that there is a reasonable likelihood that it qualifies as a printed publication." *Hulu, LLC v. Sound View Innovations, LLC*, IPR2018-01039, Paper 29, 13 (PTAB Dec. 20, 2019) (precedential).

Petitioner relies on the Declaration of Nathaniel E. Frank-White (Ex. 1007), a Records Request Processor at the Internet Archive, to support its assertion that N93, BT-Spec, and 3GPP-Spec qualify as prior art. Ex. 1007, 1. Mr. Frank-White provides credible testimonial evidence explaining that the Internet Archive's Wayback Machine has records showing that Nokia's N93 User Guide (N93) was accessible on the Internet as of April 23, 2007, 3GPP TS 36.211 V0.2.1 (3GPP-Spec) was accessible on the Internet as of January 7, 2007, and the Specification of the Bluetooth System (BT-Spec) was accessible on the Internet as of February 24, 2006.

Because all of these dates precede the critical date of the '590 patent (November 28, 2007), based on this preliminary record we determine that Petitioner has sufficiently shown the public accessibility of N93, 3GPP-Spec, and BT-Spec for purpose of institution. *See* Ex. 1004 code (30).

3. Relevant Prior Art

a. Dua (Ex. 1008)

Dua is a U.S. Patent Application Publication that published on November 16, 2006, more than one year before the earliest U.S. and foreign priority date of the '590 patent. Ex. 1004, codes (30), (63); Ex. 1008, code (43). Petitioner asserts that Dua is prior art under pre-AIA 35 U.S.C. §§ 102(a), 102(b), 102(e). Pet. 4.

Dua relates to "a wireless media system and player having improved features for establishing wireless connectivity with various electronic devices." Ex. 1008 ¶ 2. Dua describes a media player device using "integrated Radio Frequency Identification (RFID) technology to exchange communication settings, media capability, and other parameters with an external device that also has integrated RFID technology." *Id*. at code (57). According to Dua, "[t]he automatic exchange of settings and other information via a proximity-based RFID data exchange allows a media player to quickly establish a secure communication link with another device via a commonly supported wireless protocol such as Ultra Wideband (UWB) or Bluetooth." *Id*. According to Dua, the media player includes "an RFID Tag-Reader Module that is capable of functioning as both an RFID tag and an RFID reader" and that "allows interoperability with all RF 13.56 MHz readers and tags compatible with existing international standards, including ISO 14443 A/B, ISO 15693, FeliCa™, and NFC." *Id*. ¶ 15.

Dua's Figure 1 is reproduced below.

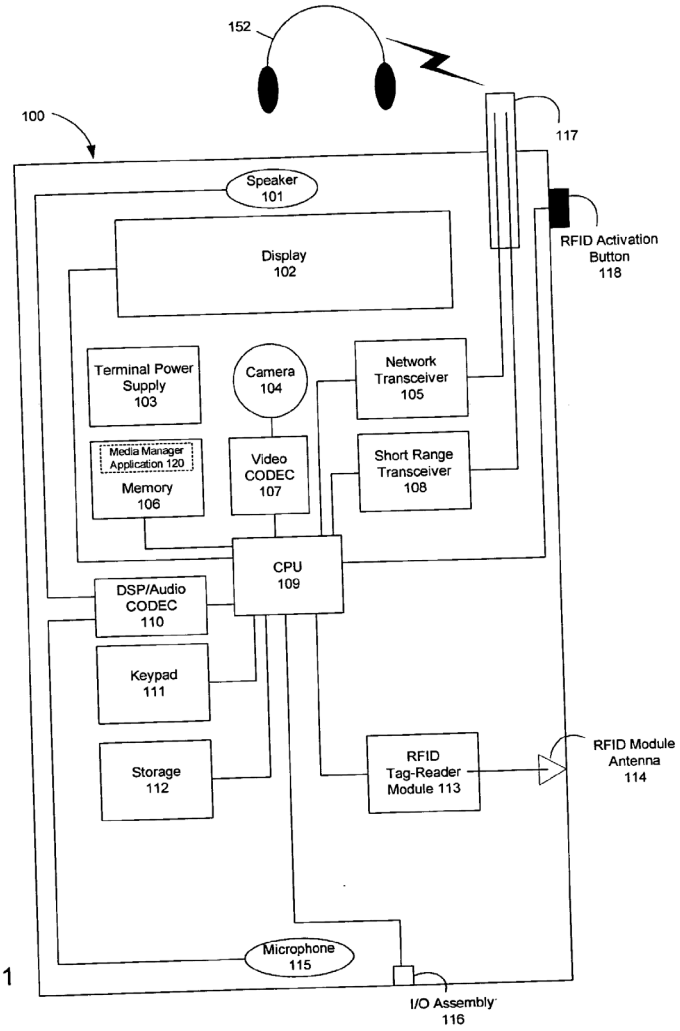


FIG. 1

Dua's Figure 1 depicts components of a media player 100 with cellular phone capability. Ex. 1008 ¶ 57. Dua describes that "[a] short-range transceiver 108 and antenna 117 provide wireless connectivity with external devices or access points using supported communications protocols (e.g., Bluetooth, 802.11 a/b/g/n, Ultra Wideband, Wireless USB, 802.15.3/WiMedia, Wireless 1394, Wireless FireWire, WiMax, and 802.15.4/ZigBee)." *Id.* ¶ 62. According to Dua, "[s]hort-range transceiver 108 interacts with a CPU 109 for implementing short-range communications protocols and processing messages exchanged between other electronic devices and the media player 100," and "CPU 109 executes programs stored

in a non-volatile or read only memory 106 and provides instructions for managing and controlling the operating of media player 100." *Id.* ¶ 66. Dua describes that "CPU 109 is also connected to network transceiver 105 for interacting with a cellular network, such as a Global System Mobile (GSM) network and the like via antenna 117." *Id.* According to Dua, "[m]edia player 100 is able to access the Internet through the cellular network, or through a wireless access point using short range transceiver 108 and a supported communications protocol (e.g., WiFi)." *Id.*

Dua also describes an RFID Tag-Reader Module 113 integrated into media player 100. Ex. 1008 ¶ 70. Dua provides RFID Tag-Reader Module 113 so that "media player 100 can rapidly exchange information with an electronic device that is in close proximity and which also has integrated RFID technology." *Id.* According to Dua, "RFID Tag-Reader Module 113 also includes a reader component used for transmitting interrogation signals via its antenna to an external electronic device's RFID tag when in close proximity, and receiving a response signal from the external device's RFID tag." *Id.* ¶ 71.

Dua's Figure 10 is reproduced below:

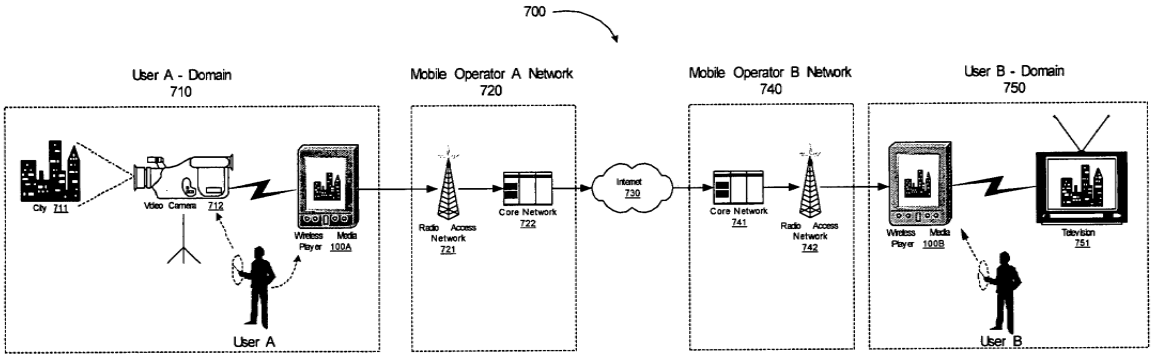


FIG. 10

Dua's Figure 10 shows "media player 100A wirelessly capturing a video feed from an external video recording device 712, and transmitting the same video content via a cellular network 720 and the Internet 730 to another media player 100B, which further transmits the content to a television 751." Ex. 1008 ¶ 190. Referring to Figure 10, Dua describes that video camera 712 "has an integrated RFID tag-reader module and a wireless interface for communication with other devices" and "is recording a city landscape 711 and simultaneously transmitting the video feed to the wireless media player 100A in User A's domain 710." *Id.* ¶¶ 191–192. User A uses the media manager application operating on the media player 100A to specify that the video feed be transmitted to User B's wireless device 100B. *Id.* ¶ 192. According to Dua, "User A's media player 100A is connected to Mobile Operator A's network 720 via RF signal to the radio access network 721" and when User A's connection attempt is accepted by User B, "a SIP peer-to-peer connection is established between the two devices" and "[m]edia player 100A begins transmitting the video content to media player 100B." *Id.* ¶¶ 193–194. If User B wants to watch the video feed on his television, assuming television 751 has an integrated RFID module and a RF interface for communication with other devices, User B can press the RFID activation button 118 on the media player 100B and bring the media player in proximity to the RFID hot spot on the television so that the media content is automatically transmitted. *Id.* ¶¶ 195–196.

b. Herle (Ex. 1009)

Herle is a U.S. Patent that issued on December 12, 2006, more than one year before the earliest U.S. priority date of the '590 patent. Ex. 1004, codes (30), (63); Ex. 1009, codes (22), (45). Petitioner asserts that Herle is prior art under pre-AIA 35 U.S.C. §§ 102(a), 102(b), 102(e). Pet. 5.

Herle relates to "an apparatus and method for upgrading the software in a wireless mobile station." Ex. 1009, 1:7–10. Herle describes over-the-air (OTA) upgrading of wireless mobile stations, such as cell phones, wireless personal digital assistants (PDAs), wireless hand-held computers, and two-way pagers, which "enables a subscriber to download and install upgraded software containing patches, bug fixes, and newer versions of mobile station software, including the operating system." *Id*. at 1:24–28, 1:39–43. Herle notes that because a wireless mobile station has limited resources, "there is a need in the art for systems and methods for performing over-the-air software upgrades that require only small upgrade file sizes." *Id*. at 1:61–62, 2:25–28.

Herle describes the technique of "Internet protocol (IP)-based over-the-air (OTA) software download (i.e., IOTA-SD) using a minimum sized delta file-based software upgrade," which comprises:

> 1) a utility application that generates the smallest possible binary difference ("delta file") between two versions of mobile station executable firmware; and 2) a software algorithm running on the mobile station that receives the binary delta file as input and applies it to the existing image file on the mobile station to transform the existing image file into a new image file.

Ex. 1009, 2:32–42. Herle points to the advantage of downloading a small delta file over the air to the mobile station, rather than a large image file. *Id*. at 2:57–59. Herle describes the mobile station using this technique, comprising:

> 1) a memory capable of storing an original image file and the delta file, wherein the delta file is suitable for upgrading the original image file; and 2) a controller capable of modifying the original image file according to instructions stored in the delta file to thereby generate an upgraded image file.

Id. at 2:65–3:4.

Figure 2 of Herle is reproduced below.

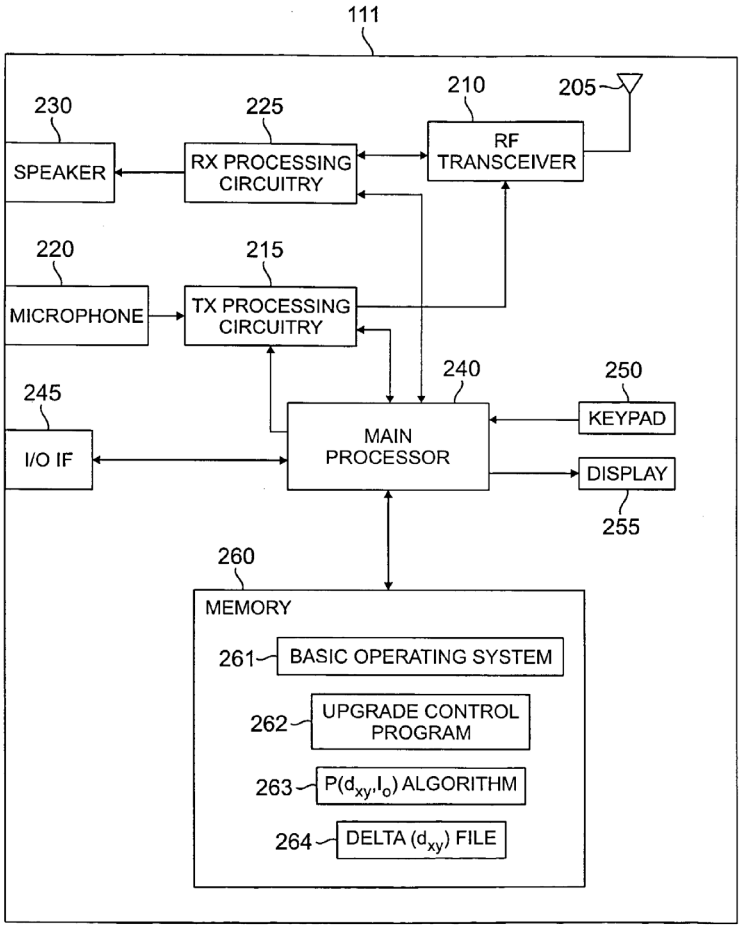


FIG. 2

Herle's Figure 2 depicts wireless mobile station 111. Ex. 1009, 6:20–30. According to Herle, main processor 240 in wireless mobile station 111 is "capable of receiving and installing software upgrades under the control of upgrade control program 262." *Id*. at 7:19–22. In response to a triggering event, such as "an operator-initiated action, an automated periodic procedure (i.e., expiration or a timer in MS 111), or receipt of a notification message from upgrade server 300," main processor 240 establishes a communication link to the wireless network and to the server via the Internet connection of

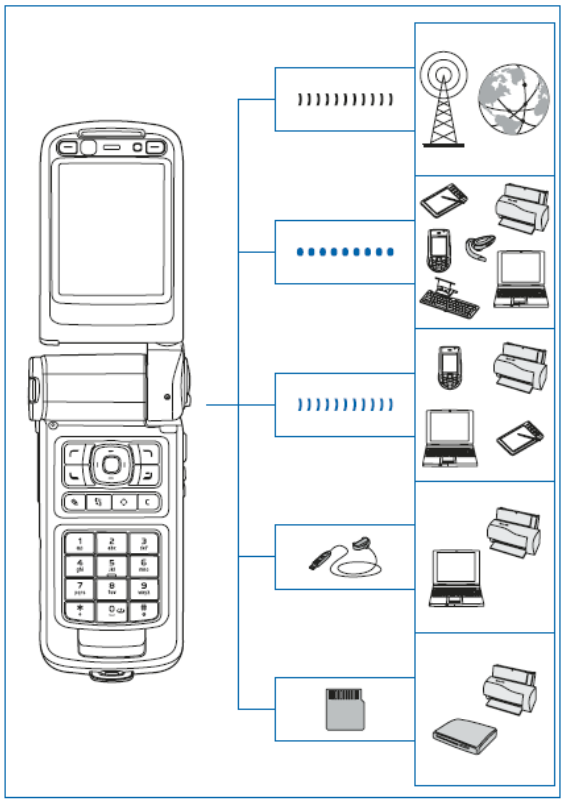
the wireless network, and the upgraded software is sent to mobile station 111 in the form of delta (d_{xy}) file 264, which is stored in memory 264. *Id*. at 7:22–29, 7:37–39. Herle describes that "P(d_{xy}, I_O) algorithm program 263 takes delta file 264 as its input and applies it to an original image file, I_O, that is already installed on MS 111 to produce a new image file, I_N," which is the upgraded version of the original image file. *Id*. at 7:39–42.

c. N93 (Ex. 1010)

N93 is a user guide for Nokia's N93 device. Ex. 1010, 1, 10, 11.[5] Petitioner asserts that N93 "was publicly available on Nokia's website at least as of April 23, 2007 when it was archived" and "is prior art under pre-AIA 35 U.S.C. §§ 102(a), 102(b)." Pet. 5 (citing Ex. 1007, 1–2).

N93's figure on page 10 of the user manual is reproduced below.

[5] The cited page numbers in Exhibit 1010 refer to page numbers added by Petitioner at the bottom right corner of the reference.



N93's page 10 figure depicts Nokia's N93 device and illustrates its connectivity to various networks and devices. Ex. 1010, 10. Nokia's N93 device may use, for example, the 2G and 3G networks; a wireless LAN to connect to the Internet and WLAN enabled devices; Bluetooth technology to transfer files and connect to compatible enhancements; and infrared to transfer and synchronize data between compatible devices. *Id.*; *see also id.* at 83 (discussing the device's Bluetooth connectivity). According to N93, Nokia's N93 device supports the following wireless LAN features: IEEE 802.11 b/g standard; operation at a frequency of 2.4 GHz; and wired equivalent privacy (WEP) with keys up to 128 bits, Wi-Fi protected access (WPA), and 802.1x encryption methods. *Id.* at 18.

Nokia's N93 device has "two cameras, a high-resolution camera on the side of the device (the main camera) and a lower-resolution camera on the top of the main display (the secondary camera)," both of which can be

used to take still images and record video. Ex. 1010, 23. According to N93, the recorded video clip may be played or sent by the device "using multimedia, e-mail, Bluetooth connectivity, or infrared." *Id*. at 24.

N93 describes the video call feature, which allows "a real-time, two-way video between [a caller] and the recipient of the call." Ex. 1010, 59. According to N93, to make a video call, the caller must be in the coverage of a UMTS network. *Id*. N93 also describes the video sharing feature "to send live video or a video clip from [the caller's] mobile device to another compatible mobile device during a voice call." *Id*. at 60. According to N93, the video sharing feature requires a 3G UMTS connection. *Id*.

According to N93, Nokia's N93 device is compatible with UPnP. Ex. 1010, 88. N93 explains that a home network can be created using a wireless LAN access point device or a wireless LAN router and compatible UPnP devices that support wireless LAN, such as Nokia's N93 device, can be connected to the home network. *Id*.

d. Rooyen (Ex. 1011)

Rooyen is a U.S. Patent Application Publication that published on June 15, 2006, more than one year before the earliest U.S. and foreign priority date of the '590 patent. Ex. 1004, codes (30), (63); Ex. 1011, code (43). Petitioner asserts that Rooyen is prior art under pre-AIA 35 U.S.C. §§ 102(a), 102(b), 102(e). Pet. 5.

Rooyen relates to "a method and system for a mobile receiver architecture for European (EU) band cellular and broadcasting." Ex. 1011 ¶ 5. Rooyen explains that "[r]eceived channels may be processed in at least one radio frequency front end (RFFE) in a mobile terminal and may comprise at least one of a VHF/UHF broadcast channel and EU band cellular channels capable of carrying voice and data," wherein "[t]he cellular

channels may be WCDMA 2100 MHz, GSM 1800 or 900 MHz channels." *Id.* ¶ 39. According to Rooyen,

> [a] single cellular/broadcast radio frequency integrated circuit (RFIC) may be utilized for processing the received channels. In another embodiment, a cellular band RFIC may process the EU band cellular channels and a broadcast RFIC may process the broadcast channel. Moreover, a first RFIC may process the WCDMA channel, a second RFIC may process the GSM channels, and a broadcast RFIC may process the broadcast channel.

Id.; *see also id.* ¶¶ 80–89, FIGS. 4a–4c. Tasks that an RFIC may perform include "modulation and/or demodulation, low pass filtering, and digital to analog (D/A) and/or analog to digital (A/D) conversion." *Id.* ¶ 40.

e. Desai (Ex. 1012)

Desai is a U.S. Patent Application Publication that published on December 7, 2006, more than one year before the earliest U.S. priority date of the '590 patent. Ex. 1004, codes (30), (63); Ex. 1012, code (43). Petitioner asserts that Desai is prior art under pre-AIA 35 U.S.C. §§ 102(a), 102(b), 102(e). Pet. 5.

Desai relates to "a method and apparatus for collaborative coexistence between Bluetooth and IEEE 802.11 g with both technologies integrated onto a system-on-a-chip (SOC) device." Ex. 1012 ¶ 4. According to Desai, "[i]n a single integrated circuit (IC) that handles Bluetooth and WLAN technologies, a WLAN priority level may be selected for WLAN transmissions and a Bluetooth priority level may be selected for Bluetooth transmissions" and "[t]he WLAN and Bluetooth priority levels may be selected from a plurality of priority levels." *Id.* ¶ 28. Desai also describes a "packet transfer scheduler (PTS)" that "may schedule the transmission of

WLAN and Bluetooth signals in accordance with the selected priority levels." *Id.*; *see also id.* ¶¶ 45–50, FIG. 3.

Figure 2 of Desai is reproduced below.

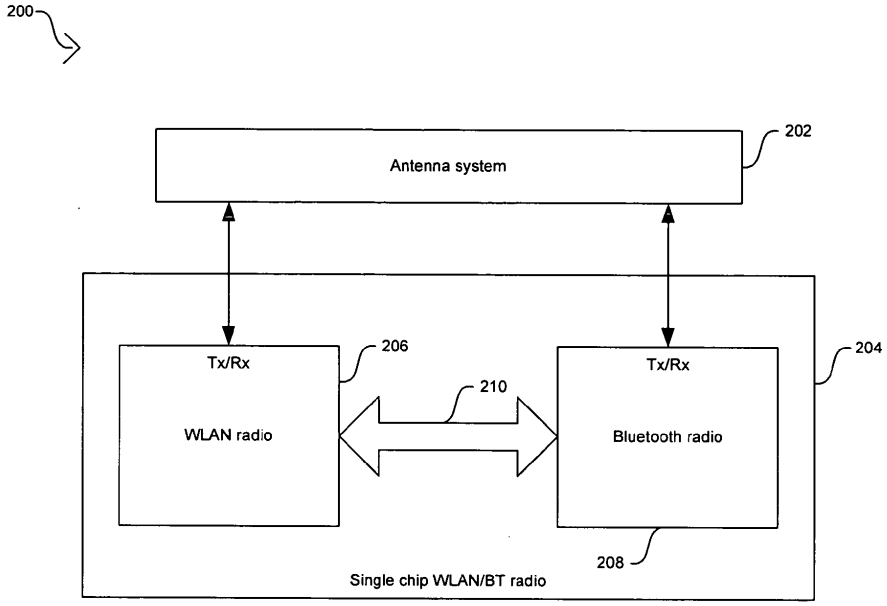


FIG. 2

Desai's Figure 2 depicts "an exemplary single radio chip that supports WLAN and Bluetooth radio operations." Ex. 1012 ¶ 38. Figure 2 shows "a WLAN/Bluetooth collaborative radio architecture 200 that may comprise a WLAN/Bluetooth coexistence antenna system 202 and a single chip WLAN/Bluetooth (WLAN/BT) radio device 204." *Id.* Desai describes that "[t]he single chip WLAN/BT radio device 204 may be implemented based on a system-on-chip (SOC) architecture" and "may comprise a WLAN radio portion 206 and a Bluetooth radio portion 208." *Id.*

According to Desai, "[t]he WLAN radio portion 206 may be adapted to transfer and/or receive WLAN protocol packets and/or information to the WLAN/Bluetooth coexistence antenna system 202 via a single

transmit/receive (Tx/Rx) port." Ex. 1012 ¶ 40. According to Desai, "[t]he Bluetooth radio portion 208 may be adapted to transfer and/or receive Bluetooth protocol packets and/or information to the WLAN/Bluetooth coexistence antenna system 202 via a single transmit/receive (Tx/Rx) port." *Id.* ¶ 42. Desai also describes that the WLAN radio portion 206 and the Bluetooth radio portion 208 may each be adapted to receive and/or transmit priority signals 210, which "may be utilized to schedule and/or control the collaborative operation of the WLAN radio portion 206 and the Bluetooth radio portion 208." *Id.* ¶¶ 41–42.

f. BT-Spec (Ex. 1014)

BT-Spec is the Specification of the Bluetooth System. Ex. 1014, 1.[6] Petitioner asserts that BT-Spec "was publicly available on the Bluetooth website at least as of February 24, 2006 when it was archived" and "is prior art under pre-AIA 35 U.S.C. §§ 102(a), 102(b)." Pet. 5 (citing Ex. 1007, 1–2).

According to BT-Spec, "Bluetooth devices operate in the unlicensed 2.4 GHz ISM (Industrial Scientific Medical) band." Ex. 1014, 193. BT-Spec defines two modulation modes: a mandatory mode called "Basic Rate" and an optional mode called "Enhanced Data Rate." *Id.* According to BT-Spec, the Basic Rate "uses a shaped, binary FM modulation to minimize transceiver complexity," and the Enhanced Data Rate "uses PSK modulation and has two variants: π/4-DQPSK and 8DPSK." *Id.*

[6] The cited page numbers in Exhibit 1014 refer to page numbers added by Petitioner at the bottom right corner of the reference.

g. 3GPP-Spec (Ex. 1015)

3GPP-Spec is the Technical Specification of 3GPP TS 36.211 V0.2.1 (2006-11). Ex. 1015, 1.[7] Petitioner asserts that 3GPP-Spec "was publicly available on the 3GPP website at least as of January 7, 2007 when it was archived" and "is prior art under pre-AIA 35 U.S.C. §§ 102(a), 102(b)." Pet. 5–6 (citing Ex. 1007, 1–2).

3GPP-Spec defines a modulation mapper as taking binary digits, 0 or 1, as input and producing complex-valued modulation symbols, $x=I+jQ$, as output. Ex. 1015, 21. 3GPP-Spec describes QPSK modulation mapping, 16QAM modulation mapping, and 64QAM modulation mapping. *Id.* at 21–23 (Tables 11–13).

h. Kao (Ex. 1013)

Kao is a U.S. Patent Application Publication that published on December 30, 2004, more than one year before the earliest U.S. and foreign priority date of the '590 patent. Ex. 1004, codes (30), (63); Ex. 1013, code (43). Petitioner asserts that Kao is prior art under pre-AIA 35 U.S.C. §§ 102(a), 102(b), 102(e). Pet. 6.

Kao relates to "a radio receiver that is capable of supporting multiple modulation formats with a single pair of analog to digital converters (ADCs)." Ex. 1013 ¶ 3. Kao notes that "there is no universal standard for wireless modulation formats" and "there may be multiple modes within a standard." *Id.* ¶ 5. Figure 1 of Kao is reproduced below.

[7] The cited page numbers in Exhibit 1015 refer to page numbers added by Petitioner at the bottom right corner of the reference.

Mode	Provided data rate(Mbps)	Sample rate(Mbps)	Carrier frequency (GHz)	Modulation
IEEE 802.11a	6, 9, 12, 18, 24, 36, 48, 54	20	5	OFDM
IEEE 802.11b		22	2.4	CCK/DSSS
IEEE 802.11g	6, 9, 12, 18, 24, 36, 48, 54	20, 22	2.4, 5	OFDM, CCK/DSSS

Fig. 1 Prior Art

Figure 1 illustrates data rates, sample rates, carrier frequencies and modulation types for various modes of IEEE 802.11 Wireless LAN (WLAN) standard. *Id.* ¶ 6. As shown in Figure 1, IEEE 802.11a is an extension of the IEEE 802.11 standard and defines requirements for a physical layer operating in the 5 GHz frequency and data rates ranging from 6 Mps to 54 Mps based on the orthogonal frequency division multiplexing (OFDM) modulation scheme. *Id.* According to Kao, "direct sequence spread spectrum/complementary code keying (DSSS/CCK) physical layer is one of the three physical layers supported in the IEEE 802.11 standard and uses the 2.4 GHz frequency band as the RF transmission media." *Id.*

According to Kao, "[i]n a multiple mode standard, like IEEE 802.11g, signals of both the OFDM mode and the DSSS/CCK mode need to be dealt with, but only one mode can be performed at a time." Ex. 1013 ¶ 8; *see also id.* ¶ 28 ("Taking IEEE 802.11g, which is a multi-mode standard, as an example, if we want a WLAN card to support the IEEE 802.11g standard, then we have to deal with a 64 QAM modulation format signal with a 20 MHz data rate for the OFDM mode, and a QPSK modulation format signal with a 22 MHz data rate for the DSSS/CCK mode, but only for one mode in a time."). Kao notes that multiple ADC pairs of different sampling rates are

therefore needed for the IEEE 802.11g WLAN card according to the prior art because each mode needs to adopt an ADC pair having a predetermined sampling rate that matches the sampling rate of that mode. *Id*.

F. Obviousness Over N93, Dua, and Herle (Ground 1)

Petitioner contends that claims 1, 4, 5, 8–12, and 14–25 are unpatentable under 35 U.S.C. § 103 as obvious over N93, Dua, and Herle. Pet. 9–53. Petitioner submits the testimony of Dr. Creusere in support of these contentions. Ex. 1002 ¶¶ 67–218. Patent Owner disputes certain aspects of Petitioner's evidence and arguments. Prelim. Resp. 35–58. Patent Owner submits the testimony of Mr. McNair in support of its contentions. Ex. 2009 ¶¶ 55–87. We begin our analysis by considering Petitioner's rationale for combining the teachings of N93, Dua, and Herle.

1. Rationale to Combine N93, Dua, and Herle

Petitioner explains that "N93 [is a user manual for] a multi-radio, multimedia cellular phone" that "teaches Bluetooth, Wi-Fi, UMTS and GSM radios, user interfaces . . . and multimedia capabilities," among other things. Pet. 9. Petitioner also explains that "Dua expounds on N93's teaching that one radio can transmit/receive video simultaneously with another radio being connected to an internet or home network," and that "Dua additionally teaches a) the internal hardware implementation details for a cellular phone like N93 and b) an NFC radio for improved user indications and other functionality." *Id.* at 10. Petitioner argues that "[i]t would have been obvious for a POSITA to combine N93's teachings related to a cellular phone with Dua's teachings of the internal hardware implementation details of such a phone." *Id.* at 11.

"For example," Petitioner explains, "N93 teaches its phone includes integrated circuits and includes four radios, Bluetooth, Wi-Fi, UMTS and GSM radios, each of which can transmit and receive video." *Id.* "Dua teaches those radios can be implemented in short-range and long-range transceivers, i.e., the claimed radio communication circuits." *Id.* Petitioner argues that a person of ordinary skill in the art "would have had a reasonable expectation of success in implementing the features described in both references in the combination using Dua's implementation details." *Id.* at 12. According to Petitioner, "Dua's details were known techniques that would yield predictable results as taught by Dua and involve only routine skill." *Id.* (citing Ex. 1002 ¶ 72).

Petitioner also explains that "Dua explicitly teaches video transfers over a short-range (Bluetooth) radio and 'simultaneous' connection to the Internet over a long-range radio (UMTS) to transfer video." Pet. 13. According to Petitioner, a person of ordinary skill in the art "would have been motivated to support simultaneous video transfers to support the use cases disclosed by Dua," and a person of ordinary skill in the art "would have had a reasonable expectation of success in supporting 'simultaneous' communications over Bluetooth and UMTS radios in the combination." *Id.* (citing Ex. 1002 ¶ 74). Petitioner asserts that a person of ordinary skill in the art "would have known Bluetooth could stream video," and that "[s]upporting simultaneous transfers would simply involve applying a known technique (simultaneous video transfers) to a known device ready for improvement (multi-radio cellular phone) to yield predictable results as taught by Dua." *Id.* at 13–14 (citing Ex. 1002 ¶ 75). Petitioner argues that a person of ordinary skill in the art "would have found obvious to support simultaneous operation of the radios so that the UMTS and GSM radios

could connect to the Internet to receive messages (SMS, MMS, email) while using the Bluetooth radio to transfer/receive video," and that "[s]upporting simultaneous video transfers would have involved only routine skill." *Id.* at 14 (citing Ex. 1002 ¶ 76).

With respect to NFC, Petitioner argues that

> [i]t would have been obvious for a POSITA to combine N93's teachings related to a cellular phone with Dua's teaching that the cellular phone should include an NFC radio circuit. A POSITA would have been motivated to do so based on Dua's explicit teachings that it would enable Dua's "improved" user indication with similarly equipped devices. A POSITA also would have been further motivated to add an NFC radio to support the functions of electronic wallets and keys.

Pet. 15 (citing Ex. 1008 ¶¶ 54, 89; Ex. 1002 ¶ 78). Petitioner argues that a person of ordinary skill in the art "would have had a reasonable expectation of success in including an NFC radio in the combination [because] NFC was a known industry standard radio and Dua explicitly teaches what is required to include it in the combination." *Id.*

Petitioner also argues that "[i]t would have been obvious to combine each of N93 and Dua's teachings with Herle's teaching of an over-the-air ("OTA") update for software (operating system and applications) in a cellular phone" because "N93 and Dua do not explicitly describe the update process." *Id.* at 15–16. According to Petitioner, a person of ordinary skill in the art "would have been motivated by N93 and Dua to find known software update processes for similar devices and been led to Herle." *Id.* at 16 (citing Ex. 1002 ¶ 80). Petitioner asserts that "Herle provides the express motivation to incorporate its OTA update process into cellular phones like N93's and Dua's to provide upgraded software, bug fixes, and newer versions." *Id.* (citing Ex. 1009, 1:39–45). According to Petitioner,

"[a]dding Herle's update process would simply involve applying a known technique (OTA updates for cellular phones as taught by Herle) to a known device ready for improvement (cellular phone) to yield predictable results (cellular phone with OTA update capability)." Pet. 17 (citing Ex. 1002 ¶ 82).

Patent Owner argues that the Petition "fails to assert 'what the combined teachings of those references would have suggested to those of ordinary skill in the art.'" Prelim. Resp. 24 (citing *Willis Elec. Co. v. Polygroup Macau Ltd.*, 777 Fed. Appx. 495, 501 (Fed. Cir. 2019)). Patent Owner argues that Petitioner "makes only conclusory statements" and "fails to map these motivations to each specific claim limitation." *Id.* at 25 (citing Pet. 9–17).

Patent Owner also argues that Petitioner "merely discusses the teachings of N93, Dua, and Herle individually and does not provide an 'account of the contemplated workings of the combination.'" Prelim. Resp. 26. Patent Owner argues that "the Petition attempts to discuss the 'combination' while only relying on descriptions of individual references separately and no rationale to combine with respect to the limitation." *Id.* at 28. Patent Owner asserts that it is "unable to discern the manner in which Petitioner suggests N93, Dua, and Herle should be combined." *Id.* at 30.

With respect to contested limitation [1h], Patent Owner relies on the testimony of Mr. McNair to argue that a person of ordinary skill in the art "would not be motivated to combine N93 with Dua because they are different systems." Prelim. Resp. 39; *see also id.* at 40–44. Mr. McNair testifies that a person of ordinary skill in the art "would not be motivated to combine the components from Dua's media player device with N93's advanced proprietary, closed-system device, because Dua and N93 required

different hardware and software that would be difficult to integrate onto a mobile device." *Id.* at 40 (citing Ex. 2009 ¶ 60). The problem with Mr. McNair's testimony, however, is that "it is not necessary that the inventions of the references be physically combinable to render obvious the invention under review." *In re Sneed*, 710 F.2d 1544, 1550 (Fed. Cir. 1983). "Combining the teachings of references does not involve an ability to combine their specific structures." *In re Nievelt*, 482 F.2d 965, 968 (CCPA 1973).

Rather, we credit Dr. Creusere's testimony that a person of ordinary skill in the art would have had a reason to combine the teachings of N93, Dua, and Herle. With respect to over-the-air updates, for example, Dr. Creusere testifies that "[i]t would have been obvious to combine each of N93 and Dua's teachings with Herle's teaching of an over-the-air ('OTA') update for software (operating system and applications) in a cellular phone" because "N93 discloses running a Symbian operating system and installed applications," and "Dua discloses its cellular phone runs an operating system and applications." Ex. 1002 ¶ 80 (citing Ex. 1010, 2, 72, 98, 111, 114–116; Ex. 1008 ¶ 60 (operating system and applications), 78 (same)). Dr. Creusere goes on to testify that "N93 discloses updating or repairing an existing application," and "Dua also teaches that software on its devices may be 'updated' with new capabilities." *Id.* (citing Ex. 1008 ¶¶ 151, 154; Ex. 1010, 115). But according to Dr. Creusere, "N93 and Dua do not explicitly describe the update process," and a person of ordinary skill in the art "would have been motivated by N93 and Dua to find known software update processes for similar devices and would have been led to Herle." *Id.*

Accordingly, we find that Petitioner has demonstrated sufficiently for purposes of institution that a person of ordinary skill in the art at the relevant

time period would have had a reasoned basis for combining the teachings of N93, Dua, and Herle in the manner proffered and would have had a reasonable expectation of success in that endeavor.

2. Independent Claim 1

We now consider the evidence and arguments of the parties directed to independent claim 1. For Ground 1, Petitioner contends that claim 1 is unpatentable under 35 U.S.C. § 103 as obvious over the combined teachings of N93, Dua, and Herle. Pet. 18–40. Petitioner submits the testimony of Dr. Creusere in support of its contentions. Ex. 1002 ¶¶ 67–218. Patent Owner disputes certain aspects of Petitioner's evidence and arguments directed to claim 1, in particular limitations [1a]–[1c], [1h], [1k], and [1l]. Prelim. Resp. 35–58. Patent Owner does not specifically contest Petitioner's evidence and arguments directed to the other limitations of claim 1. *See id.* Patent Owner submits the testimony of Mr. McNair in support of its position. Ex. 2009 ¶¶ 55–87. We consider Petitioner's evidence and arguments directed to claim 1, and we address Patent Owner's arguments directed to contested limitations [1a]–[1c], [1h], [1k], and [1l]. We start with contested limitation [1a] first.

a. Contested Limitation [1a]

Limitation [1a] recites: "*a first radio communication circuit implementing a first transmission scheme having a first modulation scheme and a first transmission frequency band, the first radio communication circuit capable of transmitting video information by radio or receiving information by radio using the first transmission frequency band*."

Petitioner contends that its proposed combination discloses or renders obvious

> a first radio communication circuit implementing a first transmission scheme (Bluetooth) having a first modulation scheme (GFSK/$\frac{\pi}{4}$-DQPSK/8DPSK) and a first transmission frequency band (2402-2480 MHz), the first radio communication circuit capable of transmitting video information (stored in Gallery) by radio or receiving information by radio (receiving video) using the first transmission frequency band (send or receive video over Bluetooth).

Pet. 18 (citing Ex. 1010, 23–26 (send/receive via Bluetooth), 31–33 (same), 83–87 (same), 125 (circuits); Ex. 1008, Figs. 1 (short range transceiver 108 for Bluetooth), 7 (Bluetooth capability), 8B, 10, 18, ¶¶ 59–64 (circuits and hardware components for Bluetooth), 137, 156–158 (wireless video transmission via Bluetooth), 172, 190–192 (receiving video via Bluetooth), 194, 196, 203; Ex. 1002 ¶ 85.

Petitioner asserts that "N93 discloses the cellular phone comprises electronic circuits and includes a Bluetooth radio communication circuit" that uses "Bluetooth radio to send and receive video and still images." Pet. 19 (citing Ex. 1010, 10, 14–16, 23–26, 31–33, 83–87, 125. According to Petitioner, "N93 teaches the user can record still pictures and video (with audio) using the imaging circuit in the camera and microphone, which is compressed and stored as a video file in the Gallery." *Id.* (citing Ex. 1010, 23–26). "N93," Petitioner asserts, "discloses that the users can select a video clip or image in the Gallery and send it via Bluetooth and receive the same from another user." *Id.* (citing Ex. 1010, 23–26 (send/receive via Bluetooth), 31–33 (same), 83–87 (same), 88 (to PC); Ex. 1002 ¶ 86).

Petitioner asserts that "Dua also discloses the cellular phone comprises 'integrated circuit chips and circuity' including a short-range transceiver that comprises a Bluetooth radio communication circuit and

provides additional implementation details." Pet. 19 (citing Ex. 1008, Fig. 1 (transceiver 108), ¶¶ 59–62 (circuits and hardware components), 62–64 (combined circuit, short-range transceiver 108 supporting Bluetooth, Wi-Fi, etc.). "Thus," Petitioner explains, "transceiver 108 is a 'combined circuit' that includes a Bluetooth radio circuit." *Id.* (citing Ex. 1004, claim 22; Ex. 1002 ¶ 87).

According to Petitioner, "Dua also discloses the short-range transceiver sends and receives video using Bluetooth," and that "video could be sent or received between media players using Bluetooth." Pet. 20 (citing Ex. 1008, Fig. 7, ¶¶ 62, 137, 156, 172, 196, 203, 206–207). Petitioner asserts also that Dua discloses the video could be "received from a local video camera using Bluetooth," and that "the video could be converted and stored first or buffered while being converted and relayed." *Id.* (citing Ex. 1008, Figs. 7, 8B (stored content 542), 10, 18 (stored video 662), ¶¶ 172 (converting), 190–192, 194 (buffering)). Petitioner points out that "Dua discloses the user can select previously recorded video to send via Bluetooth." *Id.* (citing Ex. 1008, Fig. 8B (stored content 542), Fig. 18 (stored video 662); Ex. 1002 ¶ 88).

Petitioner notes that "N93 and Dua's disclosure of Bluetooth inherently discloses to a POSITA the modulation scheme (GFSK/$\frac{\pi}{4}$-DQPSK/8DPSK) and frequencies (2402–2480 MHz) required by the Bluetooth standard." Pet. 20 (citing Ex. 1014, 198–200 (GFSK/$\frac{\pi}{4}$-DQPSK/8DPSK), 195 (2402–2480 MHz excluding guard bands); Ex. 1017, 4 (2402–2480 MHz). "In the alternative," Petitioner asserts, "the Bluetooth modulation schemes and frequencies would have been obvious based on the

knowledge of a POSITA as evidenced by those same references." *Id.* (citing Ex. 1002 ¶ 89).

Patent Owner asserts that "Petitioner fails to show that N93 in combination with Dua and Herle disclose claim elements [1.a]–[1.c] . . . such as the modulation schemes and frequencies for each alleged radio communication circuit." Prelim. Resp. 35. Patent Owner asserts that

> Petitioner asks the Board to assume that any general disclosure of Bluetooth, UMTS, GSM, and Wi-Fi capability in a device would disclose the *specific* modulation schemes or frequencies implemented in the device. *See, e.g.*, Pet. at 20. However, modulation schemes and frequencies of Bluetooth, UMTS, GSM, and Wi-Fi *vary* based on specific hardware implementations for those technologies. Petitioner's *own evidence and arguments* confirm that different devices use different modulation schemes and frequencies for Bluetooth, UMTS, GSM, and Wi-Fi.

Id. "For example," Patent Owner argues,

> Petitioner cites different frequency bands for GSM based on different references throughout the Petition. *See, e.g.*, Pet. at 9 (listing 800/1900 MHz for GSM frequency band); Pet. at 22 (listing 900, 1800, 1900 MHz for GSM frequency band); Pet. at 23 (listing 900 and 1800 MHz for GSM frequency band). If different devices use different combinations of 800, 900, 1800, and 1900 frequency bands (among other possible GSM frequency bands not cited by Petitioner), it is unclear how any one specific combination of these frequencies can be inherent from a general disclosure of GSM. Instead, the modulation schemes and frequencies are dependent on specific hardware implementations and cannot be inherent.

Prelim. Resp. 35–36.

Patent Owner also argues that "Petitioner additionally relies on its expert's declaration to assert that 'modulation schemes and frequencies would have been obvious based on the knowledge of a POSITA as evidenced by those same references.'" *Id.* at 36 (citing Ex. 1002 ¶ 89; Pet.

20). Patent Owner asserts that "[t]he Petition makes similar statements for numerous claims throughout the petition," "[h]owever, its cited expert's declaration merely parrots back the conclusory assertion from the Petition which it is offered to support—oftentimes verbatim." Prelim. Resp. 36 (citing Pet. 22–24; Ex. 1002 ¶¶ 89, 93, 97, 99, 224).

We disagree with Patent Owner. Limitation [1a] recites: "*a first radio communication circuit implementing a first transmission scheme having a first modulation scheme and a first transmission frequency band*, the first radio communication circuit capable of transmitting video information by radio or receiving information by radio using the first transmission frequency band." Ex. 1004, 1:24–39 (emphasis modified). Limitation [1a] does not specify any particular "*modulation scheme*" or "*frequency band*," for the "*first radio communication circuit*," only that the "*circuit*" be "*capable of transmitting video information by radio or receiving information by radio using the first transmission frequency band*."

For the recited "*first radio communication circuit*," Petitioner relies on N93's disclosure of Bluetooth as the "*first transmission scheme*" using GFSK/$\frac{\pi}{4}$-DQPSK/8DPSK as a "*first modulation scheme*" and 2402–2480 MHz as a "*first transmission frequency band*" where the circuit is capable of transmitting video information stored in a Gallery by radio or receiving video information by radio using Bluetooth. Pet. 18–19. Limitation [1a] recites a "*frequency band*," not any specific individual radio frequency. Thus, Patent Owner's argument that "different devices use different modulation schemes and frequencies," is unavailing where Petitioner has relied upon N93's teaching of Bluetooth's GFSK/$\frac{\pi}{4}$-DQPSK/8DPSK as the

"*first modulation scheme*" and 2402–2480 MHz as the "*first transmission frequency band*."

Based on the preliminary record before us, we determine that Petitioner has made a sufficient showing, for purposes of institution, that the combined teachings of the asserted prior art meet the subject matter recited in limitation [1a].

b. Contested Limitation [1b]

Limitation [1b] recites: "*a second radio communication circuit implementing a second transmission scheme having a second modulation scheme different from the first modulation scheme and a second transmission frequency band different from the first transmission frequency band, the second radio communication circuit capable of connecting by radio to an internet or a home network to transmit and receive information using the second transmission frequency band.*"

Petitioner contends that its proposed combination discloses or renders obvious

> a second radio communication circuit implementing a second transmission scheme (UMTS) having a second modulation scheme (QPSK/QAM) different from the first modulation scheme (GFSK/$\frac{\pi}{4}$-DQPSK/8DPSK) and a second transmission frequency band (2100MHz) different from the first transmission frequency band (2402-2480 MHz), the second radio communication circuit capable of connecting by radio to an internet or a home network to transmit and receive information using the second transmission frequency band (Internet access through cellular network).

Pet. 20–21 (citing Ex. 1010, 8 ("UMTS 2100 networks"), 15 (3G data packet connection), 61–64 (SIP and MMS); Ex. 1008, Fig. 1 (network transceiver 105), ¶¶ 59–61 (circuits and hardware components), 67 (Internet access

through cellular network), 68 (TCP/IP stack for IP-based networks), 69 (3G cellular networks); Ex. 1002 ¶ 90).

Petitioner asserts that "N93 discloses the cellular phone includes circuits and a UMTS radio communication circuit operating in the 2100 MHz band." Pet. 21 (citing Ex. 1010, 8 ("UMTS 2100 networks"), 15, 59–62, 64, 92, 106, 110, 113, 125). Petitioner explains that "UMTS radio is a 3G radio that connects to the Internet to transmit and receive information such as video calls, web browsing, e-mail, MMS, video clips, etc." *Id.* (citing Ex. 1010, 15 (3G packet data connection, available, active, on hold), 59 (video call), 60–61 (video calls and sharing video clips via SIP connections over UMTS), 64 (MMS over UMTS), 91–92 (connection manager), 106 (UMTS for MSS, Web browsing, email, and "connect to the Internet"), 113 (UMTS network mode); Ex. 1002 ¶ 91).

Petitioner asserts that "Dua also discloses the cellular phone includes a UMTS transceiver by disclosing a 3G radio that is fully compliant with all worldwide 3GPP standards and provides additional implementation details." Pet. 21 (citing Ex. 1008 ¶ 69). According to Petitioner, "Dua discloses the transceiver interacts with the CPU 109 to implement the radio communication protocols and higher level networking and application layer protocols (like TCP/IP, SIP, RTP, HTTP) to communicate over the radios and Internet. *Id.* (citing Ex. 1008 ¶¶ 66–69). Petitioner asserts that "Dua also discloses the UMTS radio connects by radio to the Internet to transmit and receive video using SIP connections." Pet. 23 (citing Ex. 1008 ¶¶ 68, 140, 183–189; Ex. 1002 ¶ 92).

According to Petitioner, "Dua's disclosure of a radio to support 'all worldwide 3GPP and 3GPP2 standards' (Ex. 1008 ¶ 69) inherently discloses to a POSITA a UMTS radio using the UMTS modulation schemes (QPSK,

16QAM, and 64QAM) and the frequency (2100 MHz), as required by those standards." Pet. 22 (citing Ex. 1015, 2 (UMTS), 21 (QPSK), 21–22 (16QAM), 22–23 (64QAM), 15 (OFDM); Ex. 1010, 8 (UMTS 2100 MHz); Ex. 1011 ¶¶ 10, 19 (UMTS uses WCDMA at 2100 MHz). Petitioner asserts that "Dua's disclosure of 'fully compliant' radio also inherently discloses UMTS with TDD, such that information is transmitted and received on the same frequencies." *Id.* (citing Ex. 1015, 7 (TDD)). "In the alternative," Petitioner argues, "the UMTS modulation schemes and frequencies would have been obvious based on the knowledge of a POSITA, as evidenced by those same references." *Id.* (citing Ex. 1002 ¶ 93).

For limitation [1b], Patent Owner relies on the same arguments it made with respect to limitation [1a]. *See* Prelim. Resp. 35–37. With respect to inherency, Patent Owner argues that "[i]f different devices use different combinations of 800, 900, 1800, and 1900 frequency bands (among other possible GSM frequency bands not cited by Petitioner), it is unclear how any one specific combination of these frequencies can be inherent from a general disclosure of GSM. Instead, the modulation schemes and frequencies are dependent on specific hardware implementations and cannot be inherent." *Id.* at 36.

We note that Patent Owner does not cite to Mr. McNair's testimony to support this position, so we infer that this is mere attorney argument, which is entitled to little weight. *See Invitrogen Corp. v. Clontech Lab., Inc.*, 429 F.3d 1052, 1068 (Fed. Cir. 2005) ("Unsubstantiated attorney argument regarding the meaning of technical evidence is no substitute for competent, substantiated expert testimony."); *Icon Health & Fitness, Inc. v. Strava Inc.*, 849 F.3d 1034, 1046 (Fed. Cir. 2017) ("Attorney argument is not evidence or explanation in support of a conclusion."); *In re Payne*, 606 F.2d 303, 315

(CCPA 1979) ("Arguments of counsel unsupported by competent factual evidence of record are entitled to little weight."). In contrast, Petitioner's position is supported by Dr. Creusere's testimony, which we credit. *See.* Ex. 1002 ¶¶ 66, 91–93.

Based on the preliminary record before us, we determine that Petitioner has made a sufficient showing, for purposes of institution, that the combined teachings of the asserted prior art meet the subject matter recited in limitation [1b].

c. Contested Limitation [1c]

Limitation [1c] recites: "*a third radio communication circuit capable of transmitting information and using a third transmission frequency band*."

Petitioner contends that its proposed combination discloses or renders obvious "a third radio communication circuit (GSM or Wi-Fi) capable of transmitting information and using a third transmission frequency band (GSM: 900, 1800, 1900 MHz; Wi-Fi: 2.4GHz or 5Ghz)." Pet. 22 (citing Ex. 1010, 8, 15–19, 30, 42–43, 53, 60, 78, 88–89, 91–92, 106–109, 112–113, 121, 125; Ex. 1008 ¶¶ 59–61, 66–69, 174; Ex. 1002 ¶ 94).

Petitioner provides two different radio mappings, Mapping A: GSM (Pet. 22–23), and Mapping B: Wi-Fi (*id.* at 23–24). For Mapping A, Petitioner asserts that

> N93 discloses the cellular phone includes a GSM radio (third radio circuit) to connect to the internet and is capable of transmitting information (SMS or data over GPRS and EDGE) using the 900, 1800 and 1900 MHz transmission frequency bands. EX1010, 7, 15, 53 (texts), 91-92 (data connections), 106-107(connect to the internet), 113, 125 (electronic circuits).

Id. at 23 (citing Ex. 1002 ¶ 95).

Petitioner also asserts that "Dua also discloses the cellular phone includes a GSM radio communication circuit in network transceiver 105 for interfacing with the cellular network and connecting to the Internet and provides additional implementation details." Pet. 23 (citing Ex. 1008, Fig. 1 (transceiver 105), ¶¶ 59 (integrated circuit chips and circuity), 66 (GSM cellular network to access the Internet), 67–69).

For Mapping B (Wi-Fi), Petitioner asserts that "N93 and Dua each disclose an additional 'third radio communication circuit,' including a Wi-Fi radio circuit in short range radio transceiver 108 (802.11b or g at 2.4GHz or 802.11a at 5GHz), which can transmit media and connect to the internet on their respective third transmission frequency band." Pet. 24 (citing Ex. 1010, 18, 125; Ex. 1008 ¶¶ 62, 66; Ex. 1002 ¶ 98).

For limitation [1c], Patent Owner relies on the same arguments it made with respect to limitations [1a] and [1b]. *See* Prelim. Resp. 35–37. Based on the preliminary record before us, and for the reasons explained above with respect to limitations [1a] and [1b], we determine that Petitioner has made a sufficient showing, for purposes of institution, that the combined teachings of the asserted prior art meet the subject matter recited in limitation [1c].

d. Contested Limitation [1h]

Limitation [1h] recites: "*a controller controlling assignment of connection of each of the first, second, and third radio communication circuits*."

Petitioner contends that its proposed combination "discloses or renders obvious 'a controller (CPU 109) controlling assignment of connection of each of the first, second, and third radio communication circuits.'" Pet. 29 (citing Ex. 1010, 2, 98, 111, 114; Ex. 1008, Fig. 1 (CPU

109), ¶¶ 59, 66; Ex. 1002 ¶ 112). Petitioner asserts that "N93 discloses the phone is a computing device running the Symbian operating system with a [user input] for presenting the user with options on the display and responding to the user's input and selection of radios to transmit or receive video or connect to the Internet or home network." Pet. 29 (citing Ex. 1010, 2, 98, 111, 114; Ex. 1002 ¶ 113). According to Petitioner, "N93 discloses the controller running the Symbian OS controls the [user input] and assignment of each of the Bluetooth UMTS, GSM, and Wi-Fi radios." *Id.* (citing Ex. 1002 ¶ 114).

Petitioner explains that for UMTS and GSM,

> N93 discloses the operating system running on the controller has a user interface whereby the controller receives user indications to assign the UMTS or GSM radio to transmit or receive video as follows: (1) user exits the "Offline profile" ("Tools>Profiles") to indicate to the controller to activate or turn on the UMTS or GSM radio (EX1010, 101), (2) user indicates the controller should assign only UMTS or only GSM using the "Network Mode" setting (*id.*, 113), (3) user indicates whether the controller should automatically search for and select an available network, or whether it should be manual (*id.*), (4) user indicates the controller should define a packet data access point (*id.*, 107), and (5) user indicates whether the controller should connect "When available" or "When needed," which will only connect when the user manually starts an application that requires it. *Id.*, 108-109. EX1002, ¶116.

Id. at 29–30.

According to Petitioner, "[a] user can then indicate to the controller to assign a connection via the specified UMTS or GSM radio to transmit video by defining the specified network as an access point for multimedia messages (Ex. 1010, 48, 53–54, 106), or e-mail (*id.* at 48, 54–55, 106) and

then going into Gallery and selecting Send>Via Multimedia or Send>Via e-mail." Pet. 30 (citing Ex. 1010, 32–33; Ex. 1002 ¶ 117).

"For Wi-Fi," Petitioner explains, "N93 discloses the controller displaying a prompt to the user to turn Wi-Fi scanning on to scan for a network, join the network, and create an IP or other connection to send/receive data over the Wi-Fi network, for example, using home share to send/receive videos." Pet. 31 (citing Ex. 1010, 15, 17–19, 30–31, 53, 88–92, 106–109, 121; Ex. 1002 ¶ 119).

Petitioner also explains that Dua explicitly identifies microprocessor/CPU 109, "which controls assignment of connection of each of Dua's radios." Pet. 31 (citing Ex. 1008, Fig. 1 (showing CPU 109 with lines connecting each component), 59, 66). According to Petitioner, "Dua discloses CPU 109 runs the operating system and media player and receives the indications from the user via the user interface," where "CPU 109 controls each assignment of each connection of each of its radios . . . because the CPU 109 implements the radio communication protocols with the transceivers and higher-level networking and application layer protocols (SIP, TCP/IP, SIP, RTP, HTTP) to communicate media over the radios and Internet." *Id.* (citing Ex. 1008 ¶¶ 59–60, 66–69; Ex. 1002 ¶¶ 120–121).

According to Petitioner, "Dua discloses CPU 109 controls assignment of the short-range radios (Bluetooth and Wi-Fi) to connect to a source/target based on profile information received via one of 1) the NFC radio, 2) from a user's selection of a stored profile, or 3) a user's manual configuration." Pet. 31–32. Petitioner explains that "Dua discloses CPU 109 controls assignment of the cellular radios (UMTS, GSM) based on the SIP protocol and target information stored in a buddy list for the buddy indicated by the user." *Id.* at 32 (citing Ex. 1008 ¶¶ 66–69, 178–185, 192–194). Petitioner

also explains that "Dua discloses the CPU 109 controls assignment of connection of the NFC radio based on the user pressing an activation button." *Id.* (citing Ex. 1008, Fig. 1 (118), ¶¶ 70–74, 90, 95–98; Ex. 1002 ¶ 121).

Patent Owner contends that "while the Petition relies on N93 to disclose assignment of connection, the Petition acknowledges that N93 fails to disclose a *controller controlling assignment* of connection of each of the circuits." Prelim. Resp. 37 (citing Pet. 11, 29–30). Patent Owner argues that "Dua fails to cure the deficiencies of N93" because "Dua fails to disclose any of the settings to 'select' UMTS or GSM that the Petition cites as 'assignment of connection' in N93." *Id.* at 38 (citing Pet. 29–30). Patent Owner argues that "[i]t is unclear how Dua could provide support for a *controller* controlling assignment of connection of the UMTS or GSM circuits, when Dua fails to disclose any assignment of connection of UMTS and GSM circuits in the first place." *Id.* Patent Owner argues that "Dua lacks many details regarding 'a controller controlling assignment of connection of each of the first, second, and third radio communication circuits,' such as the internal hardware implementation details of a controller controlling assignment of UMTS and GSM circuits (the alleged 'second' and 'third' radio communication circuits)." *Id.* at 39.

We disagree with Patent Owner. Patent Owner appears to be arguing that claim 1 precludes any user input with respect to the assignment of connection of each of the first, second and third radio communication circuits, including precluding a user from providing an indication to the apparatus as to which assignment of connection the user would prefer the controller to assign. Instead, we agree with Petitioner that N93 and Dua provide sufficient teaching showing user input indicating a preference to the

apparatus wherein the controller then controls assignment of connection of each of the first, second, and third radio communication circuits.

For example, Petitioner explains that "[a] user can then indicate to the controller to assign a connection via the specified UMTS or GSM radio to transmit video by defining the specified network as an access point for multimedia messages (Ex. 1010, 48, 53–54, 106), or e-mail (*id.* at 48, 54–55, 106) and then going into Gallery and selecting Send>Via Multimedia or Send>Via e-mail." Pet. 30 (citing Ex. 1010, 32–33; Ex. 1002 ¶ 117). This example, and other similar examples, are supported by Dr. Creusere's testimony, which we credit. *See* Ex. 1002 ¶¶ 116–121.

Based on the preliminary record before us, we determine that Petitioner has made a sufficient showing, for purposes of institution, that the combined teachings of the asserted prior art meet the subject matter recited in limitation [1g].

e. Contested Limitation [1k]

Limitation [1k] recites: "*wherein the controller controls each of the first and second radio communication circuit so that the first radio communication circuit transmits video information and the second radio communication circuit connects to the internet or the home network simultaneously*."

Petitioner contends that its proposed combination discloses or renders obvious "wherein the controller (CPU) controls each of the first and second radio communication circuit so that the first radio communication circuit (e.g., Bluetooth) transmits video information and the second radio communication circuit (e.g., UMTS) connects to the internet or the home network simultaneously." Pet. 36–38 (citing Pet. at Sec. VII.B.2.[1a] (first radio), VII.B.3.[1b] (second radio), VII.B.9.1[h] (controller), VII.B.10.1[i]

(video), VII.B.11.1[j] (controller assigning first radio); Ex. 1010, 18, 83; Ex. 1008, Figs. 10, 11, ¶¶ 190, 195–196, 203; Ex. 1002 ¶ 132).

According to Petitioner, "N93 explicitly teaches the phone can be used as a modem for a PC by simultaneously using a Bluetooth connection to the PC and a UMTS connection to the Internet." Pet. 36 (citing Ex. 1010, 83). Petitioner asserts that "N93 also explicitly teaches there can be simultaneous Wi-Fi and UMTS data packet connections" and "discloses Bluetooth can be used while running other applications." *Id.* (citing Ex. 1010, 18, 84). According to Petitioner, a person of ordinary skill in the art "would have understood N93 discloses simultaneous Bluetooth video transfers and data packet connections over UMTS." *Id.* (citing Ex. 1002 ¶ 133).

Petitioner asserts that "Dua also discloses the controller controls the Bluetooth and UMTS radios . . . so that video can be transmitted and received over the Bluetooth transceiver with local devices simultaneously with the UMTS radio connecting to the Internet to transmit and receive the video with remote devices." Pet. 36–37 (citing Ex. 1008, Fig. 10, ¶¶ 191–200 (player 100A receiving video via Bluetooth and transmitting the video via UMTS to internet 730, player 100B receiving video via UMTS from internet 730 and transmitting the video via Bluetooth to television 751), Fig. 11, ¶¶ 201–208 (media player 100B receiving video through internet 730 using cellular and transmitting the received video through Bluetooth to television 851)). According to Petitioner, "Dua explicitly teaches the video transmission/reception over the first radio (Bluetooth) can be 'simultaneous' with the internet connection via the second radio (UMTS) for video transmission/reception." Pet. 37 (citing Ex. 1008, Figs. 8a-8b, ¶¶ 155–172,

Fig. 9, ¶¶ 173–189, Fig. 16, ¶ 223, Fig. 17, ¶¶ 224, 14, 63, 176, 184, 192 (each showing simultaneous transmission for live or internet sources)).

Petitioner asserts that "[i]t would have been obvious to a POSITA to support the simultaneous operation of these radios in the combination as claimed to support the Bluetooth video transfer functionality while the UMTS radio connects to the Internet to, e.g., simultaneously send/receive the video being transferred." Pet. 38.

Patent Owner argues that "[a]ll of the Petition's theories merely show *individual* actions and not *simultaneous* actions by a single system." Prelim. Resp. 45. Patent Owner also argues that "[t]here is no explanation of the role any controller plays during Petitioner's description of these actions." *Id.* Patent Owner asserts that "[t]he Petition fails to actually map these actions to a controller controlling each of the first and second communication circuit." *Id.* at 46. Patent Owner argues that "Petitioner only provides evidence that Dua discloses transmission of media files over Bluetooth but fails to provide evidence that Dua discloses video streaming over Bluetooth." *Id.* at 47.

We disagree with Patent Owner. Here, Dr. Creusere maps Bluetooth to the "first radio communication circuit" and UMTS to the "second radio communication circuit." Ex. 1002 ¶ 132. Mr. McNair's testimony cited by Patent Owner notwithstanding (*see* Prelim. Resp. 49–50), Dr. Creusere testifies that

> Dua explicitly teaches the video transmission/reception over the first radio (Bluetooth) can be "simultaneous" with the internet connection via the second radio (UMTS) for video transmission/reception. [Ex. 1008], Figs. 8a-8b and [0155]-[0172] (illustrating and describing simultaneous transmissions for live and internet sources), Fig. 9 and [0173]-[0189] ("simultaneous" video transmissions), Fig. 16 and [0223] (live

> source), Fig. 17 and [0224] (internet source), [0014] ("simultaneous"), [0063] ("simultaneous"), [0176] ("simultaneously"), [0184] ("simultaneously"), [0192] ("simultaneously").

Ex. 1002 ¶ 134.

Based on the preliminary record before us, we determine that Petitioner has made a sufficient showing, for purposes of institution, that the combined teachings of the asserted prior art meet the subject matter recited in limitation [1k].

f. Contested Limitation [1l]

Limitation [1l] recites: "*wherein the second or third radio communication circuits receive a signal from the internet indicating that an update for an operating system of the video processing apparatus is available, and the video processing apparatus executes an update process such that an updated operating system of the video processing apparatus is stored in the video processing apparatus after execution of the update process*."

Petitioner contends that its proposed combination discloses or renders obvious

> wherein the second or third radio communication circuits (e.g., UMTS or GSM radios) receive a signal (notification message, list/notice of updates, delta file) from the internet indicating that an update for an operating system (cellphone's OS) of the video processing apparatus is available, and the video processing apparatus executes an update process (uses the delta file to create an updated OS image) such that an updated operating system of the video processing apparatus is stored in the video processing apparatus after execution of the update process." EX1010, 2, 72, 98, 111, 114–116; EX1008, Fig. 7, [0058], [0060], [0141], [0143], [0151], [0154]; EX1009, Figs. 1–4, 1:14–3:30, 6:9–7:18, 7:25–36, 7:66, 8:3–38 (software update); EX1002, ¶ 136.

Pet. 38.

Petitioner asserts that "N93 discloses its cellular phone running software, including an operating system and applications," and that "N93 discloses its cellular radios being connected to the Internet." Pet. 38 (citing Ex. 1010, 2, 72, 98, 111, 114–116; Ex. 1002 ¶ 137).

According to Petitioner, "Dua also discloses its cellular phone running software, including an operating system and applications," and "Dua discloses that the software on the cellular phone can be updated, but does not explicitly discuss how." Pet. 39 (citing Ex. 1008 ¶¶ 58, 60, 141, 143, 151, 154). Petitioner points out that "Dua discloses UMTS and GSM radios are connected to the Internet." *Id.* (citing Ex. 1002 ¶ 138).

Petitioner also asserts that "Herle discloses a cellular phone running software and further discloses updating that software (OS and applications) over the air (OTA updates)." Pet. 39 (citing Ex. 1009, Fig. 2, 1:14–3:30, 6:9–19, 6:20–7:18 (phone components); Ex. 1002 ¶ 139). According to Petitioner, "Herle discloses the update process can begin with the mobile station 111 receiving via its cellular radio a notification message from the Internet from the upgrade server 300." *Id.* (citing Ex. 1009, Fig. 1 (internet and wireless network 100), Fig. 2 (RF transceiver 210), Fig. 3 ("To/From MS 111 Via Internet"), Fig. 4 (405), 7:25–29, 8:13–18 ("a notification message from upgrade server 300")). "This notification message," Petitioner explains, "informs MS 111 that an upgrade is available." *Id.* (citing Ex. 1009, 7:66).

Petitioner explains that

> MS 111 provides the upgrade server with its software version. *Id.*, Fig. 4 (405, 410, 415), 8:3–11; 8:18–33. MS 111 may request a list of available upgrades, which list will be provided by the upgrade server, or the upgrade server may simply tell the MS 111 the upgrade is available. *Id.*, 7:30–36. Upgrade server 300 uses version information provided by MS 111 to produce and send the correct delta file. *Id.*, Fig. 4 (405, 410, 415), 8:3–11; 8:18–33.

Pet. 39.

Petitioner goes on to explain that

> MS 111 receives the delta file as an OTA download. *Id.*, Fig. 4 (420, 425), 8:11–12, 8:33–38. Each of the signal containing the notification message, the signal containing the list or upgrade notice, and the signal containing the delta file satisfies the claimed "signal" because each is received by a cellular radio from the internet, and indicates an upgrade is available. The notification message indicates an upgrade is available in general, the list or notice specifically indicates which upgrade is available for that device, and the delta file indicates the specific delta file upgrade that is available for that device. EX1002, ¶140.

Id. at 39–40.

Finally, Petitioner explains that

> MS 111 executes an update process by storing the delta file, verifying the delta file, executing a program to convert the original image into the new image file using the delta file, and then rebooting and executing the new image file. *Id.*, Fig. 4 (425, 430), 8:34–48. Thus, the updated software (OS/application) is stored in MS 111 after execution of the update process. EX1002, ¶141.

Id. at 40.

Petitioner asserts that "[i]t would have been obvious to a POSITA to implement Herle's OTA upgrade process in the combination using the UMTS or GSM radios." *Id.*

Patent Owner disagrees, arguing that "Petitioner fails to show that N93 in combination with Dua and Herle discloses claim element [1.l] that requires updating of an operating system." Prelim. Resp. 51. Patent Owner argues that "N93 only discloses pulling updates (rather than 'receiving a signal from the internet indicating that an update' is available) for *applications* and not its operating system." *Id.* at 52. Patent Owner also argues that "Dua is completely silent regarding receiving any indication over the internet or updating the **operating system**." *Id.* at 52–53. "Based on this," Patent Owner argues, "Petitioner fails to establish that it would have been obvious to combine N93, Dua, and Herle, because the Petition fails to map the rationale towards actual claim elements, which are directed to updates to an *operating system*." *Id.* at 53. According to Patent Owner, "[t]here is no evidence regarding whether the operating systems in N93 and Dua could be updated at all." *Id.* "In this case," Patent Owner argues, "it is unclear why a POSITA would look to Herle to incorporate delta-based over-the-air updates for operating systems for two devices that *do not support updates for operating systems*." *Id.*

We disagree with Patent Owner. The test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. *In re Keller*, 642 F.2d 413, 425 (CCPA 1981) (citations omitted). "[O]ne cannot show non-obviousness by attacking references individually where, as here, the rejections are based on combinations of references." *Id*. at 426.

Here, Dr. Creusere testifies that Herle teaches how to update software, including an operating system and applications, of a mobile station over the air using cellular radio. Ex. 1002 ¶¶ 139–142 (citing, e.g., Ex. 1009, Figs. 1–4, 1:14–3:30, 6:9–19, 7:18, 7:25–29, 7:66, 8:3–33); Ex. 1009, 1:39–43 ("Over-the-air upgrading of wireless mobile stations also is a relatively new procedure that enables a subscriber to download and install upgraded software containing patches, bug fixes, and newer versions of mobile station software, *including the operating system*.") (emphasis added).

Because an obviousness analysis considers the *combined* teachings of the asserted references, it is not required that each of the references teach the recited feature individually, as Patent Owner appears to argue here. *See* Prelim. Resp. 52–53 ("Dua is completely silent regarding receiving any indication over the internet or updating the **operating system**."); s*ee also KSR,* 550 U.S. at 417 ("[I]f a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill.").

Based on the preliminary record before us, we determine that Petitioner has made a sufficient showing, for purposes of institution, that the combined teachings of the asserted prior art meet the subject matter recited in limitation [1l].

i. Uncontested Limitations

Patent Owner does not expressly contest the remaining portions of independent claim 1. These include the preamble and limitations [1d]–[1g] and [1i]–[1j]. *See* Prelim. Resp. 35–58.

Petitioner provides evidence and argument, supported by the testimony of Dr. Creusere, that these uncontested portions of claim 1 are met

by Petitioner's proposed combination of N93, Dua, and Herle, and that at the time of the claimed invention, these portions of claim 1 would have been obvious to a person of ordinary skill in the art. *See* Pet. 18, 24–29, 32–35; Ex. 1002 ¶¶ 84, 100–111, 122–131.

After reviewing Petitioner's arguments and evidence concerning these uncontested portions of claim 1, we are persuaded that Petitioner has demonstrated sufficiently for purposes of institution that the combined teachings of N93, Dua, and Herle meet these uncontested portions of claim 1.

j. Conclusion as to Claim 1

Based upon the current record, we are persuaded that Petitioner has demonstrated a reasonable likelihood of prevailing in its challenge to claim 1 under 35 U.S.C. § 103 as obvious over the combined teachings of N93, Dua, and Herle.

3. Claims 4, 5, 8–12, and 14–25

Petitioner argues the combination of N93, Dua, and Herle teaches or suggests the recited limitations of claims 4, 5, 8–12, and 14–25. Pet. 40–53.

Patent Owner does not contest Petitioner's evidence and arguments with respect to dependent claims 4, 8, 11, 12, 14–22, 24, and 25. *See* Prelim. Resp. 35–58. With respect to the contested limitations of independent claims 5, 9, 10, and 23, namely limitations [5.a]–[5.c], [5.f], [5.h], [5.i], [9.d], [9.f], [9.h], [9.i], [9.k], [9.l], [10.a]–[10.c], [10.e], [10.g], [10.j], [23.a]–[25.d], [23.j], [23.l], and [23.m], Patent Owner essentially relies on the same arguments it made with respect to similar limitations of independent claim 1 to argue that Petitioner has not shown that the asserted prior art teaches or renders obvious these limitations. *See* Prelim. Resp. 37, 44, 51, and 57–58.

We have considered Petitioner's and Patent Owner's evidence and arguments with respect to claims 4, 5, 8–12, and 14–25. Based upon the current record, we are persuaded that Petitioner has shown sufficiently for purposes of institution that the combined teachings of the cited art meet the recited limitations of claims 4, 5, 8–12, and 14–25, and that a person of ordinary skill in the art at the time of the invention would have combined the references in the manner proffered and would have had a reasonable expectation of success in that endeavor.

G. Remaining Grounds 2–5

Petitioner also challenges claims 1, 4, 5, 8–12, and 14–25 based on the combined teachings of N93, Dua, Herle, Rooyen, Desai, BTSpec, 3GPP-Spec, and Kao (Ground 2), Dua and Herle (Ground 3), Dua, Herle, and N93 (Ground 4); and Dua, Herle, N93, Rooyen, Desai, BT-Spec, 3GPP-Spec, and Kao (Ground 5). Pet. 53–73. Patent Owner contests Petitioner's challenges. Prelim. Resp. 58–63.

We have considered Petitioner's evidence and arguments with respect to these other grounds as well as Patent Owner's evidence and arguments. However, because we determine that Petitioner demonstrates a reasonable likelihood of prevailing in its challenge to independent claim 1 under 35 U.S.C. § 103(a) as obvious over N93, Dua, and Herle (Ground 1), we institute *inter partes* review as to all other challenges in the Petition, including Petitioner's challenges under Grounds 2–5. *See PGS Geophysical AS v. Iancu*, 891 F.3d 1354, 1360 (Fed. Cir. 2018).

IV. CONCLUSION

For the foregoing reasons, we determine that Petitioner has demonstrated a reasonable likelihood of prevailing in showing the

unpatentability of at least one of the challenged claims of the '590 patent. We therefore institute trial as to all challenged claims on all grounds stated in the Petition.

At this preliminary stage of the proceeding, we have not made a final determination as to the patentability of any challenged claim or any factual or legal issue underlying the patentability inquiry. Any final determination will be based on the complete record developed during trial. We place Patent Owner on express notice that any argument not asserted in a timely-filed Response to the Petition, or in another manner permitted during trial, shall be deemed waived, even if that argument was presented in the Preliminary Response.

V. ORDER

Accordingly, it is

ORDERED that an *inter partes* review is instituted as to all challenged claims on all grounds raised in the Petition; and

FURTHER ORDERED that *inter partes* review is instituted commencing on the entry date of this Order, and pursuant to 35 U.S.C. § 314(c) and 37 C.F.R. § 42.4, notice is hereby given of the institution of a trial.

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