

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SAMSUNG ELECTRONICS CO., LTD.,
Petitioner,

v.

VIRGINIA INNOVATION SCIENCES, INC.,
Patent Owner.

Case IPR2013-00570
Patent 8,224,381 B1

Before MICHAEL W. KIM, BRIAN J. McNAMARA, and
MATTHEW R. CLEMENTS, *Administrative Patent Judges*.

CLEMENTS, *Administrative Patent Judge*.

FINAL WRITTEN DECISION
35 U.S.C. § 318(a) and 37 C.F.R. § 42.73

I. INTRODUCTION

Samsung Electronics Co., Ltd. (“Petitioner”) filed a Petition requesting *inter partes* review of claims 19, 20, 22, 26, 30, 32–35, 37–40, 43, 44, 46 and 47 (the “challenged claims”) of U.S. Patent No. 8,224,381 B1 (Ex. 1001, “the ’381 patent”). Paper 5 (“Pet.”). Virginia Innovation Sciences, Inc. (“Patent Owner”) filed a Preliminary Response. Paper 11 (“Prelim. Resp.”). On March 6, 2014, we instituted an *inter partes* review of all challenged claims on all grounds of unpatentability alleged in the Petition. Paper 14 (“Dec. to Inst.”).

After institution of trial, Patent Owner filed a Patent Owner Response (Paper 21, “PO Resp.”) to which Petitioner filed a Reply (Paper 26, “Pet. Reply”).

Oral hearing was held on October 1, 2014.¹

The Board has jurisdiction under 35 U.S.C. § 6(c). This Final Written Decision is issued pursuant to 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73.

Petitioner has shown, by a preponderance of the evidence, that claims 19, 20, 22, 26, 30, 32–35, 37–40, 43, 44, 46 and 47 of the ’381 patent are unpatentable.

A. *The ’381 Patent*

The ’381 patent relates to mobile terminal signal conversion for external displays. Ex. 1001, 1:24–26. According to the ’381 patent, multimedia information, such as television, 3-D images, network games, and video phone calls, are transmitted from various service providers and received for display on a screen of a mobile terminal. *Id.* at 1:41–45.

¹ A transcript of the oral hearing is included in the record as Paper 40.

However, the limited size and capability of the mobile terminal screen may diminish user enjoyment of high rate data flow applications. *Id.* at 1:52–55, 2:6–9.

To address these issues, the '381 patent discloses converting a multimedia signal destined for the mobile terminal and providing it to an external display system so that corresponding video and/or audio may be reproduced using the external display system. *Id.* at 2:15–19.

Figure 1 of the '381 patent is reproduced below:

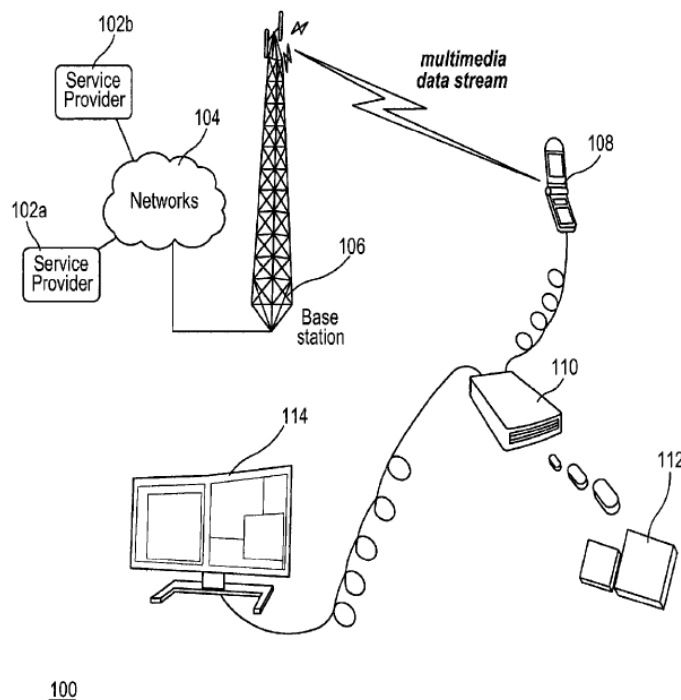


FIG. 1

Figure 1 depicts an example of a system in which mobile terminal signal conversion may reside. As shown in Figure 1, service providers 102a and 102b deliver multimedia information through network 104 to base station 106, which transmits the multimedia information, among other things, to cellular phone 108. *Id.* at 3:35–40. External display system 114 may be

digital (e.g., HDTV, LCD, or plasma) or analog (e.g., NTSC, PAL, SECAM, SVGA, VGA), and does not have the size constraints of a display screen on cellular phone 108. *Id.* at 3:46–54. Mobile Terminal Signal Conversion Module (“MTSCM”) 112 resides within separate housing 110 outside of cellular phone 108. *Id.* at 3:55–57. Cellular phone 108 is connected to MTSCM 110 by a wired or wireless connection. *Id.* at 4:4–19. A multimedia signal transmitted to cellular phone 108 may include a video signal intended for reproduction by cellular phone 108 using the display screen of cellular phone 108. *Id.* at 3:65–67. MTSCM 112 processes the video signal to provide a converted video signal that has a display format and/or signal power level appropriate for external display terminal 114. *Id.* at 4:20–23. Following signal conversion, MTSCM 112 provides the converted video signal to external display terminal 114 for display. *Id.* at 4:33–39.

Figure 3 of the '381 patent is reproduced below:

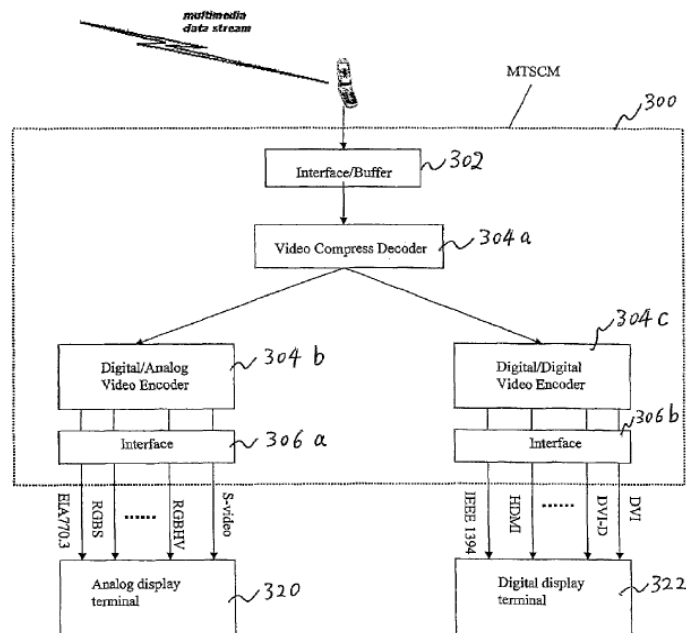


FIG. 3

Figure 3 is a block diagram illustrating an example of the MTSCM. Interface/buffer module 302 provides, for example, adequate buffering and processing rate to provide real-time audio and video. *Id.* at 5:60–6:8. Video Compress Decoder 304a receives a multimedia signal, typically in a compressed format (e.g., MPEG-1, MPEG-2, MPEG-4), and outputs a decompressed digital multimedia signal to Digital/Analog Video Encoder (“DAVE”) 304b and/or Digital/Digital Video Encoder (“DDVE”) 304c. *Id.* at 6:9–20, 6:29–32. DAVE 304b and DDVE 304c receive the decompressed multimedia signal and convert the signal to the display format and signal power level required for the external display terminals with which they interface. *Id.* at 6:35–39. Exemplary signal formats for an analog display terminal include S-video, RGBHV, RGBS, and EIA770.3. *Id.* at 6:40–42. Exemplary signal formats for a digital display terminal include DVI, DVI-D, HDMI, and IEEE1394. *Id.* at 6:42–43. The signals provided by DAVE 304b and DDVE 304c are provided to external display terminal 114 through conventional interfaces 306a and 306b. *Id.* at 6:43–46.

B. Illustrative Claims

Of the challenged claims, claims 19 and 33 are independent. Claims 19 and 33 are reproduced below:

19. A non-transitory computer readable medium storing program code for operating a conversion device, the program code being executable to perform operations comprising:

receiving, by the conversion device, a video signal appropriate for displaying a video content on a mobile terminal, the video signal being sent from a wireless network communication;

processing, by the conversion device, the video signal to produce a converted video signal for use by an alternative

display terminal, wherein the processing by the conversion device includes converting a signal format appropriate for the mobile terminal to a different format for output to the alternative display terminal, such that the converted video signal produced by the conversion device comprises a high definition television (HDTV) digital signal for output to the alternative display terminal; and

providing the converted video signal from the conversion device to the alternative display terminal through a high definition multimedia interface (HDMI) to accommodate displaying the video content by the alternative display terminal.

33. An apparatus for converting video signals, the apparatus comprising:

an input interface for receiving a video signal appropriate for displaying a video content on a mobile terminal, the video signal being sent from a wireless network communication;

a processing unit for processing the video signal to produce a converted video signal for use by an alternative display terminal, wherein the processing includes converting a signal format appropriate for the mobile terminal to a different format for output to the alternative display terminal, such that the converted video signal produced by the processing unit comprises a high definition television (HDTV) digital signal for output to the alternative display terminal; and

an output interface for providing the converted video signal to the alternative display terminal through a high definition multimedia interface (HDMI) to accommodate displaying the video content by the alternative display terminal.

C. Prior Art Supporting the Instituted Challenges

The following prior art references were asserted in the instituted grounds:

Palin	US 7,580,005 B1	Aug. 25, 2009	Ex. 1002
Seaman	US 2004/0223614 A1	Nov. 11, 2004	Ex. 1003
Hayakawa	US 2003/0137609 A1	July 24, 2003	Ex. 1004

D. The Instituted Challenges to Patentability

The following table summarizes the challenges to patentability on which we instituted *inter partes* review:

References	Basis	Claims challenged
Palin & Seaman	§ 103	19, 20, 26, 30, 33–35, 37–40, 43, and 44
Palin, Seaman, and Hayakawa	§ 103	22, 32, 46, and 47

II. ANALYSIS

A. Claim Construction

In an *inter partes* review, claim terms in an unexpired patent are interpreted according to their broadest reasonable construction in light of the specification of the patent in which they appear. 37 C.F.R. § 42.100(b); Office Patent Trial Practice Guide, 77 Fed. Reg. 48,756, 48,766 (Aug. 14, 2012). Also, claim terms are given their ordinary and customary meaning, as would be understood by one of ordinary skill in the art in the context of the entire disclosure. *In re Translogic Tech., Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007).

1. “*display terminal*”

Independent claims 19 and 33 recite a “display terminal.” Petitioner proposes that “display terminal” be construed as “device for video display.” Pet. 4 (citing Ex. 1001, 3:27–30, 3:46–51, 4:33–37). Patent Owner neither disputes Petitioner’s proposed construction nor proposes a different construction. Patent Owner repeatedly identifies a television as an example of a “display terminal.” See, e.g., Prelim. Resp. 5 (“display terminal (e.g., television)”); see also *id.* at 7, 8, 24, and 26. The ’381 patent describes the use of a “separate multimedia *display terminal* including but not limited to a monitor, television set, projector, or LCD display.” Ex. 1001, 3:28–30 (emphasis added). Each of the recited devices is a device for video display. Therefore, on this record, we are persuaded that Petitioner’s construction constitutes the broadest reasonable interpretation consistent with the Specification. Accordingly, we construe “display terminal” as “device for video display.”

2. “*wireless network communication*”

Independent claims 19 and 33 recite “wireless network communication.” Petitioner proposes that “wireless network communication” be construed as “transmission from a wireless network.” Pet. 4 (citing Ex. 1001, 3:35–45). Patent Owner neither disputes Petitioner’s proposed construction nor proposes a different construction. Apart from the claims, the ’381 patent does not use the term “wireless network communication.” However, the ’381 patent does disclose the “transmission of the multimedia information, among other things, to a cellular phone 108” (Ex. 1001, 3:38–40) by “any conventional or to-be-developed technology for delivering voice and/or data to mobile terminals” (*id.* at 3:41–43), including

“a cellular communications network or a wireless local area network” (*id.* at 3:44–45). The disclosed embodiments of a “wireless network” comprise at least a base station 106 and cellular phone 108. Petitioner’s proposed construction is ambiguous because it is unclear whether it encompasses transmissions “from” only base station 106, “from” only cellular phone 108, or “from” both. Nothing in the ’381 patent indicates that the term “wireless network communication” implies a particular direction of communication—i.e., from a base station to a mobile terminal, or from a mobile terminal to a base station. To the extent that Petitioner’s proposed construction suggests that, because the transmission is *from* the wireless network, it must be *to* something other than the wireless network, the construction is not consistent with the embodiments described in the ’381 patent. Finally, Petitioner’s use of the word “transmission” is overly narrow to the extent that it excludes the act of *receiving* information. In the context of the ’381 patent, “communication” is broad enough to encompass both information being transmitted and information being received. On this record, the broadest reasonable interpretation consistent with the Specification encompasses any communication over a wireless network, including information transmitted from a base station to a cellular phone or vice-versa, and information received by a base station from a cellular phone or vice-versa. Accordingly, we construe “wireless network communication” as “information transmitted or received over a wireless network.”

3. “HDMI”

Independent claims 19 and 33 each recite “high definition multimedia interface (HDMI).” Petitioner proposes that “HDMI” be construed as “high definition multimedia interface.” Pet. 4 (citing Ex. 1001, 6:42–43, 10:47–

50, claim 27). Patent Owner neither disputes Petitioner's proposed construction nor proposes a different construction. On this record, we are persuaded that Petitioner's construction constitutes the broadest reasonable interpretation consistent with the Specification. Accordingly, we construe "HDMI" as "high definition multimedia interface."

4. *"a power level required by the alternative display terminal"*

Dependent claims 30 and 43 each recite "a power level required by the alternative display terminal." Petitioner proposes that "a power level required by the alternative display terminal" be construed as "a signal power level required by the alternative display terminal." Pet. 4 (citing Ex. 1001, 4:20–31). Patent Owner neither disputes Petitioner's proposed construction nor proposes a different construction. Petitioner's proposal modifies "power level" by specifying that it is a "signal power level." In the context of claims 30 and 43, which recite "setting the converted video signal to have a power level," it is clear that the recited "power level" is a property of the "converted video signal." On this record, we are persuaded that Petitioner's construction constitutes the broadest reasonable interpretation consistent with the Specification. Accordingly, we construe "a power level required by the alternative display terminal" as "a signal power level required by the alternative display terminal."

5. *"housing interface"*

Dependent claims 32 and 46 each recite "housing interface." Petitioner proposes that "housing interface" be construed as "interface of the housing." Pet. 4 (citing Ex. 1001, 4:4–8). Patent Owner neither disputes Petitioner's proposed construction nor proposes a different construction. In the context of claims 32 and 46, which recite "a housing having a housing

interface,” it is clear that the “housing interface” is “of the housing,” as proposed by Petitioner. On this record, we are persuaded that Petitioner’s construction constitutes the broadest reasonable interpretation consistent with the Specification. Accordingly, we construe “housing interface” as “interface of the housing.”

*B. Claims 19, 20, 26, 30, 33–35, 37–40, 43, and 44 –
Obvious over Palin and Seaman*

Petitioner contends that claims 19, 20, 26, 30, 33–35, 37–40, 43, and 44 are unpatentable under 35 U.S.C. § 103(a) as obvious over Palin and Seaman. Pet. 8–16, 30–50. In support of this ground of unpatentability, Petitioner provides detailed explanations as to how each claim limitation is taught or suggested by Palin and Seaman, and relies upon the Declaration of Dr. Kevin C. Almeroth (Ex. 1005). *Id.* (citing Ex. 1005 ¶¶ 162–171, 174).

Patent Owner counters that claims 19, 20, 26, 30, 33–35, 37–40, 43, and 44 are not obvious over the combination of Palin and Seaman because (1) the Petition does not identify what Palin is lacking, and why it would have been obvious to cure such deficiencies, as required by *Graham v. John Deere Co.*, 383 U.S. 1 (1966) and *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398 (2007); (2) the reason to combine articulated by Petitioner is based upon impermissible hindsight; and (3) the reason to combine articulated by Petitioner is improper because it would change the principle of operation of Palin and also would render Palin unsuitable for its intended purposes. PO Resp. 12–34, 45–48. Patent Owner also argues that the combination of Palin and Seaman does not teach converting a signal format appropriate for the mobile terminal to a display format for the alternative display terminal that is different from the signal format, as required by claims 19 and 33, because

the signal being “convert[ed]” is not the same signal that is “receiv[ed].” *Id.* at 34–37. Patent Owner also argues that the reasons to combine articulated in the Petition are conclusory and devoid of rational underpinning. *Id.* at 37–44. Finally, Patent Owner argues dependent claim 40 separately. *Id.* at 44.

Upon consideration of the parties’ contentions and supporting evidence, we determine that Petitioner has demonstrated, by a preponderance of the evidence, that claims 19, 20, 26, 30, 33–35, 37–40, 43, and 44 are obvious over the combination of Palin and Seaman.

Palin (Exhibit 1002)

Palin describes wirelessly linking a mobile terminal to a display device to provide better display quality to a user of a mobile terminal. Ex. 1002, 2:11–15.

Figure 1(a) of Palin is reproduced below.

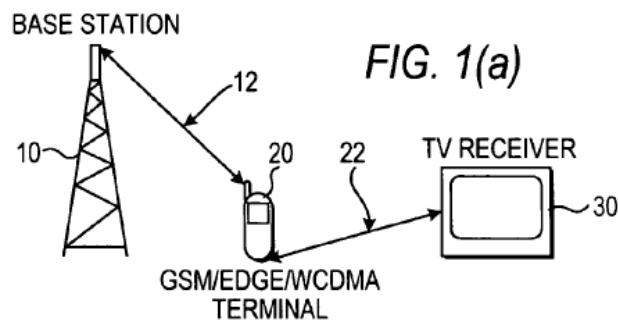


Figure 1(a) depicts a base station, mobile phone, and external display device. As shown in Figure 1(a), a conventional wireless connection has wireless link 12 between base station 10 and mobile terminal 20 to exchange conventional Radio Frequency (RF) signals. *Id.* at 4:5–10. Wireless short range RF link 22, such as a Bluetooth link, is established between mobile terminal 20 and an external display device, like television 30. *Id.* at 4:15–18.

In operation, a service provider transmits data frames as packets to mobile terminal 20 over a wireless communication network. *Id.* at 5:30–32. A packet containing video information may have a data frame structure that can be split into a mobile terminal part 54, and an external display device part 56, as shown in Figures 4(a) and 4(b). *Id.* at 5:33–38. Figures 4(a) and 4(b) are reproduced below.

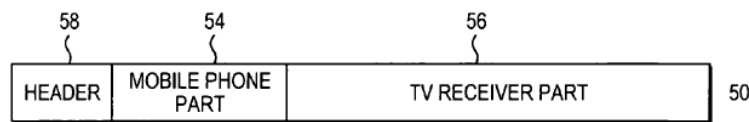


FIG. 4(a)

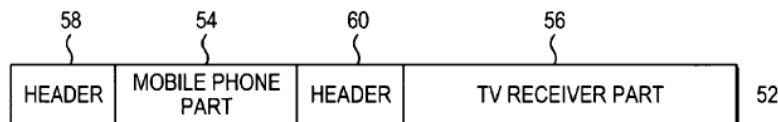


FIG. 4(b)

Figures 4(a) and 4(b) depict, respectively, first and second possible data frame structures for transmitting a combined audio and video signal. Mobile terminal part 54 includes voice data, images, and other data to be used by mobile terminal 20 such as textual information, caller-ID, and e-mail. *Id.* at 5:39–44. In contrast:

External display device part 56 is the part *to be forwarded* to the external display device 30 and generally follows the mobile terminal part 54 within the signal sent by a base station 10 to allow the mobile terminal part 54 to be split off first and used by the mobile terminal 20. The external display device part 56 generally includes a *video portion of the signal* and may include an audio portion to be played with the video on the external display device.

Id. at 5:44–51 (emphasis added). After a packet is received by mobile terminal 20, splitting application 218 splits mobile terminal part 54 from external display device part 56. *Id.* at 6:28–31. Once split, external display

device part 56 is further processed by, in one embodiment, Bluetooth protocol stack 65, where one or more external display device parts 56 are reassembled into one or more Bluetooth-compliant packets. *Id.* at 6:45–52. These packets are then transmitted to external display device 30. *Id.* at 6:61–64.

Seaman (Exhibit 1003)

Seaman describes a device that is capable of delivering a video-on-demand feed to an input of a TV set. Ex. 1003 ¶ 11. Figure 1 of Seaman is reproduced below.

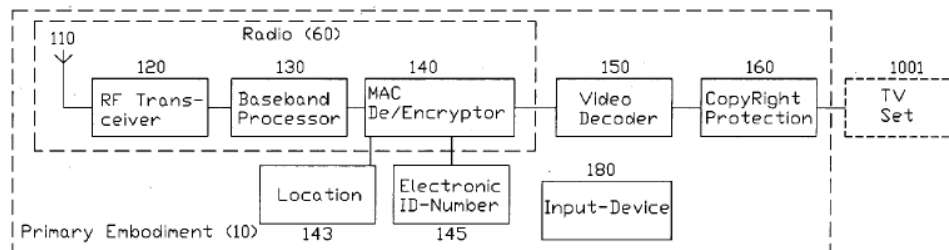


Fig 1

Figure 1 illustrates primary embodiment 10 of the device. *Id.* ¶ 17. Primary embodiment 10 comprises radio 60 and video decoder 150. *Id.* ¶¶ 22–23. Radio 60 changes a wireless encrypted video data stream into an unencrypted video data stream. *Id.* ¶ 22. “A video decoder (150) decodes the unencrypted data stream into a standard video format that TV set (1001) or monitor can display.” *Id.* ¶ 23. Copyright protection circuit 160 adds copyright protection to the signal, which is then sent to TV set 1001. *Id.* Seaman discloses various coding schemes that may be used:

Coding and de-coding of video is described. MPEG is a coding scheme that has the advantage of reducing the size of the required data stream, thus reducing the required minimum size of the data link. There are variants of MPEG that can be used that are within the scope of this invention such as MPEG-2, MPEG-3, MPEG-4 etc. Also there are other types of encoding

that can be used and still be within the scope of this invention. A non-exhaustive list includes NTSC, PAL, SECAM, HDTV, SDTV, RGB, YcbCr, YpbPr, S-Video, CVBS, SDI, HDMI, and DVI.

Id. ¶ 47.

Analysis

In light of the arguments and evidence, Petitioner has established a reasonable likelihood that claims 19, 20, 26, 30, 33–35, 37–40, 43, and 44 are unpatentable as obvious over Palin and Seaman.

For example, independent claim 33 recites “an input interface for receiving a video signal appropriate for displaying a video content on a mobile terminal, the video signal being sent from a wireless network communication.” Palin discloses that “[t]he mobile terminal receives image data from a base station in a wireless communication network or from another device utilizing any transmission method including, but not limited to GSM, EDGE, WCDMA, DAB, DVB or Bluetooth link.” Ex. 1002, 2:25–29. Palin further clarifies: “the term ‘image’ is used interchangeably with the term ‘video’ and includes a single image, picture, or graphic, a stream or plurality of still pictures, or graphics, or a conventional video.” *Id.* at 2:29–32.

Patent Owner argues that the video data received by Palin is not “a video signal appropriate for displaying a video content on a mobile terminal,” as recited in claim 33. Prelim. Resp. 30–32. However, Palin states expressly that, “[t]he image data received by the mobile terminal comprises data to be ultimately reassembled into an image to be displayed on a display either *on the mobile device*, on . . . another display device, or *on both* of these devices.” Ex. 1002, 2:54–57 (emphasis added). As a result,

we are not persuaded that the video signal received by Palin is not “appropriate for displaying a video content on a mobile terminal.”

Claim 33 also recites “a processing unit for processing the video signal to produce a converted video signal for use by the alternative display terminal.” Seaman discloses that “video decoder (150) decodes the unencrypted data stream into a standard video format that a TV set (1001) or monitor can display.” Ex. 1003, ¶ 23; Fig. 1. Seaman also discloses several known coding schemes. *Id.* ¶ 47. Seaman discloses that the signal output to TV set 1001 for display is in one of the following formats: “In accordance with claim 1, further that said standard video format is selected from the group consisting of NTSC, PAL, SECAM, HDTV, SDTV, RGB, YcbCr, YpbPr, S-Video, CVBS, SDI, HDMI, HDCP and all their variants whereby users can see the video on their existing TV set.” *Id.* at 6 (claim 7). Thus, the video decoder of Seaman “convert[s] a signal format appropriate for the mobile terminal to a different format for output to the alternative display terminal, such that the converted video signal produced by the processing unit comprises a high definition television (HDTV) digital signal for output to the alternative display terminal,” as recited by claim 33.

Finally, claim 33 recites “an output interface for providing the converted video signal to the alternative display terminal through a high definition multimedia interface (HDMI) to accommodate displaying the video content by the alternative display terminal.” Seaman discloses that the signal from video decoder 150 that is output to TV set 1001 is in “a standard video format that a TV set (1001) or monitor can display” (Ex. 1003, ¶ 23), such as “NTSC, PAL, SECAM, HDTV, SDTV, RGB, YcbCr, YpbPr, S-Video, CVBS, SDI, *HDMI*, HDCP and all their variants” (*id.* at 6, claim 7

(emphasis added)). Thus, Seaman discloses that the interface between device 10 and TV set 1001 can be a “high definition multimedia interface (HDMI),” as required by claim 33.

We are persuaded that Petitioner’s citations support Petitioner’s contentions.

Patent Owner presents several arguments as to how Petitioner has failed to provide an adequate reason to modify the references to reach the claimed invention and why Palin and Seaman do not teach all of the limitations of the claims. PO Resp. 12–48. Petitioner responds to these arguments. Pet. Reply 1–15. We address each argument in turn below.

Whether Petition Supports the Asserted Ground of Unpatentability

Patent Owner argues that “Petitioner did not specifically identify how Palin is being modified by Seaman.” PO Resp. 12–17. According to Patent Owner, “the actual rejection articulated on pages 15-18 of the [Decision to Institute] (*i.e.*, ‘the asserted Palin/Seaman obviousness rejection’) is not presented in the Petition or in Dr. Almeroth’s declaration.” *Id.* at 14. Patent Owner continues that “the Board’s choice of ‘video decoder 150’ from Petitioner’s claim chart, which does not even apply Seaman for these claim features, is unsupported by the Petition.” *Id.* at 16 (emphasis omitted). Petitioner counters that Patent Owner “waived this baseless argument when it failed to request a rehearing of the [Decision to Institute].” Pet. Reply 2. According to Petitioner, “[t]he claim charts make clear with respect to element 33-b that ‘[t]o the extent Palin is deemed not to disclose this [‘processing unit’] limitation, it would have been rendered obvious in light of Seaman.’” *Id.* at 3 (citing Ex. 1005, 240–241). Petitioner continues that “the Almeroth Declaration complements the Petition, likewise

demonstrating that the ‘coding and decoding of video’ functionality provided by features such as Seaman’s ‘video decoder (150)’ could be added to Palin to satisfy the claimed ‘converting’ limitation.” *Id.* at 3 (citing Ex. 1005, 244–253). We find Petitioner’s arguments to be persuasive.

The Petition explicitly identifies video decoder 150 for “wherein the processing by the conversion device includes converting a signal format appropriate for the mobile terminal to a different format for output to the alternative display terminal.” Pet. 32–34, 42–43. Although the claim chart also cites to Palin for that limitation, we are persuaded that the citations to Seaman teach the limitation. The Almeroth Declaration confirms explicitly this intuitive reading of the claim chart. Ex. 1005, 240–241. As such, we are not persuaded that the Petition does not adequately identify how Palin would be modified by Seaman.

Sufficiency of Graham Analysis

Patent Owner argues that “[t]he Petition provided no *Graham v. John Deere Co.* or *KSR Int’l Co. v. Teleflex, Inc.* analysis as required to make out a *prima facie* case of obviousness.” PO Resp. 19. According to Patent Owner, “none of the claim charts for Ground 1 provide any discussion identifying at least: (1) what the primary reference is lacking; and (2) why it would have been obvious to cure such deficiencies, as required under *Graham* and *KSR*.” *Id.* at 19 (emphasis omitted). Petitioner counters that “[Patent Owner] ignores the detailed information provided in the Petition and supporting declaration” and refers to the “numerous valid rationales justifying the combination [that] are provided in the Petition and declaration.” Pet. Reply 4–5 (citing Pet. 15–16, 18–30; Ex. 1005 ¶¶ 45–115, 162–206). We determine that Petitioner’s arguments are persuasive.

As discussed above, the Petition explicitly identifies video decoder 150 for “converting.” Pet. 33–34, 42–43. Although the claim chart also cites to Palin for that limitation, we are persuaded that Seaman teaches the limitation. The Almeroth Declaration confirms explicitly this intuitive reading of the claim chart. Ex. 1005, 240–241. As such, we are not persuaded that the Petition does not adequately identify how Palin would be modified by Seaman.

With respect to why a person of ordinary skill in the art would have made such a modification, Petitioner cites Dr. Almeroth’s Declaration for setting forth several reasons why a person of ordinary skill in the art would have been motivated to combine references like Palin and Seaman, albeit without identifying Palin and Seaman by name. Pet. 18–30 (citing Ex. 1005 ¶¶ 45–115, 176–201). For example, Petitioner argues that:

A person of ordinary skill in the art would have been aware of a wide variety of ways in which received content could be converted, and would have known to use whatever techniques were available and appropriate for a given device to better facilitate display on an alternative display terminal. In the prior art, this conversion could (and in some instances did) even include changing the underlying content. Incorporating any of the range of possible conversion types into a mobile device already receiving content and then providing it to an alternative display device would not have required undue experimentation, but rather would have only required incorporating the appropriate hardware and/or software into the existing device. One skilled in the art would have a high degree of success in combining the prior art references to develop the claimed technology. Ex. 1005 ¶¶ 180-81; *see also id.* ¶¶ 45-115.

Pet. 20. Thus, the Petitioner has justified sufficiently this combination by showing “some articulated reasoning with some rational underpinning to

support the legal conclusion of obviousness.” *KSR*, 550 U.S. at 418 (2007) (quoting *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006)).

Use of Hindsight

Patent Owner argues that the reason to combine articulated by Petitioner is based upon impermissible hindsight. PO Resp. 25–27. According to Patent Owner, “Dr. Almeroth’s analysis . . . us[es] the claim as a template into which he would place teachings from any one of the cited references depending on ‘how somebody would try and argue that there’s something missing from Palin.’” *Id.* at 26. Patent Owner continues:

The only reason presented is “if it’s determined that there’s a missing [element recited in the claims]” in Palin, then that missing element would be pulled in from Seaman. There is no independent reason or explanation, other than the fact that a feature is recited in the challenged claims, why a particular feature would be taken from Seaman and added into Palin. This is hindsight reconstruction.

Id. at 27. Petitioner counters that “[Patent Owner] ignores the detailed information provided in the Petition and supporting declaration” and refers to the “numerous valid rationales justifying the combination [that] are provided in the Petition and declaration.” Pet. Reply 4–5 (citing Pet. 15–16, 18–30; Ex. 1005 ¶¶ 45–115, 162–206). We determine that Petitioner’s arguments are persuasive.

Patent Owner’s argument emphasizes Dr. Almeroth’s deposition testimony, but ignores the thirteen different reasons to combine discussed in the Petition and in Dr. Almeroth’s Declaration. *See, e.g.*, Pet. 18–30 (citing Ex. 1005 ¶¶ 45–115, ¶¶176–201).

Whether Reason to Combine Is Valid

Patent Owner argues that “[t]he difference in the basic operation and functional requirements of [a] mobile phone . . . when compared to a set-top box . . . would not lead a PHOSITA to combine the two references.” PO Resp. 27 (citing Ex. 2007 ¶¶ 21, 83–93). According to Patent Owner:

[T]he modification of Palin based on Seaman adopted by the PTAB in the [Decision to Institute]: 1.) would change the principle of operation of Palin; 2.) would render Palin unsatisfactory for its intended purpose; and 3.) overlooks fundamental technical details that a PHOSITA would readily understand as contrary to the position adopted in the [Decision to Institute].

Id. at 28 (citing Ex. 2007 ¶¶ 21, 83–93). We address each of these arguments in turn.

First, Patent Owner argues that “[t]he asserted combination changes the principle of operation by inserting Seaman’s decoder (which outputs uncompressed data) into a compressed data stream of Palin.” *Id.* at 31 (citing Ex. 2007 ¶¶ 83–93). According to Patent Owner, “decoder 150 of Seaman does decoding, *i.e.*, decompression – so that the output is uncompressed video data” whereas “Palin transmits compressed data via Bluetooth to a TV.” *Id.* (citation omitted). Thus, Patent Owner concludes, “[i]nserting uncompressed data as output by decoder 150 would change the principle of operation of Palin’s wireless transmission protocol that relies on a Bluetooth connection to a TV.” *Id.* (citing Ex. 2007 ¶¶ 83–93). Petitioner counters that “[Patent Owner]’s arguments regarding Palin are all predicated on the incorrect assumption that Palin requires a wireless RF link and that this link must be implemented using Bluetooth,” but that Palin “makes clear in at least seven places that Bluetooth is optional, *not* required.” Pet. Reply

11 (citations omitted). According to Petitioner, “[b]oth [parties’] experts confirm that other RF technologies were available for use in mobile devices at the time, including IEEE 802.11, which were commonly used to transmit compressed (*e.g.*, MPEG-2 compressed HD) and uncompressed video data.” *Id.* (citations omitted). We determine that Petitioner’s arguments are persuasive.

Although Palin describes an exemplary embodiment with a “short range RF link 22” between mobile terminal 20 and TV 30, Patent Owner cites nothing in Palin that would preclude the use of either a wireless protocol other than Bluetooth or a wired connection. Thus, we are not persuaded that the output of Seaman’s video decoder must be capable of transmission over a Bluetooth wireless link. Moreover, we are not persuaded that the output of Seaman’s video transceiver is necessarily uncompressed data. Seaman teaches that the signal output to TV set 1001 for display is in one of the following: “In accordance with claim 1, further that said standard video format is selected from the group consisting of NTSC, PAL, SECAM, HDTV, SDTV, RGB, YcbCr, YpbPr, S-Video, CVBS, SDI, HDMI, HDCP and all their variants whereby users can see the video on their existing TV set.” Ex. 1003, 6 (claim 7). HDTV is a compressed format. *See, e.g.*, Ex. 2011, 12 (“Broadcast quality 720p or 1080i HDTV under the MPEG-2 standard requires nearly 20Mbps of bandwidth, and this is exactly how it is currently delivered by both over-the-air and most cable systems.”) (footnote/citations omitted). Because Seaman teaches outputting a video signal in a compressed format, we are not persuaded that Seaman’s video transceiver necessarily outputs uncompressed data.

Second, Patent Owner argues that the proposed combination of Palin and Seaman would render Palin unsuitable for its intended purposes of minimizing battery drain and maintaining wireless mobility. PO Resp. 32–34. Petitioner counters that Patent Owner’s alleged “intended purposes” of Palin “are not actually requirements of Palin,” and that “[Patent Owner]’s attempt to limit the teachings of Palin to the design choices made to implement the preferred embodiment is improper.” Pet. Reply 7. We address each of the intended purposes identified by Patent Owner in turn.

With respect to minimizing battery drain, Patent Owner argues that “[t]he key intended purpose of Palin (‘Goal #1’) is to avoid unnecessarily draining the battery while using the mobile terminal to send video to an external display with better display capabilities.” PO Resp. 28 (citing Ex. 2007 ¶ 26). Patent Owner argues that Palin achieves this intended purpose by having “the mobile device function[] only as a ‘pass-through’ for the TV receiver part 56, without any conversion.” *Id.* at 29 (citing Ex. 2007 ¶¶ 28–35). According to Patent Owner, “decoder 150 of Seaman would be a hardware chip, such as Broadcom BCM7411 High-Definition Decoder,” and would “demand[] almost twice the power as the rest of the phone,” which “would no longer avoid unnecessarily draining the battery.” *Id.* at 32 (citations omitted). Petitioner points out that “Palin teaches that the *displaying* of the video on a separate display having a separate power source avoids draining the battery unnecessarily,” and that “[i]t is uncontested that both Palin and Seaman teach displaying the video on a separate display that has a separate power source.” Pet. Reply 7. According to Petitioner, “Palin says nothing about avoiding decoding or conversion of the incoming video signal” and, to the contrary, it teaches splitting and reformatting a received

signal for transmission, all of which consumes power. *Id.* at 8 (citation omitted). Petitioner continues that “Seaman expressly states that ‘no powerful generic processor’ is needed for the additional processing,” and that even Patent Owner’s expert, Dr. Brody, “admi[tte]d that all the technology necessary to implement the additional processing was known at the time.” *Id.* at 8–9 (citations omitted). We determine that Petitioner’s arguments are persuasive.

Palin teaches not to avoid draining the battery generally, as Patent Owner contends, but to “avoid unnecessarily draining . . . the mobile terminal’s battery *by displaying the video on a separate display device that has a separate power source.*” Ex. 1002, 1:37–39 (emphasis added). The proposed combination of Palin and Seaman displays the video on a separate display that has a separate power source. Neither the Petition nor Dr. Almeroth proposes to modify Palin’s mobile terminal 20 to power the separate display. Moreover, we are not persuaded by Patent Owner’s arguments based on the power demands of a Broadcom CBM7411 High-Definition Decoder. Even assuming that that chip is representative of the video transceiver taught in Seaman, the test for obviousness is not whether one could physically incorporate such a chip into Palin, but whether a person of ordinary skill in the art would have been motivated incorporate the teachings of Seaman to modify Palin. In that regard, we note that both parties’ experts agreed that one of ordinary skill in the art could have incorporated the video processing functionality of Seaman into Palin using software and/or hardware known at the time. Pet. Reply 8 (citing Ex. 1003 ¶ 13; Ex. 1005 ¶ 180; Ex. 2007 ¶¶ 88–93).

With respect to wireless mobility, Patent Owner argues that “[a] second major intended purpose (‘Goal #2’) [of Palin] is for the user to view the larger display while conveniently holding the mobile terminal [to] use the other functions of the mobile device.” PO Resp. 28–29 (citing Ex. 2007 ¶ 27). Patent Owner argues that Palin achieves this intended purpose by using a wireless link between the mobile terminal and the external display device. *Id.* at 29–30 (citing Ex. 1002, 1:62–64 (“This would be best implemented using a wireless link between the mobile terminal and the external display device.”)). According to Patent Owner, “[i]ncorporating [a set top box – TV connection from Seaman] into Palin would result in a wired connection to the TV,” rendering the combination “unsatisfactory for the explicit purpose of maintaining mobility while using the mobile terminal.” *Id.* at 33 (citations omitted). Petitioner counters that the wireless link taught in Palin “reflects a preferred embodiment, as confirmed by the phrase ‘particularly advantageous.’” Pet. Reply 9–10 (citation omitted). Petitioner continues that Palin “refers to ‘holding’ the device, not to ‘wireless mobility,’” and that “[n]othing in the combination of Palin and Seaman prevents holding the modified Palin device during operation.” *Id.* at 10. We determine that Petitioner’s arguments are persuasive.

Palin recognizes that “[i]t would be particularly advantageous to enable the user to view the content, such as a video clip on a larger display, while the user is actually holding the mobile terminal, and allow the user to select what is viewed using the mobile terminal, or to otherwise use the mobile device while viewing the video clip.” Ex. 1002, 1:57–62. Even assuming that is an intended purpose of Palin, it does not require a wireless link. A wired connection could achieve the same advantage. Ex. 1011 ¶¶ 9,

10. Accordingly, we are not persuaded that modifying Palin to incorporate one of Seaman's wired outputs, such as HDMI, to connect to the larger display, would prevent "enabl[ing] the user to view the content, such as a video clip on a larger display, while the user is actually holding the mobile terminal, and allow the user to select what is viewed using the mobile terminal, or to otherwise use the mobile device while viewing the video clip" (Ex. 1002, 1:57–62).

Whether Reason to Combine Is Devoid of Rational Underpinnings

Patent Owner argues that the nine reasons to combine articulated in the Petition are conclusory and devoid of rational underpinning. PO Resp. 37–44. Petitioner counters that Patent Owner's arguments are predicated upon improper characterizations of Palin. Pet. Reply 14. According to Petitioner, "[Patent Owner]'s argument is that Palin and Seaman cannot be combined if it would change the preferred embodiment of Palin." *Id.* at 15. Petitioner continues that "[w]hen the actual teachings of Palin are properly considered, the articulated motivations to combine are fully supported by Palin and Seaman." *Id.* We determine that Petitioner's arguments are persuasive. We address Patent Owner's arguments in turn.

We also are not persuaded that "the different constraints and goals of a mobile phone and a set-top box would militate against the combination and the results of the combination would not be suitable for the task at hand." PO Resp. 41; *see also id.* at 42, 43. While a mobile phone and a set-top box may operate under different constraints and goals, generally, here, Palin and Seaman are both directed to receiving video signals over a cellular communication network, converting the received signal, and outputting the converted video signal for display on a separate display terminal, such as a

television. Pet. Reply 5. Accordingly, we credit Dr. Almeroth's testimony that one skilled in the art would be motivated to include the additional processing of Seaman in Palin to better facilitate display on the alternative display and to provide flexibility with respect to conversion among many different video signal formats. Ex. 1005 ¶¶ 177, 181; Ex. 1011 ¶¶ 11, 14.

Finally, we are not persuaded that the reasons to combine render Palin unsatisfactory for its intended purposes or change its principle of operation for the reasons discussed above. See, e.g., PO Resp. 38 ("change the principle of operation of Palin, and render Palin unsatisfactory for its intended purpose"), 41 ("change the principle of operation"), 42 ("render it unsatisfactory for its intended purpose"), 43 ("change the principle of operation").

Whether the Converted Signal Is the Received Signal (claims 19 & 33)

Patent Owner also argues that the combination of Palin and Seaman does not teach "converting a signal format appropriate for the mobile terminal to a different format for output to the alternative display terminal," as recited in claims 19 and 33, because the signal being "convert[ed]" is not the same signal that is "receiv[ed]" by the input interface. PO Resp. 34–37. According to Patent Owner, Palin receives "two video signals contained within one 'data frame structure 50,'" and "only the split-out 'TV receiver part 56' would, even theoretically, be provided to a decoder 150 as taught by Seaman." *Id.* at 35–36. Thus, Patent Owner concludes "any combination of Palin [and Seaman] would process the 'TV receiver part 56,'" which is not "a signal format appropriate for the mobile terminal," as required by claims 19 and 33. *Id.* at 36 (emphasis omitted).

Petitioner counters that Palin teaches “only a single signal is received, and that single signal includes two parts, a ‘mobile terminal part 54’ and a ‘TV receiver part 56’,” and that, because it contains mobile terminal part 54, it is “appropriate for displaying a video content on a mobile terminal,” as recited in claims 19 and 33. Pet. Reply 13. Petitioner continues that combining Palin with Seaman results in conversion of that received (i.e., mixed) signal to a different display format for the alternative display, thereby teaching “converting a signal format appropriate for the mobile terminal to a different format for output to the alternative display terminal.” *Id.* at 13–14. We determine that Petitioner’s arguments are persuasive.

We are not persuaded that mobile terminal part 54 and TV receiver part 56 are separate video signals received by Palin. Palin states explicitly that “[t]he image data received by the mobile terminal comprises data to be ultimately reassembled into an image to be displayed on a display either *on the mobile device*, on . . . another display device, or *on both* of these devices.”). Ex. 1002, 2:54–57 (emphasis added). The Detailed Description of Palin does not suggest otherwise. It teaches data frame structure 50 that includes mobile terminal part 54. Patent Owner concedes that mobile terminal part 54 is “appropriate for displaying a video content on a mobile terminal,” as recited in claims 19 and 33. PO Resp. 36. Because data frame structure 50 includes mobile terminal part 54, it, too, is “appropriate for displaying a video content on a mobile terminal.” And because the data that is later converted was received in data frame structure 50, the signal being converted is the same signal that was received.

Even assuming that mobile terminal part 54 and TV receiver part 56 are separate video signals, we are not persuaded by Patent Owner’s assertion

that the combination of Palin and Seaman necessarily results in Seaman's video decoder 150 processing TV receiver part 56 of the received video signal. Patent Owner relies on the testimony of its expert, Dr. Arthur T. Brody (PO Resp. 36 (citing Ex. 2007 ¶¶ 29–35, 56, 57, 81, 82), but that testimony states only that converting TV receiver part 56 does not satisfy the claims because TV receiver part 56 is not “a signal format appropriate for the mobile terminal,” as required by the claims. Ex. 2007 ¶ 82. Patent Owner provides no persuasive evidence or argument to explain why mobile terminal part 54 would not be provided to the video decoder taught by Seaman. Accordingly, we are persuaded that conversion of mobile terminal part 54 also teaches the disputed limitation.

Dependent Claim 40²

We are not persuaded by Patent Owner's argument that the proposed combination of Palin and Seaman would not teach “wherein the processing unit resides in the mobile terminal,” as recited in claim 40. PO Resp. 44. Palin's low-power processor resides within the mobile terminal and is capable of decoding video; otherwise, it would not be able to display the image data received by the mobile terminal on a display on the mobile device, as Palin teaches. Ex. 1002, 2:54–57. Based on the arguments and evidence presented by the parties, we are not persuaded that the modification of that processor to incorporate additional video conversion functionality disclosed by Seaman would result in a processor incapable of residing within the mobile terminal.

² Patent Owner does not argue dependent claims 20, 26, 30, 34, 35, 37–39, 43, or 44 separately.

Conclusion

For the foregoing reasons, we conclude that Petitioner has demonstrated, by a preponderance of the evidence, that claims 19, 20, 26, 30, 33–35, 37–40, 43, and 44 are unpatentable as obvious over Palin and Seaman.

C. Claims 22, 32, 46, and 47 – Obvious over Palin, Seaman, and Hayakawa

Petitioner argues that claims 22, 32, 46, and 47 are unpatentable under 35 U.S.C. § 103(a) as obvious over Palin, Seaman, and Hayakawa. Pet. 16–18, 35–36, 38–39, and 49–51. In support of this ground of unpatentability, Petitioner provides detailed explanations as to how each claim limitation is taught or suggested by Palin, Seaman, and Hayakawa, and relies upon the Declaration of Dr. Almeroth. *Id.* (citing Ex. 1005 ¶¶ 45–115, 162–206).

Patent Owner does not argue these claims separately.

Upon consideration of the parties’ contentions and supporting evidence, we determine that Petitioner has demonstrated, by a preponderance of the evidence, that claims 22, 32, 46, and 47 are obvious over the combination of Palin, Seaman, and Hayakawa.

Hayakawa (Ex. 1004)

Hayakawa discloses a flat panel multimedia display system and multimedia receiver system for displaying video and audio multimedia information generated for, *inter alia*, cellular telephone systems. Ex. 1004, Abstract, ¶¶ 32–33.

Figure 7 of Hayakawa is reproduced below.

FIG. 7

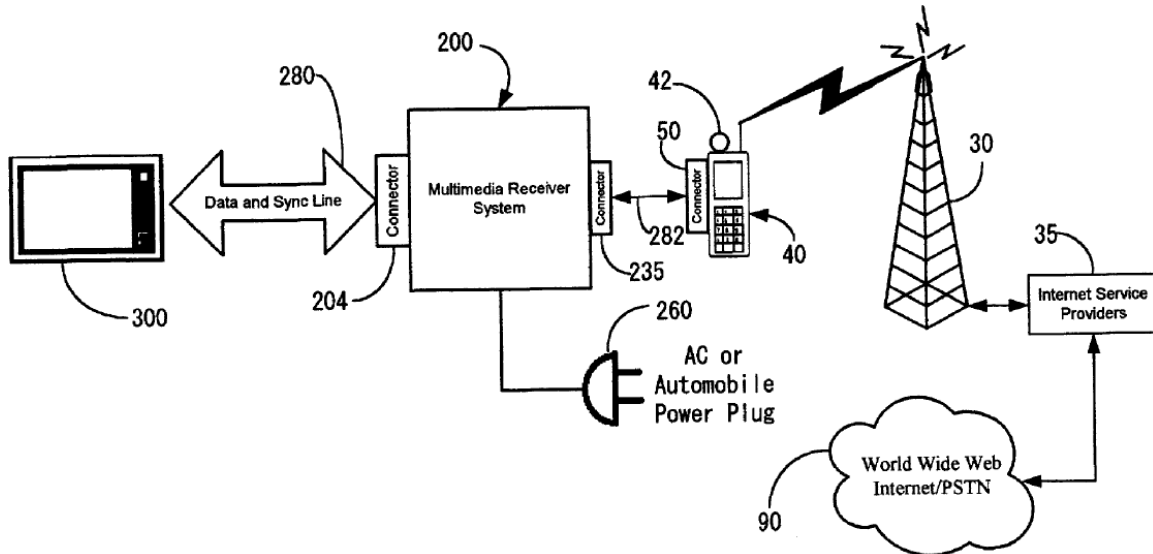


Figure 7 illustrates cellular telephone system 40 connected to multimedia receiver system 200 and internet 90. *Id.* ¶ 68. Multimedia receiver system 200 connects to display system 300 through data and sync line 280. *Id.* When large images and sound files are received by cellular telephone system 40, they are processed by multimedia receiver system 200, and its output is displayed on display system 300. *Id.* In this way, “[i]nstead of using a small LCD on the device 40, a telephone user can browse [the] Internet using the display system 210 and the receiver 200 by using an external signal cable 282.” *Id.* ¶ 53.

Figure 2 of Hayakawa is reproduced below.

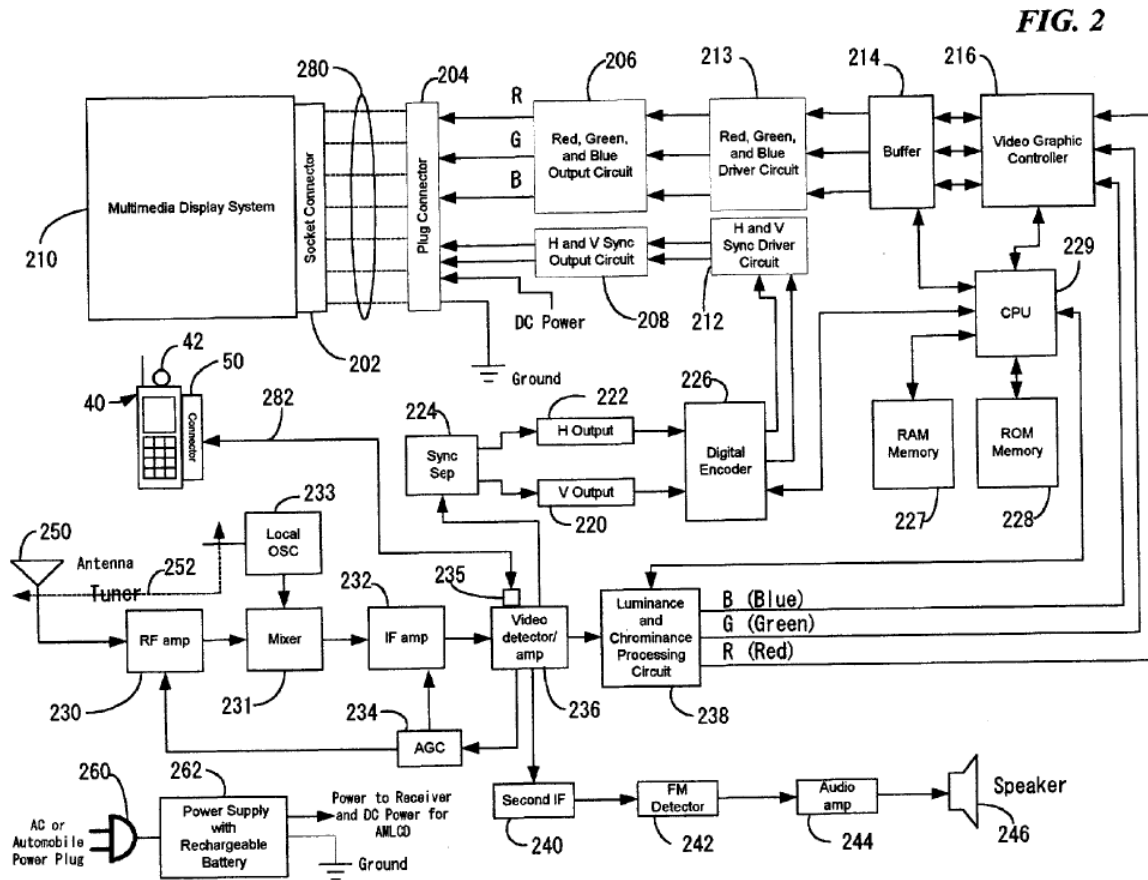


Figure 2 illustrates a detailed functional diagram of multimedia receiver system 200. *Id.* ¶ 41. As shown, power supply 262 supplies power to display system 210 and to receiver 200 through second connector 202 and plug connector 204. *Id.* ¶ 63. Plug 260 connects to an alternating current (“AC”) or automobile power source. *Id.*

Analysis

In light of the arguments and evidence, we are persuaded that Petitioner has established a reasonable likelihood that claims 22, 32, 46, and 47 are unpatentable as obvious over Palin, Seaman, and Hayakawa.

For example, dependent claim 22 recites “wherein receiving the video signal, processing the video to produce the converted video signal, and

providing the converted video signal to the alternative display terminal are performed using power from a source that differs from the internal power supply of the mobile terminal.” Petitioner cites Hayakawa for teaching that multimedia receiver system 200 is powered by power supply 262, which is connected to an AC or automobile power source by plug 260. Pet. 35 (citing Ex. 1004 ¶¶ 63, 68).

Dependent claims 32 and 46 each recite “wherein a housing having a housing interface is configured to interface with the mobile terminal, and wherein the housing provides the converted video signal to the alternative display terminal through the HDMI.” Petitioner cites Hayakawa for teaching that multimedia receiver system 200 is configured to interface with a mobile terminal (cellular telephone system 40) and provides a converted video signal to the alternative display terminal (display system 300) through data and sync line 280. Pet. 38–39, 49–50 (citing Ex. 1004 ¶¶ 68, 75). Petitioner cites Seaman for teaching an HDMI interface. *Id.* at 38, 49 (citing Ex. 1003 ¶ 47, claim 7).

Dependent claim 47 recites “wherein at least a portion of said processing the video signal occurs in the housing.” Petitioner cites Hayakawa for teaching that “the images and the recorded sounds are processed by the multimedia receiver system 200.” Pet. 50–51 (citing Ex. 1004 ¶ 68).

Finally, Petitioner contends that a person of ordinary skill in the art would have been motivated to combine Palin, Seaman, and Hayakawa. Pet. 17–18; *see also id.* at 18–30.

Patent Owner does not argue these dependent claims with particularity, and we are not persuaded by Patent Owner's arguments with respect to independent claims 19 and 33 for the reasons discussed above.

Conclusion

For the foregoing reasons, we conclude that Petitioner has demonstrated, by a preponderance of the evidence, that claims 22, 32, 46, and 47 are unpatentable as obvious over the combination of Palin, Seaman, and Hayakawa.

D. Patent Owner's Motion to Exclude Evidence

Patent Owner filed a Motion to Exclude Evidence (Paper 31), to which Petitioner responded (Paper 33). Patent Owner filed a Reply to Petitioner's Opposition to Motion to Exclude Evidence. Paper 36. Patent Owner's Motion to Exclude seeks to exclude (1) paragraphs 5–9, 11, 13–16, 19–21 of the Reply Declaration of Dr. Almeroth (Ex. 1011). Paper 31, 1–13. As movant, Patent Owner has the burden of proof to establish that it is entitled to the requested relief. See 37 C.F.R. § 42.20(c). For the reasons stated below, Petitioner's Motion to Exclude is *denied*.

Patent Owner argues that the paragraphs of Dr. Almeroth's Declaration should be excluded under Rule 702 because they are unsupported by underlying facts or data. Paper 31, 1–13. Patent Owner's arguments go to weight, not to admissibility. 37 C.F.R. § 42.65 ("Expert testimony that does not disclose the underlying facts or data on which the opinion is based is entitled to little or no weight.").

III. CONCLUSION

Petitioner has shown, by a preponderance of the evidence, that claims 19, 20, 22, 26, 30, 32–35, 37–40, 43, 44, 46 and 47 of the '381 are unpatentable under 35 U.S.C. § 103(a).

IV. ORDER

Accordingly, it is

ORDERED that claims 19, 20, 22, 26, 30, 32–35, 37–40, 43, 44, 46 and 47 of the '381 are held unpatentable;

FURTHER ORDERED that Patent Owner's Motion to Exclude is *denied*; and

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

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Patent 8,224,381 B1

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