

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

COMCAST CABLE COMMUNICATIONS, LLC,
Petitioner,

v.

ENTROPIC COMMUNICATIONS, LLC.,
Patent Owner.

IPR2024-00435
11,381,866 B2

Before LYNNE H. BROWNE, MICHELLE N. WORMMEESTER, and
FREDERICK C. LANEY, *Administrative Patent Judges*.

BROWNE, *Administrative Patent Judge*.

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

I. INTRODUCTION

A. Background

Comcast Cable Communications, LLC (“Petitioner”) filed a Petition (Paper 2, “Pet.”), seeking *inter partes* review of claims 1–82 (the “challenged claims”) of U.S. Patent No. 11,381,866 B2 (Ex. 1001, “the ’866 patent”). See Pet. 1. Entropic Communications, LLC (“Patent Owner”) filed a Preliminary Response (Paper 10, “Prelim. Resp.”). The ’866 patent is also the subject of two other petitions for *inter partes* review (IPR2024-00436 and IPR2024-00437) challenging the same claims as challenged in the instant petition and filed by Petitioner on the same day. Pet. vii.

Patent Owner’s Preliminary Response does not address the merits of Petitioner’s challenges. Instead, Patent Owner contends that the Board should exercise its discretion to deny all three petitions challenging the ’866 patent. See Prelim. Resp. 4–30. Alternatively, Patent Owner contends that the Board should exercise its discretion to deny two of the three parallel petitions that Petitioner has filed. See *id.* at 4, 30–48.

We have authority to determine whether to institute review under 35 U.S.C. § 314 and 37 C.F.R. § 42.4(a). An *inter partes* review may not be instituted unless it is determined that “the information presented in the petition filed under section 311 and any response filed under section 313 shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.” 35 U.S.C. § 314(a).

For the reasons discussed below, we determine, based on the record before us, that there is a reasonable likelihood Petitioner would prevail in

showing at least one of the challenged claims is unpatentable. Furthermore, we deny Patent Owner's request for us to exercise our discretion to deny institution in this proceeding based on Petitioner's filing of two additional parallel petitions challenging the same claims. We therefore institute *inter partes* review on all claims and all grounds. *See SAS Inst. Inc. v. Iancu*, 584 U.S. 357 (2018).

B. Real Parties in Interest

Petitioner identifies Comcast Corporation, Comcast Cable Communications, LLC, and Comcast Cable Communications Management, LLC, as the real parties-in-interest in this proceeding. Pet. vii. Patent Owner identifies itself as the real party-in-interest. Paper 4, 1.

C. Related Matters

The parties indicate that the '866 patent has been asserted in *Entropic Communications, LLC v. Comcast Corporation*, No. 2:23-cv-01050 (C.D. Cal. filed Feb. 10, 2023), *Entropic Communications, LLC v. Cox Communications, Inc.*, No. 2-23-cv-01049 (C.D. Cal. filed Feb. 10, 2023), and *Entropic Communications, LLC v. Charter Communications, Inc.*, No. 2:22-cv-00052-JRG (E.D. Tex. filed April 27, 2022). Pet vii–viii; Paper 4, 1. Patent Owner adds that U.S. Patent Nos. 8,223,775, 8,284,690, 8,792,008, 9,210,362, 9,825,826, 9,866,438, 10,135,682, 11,399,206, and 11,785,275 are also asserted by Patent Owner in these matters. Paper 4, 3. Patent Owner further indicates that the '866 patent is involved in *Comcast Corporation v. Entropic Communications, LLC*, IPR2024–00436 and *Comcast Corporation v. Entropic Communications, LLC*, IPR2024-00437. Paper 4, 1.

The parties identify as related U.S. Application No. 17/217,244 and U.S. Patent Nos. 8,526,898, 9,100,622, 9,210,363, 9,819,992, 10,313,733, and 10,972,781. Pet. viii; Paper 4, 2–3. Patent Owner further identifies U.S. Application Nos. 90/019,255, 14/521,347, 15/582,793, 16/740,524, 17/975,948, and 18/461,104, and U.S. Patent Nos. 8,892,225, 9,210,362, 9,942,598, 11,399,206, 11,490,152, 11,516,535, and 11,785,275. Paper 4, 2–3.

Petitioner further notes that “[t]he ’866 patent is part of a family that includes thirteen additional patents or applications that purport to claim priority, via a chain of continuation applications, from App. No. 12/762,900,” and indicates that “[a] family tree is included as Ex. 1027.” Pet. viii.

Patent Owner further notes that Petitioner has requested *inter partes* review of the following patents: U.S. Patent No. 7,295,518 (IPR2024-00431); U.S. Patent No. 7,889,759 (IPR2024-00452); U.S. Patent No. 8,223,775 (IPR2024-00446); U.S. Patent No. 8,284,690 (IPR2024-00430); U.S. Patent No. 8,792,008 (IPR2024-00441); U.S. Patent No. 9,210,362 (IPR2024-00432, IPR2024-00433, and IPR2024-00434); U.S. Patent No. 9,825,826 (IPR2024-00442); U.S. Patent No. 10,135,682 (IPR2024-00444 and IPR2024-00445); and U.S. Patent No. 11,399,206 (IPR2024-00438, IPR2024-00439, and IPR2024-00440). Paper 4, 3–4.

D. The ’866 Patent (Ex. 1001)

The ’866 patent, for a cable television device relates to “wideband receiver systems and methods having a wideband receiver that is capable of receiving multiple radio frequency channels located in a broad radio frequency spectrum.” Ex. 1001, code (54), 1:26–29.

The '866 patent states that “[r]eceivers used to down-convert and selectively filter TV channels are referred to as tuners, and tuners designed to concurrently receive several TV channels are referred to as wideband tuners.” Ex. 1001, 1:35–38. The '866 patent notes that “[i]n certain applications such as DVR and picture-in-picture, the receiver system may have to concurrently receive several desired channels that may or may not be contiguous,” and that “[t]he wideband receiver requirement poses a trade-off to the system to limit either the dynamic range of the wideband tuner or reduce the bandwidth covered by the tuner so that fewer channels may be received and processed by the demodulator.” *Id.* at 1:49–56. According to the '866 patent, a wide bandwidth receiver may involve “very expensive digital processing circuitry such as very high-speed analog to digital conversion and high-speed processor in the demodulator.” *Id.* at 2:34–37. The '866 patent states that “[i]t is desirable to have wideband receiver systems that can increase the dynamic range without requiring expensive data conversion, filtering and channel selection at the demodulator.” *Id.* at 2:38–41.

Figure 2, reproduced below, shows “a schematic block diagram of a wideband receiver system 200.” Ex. 1001, 4:35–36.

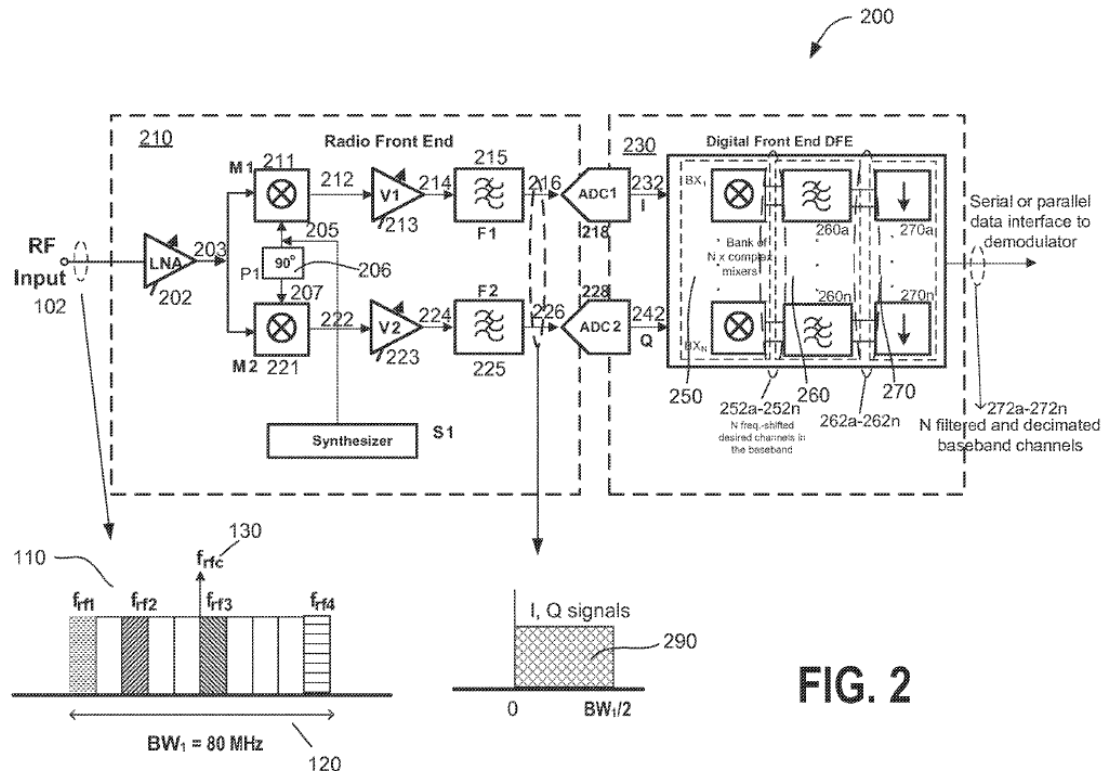


FIG. 2

As shown in Figure 2, “[w]ideband receiver system 200 includes a radio front end 210 and a digital front end 230.” Ex. 1001, 4:37–38. The ’866 patent states that “[r]adio front end 210 may be a single very wide-band tuner receiver that captures the desired swath of channels located in noncontiguous portions of the spectrum having a frequency bandwidth BW1 120.” *Id.* at 4:38–42. The ’866 patent indicates that each of mixers 211 and 221 “multiplies (mixes) an amplified RF signal 203 with a respective first oscillator frequency signal 205 and a second oscillator frequency signal 207 to generate an in-phase signal 212 and a quadrature signal 222 that have a phase shift of 90° degree between them.” *Id.* at 4:61–66. The ’866 patent indicates further that “[i]n-phase signal 212 and quadrature signal 222 are further amplified and filtered by respective amplifiers V1 213, V2 223 and filters F1 215, F2 225 to generate a filtered in-phase signal 216 and a filtered quadrature signal 226.” *Id.* at 5:17–20.

The '866 patent states that “ADC1 218 generates a digital signal I 232 that is a digital representation of the analog filtered signal 216; ADC2 228 generates a digital signal Q 242 that is a digital representation of the analog filtered signal 226.” *Id.* at 5:48–51.

In addition, the '866 patent states that “[d]igital signals I 232 and Q 242 are . . . applied to a bank of N complex mixers 250,” and “[e]ach of the N complex mixers 250 receives the digital signals I 232 and Q 242 from ADCs 218 and 228 to extract a different one of the desired channels and frequency-shifts the extracted signals to the baseband frequency.” Ex. 1001, 5:51–53, 6:3–6. The '866 patent states further that “[e]ach of the frequency shifted desired channels 252 is filtered by an associated filter module (identified as 260a to 260n).” *Id.* at 6:6–8. The '866 patent states that in an embodiment, “each of the filtered signals 260a to 260n may be sent directly to an associated demodulator (identified as 270a to 270n) for extracting the original information transmitted in the associated desired channel,” and that in another embodiment, “each of the filtered signals 262a to 262n is further decimated before providing to a demodulator.” *Id.* at 6:8–14. The '866 patent further states that “baseband channels . . . sent as a serial or parallel digital data stream to a demodulator using a serial or parallel data interface according to commonly known methods.” *Id.* at 7:10–13.

E. Challenged Claims

Petitioner challenges claims 1–82 of the '866 patent. Pet. 1. Of the challenged claims, claims 1, 14, 27, 41, 55, and 69 are independent. Independent claims 1, 14, 27, and 41 are reproduced below with Petitioner's labeling of the limitations for ease of reference.

1. [1A] A cable television (TV) device comprising:
 - [1B] a wideband analog-to-digital converter (ADC) configured to digitize a contiguous band of frequencies in an input signal, wherein the contiguous band of frequencies comprises a plurality of desired channels and a plurality of undesired channels; and
 - [1C] a digital frontend (DFE) coupled to the wideband ADC, wherein the DFE is configured to concurrently select and provide each of the plurality of desired channels, via a serial interface, without providing any of the plurality of undesired channels.

Ex. 1001, 12:15–25.

14. [14A] A cable TV device comprising:
 - [14B] a wideband analog-to-digital converter (ADC) configured to digitize an input signal, wherein the input signal comprises a plurality of desired channels and a plurality of undesired channels; and
 - [14C] a plurality of digital down converters coupled to the wideband ADC, wherein each digital down converter, of the plurality of digital down converters, is operable to generate a digital channel output corresponding to each desired channel, of the plurality of desired channels, and wherein the plurality of digital down converters is operable to provide each digital channel output via a serial interface.

Id. at 13:11–24.

27. [27A] A cable television (TV) device comprising:
 - [27B] a wideband analog-to-digital converter (ADC) configured to digitize a contiguous band of frequencies in an input signal, wherein the contiguous band of frequencies comprises a plurality of desired channels and a plurality of undesired channels; and
 - [27C] a digital frontend (DFE) coupled to the wideband ADC, wherein the DFE is configured to concurrently select and provide each of the plurality of desired channels without providing any of the plurality of undesired channels, and

wherein the cable TV device comprises a digital video recorder (DVR).

Id. at 14:9–21.

41. [41A] A cable TV device comprising:

[41B] a wideband analog-to-digital converter (ADC) configured to digitize an input signal, wherein the input signal comprises a plurality of desired channels and a plurality of undesired channels; and

[41C] a plurality of digital down converters coupled to the wideband ADC, wherein each digital down converter, of the plurality of digital down converters, is operable to generate a digital channel output corresponding to each desired channel, of the plurality of desired channels, and wherein the cable TV device comprises a digital video recorder (DVR).

Id. at 15:12–32.

F. The Alleged Grounds of Unpatentability

Petitioner asserts the following grounds of unpatentability (Pet. 10–12):

Claim(s) Challenged	35 U.S.C. §¹	Reference(s)/Basis
1, 3–7, 9, 11, 13, 14, 16–20, 22, 24, 26, 27, 29–33, 35–37, 40, 41, 43–47, 49–51, 54	102	Zhang ²
1, 3–7, 9, 11, 13, 14, 16–20, 22, 24, 26, 27, 29–33, 35–37, 40, 41, 43–47, 49–51, 54	103(a)	Zhang
9–12, 22–25, 27, 29–33, 35–41, 43–47, 49–55, 57–61, 63–69, 71–75, 77–82	103(a)	Zhang, Reisman ³
2–6, 15–19, 28–32, 42–46	103(a)	Zhang, Jackson ⁴
28–32, 42–46, 56–60, 70–74	103(a)	Zhang, Reisman, Jackson
1, 3–9, 11, 13, 14, 16–22, 24, 26, 34–36, 48–50	103(a)	Zhang, Pandey ⁵
9–12, 22–25, 34–36, 48–50, 62–64, 76–78	103(a)	Zhang, Reisman, Pandey
2–6, 15–19	103(a)	Zhang, Pandey, Jackson

¹ The Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011) (“AIA”), amended 35 U.S.C. §§ 102, 103. Because the challenged claims of the ’866 patent have an effective filing date before the effective date of the applicable AIA amendment, we refer to the pre-AIA version of 35 U.S.C. §§ 102, 103.

² U.S. Patent Publication No. 2003/0056221 A1, published March 20, 2003 (Ex. 1013) (“Zhang”).

³ U.S. Patent Publication No. 2003/0229900 A1, published December 11, 2003 (Ex. 1052) (“Reisman”).

⁴ U.S. Patent Publication No. 2009/0113504 A1, published April 30, 2009 (Ex. 1057) (“Jackson”).

⁵ U.S. Patent No. 7,237,214 B1, issued June 26, 2007 (Ex. 1014) (“Pandey”).

II. ANALYSIS

A. *Parallel Petitions*

As noted in the Background, Section I.A, of this Decision, Petitioner filed three petitions for *inter partes* review of the '866 Patent. IPR2024-00435, IPR2024-00436, IPR2024-00437. Concurrent with the filing of these petitions, Petitioner filed a Petition Ranking and Explanation of Material Differences Between Petitions, ranking its three petitions directed to the '866 patent in accordance with the guidance with respect to parallel petitions in the Board's November 2019 Consolidated Trial Practice Guide. Paper 3; *see* Patent Trial and Appeal Board Consolidated Trial Practice Guide (Nov. 2019, "CTPG"), at 59–60 (available at *Available at* <https://www.uspto.gov/TrialPracticeGuideConsolidated>). In that Paper, Petitioner ranked the instant Petition first. Paper 3, 1.

Patent Owner contends that

Even if the Board were to disregard Comcast's years-long pattern of deliberately abusing the IPR process, it should substantively consider, at most, one of the three petitions challenging the '866 patent. As should be evident from Comcast's filing practices, Comcast is not making a good faith case-by-case determination of which patents are the "rare" patents that might require more than one petition. Rather, Comcast indiscriminately files three or more petitions against patents by default.

Prelim. Resp. 30–31.

We do not agree with Patent Owner that Petitioner's filing of three parallel petitions is grounds to deny all three petitions on that basis alone. *See* Prelim. Resp. 4–30. As discussed above, Petitioner has complied with our guidance. *See* CTPG, 59–60. For reasons discussed in our concurrent Decisions Denying Institution in IPR2024-00436 and IPR2024-00437,

however, we agree with Patent Owner that plural petitions are not warranted and we deny institution in the concurrently filed Decisions for these petitions. Given our Decisions to Deny Institution in IPR2024-00436 and IPR2024-00437, Patent Owner's arguments regarding the need for more than one petition are unavailing with regard to the instant Petition.

B. Legal Standards

A prior art reference can only anticipate a claim if it discloses all the claimed limitations "arranged or combined in the same way as in the claim." *Wm. Wrigley Jr. Co. v. Cadbury Adams USA LLC*, 683 F.3d 1356, 1361 (Fed. Cir. 2012) (quoting *Net MoneyIN, Inc. v. VeriSign, Inc.*, 545 F.3d 1359, 1370 (Fed. Cir. 2008)). "However, a reference can anticipate a claim even if it 'd[oes] not expressly spell out' all the limitations arranged or combined as in the claim, if a person of skill in the art, reading the reference, would 'at once envisage' the claimed arrangement or combination." *Kennametal, Inc. v. Ingersoll Cutting Tool Co.*, 780 F.3d 1376, 1381 (Fed. Cir. 2015) (quoting *In re Petering*, 301 F.2d 676, 681 (CCPA 1962)); see also *Blue Calypso, LLC v. Groupon, Inc.*, 815 F.3d 1331, 1343 (Fed. Cir. 2016) (distinguishing *Net MoneyIN* when the reference in question explicitly contemplated the combination of the disclosed functionalities).

Unpatentability under 35 U.S.C. § 103 is established when it is shown that 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 ordinary skill in the art; and (4) when in evidence, objective evidence of nonobviousness.⁶ *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

“An obviousness determination requires finding that a person of ordinary skill in the art would have been motivated to combine or modify the teachings in the prior art and would have had a reasonable expectation of success in doing so.” *Regents of Univ. of Cal. v. Broad Inst., Inc.*, 903 F.3d 1286, 1291 (Fed. Cir. 2018).

“In an [*inter partes* review], the petitioner has the burden from the onset to show with particularity why the patent it challenges is unpatentable.” *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1363 (Fed. Cir. 2016) (citing 35 U.S.C. § 312(a)(3) (requiring *inter partes* review petitions to identify “with particularity . . . the evidence that supports the grounds for the challenge to each claim”)). This burden of persuasion never shifts to Patent Owner. *See Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015) (discussing the burden of proof in *inter partes* review).

C. Level of Ordinary Skill in the Art

Petitioner asserts that a person of ordinary skill in the art (“POSITA”) “would have had a degree in electrical engineering, or a similar discipline, along with three-to-four years of experience with digital signal processing and RF tuning systems for satellite and/or cable communications,” and that

⁶ Patent Owner does not present objective evidence of nonobviousness at this stage of the proceeding. *See generally* Prelim. Resp.

“[a]dditional education may substitute for professional experience, and significant work experience may substitute for formal education.” Pet. 15–16 (citing Ex. 1002 ¶¶ 30–32). Patent Owner does not address level of ordinary skill in the art. *See generally*, Prelim. Resp.

For purposes of this Decision, we adopt Petitioner’s proposal as reasonable and consistent with the prior art. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001) (the prior art may reflect an appropriate level of skill in the art).

D. Claim Construction

We apply the same claim construction standard used in district court actions under 35 U.S.C. § 282(b), namely that articulated in *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc). *See* 37 C.F.R. § 42.100(b) (2021). In applying that standard, claim terms generally are given their ordinary and customary meaning as would have been understood by a person of ordinary skill in the art at the time of the invention and in the context of the entire patent disclosure. *Phillips*, 415 F.3d at 1312–13. “In determining the meaning of the disputed claim limitation, we look principally to the intrinsic evidence of record, examining the claim language itself, the written description, and the prosecution history, if in evidence.” *DePuy Spine, Inc. v. Medtronic Sofamor Danek, Inc.*, 469 F.3d 1005, 1014 (Fed. Cir. 2006) (citing *Phillips*, 415 F.3d at 1312–17).

Petitioner states that “[a]ll claim terms herein should be given their ordinary and customary meaning to a POSITA as they would be given in a civil action under 35 U.S.C. § 282(b).” Pet. 16. Yet, Petitioner proposes claim construction for “wideband” and “digital down converter” / “digital

front end.” *Id.* at 16–19. Patent Owner does not address claim construction. *See generally*, Prelim. Resp.

For purposes of this Decision, we determine that no aspects of the challenged claims require explicit construction. *See, e.g., 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. Grounds A and B: Alleged Anticipation and Obviousness of Claims 1, 3–7, 9, 11, 13, 14, 16–20, 22, 24, 26, 27, 29–33, 35–37, 40, 41, 43–47, 49–51, and 54 in View of Zhang

Petitioner asserts that claims 1, 3–7, 9, 11, 13, 14, 16–20, 22, 24, 26, 27, 29–33, 35–37, 40, 41, 43–47, 49–51, and 54 are unpatentable over the teachings of Zhang. Pet. 20–28. Patent Owner does not dispute Petitioner’s assertions. *See generally* Prelim. Resp. For the reasons discussed⁷ below, Petitioner demonstrates a reasonable likelihood of prevailing on these grounds.

1. Zhang (Ex. 1013)

Zhang, relates to “digital multi-channel demodulator circuits.” Ex. 1013, code (57). Zhang indicates these circuits may be employed in “advanced wide-band frontends for digital set-top boxes, PVRs, home gateways and home media centers.” *Id.* ¶ 45. Zhang further teaches “a digital selector that receives . . . separate RF channels and selects one or more RF channels, and a plurality of demodulators that receive one or more

⁷ As Petitioner discusses Grounds A and B together, we do as well.

of the RF channels from the digital selector and demodulate one or more of the RF channels.” *Id.* ¶ 11.

Figure 2, reproduced below, shows a “a simplified high-level block diagram of an exemplary multi-channel demodulator 200.” Ex. 1013 ¶ 23.

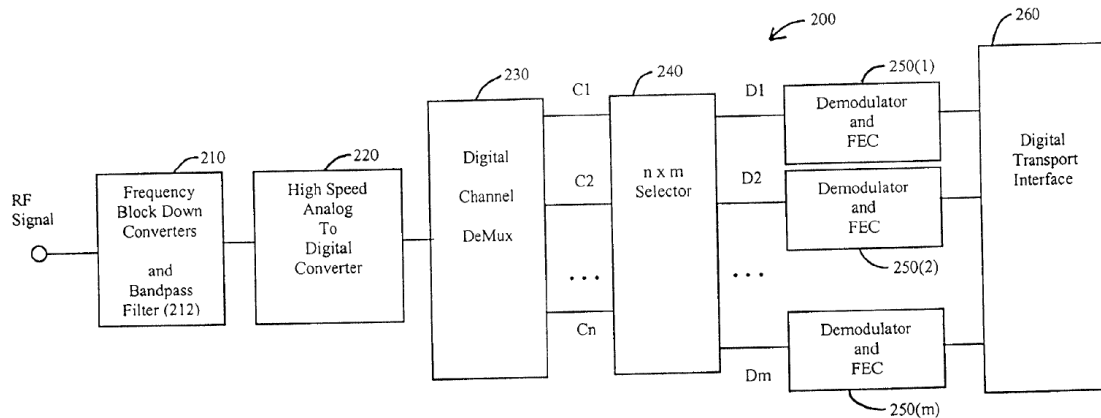


Fig. 2

As shown in Figure 2, demodulator 200 includes a “frequency-block down-converter 210 [that] receives one or more multi-channel analog RF signals” and “shifts the multi-channel analog RF signal to a lower frequency band.” *Id.* ¶¶ 23, 25. Demodulator 200 further includes an ADC 220 that “converts the down-converted multi-channel analog RF signal to a multi-channel digital RF signal.” *Id.* ¶ 27. Demodulator 200 further includes a “digital channel demultiplexer 230 [that] demultiplexes the multi-channel digital RF signal into separate digital RF channels C_1 to C_n ” and a “digital selector 240 [that] receives the demultiplexed digital RF channels C_1 to C_n , and then selects one or more of the RF channels D_1 to D_m from one or more of the digital RF channels C_1 to C_n . *Id.* ¶ 28. According to Zhang, “[t]he m selected RF channels are then fed into respective demodulators 250(1), 250(2), . . . 250(m).” *Id.* ¶ 29.

Figure 3, reproduced below, shows a “simplified high-level schematic

diagram of a digital tuner 300, which . . . can be used to implement digital channel demultiplexer 230.” Ex. 1013 ¶ 30.

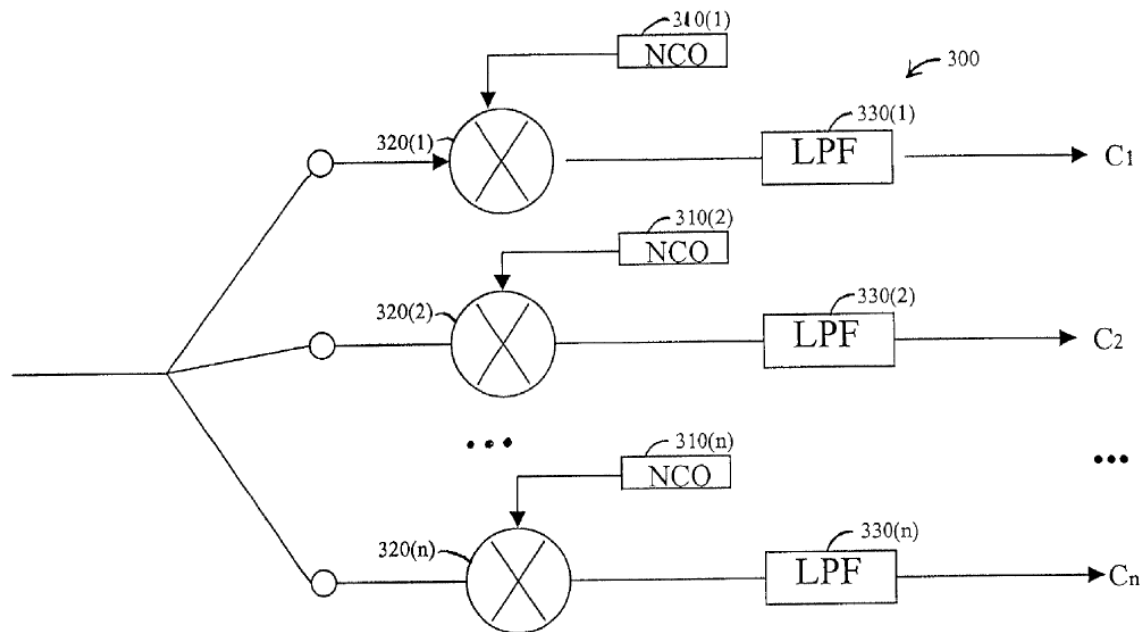


Fig. 3

As shown in Figure 3, “[d]igital tuner 300 includes a bank of n numeric control oscillators (NCOs) 310(1 . . . n), complex multipliers 320(1 . . . n), and low-pass filters (LPFs) 330(1 . . . n).” Ex. 1013 ¶ 30. Zhang further discloses

Numeric oscillator 310(1) generates a frequency, or “target” frequency, that matches the characteristic frequency of a desired RF channel, or “target” RF channel. The output of NCO 310(1) is multiplied by all the RF channels received at complex multiplier 320(1). When [a] multi-channel RF signal is multiplied with the output of NCO 310(1), the frequency of target RF channel signal is shifted to a desired channel. In some embodiments of the present invention, the target RF channel is shifted to a baseband, i.e., centered at DC. LPFS 330(1 . . . n) receive all RF channels and each filters out all RF channels except for its target RF channel. Thus, only the target RF channel passes. Accordingly, separate RF channels exit digital tuner 300, i.e., the multi-channel RF signal is

demultiplexed. Digital tuner circuit 300 then outputs the separated RF channels C_1 to C_n , each RF channel being centered at baseband.

Id. ¶ 32.

2. *Independent Claim 1*

Petitioner asserts that the teachings of Zhang disclose or render obvious the preamble and all of the limitations of claim 1. Pet. 19–28.

a. [1A] A cable television (TV) device comprising:

Petitioner asserts that “Zhang describes an RF receiver, for example in a STB, receiving digital video channels over a cable system and having a DOCSIS return channel, which the ’866 patent concedes is a protocol for ‘cable networks that carry TV programs.’” Pet. 20 (citing Ex. 1013, Fig. 2, ¶¶ 5–6, 23–25, 29, 41, 45–47, clms. 13, 27, 30, 33; Ex. 1001, 9:4–8; Ex. 1021, 1–3; Ex. 1002 ¶¶ 101–102). Thus, according to Petitioner “Zhang’s receiver teaches Element [1A].” *Id.*

b. [1B] a wideband analog-to-digital converter (ADC) configured to digitize a contiguous band of frequencies in an input signal, wherein the contiguous band of frequencies comprises a plurality of desired channels and a plurality of undesired channels; and

Petitioner asserts that “Zhang discloses the claimed ‘wideband analog-to-digital converter’ as ADC 220 . . . which digitizes a multi-channel analog RF signal received from Frequency Block Downconverter 210.⁸” Pet. 21 (citing Ex. 1013, code (57), ¶¶ 10, 25, 27, 31, 34, 44–45, Figs. 2, 6–8, clms. 1, 8; Ex. 1002 ¶¶ 103–104). According to Petitioner,

Zhang’s ADC is wideband because the digitized multi-channel RF signal includes several channels, and the channels

⁸ We do not reproduce the colored text and emphasis in the Petition.

form a contiguous band of frequencies because (like the '866 patent) they are spaced next to each other within a frequency band with a precise frequency spacing (e.g., 6 MHz) that is a fraction of the multichannel RF signal bandwidth (e.g., 540-750 MHz divided into 35 channels).

Id. at 21–22 (citing for comparison Ex. 1013 ¶¶ 6, 10, 24–25, 27, 41–42, 47 with Ex. 1001, 1:24–27, 2:50–59; Ex. 1002 ¶ 105). Petitioner asserts further that “[t]he digitized multi-channel RF signal includes target RF channels that are selected and demodulated in subsequent stages (claimed ‘desired channels’), and undesired RF channels that are filtered out (claimed ‘undesired channels’)” such that “Zhang teaches Element [1B].” *Id.* at 22 (citing Ex. 1013 ¶¶ 5, 10–12, 27–29, 31–32, 35–36, 41–42, clms. 1, 2, 4, 8, 21, 28, 34, 37; Ex. 1002 ¶¶ 106–107).

c. [1C] a digital frontend (DFE) coupled to the wideband ADC, wherein the DFE is configured to concurrently select and provide each of the plurality of desired channels, via a serial interface, without providing any of the plurality of undesired channels.

Petitioner asserts that “Zhang teaches the claimed ‘digital frontend (DFE)’ as Digital Channel Demultiplexer 230 and a portion of Digital Selector 240 . . . which are coupled to ADC 220.” Pet. 22 (citing Ex. 1013 ¶ 28; Ex. 1002 ¶¶ 108–109). According to Petitioner, Zhang’s “[d]igital tuner 300 (an embodiment of demultiplexer 230) . . . has the same structure as the '866 patent’s digital front end 230 . . . including multiple signal paths for concurrently selecting and providing a plurality of desired channels C_1 – C_n .” *Id.* at 23 (citing for comparison Ex. 1013, Fig. 3, ¶¶ 30–34, clms. 34, 36–37 with Ex. 1001, Fig. 2, 6:3–8; Ex. 1002 ¶ 110). Petitioner asserts further that “[l]ike the '866 patent’s DFE, each path includes a complex multiplier 320 . . . followed by a low pass filter (LPF) 330. *Id.*

In addition, Petitioner asserts that in Zhang “[e]ach path receives the multi-channel digital RF signal from ADC 220 and operates concurrently to select one respective desired channel,” “[d]emultiplexer 230 and selector 240 output only user selected channels (either all or a subset of the user selected ‘C’ channels) and filter out all other channels from the digitized multi-channel RF signal,” and that “[s]elector 240 further provides the desired channels ‘via a serial interface’ as recited in Element [1C].” Pet. 24 (citing Ex. 1013 ¶¶ 28, 31–32, 39, 47, clms. 2, 30, 32; Ex. 1002 ¶¶ 111–112). Petitioner also asserts that “Zhang discloses embodiments with a serial interface.” *Id.* at 26 (citing Ex. 1002 ¶ 116).

Petitioner reasons that a person of ordinary skill in the art “would have understood that this sends different channels sequentially (serially) in different time divisions over a single data path as shown, and that such a path is a ‘serial interface’ as claimed in Element [1C].” Pet 25 (citing Ex. 1013 ¶¶ 38–39; Ex. 1002 ¶¶ 74–76, 114; Ex. 1014, 30:31–42, 31:15–22; Ex. 1015, 8; Ex. 1016, 79–80; Ex. 1017, 354–355; Ex. 1034, 23, 183; Ex. 1048, 16; Ex. 1049, 1:10–40). In support of this reasoning, Petitioner provides an example from “the textbook “Digital Integrated Circuits: A Design Perspective” published in 1996 (‘Rabaey’)” wherein “digital circuits (like Zhang’s implemented in CMOS) represent data as binary units (‘bits’) in the form of electrical signals (e.g., high and low voltages for binary values ‘1’ and ‘0’ respectively)” and “the circuit can either transmit the bits over multiple separate wires, one wire for each bit, which was known as a ‘parallel interface,’ or transmit the bits one at a time sequentially over a single wire, which was known as a ‘serial interface.’” Pet. 25–26 (citing Ex. 1002 ¶¶ 74–76, 115; Ex. 1016, 23, 31–34, 49–51, 79–80, Figs. 6–26). Based

on this reasoning and the supporting evidence, Petitioner asserts that Zhang discloses element [1C]. Pet. 26.

Alternatively, and “[t]o the extent Zhang does not disclose a serial interface,” Petitioner asserts that “implementing Zhang’s circuitry to output the selected channels via a serial interface was obvious in light of the POSITA’s general knowledge, creativity, and common sense as one of two common design choices that were well-known in integrated circuits at the time.” Pet. 26–27 (citing Ex. 1002 ¶ 117; Ex. 1014, 30:31–42, 31:15–22; Ex. 1015, 4–6; Ex. 1016, 79–80; Ex. 1017, 354–355). In support of this assertion, Petitioner contends that “the ’866 patent concedes [that] outputting a digital data stream via serial interface was ‘commonly known.’” *Id.* at 27 (citing Ex. 1001, 7:10–14; Ex. 1002 ¶ 117).

In addition, Petitioner asserts that “Zhang’s circuit is implemented in CMOS, which (as discussed in Rabaey), can either transmit the bits via parallel interface or via serial interface” such that a person of ordinary skill in the art “implementing the Zhang circuit in CMOS would have been aware of and fully able to implement a serial interface and/or a parallel interface, both being obvious to try as typical, predictable choices” and that “implementing a serial interface was well within the POSITA’s skillset, leading to a high expectation of success.” Pet. 27 (citing Ex. 1016, 79–80, Fig. 6-25⁹; Ex. 1002 ¶¶ 74–76, 118–119). Thus, according to Petitioner,

⁹ The Petition cites Fig. 6.25, however, no such figure exists. We understand this to be a typographical error and that Petitioner intended to cite Figure 6-25 which is reproduced with annotations on page 26 of the Petition.

“Zhang alone, in view of the knowledge of a POSITA (as acknowledged in the ’866 patent) thus also renders obvious Element [1C].” *Id.*

As another alternative, Petitioner asserts that “[t]o the extent ‘DFE’ is a means-plus-function limitation, Zhang discloses the same or equivalent structure as in the ’866 patent (e.g., multiple paths, each including a complex and filter as shown in Figures 2 and 3 of Zhang and Figure 2 of the ’866 patent), with any differences being insubstantial.” Pet. 27 (citing Ex. 1013, code (57), ¶¶ 10, 25, 27, 31, 34, 44–45], Figs. 2, 3; Ex. 1001, Figs. 2–3, 5:51–7:9, 9:50–60. Ex. 1002 ¶ 120). In support of this assertion, Petitioner contends that

In Zhang and the ’866 patent, each path performs the same function of selecting a respective desired channel, in the same way by first downconverting the respective desired channel to baseband and then low pass filtering with a filter to isolate the channel, to achieve the same result of generating a digital channel output corresponding to a respective desired channel.

Id. at 27–28 (citing Ex. 1013, code (57), ¶¶ 10, 25, 27, 31, 34, 44–45], Figs. 2, 3; Ex. 1001, Figs. 2–3, 5:51–7:9, 9:50–60. Ex. 1002 ¶ 120).

d. Conclusion For Claim 1

Patent Owner does not dispute Petitioner’s assertions or Petitioner’s reasoning in support of its challenge to claim 1 for Grounds A and B. *See generally* Prelim. Resp. We have reviewed Petitioner assertions and reasoning, as well as the evidence of record, in support of these challenges. On the current record, we determine that Petitioner has demonstrated a reasonable likelihood of prevailing for claim 1 based on its assertions as set forth in Grounds A and B.

3. Independent Claim 14

Petitioner asserts that “[e]lements [14A]–[14B] are identical to

Elements [1A]–[1B], except Element [that] [14B] lacks ‘a contiguous band of frequencies’” and “Zhang thus discloses and renders obvious Elements [14A]–[14B] for the same reasons discussed above for Elements [1A]–[1B].” Pet. 28 (citing Ex. 1002 ¶¶ 121–124; *id.* at 20–22). Petitioner asserts further that “a POSITA would have understood ‘a plurality of digital down converters’ to be included in the DFE digital circuit illustrated in Figure 2 which . . . is the same circuit that Element [1C] is directed to” and “Zhang thus discloses the digital downconverters of Element [14C] for the same reasons it discloses the DFE of Element [1C].” *Id.* at 28–29 (citing Ex. 1002 ¶¶ 36–38, 108–112, 125; Pet. 22–28).

For element 14[D] Petitioner asserts that “Zhang’s demultiplexer 230 (the claimed ‘plurality of digital down converters’) provides channels C_1 – C_n . . . (which include each claimed ‘digital channel output’) via a selector 240 as channels D_1 – D_m to one or more demodulators 250.” Pet. 30 (citing Ex. 1013 ¶¶ 5, 28, 38–39, 41, clms. 2–4, 30; Ex. 1002 ¶¶ 192–130). Petitioner asserts further that “selector 240 may include a selector 510 that time-division multiplexes channels C_1 – C_n serially over a single data bus 520, thus providing the claimed ‘serial interface.’” *Id.* at 31 (citing Ex. 1013 ¶¶ 38–39, Fig. 5; Ex. 1002 ¶¶ 113–119; Ex. 1014, 30:31–42, 31:15–22; Ex. 1015, 6; Ex. 1016, 79–80; Ex. 1017, 354–355; Ex. 1034, 23, 183; Ex. 1048, 16; Ex. 1049, 1:10–40;¹⁰ Pet. 22–28).

In addition, Petitioner asserts that “Zhang’s demultiplexer 230, which includes the claimed ‘plurality of digital down converters,’ is thus operable

¹⁰ The Petition cites “Ex. 1049, 1:10–40, 131–132.” Pet. 31. As column 1 does not have lines 131–132 and lines 31–32 are encompassed by lines 10–40, we are unsure what part of Ex. 1049 “131–132” refers to.

to provide each desired channel C_1 - C_n output ‘via a serial interface’ (via 510/Data Bus 1)” and “Zhang thus discloses Element [14D].” Pet. 32 (citing Ex. 1002 ¶ 132).

Alternatively, Petitioner asserts that “[t]o the extent Patent Owner argues that Zhang does not expressly disclose the claimed ‘serial interface,’ implementing Zhang’s demultiplexer 230 to provide each digital channel output via a serial interface was obvious as one of two common and predictable design choices (as the ’866 Patent concedes) used by POSITAs.” Pet. 32 (citing *id.* at 22–28; Ex. 1002 ¶¶ 117–119, 133–136; Ex. 1013 ¶¶ 38–19; Ex. 1014, 30:31–42, 31:15–22; Ex. 1015, 8; Ex. 1016, 79–80; Ex. 1017, 354–355; Ex. 1001, 7:10–14) (internal citation omitted). Petitioner asserts further that “implementing a serial interface would have been well within the POSITA’s skillset, leading to a high expectation of success” and “[t]hus, Zhang also renders obvious Element [14D].” *Id.* (citing Ex. 1002 ¶ 135).

Patent Owner does not dispute Petitioner’s assertions or Petitioner’s reasoning in support of its challenge to claim 14 for Grounds A and B. *See generally* Prelim. Resp. We have reviewed Petitioner assertions and reasoning, as well as the evidence of record, in support of these challenges. On the current record, we determine that Petitioner has demonstrated a reasonable likelihood of prevailing for claim 14 based on its assertions as set forth in Grounds A and B.

4. Independent Claim 27

Petitioner asserts that “[e]lements [27A]–[27C] match Elements [1A]–[1C], except that Element [27C] lacks Element [1C]’s limitation ‘via a serial interface’” and that elements [27A]–[27C] are “Zhang for the same reasons discussed above for Elements [1A]–[1C].” Pet. 32–33 (citing *id.* at 20–28;

Ex. 1002 ¶¶ 137–138).

For element [27d], Petitioner asserts that “Zhang’s cable TV device may be integrated as a wide-band front-end of a ‘set-top box/PVR/home media server’ and that “[a] POSITA would have understood that PVR stands for ‘personal video recorder,’ which is an alternate name for ‘DVR’ or ‘digital video recorder’ for recording content received by a STB.” Pet. 33 (citing Ex. 1013 ¶ 45, Fig. 8; Ex. 1002 ¶¶ 139–140; Ex. 1051 ¶ 18; Ex. 1052 ¶¶ 48, 60) (internal quotations omitted). Thus, according to Petitioner, claim 27 is “anticipated and rendered obvious by Zhang.”

Patent Owner does not dispute Petitioner’s assertions or Petitioner’s reasoning in support of its challenge to claim 27 for Grounds A and B. *See generally* Prelim. Resp. We have reviewed Petitioner assertions and reasoning, as well as the evidence of record, in support of these challenges. On the current record, we determine that Petitioner has demonstrated a reasonable likelihood of prevailing for claim 27 based on its assertions as set forth in Grounds A and B.

5. Independent Claim 41

Petitioner asserts that “Elements [41A]-[41C] match Elements [14A]-[14C] and directed to substantially the same subject matter as Elements [27A]-[27C], and thus are disclosed and rendered obvious by Zhang for the same reasons discussed above for Elements [14A]-[14C] and [27A]-[27C].” Pet. 33 (citing *id.* at 20–30, 32–33; Ex. 1002 ¶¶ 141–142). Petitioner asserts further that “Element [41D] (reciting a ‘DVR’) is identical to Element [27D]” and “Zhang teaches a DVR, as described . . . for Element [27D].” *Id.* at 34 (citing *id.* at 32–33; Ex. 1002 ¶¶ 143–144). Thus, according to Petitioner “Zhang anticipates and renders obvious claim 41.” *Id.* (citing *id.*

at 20–32).

Patent Owner does not dispute Petitioner’s assertions or Petitioner’s reasoning in support of its challenge to claim 41 for Grounds A and B. *See generally* Prelim. Resp. We have reviewed Petitioner assertions and reasoning, as well as the evidence of record, in support of these challenges. On the current record, we determine that Petitioner has demonstrated a reasonable likelihood of prevailing for claim 41 based on its assertions as set forth in Grounds A and B.

6. *Dependent Claims 2, 3–7, 9, 11, 13, 16–20, 22, 24, 26, 29–33, 35–37, 40, 43–47, 49–51, and 54*

Petitioner asserts that the teachings of Zhang disclose or render obvious all of the limitations of claims 2, 3–7, 9, 11, 13, 16–20, 22, 24, 26, 29–33, 35–37, 40, 43–47, 49–51, and 54. Pet. 28–49. Patent Owner does not dispute Petitioner’s assertions or Petitioner’s reasoning in support of its challenge to these claims for Grounds A and B. *See generally* Prelim. Resp. As we have determined that Petitioner has demonstrated a reasonable likelihood of prevailing for claims 1, 14, 27, and 41 —from which these claims depend— based on the challenges set forth in Grounds A and B, we do not address Petitioner’s assertions for these claims. *See SAS Inst.*, 584 U.S. 357.

F. Ground C: Alleged Obviousness of Claims 9–12, 22–25, 27, 29–33, 35–41, 43–47, 49–55, 57–61, 63–69, 71–75, and 77–82 in View of the Teachings of Zhang and Reisman

Petitioner contends that claims 9–12, 22–25, 27, 29–33, 35–41, 43–47, 49–55, 57–61, 63–69, 71–75, and 77–82 are unpatentable over the combined teachings of Zhang and Reisman. Pet. 49–59. Patent Owner does not dispute Petitioner’s assertions. *See generally* Prelim. Resp. For the

reasons discussed below, Petitioner demonstrates a reasonable likelihood of prevailing on these grounds.

1. Reisman (Ex. 1052)

Reisman relates to interactive television (“ITV”) “and similar interactive hypermedia such as from television or Internet Sources, and more particularly to the provision and use of user interfaces that permit interaction using multiple coordinated device sets.” Ex. 1052 ¶ 2. According to Reisman:

ITV promises to greatly enrich the TV experience by allowing interactive features that can range from access to supplementary enhancement material such as background on programs, casts and players, sports statistics, polls, chat messaging, and interactive advertisements and purchase offers (“t-commerce”), and all manner of other tangential information, to ways to vary the core program content by acting on viewer input and choices as to camera angles or even alternative plots, as well as providing improved control of the core experience with electronic program guides (EPGs), personal video recorders (PVRs) and video on demand (VOD) and similar features.

Id. ¶ 5. Reisman teaches embodiments that purport to “allow a user and/or an author to control what resources are presented on which device sets . . . , and provide for coordinating browsing activities to enable . . . a user interface to be employed across multiple independent systems.” *Id.* ¶ 10.

According to Reisman, “a user session may be composed of one or more ‘browser sessions,’ and well as other ‘application sessions’ with other applications.” *Id.* ¶ 50. As an example, Reisman indicates that “with enhancements to a TV-centric browsing experience, it might normally be appropriate that the base TV program and the related enhancement session be considered as ‘linked sessions’ or sub-sessions that are distinct from one another.” *Id.* Reisman teaches that “coordination of multiple sub-sessions

might be applied to replays, whether broadcast or effected locally using a DVR, with enhancement screens related to both the live program and the replay segment.” *Id.* ¶ 546. Reisman further teaches that picture-in-picture (“PIP”) functions could add a further level of multitasking, and that also could coordinate with alternate device sets. *Id.* ¶¶ 121, 546.

2. Independent Claims 27 and 41

After noting that in Grounds A and B, it asserts that claims 27 and 41 are anticipated or rendered obvious by Zhang, Petitioner asserts that “[t]o the extent Patent Owner argues that Zhang’s PVR is not a ‘DVR’ as recited in Elements [27D] and [41D], Reisman discloses this feature.” Pet. 50 (citing Ex. 1002 ¶ 188). As discussed above, we have determined that at this point in this proceeding Petitioner has adequately demonstrated a reasonable likelihood of prevailing in showing that Zhang anticipates or renders obvious claims 27 and 41. Having made that determination, we do not further discuss these claims.

3. Independent Claim 55

Petitioner asserts that “Elements [55A]-[55C] match Elements [1A]-[1C], except that Element [55C] lacks Element [1C]’s limitation ‘via a serial interface’” and “are thus taught by Zhang for the same reasons discussed . . . for Elements [1A]-[1C].” Pet. 51 (citing Ex. 1002 ¶¶ 193–194; Pet. 20–28). For element [1D], Petitioner asserts that “Reisman discloses Element [55D].” *Id.* at 52 (citing ¶¶ 195–198).

Specifically, Petitioner asserts that “Reisman teaches that STBs in a cable system include a ‘picture-in-picture display.’” Pet. 52 (citing Ex. 1052 ¶¶ 73, 98, 118, 120–121, 187, 278, 291, 378, 534, 537, 546, Fig. 3; Ex. 1002 ¶ 195). Petitioner reasons that a person of ordinary skill in the art “would

have been motivated to include Reisman’s ‘picture-in-picture¹¹ display’ capability in Zhang’s STB, which in the proposed combination still has the wideband front-end receiver components cited for Elements [55A]-[55C] . . . to allow a user to view different content simultaneously.” *Id.* (citing Ex. 1002 ¶ 196). Petitioner asserts that “Reisman teaches that ‘picture-in-picture’ beneficially displays a program in a PIP window while simultaneously providing, e.g., navigation options and interactive content in other windows” and that “Reisman’s PIP also enables ‘multitasking,’ by displaying, e.g., two TV programs, and swapping them between full screen and a smaller PIP window.” Pet. 52–53 (Ex. 1052 ¶¶ 121, 278, Fig. 3; Ex. 1002 ¶ 196). Thus, according to Petitioner,

modifying Zhang with Reisman represents the obvious application of a known technique (having a STB configure and display desired channels in a picture-in-picture display, per Reisman) to a known device (Zhang’s STB with a wideband digital front-end receiver) that was ready for improvement to yield a predicable result (PIP capability in the STB).

Id. at 53 (citing Ex. 1002 ¶ 196).

Petitioner also asserts that a person of ordinary skill in the art “would have had a reasonable expectation of success, because STBs with PIP capability were well-known, and assembling and programming components (CPUs, software, memory, MPEG-2 decoders, etc.) making up such systems was well within the skillset of a POSITA.” Pet. 53 (citing Ex. 1052 ¶¶ 112, 121, 534; Ex. 1002 ¶ 197). In addition, Petitioner asserts that “Reisman’s PIP and Zhang’s receiver provide complementary features: Zhang’s receiver provides multiple channels concurrently, and Reisman’s PIP displays

¹¹ Also referred to by Petitioner using the acronym “PIP.”

multiple programs concurrently.” *Id.* (citing Ex. 1052 ¶¶ 378, 534; Ex. 1013 ¶¶ 5, 11, 29–31, 38–39, 42, 44–45; Ex. 1002 ¶ 197). Thus, according to Petitioner, that the combined teachings of Zhang and Reisman renders claim 55 obvious. *Id.*

4. Independent Claim 69

Petitioner asserts that “Elements [69A]-[69C] match Elements [14A]-[14C] and directed to substantially the same subject matter as Elements [55A]-[55C], and thus are anticipated and rendered obvious by Zhang for the same reasons discussed . . . for Elements [1A]-[1C] and [55A]-[55C].” Pet. 54 (citing *id.* at 20–30, 51–53; Ex. 1002 ¶¶ 199–200). Petitioner asserts further that “Element [69D], like Element [55D], requires a ‘a picture-in-picture display’” and that “Zhang-Reisman as discussed . . . for Element [55D] renders this obvious.” *Id.* (citing *Id.* at 52–53; Ex. 1052 ¶¶ 73, 98, 118, 120–121, 187, 278, 291, 378, 534, 537, 546, Fig. 3; Ex. 1002 ¶ 201). According to Petitioner, “Zhang-Reisman as described with respect to Element [55D] also teaches Element [69D], and thus renders claim 69 obvious.” *Id.* (citing *id.* at 52–53; Ex. 1002 ¶¶ 202–203).

5. Dependent Claims 10–12, 23–25, 33, 35–40, 47, 49–54, 61, 63–68, 75, and 77–82

Petitioner asserts that the combined teachings of Zhang and Reisman disclose or render obvious all of the limitations of claims 10–12, 23–25, 33, 35–40, 47, 49–54, 61, 63–68, 75, and 77–82. Pet. 54–59. Patent Owner does not dispute Petitioner’s assertions or Petitioner’s reasoning in support of its challenge to these claims for Ground C. *See generally* Prelim. Resp. As we have determined that Petitioner has demonstrated a reasonable likelihood of prevailing for claims 27, 41, 55, and 69—from which these claims depend—based on the challenges set forth in Grounds A, B or C, we

do not address Petitioner's assertions for these claims. *See SAS Inst.*, 584 U.S. 357.

6. *Grounds D–H: Alleged Obviousness of Claims 2–6, 15–19, 28–32, and 42–46 in View of the Combined Teachings of Zhang and Jackson; Alleged Obviousness of Claims 28–32, 42–46, 56–60, and 70–74 in View of the Combined Teachings of Zhang, Reisman, and Jackson; Alleged Obviousness of Claims 1, 3–9, 11, 13, 14, 16–22, 24, 26, 34–36, and 48–50 in View of the Combined Teachings of Zhang and Pandey; Alleged Obviousness of Claims 9–12, 22–25, 34–36, 48–50, 62–64, and 76–78 in View of the Combined Teachings of Zhang, Reisman, and Pandey; and Alleged Obviousness of Claims 2–6 and 15–19 in View of the Combined Teachings of Zhang, Pandey, and Jackson.*

Petitioner asserts that claims 2–13, 15–26, 28–40, 42–54, 56–68, and 70–82 are unpatentable over Zhang alone or based on seven various combinations of Zhang with Reisman, Jackson, and Pandey. Pet. 11–12. Patent Owner does not dispute Petitioner's assertions for Grounds D–H. *See generally* Prelim. Resp. As we have determined that Petitioner has sufficiently demonstrated a reasonable likelihood of prevailing for at least one claim per *SAS Inst.*, we do not address Petitioner's assertions for Grounds D–H.

III. CONCLUSION

Based on the current record, we determine Petitioner has shown a reasonable likelihood of prevailing with respect to at least one claim of the '866 patent. Accordingly, we institute *inter partes* review of all claims challenged on all of the grounds in the Petition. *See Consolidated Trial Practice Guide* (Nov. 2019), 64.¹²

¹² Available at www.uspto.gov/sites/default/files/documents/tpgnov.pdf.

IV. ORDER

Accordingly, it is:

ORDERED that pursuant to 35 U.S.C. § 314, an *inter partes* review is hereby instituted as to claims 1–82 of the '866 patent based on the unpatentability challenges presented in the Petition; and

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

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11,381,866 B2

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