

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

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

v.

SMART MOBILE TECHNOLOGIES LLC,
Patent Owner.

IPR2022-01249
Patent 9,019,946 B1

Before HYUN J. JUNG, GARTH D. BAER, and AARON W. MOORE,
Administrative Patent Judges.

JUNG, *Administrative Patent Judge.*

JUDGMENT
Final Written Decision
Determining Some Challenged Claims Unpatentable
Granting Petitioner's Motion to Submit Supplemental Information
35 U.S.C. § 318(a)

I. INTRODUCTION

We have jurisdiction under 35 U.S.C. § 6. This Final Written Decision is issued pursuant to 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73. For the reasons that follow, we determine that Samsung Electronics Co., Ltd., Samsung Electronics America, Inc., and Apple Inc. (collectively, “Petitioner”) have shown by a preponderance of the evidence that claims 14, 15, 17–21, and 27–30, but not claims 1–13, 16, and 26, of U.S. Patent No. 9,019,946 B1 (Ex. 1001, “the ’946 patent”) are unpatentable. We also grant Petitioner’s Motion to Submit Supplemental Information.

A. Background and Summary

Petitioner filed a Petition (Paper 3, “Pet.”) requesting institution of an *inter partes* review of claims 1–21 and 26–30 of the ’946 patent. Smart Mobile Technologies LLC (“Patent Owner”) filed a Preliminary Response (Paper 7). With our authorization, the parties filed additional briefs directed solely to the issue of inconsistent claim constructions between this proceeding and related litigation. Papers 11, 12. Pursuant to 35 U.S.C. § 314, we instituted an *inter partes* review of claims 1–21 and 26–30 of the ’946 patent on all presented challenges. Paper 13 (“Inst. Dec.”), 2, 53.

After institution, Patent Owner filed a Response (Paper 33, “PO Resp.”), to which Petitioner filed a Reply (Paper 38, “Pet. Reply”), and Patent Owner thereafter filed a Sur-reply (Paper 47, “PO Sur-reply”). Petitioner also filed a Motion to Submit Supplemental Information (Paper 24), and Patent Owner filed an Opposition (Paper 25). An oral hearing in this proceeding was held on October 24, 2023; a transcript of the hearing is included in the record. Paper 52.

B. Real Parties in Interest

Petitioner identifies Samsung Electronics Co., Ltd., Samsung Electronics America, Inc., and Apple Inc. as real parties in interest. Pet. 86. Patent Owner only identifies itself as a real party in interest. Paper 5, 1.

C. Related Matters

The parties identify *Smart Mobile Techs. LLC v. Apple Inc.*, 6:21-cv-00603 (W.D. Tex.) and *Smart Mobile Techs. LLC v. Samsung Elecs. Co., Ltd.*, 6:21-cv-00701 (W.D. Tex.) as related matters. Pet. 86; Paper 5, 1. Related patents are challenged in IPR2022-00766, IPR2022-01004, IPR2022-01005, IPR2022-01222, IPR2022-01223, and IPR2022-01248.

D. The '946 Patent (Ex. 1001)

The '946 patent issued on April 28, 2015, from an application filed on September 8, 2014, which is a continuation application of several previously filed continuation and continuation-in-part applications, the earliest of which was filed on June 4, 1999. Ex. 1001, codes (22), (45), (63), 1:8–19.

According to the '946 patent, an unfulfilled need exists for multiple transmitters and receivers (“T/R”) in a cellular telephone or mobile wireless device (“CT/MD”). Ex. 1001, 1:48–49. Figure 5A of the '946 patent is reproduced below.

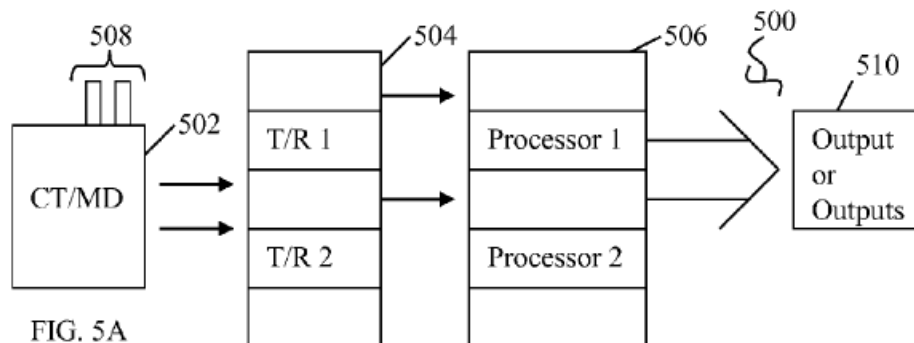


Figure 5A shows a “a dual antenna, dual T/R unit in a CT/MD interfacing with a dual processor.” Ex. 1001, 2:15–17. Dual antenna 508

and dual T/R unit 504 interface with dual processor 506 in dual band system 500. *Id.* at 4:37–39. System 500 can communicate through outputs 510, which can be “fibre optic channel, ethernet, cable, telephone, or other.” *Id.* at 4:42–45.

“The multiple processors 506 allow for parallel and custom processing of each signal or data stream to achieve higher speed and better quality of output.” Ex. 1001, 4:51–53. Processors 506 include “DSP, CPU, memory controller, and other elements essential to process various types of signals.” *Id.* at 4:56–58.

“The processor contained within the CT/MD 502 is further capable of delivering the required outputs to a number of different ports such as optical, USB, cable and others” and “capable of taking different inputs, as well as wireless.” *Id.* at 4:60–64. “Thus the CT/MD 502 has universal connectivity in addition to having a wide range of functionality made possible through the features of multiple antennas, multiple T/R units 504 and processors 506.” *Id.* at 4:67–5:3.

“[T]he CT/MD may use one or more transmission protocols as deemed optimal and appropriate,” and “the CT/MD determines the required frequency spectrum, other wireless parameters such as power and signal to noise ratio to optimally transmit the data.” Ex. 1001, 11:5–7, 11:9–11:11. The CT/MD has “the ability to multiplex between one or more transmission protocols such as CDMA, TDMA to ensure that the fast data rates of the optical network or matched closely in a wireless network to minimize the potential data transmission speed degradation of a wireless network.” *Id.* at 11:12–15. “Thus it is possible that various optical and wireless protocols can co-exist in a network.” *Id.* at 11:29–30.

E. Illustrative Claim

The '943 patent includes 30 claims, of which Petitioner challenges claims 1–21 and 26–30. Of the challenged claims, claims 1, 14, 17, and 27 are independent, and reproduced below is claim 14.

14. An Internet-enabled mobile communication device comprising:

a memory;

a display;

at least two or more antennas;

at least one or more processors; and

a plurality of wireless transmit and receive units including a first wireless transmit and receive unit and a second wireless transmit and receive unit, wherein each wireless transmit receive unit is configured to communicate using one or more protocols;

wherein the device is enabled for communication using Internet Protocol (IP);

wherein the device is enabled for wireless communication on a wireless local area network;

wherein the first wireless transmit and receive unit is enabled to communicate using one or more antennas simultaneously; and

wherein the mobile device maintains multiple IP addresses, wherein the first wireless unit is accessible on a first IP address and the second wireless transmit and receive unit is accessible on a second IP address and wherein the mobile device operates using a plurality of ports; and

wherein data transferred by the plurality of transmit and receive units is improved by the simultaneous use of multiple network paths including at least one connection to a networked server; and

wherein the device is enabled for communication of wireless signals representing voice data and for communication of wireless signals representing non-voice data.

Ex. 1001, 13:17–47.

F. Asserted Prior Art and Proffered Testimonial Evidence

Petitioner identifies the following references as prior art in the asserted grounds of unpatentability:

Name	Reference	Exhibit
Bernard	US 5,497,339, issued Mar. 5, 1996	1007
Billström	US 5,590,133, issued Dec. 31, 1996	1006
Johnston	US 5,784,032, issued July 21, 1998	1005
Sainton	US 5,854,985, issued Dec. 29, 1998	1009
Preiss	US 6,031,503, filed Feb. 20, 1997, issued Feb. 29, 2000	1010
Yegoshin	US 6,711,146 B2, filed Feb. 22, 1999, issued Mar. 23, 2004	1004
WO748	WO 98/27748, published June 25, 1998	1008

Pet. 2. Petitioner states that “[t]hese references qualify as prior art based on the earliest claimed priority date (6/4/1999; ‘Critical Date’)” but “does not concede entitlement to the claimed priority.” *Id.* at 1. According to Petitioner, Bernard and Billström are prior art under § 102(b); Yegoshin and Preiss are prior art under § 102(e); and Johnston, WO748, and Sainton are prior art under §§ 102(a) and (e).¹ *Id.*

Petitioner also provides a Declaration of Dr. Michael Allen Jensen (Ex. 1003) and a Second Declaration of Dr. Michael Allen Jensen (Ex. 1051). Patent Owner provides a Declaration of Professor Todor V. Cooklev, Ph.D. (Ex. 2001) and a Second Declaration of Professor Todor V. Cooklev, Ph.D. (Ex. 2019). Deposition transcripts for Dr. Jensen (Ex. 2020)

¹ The relevant sections of the Leahy-Smith America Invents Act (“AIA”), Pub. L. No. 112–29, 125 Stat. 284 (Sept. 16, 2011), took effect on March 16, 2013. Because the ’946 patent claims priority to an application filed before that date, our citations to 35 U.S.C. §§ 102 and 103 in this Decision are to their pre-AIA versions. *See also* Pet. 1 (stating but not conceding that “the earliest claimed priority date” is “6/4/1999”).

and Prof. Cooklev have been filed (Ex. 1053). With our authorization, Patent Owner also filed a deposition transcript for Dr. Jensen from IPR2022-01248 (Ex. 2029).

G. Asserted Grounds

Petitioner asserts that claims 1–21 and 26–30 are unpatentable on the following grounds:

Claim(s) Challenged	35 U.S.C. §	References/Basis
14, 15	103(a)	Yegoshin, Johnston, Billström
1–11, 16–21	103(a)	Yegoshin, Johnston, Billström, Bernard
12	103(a)	Yegoshin, Johnston, Billström, Bernard, WO748
13, 26	103(a)	Yegoshin, Johnston, Billström, Bernard, Sainton
27–30	103(a)	Yegoshin, Johnston, Billström, Bernard, Preiss

Pet. 1.

II. ANALYSIS

A. Petitioner’s Motion to Submit Supplemental Information

Petitioner moves to submit a Supplemental Declaration of Dr. Michael A. Jensen as supplemental information. Paper 24. Petitioner contends that the motion is timely, the declaration is relevant to the challenged claims, and numerous Board cases support granting the motion. *Id.* at 3–8.

Patent Owner filed an opposition to the motion. Paper 25. Patent Owner contends that Petitioner fails to show why the supplemental declaration cannot be filed with Petitioner’s reply. *Id.* at 1–2. Patent Owner also contends that the proposed declaration circumvents our word limits and adds new citations to the record. *Id.* at 2–9. Patent Owner further contends that the proposed declaration amounts to an additional brief because it

analyzes claim construction and includes new cites to the record. *Id.* at 9–10.

Having reviewed the parties’ positions, we grant Petitioner’s Motion to Submit Supplemental Information. In view of the full record and for the reasons below, our determination would not change even if we denied the motion.

B. Legal Standards

“In an [*inter partes* review], the petitioner has the burden from the onset to show with particularity why the patent [claim] it challenges is unpatentable.” *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1363 (Fed. Cir. 2016). This burden of persuasion never shifts to Patent Owner. *Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015). To prevail in an *inter partes* review, the petitioner must support its challenges by a preponderance of the evidence. 35 U.S.C. § 316(e) (2018); 37 C.F.R. § 42.1(d) (2021).

Petitioner contends that the challenged claims of the ’946 patent are unpatentable under § 103. Pet. 1. A claim is unpatentable under § 103 if the differences between the claimed subject matter and the prior art are such that the subject matter, as a whole, would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations, including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of skill in the art; and (4) where in evidence, so-called secondary considerations. *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966). When evaluating a combination of teachings, we must also

“determine whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue.” *KSR*, 550 U.S. at 418 (citing *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006)). Whether a combination of elements produces a predictable result weighs in the ultimate determination of obviousness. *Id.* at 416–417.

C. Level of Ordinary Skill in the Art

Petitioner asserts that one of ordinary skill in the art “would have had a Bachelor’s degree in electrical engineering, computer engineering, computer science, or a related field, and at least two years of experience related to the design or development of wireless communication systems, or the equivalent.” Pet. 3 (citing Ex. 1003 ¶¶ 27–28). Petitioner also states that “[a]dditional graduate education could substitute for professional experience, or significant experience in the field could substitute for formal education.” *Id.* (citing Ex. 1003 ¶¶ 27–28).

We preliminarily adopted Petitioner’s proposed level of ordinary skill in the art. Inst. Dec. 8. Patent Owner does not dispute Petitioner’s proposal and does not propose its own level of ordinary skill in the art. *See generally* PO Resp.; *see also* Ex. 2019 ¶ 17 (Patent Owner’s declarant accepting Petitioner’s proposed level of ordinary skill in the art).

Based on the full record, we maintain and affirm that one of ordinary skill in the art “would have had a Bachelor’s degree in electrical engineering, computer engineering, computer science, or a related field, and at least two years of experience related to the design or development of wireless communication systems, or the equivalent” and that “[a]dditional graduate education could substitute for professional experience, or significant experience in the field could substitute for formal education.” Pet. 3 (citing Ex. 1003 ¶¶ 27–28).

D. Claim Construction

In an *inter partes* review, the claims are 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(b) (2021); *see Phillips v. AWH Corp.*, 415 F.3d 1303, 1312–13 (Fed. Cir. 2005) (en banc).

Petitioner states that “no formal claim constructions are necessary in this proceeding.” Pet. 2. For our Institution Decision, we did not need to interpret expressly any claim term. Inst. Dec. 9. Patent Owner does not propose an interpretation for any term. *See generally* PO Resp.

In related litigation, the District Court adopted the plain and ordinary meaning for “interface,” “multiplexed,” and “server” recited by the claims of the ’946 patent but did not elaborate what would be the plain and ordinary meaning for these terms. Ex. 1099 (Claim Construction Order), 7–9.

Patent Owner responds that Petitioner fails to show that Yegoshin multiplexes under any construction, including those asserted in related litigation. PO Resp. 10–12 (citing Pet. 2; Ex. 1003 ¶ 127; Ex. 2003 (Defendants’ Opening Claim Construction Brief Regarding the ’434 Patent Family), 7; Ex. 2019 ¶¶ 58–59, 61–64; Ex. 2020, 65:19–66:4).

Petitioner replies that the “prior art reads on the claims in a manner that does not require construction.” Pet. Reply 19. Petitioner argues that the “term ‘multiplex’ applies to different signals arriving either simultaneously or non-simultaneously.” *Id.* at 18 (citing Pet. 34–39, 42, 50, 54; Ex. 1050 ¶¶ 6–33; Ex. 1051 ¶ 43); *see also id.* at 18–19 (citing Ex. 1011, 15, Fig. 1.7;

Ex. 1013, 33; Ex. 1050 ¶¶ 9–10, 30–32; Ex. 1051 ¶ 45; Ex. 1071, 1; Ex. 2020, 66:5–68:6). Petitioner also argues that the asserted art renders obvious “multiplex” and “covers both parties district court constructions.” *Id.* at 19–20 (citing Ex. 1050 ¶¶ 5–10; Ex. 1051 ¶¶ 46, 47; Ex. 1053, 9:17–21, 11:12–13, 16:6–15; Ex. 1061; Ex. 1062; Ex. 2003, 40). Petitioner further argues that the intrinsic record supports Petitioner’s understanding of “multiplex.” *Id.* at 20–21 (citing Ex. 1001, 3:47–48, 5:8–67, 8:32–37, 9:4–44, 10:18–21, 11:1–41; Ex. 1050 ¶¶ 11–16; Ex. 1051 ¶¶ 48–53).

We note that Petitioner’s understanding of “multiplex” in its Reply argument does not distinguish meaningfully from merely switching between data sources. *See* Pet. Reply 18–20. Also, in its discussion of Exhibit 1011 and synchronous time-division multiplexing, Petitioner does not address that the exhibit states that “[f]or the purposes of this discussion, assume that each host on the left has a large supply of data that it wants to send to its counterpart on the right,” which tends to undermine Petitioner’s argument that “multiple data flows do not have to be simultaneously or continuously communicated together for them to be multiplexed into a single output link” and the cited testimonial evidence. *Id.* at 18–19; Ex. 1011, 15; Ex. 1050 ¶¶ 7–8; Ex. 1051 ¶ 44.

Based on the full record, we agree with the parties that express interpretation is not required to resolve the parties’ dispute (Pet. 2; PO Resp. 10; Pet. Reply 19) and determine that no claim term requires express interpretation. *Realtime Data, LLC v. Iancu*, 912 F.3d 1368, 1375 (Fed. Cir. 2019) (“The Board is required to construe ‘only those terms . . . that are in controversy, and only to the extent necessary to resolve the controversy.’”) (quoting *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999)).

E. Asserted Obviousness Based on Yegoshin, Johnston, and Billström

1. Yegoshin (Ex. 1004)

Yegoshin describes a “dual-mode communication device,” one embodiment of which includes a “microphone and speaker apparatus including converters for rendering audio data as audible speech, and for rendering audible speech as audio data.” Ex. 1004, 3:18–21. The device includes “a first communication interface comprising circuitry for receiving and sending the audio data on a cell-phone network” and “a second communication interface comprising circuitry for connecting to a local area network (LAN), and for receiving and sending the audio data on the LAN.” *Id.* at 3:22–27. “In some embodiments the dual-mode communication device is implemented in the form of a cell phone.” *Id.* at 27–29.

Yegoshin’s device “allow[s] a user to switch modes from cellular to IP communication, and perhaps to switch from differing types of networks using known protocols.” Ex. 1004, 5:33–54. Yegoshin states that the device is “capable of taking some calls via cellular path while receiving other calls via IP path,” and that it is capable of “taking all cellular calls in IP format.” *Id.* at 5:55–65; 8:47–56.

2. Johnston (Ex. 1005)

Johnston describes “diversity antennas” that can “simultaneously receive or transmit two or three components of electromagnetic energy.” Ex. 1005, 1:5–7. In the embodiment cited by Petitioner—shown in Johnson’s Figure 29B—there are three “[a]ntennas 300” connected to transceiver 309 “through feed circuit 302, tuning and matching circuit 304 and combiner 306 or 307 respectively.” *Id.* at 11:9–23. Johnston states that diversity antenna arrangements have a number of advantages, including improved radio communication in a “multipath fading environment,”

improved signal reliability, and reduced power requirements. *See id.* at 1:11–29.

3. *Billström (Ex. 1006)*

Billström “relates to digital TDMA (Time Division Multiple Access) cellular radio mobile telecommunications systems” and “is directed towards apparatuses and mobile stations for providing packet data communications services in current TDMA cellular systems.” Ex. 1006, 1:7–12.

Billström states that “[p]roviding the packet data services on a cellular system platform offers potential advantages in terms of widespread availability, possibility of combined voice/data services, and comparatively low additional investments by capitalizing on the cellular infrastructure.” Ex. 1006, 1:54–58. According to Billström, “[o]f particular interest are current TDMA cellular systems, through their spectrum efficiency and world wide penetration” and identifies “GSM (Global System for Mobile communication)” as an example of a TDMA platform. *Id.* at 1:58–62.

Billström provides “general purpose packet data communication services in current digital TDMA cellular systems, based on providing spectrum efficient shared packet data channels optimized for packet data and compatible with cellular requirements” with GSM as a target system and “a mobile station for packet data communication over digital TDMA cellular shared packet data channels.” Ex. 1006, 3:53–59, 4:59–61. Billström also provides “new packet data services in a closely integrated way, utilizing the current TDMA cellular infrastructure” and “with minimum impact on the current TDMA cellular infrastructure.” *Id.* at 3:63–65, 4:5–8. “The basic packet data network service provided is a standard connectionless network (datagram) service based on a standard connectionless IP protocol,” and “IP is here used to denote the Internet Protocol.” *Id.* at 7:58–61.

4. *Independent Claim 14*

a) *“An Internet-enabled mobile communication device,”*

For the preamble, Petitioner argues that, to the extent the preamble is limiting, Yegoshin teaches cellular telephone 9 that can communicate on an IP data network. Pet. 8 (citing Ex. 1003 ¶ 59; Ex. 1004, 1:9–14, 1:30–57, 4:63–5:3); *see also id.* at xi (labeling the preamble “14[pre]”).

The relied-upon portions describe that Yegoshin “is in the field of telephony communications including data network telephony (DNT), which encompasses Internet Protocol Network Telephony (IPNT)” and that cellular telephone 9 is “capable of communicating on an IP data network in either a wired or wireless form.” Ex. 1004, 1:9–14, 1:30–57, 4:63–5:3. We credit Petitioner’s testimonial evidence regarding the preamble because the cited portions of Yegoshin support it. Ex. 1003 ¶ 59; Ex. 1004, 1:9–14, 1:30–57, 4:63–5:3. Patent Owner does not provide a responsive argument regarding the preamble of claim 14. *See generally* PO Resp.

Based on the full record before us, Petitioner persuades us, and we find, that Yegoshin teaches or suggests, to the extent the preamble is limiting, an “Internet-enabled mobile communication device.”

b) *“a memory”*

Petitioner argues that Yegoshin teaches that its phone includes memory for storing client software suite 19 and that it was well known that phones used memory to store and process data for transmission. Pet. 9 (citing Ex. 1003 ¶ 60; Ex. 1004, 2:1–14, 5:37–40); *see also id.* at xii (labeling the limitation “14[a]”).

A relied-upon portion describes that “[c]lient software 19 . . . may be pre-loaded into a suitable built-in memory provided and adapted for the purpose.” Ex. 1004, 5:37–40. We credit Petitioner’s testimonial evidence

regarding the limitation because the cited portions of Yegoshin support it. Ex. 1003 ¶ 60; Ex. 1004, 2:1–14, 5:37–40. Patent Owner does not provide a responsive argument regarding the “memory” of claim 14. *See generally* PO Resp.

Based on the full record before us, Petitioner persuades us, and we find, that Yegoshin teaches or suggests “a memory.”

c) “a display”

Petitioner argues that Yegoshin teaches that its phone includes a display to present information and that it was well known that phones had displays. *Id.* at 9 (citing Ex. 1003 ¶ 61; Ex. 1004, 2:1–15, Fig. 1; Ex. 1009, 10:42–65, 12:65–13:19); *see also id.* at xii (labeling the limitation “14[b]”).

A relied-upon portion shows that Yegoshin’s cellular phone 9 includes a display. Ex. 1004, Fig. 1. We credit Petitioner’s testimonial evidence regarding the limitation because the cited portions of the record support it. Ex. 1003 ¶ 61; Ex. 1004, 2:1–15, Fig. 1; Ex. 1009, 10:42–65, 12:65–13:19. Patent Owner does not provide a responsive argument regarding the “display” of claim 14. *See generally* PO Resp.

Based on the full record before us, Petitioner persuades us, and we find, that Yegoshin teaches or suggests “a display.”

d) “at least two or more antennas”

Petitioner argues that Yegoshin teaches that its phone includes antennas and that it would have been obvious to use different antenna for cellular and WLAN communications. Pet. 10 (citing Ex. 1003 ¶¶ 62, 63; Ex. 1004, 1:52–2:15, 6:65–7:14, Fig. 1); *see also id.* at xii (labeling the limitation “14[c]”). Petitioner also argues that it was well known to provide such phones with multiple antennas for different frequencies and

communications requirements. *Id.* (citing Ex. 1025, Abstr.; Ex. 1026, 10:10–21; Ex. 1027, 7:11–15).

Petitioner further argues that it would have been obvious to modify Yegoshin to have multiple cellular antennas as taught by Johnston for the antenna diversity benefits described by Johnston. Pet. 10–12 (citing Ex. 1003 ¶¶ 64–67; Ex. 1004, 2:14–41; Ex. 1005, 1:10–30, 2:17–23, 11:9–23, 11:53–59, 12:40–46, Figs. 29A–29B; Ex. 1021, 3; Ex. 1022, 1–6; Ex. 1023, 1–2, 6–7). According to Petitioner, the proposed combination would have been within ordinary skill, yielded predictable results, and had a reasonable expectation of success. *Id.* at 12–13 (citing Ex. 1003 ¶¶ 68, 69).

A relied-upon portion of Yegoshin shows that its cellular phone 9 includes an antenna. Ex. 1004, Fig. 1. The relied-upon portions of Johnston show multiple antennas and describe the advantages of antenna diversity. Ex. 1005, 1:10–30, 2:17–23, 11:9–23, 11:53–59, 12:40–46, Figs. 29A–29B. We credit Petitioner’s testimonial evidence regarding Yegoshin’s teachings and that Yegoshin’s phone 9 would have obviously had two antennas based on what was known in the art because the cited portions of the record support it. Ex. 1003 ¶¶ 62, 63; Ex. 1004, 1:52–2:15, 6:65–7:14, Fig. 1; Ex. 1025, Abstr.; Ex. 1026, 10:10–21; Ex. 1027, 7:11–15.

We also credit Petitioner’s testimonial evidence that one of ordinary skill in the art would have been motivated to modify Yegoshin based on Johnston for the reasons provided with a reasonable expectation of success because the cited portions of the record support the testimony. Ex. 1003 ¶¶ 64–69; Ex. 1004, 2:14–41; Ex. 1005, 1:10–30, 2:17–23, 11:9–23, 11:53–59, 12:40–46, Figs. 29A–29B; Ex. 1021, 3; Ex. 1022, 1–6; Ex. 1023, 1–2, 6–7. Patent Owner does not provide a responsive argument regarding the “antennas” of claim 14. *See generally* PO Resp.

Based on the full record before us, Petitioner persuades us, and we determine, that Yegoshin teaches or suggests or that Yegoshin modified by Johnston would have had “at least two or more antennas.”

e) “*at least one or more processors*”

Petitioner argues that one of ordinary skill in the art would have understood that Yegoshin’s phone had a processor to execute client software suite 19 and it would have been obvious that a processor performed communication processes and other telephone functionalities. Pet. 13 (citing Ex. 1003 ¶¶ 70, 71; Ex. 1004, 5:33–65; Ex. 1019, 13:20–14:8, 18:23–59, 21:54–22:19, 25:65–67, Figs. 2, 6); *see also id.* at xii (labeling the limitation “14[d]”). Petitioner also argues that Billström confirms the use of processors in cellular telephones. *Id.* at 13–14 (citing Ex. 1003 ¶ 72; Ex. 1006, 24:29–60).

The relied-upon portion of Yegoshin describes phone 9 being able to communicate on a cellular path and an IP path. Ex. 1004, 5:33–65. The relied-upon portion of Billström describes a microprocessor. Ex. 1006, 24:29–60.

We credit Petitioner’s testimonial evidence that it would have been known or obvious that Yegoshin’s phone includes one or more processors because the cited portions of the record support it. Ex. 1003 ¶¶ 70, 71; Ex. 1004, 5:33–65; Ex. 1019, 13:20–14:8, 18:23–59, 21:54–22:19, 25:65–67, Figs. 2, 6. We also credit Petitioner’s testimonial evidence that Billström confirms the known use of processors in cellular telephones because the cited portions of Billström support it. Ex. 1003 ¶ 72; Ex. 1006, 24:29–60. Patent Owner does not provide a responsive argument regarding the “processors” of claim 14. *See generally* PO Resp.

Based on the full record before us, Petitioner persuades us, and we determine, that Yegoshin teaches or suggests or that Yegoshin and Billström would have had “at least one or more processors.”

f) *“a plurality of wireless transmit and receive units including a first wireless transmit and receive unit and a second wireless transmit and receive unit, wherein each wireless transmit receive unit is configured to communicate using one or more protocols”*

Petitioner argues that Yegoshin teaches first and second communication interfaces for cellular and IP-LAN that correspond to the recited wireless transmit and receive units. Pet. 14 (citing Ex. 1003 ¶ 73; Ex. 1004, 3:17–7:25); *see also id.* at xii (labeling the limitation “14[e]”). For “wherein each wireless transmit receive unit is configured to communicate using one or more protocols,” Petitioner argues that cellular and WLAN networks would use different protocols. *Id.* (citing Ex. 1003 ¶ 74; Ex. 1004, 5:23–54, 6:5–14, 6:52–64, 7:48–58, 9:19–29).

The relied-upon portion describes first and second communication interfaces. Ex. 1004, 3:21–25. We credit Petitioner’s testimonial evidence regarding the required transmit and receive units because the cited portions of Yegoshin support it. Ex. 1003 ¶ 73; Ex. 1004, 3:17–4:42, 4:59–7:25.

We also credit Petitioner’s testimonial evidence that the transmit and receive units use different protocol because the cited portions of Yegoshin support it. Ex. 1003 ¶ 74; Ex. 1004, 5:23–54, 6:5–14, 6:52–64, 7:48–58, 9:19–29. Patent Owner does not provide a responsive argument regarding the above-quoted limitations. *See generally* PO Resp.

Based on the full record before us, Petitioner persuades us, and we find, that Yegoshin teaches or suggests “a plurality of wireless transmit and receive units including a first wireless transmit and receive unit and a second

wireless transmit and receive unit, wherein each wireless transmit receive unit is configured to communicate using one or more protocols.”

g) “*wherein the device is enabled for communication using Internet Protocol (IP)*”

Petitioner argues that Yegoshin teaches that its phone can use IP communication over an IP network. Pet. 14–15 (citing Ex. 1003 ¶ 75; Ex. 1004, 4:59–5:3); *see also id.* at xii (labeling the limitation “14[f]”).

The relied-upon portion describes “a cellular-capable device to receive calls routed . . . over a private IP network.” Ex. 1004, 4:59–5:3. We credit Petitioner’s testimonial evidence because the cited portion of Yegoshin supports it. Ex. 1003 ¶ 75; Ex. 1004, 4:59–5:3. Patent Owner does not provide a responsive argument regarding the above-quoted wherein clause. *See generally* PO Resp.

Based on the full record before us, Petitioner persuades us, and we find, that Yegoshin teaches or suggests “wherein the device is enabled for communication using Internet Protocol (IP).”

h) “*wherein the device is enabled for wireless communication on a wireless local area network*”

Petitioner argues that Yegoshin teaches cell phone 9 communicating in a “wireless mode on wireless IP-LAN 38.” *Id.* at 15 (citing Ex. 1003 ¶ 76; Ex. 1004, 1:31–67, 2:21–4:14, 4:65–5:32, 6:62–7:14, 8:28–34, Fig. 2); *see also id.* at xii (labeling the limitation “14[g]”).

The relied-upon portion teaches “cell phone 9 may communicate in wireless mode on wireless IP LAN 38.” Ex. 1004, 7:1–2. We credit Petitioner’s testimonial evidence because the cited portions of Yegoshin support it. Ex. 1003 ¶ 76 Ex. 1004, 1:31–67, 2:21–41, 2:66–3:10, 3:18–34, 3:52–55, 3:66–4:14, 4:65–5:8, 5:23–32, 6:62–64, 6:65–7:14, 8:28–34,

Fig. 2. Patent Owner does not provide a responsive argument regarding the above-quoted wherein clause. *See generally* PO Resp.

Based on the full record before us, Petitioner persuades us, and we find, that Yegoshin teaches or suggests “wherein the device is enabled for wireless communication on a wireless local area network.”

i) “*wherein the first wireless transmit and receive unit is enabled to communicate using one or more antennas simultaneously*”

Petitioner argues that Yegoshin teaches the first wireless transmit and receive unit and Yegoshin as modified by the multiple antennas of Johnston would simultaneously receive electromagnetic energy. Pet. 15–16 (citing Ex. 1003 ¶¶ 77, 78; Ex. 1005, 1:5–7, 6:5–15, 11:9–23, 12:6–46, Fig. 29B; Ex. 1028, 316–321); *see also id.* at xii (labeling the limitation “14[h]”). Petitioner, thus, argues that Yegoshin modified by Johnston would be enabled to communication using multiple antennas simultaneously. *Id.* at 16 (citing Ex. 1003 ¶ 79).

A relied-upon portion of Johnston describes “diversity antennas that can simultaneously receive or transmit two or three components of electromagnetic energy.” Ex. 1005, 1:5–7. We credit Petitioner’s testimonial evidence regarding the limitation because the cited portions of the record support it. Ex. 1003 ¶¶ 77, 78, 79; Ex. 1004, 1004, 3:17–34, 4:59–7:25; Ex. 1005, 1:5–7, 6:5–15, 11:9–23, 12:6–46, Fig. 29B; Ex. 1028, 316–321. Patent Owner does not provide a responsive argument regarding the above-quoted wherein clause. *See generally* PO Resp.

Based on the full record before us, Petitioner persuades us, and we determine, that Yegoshin and Johnston would have had a “first wireless transmit and receive unit [that] is enabled to communicate using one or more antennas simultaneously.”

- j) “wherein the mobile device maintains multiple IP addresses, wherein the first wireless unit is accessible on a first IP address and the second wireless transmit and receive unit is accessible on a second IP address”

Petitioner argues that Yegoshin teaches the use of a temporary IP address when communicating on an IP network. Pet. 16–18 (citing Ex. 1003 ¶¶ 80, 81; Ex. 1004, 5:33–37, 5:49–54, 7:7–14, 7:48–58, Fig. 2); *see also id.* at xii–xiii (labeling the limitation “14[i]”). Petitioner also argues that it would have been obvious that Yegoshin assigns another IP address when taking a cellular call in IP format. *Id.* at 18 (citing Ex. 1003 ¶ 82; Ex. 1004, 8:47–56).

Petitioner further argues that Billström confirms the well-known technique of communicating data using a cellular telephone. Pet. 18 (citing Ex. 1003 ¶ 82). According to Petitioner, one of ordinary skill in the art would have been motivated to combine Yegoshin and Billström to use IP and have packet data communications in a cellular system. *Id.* at 18–19 (citing Ex. 1003 ¶ 83; Ex. 1004, 4:63–5:3, 5:23–28, 6:5–14; Ex. 1006, Abstr., 1:6–12, 1:54–60, 3:53–4:22). Petitioner contends that Billström teaches the use of an IP address for a cellular network, so that the combination of Yegoshin and Billström would have an IP address for Yegoshin’s first communication interface. *Id.* at 19 (citing Ex. 1003 ¶ 84; Ex. 1006, 5:60–6:2, 21:26–24:28, Figs. 2, 3, 14, 15; Ex. 1030; Ex. 1031; Ex. 1032; Ex. 1033). Petitioner also contends that it was known to maintain different IP addresses for routing packet over different channels. *Id.* (citing Ex. 1003 ¶ 85; Ex. 1016, 6:42–56, 9:6–10).

In Petitioner’s view, one of ordinary skill in the art would have combined Yegoshin as modified by Johnston with Billström to use Billström’s well-known standard, provide an integrated system, expand

coverage, and provide packet data services. Pet. 19–21 (citing Ex. 1003 ¶¶ 86–89; Ex. 1004, 5:66–9:32; Ex. 1006, 3:53–4:20; Ex. 1024, 18).

Petitioner further contends that the proposed combination would have been a combination of known prior art elements combined according to known methods with predictable results and would not change the “hallmark aspects” of the references. *Id.* at 21 (citing Ex. 1003 ¶ 90; Ex. 1004, 8:47–56; Ex. 1006, Abstr., 3:53–4:22). Petitioner additionally contends that the proposed combination would have been within ordinary skill. *Id.* at 21–22 (citing Ex. 1003 ¶ 91).

A relied-upon portion of Yegoshin describes “client software suite 19 enables a user to select a type of network for communication, to select a protocol for voice communication, and to set-up a temporary IP address on a network for the purpose of identifying and registering the device for normal operation on the network.” Ex. 1004, 5:33–37. Another relied-upon portion of Yegoshin describes that “[w]hen a user 10 operating cell phone 9 logs-on to either LAN (38 or 39) he or she is assigned a temporary IP address for purposes of device identification.” *Id.* at 7:7–14; *see also id.* at 7:48–58 (stating that “when a user, via the dual-mode device 9, logs onto network 27 via LAN 38 or 39 of FIG. 2, he or she will, during configuration, obtain a new and temporary IP address (DN 2) as previously described”).

We credit Petitioner’s testimonial evidence regarding what Yegoshin describes because the cited portions of Yegoshin support it. Ex. 1003 ¶¶ 80, 81; Ex. 1004, 5:33–37, 5:49–54, 7:7–14, 7:48–58, Fig. 2. Another cited portion of Yegoshin describes that “[t]he example described . . . of an instance of a cellular call 55 placed to cell phone 9 assumes that the user is taking all cellular calls in IP format while logged-on to IP network 50.” Ex. 1004, 8:47–50. We agree with Petitioner’s declarant that “[i]n order to

achieve this, it would have been obvious to assign another IP address to Yegoshin’s phone for cellular connection.” Ex. 1003 ¶ 82.

The relied-upon portions of Billström describe providing packet data communications in cellular systems. Ex. 1006, Abstr., 1:6–12, 1:54–60, 3:53–4:22; *see also* Ex. 1004, 4:63–5:3, 5:23–28, 6:5–14 (describing that Yegoshin’s phone is configured to use any known cellular networks). Petitioner also relies on portions of Billström that describe a mobile station, such as a cellular phone, storing an IP address to identify the mobile station “as belonging to a particular public land mobile network.” Ex. 1006, 5:60–6:2, 21:26–24:28, Figs. 2, 3, 14, 15. We credit Petitioner’s testimonial evidence regarding Billström because the cited portions of the record support it. Ex. 1003 ¶¶ 83–85; Ex. 1004, 4:63–5:3, 5:23–28, 6:5–14; Ex. 1006, Abstr., 1:6–12, 1:54–60, 3:53–4:22, 5:60–6:2, 21:26–24:28, Figs. 2, 3, 14, 15; Ex. 1030; Ex. 1016, 6:42–56, 9:6–10; Ex. 1031; Ex. 1032; Ex. 1033.

(1) Patent Owner’s Response

Patent Owner responds that Petitioner fails to show that Yegoshin and Billström would have been combined with a reasonable expectation of success. PO Resp. 38–39 (citing Pet. 17–19). Patent Owner argues that “Yegoshin and Billström each teach a device with only a single IP address” and, thus, “each reference only teaches how to route using one IP address, not two.” *Id.* at 39–40 (citing Ex. 2019 ¶¶ 113, 114). Patent Owner also argues that “unlike Yegoshin’s single IP address structure, it would not be possible for the Yegoshin-Billström system to merely assign which IP address to use for each data packet based on the user’s phone number.” *Id.* at 40–41 (citing Ex. 2019 ¶¶ 115, 117, 118). Patent Owner, thus, argues that Petitioner fails to explain how its combination would work. *Id.* at 42.

Patent Owner also responds that Petitioner’s proposed modification of Yegoshin to work in Billström’s cellular network would have been beyond Petitioner’s proposed level of ordinary skill in the art, as admitted by Petitioner’s declarant during deposition. PO Resp. 42–44 (citing Pet. 3, 20–21; Ex. 1003 ¶¶ 27–28; Ex. 2029, 101:15–18, 102:12–103:2). According to Patent Owner, Billström’s second embodiment would have required even more modifications than the first embodiment because “the second embodiment only relies on the existing GSM’s base station portions, and on substantially modified infrastructure for the remainder of the system.” *Id.* at 44 (citing Ex. 1006, 6:11–25); *see also id.* at 44–47 (citing Ex. 2019 ¶¶ 123–125). Patent Owner also argues that, even if the modifications were surmountable, those modifications would have been beyond the proposed level of ordinary skill in the art and, thus, Petitioner fails to show a reasonable expectation of success in making the proposed combination. *Id.* at 47–48 (citing Ex. 2019 ¶ 126).

(2) *Petitioner’s Reply*

Petitioner replies that “claim 14 does not state *selecting* between a first IP address or a second IP address” and if a selection were required, “the selection would be simple and straightforward—use the first IP address when communicating over the cellular network and use the second IP address when communicating over the WLAN.” Pet. Reply 1 (citing PO Resp. 39; Ex. 1001, 13:35–38; Ex. 1051 ¶¶ 2, 3). Petitioner argues that the proposed combination “maintains two IP addresses, one accessible for WLAN communication (as taught by Yegoshin) and the other accessible for IP-based cellular communication (as taught by Billström).” *Id.* at 2 (citing Pet. 17–18; Ex. 1004, 5:33–54, 7:7–14, 7:44–58, 8:47–56, Figs. 2, 3;

Ex. 1006, 1:6–12, 1:54–60, 3:53–4:22, 4:63–5:28, 5:60–6:14, 21:26–24:28, Figs. 2, 3, 14, 15; Ex. 1051 ¶¶ 4, 5).

Petitioner also argues that Yegoshin shows that “cellular networks were known to use IP” and mobile switching centers (“MSC”) were known, and that Billström shows assigning an IP address from standard IP protocol to identify a mobile station as belonging to a particular MSC. Pet. Reply 2 (citing Ex. 1004, 2:30–36, 5:6–9, 6:27–35, 9:19–29; Ex. 1006, 5:60–6:2, 7:40–8:3; Ex. 1051 ¶ 5). Petitioner further argues that Billström shows one of ordinary skill in the art “would have understood that, in addition to an IP address for WLAN communication as disclosed in Yegoshin, a separate IP address would be a useful and well-known option for implementing IP-based cellular communication.” *Id.* (citing Ex. 1006, 5:63–6:2, 10:64–66; Ex. 1051 ¶ 6). In Petitioner’s view, one of ordinary skill in the art “would have found it predictable to use an IP address for IP-based cellular communication in Yegoshin.” *Id.*

Petitioner contends that Yegoshin’s description of its phone number “does not disrupt the combination,” as argued by Patent Owner, because “Yegoshin’s association between the IP address and phone number is an example way to *forward* a regular cellular call (using a telephone number) to the WLAN when the phone is ‘not within the range of the local service area’” and the combination is not limited to call forwarding. Pet. Reply 2–3 (citing PO Resp. 40–41, 48–49; Ex. 1004, 4:10–14, 8:16–27; Ex. 1051 ¶ 7). Petitioner also contends that Billström’s IP address “would not be redundant because it is for IP-based cellular data communication, which is independent from IP-based WLAN communication using another IP address.” *Id.* at 3 (citing Ex. 1006, 9:41; Ex. 1051 ¶ 7; Ex. 1053, 18–25; Ex. 1054, 50:8–13, 58:4–9).

Petitioner also replies that Patent Owner has “an overly narrow view of the combination” and that “Petitioner’s combination simply modifies Yegoshin’s *phone* to use Billström’s *IP address* for IP-based cellular communication.” Pet. Reply 3–4 (citing PO Resp. 42–48; Ex. 1051 ¶ 8; Ex. 2019 ¶¶ 123–126). Petitioner argues that Patent Owner’s argument requires bodily incorporation. Petitioner also argues that “implementing IP-based cellular communication using an IP address (Billström’s or generally) was well-known and within the [ordinary] skill” in the art. *Id.* at 4 (citing PO Resp. 42–48; Ex. 1004, 2:30–36; Ex. 1006, 5:60–6:2; Ex. 1051 ¶¶ 9, 10; Ex. 1053, 28:14–16, 29:10–12). Petitioner further argues that “the ’946 patent has limited disclosure of implementing IP, indicating that a [person of ordinary skill in the art] would have had the skill needed to implement IP-based technologies.” *Id.* at 4–5 (citing Ex. 1001, 2:28–31, 4:44–48, 6:14–41, 10:48–11:8; Ex. 1051 ¶ 11; Ex. 1053, 98:17–101:3).

(3) Patent Owner’s Sur-Reply

Patent Owner replies that “the Petition’s proposed combination requires ‘implement[ing] Billström’s cellular network employing IP,’” and that Petitioner’s declarant confirmed “in the combination, Yegoshin’s phone would be communicating over Billström’s network.” PO Sur-reply 1 (citing Pet. 20–21; Pet. Reply 4; Ex. 2035, 33:23–34:5, 34:13–24). Patent Owner also replies that “the issue is not whether a mobile device could generically use IP” but whether there was “reasonable expectation of success in adding IP data to an existing GSM cellular network, as required by Petitioner’s combination.” *Id.* (citing Pet. Reply 4; Ex. 2035, 46:9–48:11).

(4) Petitioner Shows that Yegoshin and Billström Would Have Been Combined with a Reasonable Expectation of Success

Based on the full record before us, we credit Petitioner’s testimonial evidence that one of ordinary skill in the art would have combined Yegoshin and Billström. Ex. 1003 ¶¶ 86–90. The cited portions of the record support Petitioner’s asserted reasons that would have motivated the proposed combination. Ex. 1004, 5:66–9:32; Ex. 1006, Abstr., 3:53–4:22; Ex. 1024, 18. Patent Owner does not dispute those reasons. *See* PO Resp. 38–48; PO Sur-reply 1.

Regarding reasonable expectation of success, Petitioner proposes modifying Yegoshin’s phone, which already uses an IP address for communication on a LAN, so that the phone also operates with Billström’s digital cellular network that uses IP to provide packet data communication services in a cellular system. Ex. 1003 ¶¶ 80, 83. We find that Yegoshin describes that its phone is configured for any cellular network, such as TDMA. Ex. 1004, 4:63–5:3, 5:23–28, 6:5–14. We also find that Billström describes that its mobile stations, such as cellular phones, “provid[e] packet data communication services in current TDMA cellular systems.” Ex. 1006, 1:6–12.

We agree with Petitioner’s declarant that, “because significant overlap exists across the teachings of Yegoshin-Johnston and Billström” and because “the references are in the same technical field of cellular communication technology,” Yegoshin’s “telephone would have been easily modified to implement Billström’s techniques because such modification would only change the cellular part of the system so as to enable the combined system for IP-based cellular communication.” Ex. 1003 ¶ 91. We determine that Petitioner’s proposed person of ordinary skill in the art, who “would have

had a Bachelor's degree in electrical engineering, computer engineering, computer science, or a related field, and at least two years of experience related to the design or development of wireless communication systems" (Pet. 3; Ex. 1003 ¶¶ 27–28), would have been able to modify Yegoshin's phone to operate with Billström's known digital cellular system with a reasonable expectation of success. Billström shows that modifying a phone, such as Yegoshin's, for IP-based cellular communication was known and within ordinary skill in the art. Ex. 1003 ¶¶ 83, 84; Ex. 1004, 4:63–5:3, 5:23–28, 6:5–14; Ex. 1006, 5:60–6:2, 21:26–24:28, Figs. 2, 3, 14, 15.

Based on the full record before us, Petitioner persuades us, and we determine, that Petitioner's proposed combination of Yegoshin, Johnston, and Billström would have had a "mobile device [that] maintains multiple IP addresses, wherein the first wireless unit is accessible on a first IP address and the second wireless transmit and receive unit is accessible on a second IP address."

k) "wherein the mobile device operates using a plurality of ports"

Petitioner argues that Yegoshin teaches that its phone has an adapter port and a communication port and that Johnson teaches three input or output ports for its antennas. Pet. 22–23 (citing Ex. 1003 ¶ 92; Ex. 1004, 5:14–32, 6:65–7:14, Fig. 1; Ex. 1005, 8:60–63). Petitioner, thus, argues that Yegoshin as modified by Johnston would have Johnston's antenna ports. *Id.* at 23 (citing Ex. 1003 ¶ 93; Ex. 1018, 6:54–8:37).

The relied-upon portions of Yegoshin describe communication port 11 and port 13. Ex. 1004, 5:14–32, 6:65–7:14, Fig. 1. The relied-upon portion of Johnston describes an antenna that "has three input or output ports." Ex. 1005, 8:60–63. We credit Petitioner's testimonial evidence regarding

the ports because the cited portions of the record support it. Ex. 1003 ¶¶ 92, 93; Ex. 1004, 5:14–32, 6:65–7:14, Fig. 1; Ex. 1005, 8:60–63; Ex. 1018, 6:54–7:22, 7:47–8:37. Patent Owner does not provide a responsive argument regarding the above-quoted wherein clause. *See generally* PO Resp.

Based on the full record before us, Petitioner persuades us, and we find, that Petitioner’s proposed combination of Yegoshin, Johnston, and Billström would have had a “mobile device [that] operates using a plurality of ports.”

- l) *“wherein data transferred by the plurality of transmit and receive units is improved by the simultaneous use of multiple network paths including at least one connection to a networked server,”*

Petitioner argues that Yegoshin teaches that its phone communicates with a public switched telephone network (“PSTN”)-connected routing server and IP telephony server, and that the proposed combination would have multiple IP data packets being communicated simultaneously over multiple IP-based cellular network paths as taught by Johnston. Pet. 23–25 (citing Ex. 1003 ¶¶ 94–96; Ex. 1004, 1:31–67, 2:21–4:34, 4:65–5:8, 5:23–32, 5:66–6:4, 6:38–7:37, 8:28–34, Fig. 2; Ex. 1005, 1:10–30, 6:48–7:32, 8:33–43, 9:35–41, 10:15–31, 11:9–23, 12:8–30; Ex. 1028, 313–323); *see also id.* at xiii (labeling the limitation “14[j]”).

Petitioner alternatively argues that Yegoshin teaches the simultaneous use of cellular and WLAN interfaces, and those connections are routed through servers. Pet. 25 (citing Ex. 1003 ¶ 97; Ex. 1004, 3:35–51, 5:55–57). Petitioner further argues that data transferred using both cellular and WLAN paths would be an improvement. *Id.* (citing Ex. 1003 ¶ 98; Ex. 1004, 1:17–2:41; Ex. 1013, 33; Ex. 1045, 6:35–7:16).

(1) *Patent Owner's Response*

Patent Owner responds that Yegoshin teaches “us[ing] the cellular and LAN connections *consecutively*, not *simultaneously*.” PO Resp. 48.

According to Patent Owner, “Yegoshin simply teaches that some calls may be taken via the cellular path and other calls may be taken via the WLAN path.” *Id.* at 48–49 (citing Pet. 25; Ex. 1004, 5:55–57, 5:59–62; Ex. 2019 ¶¶ 54, 131). Patent Owner argues that “Yegoshin’s mobile device can use either the cellular network, or the LAN network, but not both simultaneously” and “therefore does not teach the simultaneous use of both network paths.” *Id.* at 50 (citing Inst. Dec. 33–34).

Patent Owner also responds that claim 14 requires “network paths,” not “communication paths.” PO Resp. 51. In Patent Owner’s view, “Petitioner cited *only* to Yegoshin for ‘simultaneous use of multiple network paths’” and “focused on Johnston’s use of multiple diversity antennas to purportedly show ‘that *data transferred by the plurality of transmit and receive units is improved* in terms of improved bandwidth, signal quality/reliability, data rate, etc., as taught by Johnston.” *Id.* (citing Pet. 23, 25). Patent Owner also argues that, even if Johnston’s diversity antennas show multiple network paths, Petitioner fails to explain how multipath effects “could be understood as establishing multiple *network* paths,” when they do not. *Id.* at 51–52 (citing Ex. 2019 ¶¶ 132, 133).

Patent Owner further argues that “Petitioner did not argue that three-way linking of calls would satisfy the ‘multiple network paths’ element” but “argued that ‘the use of both cellular and WLAN paths would allow three-way linking of different calls, *thereby improving data communication*.’” PO Resp. 52 (citing Pet. 25). According to Patent Owner, “[s]ince Yegoshin does not disclose simultaneous use of multiple network paths, Petitioner’s

three-way linking theory fails.” *Id.* at 53. Patent Owner also contends that the asserted three-way linking relates to analog voice calls, not data being transferred as required by claim 14. *Id.* at 53, 54–55 (citing Ex. 1045, 6:62–7:1; Ex. 2019 ¶¶ 149; Ex. 2030, 83:10–20). Patent Owner further contends that the data of claim 14 is digital information. *Id.* at 53–54 (citing Ex. 1001, 1:43–45, 2:52–62, 3:6–8, 3:31–33, Fig. 2; Ex. 2004 ¶¶ 36, 37; Ex. 2019 ¶¶ 135, 137–141, 147).

(2) *Petitioner’s Reply*

Petitioner replies that “Patent Owner’s interpretation of ‘simultaneous use of multiple network paths’ is overly narrow and its views of obviousness are unduly restrictive.” Pet. Reply 5. Petitioner argues that the claims require simultaneous use, not simultaneous transfer of data and “do ***not*** require that the device ***simultaneously*** connects to different networks (e.g., cellular and WLAN), but merely requires ‘the simultaneous ***use*** of multiple network paths.’” *Id.* (citing PO Resp. 48–55; Ex. 1051 ¶¶ 12–13; Ex. 1053, 105:1–13). Petitioner also argues that “at least one connection to a network server” clearly does not require multiple established connections to multiple networks. *Id.* at 5–6.

According to Petitioner, Yegoshin simultaneously uses both cellular and WLAN interfaces, such as when a cellular call gets a busy signal or redirected to an IP call point, while Yegoshin is engaged with an IP call. Pet. Reply 6 (citing Ex. 1004, 5:55–65; Ex. 1051 ¶¶ 14, 15). Petitioner also contends that Yegoshin describes how cell phone 9 can communicate with a cellular network normally while communicating in wireless mode. *Id.* at 7 (citing Ex. 1004, 6:65–7:3). Petitioner further contends that Yegoshin describes delivering a cell call to the cellular interface despite another IP WLAN call. *Id.* (citing Ex. 1051 ¶ 16).

Petitioner also replies that Patent Owner’s distinction between network and communication paths is unsupported. Pet. Reply 7. Petitioner argues that communicating on multiple antennas simultaneously according to Johnston’s antenna diversity technique meets the recited network paths, thereby improving data transfer. *Id.* at 7–8 (citing Pet. 15–16, 23–25; Ex. 1005, 1:5–7; Ex. 1051 ¶ 17). Petitioner also argues that term “*the* simultaneous” in “the simultaneous use of multiple network paths” must find antecedent basis from “using one or more antennas simultaneously.” *Id.* at 8 (citing Ex. 1001, 13:32–34, 13:41–44; Ex. 1051 ¶ 18). Petitioner further argues that there is no support for “network paths” meaning paths to different types of networks. *Id.* (citing PO Resp. 51–52; Ex. 2019 ¶¶ 132–133). Because the term “network paths” appears only in the claims, Petitioner argues that one of ordinary skill in the art would have understood it to cover multiple paths to the same network. *Id.* at 8–9 (citing Ex. 1051 ¶¶ 19–20; Ex. 2019 ¶ 131).

(3) Patent Owner’s Sur-Reply

Patent Owner replies that it does not dispute that the claims do not require data to be transmitted simultaneously but the claims require “the transmit and receive units must be configured to simultaneously use, i.e., connect to, the multiple network paths.” PO Sur-reply 2 (citing Ex. 1001, claims 14, 17). Patent Owner also argues that Petitioner misquotes additional claim language to support its reading because the claims recite “networked server,” not “network server.” *Id.* (citing Pet. Reply 5–6).

Patent Owner further argues that Yegoshin’s MSC 34, not its phone, redirects a cellular call to LAN, and so the phone only uses the WLAN path, not the cellular path. PO Sur-reply 2–3 (citing Pet. Reply 6; Ex. 1004, 8:16–27, Fig. 3). Patent Owner additionally argues that Petitioner’s additional

citations to Yegoshin do not describe simultaneous use of cellular and LAN network and, instead, describe using one or the other. *Id.* at 3 (citing Ex. 1004, 6:67–7:3, 7:15–18, 8:47–56).

Patent Owner also replies that Johnston’s multipath effects are “a natural propagation phenomenon,” not network paths from node to node. PO Sur-reply 3 (citing PO Resp. 51–52; Ex. 2019 ¶¶ 132–133). Patent Owner argues that Petitioner provides no evidence for how “network path” would have been understood and asserts an argument based on antecedent basis that “makes no grammatical sense.” *Id.* at 3–4. Patent Owner also argues that Petitioner’s interpretation would read out “network.” *Id.* (citing Pet. Reply 8–9). Patent Owner further argues that the claims recite both “communication paths” and “network paths,” and so “‘network paths’ is not synonymous with ‘communication paths.’” *Id.* at 4. Patent Owner additionally argues that its testimonial evidence is not conclusory and does not support Petitioner’s position. *Id.* at 4–5 (citing Ex. 2019 ¶¶ 132–133). Patent Owner reiterates that Petitioner did not cite Johnston for “simultaneous use of multiple network paths.” *Id.* at 5 (citing Pet. 23, 25; PO Resp. 51; Pet. Reply 8 n.1).

Patent Owner further replies that Petitioner did not explain why it would have been obvious to transmit data simultaneously using cellular and WLAN. PO Sur-reply 5 (citing Pet. 25; Pet. Reply 9; Ex. 1003 ¶¶ 97–98). Patent Owner argues that the cited portions rely solely on Yegoshin without modification. Patent Owner also argues that Petitioner newly argues three-way calling without explaining how the modification would be made with a reasonable expectation of success. *Id.* at 6 (citing Ex. 1051 ¶¶ 21, 22). Patent Owner further argues that Petitioner’s evidence does not support that “data” would have included analog voice communications. *Id.*

(4) *Petitioner Shows that Yegoshin Teaches or Suggests the Limitation*

Petitioner argues that

in the Yegoshin-Johnston-Billström combination, the communication of multiple IP data packets over the IP-based cellular network (as taught by Yegoshin-Billström) involves ***simultaneous use of multiple network paths*** using multiple antennas (as taught by Johnston) between the phone and the server, such that ***data transferred by the plurality of transmit and receive units is improved*** in terms of improved bandwidth, signal quality/reliability, data rate, etc., as taught by Johnston.

Pet. 24–25 (citing Ex. 1003 ¶ 96). Petitioner also argues that “Yegoshin’s phone uses both cellular and WLAN connections (***simultaneous use of multiple network paths***)” and calls are routed through servers. *Id.* at 25 (citing Ex. 1003 ¶ 97; Ex. 1004, 3:35–51, 5:55–57).

A relied-upon portion of Yegoshin describes “a dual-mode communication device comprising first apparatus for conducting telephone calls on a cell-phone network, including a cell-phone number, and second apparatus for conducting telephone calls over the IP-LAN.” Ex. 1004, 3:37–41. Yegoshin goes on to list in its system a “publicly-switched telephone network (PSTN) having a trunk connection to the IP telephony server; and a PSTN-connected routing server,” “IP telephony server,” and a “routing server that routes calls for the cell phone number to the IP telephony server.” *Id.* at 3:41–49. We find that these portions teach the “use of multiple network paths including at least one connection to a networked server.”

Another relied-upon portion of Yegoshin states that “cell phone 9 is capable of taking some calls via cellular path while receiving other calls via IP path.” Ex. 1004, 5:55–57. We find that this portion of Yegoshin teaches

“simultaneous use,” even if there are no simultaneous connections to both of the cellular and IP paths, as argued by Patent Owner. PO Resp. 48–50.

We agree with Petitioner that “[b]ecause a cellular call is processed (e.g., redirected to the IP call point) while engaged with a WLAN call, both cellular and WLAN networks are in *use simultaneously*, even if the phone does not establish cellular and WLAN calls simultaneously.” Pet. Reply 6 (citing Ex. 1051 ¶ 15). We also agree with the parties that the claim does not require the simultaneous transfer of data. Pet. Reply 5; PO Sur-reply 2.

Petitioner also relies on portions of Johnston that describe antenna diversity, how to implement it, and its benefits. Ex. 1005, 1:10–30, 6:48–7:32, 8:33–43, 9:35–41, 10:15–31, 11:9–23, 12:8–30.

Based on the full record before us, Petitioner persuades us, and we determine, that Petitioner’s proposed combination of Yegoshin, Johnston, and Billström would have had “data transferred by the plurality of transmit and receive units [that] is improved by the simultaneous use of multiple network paths including at least one connection to a networked server.”

m) “wherein the device is enabled for communication of wireless signals representing voice data and for communication of wireless signals representing non-voice data”

Petitioner argues that Yegoshin teaches voice communication and the proposed combination would have Billström’s packet data services for providing non-voice data. Pet. 25–26 (citing Ex. 1003 ¶¶ 99, 100; Ex. 1004, 1:53–54, 2:1–15; Ex. 1006, 1:54–58); *see also id.* at xiii (labeling the limitation “14[k]”).

The relied-upon portions of Yegoshin describe “wireless data transmission” and the problems of sending “voice-data” versus “data-data.” Ex. 1004, 1:53–54, 2:1–15. The relied-upon portion of Johnston describes

“packet data services on a cellular system.” Ex. 1006, 1:54–58. We credit Petitioner’s testimonial evidence because the citations to the record support it. Ex. 1003 ¶¶ 99, 100; Ex. 1004, 1:53–54, 2:1–15; Ex. 1006, 1:54–58.

Patent Owner does not provide a responsive argument regarding the above-quoted wherein clause. *See generally* PO Resp.

Based on the full record before us, Petitioner persuades us, and we determine, that Petitioner’s proposed combination of Yegoshin, Johnston, and Billström would have had a “device [that] is enabled for communication of wireless signals representing voice data and for communication of wireless signals representing non-voice data.”

n) Objective Indicia of Nonobviousness

Patent Owner does not present any arguments or evidence regarding any objective indicia of nonobviousness for any of the challenged claims. *See generally* PO Resp.

o) Petitioner Shows by a Preponderance of the Evidence that Claim 14 is Unpatentable

“Once all relevant facts are found, the ultimate legal determination [of obviousness] involves weighing of the fact findings to conclude whether the claimed combination would have been obvious to an ordinary artisan.”

Arctic Cat Inc. v. Bombardier Recreational Prods. Inc., 876 F.3d 1350, 1361 (Fed. Cir. 2017) (quoting *In re Cyclobenzaprine Hydrochloride Extended-Release Capsule Patent Litig.*, 676 F.3d 1063, 1068–69 (Fed. Cir. 2012)).

Above, based on full record before us, we provide our factual findings regarding (1) the level of ordinary skill in the art, (2) the scope and content

of the prior art, (3) any differences between the claimed subject matter and the prior art, and (4) objective evidence of nonobviousness.

In particular, we find that (1) Petitioner’s proposed level of ordinary skill in the art is consistent with the prior art of record, (2) Yegoshin, Johnston, and Billström teach or suggest all the limitations of claim 14, (3) one of ordinary skill in the art would have combined Yegoshin, Johnston, and Billström with a reasonable expectation of success, and (4) no objective evidence of nonobviousness presented in relation to any of the challenged claims. Weighing these underlying factual determinations, a preponderance of the evidence persuades us that claim 14 of the ’946 patent is unpatentable over Yegoshin, Johnston, and Billström. *Arctic Cat*, 876 F.3d at 1361.

5. *Dependent Claim 15*

Claim 15 depends from independent claim 14 and recites “further in communication with a server, wherein the mobile device is configured to receive multiple IP data packets on a plurality of ports at substantially the same time and send multiple data packets to the server, to allow multiple simultaneous communication paths over connections between the device and the server such that the communication rate between the server and device is increased.” Ex. 1001, 13:48–55.

Petitioner argues that Yegoshin’s phone communicates with servers by IP-LAN, and Yegoshin’s phone as modified by Billström communicates using IP-based cellular. Pet. 26–27 (citing Ex. 1003 ¶¶ 101, 102; Ex. 1004, 3:17–4:34, 4:59–9:31; Ex. 1006, 3:53–4:22). Petitioner, thus, argues that its proposed combination would transmit and receive IP data packets. *Id.* at 27 (citing Ex. 1003 ¶ 102; Ex. 1004, 1:30–2:15; Ex. 1006, 1:6–12). Petitioner refers to its modification in view of Johnston to argue that proposed combination would include “multiple simultaneous communication paths

over connections between the device and the server,” which would increase data rate. *Id.* at 27–28 (citing Ex. 1003 ¶¶ 103–108; Ex. 1004, 1:17–2:41, 3:35–51, 5:55–57; Ex. 1005, 1:5–7, 1:10–30, 6:48–7:32, 8:33–43, 9:35–41, 10:15–31, 11:9–23, 12:8–30, Fig. 29B; Ex. 1013, 33; Ex. 1028, 313–323).

Patent Owner responds that, because of its dependency from claim 14, Petitioner’s arguments for dependent claim 15 fail to disclose or render obvious multiple IP addresses. PO Resp. 38. For the reasons explained above for claim 14, Petitioner persuades us that Yegoshin, Johnston, and Billström teach or suggest all the limitations of claim 14.

Weighing the underlying factual determinations, a preponderance of the evidence persuades us that claim 15 of the ’946 patent is unpatentable over Yegoshin, Johnston, and Billström. *Arctic Cat*, 876 F.3d at 1361.

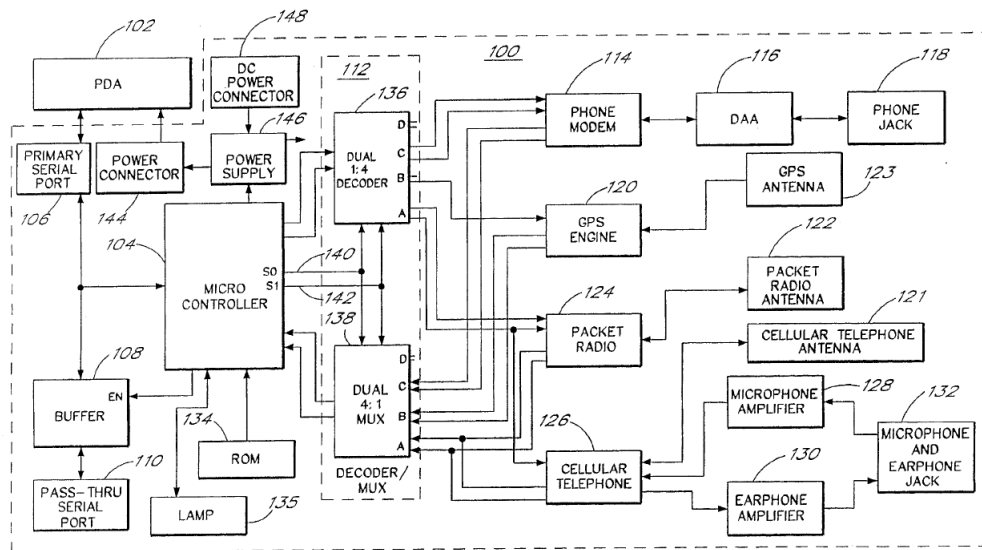
F. Asserted Obviousness Based on Yegoshin, Johnston, Billström, and Bernard

1. Bernard (Ex. 1007)

Bernard describes a device that “connects to and interfaces with a PDA to dramatically increase the functional capabilities of the PDA,” adding “multiple integrated communication media to the resources currently available to the PDA.” Ex. 1007, 1:39–43. “[T]he combination of the . . . invention with a PDA can be used to place or receive a cellular telephone call or a land line telephone call, to transmit or receive packet radio data, to obtain three-dimensional location data from the Global Positioning System (GPS) and to send or receive data over a telephone cellular link or over a land line using a built in phone modem.” *Id.* at 1:43–50.

As shown in Figure 4, reproduced below and described at column 5, lines 9–45, Bernard’s device includes a phone modem, a packet radio, and a

cellular telephone, all of which communicate with a micro controller through a “decoder/multiplexer 112.”



“FIG. 4 is a general functional block diagram of a first embodiment of [Bernard’s] communication device . . . connected to a palm computer.” Ex. 1007, 2:27–29. Bernard also includes a second embodiment, shown in Figures 10 to 15C, the first of which is reproduced below.

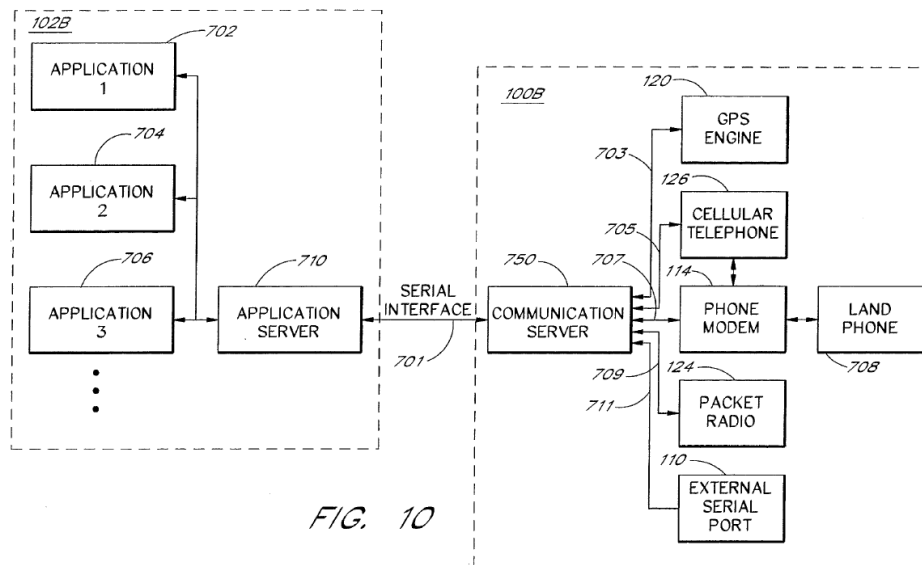


FIG. 10

“FIG. 10 is a functional block diagram of a second embodiment of [Bernard’s] communication device . . . connected to a palm computer.” Ex. 1007, 1:43–45. In this embodiment, “the program executed in the PDA 102B to interface with the communication device 100B is different in some respects from the program executed in the PDA 102 to interface with the communication device 100” of the first embodiment. *Id.* at 17:29–32. However, “the communication circuits 114, 120, 124, 126, as well as the external serial port 110 are utilized for the same purposes as in the first embodiment communication device 100” such that “[e]ach application program 702, 704, 706 can generally utilize any of the functions of the communication circuits 114, 120, 124, 126.” *Id.* at 17:61–66.

Bernard explains that, in the second embodiment, “only one of the four . . . connections can be established at a time,” but that “a person of skill in the art will understand that an alternative interconnection could be used that would allow multiple connections to be established simultaneously.” Ex. 1007, 26:56–60. “For example, an alternative embodiment can allow data to be transferred over a cellular system using the phone modem 114 and the cellular telephone 126, while a user talks over a land-based telephone line using an attached microphone and earphone and the land phone 708.” *Id.* at 26:60–65. This is accomplished by use of “arbitrator 716,” as described in connection with Figures 15A–C. *See id.* at 26:67–29:13.

2. *Claim 1*

Petitioner argues with reference to its contentions for independent claim 14 and to record evidence that Yegoshin, Johnston, Billström, and Bernard would have rendered obvious claims 1–11 and 16–21. Pet. 30–39, 46. Petitioner also argues that one of ordinary skill in the art would have combined Yegoshin’s phone as modified by Johnston and Billström with

Bernard so that the proposed combination would have “multiplexed signals.”
Id. at 39–46.

In particular, for the limitation

wherein a first interface for transmission is created and wherein said first interface for transmission uses a plurality of interfaces for Internet Protocol communication on the mobile device which utilize the plurality of wireless transmit and receive units on the mobile device to enable a single interface comprised of multiplexed signals from the plurality of wireless transmit and receive units

recited by claim 1 (Ex. 1001, 12:8–16), Petitioner argues that “Yegoshin’s phone *creates a first interface for transmission* for voice communication by utilizing two wireless transmit/receive units for cellular and WLAN” and its use of IP-LAN corresponds to an interface for Internet Protocol communication. Pet. 32–33 (citing Ex. 1003 ¶¶ 122, 123; Ex. 1004, 3:17–4:42, 4:59–7:25).

Petitioner also argues that “Yegoshin’s phone *enables a single interface comprised of multiplexed signals* from its first and second communication interfaces for cellular and WLAN (*first and second wireless transmit and receive units*).” Pet. 33 (citing Ex. 1003 ¶ 126). Petitioner contends, as an example, that “Yegoshin’s phone switches between cellular and IP-LAN modes, and is ‘capable of taking some calls via cellular path while receiving other calls via IP path.’” *Id.* at 33 (citing Ex. 1004, 5:33–65). Petitioner, thus, contends that “[i]t would have been obvious that Yegoshin’s phone selectively or simultaneously uses its first/cellular and second/WLAN communication interfaces to receive signals for calls and output the signals through a *single interface* that includes or is coupled to the ‘speaker apparatus.’” *Id.* at 34 (citing Ex. 1003 ¶ 126; Ex. 1004, 3:18–22).

a) Yegoshin Does Not Disclose Expressly “Multiplexed Signals”

We agree with Patent Owner that “Petitioner does not contend that Yegoshin expressly teaches ‘multiplexing.’” PO Resp. 3; *see also* Pet. 32–34 (citing testimonial evidence for “multiplexed signals”). As we preliminarily determined in the Institution Decision, “[t]he cited portion does not teach expressly multiplexed signals, as Petitioner implicitly acknowledges by arguing that one of ordinary skill in the art would have understood that Yegoshin includes multiplexed signals.” Inst. Dec. 34 (citing Pet. 34; Ex. 1004, 5:33–65). Petitioner does not dispute our preliminary determination that Yegoshin does not teach or suggest expressly the required “multiplexed signals.” *See generally* Pet. Reply.

Thus, based on the full record before us, we find that Yegoshin does not teach the “multiplexed signals” of claim 1. Pet. 34; Ex. 1004, 5:33–65.

b) Asserted Obviousness Based on Yegoshin Alone

Petitioner argues that “Yegoshin-Johnston-Billström’s phone communicates on cellular and WLAN selectively or simultaneously (as taught by Yegoshin) using IP-enabled cellular and WLAN communication interfaces (as taught by Yegoshin and Billström).” Pet. 34 (citing Ex. 1003 ¶ 127; Ex. 1004, 5:33–65; Ex. 1006, 1:6:12, 1:54–60, 3:53–61). According to Petitioner, one of ordinary skill in the art “would have found it obvious that, to receive calls on both cellular and WLAN simultaneously or to switch between two networks, the phone multiplexes the signals communicated on two network paths.” *Id.* (citing Ex. 1003 ¶ 127). Petitioner provides similar arguments in its Reply. Pet. Reply 21–22 (citing Pet. 50; Ex. 1004, 5:55–57, 5:59–65, 8:47–56; Ex. 1050 ¶¶ 34–36; Ex. 1051 ¶¶ 54, 55).

The cited portion of Yegoshin describes “client software suite 19 enables a user to *select a type of network for communication*, to select a

protocol for voice communication and to set-up a temporary IP address on a network for the purpose of identifying and registering the device for normal operation on the network.” Ex. 1004, 5:33–35 (emphasis added). Yegoshin also describes “[a] series of selection buttons such as 15 and 17 allow a user to *switch modes from cellular to IP communication*, and perhaps to *switch from differing types of networks* using known protocols that are made available via client software 19.” *Id.* at 5:40–44 (emphases added).

Yegoshin further states that “[s]election of the network could be according to an order of preference, by availability.” Ex. 1004, 5:53–54; *see also id.* at 5:63–65 (stating that “[i]n a preferred embodiment, phone 9 may be switched from one network capability to another at the user’s discretion”).

Based on the above-quoted portions of Yegoshin cited by Petitioner, we find that an ordinarily skilled artisan would not have understood or found obvious that calls are received on both cellular and WLAN simultaneously. Ex. 1004, 5:33–54. This cited portion of Yegoshin does not relate to receiving calls on both cellular and WLAN and does not support the argument that “to receive calls on both cellular and WLAN simultaneously or to switch between two networks, the phone multiplexes the signals communicated on two network paths.” *See* Pet. 34; Ex. 1004, 5:33–54. Yegoshin makes clear that a “user” or “an order of preference” causes a switch between networks without mentioning anything else, such as multiplexing. *Id.* at 5:33–35, 5:40–44, 5:53–54.

Petitioner also cites a portion of Yegoshin that states “cell phone 9 is capable of taking some calls via cellular path while receiving other calls via IP path” and “[i]n such a situation, integrating software is provided to coordinate activity between the two paths.” Ex. 1004, 5:55–59. Yegoshin explains that “[f]or example, if engaged with an IP call, an incoming cell call

would get a busy signal and so on, or it would be redirected to the IP call point, where it would then be presented as a call-waiting call, if that feature set is available and enabled.” *Id.* at 5:59–63. This description taken together with what is described before it would not be understood and would not have rendered obvious that “to receive calls on both cellular and WLAN simultaneously or to switch between two networks, the phone multiplexes the signals communicated on two network paths.” Pet. 34; Ex. 1004, 5:55–65. We, thus, find that Yegoshin’s integrating software only coordinates activity between cellular and IP calls, and such coordination would not be understood to involve multiplexing. Ex. 1004, 5:55–65.

In Reply, Petitioner points to a portion of Yegoshin that describes “an instance of a cellular call 55 placed to cell phone 9 [that] assumes that the user is taking all cellular calls in IP format while logged-on to IP network 27” and that “[a]ll such calls would then be routed via PSTN 25 to IP network 27.” Pet. Reply 21; Ex. 1004, 8:47–56. This additionally cited description does not support that it would have been obvious that, “to receive calls on both cellular and WLAN simultaneously or to switch between two networks, the phone multiplexes the signals communicated on two network paths.” Pet. 34.

In sum, Petitioner does not sufficiently show that Yegoshin’s simultaneous or selective use of two networks involves multiplexed signals, in view of Yegoshin’s express description of providing a busy signal or using call-forwarding for an incoming cell call when on an IP call. Ex. 1004, 5:59–63; *see also* PO Resp. 3–6 (arguing that “multiplexing” is not necessarily present).

Petitioner’s cited testimonial evidence also does not explain sufficiently with support how the relied-upon portion of Yegoshin would

have rendered obvious multiplexed signals. Ex. 1003 ¶¶ 126, 127. We agree that “Yegoshin’s phone is configured to switch between cellular and IP communication modes, and also ‘capable of taking some calls via cellular path while receiving other calls via IP path’” but that does not lead to the conclusion, or support, that “in order to receive calls on both cellular network and WLAN simultaneously or to switch between two networks, the phone includes multiplexing of the signals communicated on two network paths.” Ex. 1003 ¶¶ 126 (citing Ex. 1004, 3:18–22, 5:33–65), 127 (citing Ex. 1004, 5:33–65; Ex. 1006, 1:6:12, 1:54–60, 3:53–61). The declarant’s citations to the record also do not support that Yegoshin’s “phone includes multiplexing of the signals communicated on two network paths.” Ex. 1004, 3:18–22, 5:33–65; Ex. 1006, 1:6:12, 1:54–60, 3:53–61.

Thus, based on the full record before us, we determine that Petitioner does not show that Yegoshin would have rendered obvious multiplexed signals.

c) Asserted Knowledge in the Art

Petitioner additionally argues that multiplexing techniques were well-known. Pet. 34 (citing Ex. 1003 ¶ 128; Ex. 1004, 1:40–51, 2:1–15, 9:23–26; Ex. 1006, Abstr.; Ex. 1011, 14–17, 284; Ex. 1012, 506–508, 543–545; Ex. 1013, 32–33, 382); Pet. Reply 18 (citing Pet. 34–39, 42, 50, 54; Ex. 1050 ¶¶ 6–33; Ex. 1051 ¶ 43). Even if multiplexing techniques were well-known, Petitioner does not argue sufficiently that Yegoshin uses multiplexing techniques during cellular calls when another call is received through WLAN.

As we pointed out in our Institution Decision, “[t]he additional evidence cited also does not expressly indicate that multiplexing is used when receiving a WLAN call during a cellular call.” Inst. Dec. 34–35

(citing Ex. 1011, 14–17, 284; Ex. 1012, 506–508, 543–545; Ex. 1013, 32–33, 382). Petitioner does not provide sufficient further explanation or evidence that one of ordinary skill in the art with the knowledge of multiplexing described in Exhibits 1011–1013 would have understood that Yegoshin multiplexes when describes that “cell phone 9 is capable of taking some calls via cellular path while receiving other calls via IP path” and “if engaged with an IP call, an incoming cell call would get a busy signal and so on, or it would be redirected to the IP call point, where it would then be presented as a call-waiting call.” Pet. 34; Pet. Reply 18–22; Ex. 1003 ¶¶ 128; Ex. 1004, 5:33–65; Ex. 1050 ¶¶ 5, 8, 34–36; Ex. 1051 ¶¶ 42–45, 54–55.

In view of the full record, we find that the additionally cited exhibits show that one of ordinary skill in the art with the knowledge of multiplexing described in Exhibits 1011–1013 would not have understood Yegoshin to be multiplexing in its described handling of cellular and IP calls. None of Exhibits 1011–1013 expressly apply to the relied-upon portion of Yegoshin. *See also* Pet. 34 (stating that “[f]or example, multiplexing was a well-known function of transport protocols as part of the IP suite”) (citing Ex. 1003 ¶ 128; Ex. 1011, 14–17, 284; Ex. 1013, 32–33, 382; Ex. 1012, 507, 543–545).

Page 14 of Exhibit 1011 states that “this book focuses on packet-switched networks” and that pages 14–17 “explain[] the key requirement of computer networks—in short, efficiency—that leads us to packet switching as the strategy of choice.” Page 284 of the same exhibit states that “the protocol needs to add a level of demultiplexing, thereby allowing multiple application processes on each host to share the network.”

We find that these cited portions do not address whether one of ordinary skill in the would have understood Yegoshin to be multiplexing in its described handling of cellular and IP calls. Furthermore, Petitioner relies on Billström for teaching the use of IP and packet data communications in a cellular system. Pet. 18–19.

Pages 506–508 of Exhibit 1012 describe “multiplexing several conversations onto connections, virtual circuits, and physical links . . . in several layers of the network architecture,” upward multiplexing which is “multiplexing of different transport connections onto the same network connection,” and downward multiplexing which is “hav[ing] the transport layer open multiple network connections and distribute the traffic among them on a round-robin basis.” Pages 543–545 of the same exhibit describe a solution of splitting a TCP connection between sender and receiver by adding an intermediate base station.

We find that these cited portions are also unhelpful in determining whether one of ordinary skill in the would have understood Yegoshin to be multiplexing in its described handling of cellular and IP calls. Exhibit 1012 describes multiplexing within one network, not between two networks, such as cellular and IP.

Page 32 of Exhibit 1013 states that “[m]ultiplexing is a process in which multiple data channels are combined into a single data or physical channel at the source.” Pages 32–33 of Exhibit 1013 state that “[a]nother example of multiplexing is when data from multiple devices is combined into a single physical channel (using a device called a multiplexer)” and “[a] multiplexer is a physical-layer device that combines multiple data streams into one or more output channels at the source.”

We find that these cited portions do not address whether one of ordinary skill in the would have understood Yegoshin to be multiplexing in its described handling of cellular and IP calls. Exhibit 1013 indicates multiplexing occurs at a source of data, not at a phone for its speaker apparatus (Pet. 33–34; Ex. 1003 ¶ 126).

Petitioner’s cited testimonial evidence does not explain how one of ordinary skill in the art would have understood Yegoshin to be multiplexing cellular and WLAN calls in view of these exhibits. Ex. 1003 ¶ 128; Ex. 1050 ¶¶ 5, 8, 34–36; Ex. 1051 ¶¶ 42–45, 54–55. Nor does Petitioner provide a reason why one of ordinary skill in the art would have been motivated to modify Yegoshin’s system to use multiplexing. *See* Pet. 32–35; *see also* PO Resp. 6 (arguing that Petitioner does not provide a motivation to modify Yegoshin to multiplex signals).

d) Asserted Obviousness Based on Modification with Bernard

Petitioner argues that Bernard confirms “known multiplexing features.” Pet. 35 (citing Ex. 1003 ¶ 130). Petitioner provides its understanding of what Bernard teaches regarding its second embodiment. *Id.* at 35–37 (citing Ex. 1003 ¶¶ 131, 132; Ex. 1007, 17:40–19:2, 19:37–21:54, 24:19–25:24, Figs. 10, 12). Petitioner contends that Bernard’s second embodiment “includes or operates as a multiplexer for combining the data packets.” *Id.* at 38 (citing Ex. 1003 ¶ 133; Ex. 1007, 3:59–4:15, 17:10–25, Fig. 4; Ex. 1012, 133–134, Figs. 2–36; Ex. 1014, 230, 254–256). Petitioner also argues that Bernard teaches “multiplexing multiple packets from multiple communication networks onto a single channel (e.g., serial interface 701).” *Id.* at 38–39 (citing Ex. 1003 ¶ 134; Ex. 1011, 14–17, 284; Ex. 1012, 506–508, 543–545; Ex. 1013, 32–33, 382).

Patent Owner responds that the cited portions of Bernard do not teach multiplexing. PO Resp. 12–20 (citing Pet. 35–39, 41; Ex. 1007, 26:56–60, Fig. 4; Ex. 2019 ¶¶ 66–70, 74–78, 81, 82; Ex. 2020, 59:2–23, 61:3–11).

Patent Owner also responds that Petitioner fails to show a motivation to combine Yegoshin and Bernard. PO Resp. 12, 20–28 (citing Pet. 38–42; Ex. 1007, 17:40–44; Ex. 2019 ¶¶ 8, 46–48, 86–89; Ex. 2029, 72:2–73:14).

Petitioner replies that the combination of Yegoshin and Bernard would have rendered obvious “multiplexed signals.” Pet. Reply 22 (citing Pet. 34–46; Ex. 1050 ¶¶ 37–41; Ex. 1051 ¶ 56). Petitioner argues that Bernard’s second embodiment aligns with the well known use of multiplexing because several applications utilize several communication circuits through serial interface 701. *Id.* at 22–25 (citing Ex. 1007, 17:26–60, 17:64–18:2, 18:47–51, Figs. 10, 12; Ex. 1050 ¶¶ 17–33, 39–41; Ex. 1051 ¶¶ 57–61; Ex. 1053, 80:4–10). Petitioner also argues that Bernard can establish multiple connections simultaneously. *Id.* at 25–27 (citing PO Resp. 16–17, 19, 20; Ex. 1007, 2:55–58, 17:66–18:1, 18:19–20, 25:19–29, 26:25–42, 26:56–65, Fig. 13; Ex. 1050 ¶¶ 47–51; Ex. 1051 ¶¶ 62–67; Ex. 1053, 63:15–16; Ex. 1054, 75:7–20, 77:16–78:1, 78:23–79:4; Ex. 2019 ¶ 81). Petitioner also replies that sufficient motivation existed to modify Yegoshin to satisfy the multiplex limitations. Pet. Reply 27–30 (citing PO Resp. 20–28; Ex. 1004, 5:4–9, 5:23–32; Ex. 1007, Abstr., 1:11–14, 30:1–2; Ex. 1051 ¶¶ 68–71; Ex. 1053, 41:9–19).

Patent Owner replies that neither Yegoshin nor Bernard teach multiplexing and Petitioner “assert[s] that any two signals, even if *unrelated*, randomly distributed and separated by days or *years*, are multiplexed” without any support from the record. PO Sur-reply 15–19 (citing PO Resp. 10–12, 16–17; Pet. Reply 20; Ex. 1011, 15; Ex. 1012;

Ex. 1013; Ex. 1051 ¶¶ 51, 52; Ex. 1052, 11:30–12:2; Ex. 1061; Ex. 1062; Ex. 2003, 37; Ex. 2023, 3; Ex. 2035, 55:5–56:11, 56:8–12, 63:13–16, 67:7–15). Patent Owner also replies that Petitioner fails to show Bernard’s signals are multiplexed. *Id.* at 20–24 (citing Pet. 37–39; Pet. Reply 23, 24; Ex. 1007, 17:61–18:8, 18:19–20, 18:36–51; 26:56–60; Ex. 1011, 15; Ex. 1012; Ex. 1013, 15; Ex. 1050 ¶¶ 24–33; Ex. 1051 ¶ 61; Ex. 1061; Ex. 1062; Ex. 2019 ¶¶ 73–79; Ex. 2023, 3). Patent Owner further replies that Petitioner fails to show sufficient motivation to make the proposed modification. *Id.* at 24–26 (citing Pet. 39; PO Resp. 21–28; Pet. Reply 28, 29; Ex. 2019 ¶¶ 46–48, 86–87).

Petitioner cites to description related to Figures 10 and 12 of Bernard, which illustrate “a functional block diagram of the second embodiment communication device 100B connected to a PDA 102B” and “a software functional block diagram of the communication server 750 of FIG. 10.” Pet. 35–39; Ex. 1007, 17:26–28, 19:36–37.

We find that the portions of Bernard cited by Petitioner, like Yegoshin, do not teach expressly that data packets from its cellular phone, phone modem, or other sources are multiplexed. Ex. 1007, 17:40–19:2, 19:37–21:54, 24:19–25:24, Figs. 10, 12. In particular, we find that Bernard’s Figure 13 shows that, in the second embodiment, microcontroller 772 uses serial interfaces 703, 705 to communicate with the same GPS engine 120 and cellular telephone 126 and uses quad UART 776 to communicate via parallel interface 771 with the same phone modem 114, packet radio 124, and external serial port 110. *See also id.* at 23:60–25:24 (describing the block diagram shown in Fig. 13). The cited portions of Bernard do not support “that packet interface 752 in cradle 100B includes . . . a multiplexer for combining the data packets coming from such different

networks.” Pet. 38 (citing Ex. 1003 ¶ 133; Ex. 1007, 3:59–4:15, 17:10–25, Fig. 4). Bernard expressly describes that the second embodiment does not include a multiplexer. Ex. 1007, 17:40–19:2, 19:37–21:54, 24:19–25:24, Figs. 10, 12.

Despite the express disclosure of a multiplexer in another embodiment, Petitioner contends that one of ordinary skill in the art would have understood or found obvious “that packet interface 752 in cradle 100B . . . operates as a multiplexer for combining the data packets coming from such different networks.” Pet. 38. Petitioner’s reference to decoder/multiplexer 112 from Bernard’s first embodiment highlights that Bernard’s second embodiment does not operate as a multiplexer and does not include multiplexed signals. Pet. 38 (citing Ex. 1007, 3:59–4:15, 17:10–25, Fig. 4). We find that Figure 4 of Bernard shows that, in the first embodiment, decoder/multiplexer 112 connects microcontroller 104 to phone modem 114, GPS engine 120, packet radio 124, and cellular telephone 126. *See also* Ex. 1007, 3:59–6:19 (describing the block diagram shown in Fig. 4). Although Bernard states that “[m]any of the implementation details that have been described above with respect to the first embodiment 100 also apply to the second embodiment 100B,” Bernard does not describe or show in its second embodiment a decoder/multiplexer between its microcontroller and phone modem, GPS engine, packet radio, and cellular telephone. Ex. 1007, 17:12–15.

Instead of decoder/multiplexer 112 connecting microcontroller 104 to phone modem 114, GPS engine 120, packet radio 124, and cellular telephone 126, the second embodiment of Bernard uses quad UART 776 between microcontroller 772 and phone modem, GPS engine, packet radio, and cellular telephone in communication server 750. *Compare* Ex. 1007,

3:59–6:19, Fig. 4, *with id.* at 23:60–25:24, Fig. 13. We find no description in Bernard that the second embodiment by using UART 776 provides an output similar to decoder/multiplexer 112 to send over serial interface 701. *See id.* at 17:10–25:24. Petitioner does not explain why quad UART 776 would need to multiplex signals when “[i]n this second embodiment, only one of the four above-described connections can be established at a time.” *See* Pet. 35–46; Ex. 1007, 24:23–27, 26:56–57, Fig. 13. Petitioner, thus, does not argue sufficiently that UART 776 of Bernard’s second embodiment operates as a multiplexer and provides multiplexed signals.

Petitioner points to a brief passage in the description of the second embodiment stating that “an alternative interconnection could be used that would allow multiple connections to be established simultaneously.” *See* Pet. Reply 25–26 (citing Ex. 1007, 26:56–65). Petitioner, however, fails to identify the “alternative interconnection” or explain how it could be incorporated into the combination. To the extent Petitioner is intending to rely on the technique shown in Figures 15A–C, we find that to be inadequately supported in the Petition.

Bernard shows multiplexer/decoder 780 in its Figure 14, and this additional description further reinforces that, when Bernard requires multiplexed signals, Bernard uses a multiplexer, and that one of ordinary skill in the art would have understood that the second embodiment does not include or operate as a multiplexer, as argued by Petitioner. *See also* Ex. 1007, 25:25–26:65 (describing the block diagram shown in Fig. 14 and stating “[i]n this second embodiment, only one of the four above-described connections can be established at a time”).

Based on Bernard’s description of alternative embodiments, one of ordinary skill in the art would have understood that a UART is not a

multiplexer. Ex. 1007, 3:59–6:19, 23:60–25:24, 25:25–26:65, Figs. 4, 13. The fact that a UART can be an alternative to a multiplexer does not lead to the conclusion that the UART operates as a multiplexer or that the UART provides multiplexed signals like a multiplexer, because of Bernard’s description that “[i]n this second embodiment, only one of the four above-described connections can be established at a time.” Ex. 1007, 26:56–57. Bernard’s description also does not fall within the proposed interpretation of “multiplex” and its variants from related litigation (“to interleave or simultaneously transmit two or more messages on a single communications channel”), because Bernard expressly describes it is establishing, and therefore transmitting from, only one of the four connections at a time. *See id.*; Ex. 1099, 7; Ex. 2023, 7. Based on our findings above, we determine that the second embodiment of Bernard does not “interleave two or more messages on a single communications channel” and does not “simultaneously transmit two or more messages on a single communications channel.”

Regarding Petitioner’s supporting testimonial evidence, we give little weight to it because Bernard does not support the opinion and contradicts that “cradle 100B includes . . . a multiplexer for combining the data packets coming from such different networks.” Ex. 1003 ¶¶ 133–134. Petitioner’s declarant no longer opines in subsequent declarations that Bernard’s second embodiment includes a multiplexer. *See* Ex. 1050 ¶¶ 17–33, 37–41, 47–51; Ex. 1051 ¶¶ 56–71. The subsequent declarations focus on sending data from phone modem 114, GPS engine 120, packet radio 124, and cellular telephone 126 over serial interface 701. *See* Ex. 1050 ¶¶ 17–33, 37–41, 47–51; Ex. 1051 ¶¶ 56–71. Because of Bernard’s description that “only one of the four above-described connections can be established at a time,” use of a

UART in the relied-upon second embodiment, and alternative use of a multiplexer in the first embodiment, we give little weight to the subsequent opinions about how data sent over serial interface 701 is a multiplexed signal. Ex. 1050 ¶¶ 17–33, 37–41, 47–51; Ex. 1051 ¶¶ 56–71. We find that one of ordinary skill in the art would have understood that the relied-upon embodiment of Bernard does not simultaneously use communication circuits 114, 120, 124, 126. Ex. 1007, 17:64–18:2, 26:56–57. Bernard describes an alternate arrangement of components with no indication that signals from packet interface 752 are multiplexed. *See id.*

We further find that Bernard provides insufficient detail regarding yet another “alternative embodiment [that] can allow data to be transferred over a cellular system using the phone modem 114 and the cellular telephone 126, while a user talks over a land-based telephone line” to meet Petitioner’s burden. Ex. 1007, 26:61–64; Ex. 1050 ¶ 51. This description also confirms that the second embodiment of Bernard that Petitioner relies on, would not have been understood to have simultaneous connections. Ex. 1007, 26:61–64.

As described above, the additionally cited exhibits do not relate to a circuit like Bernard’s second embodiment and whether it would provide a multiplexed signal in a manner known in the art. Ex. 1011; Ex.1012; Ex. 1013. None of the additional evidence provide any support that the circuit arrangement of Bernard’s second embodiment would have been understood to provide multiplexed signals because none describes multiplexing using an UART. Ex. 1011; Ex.1012; Ex. 1013.

Petitioner proposes modifying its Yegoshin-Johnston-Billström phone with Bernard so that the phone includes “*a single interface* (e.g., Bernard’s serial interface connecting to multiple applications running on the PDA)

comprised of signals (e.g., data packets) from the IP-enabled cellular and WLAN interfaces (as taught by Yegoshin-Billström), which are multiplexed by Bernard’s communication packet interface.” Pet. 39 (citing Ex. 1003 ¶ 135); *see also id.* at 39–46 (explaining two alternative proposed combinations with Bernard’s cradle or communication server 750) (citing Ex. 1003 ¶¶ 136–146; Ex. 1004, 2:42–4:42, 4:59–7:25, 8:15–27, 9:13–18; Ex. 1007, 1:38–57, 2:65–3:22, 4:7–9, 17:10–25, 17:40–18:51, 19:36–25:25, 26:56–65, Figs. 1–3; Ex. 1011, 16–17, Fig. 1.8; Ex. 1015). As discussed above, Petitioner does not show that Bernard’s cradle or communication server 750 multiplexes signals. Pet. 35–46. Petitioner also does not propose further modifications based on Bernard’s Figure 14 or its associated description. *See id.* at 32–46.

e) Petitioner Fails to Show “Multiplexed Signals” by a Preponderance of the Evidence

For the reasons above, based on the full record, Petitioner fails to show by a preponderance of the evidence that Yegoshin would have been understood to have multiplexed signals or that Bernard “includes or operates as a multiplexer for combining the data packets.” *See* Pet. 32–46. Because Petitioner does not show multiplexed signals in any of the asserted references, Petitioner does not show by a preponderance of the evidence that its proposed combination of Yegoshin, Johnston, Billström, and Bernard would have “a single interface comprised of *multiplexed* signals from the plurality of wireless transmit and receive units,” as required by claim 1.

Also, because Petitioner fails to show Yegoshin would have been understood to have multiplexed signals and that Bernard “includes or operates as a multiplexer for combining the data packets,” Petitioner’s

asserted motivation to modify Yegoshin, Johnston, and Billström in view of Bernard to include “multiplexed signals” lacks rational underpinning.

3. *Dependent Claims 2–11 and 16*

Claim 2–11 depend ultimately from claim 1. Ex. 1001, 12:25–13:7. Claims 2–4 recite “wherein the processor multiplexes the receiving signals into the single transmission connection” or “wherein data transmitted and received is multiplexed as each end.” *Id.* at 12:29–30, 12:35–36, 12:41–42.

For these recitations, Petitioner refers to its arguments for claim 1’s limitation of “a single interface comprised of multiplexed signals from the plurality of wireless transmit and receive units.” Pet. 47–48, 50–51. For the reasons above, Petitioner does not sufficiently show that its proposed combination would have “multiplexed signals,” and Petitioner’s arguments for claims 2–4 do not substantively add to the arguments for “multiplexed signals.” *See id.* at 47–48, 50–51. Petitioner’s arguments for claims 5–11 do not further address “multiplexed signals.” *See id.* at 51–55.

Claim 16 depends from independent claim 14 and recites “wherein the device is configured for *multiplexing* between a plurality of protocols including transmission control, CDMA, TDMA, internet protocol (IP) and/or combinations thereof.” Ex. 1001, 13:56–59 (emphasis added).

Petitioner argues with reference to its contentions for claim 1’s “multiplexed signals” that Yegoshin’s phone as modified by Johnston, Billström, and Bernard would multiplex data packets on CDMA, TDMA or IP-based WLAN. *See* Pet. 55 (citing Ex. 1003 ¶¶ 175, 176; Ex. 1004, 2:30–37, 5:23–32, 6:5–14). For the reasons above, based on the full record, Petitioner does not show by a preponderance of the evidence that its proposed combination would have “multiplexed signals.”

Therefore, on the full record, Petitioner does not show by a preponderance of the evidence that the proposed combination of Yegoshin, Johnston, Billström, and Bernard would have rendered obvious dependent claims 2–11 and 16.

4. Independent Claim 17

For most of the limitations of claim 17, Petitioner argues with reference to its contentions for claims 1 and 14. Pet. 55–56 (citing also Ex. 1003 ¶¶ 177–186), 58–59 (citing also Ex. 1003 ¶¶ 191, 192; Ex. 1004, 1:9–43, 1:51–57, 4:59–5:3). Except for the limitations discussed below, Patent Owner does not provide a responsive argument for these other limitations. *See generally* PO Resp.

For the reasons provided above for claim 14, Petitioner persuades us, and we find, that Yegoshin teaches or suggests “[a] portable wireless communication device” that includes the recited “memory,” “at least two or more antennas,” “at least one or more processors,” and “a plurality of wireless transmit and receive units.” Ex. 1003 ¶¶ 177–182. We also determine the proposed combination would have been a “device [that] is configured for multi-band wireless communication,” “enabled for communication using Internet Protocol (IP),” and “enabled for wireless communication on a local area network.” *Id.* ¶¶ 183–185. We further determine that the proposed combination would have had a “first wireless transmit and receive unit [that] is configured to communicate using a plurality of antennas.” *Id.* ¶ 186.

- a) “wherein the first wireless transmit and receive unit is configured to communicate over Internet Protocol with a remote system over a first network path and the second wireless transmit and receive unit is configured to communicate with the same or a different remote system using*

a second network path and wherein the processor on the device is configured to combine the data paths into a single transmission interface to one or more applications on the device,”

Petitioner relies on Yegoshin’s cellular and WLAN interfaces. Pet. 56 (citing Ex. 1003 ¶ 187; Ex. 1004, 3:17–34, 5:33–54, 7:7–14, 7:48–58, 8:47–56; Ex. 1006, 1:6–12, 1:54–60, 3:53–61, 5:60–6:2, 21:26–24:28, Figs. 2, 3, 14, 15); *see also id.* at xv (labeling the limitation “17[i]”). Petitioner argues that Yegoshin’s PSTN switch 31 and IP switch 35 teach “a remote system” and “a different remote system,” respectively. *Id.* at 56–58 (citing Ex. 1003 ¶¶ 188, 189; Ex. 1004, 3:35–4:42, 5:66–9:12, Figs. 2, 3).

Petitioner argues that its proposed combination “multiplexes (***combines***) the signals received over cellular and WLAN into the single interface (e.g., serial interface) (***single transmission interface***) connected/integral to the phone, which routes the received signals to ‘appropriate ***applications***’ running on the phone as taught in Bernard.” Pet. 58 (citing Ex. 1003 ¶ 190; Ex. 1007, 17:33–19:2, 19:37–21:54, 23:60–25:25). Petitioner also argues that Bernard’s microcontroller 772 performs the multiplexing. *Id.* (citing Ex. 1003 ¶ 190; Ex. 1007, 17:33–22:4, 24:12–25:24).

(1) Patent Owner’s Response

Patent Owner argues that, in Yegoshin, “the data paths are never combined into a ‘single transmission interface’ to one or more applications” but instead “are always separate and distinct.” PO Resp. 32 (quoting Ex. 2019 ¶ 98). Patent Owner illustrates this with the annotated figures reproduced below:

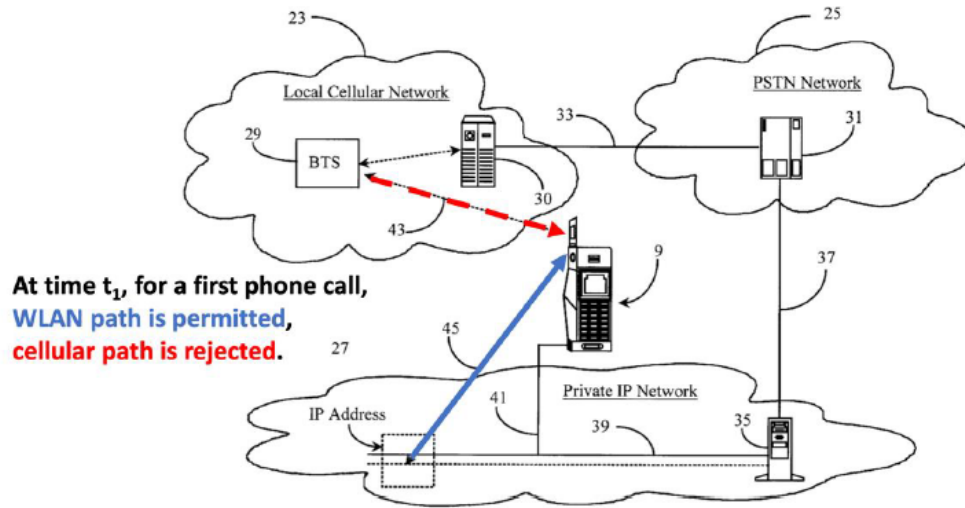


Fig. 2

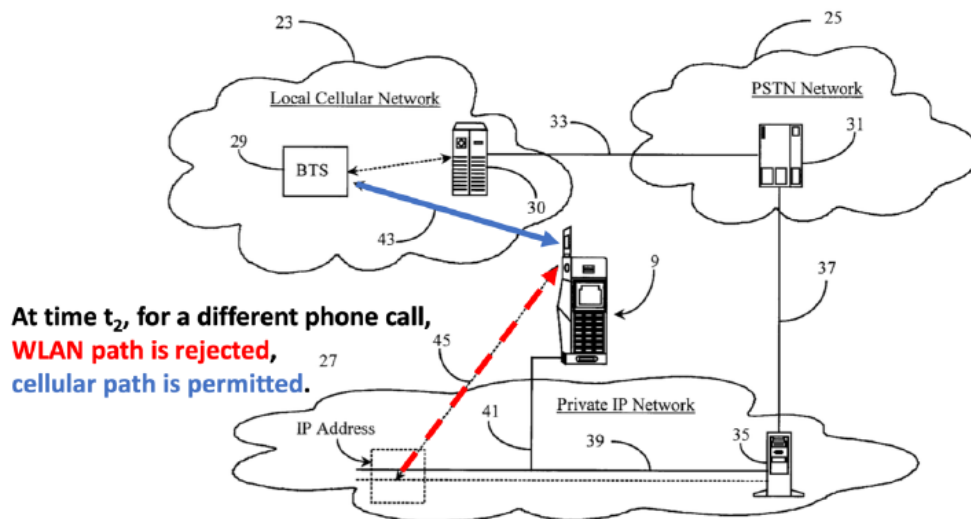


Fig. 2

Patent Owner Annotated Versions of Yegoshin's Figure 2

According to Patent Owner, “[i]n the first annotated version of Yegoshin’s Figure 2, for a first phone call, the cellular path is not selected, and the phone application only uses the WLAN path,” “[i]n the second annotation, for a different call, the WLAN path is not selected, and the phone application only uses the cellular path,” meaning that “the two paths are never combined for any call.” PO Resp. 32 (quoting Ex. 2019 ¶ 98).

Patent Owner also argues that Petitioner cannot rely on Bernard because (a) Petitioner has not provided a motivation to modify Yegoshin and (b) “Bernard does not disclose this limitation to begin with” because “Petitioner relies on Bernard’s routing mechanism” but “packet routing has nothing to do with the claimed invention.” PO Resp. 33–37 (citing Ex. 2019 ¶¶ 100–103, 105). Patent Owner quotes Dr. Cooklev: “That in Bernard, because of connection to an external cradle, a serial connection happens to be used, and therefore, the data that is transmitted at different times all happen to pass through the same connection, albeit never at the same time, has no relevance to the claimed invention.” *Id.* at 34. Dr. Cooklev further asserts that “Bernard explains that a user can utilize the phone application with only one of the landline or cellular networks . . . thus never ‘combining’ the two paths to an application.” *Id.*

Dr. Cooklev further argues that Bernard does not “combine the data paths into a single interface to one or more applications” because “the different data paths are separated upon arrival at the mobile device,” as “[d]epending on whether the received packet is GPS, cellular, land phone, packet radio or from an external connection, the packet distributor causes the packets to be distributed for processing to each packet type’s respective interface.” Ex. 2019 ¶ 102.

(2) Reply Arguments

Petitioner replies that “Patent Owner assumes that ‘combin[ing]’ in claims 6 and 17 requires simultaneous communication of data over two networks” but “Patent Owner is incorrect” because the actual language of the claims is not so narrow. Pet. Reply 14 (citing PO Resp. 29–35; Ex. 1051 ¶¶ 35–36). Petitioner argues that “claims 6 and 17 require ‘data *paths*’ (not ‘data’) to be combined” and that “[s]imultaneous communication of ‘data’

over different networks is not required.” *Id.* Petitioner asserts that “because Yegoshin’s cellular and WLAN paths combine into a single interface, an application on Yegoshin’s phone (e.g., a call handling application) operates in the same way, regardless of whether data is received by the cellular path or the WLAN path.” *Id.* at 14–15 (citing Ex. 1004, 3:14–15, 6:65–7:3, 7:15–25, 8:47–56; Ex. 1051 ¶ 36).

Regarding Bernard’s serial interface 701, Petitioner argues that it would be sufficient because “the claims do not require ‘data paths’ . . . to be *directly* delivered or connected ‘to one or more applications on the mobile device.’” Pet. Reply 17 (citing Ex. 1001, claims 6,17; Ex. 1053, 93:1–13). According to Petitioner, “Bernard clearly describes an instance where data from multiple networks are combined through Bernard’s serial interface 701 and then delivered to a single application.” *Id.* (citing Ex. 1007, 17:66–18:1).

Patent Owner responds, with respect to Yegoshin, that “Petitioner’s expert testified that the phone application itself is the claimed ‘transmission interface’ where the data paths are combined” and the application cannot be the “single transmission interface” because the claim requires that the “processor . . . is configured to combine the data paths into a single transmission interface *to* one or more applications on the mobile device.” PO Sur-reply 19 (citing Ex. 1001, claim 17; Ex. 2035, 64:9–17). In other words, because “the application must receive the already combined data paths,” it “cannot itself be the ‘transmission interface.’”

With respect to Bernard, Patent Owner argues that “packets sent over Bernard’s serial interface are not combined into a single interface to any application, because the packets are delivered to each application

separately.” PO Sur-reply 14. Patent Owner illustrates this with the annotated figure reproduced below:

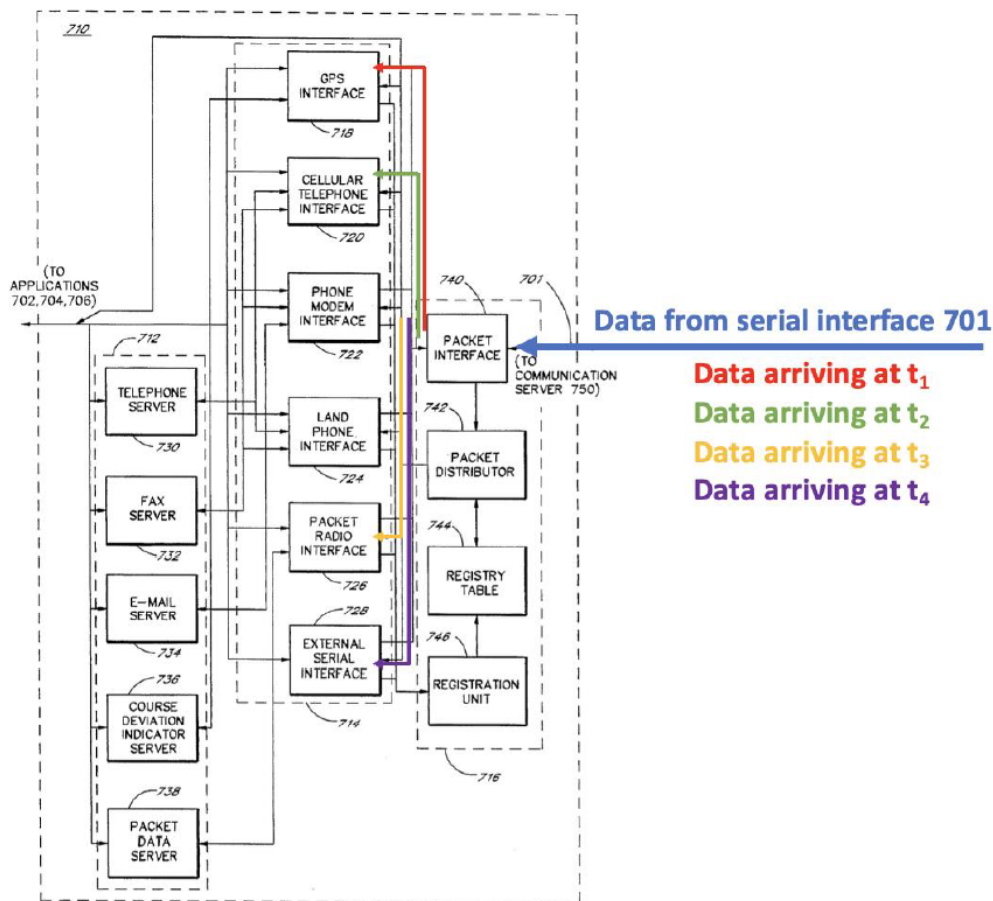


FIG. 11

Petitioner’s Annotated Version of Barnard’s Figure 11

See id.

(3) Petitioner Shows the Limitation

We agree with Patent Owner that Petitioner has not shown the recited “single transmission interface” in Yegoshin. An inspection of the Petition reveals that Petitioner relied only on the “serial interface” of Barnard for that limitation. *See* Pet. 58 (“the phone in the combination multiplexes (**combines**) the signals . . . into the single interface (e.g., the serial interface) . . . connected/integral to the phone, which routes the received signals to

‘appropriate *applications*’ running on the phone as taught in Bernard”) (citing only Ex. 1003 ¶ 190; Ex. 1007, 17:33–19:2, 19:37–21:54, 23:60–25:25). We, thus, find that Petitioner may not now rely on Yegoshin for the single interface.

But we also find that, although the Reply refers to Petitioner’s annotated version of Yegoshin’s Figure 2, Petitioner fails to specifically identify what might be the “single interface” in Yegoshin. Petitioner argues that “the cellular and WLAN paths combine into a single interface,” but Petitioner never actually identifies something that would be single interface in Yegoshin. *See* Pet. Reply 14–15.

However, we find that Petitioner *has* shown a “single transmission interface” in Bernard’s serial interface 701, which is a single interface that sits between the communication server 750 and the application server 710, receiving and transmitting data between the cellular telephone and packet radio, for example, and the applications. *See* Ex. 1007, Figs. 10, 11.

Dr. Cooklev briefly argues that “even if the concept of ‘combining’ two data paths ‘into a single transmission interface to one or more applications’ were known in the art . . . Petitioner has not explained why or how to implement that in Yegoshin, particularly as Yegoshin’s principle of operation does not work in this fashion.” Ex. 2019 ¶¶ 97–98. This cursory argument is not persuasive. The Petition explains that “[i]n a first scenario, the phone in the combination would have been modified to be used with Bernard’s cradle to provide multiple network connections,” and that “[i]n a second scenario, it would have been obvious to implement or modify the internal circuitry [of the] phone . . . so that the phone integrally contains the functionality executed in Bernard’s cradle.” Pet. 39–40. Petitioner argues that “a POSITA would have seen benefits to implementing Bernard’s cradle

functionality internal to the mobile device to avoid the need for a separate cradle device and/or to achieve the benefits of Bernard's multi-network connectivity without requiring the mobile device to be connected to the cradle." *Id.* at 40. Neither Petitioner nor Dr. Cooklev addresses that explanation, and we agree that it would have been obvious and predictable to include, in a device like that of Yegoshin, a single serial interface, as in Bernard, to carry data traversing multiple paths.

We also find unpersuasive Patent Owner's argument that data "transmitted at different times [that] all happen[s] to pass through the same connection, albeit never at the same time, has no relevance to the claimed invention." PO Resp. 34; Ex. 2019 ¶ 100. This misses the mark because nothing in claim 17 requires that the data be transmitted at the same time. The claim simply requires that the "data paths" are combined into a single interface, which is the case where the data paths between, for example, (a) the cellular telephone and an application and (b) the packet radio and an application both pass through the serial interface.

Finally, Patent Owner's argument that the different data paths are separated upon arrival at the mobile device is not persuasive because the claim does not require that the data paths not separate at some point, but only that they pass through a single transmission interface.

Based on the full record before us, Petitioner persuades us, and we determine, that Petitioner's proposed combination would have included

the first wireless transmit and receive unit [that] is configured to communicate over Internet Protocol with a remote system over a first network path and the second wireless transmit and receive unit [that] is configured to communicate with the same or a different remote system using a second network path and wherein the processor on the device is configured to combine the

data paths into a single transmission interface to one or more applications on the device.

- b) *“wherein data transferred by the plurality of transmit and receive units is improved by the simultaneous use of multiple network paths including at least one connection to a networked server”*

Petitioner refers to its arguments for claim 14. Pet. 58 (citing Ex. 1003 ¶ 191); *see also id.* at xv (labeling the limitation “17[j]”). As discussed for claim 14, Patent Owner responds that Petitioner fails to show simultaneous use of multiple network paths. PO Resp. 48–55.

For the reasons discussed for claim 14, Petitioner persuades us that its proposed combination would have had “data transferred by the plurality of transmit and receive units [that] is improved by the simultaneous use of multiple network paths including at least one connection to a networked server.”

- c) *“wherein at least one of the different networks comprises a voice network and wherein at least one of the different networks comprises an Internet protocol data network”*

Petitioner argues that “Yegoshin’s cellular network handles voice calls and is considered as a **voice network**” and “Yegoshin’s WLAN is ‘**IP data network**.’” Pet. 59 (citing Ex. 1003 ¶ 192; Ex. 1004, 1:9–43, 1:51–57, 4:59–5:3); *see also id.* at xv (labeling the limitation “17[k]”).

The cited portions of Yegoshin describe cellular phone 9 capable of communicating on a cellular network and an IP data network. Ex. 1004, 1:9–43, 1:51–57, 4:59–5:3. We credit Petitioner’s testimonial evidence because Yegoshin supports it. Ex. 1003 ¶ 192; Ex. 1004, 1:9–43, 1:51–57, 4:59–5:3. Patent Owner does not provide a responsive argument regarding the above-quoted wherein clause. *See generally* PO Resp.

Based on the full record before us, Petitioner persuades us, and we determine, in that Petitioner’s proposed combination, “at least one of the different networks comprises a voice network and wherein at least one of the different networks comprises an Internet protocol data network.”

d) Petitioner Shows by a Preponderance of the Evidence that Claim 17 is Unpatentable

Weighing the underlying factual determinations, a preponderance of the evidence persuades us that claim 17 of the ’946 patent is unpatentable over Yegoshin, Johnston, Billström, and Bernard. *Arctic Cat*, 876 F.3d at 1361.

5. Dependent Claims 18–21

Claim 18 depends from claim 17 and recites “wherein each of the plurality of communication paths employs a different network including at least one wireless network.” Ex. 1001, 14:30–32. Petitioner argues that, in the combination, “the ***first and second network paths (communication paths)*** employ different ***wireless*** networks—cellular and WLAN.” Pet. 59 (citing Ex. 1003 ¶ 193).

Claim 19 depends from claim 18 and recites “wherein the device is enabled for audio or video communication on a[n] Internet protocol data network.” Ex. 1001, 14:33–35. Petitioner argues that “Yegoshin’s phone handles voice calls and is enabled for ***audio communication*** on the ‘***IP data network.***” Pet. 59 (citing Ex. 1003 ¶ 194; Ex. 1004, 1:9–43, 1:51–57, 4:59–5:3). Petitioner also argues that Yegoshin describes different types of data packets and that it would have been obvious that video would be transmitted over the IP data network and cellular network as confirmed by Billström. *Id.* (citing Ex. 1003 ¶ 195; Ex. 1004, 1:51–57, 2:1–14, 4:59–5:3).

Claim 20 depends from claim 19 and recites “wherein each of the plurality of communication paths employs a different communication protocol and wherein each of the plurality of communication paths involves wireless signals transmitted at a different frequency.” Ex. 1001, 14:36–40. Petitioner argues that “the ***first and second network paths (communication paths)*** employ cellular and WLAN networks, which are considered as, or utilize, different communication protocols,” and that “it was known that the typical cellular and WLAN frequencies are different from each other.” Pet. 60 (citing Ex. 1003 ¶¶ 196–197; Ex. 1004, 5:23–54; Ex. 1017, 2:1–4; Ex. 1018, 1:18–25; Ex. 1027, 7:19–24).

Claim 21 depends from claim 20 and recites “wherein one of the plurality of communication paths is used for wireless signals representing voice data, and another of the plurality of communication paths is used for wireless signals representing non-voice data.” Ex. 1001, 14:41–45. Petitioner refers to arguments made for claims 1 and 14. Pet. 60 (citing Ex. 1003 ¶¶ 198–201).

Petitioner persuades us, and we find, that its citations to Yegoshin show that Yegoshin teaches or suggests or the proposed combination would have had the limitations of claims 18–21. Ex. 1004, 1:9–43, 1:51–57, 2:1–14, 4:59–5:3, 5:23–54. We also credit Petitioner’s testimonial evidence regarding these claims because the record supports it. Ex. 1003 ¶¶ 193–201. Patent Owner does not provide a responsive argument specifically for dependent claims 18–21. *See generally* PO Resp.

Weighing the underlying factual determinations, a preponderance of the evidence persuades us that claims 18–21 of the ’946 patent are unpatentable over Yegoshin, Johnston, Billström, and Bernard. *Arctic Cat*, 876 F.3d at 1361.

G. Asserted Obviousness Based on Yegoshin, Johnston, Billström, Bernard, and WO748

Claim 12 recites that the device of claim 1 is “further in communication with a network box, which is configured with a plurality of antennas and a wireless transmit and receive unit, wherein the network switch box wireless transmit and receive unit is configured to communicate a signal stream using the network switch box plurality of antennas simultaneously.” Ex. 1001, 13:8–13.

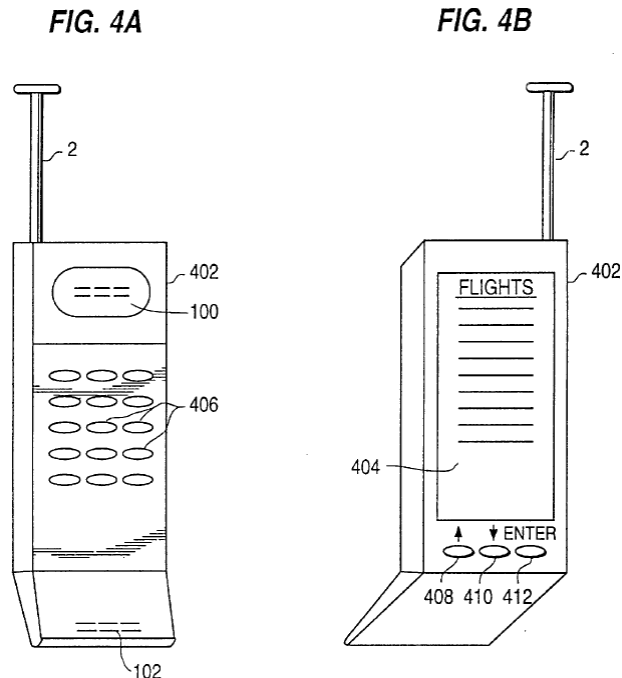
Petitioner argues with citations to the record that its proposed combination of Yegoshin, Johnston, Billström, Bernard, and WO748 would have rendered obvious claim 12. Pet. 61–66. Petitioner also argues with citations to the record that one of ordinary skill in the art would have combined Yegoshin’s phone as modified by Johnston, Billström, and Bernard to communicate in WO748’s microcell. *Id.* at 63–66.

For the reasons above, based on the full record, Petitioner does not show that its proposed combination would have “multiplexed signals” and, thus, does not show by a preponderance of the evidence that Yegoshin, Johnston, Billström, Bernard, and WO748 would have rendered obvious dependent claim 12.

H. Asserted Obviousness Based on Yegoshin, Johnston, Billström, Bernard, and Sinton

1. Sinton (Ex. 1009)

Sinton relates to wireless communication devices and systems for different radio frequencies, transmission protocols, and radio infrastructures. Ex. 1009, 1:8–12. Figures 4A and 4B of Sinton are reproduced below.



Figures 4A and 4B are front and back views of a data transmission and display radiotelephone. Ex. 1009, 4:8–12. Communication device 402 could be a cellular phone that employs circuit 1. *Id.* at 12:65–13:3. “Since the device is programmable through the use of microprocessor 110 and memory 112 (FIG. 1B), it is capable of switching between voice and data modes of operation,” which “allows the user to conduct a voice conversation and then to receive data for display on the integrated display device.” *Id.* at 13:22–27. “Alternatively, the omni-modal circuit could access another communication service to receive data for display, or it might receive data over a subchannel during the conversation,” which “would be particularly advantageous if the user desired to continue a voice call while continuing to receive data information.” *Id.* at 13:27–32.

Sainton’s circuit 1 “provides a multi-modal or omni-modal communications capability” and can “transfer information over at least two different radio communications networks, and preferably all networks available in a particular area within the frequency range of the transceiver of

circuit 1.” Ex. 1009, 5:5–13. Circuit 1 “may be implemented on a single VLSI chip or on a set of VLSI chips making up a chipset” and “can be advantageously implemented on a removable card with a standardized interface connector or connectors, so that it can then be selectively inserted into and removed from a variety of devices.” *Id.* at 4:57–59, 4:66–5:3. Circuit 1 is also designed to be “a standard building block for radio voice and/or data communications devices” and “provides microprocessor 110 and memory 112 that allow manufacturers to customize the operation of the circuit with little or no additional components.” *Id.* at 10:29–31, 10:34–38.

Sainton provides example radio communications networks that circuit 1 can use, such as personal cellular systems, FM, cordless landline telephones, wireless LAN systems, public switched telephone network (“PSTN”), and others. Ex. 1009, 5:14–29.

2. Dependent Claim 13

Claim 13 recites that the device of claim 1 further comprises “a processor for voice communication and a second processor for data communication.” Ex. 1001, 13:14–16. Petitioner argues that Yegoshin, Johnston, Billström, Bernard, and Sainton teach all the limitations of claim 13 and that one of ordinary skill in the art would have combined the references to include Sainton’s multiple processors. Pet. 67–72.

For the reasons stated above for claim 1, Petitioner does not show that its proposed combination would have “multiplexed signals,” and, thus, Petitioner does not show by a preponderance of the evidence that claim 13 is unpatentable.

3. Dependent Claim 26

Claim 26 depends from independent claim 17 and recites “wherein the one or more processors are programmed to process voice data represented by

wireless signals received via one of the plurality of communication paths, and to process non-voice data represented by wireless signals received via another of the plurality of communication paths.” Ex. 1001, 15:4–9.

Petitioner argues that Sainton teaches multiple processors and one of ordinary skill in the art would have combined Yegoshin, Johnston, Billström, Bernard, and Sainton with a reasonable expectation of success. Pet. 68–73 (citing Ex. 1003 ¶¶ 216–223; Ex. 1004, 2:1–15, 5:55–57; Ex. 1009, 4:55–5:29, 6:45–55, 8:18–10:15, 10:29–42, 13:9–33). Petitioner also argues that one of the cellular and WLAN paths would have been used for “voice-data” while the other is used for “data-data,” and so the processors would have processed the two data types separately. *Id.* at 73 (citing Ex. 1003 ¶¶ 224, 225; Ex. 1004, 2:1–15; Ex. 1006, 1:54–58).

Petitioner shows by a preponderance of the evidence that the proposed combination of Yegoshin, Johnston, Billström, Bernard, and Sainton would have included the additional limitations of dependent claim 26.

Weighing the underlying factual determinations, a preponderance of the evidence persuades us that claim 26 of the ’946 patent is unpatentable over Yegoshin, Johnston, and Billström. *Arctic Cat*, 876 F.3d at 1361.

I. Asserted Obviousness Based on Yegoshin, Johnston, Billström, Bernard, and Preiss

1. Preiss (Ex. 1010)

Preiss relates specifically to “a polarization diverse antenna assembly for use with small communication devices.” Ex. 1010, 1:5–56. Preiss describes and shows a portable laptop computer with antenna assembly 11 in wireless communication with a local area network. *Id.* at 2:50–65, Figs. 1, 2. Preiss’s antenna assembly 11 includes polarization diverse antennas

encased in a communications card for implementation in a portable device.
Id. at 1:59–67, 2:50–65, Fig. 2.

2. *Independent Claim 27*

For the preamble of claim 27 and the recited memory and processors, Petitioner refers to arguments made for claims 1 and 14. Pet. 74 (citing Ex. 1003 ¶¶ 227–229). Petitioner also argues with reference to its contentions for claim 14 that Yegoshin teaches the recited communication units. *Id.* at 74–75 (citing Ex. 1003 ¶¶ 230–232; Ex. 1004, 3:17–4:42, 4:59–7:25, 7:48–58, 9:19–29; Ex. 1017, 2:1–4; Ex. 1018, 1:18–25; Ex. 1027, 7:19–24).

For the reasons discussed above for claim 14, Petitioner persuades us, and we find, that Yegoshin teaches or suggests “[a]n IP-enabled communication device” that includes the recited “memory,” “one or more processors,” and “a plurality of wireless communication units.” Ex. 1003 ¶¶ 227–232; Ex. 1004, 3:17–4:42, 4:59–7:25, 7:48–58, 9:19–29.

- a) *“wherein a first wireless communication unit is coupled to a first set of antennas configured to transmit and receive on a first network and wherein a second wireless communication unit is coupled to a second set of antennas and configured to transmit and receive on a second network”*

Petitioner argues that Yegoshin teaches the communication units and that Yegoshin modified by Johnston would have a first communication unit connected to a first set of antennas. Pet. 75 (citing Ex. 1003 ¶¶ 233, 234; Ex. 1005, 6:5–15, 11:9–23, 12:6–46; Ex. 1048, 56, Fig. 4.8); *see also id.* at xvii (labeling the limitation “27[d]”). Petitioner proposes further modifying in view of Preiss for the second set of antennas. *Id.* at 75–76 (citing Ex. 1003 ¶ 235; Ex. 1010, 1:5–56, 2:50–65, 4:49–56). Petitioner provides a reason to combine the asserted references and argues that one of ordinary

skill in the would have had a reasonable expectation of success in making the proposed combination. *Id.* at 76–78 (citing Ex. 1003 ¶¶ 236–239; Ex. 1004, 2:14–41; Ex. 1010, 1:22–37, 1:52–56, 4:49–56).

As discussed above for claim 14, Petitioner persuades us, and we find, that Yegoshin’s communication interfaces teach or suggest the recited first and second wireless communication units. Ex. 1003 ¶ 233. Also, Petitioner persuades that Yegoshin’s cellular network interface would have been modified to communicate using multiple antennas as taught by Johnston. *Id.*; Ex. 1005, 6:5–15, 11:9–23, 12:6–46.

We credit Petitioner’s testimonial evidence that one of ordinary skill in the art would have been motivated to further modify Yegoshin in view of Preiss so that Yegoshin’s second communication interface is coupled to a second set of antennas with a reasonable expectation of success. Ex. 1003 ¶¶ 235–239; Ex. 1004, 2:14–41; Ex. 1010, 1:22–37, 1:52–56, 4:49–56. Patent Owner does not provide a responsive argument regarding the above-quoted wherein clause. *See generally* PO Resp.

Based on the full record before us, Petitioner persuades us, and we determine, that, in the proposed combination, “a first wireless communication unit is coupled to a first set of antennas configured to transmit and receive on a first network,” and “a second wireless communication unit is coupled to a second set of antennas and configured to transmit and receive on a second network.”

b) “*wherein the at least one wireless communication unit is configured for radio frequency communication*”

Petitioner argues that Yegoshin teaches using cellular and WLAN which are known RF communication. Pet. 78 (citing Ex. 1003 ¶ 240; Ex. 1004, 2:36–37); *see also id.* at xvii (labeling the limitation “27[e]”).

The cited portion of Yegoshin describes that RF is used in a cellular system. Ex. 1004, 2:36–37. We credit Petitioner’s testimonial evidence because Yegoshin supports it. Ex. 1003 ¶ 240; Ex. 1004, 2:36–37. Patent Owner does not provide a responsive argument regarding the above-quoted limitation. *See generally* PO Resp.

Based on the full record before us, Petitioner persuades us, and we find, that Yegoshin teaches or suggests “at least one wireless communication unit [that] is configured for radio frequency communication.”

- c) *“wherein the first wireless communication unit is configured to operate at a lower frequency than the second wireless communication unit such that the first and second wireless communication units operate as complementary systems and reduce interference with each other”*

Petitioner argues that the limitation would have been understood or obvious from Yegoshin’s description. Pet. 78–79 (citing Ex. 1003 ¶¶ 241–245; Ex. 1001, 1:21–40; Ex. 1004, 2:42–3:15, 5:40–54, 6:12–14, 8:15–9:12; Ex. 1017, 2:1–4; Ex. 1018, 1:18–25; Ex. 1026, 8:34–9:10; Ex. 1027, 7:19–24); *see also id.* at xvii (labeling the limitation “27[f]”).

We credit Petitioner’s testimonial evidence regarding the above-quoted wherein clause because the cited portions of the record support it. Ex. 1003 ¶¶ 241–245; Ex. 1004, 2:42–3:15, 5:40–54, 6:12–14, 8:15–9:12; Ex. 1017, 2:1–4; Ex. 1018, 1:18–25; Ex. 1026, 8:34–9:10; Ex. 1027, 7:19–24. Patent Owner does not provide a responsive argument for this wherein clause. *See generally* PO Resp.

Based on the full record before us, Petitioner persuades us, and we determine, that Yegoshin’s communication interfaces would have been understood to include a “first wireless communication unit [that] is configured to operate at a lower frequency than the second wireless

communication unit such that the first and second wireless communication units operate as complementary systems and reduce interference with each other.”

d) *“wherein the device is configured for voice and/or data connectivity and Internet connectivity,”*

Petitioner argues that Yegoshin teaches the limitation. Pet. 80 (citing Ex. 1003 ¶¶ 246–248; Ex. 1004, 1:30–43, 2:1–15; Ex. 1006, 1:54–58); *see also id.* at xviii (labeling the limitation “27[g]”).

The cited portions of Yegoshin describe “data-data,” “voice-data,” and “well-known Internet,” and the cited portion of Billström describes “combined voice/data services.” Ex. 1004, 1:30–43, 2:1–15; Ex. 1006, 1:54–58. We credit Petitioner’s testimonial evidence regarding the above-quoted wherein clause because the cited portions of the record support it. Ex. 1003 ¶¶ 246–248; Ex. 1004, 1:30–43, 2:1–15; Ex. 1006, 1:54–58. Patent Owner does not provide a responsive argument for this wherein clause. *See generally* PO Resp.

Based on the full record before us, Petitioner persuades us, and we determine, that proposed combination would have included a “device [that] is configured for voice and/or data connectivity and Internet connectivity.”

e) *“wherein the first wireless transmit and receive unit operates on the first network path to a remote server and the second wireless transmit and receive unit communicates to the remote server on the second network path in response to a change in the signal strength and/or connectivity of the first wireless communication unit or second wireless communication unit”*

Petitioner argues that Yegoshin teaches that its first and second communication interfaces communicate with a PSTN switch on cellular and WLAN networks and that the PSTN switch teaches the recited “remote server.” Pet. 80–81 (citing Ex. 1003 ¶ 249; Ex. 1004, 3:35–4:42, 5:33–54,

5:66–7:25, 7:48–58, 8:47–56); *see also id.* at xviii (labeling the limitation “27[h]”). Petitioner also argues that Yegoshin’s first and second communication interfaces are selectively used and that one of ordinary skill in the art would have found it obvious that “Yegoshin’s phone switches between cellular and WLAN connections as the phone moves between a cellular-only area and a WLAN area.” *Id.* at 81 (citing Ex. 1003 ¶ 250; Ex. 1004, 2:42–3:15, 3:4–15, 5:40–54, 6:12–14, 8:15–9:12).

Petitioner further argues that Bernard teaches determining signal strength. Pet. 81 (citing Ex. 1003 ¶ 251; Ex. 1007, 21:55–22:4, 22:30–42, 22:56–23:4, 23:18–45). In Petitioner’s view, its proposed combination would monitor the signal strength of network connections and communicate on a cellular or WLAN path in response to a change in signal strength or connectivity of those paths. *Id.* at 81–82 (citing Ex. 1003 ¶ 252; Ex. 1009, Abstr., 2:35–52, 5:66–6:13, 16:28–54).

(1) Patent Owner’s Response

Patent Owner responds that “Yegoshin’s PSTN switch is not a server, and Petitioner makes no attempt to show that it is.” PO Resp. 55–56 (citing Pet. 58, 80–81). According to Patent Owner, Yegoshin does not describe the Connection Oriented/Switched Telephony (COST) telephone switch 31 or PSTN switch 31 as a server and “is merely a typical PSTN switch.” *Id.* at 56 (citing Ex. 1004, 6:39–40, 7:19–25, 7:29–30, Fig. 3; Ex. 2019 ¶ 152). Patent Owner quotes its testimonial evidence that opines that switch 31 is connected to a routing server and is not a server and contends that Petitioner’s declarant “agrees that PSTN switch 31 is just an old-style circuit switch.” *Id.* at 56–59 (citing Ex. 2019 ¶¶ 153, 155; Ex. 2020, 41:13–42:21).

Patent Owner argues that the ’946 patent does not suggest switch 31 would be a server and would not be a server under the claim construction

asserted in related litigation. PO Resp. 59 (citing Ex. 1001, 4:49–51, 7:9–10; Ex. 2019 ¶ 158; Ex. 2026 ¶ 24; Ex. 2027, 815). Patent Owner also argues that “Johnston’s diversity antennas do **not** disclose multiple **network** paths” and would not have been combined with Yegoshin. *Id.* at 59–60 (citing Ex. 1005, 11:9–14, Figs. 29A–29B; Ex. 2019 ¶¶ 161–162, 164; Ex. 2020, 25:10–15, 29:19–30:10).

Patent Owner also responds that “Yegoshin does not teach selecting a network path in response to a change in signal strength or connectivity, or anything else other than a user input or setting.” PO Resp. 61–63 (citing Pet. 81). Patent Owner also argues that “Yegoshin was not directed to a means for improving signal quality, but rather to means for reducing the cost of cell phone calls.” *Id.* (citing Ex. 1004, 2:55–3:10, 5:15–25, 5:33–43, 5:49–54; Ex. 2019 ¶¶ 168–169).

Patent Owner further argues that Petitioner’s assertion that it would have been obvious to switch when moving from a cellular-only area to a WLAN area is not supported by Petitioner’s declarant and the proposed combination with Bernard is not supported by Bernard’s disclosure. PO Resp. 63–64 (citing Pet. 81).

(2) Petitioner’s Reply

Petitioner replies that, in the Petition, it argued Yegoshin’s phone was connected to several remote systems, including “networked servers,” “PSTN-connected routing server,” and “IP telephony server.” Pet. Reply 10–11 (citing Pet. 23, 56–57; PO Resp. 55–59). Petitioner argues that PSTN switch 31 is connected to a routing server. *Id.* at 11–12 (citing Pet. 23; Ex. 1004, 3:35–4:34, 7:26–37, 9:1–12, Fig. 2; Ex. 1051 ¶ 28). Petitioner also argues that Patent Owner’s interpretation is inconsistent with Figure 2 of Yegoshin and that one of ordinary skill in the art would have understood

that “PSTN switch 31 does not operate alone, but works with other components to enable switching in PSTN network 25 and thus constitutes at least a part of a server system.” *Id.* at 12 (citing Ex. 1004, 7:26–8:34; Ex. 1051 ¶ 29).

Petitioner also replies that its proposed combination relies on Johnston for the first set of antennas and Preiss for the second set of antennas. Pet. Reply 12 (citing Pet. 75–78; PO Resp. 59–61; Ex. 1051 ¶ 30; Ex. 1053, 119:11–18; Ex. 1054, 9:13–20).

Petitioner further replies that “Yegoshin describes several examples where the phone selectively uses one of WLAN and cellular networks,” such as when moving into an IP LAN-connected site and when choosing the “best possible connection.” Pet. Reply 13 (citing Pet. 81; Ex. 1004, 2:53–3:16, 5:33–51, 5:53–54; Ex. 1027, 3:43–51; Ex. 1051 ¶ 31). Petitioner contends that “user selection changes the device’s capability of connecting to a network, and thus relates to “connectivity” of the phone’s interfaces.” *Id.* at 13–14 (citing Ex. 1051 ¶ 32). Petitioner also contends that Bernard’s PDA operates based on “determining the current signal strength” and, thus, suggests using signal strength to choose the best connection. *Id.* at 14 (citing Pet. 81; Ex. 1051 ¶¶ 33–34).

(3) Patent Owner’s Sur-Reply

Patent Owner replies that Petitioner only mapped to switch 31. PO Sur-reply 7 (citing Pet. 58, 80–81; Pet. Reply 11). Patent Owner also argues that, while PSTN-connected routing server and IP telephony server were in the mapping for claim 14, claim 14 does not require first and second network paths connected to the same remote server. *Id.* at 8. Patent Owner, thus, argues that “Petitioner’s mapping of various ‘servers’ onto claim 14 did not put Patent Owner on notice that it should have looked to the different

mappings of different claims to supplement the clearly-described mapping of claim 27.” *Id.*

In Patent Owner’s view, Petitioner clearly mapped claim 27’s “remote server” to switch 31. PO Sur-reply 8. Patent Owner also argues that Petitioner does not dispute that switch 31 is not a server. *Id.* at 8–9 (citing PO Resp. 56–59; Ex. 1051 ¶ 29; Ex. 2019 ¶¶ 152–158). Patent Owner further argues that the claim recites a “remote server,” not a “server system.” *Id.* at 9. Patent Owner also replies that Preiss is not relevant to its argument and the combination with Johnston fails. PO Sur-reply 9–10 (citing PO Resp. 51–52, 60–61; Pet. Reply 12; Ex. 1051 ¶ 30; Ex. 2019 ¶¶ 132–133, 161–164).

Patent Owner further replies that Petitioner does not identify communicating on a network path in response to changes in signal strength or connectivity. PO Sur-reply 10 (citing Pet. Reply 13). Patent Owner argues that Petitioner’s examples show call forwarding to avoid roaming charges or initially connecting to a LAN. *Id.* at 10 (citing Ex. 1004, 2:53–3:16, 5:33–54; Ex. 2019 ¶ 169). Patent Owner also argues that Yegoshin does not support Petitioner’s declarant. *Id.* (citing Ex. 1051 ¶ 31).

Patent Owner further argues that the claim requires the device, not the user, to change in response to signal strength or connectivity. PO Sur-reply 10–11 (citing Ex. 2019 ¶¶ 169–173). Patent Owner additionally argues that Bernard does not explain why it determines signal strength and does not suggest changing in response to signal strength or connectivity. *Id.* at 11 (citing PO Resp. 64; Pet. Reply 14).

(4) Petitioner Shows the Limitation

In the Petition for claim 27, Petitioner argues that “[a]s described in 17[i], Yegoshin’s first and second communication interfaces (*first and*

second wireless transmit and receive units) in the phone communicate with the PSTN switch (*remote server*) on cellular and WLAN networks (*first and second network paths*).” Pet. 80–81 (citing Ex. 1003 ¶ 249; Ex. 1004, 3:35–4:42, 5:33–54, 5:66–7:25, 7:48–58, 8:47–56). For claim 17, Petitioner argues with reference to its contentions for claims 5, 14, and 15, that “[a]s illustrated in Figure 2, Yegoshin’s phone is in communication with several remote systems.” *Id.* at 56 (citing Ex. 1004, 5:66–7:25; Ex. 1003 ¶ 188). For claim 14, Petitioner argues that “Yegoshin’s phone is in communication with *networked servers* such as ‘PSTN-connected routing server’ and ‘IP telephony server.’” *Id.* at 23 (citing Ex. 1003 ¶ 94; Ex. 1004, 3:35–4:34, 5:66–6:4, 6:38–64, 7:15–37, Fig. 2).

Petitioner’s arguments for claim 27 explicitly refer to contentions for claim 17 that, in turn, refer to contentions for claims 5, 14, and 15. Pet. 56, 80–81. Moreover, as discussed below, even if switch 31 were itself not a server, Yegoshin describes a system with a telephony server and routing server, and that description was cited by Petitioner in its arguments for claims 14 and 27. Pet. 23, 80–81; Ex. 1003 ¶¶ 94, 188, 249. When the arguments in the Petition and cited evidence are considered in their entirety, Patent Owner had adequate notice and should have addressed not just the words of Petitioner’s arguments but also Petitioner’s citations to Yegoshin. PO Sur-reply 8.

A cited portion of Yegoshin describes that its “system for a telephone communication” includes “a dual-mode communication device,” “an IP-LAN including an IP telephony server,” and “a publicly-switched telephone network (PSTN) having a trunk connection to the IP telephony server; and a PSTN-connected routing server.” Ex. 1004, 3:35–43. “[T]he routing server

then routes calls for the cell phone number to the IP telephony server.” *Id.* at 3:48–49.

Another cited portion of Yegoshin, in reference to Figure 2, describes that “local cellular network 23, a local switch 31 in a PSTN network 25, and a private IP network 27 are shown including connection between the networks and phone 9” and “[t]elephony switch 31 in this embodiment is connected via trunk 37 to an IP switch 35 illustrated within IP network 27.” Ex. 1004, 6:1–3, 6:52–53.

We agree with Petitioner’s declarant that one of ordinary skill in the art “would have understood that the PSTN switch 31 does not operate alone in the PSTN network 25 but works with other components to enable switching in the PSTN network 25 and thus constitutes at least a part of a server system in the PSTN network (e.g., ‘PSTN-connected routing server’).” Ex. 1051 ¶ 29; Ex. 1004, 7:26–8:34.

The cited portions of Yegoshin describe that “[i]t would be desirable then, to have a cell phone or equivalent device adaptable to a wireless or wired IP network at the location or site that a person may be visiting, and have incoming calls forwarded to the connected to the device,” that a “program may be given a series of preferences by the user, and then may negotiate the best possible connection accordingly,” that there are limits to the extent of cellular service, and that, if the phone is not in range, then a call would be forwarded to an IP address associated with the cell phone number. Ex. 1004, 2:42–3:15, 5:40–54, 6:12–14, 8:15–9:12.

Based on these descriptions, we agree with Petitioner’s declarant that one of ordinary skill in the art would have found it obvious that “Yegoshin’s phone switches between cellular and WLAN connections as the phone moves between a cellular-only area and a WLAN area, or when the phone

moves from an area where only cellular service is available into an area where the more inexpensive WLAN coverage is available.” Ex. 1003 ¶ 250. For example, because the “program may be given a series of preferences by the user,” that may be in order of least to most expensive, the availability of cellular or WLAN would affect the “series of preferences” by limiting the series of preferences to what is available. Ex. 1003 ¶ 250; Ex. 1004, 5:49–51. Yegoshin’s phone, thus, would include a “second wireless transmit and receive unit [that] communicates to the remote server on the second network path in response to a change in the . . . connectivity of the first wireless communication unit or second wireless communication unit.”

The cited portions of Bernard describe telephone server 730 providing functions that include “determining signal strength” to applications 702, 704, 706, packet data server 738 providing functions that include “determining signal strength,” cellular telephone interface 720 providing functions that include “determining the current signal strength,” and land phone interface providing functions that include “determining the current signal strength.” Ex. 1007, 21:59–64, 22:31–38, 22:60–65, 23:20–25. Bernard teaches that cellular telephone and land phone interfaces monitor current signal strength. *Id.* at 22:60–65, 23:20–25.

Based on these descriptions, we agree with Petitioner’s declarant that one of ordinary skill in the art

would have found it obvious that the phone in the combination monitors the signal strength of the network connections (as taught by Bernard), and the first/cellular and second/WLAN communication interfaces communicate to the remote server on either the first/cellular or second/WLAN path in response to a change in the signal strength and/or connectivity of the cellular and WLAN paths using the respective communication interfaces.

Ex. 1003 ¶ 252. The opinion cites additional record evidence that it was known to select wireless data services based on signal strength and availability. Ex. 1009, Abstract, 2:35–52, 5:66–6:13, 16:28–54.

Based on the full record before us, Petitioner persuades us, and we determine, that, in the proposed combination,

first wireless transmit and receive unit operates on the first network path to a remote server and the second wireless transmit and receive unit communicates to the remote server on the second network path in response to a change in the signal strength and/or connectivity of the first wireless communication unit or second wireless communication unit.

f) “wherein video or audio can be accessed simultaneously with performance optimized for each through dedicated or multiplexed paths,”

Petitioner argues that Yegoshin’s cellular and WLAN interfaces can simultaneously transmit and receive data packets over both cellular and WLAN paths. Pet. 82 (citing Ex. 1003 ¶ 253); *see also id.* at xviii (labeling the limitation “27[i]”). Petitioner refers to its arguments for claim 1’s “wherein data transferred by the plurality of transmit and receive units is improved by the simultaneous use of multiple communication paths,” which, in turn, refer to a similar limitation recited by claim 14. *Id.* at 23–25, 46, 82.

According to Petitioner, the cellular and WLAN paths would have been understood to be dedicated paths. Pet. 82 (citing Ex. 1003 ¶ 253). Petitioner further argues that audio and video would have been obviously optimized. *Id.* (citing Ex. 1003 ¶ 254; Ex. 1004, 2:1–145; Ex. 1007, 16:25–31, 18:8–51, 21:39–54, 26:66–29:65).

We agree with Petitioner’s testimonial evidence that Yegoshin describes “data-data” and “voice-data,” that video is an example of “data-data,” and that “streaming of video and audio is optimized according to the

respective transmission requirements or data attributes.” Ex. 1003 ¶ 254; Ex. 1004, 2:1–15; Ex. 1007, 16:25–31, 18:8–51, 21:39–54, 26:66–29:65. We also agree that one of ordinary skill in the art would have understood that “each of the cellular and WLAN paths is a path dedicated for the data being transmitted.” *Id.* ¶ 253. Patent Owner does not provide a responsive argument for the above-quoted wherein clause. *See generally* PO Resp.

Based on the full record before us, Petitioner persuades us, and we determine, that, in the proposed combination, “video or audio can be accessed simultaneously with performance optimized for each through dedicated . . . paths.”

g) Petitioner Shows by a Preponderance of the Evidence that Claim 27 is Unpatentable

Weighing the underlying factual determinations, a preponderance of the evidence persuades us that claim 27 of the ’946 patent is unpatentable over Yegoshin, Johnston, Billström, Bernard, and Preiss. *Arctic Cat*, 876 F.3d at 1361.

3. Dependent Claims 28–30

Claim 28 depends from claim 27 and recites

further in communication with the remote server, wherein the mobile device is configured to receive multiple IP data packets on a plurality of ports at substantially the same time and send multiple data packets to the server, to allow multiple simultaneous communication paths over connections between the device and the server.

Ex. 1001, 16:11–16.

Petitioner refers to arguments for claims 15 and 27. Pet. 82 (citing Ex. 1003 ¶¶ 255–256). Patent Owner does not provide a responsive argument specifically for dependent claim 28. *See generally* PO Resp.

For the reasons discussed above for claim 15 and 27, Petitioner persuades us, and we determine, that Petitioner's proposed combination would have had the additional limitations of claim 28.

Claim 29 depends from claim 27 and recites

further in communication with the remote server, wherein the mobile device is configured to receive multiple IP data packets on a plurality of ports at substantially the same time and send multiple data packets to the server, to allow multiple simultaneous communication paths over connections between the device and the server.

Ex. 1001, 16:17–23.

Petitioner refers to arguments for claim 28. Pet. 83 (citing Ex. 1003 ¶ 257). Patent Owner does not provide a responsive argument specifically for dependent claim 29. *See generally* PO Resp.

For the reasons discussed above for claim 28, Petitioner persuades us, and we determine, that Petitioner's proposed combination would have had the additional limitations of claim 28.

Claim 30 depends from claim 29 and recites

wherein the IP enabled communication device is a mobile device, and wherein the mobile device is configured as a server and wherein the mobile device is configured to transmit and receive a signal stream with a second mobile device.

Ex. 1001, 16:24–28

Petitioner refers to arguments for the preamble of claim 14. Pet. 83 (citing Ex. 1003 ¶ 258). Petitioner also argues for claim 30 that it would have been obvious to configure Yegoshin's phone to operate as a server and communicate with a second mobile device. *Id.* at 83–84 (citing Ex. 1003 ¶¶ 259–261; Ex. 1007, 1:31–35, 4:36–40, 18:8–25; Ex. 1017, 3:1–3, 3:26–

43; Ex. 1018, 1:34–40). Patent Owner does not provide a responsive argument specifically for dependent claim 28. *See generally* PO Resp.

For the reasons discussed above for the preamble of claim 14, Petitioner persuades us, and we find, that Yegoshin’s phone is a mobile device. We credit Petitioner’s testimonial evidence regarding claim 30 because the cited portions of the record support it. Ex. 1003 ¶¶ 258–261; Ex. 1007, 1:31–35, 4:36–40, 18:8–25; Ex. 1017, 3:1–3, 3:26–43; Ex. 1018, 1:34–40.

Weighing the underlying factual determinations, a preponderance of the evidence persuades us that claims 28–30 of the ’946 patent are unpatentable over Yegoshin, Johnston, Billström, Bernard, and Preiss. *Arctic Cat*, 876 F.3d at 1361.

III. CONCLUSION²

In summary:

Claims	35 U.S.C. §	References/Basis	Claims Shown Unpatentable	Claims Not Shown Unpatentable
14, 15	103(a)	Yegoshin, Johnston, Billström	14, 15	
1–11, 16–21	103(a)	Yegoshin, Johnston, Billström, Bernard	17–21	1–11, 16
12	103(a)	Yegoshin, Johnston, Billström, Bernard, WO748		12
13, 26	103(a)	Yegoshin, Johnston, Billström, Bernard, Sainton		13, 26
27–30	103(a)	Yegoshin, Johnston, Billström, Bernard, Preiss	27–30	
Overall Outcome			14, 15, 17–21, 27–30	1–13, 16, 26

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

IV. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that claims 14, 15, 17–21, and 27–30 of U.S. Patent No. 9,019,946 B1 have been shown, by a preponderance of the evidence, to be unpatentable;

FURTHER ORDERED that claims 1–13, 16, and 26 of U.S. Patent No. 9,019,946 B1 have not been shown, by a preponderance of the evidence, to be unpatentable;

FURTHER ORDERED that Petitioner’s Motion to Submit Supplemental Information is granted; and

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

IPR2022-01249
Patent 9,019,946 B1

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