Trials@uspto.gov
571-272-7822

Paper 24
Date: October 21, 2025

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

AMAZON.COM, INC., AMAZON WEB SERVICES, INC., and AMAZON.COM SERVICES LLC.,
Petitioner,

v.

B.S.D. CROWN, LTD.,
Patent Owner.

IPR2025-00057
Patent 8,934,887 B2

Before HUNG H. BUI, SCOTT A. DANIELS, and JON M. JURGOVAN, *Administrative Patent Judges.*

BUI, *Administrative Patent Judge*.

DECISION
On Remand Following Director Review of
Denying Institution of *Inter Partes* Review
35 U.S.C. § 314

I. INTRODUCTION

Amazon.com, Inc., Amazon Web Services, Inc., and Amazon.com Services LLC ("Petitioner") filed a Petition (Paper 4 ("Pet.")) requesting *inter partes* review of claims 1–8, 11–17, 20–25, and 28 ("challenged claims") of U.S. Patent No. 8,934,887 B2 (Ex. 1001, "the '887 patent"). B.S.D. Crown, Ltd. ("Patent Owner") filed a Preliminary Response. Paper 10 ("Prelim. Resp."). With Board authorization, Petitioner filed a Preliminary Reply (Paper 11, "Prelim. Reply"), and Patent Owner filed a Preliminary Sur-Reply (Paper 12, "Prelim. Sur-reply").

On May 29, 2025, the Board issued a Decision Denying Institution of *Inter Partes* Review because the Board determined that Petitioner has not demonstrated a reasonable likelihood of prevailing on at least one of the challenged claims of the '887 patent (Paper 13, "prior Dec."). Petitioner filed a timely request for Director Review of the Board's Decision Denying Institution (Paper 14, "DDR Request"). Patent Owner opposed and filed an authorized response to Petitioner's Director Review Request (Paper 15, "DDR Resp.").

On August 12, 2025, the Acting Director issued a Remand Order to grant Director Review, vacate the Board's Decision Denying Institution, and remand "to the Board with instructions to allow additional briefing on the claim construction issue and to construe the disputed claim term" (Paper 16, "Remand Order"). According to the Remand Order,

> Petitioner is correct that the Board appears to have misapprehended Figure 2 of the challenged patent. DR Request 9–10. As Petitioner points out, Figure 2 shows the mobile device receiving only audio data and video data, not audio data, video data, and an HW action, as the Board found. *See* Decision 17; DR Request 9–10. The Board relied in part on this finding to

> determine that the Federal Circuit's decision in *SuperGuide Corp. v. DirecTV Enters., Inc.*, 358 F.3d 870, 885–86 (Fed. Cir. 2004) controlled the claim construction in this case. *See* Decision 17. Although there may be sufficient basis for the Board's claim construction and reliance on *SuperGuide*, because other portions of the Specification the Board identifies do not rebut the presumption that the patentee intended the plain and ordinary meaning of "at least one of . . . and," it is the better course to allow the Board to decide that issue in the first instance. The Board shall allow the parties limited briefing to address this claim construction issue on remand.[1]

Remand Order 3.

The Board issued an Order to authorize Petitioner and Patent Owner to submit limited briefing to address the claim construction issue (Paper 18,

[1] The Board did not misapprehend Figure 2 of the challenged patent, as characterized by Petitioner. DR Request 9–10. Figure 2 shows multiple interactions between mobile device 10 and remote server 12, including how remote server 12 receives (1) input information from mobile device 10 to produce "[A] a display, [B], audio and [C] a hardware action by a HW action component of mobile device; (2) processes that input information to produce "user interface information"; and then (3) sends the "user interface information" to mobile device 10 to reproduce at mobile device 10 "at least one of [A] the display, [B] the audio and [C] the HW action" by the HW component of mobile device 10. As shown in Figure 2, input information (e.g., a touch screen, buttons, sensors, a camera, Bluetooth) is received from input components (e.g., a touch screen, buttons, sensors, a camera, Bluetooth, etc.) of mobile device 10 to indicate "a hardware (HW) action" by a HW component of mobile device 10 (i.e., touch screen gestures, pressed buttons, sensor data etc.) and is then sent along with audio data and video data to remote server 12 for processing at remote server 12 and then sending back to mobile device 10 to reproduce at mobile device 10 "at least one of [A] the display, [B] the audio and [C] the HW action". Exhibit 1001, 4:53–63. For reasons discussed herein, we remain unpersuaded by Petitioner's arguments presented in the Request for Director Review (Paper 14) or the Remand Claim Construction Brief (Paper 19, "Remand Br.").

"Order"). Petitioner filed its Remand Claim Construction Brief regarding the term "at least one of [A] the display, [B] the audio, and [C] the hardware (HW) action" (Paper 19, "Remand Br."). Patent Owner opposed and filed its Responsive Remand Claim Construction Brief regarding the same term (Paper 20, "Responsive Br.").

As instructed by the Acting Director's Remand Order, we have considered carefully both Petitioner's and Patent Owner's arguments presented in their claim construction briefing. *See* Papers 19, 20. As explained in detail below, and consistent with our determination in the prior Decision Denying Institution (Paper 13, "prior Dec."), we also determine that Petitioner has not demonstrated a reasonable likelihood of prevailing on at least one of the challenged claims of the '887 patent.

For the reasons discussed below, we again deny the Petition and do not institute an *inter partes* review of all challenged claims of the '887 patent under 35 U.S.C. § 314 and 37 C.F.R. § 42.4.

II. BACKGROUND

A. Real Parties-in-Interest

Petitioner identifies itself as a real party-in-interest. Pet. 83 (Paper 4). Patent Owner names itself as the real party-in-interest. Patent Owner's Mandatory Notice (Paper 5).

B. Related Matters

Petitioner identifies, as a matter currently involving the '887 patent, *BSD Crown, Ltd. f/k/a Emblaze, Ltd. v. Amazon.com Inc*., NDCA-3-24-cv-03503. Pet. 84. Patent Owner identifies, as a matter currently involving the '887 patent, *B.S.D. Crown, Ltd. v. Amazon.com, Inc., Amazon Web Services,*

Inc., and Amazon.com Services, LLC, 3:23-cv-00057-WHO (N.D. Cal.). Paper 5, 1.

C. The '887 Patent

The '887 patent is titled "System and Method for Running Mobile Devices in the Cloud." Ex. 1001, code (54). The '887 patent relates "to systems and methods in which a mobile device acts as an input/output interface for a user, and actual processing, storage and network interfaces are performed by a remote server." *Id.* at 1:13–18.

The '887 patent describes providing "systems and methods for decoupling mobile device HW capabilities from actual mobile device performance and a user experience, which enables upgrading mobile device functionality, performance, OS and applications without the need to change the HW or the local SW of the mobile device itself." *Id.* at 2:19–24.

> According to an example embodiment, a method for operating a mobile device comprises executing, by a mobile device, a basic software (SW) protocol or operating system (OS) to receive input information from one or more hardware (HW) components of the mobile device, establish a network connection to a server, and send the input information to the server over the network connection without performing more detailed processing of the input information by the mobile device. The mobile device receives at least one data stream from the server. The mobile device produces at least one of [1] a display, [2] audio and [3] a HW action by a HW component of the mobile device from the at least one data stream.

Id. at 2:25–36 (bracketed numerals added for clarity).

Figure 2, reproduced below with additional annotations for clarity, "shows an end-to-end network system" including mobile device 10 connected to remote server 12, via a wireless network (e.g., WiFi or 3G/4G cellular, and/or the Internet) in which remote device 10 "acts as an

input/output interface for a user such that actual processing, storage and network interfaces are performed or provided by [] remote server [12]." *Id.* at 4:39–46.

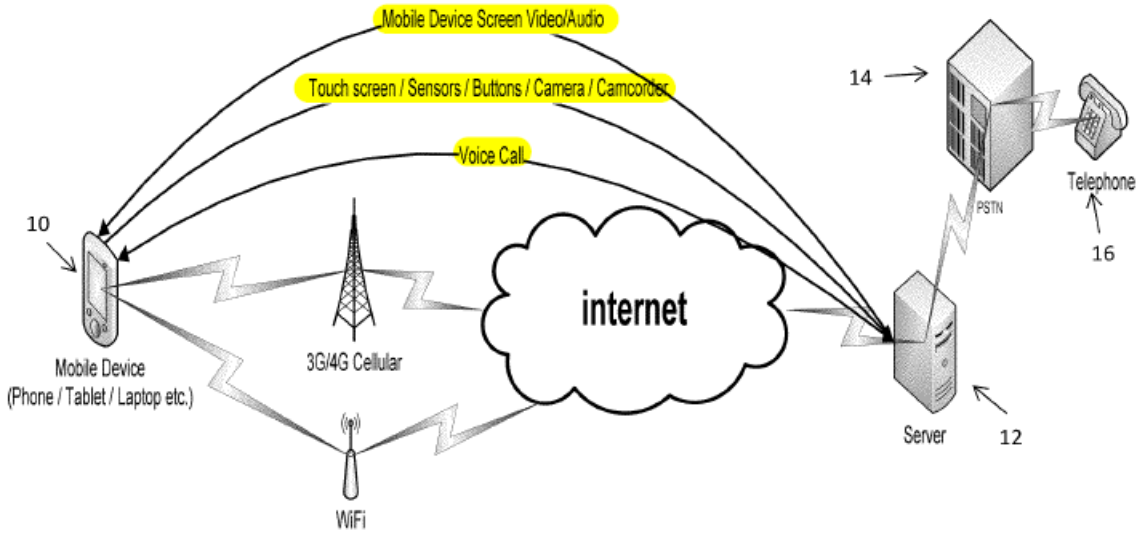

Figure 2 shows mobile device 10 configured to receive input information, via its input components (e.g., a touch screen, buttons, sensors, a camera, and Bluetooth), and sends such input information (highlighted by the Board in yellow) indicative of a hardware (HW) action by a HW component of mobile device 10 (i.e., touch screen gestures, pressed buttons, and sensor data) along with audio data and video data to remote server 12 for processing at remote server 12. *Id.* at 4:53–63.

For example, "mobile device 10 sends each type of data (e.g., voice, audio, image, video, notification, sensor, etc.) to the server 12 in a separate stream." *Id.* at 7:63–65. This way "mobile device 10 (i.e., the hardware (HW) and local software (SW) of . . . mobile device 10) thus does not perform the processing locally at the mobile device 10 itself." *Id.* at 4:59–60. Instead, remote server 12 "emulates mobile device HW and executes or runs a mobile device OS and applications on the emulated HW to process[]

the input information received from . . . mobile device 10" to produce "user interface information" for use in reproducing at mobile device 10. *Id.* at 5:29–43.

Figure 3, reproduced below, "shows an example system solution SW stack separated between a mobile device and a server." *Id.* at 4:12–14.

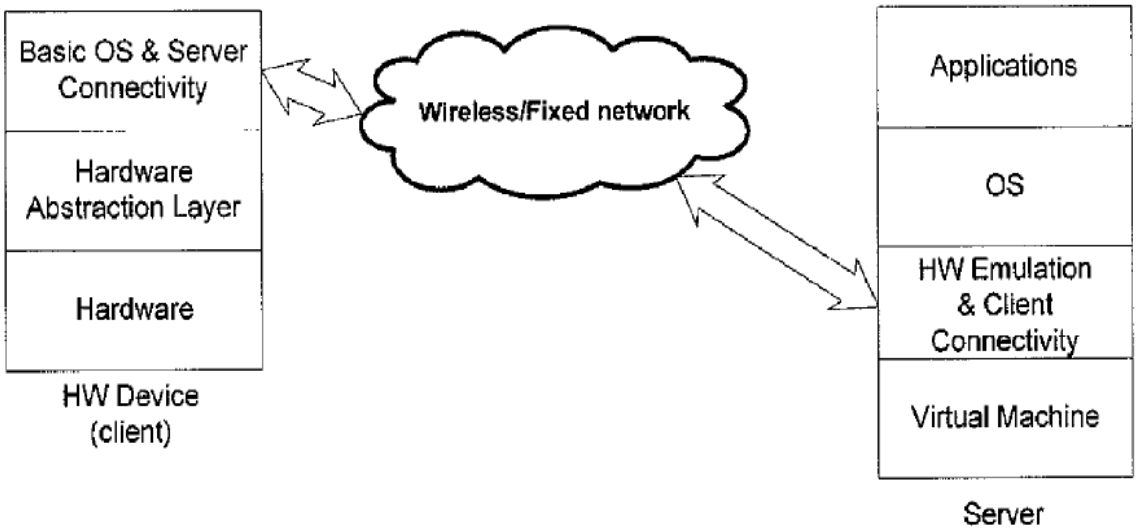

Figure 3, reproduced above, shows "Main SW (i.e., a mobile OS and applications) is executed on the server 12 on a server side," and "mobile device 10 on a mobile device side executes only basic SW (e.g., a more basic OS or a simple SW protocol without an OS) which is required for basic functionality of the mobile device 10 before a network connection of the mobile device 10 to the server 12." *Id.* at 5:49–56, 7:26–62. According to the '887 patent, "server 12 processes the mirrored information and mirrors the emulated user interface information (e.g., display and speaker audio) back to the mobile device 10." *Id.* at 6:63–66. Then, "mobile device 10 produces the display, speaker audio and/or a HW action of a hardware component (e.g., activates and/or controls a GPS and/or one or more

sensors) based on the mirrored emulated user interface information." *Id.* at 6:66–7:3.

D. Illustrative Claim

Petitioner challenges claims 1–8, 11–17, 20–25, and 28 of the '887 patent. Pet. 1 (Paper 4). Claims 1, 11, 20, and 28 are the independent claims. Independent claim 1, reproduced below, with Petitioner's annotations, is illustrative of the claimed subject matter.

> 1[preamble] A method for emulating a mobile device at a server, the method comprising:
>
> 1[a] receiving, by the server, input information from at least one mobile device, wherein the input information has not been processed to produce a display, audio and a hardware (HW) action by a HW component of the mobile device;
>
> 1[b] processing, by a mobile device operating system (OS) executed at the server, the input information to produce a stream of user interface information for use in reproducing at the mobile device at least one of the display, the audio and the hardware (HW) action by the HW component of the mobile device based on a same instance of the mobile device operating system; and
>
> 1[c] sending, by the server, the stream of user interface information to the mobile device to reproduce at the mobile device at least one of the display, the audio and the HW action by the HW component of the mobile device.

Pet. ix; Ex. 1001, 13:40–57.

E. Evidence

Petitioner relies on the patent references summarized in the table below.

Name	Reference	Exhibit
Yun[2]	KR 2012/0046807 A, published May 11, 2012	1005
Overton	US 9,424,052 B2, issued Aug. 23, 2016	1006
Lu	US 2009/0305790 A1, published Dec. 10, 2009	1007
Lubonski	"An Adaptation Architecture to Improve User-Perceived QoS of Multimedia Services for Enterprise Remote Desktop Protocols," Next Generation Internet Networks, 2005, Rome, Italy, 2005, pp. 149–156	1008
Richardson	THE H.264 ADVANCED VIDEO COMPRESSION STANDARD (2nd ed.), 2010, Wiley Publishing	1009
Nix	US 2006/0098619 A1, published May 11, 2006	1010

Petitioner also relies on the Declaration of Dr. Paul D. Martin (Ex. 1003) to support its contentions that the challenged claims are unpatentable.

F. Asserted Grounds

Petitioner asserts that the challenged claims of the '887 patent are unpatentable based on the following grounds summarized in the table below (Pet. 2):

Claim(s) Challenged	35 U.S.C. §[3]	Reference(s)/Basis	Ground name
1–3, 5, 20, 21, 28	103(a)	Yun	1A
4, 14, 22	103(a)	Yun, Nix	1B
6–8, 11–13, 15–17, 23–25	103(a)	Yun, Lubonski, Richardson	1C

[2] Petitioner and its expert declaration from Dr. Paul D. Martin incorrectly referred to Yun as "Yoon." For the record, we shall address the correct inventor name identified in KR 2012/0046807 as "Yun" herein.
[3] The Leahy-Smith America Invents Act ("AIA"), Pub. L. No. 112-29, 125 Stat. 284 (2011), amended 35 U.S.C. § 103, effective March 16, 2013. Because the challenged claims of the '887 patent have an apparent effective filing date before March 16, 2013, the pre-AIA version of § 103 applies.

Claim(s) Challenged	35 U.S.C. §[3]	Reference(s)/Basis	Ground name
1–3, 5, 20, 21, 28	103(a)	Overton	2A
4, 14, 22	103(a)	Overton, Nix	2B
6–8, 11–13, 15–17, 23–25	103(a)	Overton, Lubonski, Richardson	2C
1–3, 5, 20, 21, 28	103(a)	Lu	3A
6–8, 11–13, 15–17, 23–25	103(a)	Lu, Lubonski, Richardson	3B

III. ANALYSIS

A. Legal Standards

"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")); *see also* 37 C.F.R. § 42.104(b) (requiring a petition for *inter partes* review to identify how the challenged claim is to be construed and where each element of the claim is found in the prior art patents or printed publications relied upon). 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).

A patent claim is unpatentable under 35 U.S.C. § 103(a) when 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, i.e., secondary considerations.[4] *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

Additionally, the obviousness inquiry typically requires an analysis of "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) (requiring "articulated reasoning with some rational underpinning to support the legal conclusion of obviousness")). Petitioner cannot satisfy its burden of proving obviousness by employing "mere conclusory statements," but "must instead articulate specific reasoning, based on evidence of record, to support the legal conclusion of obviousness." *In re Magnum Oil Tools Int'l, Ltd.*, 829 F.3d 1364, 1380 (Fed. Cir. 2016).

B. Level of Ordinary Skill in the Art

The level of ordinary skill in the art is "a prism or lens" through which we view the prior art and the claimed invention. *Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001). The person of ordinary skill in the art is a hypothetical person presumed to have known the relevant art at the time of the invention. *In re GPAC Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995). In determining the level of ordinary skill in the art, we may consider certain

[4] The present record does not include any objective evidence of nonobviousness.

factors, including: "(1) the educational level of the inventor; (2) type of problems encountered in the art; (3) prior art solutions to those problems; (4) rapidity with which innovations are made; (5) sophistication of the technology; and (6) educational level of active workers in the field." *Best Med. Int'l, Inc. v. Elekta Inc.*, 46 F.4th 1346, 1353 (Fed. Cir. 2022) (quoting *Daiichi Sankyo Co. v. Apotex, Inc.*, 501 F.3d 1254, 1256 (Fed. Cir. 2007)). "The patent's purpose can also be informative." *Id.*

Petitioner contends that a person of ordinary skill in the art "would have had a bachelor's degree and two years' experience in cloud computing or a similar field, or a master's degree, in computer science or similar field." Pet. 5 (Paper 4, citing Ex. 1003 ¶ 61). Patent Owner does not challenge the level of ordinary skill in the art proposed by Petitioner's expert. *See generally* Prelim. Resp (Paper 10).

For purposes of this Decision, we adopt Petitioner's undisputed proposal as reasonable and consistent with the cited prior art and the disclosure of the '887 patent. *See Okajima*, 261 F.3d at 1355 (explaining that specific findings regarding ordinary skill level are not required "where the prior art itself reflects an appropriate level and a need for testimony is not shown" (quoting *Litton Indus. Prods., Inc. v. Solid State Sys. Corp.*, 755 F.2d 158, 163–64 (Fed. Cir. 1985)).

C. Testimonial Evidence – Expert Witness

Petitioner relies on the testimony of Dr. Paul D. Martin to support the Petition. Dr. Martin testifies that (1) he is the Chief Scientist at Harbor Experts, Inc. and a part-time Lecturer in the Department of Computer Science at Johns Hopkins University, and (2) he has B.S., M.S.E., and Ph.D. degrees in computer science from Johns Hopkins University. Ex. 1003 ¶ 4;

Ex. 1004 (CV). Dr. Martin also testifies that he has extensive experience in (1) remote access technology and (2) cloud virtualization technology including virtualization, cloud-based streaming, and mobile cloud computing between mobile devices and remote servers, via networks (e.g., wired or wireless). Ex. 1003 ¶¶ 4–26.

Patent Owner does not dispute Dr. Martin's qualification to express opinions regarding the technology involved in this proceeding. Dr. Martin is qualified to serve as an expert regarding the technology involved in this proceeding.

D. Claim Construction

We interpret the challenged claims

> 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). Under that standard, we generally give claim terms their ordinary and customary meaning, as would be understood by a person of ordinary skill in the art at the time of the invention, in light of the language of the claims, the specification, and the prosecution history. *Phillips v. AWH Corp*., 415 F.3d 1303, 1312–14 (Fed. Cir. 2005) (en banc). Only those terms in controversy need to be construed, and only to the extent necessary to resolve the controversy. *Realtime Data, LLC v. Iancu*, 912 F.3d 1368, 1375 (Fed. Cir. 2019).

The ordinary and customary meaning of claim terms can be evidenced by a variety of sources, including "the words of the claims themselves, the remainder of the specification, the prosecution history, and extrinsic

evidence concerning relevant scientific principles, the meaning of technical terms, and the state of the art." *Phillips*, 415 F.3d at 1314. Typically, it is the use of the words in the context of the written description and customarily by those skilled in the relevant art that accurately reflects both the "ordinary" and the "customary" meaning of the terms in the claims. *Ferguson Beauregard/Logic Controls, Div. of Dover Res., Inc. v. Mega Sys., LLC*, 350 F.3d 1327, 1338 (Fed. Cir. 2003).

> The claims, of course, do not stand alone. Rather, they are part of a fully integrated written instrument . . . consisting principally of a specification that concludes with the claims. For that reason, claims must be read in view of the specification . . . . [T]he specification is always highly relevant to the claim construction analysis. Usually, it is dispositive; it is the single best guide to the meaning of a disputed term.

Phillips, 415 F.3d at 1315 (internal quotations omitted). As such, the '887 patent's specification is the best guide to the meaning of claim terms. Extrinsic evidence is "less significant than the intrinsic record in determining 'the legally operative meaning of claim language.'" *Id.* at 1317.

Independent claim 1 recites, in relevant part, "*at least one of the display, the audio and the hardware (HW) action*" (emphasis added). Independent claims 11, 20, and 28 recite the same phrase using the same format of "at least one of [A], [B], and [C]." '887 patent, Claims 1, 11, 20, and 28.

Petitioner and Patent Owner have exchanged claim constructions for the term "at least one of the display, the audio, and the hardware (HW) action" in the parallel district court proceeding. Ex. 2001, Ex. 2002. In particular, Petitioner proposed a "[p]lain and ordinary meaning" construction for this term in district court (Ex. 2002, 6), and Patent Owner advocated for

a conjunctive construction of the "at least one of . . . and" term, proposing that this term be construed as "at least one of each of the display, the audio and the hardware (HW) action" (Ex. 2001, 16–17).

In support of the Petition, Petitioner does not propose construction of any term, except noting "the plain and ordinary meanings of the claim terms" should apply. Pet. 5 (Paper 4).

Patent Owner argues that the plain and ordinary meaning of the phrase "at least one of . . . and" is conjunctive consistent with the Federal Circuit's decision in *SuperGuide Corp. v. DirecTV Enters., Inc.*, 358 F.3d 870, 885–86 (Fed. Cir. 2004); *see also Medgraph, Inc. v. Medtronic, Inc.*, 843 F.3d 942, 949–50 (Fed. Cir. 2016) (applying conjunctive meaning to "and" where support "does not compel a disjunctive construction"). Prelim. Resp. 8 (Paper 10).

In response to the Acting Director's Remand Order (Paper 16), Petitioner contends the plain and ordinary meaning of the phrase "at least one of . . . and" is disjunctive, noting:

> [t]he Federal Circuit has held that the plain and ordinary meaning of "at least one of" is the disjunctive "one or more." *SuperGuide Corp. v. DirecTV Enters., Inc.*, 358 F.3d 870, 886 (Fed. Cir. 2004).

Remand Br. 1 (Paper 19) (emphasis added).

Petitioner's characterization of the Federal Circuit's decision in *SuperGuide Corp.* is incorrect. Instead, the Federal Circuit held the exact opposite—there is a rebuttable presumption that the plain and ordinary meaning of the term "at least one of [A], [B], and [C]" as conjunctive, i.e., to mean "at least one of [A], at least one of [B], and at least one of [C]." *SuperGuide*, at 886.

For example, the disputed limitation in *SuperGuide* was the phrase "at least one of [A] a desired program start time, [B] a desired program end time, [C] a desired program service, and [D] a desired program type." The Federal Circuit affirmed a district court decision supporting DirecTV's narrow construction of the phrase "at least one of [A], [B], and [C]" as conjunctive, which meant that the phrase should refer to "[A] at least one display action, [B] at least one audio action, ***and*** [C] at least one hardware (HW) action. *Id.* According to the Federal Circuit, "an article of a preposition applying to all the members of the series must either be used only before the first term or else be repeated before each term," citing the standard English language usage book "Elements of Style" by William Strunk, Jr. & E.B. White. *Id.* As an example of the disjunctive sense, the Federal Circuit explained that "'in spring, summer, or winter' means 'in spring, in summer, or in winter.'" *Id.* (brackets omitted).

In light of *SuperGuide*, Patent Owner argues the "Board should apply a conjunctive construction to the 'at least one of . . . and' terms because the plain and ordinary meaning of the claim supports it, and rather than compelling a disjunctive construction, other claim language and the specification confirms that the conjunctive construction is correct." Prelim. Resp. 9 (Paper 10). According to Patent Owner,

> the terms 'at least one of the display, the audio and the hardware (HW) action' should be construed as 'at least one of each of the display, the audio and the hardware (HW) action,' which requires at least one display action, at least one audio action, ***and*** at least one hardware (HW) action consistent with the plain and ordinary meaning of its conjunctive form."

Id. at 10 (emphasis in original).

In its Preliminary Reply, Petitioner argues the conjunctive construction of *SuperGuide* is overly narrow and is not a *per se* rule because some courts and tribunals (including PTAB) at times have departed from *SuperGuide* for a disjunctive construction. Prelim. Reply 5 (Paper 11, citing *Apple, Inc. v. CPC Patent Tech. PTY, Ltd.*, IPR2022-00601, Paper 31, 27–28 (collecting cases)). However, Petitioner does not proffer any explanation as to (1) why the normal conjunctive meaning of the phrase "at least one of [A], [B], and [C]" does not apply in this Petition, or (2) why a disjunctive construction should apply when a patent claim, specification, or the prosecution history necessitates a meaning that is wider in scope. Instead, Petitioner indicates "after institution, Petitioner will address how PO's construction of this limitation is incorrect." *Id.*

In response to the Acting Director's Remand Order (Paper 16), Petitioner reiterates that "*SuperGuide* did not establish 'a *per se* rule that the use of 'at least one of' followed by 'and' necessarily connotes a conjunctive list," and cites the Board's decision in *Taiwan Semiconductor Mfg. Co. v. Godo Kaisha IP Bridge 1*, IPR2017-01862, Paper 9, 9–10 (Feb. 6, 2018) ("TSMC") to guide the application of *SuperGuide*. Remand Br. 2–3 (Paper 19).

However, *TSMC* is inapposite. We are mindful that the conjunctive construction of *SuperGuide* is not a *per se* rule precisely because the presumption established by the Federal Circuit that "at least one of A, B, and C" means "at least one of A, one of B, and at least one of C" can be rebutted. *SuperGuide*, at 886. We are also cognizant that numerous courts and tribunals (including PTAB) have declined to follow the Federal Circuit's *SuperGuide* construction of "at least one of" particularly, when the patent's

claims, specification, or prosecution history provide an exception to the above rule, i.e., to rebut the presumption that the patentee intended to use the plain and ordinary meaning and necessitate a broader meaning, i.e., a disjunctive construction.[5]

---

[5] *See, e.g.*, *Fujifilm Corp. v. Motorola Mobility LLC,* No. 12-cv-03587-WHO, 2015 WL 1265009, at *8 (N.D. Cal. Mar. 19, 2015) (summarizing cases and noting *"SuperGuide* did not erect a universal rule of construction for all uses of 'at least one of' in all patents" when the specification or claims suggest otherwise); *VendoNet, Inc. v. Redbox Automated Retail, LLC*, No. 13-cv-03475, 2014 WL 4555287, at *4 (N.D. Ill. Sept. 15, 2014) ("[*SuperGuide*] did not announce that its rule of grammar was a mandatory rule of claim construction, to be used even when unnecessary to serve the purpose of the invention."); *Inventio AG v. ThyssenKrupp Elevator Americas Corp.*, No. 08-cv-00874-RGA, 2014 WL 129799, at *3–4 (D. Del. Jan. 14, 2014) (distinguishing *SuperGuide* and construing "at least one of [A] or [B]" as "[A], [B], or [A] and [B]"); *Dealertrack, Inc. v. Huber*, No. 06-cv-02335, 2008 WL 5792509, at *7–8 (C.D. Cal. Sept. 27, 2008) (finding *SuperGuide* "inapplicable" in part because the limitation at issue in *SuperGuide* included categories with values "that users . . . could choose 'at least one of'"); *Power-One, Inc. v. Artesyn Technologies, Inc.*, No. 05-cv-00463, 2007 WL 896093, at *14 (E.D. Tex. Mar. 22, 2007) (distinguishing *SuperGuide* and construing "at least one of X, Y, and Z" as "a group [of X, Y and Z from which] at least one is selected"); *Mad Catz Interactive, Inc. v. Razer USA, Ltd.*, No. 3:13-cv-2371-gpc, 2015 WL 3905074, at *13–14 (S.D. Cal. June 25, 2015) (following *SuperGuide* for some claims but distinguishing it for others based on the claim language and embodiments disclosed in the specification); *Joao v. Sleepy Hollow Bank*, 348 F. Supp. 2d 120, 124 (S.D.N.Y. 2004) (rejecting a conjunctive reading of the limitation "the banking transaction is *at least one of* a clearing transaction, a check clearing transaction, an account charging transaction, and a charge-back transaction" as nonsensical because a single banking transaction cannot be all four); *Joao Bock Transaction Sys., LLC v. First Nat'l Bank,* No. 11-c-6472, 2013 WL 3199981, at *6–7 (N.D. Ill. June 24, 2013) (rejecting a conjunctive reading of the limitation "one of approving and disapproving" because it "would render a substantial portion of Plaintiffs claims meaningless"); *Pinpoint Inc. v. Amazon.com,* No. 03-c-4954, 2004 WL 5681471, at *16 (N.D. Ill. Sept. 1,

For example, in *Ex parte Concha*, the issue focused on the construction of a limitation in the "at least one of [A] and [B]" format. *Ex parte Concha*, No. 2012-008364 (PTAB Jan. 28, 2015). Upon consideration of the specification and the positions of the applicants and the Examiner, the panel found "*Superguide* [sic] is not pertinent" because the claims and specification suggested only a single item should be selected rather than a plurality. *Id.*

Likewise, the challenged claim in *TSMC* recited "a first interconnect . . . having convex or concave portions at least at one of its side surfaces and bottom surface." *Taiwan Semiconductor Mfg. Co. v. Godo Kaisha IP Bridge 1*, IPR2017-01862, Paper 9, 9–10 (Feb. 6, 2018). The panel interpreted this as a disjunctive list (1) because the specification disclosed "embodiments wherein an interconnect has convex/concave portions only on a bottom surface, embodiments wherein an interconnect has convex/concave portions only on the side surfaces, and embodiments having convex and concave portions on the bottom surface and the side surfaces" and (2) because "the surfaces either have convex/concave portions or they do not" such that "the side and bottom surfaces" are "individual parameters as opposed to

---

2004) *(*"*Superguide* [sic] is inapplicable because the prosecution history supports Pinpoint's proposed construction" and reveals both the inventors and the examiner "explicitly asserted that the phrase meant . . . '*either* . . . *or*'"); *QSC Audio Prods., LLC, v. Crest Audio, Inc.*, No. IPR2014-00131, 2015 WL 2089370, at *4–5 (PTAB May 1, 2015) (following *SuperGuide* for one limitation but not another because "*SuperGuide* has been distinguished on the basis that the normal conjunctive meaning does not apply when the specification or claims imply a broader meaning"); *In re Certain Ground Fault Circuit Interrupters*, Inv. No. 337-ta-739, 2012 WL 2394435, at *20–21 (USITC June 8, 2012) (distinguishing because the specification described a disjunctive embodiment but not a conjunctive one).

categories from which different values can be selected." *TSMC*, 10–11. In other words, the specification supports a disjunctive construction.

In contrast, in *Ex parte Jung*, the panel reached the opposite result while following *SuperGuide*. *Ex parte Jung*, No. 2016-008290 (PTAB Mar. 20, 2017). The panel concluded, based on the review of the specification and prosecution history, the plain and ordinary meaning of "at least one of A and B" is the conjunctive unless the record indicates otherwise. *Id.*

For these reasons, we remain unpersuaded by Petitioner's interpretation of *SuperGuide*. Nevertheless, Petitioner repeats the same argument presented in the Petition (Paper 4)—that the term "at least one of [A] the display, [B] the audio, and [C] the hardware action" recited in the claims should be construed as disjunctive, as opposed to conjunctive set forth by *SuperGuide*. Remand Br. 2–3 (Paper 19). According to Petitioner, the disjunctive construction is supported by (1) the claim language, (2) the specification, and (3) prosecution history. *Id.*, 3–10.

In response, Patent Owner argues the Board correctly construed that term as conjunctive set forth by *SuperGuide* consistent with (1) the claim language, (2) the specification, and (3) prosecution history. Responsive Remand Br. 2–10 (Paper 19).

However, Petitioner's arguments are not persuasive because the Board's conjunctive construction of the phrase "at least one of [A] the display, [B] the audio and [C] the hardware (HW) action" is correct in light of (1) the claim language, (2) the specification (disclosed embodiments), (3) prosecution history, and (4) Federal Circuit precedent for reasons we will discuss *seriatim* below.

(1) *The Claim Language Supports a Conjunctive Construction*

There is a "heavy presumption" that the terms used in claims "mean what they say and have the ordinary meaning that would be attributed to those words by persons skilled in the relevant art." *SuperGuide*, at 875 (citing *Tex. Digital Sys., Inc. v. Telegenix, Inc.,* 308 F.3d 1193, 1202 (Fed.Cir.2002)).

Independent claim 1 recites three basic steps: "receiving," "processing," and "sending" as follows:

> 1[a] receiving, by the server, *input information* from at least one mobile device, wherein *the input information has not been processed to produce a display, audio and a hardware (HW) action by a HW component of the mobile device*;
>
> 1[b] processing, by a mobile device operating system (OS) executed at the server, the input information to produce a stream of user interface information for use in reproducing at the mobile device *at least one of the display, the audio and the hardware (HW) action by the HW component of the mobile device* based on a same instance of the mobile device operating system; and
>
> 1[c] sending, by the server, the stream of user interface information to the mobile device to reproduce at the mobile device *at least one of the display, the audio and the HW action by the HW component of the mobile device*.

Ex. 1001, 13:40–57 (emphases added). Claim 20 recites similar limitations. *Id.*, 15:40–45.

As recited in the challenged claims 1 and 20 of the '887 patent, "input information" is received by remote server 12 from mobile device 10, shown in Figure 1 of the '887 patent, to produce three (3) separate and distinct components: "[A] a display, [B] audio and [C] a hardware (HW)

action by a HW component of the mobile device" even though "the input information has not been processed [at that time]." *Id.*, 3:44–46, 1543–44. Upon receipt of "input information" from mobile device 10, such "input information is then processed by remote server 12 to produce a stream of user interface information for use in reproducing at the mobile device "at least one of [A] the display, [B] the audio and [C] the hardware (HW) action" and sending back to the mobile device in order to reproduce at the mobile device "at least one of [A] the display, [B] the audio and [C] the hardware (HW) action."

As correctly recognized by Patent Owner, the antecedent basis for sending "at least one of [A] the display, [B] the audio and [C] the HW action" in claims 1 and 20 of the '887 patent is "to produce "[A] a display, [B] audio and [C] a hardware (HW) action." Prelim. Resp. 9 (Paper 10); Responsive Remand Br. 2–3 (Paper 20). Such recitations suggest a conjunctive understanding of the phrase "at least one of [A], [B], and [C]."

As we previously explained,

> if "input information" is required to produce three (3) separate and distinct components: "[A] a display, [B] audio and [C] a hardware (HW) action by a HW component of the mobile device," then the "user interface information" for use in reproducing at the mobile device is, likewise, required to include the three (3) separate and distinct components: "at least one of [A] the display, [B] the audio ***and*** [C] the hardware (HW) action by the HW component of the mobile device."

Prior Dec. 16–17 (Paper 13).

Nevertheless, Petitioner presents several new arguments to support a disjunctive construction. Remand Br. 3–5 (Paper 19). But we remain unpersuaded for reasons below.

First, Petitioner argues like the claims in *TSMC*, "[d]isplay, audio, and hardware action are not values that users must choose at least one of for the invention's purpose to be served, as in *SuperGuide*; rather, they are types of data (i.e., parameters) where the invention contemplates including less than all of them." *Id.*, 3.

We disagree. As previously discussed, whether the term "at least one of [A] the display, [B] the audio, and [C] the hardware action" should be construed as conjunctive set forth by *SuperGuide* depends upon whether that term is consistent with the claim language, the specification and the prosecution history, and not whether that term indicates values vs. parameters recited in *TSMC*.

Second, Petitioner acknowledges the antecedent basis for "[A] the display, [B] the audio, and [C] the hardware (HW) action" in claims 1 and 20 of the '887 patent, but argues "the Applicant clearly knew how to recite a conjunctive list–e.g., by omitting 'at least one of'" "but deliberately chose to use different phrasing" to support a disjunctive construction. *Id.*

We agree with Petitioner that "the Applicant clearly knew how to recite a conjunctive list." Accordingly, **if the Applicant intended the term "at least "[A] a display, [B] audio and [C] a hardware (HW) action by a HW component" to mean A, B, or C, Applicant should have used "OR."**

Third, Petitioner argues the "receiving" step of claims 1 and 20 recites "negative limitations about how input information is processed (i.e., "the input information has not been processed to produce a display, audio and hardware (HW) action by a HW component of the mobile device") and, as

such, "clearly exclude[s] all three options in their negative limitations." *Id.*, 4.

We disagree. Contrary to Petitioner's argument, the negative limitation does not exclude the production of "[A] a display, [B] audio and [C] a hardware (HW) action by a HW component of the mobile device." Instead, a skilled artisan would understand the negative limitation recited in claims 1 and 20 is supported by the '887 patent's disclosure (Ex. 1001, 4:53–63, 5:29–43, 6:58–60, 6:63–7:3, 7:63–65) as referring to "input information" received by server 12, shown in Figure 2, but has not been processed until server's processing to produce "[A] a display, [B] audio and [C] hardware (HW) action by a HW component of the mobile device." *Id.*, 6:58–60 "mobile device 10 does not process the input information . . . instead minors [sic, mirrors] the information or changes input to the HW components of the mobile device 10 to the server 12."

Lastly, Petitioner argues "other independent claims also support a disjunctive construction." Remand Br. 5 (Paper 19). According to Petitioner, independent claim 11 recites "sending, by the server, the stream of user interface information to the mobile device, wherein the stream of user interface information . . . comprises a plurality of different types of data and the server sends each different types of data . . . in a separate data stream" but such recitations do not require "all three data types in claim 11." *Id.*, 5–6.

> We remain unpersuaded. As correctly recognized by Patent Owner,
>
> claim 11 confirms a conjunctive construction by referring to a "plurality of different data types and the server sends each different type of data" 3 ('887 patent, 14:55-57), which only makes sense when "and" is read conjunctively to include "each"

> of the different data types, i.e., the display, the audio, and hardware action.

Responsive Remand Br. 3 (Paper 20). Otherwise, only one type of data is required (i.e., display, audio, ***or*** hardware action), which is illogical when independent claim 11 requires "a plurality of different types of data and the server sends each different types of data . . . in a separate data stream." Ex. 1001, 14:55–60.

For these reasons, we are persuaded that the claims themselves compel a conjunctive construction of the phrase "at least one of [A], [B], and [C]."

(2) *The Specification Supports a Conjunctive Construction*

The specification and the drawing (Figure 2) of the '887 patent also reinforce the conjunctive construction and confirm that the patentee's use of the disputed term is consistent with the meaning given to it by the court. *Rexnord Corp. v. Laitram Corp.,* 274 F.3d 1336, 1342 (Fed.Cir.2001). Specifically:

> claim terms take on their ordinary and accustomed meanings unless the patentee demonstrated an intent to deviate from the ordinary and accustomed meaning of a claim term by redefining the term or by characterizing the invention in the intrinsic record using words or expressions of manifest exclusion or restriction, representing a clear disavowal of claim scope.

Teleflex, Inc. v. Ficosa N. Am. Corp., 299 F.3d 1313, 1327 (Fed.Cir.2002); *see Tex. Digital Sys.,* 308 F.3d at 1204.

For example, input information (e.g., a touch screen, buttons, sensors, a camera, Bluetooth, etc.) is received at mobile device 10, via its input

components (e.g., a touch screen, buttons, sensors, a camera, Bluetooth, etc.) shown Figure 2, to indicate "a hardware (HW) action" by a HW component of mobile device 10 (i.e., touch screen gestures, pressed buttons, sensor data etc.) along with audio data and video data, and is then sent to remote server 12 for processing at remote server 12. Ex. 1001, 4:53–63, 5:3–12, 5:29–38, 6:66–7:3.

Similarly, the specification of the '887 patent describes hardware (HW) actions as separate and distinct from video/audio actions. For example, the specification describes: (1) "[t]he mobile device 10 produces the **display**, speaker **audio** and/or a **HW action** of a hardware component (e.g., **activates and/or controls a GPS and/or one or more sensors**) based on the mirrored emulated user interface information)" and (2):

> [t]he mobile device 10 decodes and assembles the separate **video**, image and text data streams of the display data/user interface data into a display . . . enables **different HW operations or actions** according to requests from the [server] 12. For example, the mobile device 10 **enables the camera and/or microphone** in response to a request from the server 12. The mobile device 10 decodes the compressed **audio** of the user interface data and reproduces the audio at the speaker in coordination with the assembled display.).

Prelim. Resp. 10 (Paper 10, citing Ex. 1001, 6:66–7:3, 10:56–64) (emphasis in original).

The specification of the '887 patent also describes:

> A server-to-client protocol at the server 12 separates the emulated user experience, i.e., the user interface data resulting from processing of the input information by the mobile OS and/or applications at the server 12, into <u>different data streams including video, image, audio, notifications and text data streams</u>. The video, image and text data may be separated into individual streams by an identification unit configured to identify

> the video, image and text data in one or more streams of display data output from a hardware emulation of the display. The server 12 sends, e.g., streams, each type of data independently to the mobile device 10 in a separate stream.

Ex. 1001, 8:54–64 (emphases added).

Nevertheless, Petitioner argues the specification compels a disjunctive construction. Remand Br. 6–10 (Paper 19). For example, Petitioner argues "[t]he '887 Patent illustrates eleven [11] embodiments in which a mobile deice gathers input data and sends it to a server for processing, after which the server sends display and/or audio UI information to the mobile device for output to the user" and those "embodiments thus do not restrict the server to send–and the mobile device to reproduce–a video/display, audio, **and** a HW action." *Id.*, 7. In support of that argument, Petitioner provides the following embodiments:

Embodiment	Description
Fig. 2	Ex. 1001, 4:43–5:47, 4:64–65 ("server 12 processes the input information to produce a display and/or audio output")
Fig. 3	*Id.*, 5:48–6:21, 6:15–21 ("pass in real time…display graphics motions…perform voice calling or send a SMS")
Fig. 4	*Id.*, 6:22–8:3, 6:66–7:3 (The mobile device 10 produces the display, speaker audio **and/or** a HW action…")
Fig. 5	*Id.*, 8:4–9:17, 8:37–43 ("If the mobile OS on the server 12 receives input information to draw a circle on the display…[it] emulates the resulting display and sends user interface information for reproducing the resulting display…")
Fig. 6	*Id.*, 9:18–11:11, 9:29–32 ("For example, audio data is sent from the server…in a first stream separate and different from a second stream in which video data is sent.")
Fig. 7	*Id.*, 11:12–33, 11:29–33 ("The mobile device 10 decodes

	the processed audio/video data…and displays the results and reproduces the audio.")
Fig. 8	*Id.*, 11:34–62, 11:57–62 ("The first and second mobile devices 10 receive the processed audio/video streams…)
Fig. 9	*Id.*, 11:63–12:11, 12:8–11 ("The mobile device 10 decodes audio data sent from the server 12")
Fig. 10	*Id.*, 12:12–33, 12:22–26 ("The server 12…separates the web page display into video, image, text and audio streams and sends the web page to the mobile device.")
Fig. 11	*Id.*, 12:34–48, 12:39–44 ("The server 12…sends user interface information including display data and audio data to the mobile device 10")
Fig. 12	*Id.*, 12:49–62, 12:53–59 ("server 12…sends user interface information including display data and/or audio data…to the mobile device 10")

We agree with Petitioners that the specification provides multiple embodiments of input information used to produce different types of output information including, for example: (1) "display and/or audio," (2) "display graphics," (3) "display, speaker audio **and/or** a HW action," or (4) "video, image, text and audio streams." Remand Br. 6–7 (Paper 19).

However, as correctly recognized by Patent Owner, "[i]t is wrong to insert an 'or' into the claims where no 'or' was used or intended." Responsive Remand Br. 9 (Paper 20). Indeed, if the Applicant intended the term "at least "[A] a display, [B] audio and [C] a hardware (HW) action by a HW component" to mean A, B, or C, Applicant should have used "OR." The written description is not a substitute for, nor can it be used to rewrite, the chosen claim language. "**Specifications teach. Claims claim**." *SRI Int'l v. Matsushita Elec. Corp. of Am.,* 775 F.2d 1107, 1121 n. 14 (Fed.Cir.1985) (en banc).

(3) *The Prosecution History of the '887 Patent Supports a Conjunctive Construction*

Petitioner argues because "[a]t no time did the Examiner interpret the independent claims to require that each of a display, audio, and HW action be sent to and/or reproduced by the mobile device, nor did the Examiner cite art teaching all three being sent/reproduced to/by the mobile device . . . [N]or did the Applicant ever advocate for a conjunctive construction," "the prosecution history thus also supports a disjunctive construction." Remand Br. 10 (Paper 19).

We disagree. Petitioner's reliance on a prosecution history that states "and/or" does not weigh in favor of a disjunctive construction of the phrase "at least one of [A] the display, [B] the audio and [C] the hardware (HW) action." Different claim terms in an *issued patent* are "presumed to have different meanings." *Bd. of Regents of the Univ. of Tex. Sys. v. BENQ Am. Corp.*, 533 F.3d 1362, 1371 (Fed. Cir. 2008).

Based on our review of the arguments and evidence, we construe the plain and ordinary meaning of the phrase "at least one of [A] the display, [B] the audio and [C] the hardware (HW) action" as conjunctive for purposes of this Decision.

E. Ground 1A: Asserted Obviousness of Claims 1–3, 5, 20, 21, and 28 based on Yun

Petitioner contends that Yun renders obvious the subject matter of independent claims 1, 20, and 28 and their respective dependent claims 2–3, 5, and 21. Pet. 5–19 (Paper 4). Patent Owner disputes whether the "hardware (HW) action" recited in independent claims 1, 20, and 28 are disclosed, based on its claim construction. Prelim. Resp. 13–17 (Paper 10). Based on our conjunctive construction of the phrase "at least one of [A] the

display, [B] the audio and [C] the hardware (HW) action" and reasons discussed below, Petitioner has failed to establish a reasonable likelihood that Yun teaches or suggests the missing "hardware (HW) action" of the phrase "at least one of [A] the display, [B] the audio and [C] the hardware (HW) action" recited in claims 1, 20, and 28. *Id.* We provide below a brief overview of Yun and a discussion of the deficiency of Petitioner's assertion of unpatentability.

1. Yun (Exhibit 1005)

Yun is titled "Method and Apparatus for Providing Virtual Platform." Ex. 1005, code (54). Yun discloses "a virtual environment of a mobile operating system (OS) and a mobile application," where a "virtualization server generates a virtual environment of a mobile OS, and operates a mobile application in the virtual mobile OS." *Id.* at code (57).

Yun describes that "an application that is developed for a specific smart phone OS may not be used for other smart phones that do not use the OS." *Id.* at 7. To address this, Yun discloses a "virtualization server for virtualizing a specific portable terminal platform and a streaming server for providing a virtual environment." *Id.* at 6. Figure 1, reproduced below, shows a diagram of Yun's virtual platform structure. *Id.* at 10.

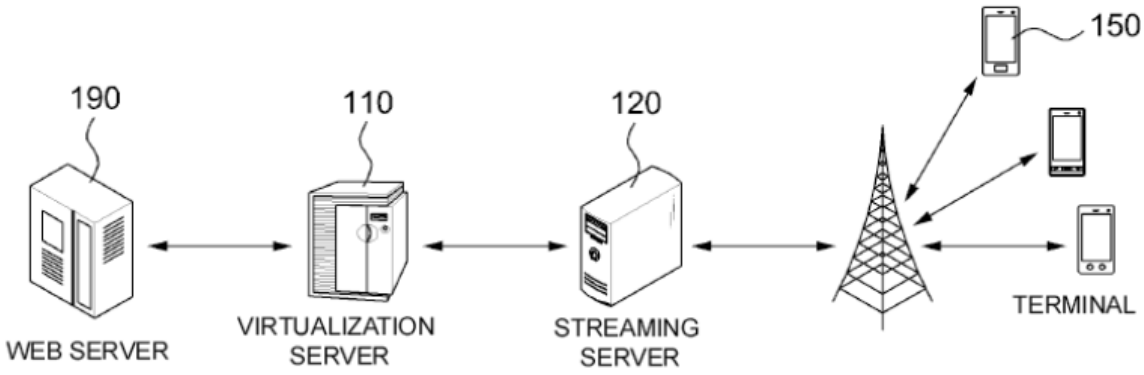

Figure 1 illustrates virtualization server 110, streaming server 120, connected through a high-speed network such as a local area network (LAN) or the like, and terminal 150 (e.g., mobile device), to which the virtualization service is provided, where terminal 150 (e.g., mobile device) may be connected through a wireless communication network. *Id.* at 11. Yun's virtualization service includes:

> receiving a virtualization service request from a terminal; operating the mobile OS or the application for the terminal; transmitting information on operations of the mobile OS or the application to the terminal; and receiving input information for manipulating the mobile OS or the application from the terminal.

Id. at 7–8.

As shown in Yun's Figure 1, data related to virtual environment is exchanged between virtualization server 110 and remote terminal 150 (mobile device). For example, Yun's "virtual environment information is transmitted from the virtualization server 110 to the terminal 150 [mobile device], and input information is transmitted from the terminal 150 [mobile device] to the virtualization server 110." *Id.* at 14. Yun's Figure 2 is reproduced below with Petitioner's additional annotations for clarity.

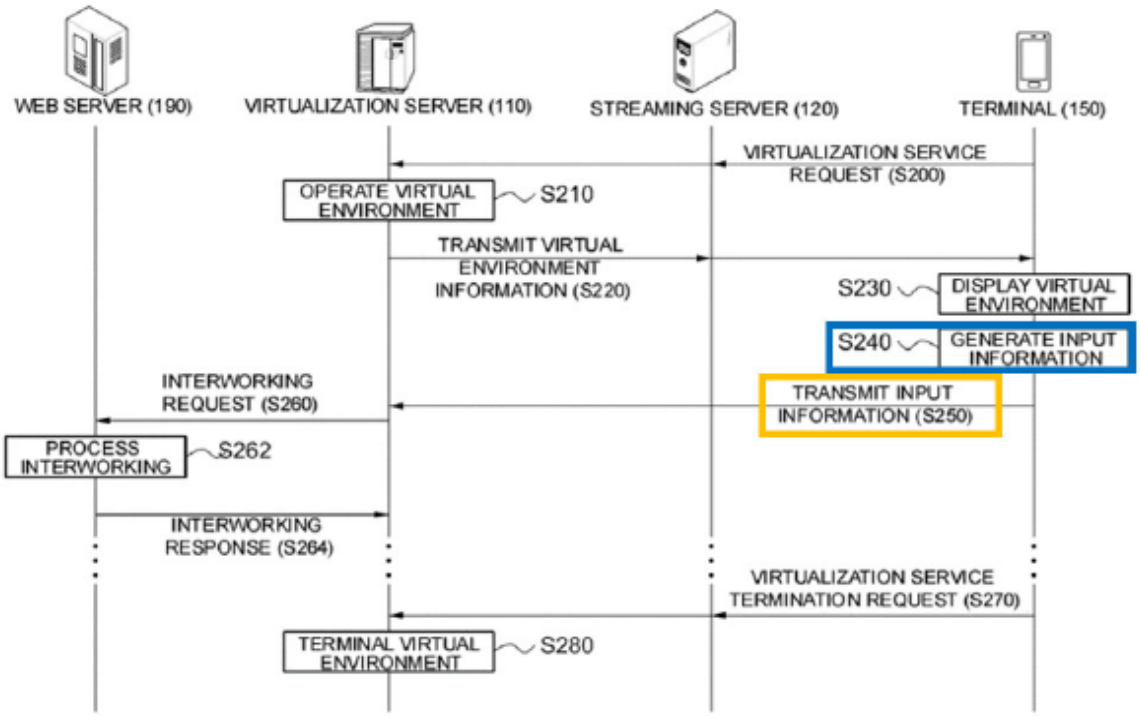

Figure 2, reproduced above, illustrates that (1) virtual environment information (S220) is generated virtualization server 110 to terminal 150 (mobile device), and (2) input information (S240 marked in blue) is generated by terminal 150 (mobile device) and transmitted to virtualization server 110 (S250 marked in yellow).

2. Discussion

Independent claim 1 of the '887 patent recites a "method of emulating a mobile device at a server" comprising limitations 1[a]–1[c], as reproduced below:

> 1[a] receiving, by the server, input information from at least one mobile device . . . to produce a display, audio and a hardware (HW) action by a HW component of the mobile device;
>
> 1[b] processing, . . . at the server, the input information to produce a stream of user interface information for use in reproducing at the mobile device at least one of the display, the audio and the hardware (HW) action by the

HW component of the mobile device based on a same instance of the mobile device operating system; and

1[c] sending, by the server, the stream of user interface information to the mobile device to reproduce at the mobile device at least one of the display, the audio and the HW action by the HW component of the mobile device.

Pet. ix; Ex. 1001, 13:40–57.

As recited in claim 1, limitation 1[a] requires the server to receive "input information" from a mobile device to produce three (3) separate and distinct components: "[A] a display, [B] audio and [C] a hardware (HW) action by a HW component of the mobile device." Similarly, limitation 1[b] requires the server to process the "input information to produce a stream of user interface information for use in reproducing at the mobile device at least one of [A] the display, [B] the audio and [C] the hardware (HW) action by the HW component of the mobile device." Likewise, limitation 1[c] requires the server to send "the stream of user interface information to the mobile device to reproduce at the mobile device at least one of [A] the display, [B] the audio and [C] the HW action by the HW component of the mobile device." Independent claims 20 and 28 recite the same phrase using the same format of "at least one of [A], [B], and [C]." Ex. 1001, claims 20 and 28.

Petitioner contends that Yun teaches or suggests all limitations of independent claim 1 and, similarly, independent claims 20 and 28. Pet. 5–19 (Paper 4).

Patent Owner responds that Petitioner does not establish that Yun teaches or suggests the "hardware (HW) action" aspect of the claims because (1) Petitioner "incorrectly interprets and addresses the phrase 'at least one of

the display, the audio and the hardware (HW) action'" in claim 1 (and similar phrases in claims 20 and 28) in the disjunctive, "interpreting 'at least one of . . . and' as an 'or' to merely require a display action, an audio action, ***or*** a hardware action"); and (2) Petitioner "skips over the 'hardware (HW) action" aspect of the claims and only attempts to address whether the reference [Yun] has audio or video actions." Prelim. Resp. 13–14 (Paper 10) (alteration in original). For example, Petitioner contends that Yun "discloses that the virtualization server transmits . . . the stream of ***video and sound*** . . . the [mobile] terminal . . . . The [mobile] terminal then ***displays images and plays sounds*** received from the virtualization server." Pet. 11–12 (Paper 4) (emphases added).

We agree with Patent Owner. First, the construction of the phrase "at least one of [A] the display, [B] the audio and [C] the hardware (HW) action" is conjunctive in light of the language of the claims and the specification of the '887 patent. As such, Petitioner has the burden, but fails to show all three (3) components to be reproduced at Yun's mobile device, including: [A] the display, [B] the audio and [C] the hardware (HW) action by the HW component of the mobile device.

Second, as Patent Owner observes, and we agree, "Petitioner ignores the requirement for 'the hardware (HW) action' entirely" and does not even mention any "hardware (HW) action." Prelim. Resp. 14 (Paper 10).

Third, Petitioner's expert, Dr. Paul D. Martin, tracks the arguments presented in the Petition and, likewise, fails to address "the hardware (HW) action" as a conjunctive aspect of the claims. For example, Dr. Martin's Declaration explains:

> [Yun's] "virtualization server 110 generates an execution screen image of the running mobile OS and/or application" as well as

> "a sound generated by the running mobile OS and/or application," and both are transmitted in a stream to the terminal."

Ex. 1003 ¶ 84. Dr. Martin's Declaration also describes:

> [Yun] discloses that the virtualization server transmits ('sending') the stream of video and sound ('user interface information') output from the virtualization server to the [mobile] terminal . . . The [mobile] terminal then displays images and plays sounds received from the virtualization server.

Id. ¶ 86 (emphasis omitted).

Petitioner's expert fails to account for "the hardware (HW) action" and articulate specific reasoning, based on evidence of record, as to why such "hardware (HW) action" would have been understood by a person skilled in the art as a separate part of Yun's input information to be processed at remote virtualization server 110 as opposed to terminal 150 (e.g., mobile device), shown in Yun's Figure 1, and then to be reproduced at terminal 150 (e.g., mobile device) along with video (image) and audio (sound).

For these reasons, we determine that Petitioner has not met its requisite burden of showing a reasonable likelihood of success that claims 1, 20, and 28 are unpatentable based on Yun. Claims 2, 3, 5, and 21, which depend from independent claims 1 and 20, have the same deficiencies as those discussed above in connection with claim 1. We also determine that Petitioner has not established the necessary showing with respect to claims 2, 3, 5, and 21.

F. Ground 1B–1C: Asserted Obviousness of (1) Claims 4, 14, and 22 based on Yun and Nix and (2) Claims 6–8, 11–13, 15–17, and 23–25 based on Yun, Lubonski, and Richardson

Petitioner asserts that (1) claims 4, 14, and 22 are unpatentable as obvious over Yun and Nix (Pet. 19–23) and (2) claims 6–8, 11–13, 15–17, and 23–25 are unpatentable as obvious based on Yun, Lubonski, and Richardson (*id.* at 23–35).

Because claims 4, 6–8, 12–13, 15–17 and 22 depend from independent claims 1, 20, and 28, and suffer the same have the same deficiencies as those discussed above in connection with claim 1, we also determine that Petitioner has not established the necessary showing with respect to claims 4, 6–8, 12–13, 15–17 and 22.

Separately, we note that claim 11 is independent and is slightly narrower than independent claims 1, 20, and 28. For example, claim 11 also requires the server to send "the stream of user interface information . . . to the mobile device" for reproduction "on the mobile device at least one of [A] the display, [B] the audio and [C] the HW action by the HW component of the mobile device." Ex. 1001, 14:53–57. In addition, claim 11 further defines "the stream of user interface information . . . comprises a plurality of different types of data" and "the server sends each different types of data to the mobile device in a separate data stream." *Id.* Because Petitioner fails to show a reasonable likelihood of success that claims 1, 20, and 28 are unpatentable based on Yun, and because Petitioner has not shown Lubonski or Richardson to remedy Yun's deficiencies, we determine Petitioner has not met its requisite burden of showing a reasonable likelihood of success that (1) claim 11 is unpatentable based on Yun, Lubonski, and Richardson, and

(2) claim 14, which depends from claim 11, is unpatentable based on Yun, Lubonski, and Richardson.

G. Ground 2A: Asserted Obviousness of Claims 1–3, 5, 20, 21, and 28 based on Overton

Petitioner asserts that claims 1–3, 5, 20, 21, and 28 are unpatentable as obvious over Overton. Pet. 36–52 (Paper 4). Patent Owner disputes whether the "hardware (HW) action" recited in independent claims 1, 20, and 28 are disclosed, based on its claim construction. Prelim. Resp. 13–17 (Paper 10).

We begin with an overview of the asserted art. We then turn to the parties' arguments.

1. Overton (Exhibit 1006)

Overton is titled "Remotely Emulating Computing Devices." Ex. 1006, code (54). Overton "relates to emulating computing devices over a network." *Id.* at 1:54–55. Overton seeks to help permit customers to purchase applications that may not execute on the customer's client device, such as a smartphone application intended to execute on the customer's desktop computer. *Id.* at 1:55–62. Overton "enable[s] customers to use applications running remotely on emulated computing devices." *Id.* at 1:63–65.

Figure 1, reproduced below with additional markings, illustrates a networked environment for Overton's embodiments.

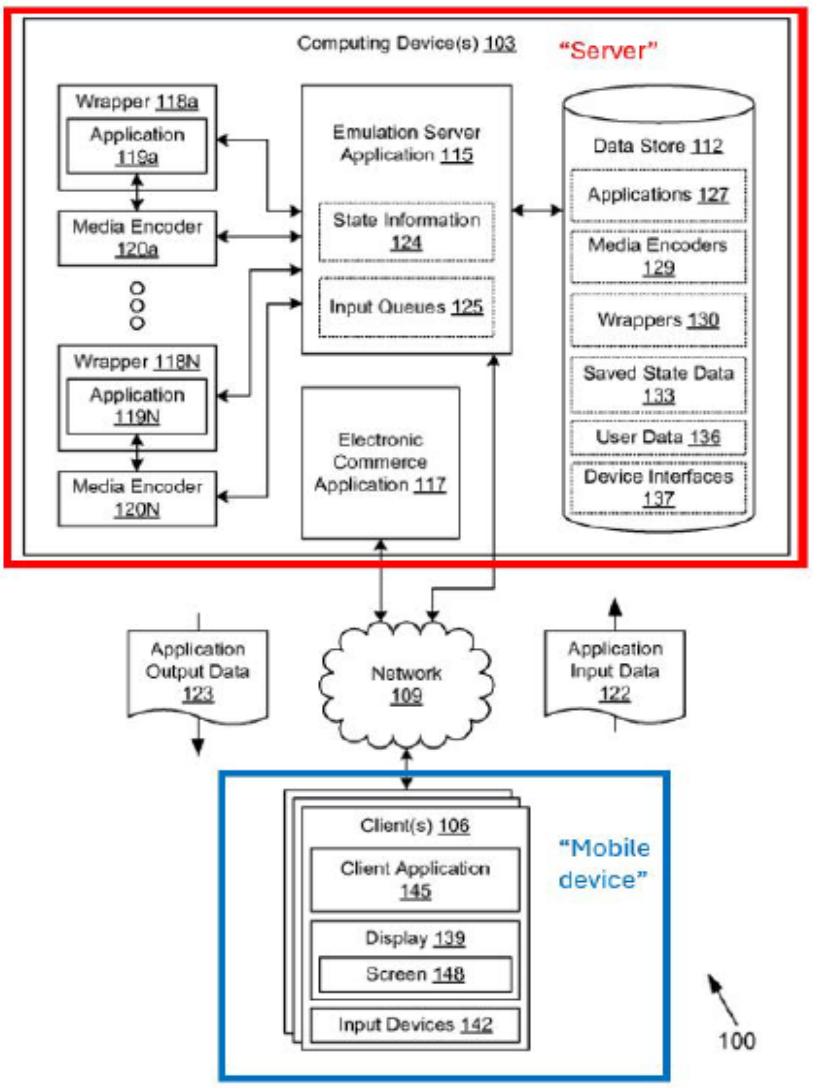

FIG. 1

Figure 1, above, illustrates computing devices 103 (i.e., "server" marked in red) in data communication with one or more clients 106 (i.e., "mobile device" marked in blue) by way of network 109. *Id.* at 2:24–28. On computing device 103 (i.e., "server" marked in red), "emulation server application 115 is executed to launch applications 119, which are executed within the wrappers 118," and "is also executed to obtain application input data 122 from the client(s) 106 and provide the application input data 122 to the respective wrapper 118." *Id.* at 2:65–3:3.

As shown in Figure 1 above, Overton's application 119 generates application output data 123—i.e., a video and/or audio signal. *Id.* at 3:4–6, 4:21–24. The video and/or audio generated at computing devices 103 ("server" marked in red) is encoded into a media stream (*id.* at 4:28–32) and sent to client device 106 ("mobile device" marked in blue) via network (*id.* at 6:41–44). Client device 106 then renders the video on display 139 and plays audio. *Id.* at 6:41–46, Fig. 1.

2. Discussion

In Petitioner's view, all limitations of claims 1–3, 5, 20, 21, and 28 are found in Overton. Pet. 36–52 (Paper 4). As with the ground that was based on Yun, Patent Owner challenges Petitioner's view as being deficient for failure to account "the hardware (HW) action" aspect of the claims and "only attempts to address whether the reference [Overton] has audio or video actions." Prelim. Resp. 13–14 (Paper 10).

Based on our construction of the phrase "at least one of [A] the display, [B] the audio and [C] the hardware (HW) action" as conjunctive, we agree with Patent Owner that (1) Petitioner "ignores the requirement for 'the hardware (HW) action' entirely" and does not even mention any "hardware (HW) action," and (2) Petitioner's expert, Dr. Paul D. Martin, also fails to address "the hardware (HW) action" as a conjunctive aspect of the claims. For example, Dr. Martin's Declaration explains:

> Overton further discloses that the application 119 generates a video and/or audio signal—i.e., application output data 123 []. Overton, 3:4–6, 4:21–24 ("Further, the wrapper 118 is able to obtain a video signal and/or audio signal generated by the application 119 as if the wrapper 118 emulates a display device, an audio device, or another type of output device."). This application output data is sent by the server to client 106 (mobile device).

Ex. 1003 ¶ 159 (emphasis omitted). Dr. Martin's Declaration also testifies:

> The video and/or audio generated at the server is encoded into a media stream (Overton 4:28–32) and sent to client device 106 (mobile device) via a network (Overton, 6:41–44). The client device then renders the video on display 139 [] and plays the audio (*reproducing . . . at least one of the display, the audio and the hardware (HW) action by the HW component of the mobile device*) Overton, 6:41–46, Fig. 1 (annotated).

Id. ¶ 160 (second alteration in original).

> Overton discloses that computing device 103 (*the server*) sends the media stream (*user interface information*) to a client device 106 (*mobile device*). Overton, 4:21–39 ("wrappers 118 may communicate directly with the clients 106 to . . . serve up the application output data 123."). The client device receives the media stream and renders video and audio from the stream on the device (*reproduce at the mobile device at least one of the display, the audio and the HW action by the HW component of the mobile device*.). Overton, 6:41–46 ("The client application 145 is also configured to obtain application output data 123 over the network 109 from the computing device 103 and render a screen 148 on the display 139. To this end, the client application 145 may include one or more video and audio players to play out a media stream generated by an application 119.").

Id. ¶ 162 (alteration in original).

Petitioner's expert fails to account for "the hardware (HW) action" and articulate an adequate evidentiary basis as to why such "hardware (HW) action" would have been understood by a person skilled in the art as a separate part of Overton's input information to be processed at computing device 103 (e.g., "server") as opposed to client 106 (e.g., "mobile device"), shown in Overton's Figure 1, and then to be reproduced at client 106 (e.g., mobile device) along with video (image) and audio (sound).

For these reasons, we determine that Petitioner has not met its requisite burden of showing a reasonable likelihood of success that claims 1, 20, and 28 are unpatentable based on Overton.[6] Claims 2, 3, 5, and 21, which depend from independent claims 1 and 20, have the same deficiencies as those discussed above in connection with claim 1. We also determine that Petitioner has not established the necessary showing with respect to claims 2, 3, 5, and 21.

H. Ground 2B–2C: Asserted Obviousness of (1) Claims 4, 14, and 22 based on Overton and Nix, and (2) Claims 6–8, 11–13, 15–17, and 23–25 based on Overton, Lubonski, and Richardson

Petitioner asserts that (1) claims 4, 14, and 22 are unpatentable as obvious over Overton and Nix (Pet. 52–58, Paper 4) and (2) claims 6–8, 11–13, 15–17, and 23–25 are unpatentable as obvious based on Overton, Lubonski, and Richardson (*id.* at 58–65).

Because claims 4, 6–8, 12–13, 15–17 and 22 depend from independent claims 1, 20, and 28, and suffer the same deficiencies as those discussed above in connection with claim 1, and because Petitioner has not shown Nix, Lubonski or Richardson to remedy Overton's deficiencies, we determine that Petitioner has not established the necessary showing with respect to claims 4, 6–8, 12–13, 15–17 and 22.

---

[6] In the Petitioner's Reply to the Patent Owner's Preliminary Response, Petitioner presents several arguments to address the *Fintiv* factors, *Apple Inc. v. Fintiv, Inc.*, IPR2020-00019, Paper 11 (Mar. 20, 2020) (precedential) ("*Fintiv*"). In support of Factor 6, Petitioner argues for the first time that Overton (not Yun or Lu) is allegedly teaching "the hardware (HW) action" aspect of the claims. Prelim. Reply 5 (citing Ex. 1006, 11:13–24 "force feedback . . . to the input devices 142 [shown in Figure 1]"). However, we decline to consider this belated argument raised for the first time in the context of a *Fintiv* analysis instead of the Petition.

However, claim 11 is independent and contains similar limitations of independent claims 1, 20, and 28, and thus suffers the same deficiencies as those discussed above in connection with claim 1. Because Petitioner fails to show a reasonable likelihood of success that claims 1, 20, and 28 are unpatentable based on Overton, we also determine Petitioner has not met its requisite burden of showing a reasonable likelihood of success that claim 11 is unpatentable based on Overton, Lubonski, and Richardson, and its dependent claim 14 based on Overton, Lubonski, and Richardson.

I. Ground 3A: Asserted Obviousness of Claims 1–3, 5, 20, 21, and 28 based on Lu

Petitioner asserts that claims 1–3, 5, 20, 21, and 28 are unpatentable as obvious over Lu. Pet. 65–75 (Paper 4). Patent Owner also disputes whether the "Hardware (HW) Action" in claims 1, 20, and 28 are disclosed, based on its claim construction. Prelim. Resp. 13–17 (Paper 10).

We begin with an overview of the asserted art. We then turn to the parties' arguments.

1. Lu (Exhibit 1007)

Lu is titled "Method and Apparatuses of Game Appliance Execution and Rendering Service." Ex. 1007, code (54). Lu relates to a game appliance system (e.g., "server") to:

> on-demand fetch game appliance from a game appliance distribution system, execute the game appliance on a game appliance apparatus [e.g., mobile phone] using emulation or virtualization, capture graphics rendering command of the executed game appliance using virtual graphics driver, render frame for the executed game appliance by a graphics rendering apparatus, compress and transcode the rendered frame into streaming video, and stream the video to at least one client system over a network.

Id. ¶ 3.

Lu discloses its

> game appliance apparatus (4000) can offer game appliance execution service for at least one client system wherein a game appliance apparatus can start a game appliance for a client system and said client system can send input to the game appliance apparatus via network to control game play of the game appliance and in return receive media stream of the game appliance via a local network.

Id. ¶ 87.

Lu's Figure 1, reproduced below with additional markings, depicts its game appliance system 3000 (marked in red, "server") comprising game appliance apparatus 4000 (marked in orange) and client system 700 (marked in blue, "mobile device").

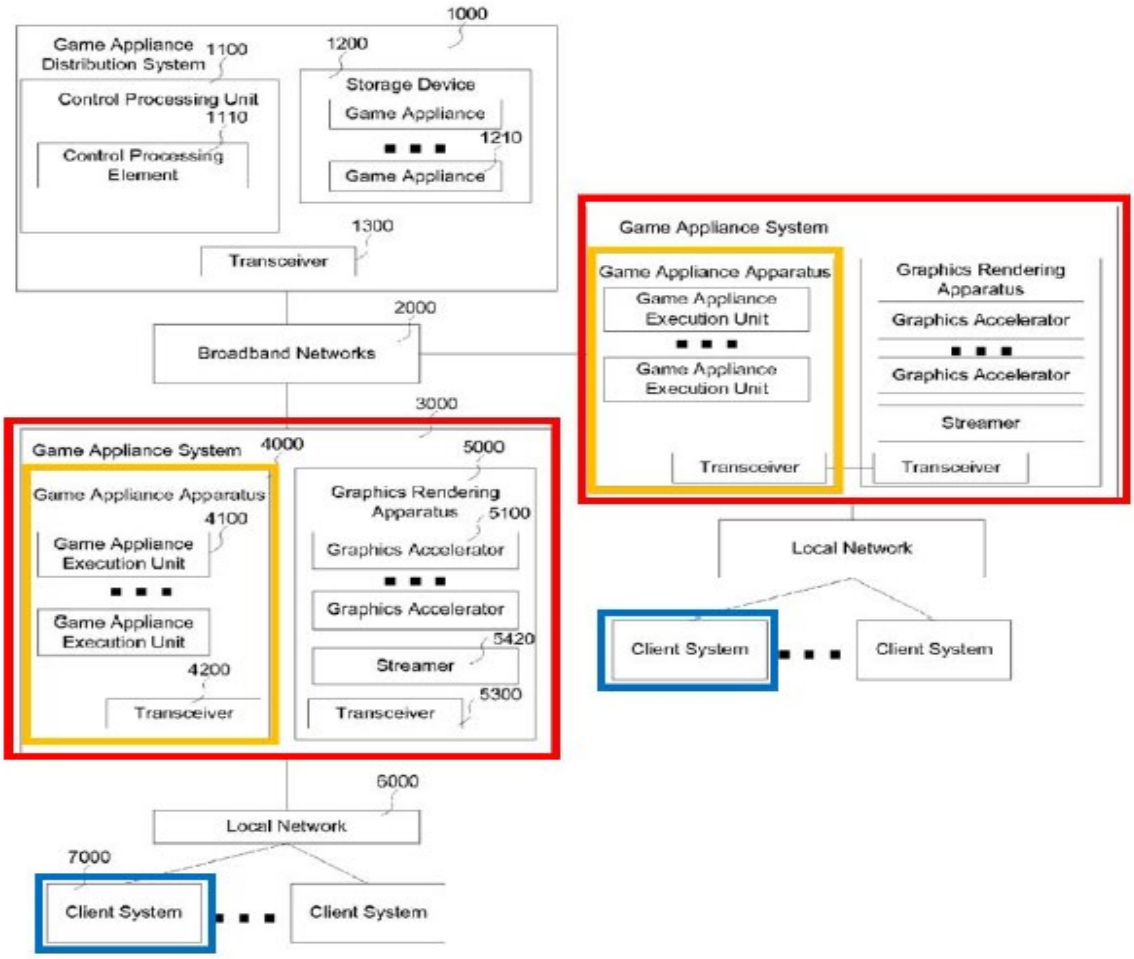

Fig. 1

Lu's Figure 1, reproduced above, shows that game appliance apparatus 4000 ("server") receives input sent from client system 7000 ("mobile device") "to control game play of the game appliance and in return receive media stream of the game appliance." *Id.*

2. Discussion

In Petitioner's view, all limitations of claims 1–3, 5, 20, 21, and 28 are found in Lu. Pet. 65–75 (Paper 4). As with the ground that was based on Yun or Overton, Patent Owner also challenges Petitioner's view as being deficient for failure to account "the hardware (HW) action" aspect of the

claims and "only attempts to address whether the reference [Lu] has audio or video actions." Prelim. Resp. 13–14 (Paper 10).

Based on our construction of the phrase "at least one of [A] the display, [B] the audio and [C] the hardware (HW) action" as conjunctive, we also agree with Patent Owner that both Petitioner and Petitioner's expert, Dr. Paul D. Martin, fail to address "the hardware (HW) action" as a conjunctive aspect of the claims. In particular, Petitioner's expert fails to account for "the hardware (HW) action" and articulate an adequate evidentiary basis as to why such "hardware (HW) action" would have been understood by a person skilled in the art as a separate part of Lu's input information to be processed at computing device 103 (e.g., "server") as opposed to client 106 (e.g., "mobile device"), shown in Lu's Figure 1, and then to be reproduced at client 106 (e.g., mobile device) along with video (image) and audio (sound).

For these reasons, we determine that Petitioner has not met its requisite burden of showing a reasonable likelihood of success that claims 1, 20, and 28 are unpatentable based on Lu. Claims 2, 3, 5, and 21, which depend from independent claims 1 and 20, have the same deficiencies as those discussed above in connection with claim 1. We also determine that Petitioner has not established the necessary showing with respect to claims 2, 3, 5, and 21.

J. Ground 3B: Asserted Obviousness of Claims 6–8, 11–13, 15–17, and 23–25 based on Lu, Lubonski, and Richardson

Petitioner asserts that claims 6–8, 11–13, 15–17, and 23–25 are unpatentable as obvious over Lu, Lubonski, and Richardson. Pet. 76–82 (Paper 4).

Because claims 6–8, 12–13, and 23–25 depend from independent claims 1, 20, and 28, and suffer the same deficiencies as those discussed above in connection with claim 1, we also determine that Petitioner has not established the necessary showing with respect to claims 6–8, 12–13, and 23–25.

However, claim 11 is independent and contains similar limitations of independent claims 1, 20, and 28. Because Petitioner fails to show a reasonable likelihood of success that claims 1, 20, and 28 are unpatentable based on Lu, and because Petitioner has not shown Lubonski or Richardson to remedy Lu's deficiencies, we determine Petitioner has not met its requisite burden of showing a reasonable likelihood of success that claim 11 is unpatentable based on Lu, Lubonski, and Richardson.

K. Discretion to Denial Under § 314(a)

Patent Owner argues that we should exercise discretion under 35 U.S.C. § 314(a) and not institute trial, given the state of the parallel district court litigation. Prelim. Resp. 26–38 (Paper 10). Because we determine that Petitioner does not establish a reasonable likelihood of prevailing based on the merits of its challenges, we need not consider Patent Owner's arguments regarding discretionary denial.

IV. CONCLUSION

For the foregoing reasons and our conjunctive construction of the phrase "at least one of [A] the display, [B] the audio, and [C] the hardware (HW) action," we conclude that Petitioner has not demonstrated that there is a reasonable likelihood that it would prevail in proving the unpatentability of at least one of the challenged claims of the '887 patent. We thus do not

institute an *inter partes* review of all of the challenged claims of the '887 patent on all grounds asserted in the Petition (Paper 4).

V. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that the Petition is denied, and no trial is instituted.

FOR PETITIONER:

Jessica Kaiser
Jonathan Carter
Atanas Baitchev
PERKINS COIE LLP
kaiser-ptab@perkinscoie.com
carter-ptab@perkinscoie.com
baitchev_ptab@perkinscoie.com

FOR PATENT OWNER:

Wayne M. Helge
James T. Wilson
BUNSOW DE MORY LLP
whelge@bdiplaw.com
jwilson@bdiplaw.com