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Paper 11
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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

HTC AMERICA, INC.,
Petitioner,

v.

VIRGINIA INNOVATION SCIENCES, INC.,
Patent Owner.

Case IPR2017-00870
Patent 7,899,492 B2

Before JAMESON LEE, MICHAEL W. KIM, TREVOR M. JEFFERSON, BRIAN J. McNAMARA and CHRISTA P. ZADO, *Administrative Patent Judges.*

Opinion for the Board filed by McNAMARA, *Administrative Patent Judge*.

Opinion Dissenting filed by LEE, joined by KIM, *Administrative Patent Judges.*

McNAMARA, *Administrative Patent Judge*.

DECISION
Institution of *Inter Partes* Review
37 C.F.R. § 42.108

BACKGROUND

HTC America, Inc. ("Petitioner") filed a petition, Paper 1 ("Pet."), to institute an *inter partes* review of claims 1, 2, 4, 6, 7, 11, 23, 24, 26, 28, 29, and 33 (the "challenged claims") of U.S. Patent No. 7,899,492 B2 ("the '492 patent"). 35 U.S.C. § 311. Virginia Innovation Sciences, Inc. ("Patent Owner") timely filed a Preliminary Response, Paper 8 ("Prelim. Resp."), contending that the petition should be denied as to all challenged claims. We have jurisdiction under 37 C.F.R. § 42.4(a) and 35 U.S.C. § 314, which provide that an *inter partes* review may not be instituted unless the information presented in the Petition "shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition." Having considered the arguments and the associated evidence presented in the Petition and the Preliminary Response, for the reasons described below, we institute *inter partes* review of all the challenged claims (claims 1, 2, 4, 6, 7, 11, 23, 24, 26, 28, 29, and 33).

This decision is one of a series of decisions concerning related petitions for *inter partes* review.[1] In view of a substantial difference of opinion among the original judges of the paneled cases, those judges suggested combining the original three judge panels into expanded five judge panels to secure and maintain uniformity of the Board's decisions. The Chief Judge exercised his discretion to expand the panels and accordingly.[2]

[1] IPR22017-00870, IPR2017-00871, IPR2017-00872, IPR2017-00873, IPR2017-00874, IPR2017-00875, IPR2017-00876, IPR2017-00877, IPR2017-00878, and IPR2017-00879.

[2] Our standard operating procedures provide the Chief Judge with discretion to expand a panel to include more than three judges. PTAB SOP 1, 1–3 (§§ II, III) (Rev. 14); *see id.* at 1 (introductory language explaining that the

REAL PARTIES IN INTEREST

The Petition identifies HTC America, Inc. and HTC Corporation as the real parties-in-interest. Pet. 1.

PENDING LITIGATION

The Petition states that the '492 Patent has been asserted against Petitioner in *Virginia Innovation Sciences, Inc. v. HTC Corporation*, No. 1:16-cv-01350 (E.D. Va.), initially filed as No. 2:16-cv-00060. Pet. 1–2. Patent Owner also identifies as related matters multiple cases before the U.S. Court of Appeals for the Federal Circuit. Paper 4, 3. In particular, one such case is *Virginia Innovation Sciences, Inc. v. HTC Corporation and Amazon.com, Inc.*, Appeal No. 17-1482 (Fed. Cir.). *Id.*

Petitioner identifies the following proceedings, all terminated, as involving patents related to the '492 patent: IPR2013-00569, IPR2013-00570, IPR2013-00571, IPR2014-00557, IPR2013-00573, and IPR2015-00054. Pet. 2–3

Petitioner also notes that the '492 patent was challenged in *Samsung Electronics Co., Ltd. v. Virginia Innovation Sciences, Inc.*, IPR2013-00572.

Director has delegated to the Chief Judge the authority to designate panels under 35 U.S.C. § 6); *see also In re Alappat*, 33 F.3d 1526, 1532 (Fed. Cir. 1994) (providing that Congress "expressly granted the Commissioner the authority to designate expanded Board panels made up of more than three Board members."). The standard operating procedure exemplifies some of the reasons for which the Chief Judge may expand a panel. PTAB SOP 1, 3 (§ III.A). For example, an expanded panel may be appropriate when the matter involves an issue of exceptional importance or "[c]onsideration by an expanded panel is necessary to secure and maintain uniformity of the Board's decisions." *Id*. (§ III.A.1).

In that case we declined to institute an *inter partes* review of challenged claims 23, 24, 26, and 33. See Ex. 2001, Samsung *Electronics Co., Ltd. v. Virginia Innovation Sciences, Inc.*, Case IPR2013-00572, slip op. (PTAB, Mar. 6, 2014) (Paper 15, Dec. Denying Inst.).

THE '492 PATENT (EXHIBIT 1001)

The '492 Patent is directed to conversion of signals intended for mobile terminals to provide signals for external display. Ex. 1001, 1:19–21. The '492 Patent explains that in preexisting systems a mobile terminal functions as a multimedia terminal to display multimedia information sent from a high data rate wireless communications network. *Id.* at 1:43–47. The '492 patent notes that the limited size and capability of a mobile terminal screen may render enjoyment of high rate data flow applications inconvenient, and in some instances useless. *Id.* at 1:47–49. According to the '492 Patent, what is needed is a solution to the problem of diminished user enjoyment of mobile terminals because of display limitations. *Id.* at 2:20–22. The specification states: "In accordance with the present invention, the multimedia signal destined for the mobile terminal is converted and provided to an external display system, so that the corresponding video and/or audio may be reproduced using the external system." *Id.* at 2:9–14.

Figures 1 and 4 of the '492 patent are reproduced below:

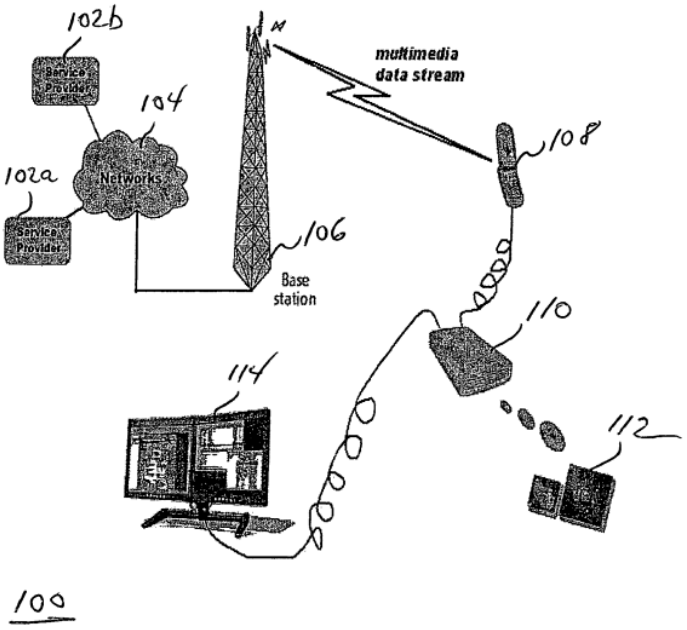

FIG. 1

Figure 1 illustrates a system implementing mobile signal conversion according to the ’492 patent. *Id.* at 2:42–44.

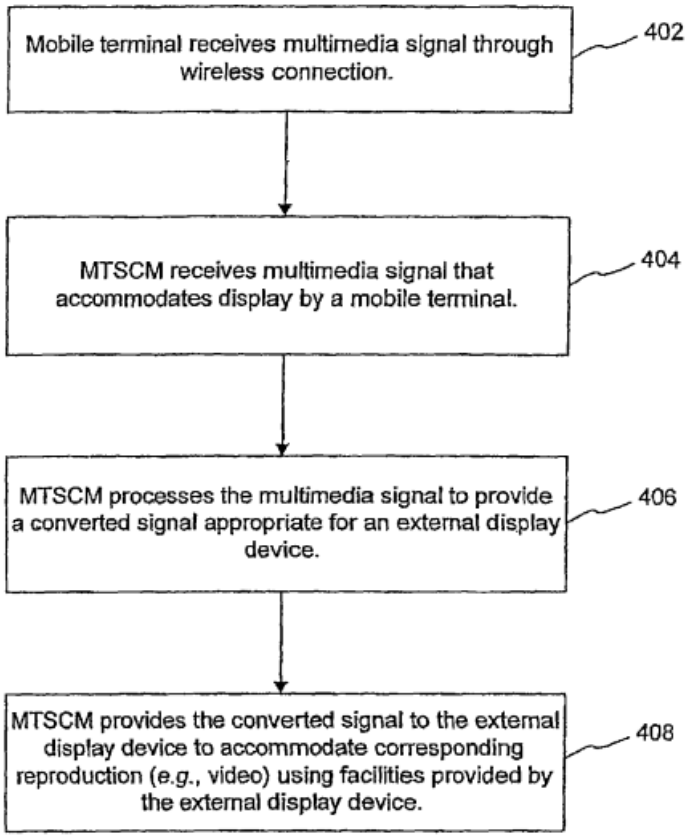

FIG. 4

Figure 4 is a flow diagram illustrating a process implementing mobile terminal signal conversion in accordance with the '492 patent. *Id.* at 2:51–54.

Referring to Figure 1 and system 100 in Figure 1, the specification describes that multimedia information may be provided by any number of service providers 102a-b and delivered through wireless network 104 to base station 106 to ultimately accommodate transmission of the multimedia information, among other things, to cellular phone 108. *Id.* at 3:31–37. The specification states that wireless communication networks include, but are

not limited to, a cellular communications network or a wireless local area network. *Id.* at 3:39–42. System 100 further includes external display system 114 which does not have the size constraints of the display screen on cellular phone 108 and is preferably powered independently. *Id.* at 3:43–50. As shown in Figure 1, mobile terminal signal conversion module (MTSCM) 112 resides within a separate housing, outside of cellular phone 108. *Id.* at 3:51–53.

With respect to step 402 of Figure 4, the ’492 patent describes that a multimedia signal is transmitted to cellular phone 108 through the wireless communications network, and that the multimedia signal may include a video signal intended for reproduction by cellular phone 108. *Id.* at 3:58–64. With respect to step 404 of Figure 4, the ’492 patent describes that cellular phone 108 is connected to MTSCM 110 through a cable connection via which MTSCM 112 receives the video signal from cellular phone 108. *Id.* at 4:1–3. The video signal as received may be configured to accommodate a video display on the screen provided by cellular phone 108. *Id.* at 4:5–7.

With respect to step 406, the ’492 patent describes that MTSCM 112 processes the video signal to provide a converted video signal that has a display format and/or signal power level appropriate for an external display terminal 114 that is separate from cellular phone 108. *Id.* at 4:17–20. With respect to step 408, the ’492 patent describes that following signal conversion, MTSCM 112 provides the converted video signal to external display terminal 114 to accommodate the corresponding video display on a screen provided by the external display terminal. *Id.* at 4:30–34.

ILLUSTRATIVE CLAIM

Claim 1, reproduced below, is illustrative:

1. A method for processing signals to accommodate reproduction by an alternative display terminal, the method comprising:
    receiving by a conversion module a video signal appropriate for displaying a video content on a mobile terminal, the video signal being received by the conversion module from a cellular network communication that is sent to the mobile terminal and then received by the conversion module;
    processing by the conversion module the video signal to produce a converted video signal for use by the alternative display terminal, wherein processing by the conversion module includes converting the video signal from a compression format appropriate for the mobile terminal to a display format for the alternative display terminal that is different from the compression format, such that the converted video signal produced by the conversion module comprises a display format and a power level appropriate for driving the alternative display terminal; and
    providing the converted video signal from the conversion module to the alternative display terminal to accommodate displaying the video content by the alternative display terminal.

ART CITED IN PETITIONER'S CHALLENGES

Petitioner cites the following references in its challenges to patentability:

Reference	Designation	Exhibit No.
U.S. Pat. No. 7,480,484 B2, issued Jan. 20, 2009	Nam	1005
U.S. Pat. No. 6,781,635 B1, issued Aug. 24, 2004	Takeda	1006

CHALLENGES ASSERTED IN PETITION

Claims	Statutory Basis	Challenge
1, 2, 6, 7, 11, 23, 24, 28, 29, 33	35 U.S.C. § 102(e)	Anticipated by Nam
23, 24, 28, 29, 33	35 U.S.C. § 103(a)	Obvious over Nam
4, 26	35 U.S.C. § 103(a)	Obvious over the combination of Nam and Takeda

ISSUES UNDER 35 U.S.C. § 325(d)

Patent Owner argues that the challenged claims were examined and confirmed patentable in IPR2013-00572 and in a summary judgment decision by the E.D. Va. over U.S. Patent 7,580,005 ("Palin"). Prelim. Resp. 2. The district court's summary judgment decision, attached to the Petition as Exhibit 1009 in this proceeding, was remanded by the Federal Circuit on June 9, 2015. *Va. Innovation Scis., Inc. v. Samsung*, 614 Fed. Appx. 503 (Fed. Cir. 2015).

In IPR2013-00572, we addressed challenges brought by a different petitioner (Samsung) against some, but not all, of the claims challenged in this proceeding (i.e., apparatus claims 23, 24, 26, and 33) in the context of different references. *Samsung v. Va. Innovation Scis.*, Case IPR2015-000572, slip op. (PTAB March 6, 2014) (Paper 15, Dec. Denying Inst.). Specifically, we declined to institute a trial on Samsung's challenges to claims 23, 24, and 26 as anticipated by Palin, claim 26 as unpatentable over Palin and US 2003/0137609 ("Hayawaka") and, claim 23 as obvious over Palin and US2004/0223614 ("Seaman"). *Id.* at 13–18. Patent Owner argues that we should deny the current Petition for *inter partes* review because it "involves substantially the same prior art or arguments before the PTAB in

the prior IPR." Prelim Resp. 33. As we discuss in our analysis of anticipation by Nam herein, our earlier decision denying institution over Palin is based on entirely different considerations relating to Palin's disclosure of transport protocols, rather than video signal conversion, that are not discussed in Nam.

In view of the difference in parties, the different claims challenged in this proceeding, and the difference in the subject matter of the Nam and Palin references, we decline to exercise our discretion to deny the Petition under 35 U.S.C. § 325(d).

CLAIM CONSTRUCTION

We interpret claims of an unexpired patent using the broadest reasonable construction in light of the specification of the patent in which they appear. *See* 37 C.F.R. § 42.100(b); *Cuozzo Speed Techs. LLC v. Lee*, 136 S. Ct. 2131, 2144–46 (2016). In applying a broadest reasonable construction, claim terms generally are given their ordinary and customary meaning, as would be understood by one of ordinary skill in the art[3] in the context of the entire disclosure. *See In re Translogic Tech., Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007). Any special definition for a claim term must

[3] Petitioner identifies a person of ordinary skill as having the equivalent of a four year degree (e.g., a B.S.) in computer science, computer engineering, or equivalent, from an accredited institution, (2) a working knowledge of wireless networking and video transcoding technologies, and (3) at least two years of experience in related hardware/software analysis, design, and development. Pet. 6–7. Petitioner states that additional graduate education could substitute for professional experience and significant experience in the field could substitute for formal education. *Id.* Patent Owner does not dispute Petitioner's assessment of the level of ordinary skill and we apply Petitioner's assessment in this proceeding.

be set forth in the specification with reasonable clarity, deliberateness, and precision. *In re Paulsen*, 30 F.3d 1475, 1480 (Fed. Cir. 1994).

Petitioner proposes constructions for the following terms: display terminal; cellular network communication; a power level appropriate for driving the alternative display terminal; converting [the video signal]; compressing [decompression]; and display format. Pet. 16–24. Patent Owner proposes no claim constructions and offers no arguments concerning Petitioner's proposals, but criticizes Petitioner's failure to propose constructions for certain "material limitations," e.g., "signal conversion module" or "device interface module" that Patent Owner contends are not found in Nam. Prelim. Resp. 55–56. Our claim constructions at this stage of the proceeding are preliminary.

display terminal

Petitioner proposes that we construe the term "display terminal" as a "device for video display." Pet. 8. In IPR2013-00572 we noted that the '492 patent describes the use of a "separate multimedia *display terminal* including but not limited to a monitor, television set, projector, or LCD display," and that each of the recited devices is a device for video display. *Samsung v. Va. Innovation Scis.*, Case IPR2013-00572, Dec. Denying Inst at 8 (citing) Ex. 1001, col. 3, ll. 24–26 (emphasis added). In the most general context, the IEEE Dictionary defines a terminal as "An input-output peripheral device capable of transmitting entries to and obtaining output from a system." Ex. 1003. In the context of the '492 patent, the input-out information is video. Therefore, as we did in IPR2013-00572, we apply Petitioner's proposed construction as consistent with the ordinary meaning

in this proceeding and construe "display terminal" to mean *device for video display*.

cellular network communication

Petitioner proposes that we construe "cellular network communication" to mean "information transmitted or received over a cellular network." Pet. 9. In IPR2013-00572, we noted that this terms is sufficiently broad to encompass both information being transmitted and information being received. *Samsung v. Va Innovation. Scis*., Case IPR2013-00572, Dec. Denying Inst. 9–10. As we did in IPR2013-00572, we construe cellular network communication" to mean *information transmitted or received over a cellular network.*

a power level appropriate for driving the alternative display terminal

Petitioner proposes that we construe this term to mean "a signal power level appropriate for driving the alternative display terminal." Pet. 17. In IPR2013-00572, we noted that it is clear that the recited power level is a property of the converted video signal. *Samsung v. Va. Innovation. Scis*., Case IPR2013-00572, Dec. Denying Inst. 9–10. As we did in IPR2013-00572, we construe "a power level appropriate for driving the alternative display terminal" to mean *a signal power level appropriate for driving the alternative display terminal.*

converting the video signal *from a* ***compression*** *format appropriate for the mobile terminal to a* ***display format*** *for the alternative display terminal that is* ***different from the compression format*** (bolded terms discussed below)

Petitioner proposes that, applying the broadest reasonable interpretation, this phrase be interpreted to mean:

> the video signal is first received in a compressed format at the mobile terminal, can be decompressed (if required), changed to a "display format" (an arrangement of information for display) for use by the alternative "display terminal" (device for video display) that is different from the compressed format that the video signal is in when first received by the mobile terminal.

Pet. 24 (citing Ex. 1003, Declaration of Kevin C. Almeroth ("Almeroth Decl.") ¶ 125). Petitioner's proposal addresses each of the bolded terms in the expression.

(a) converting [the video signal]

In IPR2013-00572, neither party sought a construction for the term "converting." In our analysis of Palin in that case, we recognized a distinction between converting signal formats and routing a signal via a communications protocol, stating that in Palin

> [e]ven assuming that the format of the video signal contained in external device parts 56 is 'in a compression format appropriate for the mobile terminal,' the video signal is not 'converted' because external display device parts 56 output to external display device 30 are the same external display device parts 56 received by mobile terminal 20.

Samsung v. Va. Innovation Scis., Case IPR2013-00572, Dec. Denying Inst. at 15. In support of this analysis, we cited the IEEE Dictionary definition of "convert" which defines convert (data processing); to change the representation of data from one form to another, for example, to change numerical data from binary to decimal or from cards to tape. *Id.* (citing Institute of Electrical and Electronics Engineers, *The Authoritative Dictionary of IEEE Standard Terms* 238 (7th Ed., IEEE Press 2000)). As to our interpretation of this term, the Federal Circuit has stated:

> in rejecting a petition for *inter partes* review of the '492 patent[] Appellant's Br. 33; J.A. 5516–17 (IPR2013–00572)[,]

> VIS [Patent Owner] fails to mention . . . that the Patent Office found the broadest reasonable interpretation of the term "convert" in "converted video signal" to be "to change the representation of data from one form to another." J.A. 5516. As the Patent Office explained, this was how the IEEE dictionary defined "convert" at the time of the claimed invention. *Id.* (citing Institute of Electrical and Electronics Engineers, *The Authoritative Dictionary of IEEE Standard Terms* 238 (7th Ed., IEEE Press 2000)). The Patent Office found the treatise definition consistent with the specification, which it found to "differentiate [ ] repeatedly between converting signal formats and routing via a communications protocol." J.A. 5516. . . . While we emphasize that the district court is not bound by determinations of the Patent Office, our review of the record suggests that the Patent Office's approach to rely on relevant treatises and other extrinsic evidence may be more illuminating than the specification] in this particular instance.

See Va. Innovation Scis. v. Samsung, 614 Fed. Appx. at 512 (remanding for further claim construction).[4] Therefore, we apply the same interpretation of "converting" in this proceeding and construe "converting" to mean *changing the representation of data from one form to another*.

(b) compressing [decompressing]

In IPR2013-00572, neither party sought a construction of the term "compression" nor did we articulate a construction for that term. Petitioner proposes that in this proceeding, that we apply the plain and ordinary meaning. Pet. 21. Petitioner notes that in the district court Patent Owner sought to impute a decompression element into the conversion process on the premise that decompression is inherent to the processing of converting a signal from a compression format appropriate for the mobile terminal to a

[4] Cited by Petitioner as *Va. Innovation Scis., Inc. v. Samsung Elecs. Co.*, No. 2014-1477, slip op. at 16-17 (Fed. Cir. Jun. 9, 2015).

display format for the alternative terminal that is different from the compression format. *Id.* at 20. Patent Owner's position in the district court concerns the meaning of a different aspect of the claims and has no direct effect on the meaning of the term "compression." We agree with Petitioner that we should apply the plain and ordinary meaning to the term "compression." In the context of data transmission, the IEEE Dictionary defines "compression" as "[a] process in which the effective gain applied to a signal is varied as a function of the signal magnitude, the effective gain being greater for small rather than for large signals." Ex. 3001.

(c) display format/different from the compression format

In IPR2013-00572, neither party sought a construction of the term "display format" nor did we articulate a construction for that term. Petitioner notes that in its analysis of Palin and in remanding to the district court, the Federal Circuit agreed that decompression is a necessary limitation of the claims. Pet. 20–21 (citing *Va. Innovation Scis., Inc. v. Samsung* , No. 2014-1477, slip op. at 8–9 (Fed. Cir. Jun. 9, 2015)). The court stated: "The limitations of the asserted claims suggest that a 'display format' is more than an uncompressed video" and "involves additional processing beyond simply decompressing a compressed video signal." *Va. Innovation. Scis. v. Samsung*, 614 F. Appx. at 508–509. However, the court found the record "not sufficiently developed to discern the skilled artisan's understanding of the relevant aspect of a video signal in a 'display format'" and remanded "with instructions to further develop the record and to determine the meaning of 'display format' to one of skill in the art at the effective filing date of the patents-in-suit, whether by further examination of direct and cross examination testimony from experts showing and explaining usage in

the field, or consultation of other relevant sources as set forth in *Philips.*" *Va. Innovation Scis., Inc. v. Samsung* , 614 Fed. Appx. at 511. The Federal Circuit further found that the district court erred in "narrowing its construction of 'display format' to exclude signals that required further deconstruction or reassembly at the external monitor in order to be displayed by the monitor." *Va. Innovation Scis., Inc. v. Samsung* , 614 Fed. Appx. at 509. Noting that "the intrinsic record strongly suggests that the claimed 'display format' must be a video signal that is 'ready for use' by a conventional external monitor," the court recognized that "the specification lists examples of standard display formats without elaborating on the term's meaning, suggesting that those of skill in the art would understand the term's meaning simply by reference to the listed examples and standards" and "one of skill in the art understood a 'display format' to have particular technical characteristics describing its compatibility and operation interaction with an external monitor." *Va. Innovation Scis., Inc. v. Samsung* , 614 Fed. Appx. at 510. Nevertheless, the court noted "[w]hat those characteristics are, however has not been established by the record on appeal." *Id.*

The specification describes external device interface 206 as in communication with signal conversion module 204 to access the converted signal and allow connection to the external device to provide (i) "both the feeding of the converted signal to the external device, and driving the external device" or, alternatively (ii) it may "merely feed the converted signal to the external device, with the external device including internal elements for driving its signal reproduction (e.g., display) facilities." Ex. 1001, 5:34–43. Applying the broadest reasonable construction, we do not

limit the "display format" to be one that is ready for use without further processing by a conventional monitor.

Petitioner contends that we need not address the issue further, however, because the Nam reference addresses the display format in the same terms as those in the '492 patent. Pet. 23–24.

The IEEE Dictionary defines a "display format" as "[m]ethod of data representation, such as a trend plot, bar chart, graph, table, or cross-plot." Ex. 3001, IEEE Dictionary 324. Petitioner's testifying expert, Dr. Kevin Almeroth, states "in my opinion, one skilled in the art would have thus understood at the time of the alleged invention for the '492 patent that 'display format' had a common understanding as 'an arrangement of information for display.' I apply this understanding in my analysis in this declaration." Almeroth Decl. ¶ 123. Dr. Almeroth also states

> The specification describes converting the video signal to a display format for an external display device in terms of known display formats and technologies, such as S-video, RGB, EIA7703, DVI, HDMI, and IEEE 1394. (*See, e.g., id.*, Fig. 3, 6:26-47.) One of ordinary skill in the art would have understood those formats as arrangements of information used by display on the alternative display, which is described in the '492 patent to be an analog or digital display device (*id.*, Fig. 3, 6:37-61). One of ordinary skill in the art would have understood at the time of the alleged invention the exemplary types of display formats provided in the specification, such as S-video, where known, and how such formats differ from other formats, such as component or composite signals, and HDMI display format signals.

Id. ¶ 124. Dr. Almeroth also states (i) that at the time of the invention known formats included S-video and RGB formats, and HDMI, DVI formats, (ii) that one of ordinary skill would have been familiar with the configuration and use of interfaces relating to such display formats, the use

of standards associated with such display formats, how display devices processed video signals that were received over known video signal display formats, and (iii) that display devices configured to be compatible with multimedia signals formatted in a particular display format were configured with technologies capable of processing such received signals to present content corresponding to the signals on a display (e.g., high definition televisions, monitors, LCD, plasma, cathode ray tube, etc.). Almeroth Dec. ¶¶ 95, 101–103. Dr. Almeroth discusses the technical details of, HDMI (*id*. ¶¶ 65–72), DVI (*id*. ¶¶ 73–77), codes and transcoding (*id*. at ¶¶ 78–93), S-video *id*. ¶ 96, and composite video (*id*. at ¶¶97–98).

As noted above, Patent Owner does not propose a construction of this term.

In consideration of the above, we are persuaded that Petitioner's interpretation of "display format" as "an arrangement of information for display" is consistent with its use in the claim and that a person of ordinary skill at the time of the invention would have known how to implement a display format corresponding to a particular device that is not the display of the mobile terminal. Therefore, on the present record, we construe the phase

> converting the video signal from a compression format appropriate for the mobile terminal to a display format for the alternative display terminal that is different from the compression format
>
> to mean
>
> *changing the video signal received in a compressed format appropriate for the mobile terminal into an arrangement of information for display by the alternative display terminal that is different from the compressed format appropriate for the mobile terminal*

PATENT OWNER'S "MODULE" CONSTRUCTION ARGUMENTS

Patent Owner argues that it is prejudiced by Petitioner's "failure to provide a correct claim construction" for "material limitations," i.e., "signal conversion module" and "device interface module" (the "module terms") because "clear constructions of both terms would reflect the major flaws" in Petitioner's arguments. Prelim. Resp. 55–56. According to Patent Owner, without explicit claim construction guidance to interpret the claims, the Board cannot gauge whether the construction applied by Petitioner is reasonable. *Id.* at 56. Patent Owner contends having not presented explicit claim constructions for these terms, Petitioner has not met its burden to show a reasonable likelihood it would prevail. *Id.*

Patent Owner's argument is predicated on the assumption that the claim terms "signal conversion module" and "interface device module" require express construction (rather than applying the ordinary and customary meaning, as would be understood by one of ordinary skill in the art in the context of the entire disclosure). Although Patent Owner argues the terms are "key claim elements," Patent Owner does not propose any construction for these terms. *Id.*

Figure 2 of the '492 patent is a block diagram illustrating an example of a mobile terminal signal conversion module (MTSCM) 200 in accordance with the invention. Ex. 1001, 2:45–47; 4:44–47. A conventional physical interface provides a connection between MTSCM 200 and the mobile terminal through which signals flow to the MTSCM. *Id.* at 5:13–16. The specification states that Figure 2 represents one modular breakdown for the components of MTSCM 200, but that "[i]t should be understood that the described *functionality* may alternatively be provided by an MTSCM having

fewer, greater, or differently named modules from those illustrated in the figure." *Id.* at 4:55–60 (emphasis added). According to the specification, mobile terminal interface module 202 accommodates receiving the multimedia signal from the mobile terminal, recognizes the multimedia signal, and stores it for processing by the remaining modules. *Id.* 5:12–20. The specification describes signal conversion module 204 as being in communication with mobile terminal interface module 202, accessing the received multimedia signal, recognizing its signal format, and processing the signal to provide a converted signal that may be different from the one used by the mobile terminal, as appropriate for the external device to which MTSCM 200 is connected. *Id.* 5:22–33. The specification describes external device interface 206 as in communication with signal conversion module 204 to access the converted signal and allow connection to the external device to provide (i) "both the feeding of the converted signal to the external device, and driving the external device" or, alternatively (ii) it may "merely feed the converted signal to the external device, with the external device including internal elements for driving its signal reproduction (e.g., display) facilities." *Id.* at 5:34–43. In short, the '492 patent discloses these modules solely as functional elements without any particular structure. The specification explicitly states that MTSCM 200 of which these functional modules are a part may be provided as software, firmware, hardware, or any combination thereof and that these functions can be distributed among fewer, greater or differently named modules. *Id.* at 4:45–47, 55–60. Thus, there are no structural limitations on the modules—they are described solely as performing functions.

Read in light of the specification, the claims of the ’492 patent preempt any hardware, software, or firmware implementation that performs the function of receiving a signal for a mobile device, converting that signal to a different format suitable for an external device (whether or not the external device needs to perform any further processing), and providing the signal to the external device. Although this may raise issues such as indefiniteness under 35 U.S.C. § 112, under 35 U.S.C. § 311(b) our jurisdiction does not extend to making such a determination. The Board has exercised its discretion to deny a petition where the challenged claim is so indefinite that we cannot conduct *inter partes* review. *See Space Exploration Techs. Corp. v. Blue Origin LLC*, Case IPR2014-01378, slip op at 8 (PTAB March 3, 2015) (Paper 6, denying institution where the panel could not identify any structure corresponding to the recited functions).

For purposes of this *inter partes* review, there are three options for construing the “module” limitations of the ’492 Patent: (i) because the specification contains sufficient description for a person of ordinary skill to understand the meaning and scope of the structure corresponding to the “module” terms, they should be given their ordinary and customary meaning in light of the specification, (ii) the description in the specification is inadequate to ascribe any construction to the “module” terms, and (iii) the “module” terms should be construed as “means-plus-function” limitations. The dissent would consider the “module” recitations to be means-plus-function limitations and would dismiss the Petition for failing to identify the specific portions of the specification that describe the structure or acts corresponding to each claimed function. 37 C.F.R. 42. 104(b)(3). Although the result advocated by the dissent would achieve Patent Owner’s goals of

dismissal, the dissent arrives at that result applying an analysis not advocated by Patent Owner in the Preliminary Response or raised in *Va. Innovation Scis. v. Samsung*, 614 F. Appx. at 505, in which claim 23 was treated as representative.

Under *Williamson v. Citrix Online, LLC*, 792 F.3d 1339, 1348 (Fed. Cir. 2015) (en banc), there is a rebuttable presumption that claim terms lacking the word "means" do not invoke § 112, ¶ 6. After *Williamson*, our reviewing Court confirmed that rebutting this presumption requires demonstrating "by a preponderance of the evidence that the claims are to be governed by § 112, ¶ 6." *Advanced Ground Info Sys. V. Life360, Inc.*, 830 F.3d 1341, 1347 (Fed. Cir. 2016) (citation omitted). Neither Petitioner nor Patent Owner has argued, much less demonstrated, that the "module" terms should be construed as means-plus-function limitations. Therefore, the presumption that these terms do not invoke § 112, para. 6 stands.

Furthermore, evidence that Patent Owner did not intend for the challenged claims to be "means-plus-function" claims is found in unchallenged claims 12–22. Independent claim 12 and dependent claims 13–22 recite almost the same limitations in "means-plus-function" language (i.e., "means for receiving a video signal," "means for processing the video signal to produce a converted video signal," and "means for providing the converted video signal"). The doctrine of claim differentiation supports the view that Patent Owner did not intend that any of the challenged claims recite means-plus-function limitations. Thus, our case is distinguished from that in IPR2014-01378, where the panel denied institution because the claims lacked adequate structural support for some of the means-plus-

function limitations and were not amenable to construction. *Space Exploration Techs.*, IPR2014-01378, slip op at 8.

The proliferation of functional claiming untethered to § 112, para. 6 is precisely the concern *Williamson* sought to address. *Williamson* 792 F. 3d at 1349. The term "module" is a well-known nonce word that can operate as a substitute for "means" in the context of 35 U.S.C. § 112 para 6. *Williamson* 792 F. 3d at 1350 (noting that "module" is simply a generic description for software or hardware that performs a specific function).Although *Williamson* set aside the strong presumption that the absence of the word "means" in a claim is not subject to 35 U.S.C. § 112, para 6, it did not replace that presumption with another presumption that the presence of nonce words requires us to determine that the claims are in means-plus-function format. *Id.* Indeed, as we discussed above in our construction of "display terminal," the IEEE dictionary defines "terminal" using what is arguably a nonce word, i.e., "device." Thus, the presence of a nonce word in a claim or the construction of a claim does not determine whether a claim recites a means- plus-function limitation.

A patent's claims, viewed in light of the specification and prosecution history must inform those skilled in the art about the scope of the invention with reasonable certainty. *Nautilus, Inc. v. Biosig Instruments, Inc.*, 572 U.S. ___, 134 S. Ct. 2120, 2130 (2014). Nevertheless, "the certainty which the law requires in patents is not greater than is reasonable, having regard to their subject matter." *Id.* (citing *Minerals Separation, Ltd. v. Hyde*, 242 U.S. 261, 270; 37 S. Ct. 82 (1916)). The Office establishes a prima facie case of indefiniteness with a rejection explaining how the metes and bounds of a pending claim are not clear because the claim contains words or phrases

whose meaning is unclear. *See In re Packard*, 751F.3d 1307, 1310 (Fed. Cir. 2014) (per curiam). [5]

> At the same time, this requirement is not a demand for unreasonable precision. The requirement, applied to the real world of modern technology, does not contemplate in every case a verbal precision of the kind found in mathematics. Nor could it do so in a patent system that actually works, in practice, to provide effective protection for modern-day inventions. Rather, how much clarity is required necessarily invokes some standard of reasonable precision in the use of language in the context of the circumstances.

In re Packard, 751 F.3d at 1313.

Recognizing that the specification does not describe any specific structure of the claimed "modules," we are not persuaded that the use of the nonce word "module" necessitates that their recitations are means-plus-function limitations. We consider whether, in regard to the subject matter, the claim terms and the specification provide the requisite disclosure. This leaves us with two options—either the specification and prosecution history inform those skilled in the art about the scope of the invention sufficiently under 35 U.S.C. § 112, or they fail that test, requiring us to dismiss the Petition because the claims are so indefinite that we cannot perform an *inter partes* review. In either case, the claims do not recite means-plus-function limitations.

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[5] We do not understand *Nautilus* to mandate a change in the Office's approach in matters in which "[a] claim is indefinite when it contains words or phrases whose meaning is unclear." *Ex parte McAward*, Appeal No. 2015-006416 (slip op. at 11)(PTAB Aug. 25, 2017) (precedential) (applying the standard approved by the Federal Circuit in *In re Packard*, 751 F.3d 1307,1310, 1314 (Fed. Cir. 2014), in a patent application matter).

We note the Federal Circuit's previous treatment of challenged claim 23 considered as a representative claim in *Va. Innovation Scis. v. Samsung*, 614 F. Appx. at 505, decided one week before *Williamson*.[6] The Federal Circuit did not address the construction of "interface module," "signal conversion module," or "device interface module," as recited in claim 23. Instead, the court addressed other claim construction issues, as discussed above. In this proceeding, we follow the same path and do not adopt Patent Owner's arguments that Petitioner failed to construe material elements of the claims. At this stage of the proceeding and for purposes of institution only, in the absence of evidence to the contrary, we determine that the claims are sufficiently clear that a person of ordinary skill would be informed of the scope of the invention with reasonable certainty, and we construe the claims under their broadest reasonable interpretation. As discussed above, in the context of the specification, the broadest reasonable interpretation of each "module" includes any hardware, software, or firmware that performs the functions enumerated in the claims using any number of modules with any names. *See*, Ex. 1001, 4:45–47, 55–60; 5:12–43.

Similarly, we are not persuaded by the argument in the dissent that construing "display terminal" as "a device for video display" broadens the construction by adopting an entirely functional description. Although "display terminal" appears structural, a requirement of the display terminal recited in the claims is that it be capable of displaying video—a feature that is not necessarily inherent in the structural term "display terminal." We find the IEEE Dictionary's use of "device" in its definition of "terminal" to be structural and to be persuasive evidence that a person of ordinary skill would

[6] Decided June 9, 2015; *Williamson* was decided on June 16, 2015.

be informed about the scope of the invention with reasonable certainty under this construction.

ANALYSIS OF PETITIONER'S PRIOR ART CHALLENGES

Introduction

A claim is unpatentable under 35 U.S.C. § 102 if a prior art reference discloses every limitation of the claimed invention, either explicitly or inherently. *Glaxo Inc. v. Novopharm Ltd.*, 52 F.3d 1043, 1047 (Fed. Cir.1995); *see MEHL/Biophile Int'l Corp. v. Milgraum*, 192 F.3d 1362, 1365 (Fed.Cir.1999) ("To anticipate a claim, a prior art reference must disclose every limitation of the claimed invention . . .;" any limitation not explicitly taught must be inherently taught and would be so understood by a person experienced in the field); *In re Baxter Travenol Labs.*, 952 F.2d 388, 390 (Fed.Cir.1991) (the dispositive question is "whether one skilled in the art would reasonably understand or infer" that a reference teaches or discloses all of the elements of the claimed invention).

A patent claim is unpatentable under 35 U.S.C. § 103(a) if the differences between the claimed subject matter and the prior art are such that the subject matter, as a whole, would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of ordinary skill in the art; and (4) objective evidence of nonobviousness. *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

Anticipation of Claims 1, 2, 6, 7, 11, 23, 24, 28, 29, and 33

The Nam Reference

Petitioner contends that claims 1, 2, 6, 7, 11, 23, 24, 28, 29, and 33 are anticipated by Nam. Nam discloses a multi-video interface configured to permit information present at a mobile device to be viewed in an external display. Ex. 1005, Abstract. Figure 1 of Nam is shown below.

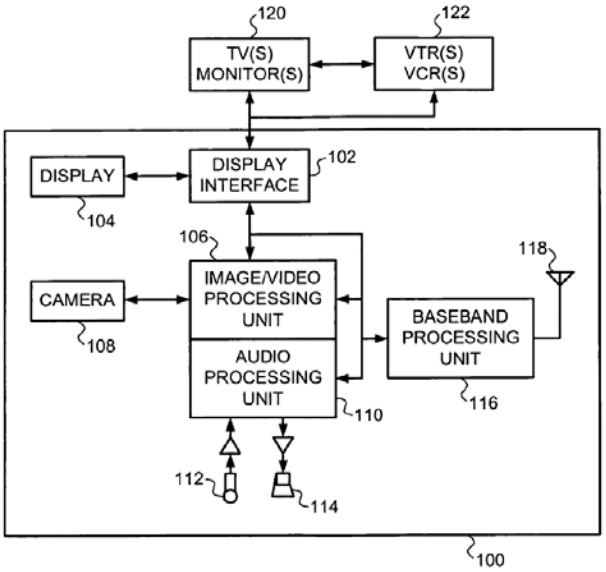

Figure 1 of Nam

Nam's mobile device 100 includes display interface 102 coupled between image/video processing unit 106 and native display 104, such as monochrome or color liquid crystal display (LCD) or touchscreen. *Id.* at 2:7–9, 31–37. Processing unit 106 is configured to process image/video signals received or transmitted by mobile device 100. *Id.* at 2:64–66. Processing unit 106 decompresses input signals received from transceiver 118 and transmits the decompressed signals to display interface 102 that conditions the decompressed signals into signals compatible with native display 104 for presentation. *Id.* at 3:10–17. Processing unit 106 also can receive signals from camera 108 and, if they are to be stored suitably,

compress them for storage, e.g., using MPEG, M-JPEG, JPEG compression. *Id*. at 3:3–10. To perform its functions, processing unit 106 may include one or more image/video encoders and decoders, memories, processors, microcontrollers, buffers, and routers. *Id*. at 3:17–20.

External display 120 (e.g., large screen TV, plasma display, LCD display, rear projection display, CRT, etc.) and external storage unit 122 (e.g., video tape recorder, video cassette recorder, recordable DVD player) are not native to mobile device 100. *Id.* at 3:55–56, 4:4–17. Display interface 102 configures images/video for transport, storage, or display and permits images/video present at the mobile device to be outputted to a variety of devices not native to the mobile device in a format compatible with standard TV monitors, VCRs, and other entertainment devices. *Id.* at 2:20–21; 4:36–40. As a multiple display or multi-video interface, display interface 102 is adapted to convert the images produced by image/video processing unit 106 into one of any of a variety of output formats, such as NTSC, PAL or digital video. *Id.* at 4:28–32. Output signals from display interface 102 to external storage unit 122 and/or external display 120 can be composite or component signals in analog or digital format transmitted over one or more lines, as appropriate for the non-native external device. *Id.* at 2:21–30. For example, when external display 120 is a TV, monitor or other display type with an "S-video in" port, display interface 102 may include a corresponding "S-video out" port. *Id.* at 3:64–4:9.

Nam also discloses that the components of mobile device 100 may comprise separate chips for display interface 102, baseband processing unit 116, and transceiver 118 or the functions of two or more chips may be embodied in a single system-on-chip device. *Id.* at 3:39–46. Nam further

states that various features may be omitted, for example if mobile device 100 has no wireless communications, transceiver 118 and baseband processing unit 116 need not be included. *Id.* at 3:46–51.

Independent Claim 1

The preamble of claim 1 recites "[a] method for processing signals to accommodate reproduction by an alternative display terminal." Petitioner cites Nam as disclosing a multi-video interface capable of displaying simultaneously video on a display of the mobile device and an external display, such as a television. Pet. 26–27 (citing Ex. 1005, Fig. 1, 4:33–36).

Claim 1 next recites "receiving by a conversion module a video signal appropriate for displaying video content on a mobile terminal" from a cellular network communication sent to the mobile terminal that is "then received by the conversion module." Petitioner cites Nam's disclosure that input signals received by transceiver 118 are to be displayed at display 104. *Id.* at 27–28. Petitioner identifies processing unit 106 and display interface 102, collectively, as the recited "conversion module." *Id.* at 28. Petitioner notes that Nam's processing unit 106 decompresses the input signals received by the transceiver and transmits the compressed signals to interface module 104. *Id.*

Claim 1 next recites "processing by the conversion module the video signal to produce a converted video signal for use by the alternative display terminal." Petitioner cites Nam's disclosure that display interface 102 is configured to permit video signals received at the mobile device to be output to external display devices 120, e.g., televisions, monitors, and VCRs, that are not native to the mobile device. Pet. 29.

Claim 1 next recites that the "processing by the conversion module includes converting the video signal from a compression format appropriate for the mobile terminal to a display format for the alternative display terminal that is different from the compression format." Petitioner notes that, because processing module 106 decompresses the received signal, Nam necessarily discloses the received signal is in a compressed format and is appropriate for the mobile device because after decompression and conditioning by interface module 102, the signal is presented on native display 104. *Id.* at 30–31. Petitioner further argues that Nam discloses the claimed conversion into a display format for the alternative display terminal, different from the compression format because in Nam processing unit 106 decompresses the received video and display interface 102 is configured "to convert the video produced by image/processing unit 106 into any one of a variety of output formats, such as NTSC, PAL, or digital video." *Id.* at 32 (citing Ex. 1005, 4:4–9, 28–32, 36–40).

Claim 1 next recites that "the converted video signal produced by the conversion module comprises a display format and a power level appropriate for driving the alternative display terminal." Petitioner argues that Nam discloses this feature because it describes display interface 102 converting the signal to a format, such as NTSC and PAL, that can be displayed on television screens. Pet. 35. Petitioner notes that compatibility with external display 120, requires that the signal format and power level output from display interface 102 be appropriate for driving the display. *Id.* at 35–36. Petitioner also notes that Nam discloses all the requisite processing and signal conversion is performed in its disclosed interface because Nam states "[t]he external display is not required to specially process the output signals

from the mobile device." *Id*. at 37–38 (citing Ex. 1005, Abstract, 4:28–43). Petitioner also cites to Nam's disclosure of S-video as an example of a standard television input also discussed in the '492 patent. *Id*. at 38.

The final limitation of claim 1 recites "providing the converted video signal from the conversion module to the alternative display terminal to accommodate displaying the video content by the alternative display terminal." Petitioner cites Nam as disclosing a multi-video interface adapted to convert motion video produced by image processing unit 106 into a variety of formats, such as NTSC, PAL, or digital video and permit images/video received at the mobile device to be output to the a variety of device not native to the mobile terminal. *Id.* at 38–39 (citing Ex. 1005, 4:28–32).

Patent Owner states that "[e]ach of the challenged claims requires that the signal conversion module process a signal that is appropriate for displaying video content on the mobile terminal to produce a converted video signal for use by the alternative display terminal." Prelim. Resp. 12. According to Patent Owner, in order to anticipate, Nam must disclose in the claimed order, a signal conversion module that converts from a compression format to a display format that is different from the compression format (i.e., the decompressed format) to produce a converted video signal for transmission to an alternative display terminal. *Id.* at 12. Patent Owner argues that Nam fails to disclose this feature because Nam only discloses that decompressed input signals are conditioned into signals compatible with display 104 and are transmitted to display 104, i.e., the display native to the mobile device, for presentation. *Id.* at 13–15.

Patent Owner states that our decision in IPR2013-00572 makes it clear that the format of a video signal for an internal display of a mobile terminal is not the same as the format for the alternative display terminal. *Id.* at 18–19. We based our decision in IPR2013-00572 on Palin's disclosure of splitting a data packet into a mobile terminal part and an external display part that is isolated and repackaged into a transport protocol, such as a Bluetooth protocol, for transmission to an external device. *Samsung v. Va. Innovation Scis.*, IPR2017-00572, Dec. Denying Inst at 13–14. Noting that Palin repeatedly distinguishes between converting signal formats and routing via a communications protocol, we determined that, even after considering reassembling external device parts into one or more Bluetooth compliant packets, Palin's splitting application does not convert the video signal from a compression format appropriate for a mobile terminal to a display format for the alternative display terminal that is different from the compression format. *Id.* 15–16.

Patent Owner's citation to IPR2013-00572 is inapposite. Unlike Palin, Nam does not involve data packets or transport protocols, but instead explicitly teaches a display interface 102 that conditions a signal for a display native to the mobile terminal (Ex. 1005, 3:13–16) and converts images to any of a variety of formats to accommodate a display device that is not native to the mobile terminal (*id*. at 4:28–33).

Suggesting that Petitioner is "fabricating the teaching of a 'conversion module' in Nam," Patent Owner contends "**the same decompressed and encoded video signal in a 'display format' for the alternative display terminal cannot be transmitted to an internal display of the mobile**

device through the same interface (e.g. 'display interface 102' in Nam)." Prelim. Resp. 21 (emphasis in original).

Nam contradicts Patent Owner's assertions. As discussed above, Nam explicitly states "processing unit 106 decompresses the input signals, transmits the decompressed input signals to the display interface 102, the decompressed input signals are conditioned into signals compatible with the display 104," i.e., the display native to the mobile device. Ex. 1005, 3:13–16. Nam also explicitly states that the "display interface is configured to permit images/video captured, received, or otherwise present at the mobile device to be outputted to a variety of devices not native to the mobile device, in a format compatible with TVs monitors, VCRs, and other entertainment device." *Id.* at 4:36–40. In order to achieve this, "display interface 102 . . . is adapted to convert the images and/or motion video *produced by image/video processing unit 106* into one of any of a variety of output formats such as NTSC, PAL, or digital video." *Id*. at 4:28–32 (emphasis added). As discussed above, Nam discloses that "processing unit 106 decompresses the input signals." *Id.* at 3:13. Thus, Nam discloses processing unit 106 decompresses the signal received by the mobile unit and that interface 102 both conditions the decompressed signal produced by the image/video processing unit for the display native to the mobile terminal and converts the decompressed signal produced by image/video processing unit 106 to a display format appropriate for the display device.

Patent Owner also argues that Nam is completely silent on how display interface 102 converts the images and motion video and how the images and motion video is processed by the image/video processing unit 106. Prelim. Resp. 22. Patent Owner critiques Nam as not discussing

compression formats or conversion of a compressed format to a decompressed format for the external display. *Id.* at 23. These arguments are unpersuasive because claim 1 does not recite any limitations on the compression format, or the display format. Moreover, although the '492 patent discusses the MPEG standards as examples of compression formats (Ex. 1001, 6:9–15, 7:63–65), the '492 patent is silent about how the compressed signal is decompressed. Nam also identifies MPEG as an image compression scheme. Ex. 1005, 3:7–8. Although the '492 patent mentions several analog formats, including S-video, RGBHV, RGBS, EIA770.3, and digital formats including, DVI, DVI-D, HDMI, and IEEE1394, (Ex. 1001, 6:37–40) used by external devices, the '492 patent provides no information about how to convert signals into any particular display format, stating only that for an analog external device, a video data stream may be a digital RGB signal representing red, green and blue light intensity and may be converted to an analog signal to drive a cathode ray tube "quantified to the voltage and format required by the standard" (*id.* at 6:50–56). Thus, the level of disclosure in the '492 patent and Nam are equivalent.

Patent Owner attacks the testimony of Petitioner's testifying expert, Dr. Almeroth, stating that its own expert Dr. Jose Melendez "discusses the fallacy of Dr. Ameroth's conclusions in detail in the attached Declaration (Dr. Melendez Declaration, Ex. 2003, ¶12-17)." Prelim. Resp. 27. Patent Owner's failure to discuss explicitly this alleged fallacy in the Preliminary Response is an improper incorporation by reference. 37 C.F.R. § 42. 42.6(a)(3). Nevertheless, we are unpersuaded by Dr. Melendez's cited testimony. Dr. Melendez states that Dr. Almeroth's testimony is "materially false," "completely misrepresents what is disclosed by Nam," and argues

that "[t]o fully comprehend the absurdity, note that what Nam actually states, and is quoted by Almeroth, is nothing more than how mobile devices already worked at the time." Ex. 2003, Declaration of Dr. Melendez ("Melendez Decl.") ¶ 15. We agree with both Dr. Almeroth and Dr. Melendez that on the filing date of the application for the '492 patent, mobile devices received compressed content, decompressed the content, and formatted the content for an internal display. *See id*. We are not persuaded, however, by Dr. Melendez's contention that Dr. Almeroth's testimony is inconsistent because Nam discloses the ability of display interface 102 to route signals to and from display 104, image processing unit 106, baseband processing unit 116, external display 120, and external storage unit 122. *Id*. ¶ 16 (citing Ex. 1005, 2:15–20). The very next sentence of Nam states "[t]he display interface 102 configures the images/video for transport, storage, or display." Ex. 1005, 2:20–21. Nam next states that the output signals from the display interface 102 to each of external display 120 and storage unit 122 can be analog or digital, composite or component signal (*id.* at 2:21–24), i.e., they are in a format that is appropriate for the external device that is different from the format of native display 104.

We also give little weight to Dr. Melendez's assertion that Dr. Almeroth's testimony is "false and materially misrepresents what is disclosed by Nam" because it

> was formed by pasting together two different fragments pulled from two different scenarios discussed by Nam, specifically Nam 3:10–17 which is specific to an example where input signals are decompressed at 106, and, <u>are conditioned into signals compatible with</u> the <u>display 104</u>," at 102, and only for display at the mobile device display 104; and Nam 4:28-32, which is specific to an example where the display interface 102 itself, "is adapted to <u>convert</u> the images and/or motion video

> produced by the image/video processing unit 106 into one of any of a variety of output formats, such as NTSC, PAL, or digital video." (emphasis added, Nam 3:10-17 and Nam 4:28-32).

Melendez Decl. ¶ 13. According to Dr. Melendez:

> Nam does not discuss or even attempt to disclose an embodiment, abstract or otherwise, where an image signal is received wirelessly, decompressed by processing unit 106, and converted into a display format for an "alternative display terminal" alleged as external display 120.

Id. ¶ 14. Dr. Melendez's above testimony is inconsistent with the disclosures in Nam (i) of "a system and method-for viewing information from a mobile device at more than one display, even a display not attached or embedded to the mobile device" (Ex. 1005, 4:33–35), (ii) that the "[*s*]*ame* or different images/video can be *simultaneously viewed at the display 104 and the external display 120"* (*id*. at 4:1–3)(emphasis added) and (iii) that "[t]he *display interface 102 is configured to allow . . .* same or different images/video to be simultaneously displayed at the external display 120 and the display 104" (*id.* at 4:17–22).

As discussed above, Petitioner has cited specific subject matter that supports its assertion that Nam discloses all the elements of claim 1. Other than its arguments concerning the conversion module discussed above, Patent Owner does not dispute explicitly Petitioner's assertion that Nam discloses the remaining elements of claim 1. In consideration of the above, on the current record, we are persuaded that Petitioner has shown that Nam discloses all the elements of claim 1.

Independent Claim 23

Independent claim 23 is an apparatus claim that recites subject matter similar to that of claim 1, in the form of (i) an interface module that receives the video signal, (ii) a signal conversion module in operative communication with the interface module to produce a converted signal by processing that includes converting the video signal in substantively the same manner as that recited in claim 1 discussed above, and (iii) a device interface module in operative communication with the signal processing module that provides the converted signal to the alternative display terminal. Petitioner cites transceiver 118 that receives the cellular signal and/or baseband unit 116 in Nam as corresponding to the claimed interface module. Pet. 41–42. Petitioner cites processing unit 106 and display interface 102 as the claimed signal conversion module, applying the same reasoning as that applied to the conversion module in claim 1. *Id.* at 43–44. Petitioner argues that Nam discloses the claimed interface module in several ways: (i) as an "S-video out" port in operative communication with display interface 102 to provide an S-video output signal to external device 120 (*id.* at 44–45); (ii) a device interface explicitly illustrated in Demonstrative B (Figure 1 of Nam with the connecting line between monitor 120 and display interface 102 highlighted, id. *at* 46) because it provides operative communication between display module 102 and display device 120, and (iii) as necessarily included given that Nam explains the display interface provides the converted signals to external display 40 (*id*. at 46–47).

Patent Owner does not respond to Petitioner's anticipation contentions concerning claim 23. However, Patent Owner responds to Petitioner's designation of the various modules as corresponding to the disclosures in

Nam in its response to Petitioner's obviousness challenge to claim 23. Prelim Resp. 35–42. Patent Owner states that Petitioner and its expert are "wrong with their coined 'signal conversion module' using the combination of 'image/video processing unit 106' and 'display interface 102' in Nam" and "wrong in alleging that the claimed 'device interface module' is an 'S-video port in Nam.'" *Id.* at 40. Therefore, we address Patent Owner's contentions in our analysis of anticipation of claim 23.

According to Patent Owner, claim 23 of the '492 patent connects the interface module to the signal conversion module on one side and S-video channel on the other for transmission of converted signals to an alternative display, whereas Nam discloses an S-video channel between display interface 102 and TV monitor 120. *Id.* at 38–39, *see* Ex. 1001, Fig 3b, element 306b. In the context of claim 23 and the '492 patent, this appears to be a distinction without a difference. Claim 23 does not recite an actual connection but a device module "in operative connection" with the signal conversion module. Claim 23 recites that the interface module "provides the converted signal to the alternative display terminal." Thus, claim 23 recites an interface module in operative rather than physical connection with the signal conversion module to perform a function, i.e., to provide the signal to the external device. Petitioner contends that the "S-video out" in Nam connects display interface 102, which is part of the signal conversion module to the external output and thus the S-video out is the interface module. Thus, we are persuaded that Petitioner has demonstrated that at least Nam's disclosure of an S-video out connected to display interface 102 discloses structure that performs the function of providing the converted

signal to external device 120 and is operatively connected to the signal conversion module formed by display interface 102 and processing unit 106.

For the reason discussed above, on the current record we are persuaded that Petitioner has demonstrated that Nam discloses all the elements of claim 23.

Claims 2 and 24

Claims 2 and 24 depend from claims 1 and 23, respectively, and recite that the mobile terminal is a cellular phone. As Petitioner points out, Nam discloses mobile device 100 may be a cellular phone. Pet. 39 (citing Ex. 1005, 1:66–67). Patent Owner does not dispute this assertion.

Claims 6 and 28

Claims 6 and 28 depend from claims 1 and 23, respectively, and recite that the video signal received is part of a multimedia signal that is received in cellular network communication. As Petitioner points out, Nam discloses receiving over cellular network wireless signals that may comprise data representative of images/video, sound, and data. Pet. 39 (citing Ex. 1005, 1:66–2:2, 2:50–63, and 3:10–17). Patent Owner does not dispute this assertion.

Claims 7 and 29

Claims 7 and 29 depend from claims 1 and 23, respectively, and recite that the alternative display is an external display terminal. As Petitioner points out, Nam discloses that external device 120 is non-native to the mobile terminal and is an alternative display terminal because it has its own display. Pet. 49 (citing Ec. 1005, 2:32–34). Patent Owner does not dispute this assertion.

Claims 11 and 33

Claims 11 and 33 depend from claim 1 and 23, respectively, and recite that the alternative display terminal is a digital display device. Petitioner points out, and on this record, we agree, that Nam discloses external display 120 can be a large screen TV, plasma display, LCD, and may use a digital video format. Pet. 40 (citing Ex. 1005, 4:4–9, 28–32). Patent Owner does not dispute this contention.

In consideration of the above, we are persuaded that on the current record Petitioner has demonstrated that Nam discloses all of the elements recited in claims 1, 2, 6, 7, 11, 23, 28, 29, and 33.

Obviousness of Claims 23, 24, 28, 29, and *33 Over Nam*

Petitioner contends that to the extent Patent Owner argues or it is found that Nam does not disclose a device interface module like that recited in claim 23, it would have been obvious to one of ordinary skill to implement such a module. Pet. 49. We addressed Petitioner's contentions and Patent Owner's response in our analysis of anticipation of claim 23 by Nam. Our analysis of Patent Owner's contentions that Petitioner did not propose constructions of the modules also recognizes that the '492 specification explicitly states that MTSCM 200 of which these functional modules are a part may be provided as software, firmware, hardware, or any combination thereof and that these functions can be distributed among fewer, greater or differently named modules. Ex. 1001, 4:45–47, 55–60. In the absence of substantive structural limitations on the modules—they are described solely as performing functions—we are persuaded that it would have been obvious to distribute the functions of providing the signal to the external device in a device interface module as claimed. Thus, we determine

that for purposes of institution, Petitioner has demonstrated that claim 23 would have been obvious to one of ordinary skill over Nam.

As discussed above, Nam discloses the features recited in claims 24, 28, 29, and 33. Therefore, we are persuaded that on the current record Petitioner has demonstrated claims 24, 28, 29, and 33 are also obvious over Nam.

Obviousness of Claims 4 and 26 Over Nam and Takeda

Claims 4 and 26 depend from claims 1 and 23, respectively, and recite that receiving the video signal, processing the video signal, and providing the converted signal to the alternative display are performed using power from a source that differs from the power supply of the mobile terminal (method claim 4) and that the power to perform these functions is from a source that differs from the internal power supply of the mobile terminal (apparatus claim 26).

Petitioner cites Takeda, which discloses a display processing system that includes portable phone 20, conversion adaptor 40, controller 50 (e.g., game controller 50), and TV monitor 60, as teaching such a system. Pet. 52 (citing Ex. 1006, Abstract, 5:41–61, Fig. 1). Takeda seeks to display on a large screen TV monitor images based on data received from information provided by portable phone 20. *Id.*, Abstract. When placed in conversion adapter 40, portable phone 20 may receive a display switching signal from controller 50, causing CPU 23 in the portable phone to supply image display data for temporary storage to video memory 44 in conversion adapter 40. *Id.* Abstract, 8:40–46, Fig. 2. At predetermined times, memory 44 is read by video conversion circuit 45, which converts the data into a video signal that is then supplied to television monitor 60, for display as a one-frame image.

Id. at 46–51. Another display mode selectable using controller 50 supplies the image to both the native mobile phone display RAM 29 and video memory 44, such that the image is displayed on both on mobile phone LCD 21 and television monitor 60. *Id.* at 8:60–67.

Petitioner notes that in Takeda portable phone 20 has power mode switching circuit 25 that detects when the phone is connected to conversion adaptor 40, so that the phone can switch from internal battery power to a mode in which the phone receives power from the conversion adaptor (the normal power mode). Pet. 52–54 (citing Ex. 1006 6:43-48, 7:15-29, 7:45-48, Fig. 2). In the normal power mode, i.e., when phone 20 is receiving power from conversion adaptor 40, power switching circuit 25 in phone 20 changes the clocks to higher frequencies to accommodate generation of the image in high resolution. Ex. 1006, 7:15–30. Petitioner cites this feature of Takeda as evidence that Takeda discloses processing the video signal to produce converted video signals and providing the converted video signal to an alternative display using power from a source that differs from the power supply of the mobile terminal, as recited in claims 4 and 26. Pet. 55. Petitioner further notes that Takeda discloses that, based on user input from controller 50, portable phone 20 can receive game data and convert it to video signals appropriate for an external display. Pet. 56 (citing Ex. 1006, 9:29–39).

Patent Owner acknowledges that video conversion circuit 45 in conversion adaptor 40 of Takeda converts the signal to a display format, such as PAL or NTSC. Prelim. Resp. 43. Recognizing that conversion circuit 45 is part of conversion adaptor 40, as opposed to mobile phone 20, Patent Owner contends Petitioner's assertion of obviousness over Nam and

Takeda is inconsistent with Dr. Almeroth's testimony supporting anticipation, where Dr. Almeroth testified that the signal conversion module is inside the mobile device. *Id*. at 45. Patent Owner further argues that the "conversion module" alleged by Dr. Almeroth provides video signals to both the internal display of the mobile device and the external display and that "this cannot coexist with Takeda and technical common sense." *Id.* at 50.

We agree with Petitioner's analysis and are not persuaded by Patent Owner's arguments. As discussed above, the specification of the '492 patent does not describe any specific structure of the claimed "modules" and states that MTSCM 200, of which these functional modules are a part, may be provided as software, firmware, hardware, or any combination thereof and that these functions can be distributed among fewer, greater or differently named modules. Ex. 1001, 4:45–47, 55–60. Claims 4 and 26 do not require that the functions performed (claim 4) or the modules that perform the functions (claim 26) be located in any particular device, including the mobile device, or even in any one device. The specification of the '492 patent discloses an embodiment in Figure 6 where the MTSCM that has modules to perform the recited functions is located in the external display. Ex. 1001, 7:41–59.

Takeda's discussion of adjusting the clock frequencies to achieve higher resolution in the larger external display is in some ways more informative of the techniques for converting the video appropriate for display on a mobile device to a display format appropriate for an alternative device than that discussed in either the '492 patent or Nam. Takeda discloses that the operation of conversion circuit 45 in conversion adaptor 40 is affected by switching circuit 25 that causes phone 20 to increase the clock

frequencies to improve display resolution. Thus, the conversion function in Takeda is distributed between both the mobile phone and the conversion adaptor. The claims do not preclude a structure with such a distribution of functions.

Petitioner cites Takeda for the proposition that it would have been obvious to configure Nam to provide power from an external source to perform the processing and provide the disclosed operations. Pet. 57. Petitioner argues that a person of ordinary skill would have been motivated to combine the teachings of Nam and Takeda to operate from a source other than a battery because (i) Nam teaches displaying a video on an alternate display may be desirable to achieve a higher resolution and (ii) Takeda teaches that generating higher resolution images consumes additional power. Pet. 58. We are persuaded that Petitioner has articulated a reasoned analysis with rational underpinning to support the combination of references. Petitioner further notes that Nam's disclosure of composite signals containing all signal components except power and ground recognizes using a separate cable for carrying power (*id.* at 59) and that such modifications are predictable and require little experimentation, using known components for known purposes (*id.* at 63–65).

In consideration of the above we are persuaded that, on the current record, Petitioner has demonstrated that clams 4 and 26 would have been obvious to a person of ordinary skill over the combination of Nam and Takeda.

SUMMARY

For the reasons discussed above, we are persuaded that Petitioner has demonstrated a reasonable likelihood that it will prevail on the following challenges to patentability:

Claims 1, 2, 6, 7, 11, 23, 24, 28, 29, and 33 as anticipated under 35 U.S.C. § 102(b) by Nam;

Claims 23, 24, 28, 29, and 33 as obvious under 35 U.S.C. § 103(a) over Nam; and

Claim 4 and 26 as obvious under 35 U.S.C. § 103(a) over Nam and Takeda.

ORDER

In consideration of the foregoing, it is hereby:

ORDERED that pursuant to 35 U.S.C. § 314(a) an *inter partes* review of the ’492 patent is hereby instituted, commencing on the entry date of this Order, and pursuant to 35 U.S.C. § 314(c) and 37 C.F.R. § 42.4, notice is hereby given of the institution of a trial.

FURTHER ORDERED that the trial is limited to the following grounds and no other grounds are authorized:

Claims 1, 2, 6, 7, 11, 23, 24, 28, 29, and 33 as anticipated under 35 U.S.C. § 102(b) by Nam;

Claims 23, 24, 28, 29, and 33 as obvious under 35 U.S.C. § 103(a) over Nam; and

Claim 4 and 26 as obvious under 35 U.S.C. § 103(a) over Nam and Takeda;

FURTHER ORDERED that the trial will be conducted in accordance with the accompanying Scheduling Order. In the event that an initial

conference call has been requested or scheduled, the parties are directed to the Office Trial Practice Guide, 77 Fed. Reg. 48756, 48765–66 (Aug. 14, 2012), for guidance in preparing for the initial conference call, and should come prepared to discuss any proposed changes to the scheduling order entered herewith and any motions the parties anticipate filing during the trial.

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

HTC AMERICA, INC.,
Petitioner,

v.

VIRGINIA INNOVATION SCIENCES, INC.,
Patent Owner.

Case IPR2017-00870
Patent 7,899,492 B2

Before JAMESON LEE, MICHAEL W. KIM, TREVOR M. JEFFERSON, BRIAN J. McNAMARA and CHRISTA P. ZADO, *Administrative Patent Judges.*

LEE, joined by KIM, *Administrative Patent Judges*, dissenting.

We reach a conclusion different from that of our colleagues, because (1) each challenged claim includes a means-plus-function element under 35 U.S.C. § 112, sixth paragraph,[1] and (2) Petitioner has not complied with the requirement of 37 C.F.R. § 42.104(b)(3) to set forth, with respect to the means-plus-function claim element, corresponding structure, material, or acts described in the specification of the '492 patent. In summary, Petitioner has not explained how any properly construed challenged claim is met by the applied prior art.[2]

A. Claim Construction

Claim 23 recites the following phrase:[3]

> *signal conversion module, in operative communication with the interface module, which processes the video signal to produce a converted signal for use by the alternative display terminal, wherein processing by the signal conversion module includes converting the video signal from a compression format appropriate for the mobile terminal to a display format for the alternative display terminal that is different from the compression format, such that the converted video signal comprises a display format and a power level appropriate for driving the alternative display terminal*

[1] Paragraphs 1 through 6 of 35 U.S.C. § 112 were renamed as paragraphs (a) through (f) when § 4(c) of the Leahy-Smith America Invents Act, Pub. L. No. 112–29, 125 Stat. 284, 329 (2011) ("AIA") took effect on September 16, 2012. Because the patent application resulting in the '492 patent was filed before the effective date of the AIA, we refer to the pre-AIA version of § 112.

[2] The Board is not a party to this proceeding. Here, we do not attempt to cure deficiencies in the Petition by performing the required tasks ourselves, e.g., explaining how the means-plus-function element is met by the prior art.

[3] Claims 24, 26, 28, 29, and 33 each depend directly from claim 23 and thus each incorporate all limitations of claim 23.

Neither party explains the scope of a signal conversion module recited as such and, in particular, what structure is required. In reviewing the Petition, however, we must consider the proper scope of this recitation.

35 U.S.C. § 112, sixth paragraph, provides:

> An element in a claim for a combination may be expressed as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof, and such claim shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof.

Absence of the word "means" in a claim limitation gives rise to a rebuttable presumption that means-plus-function treatment does not apply. *Williamson v. Citrix Online, LLC*, 792 F.3d 1339, 1348 (Fed. Cir. 2015) (en banc). The presumption may be overcome, however, if "the claim fails to 'recite sufficiently definite structure' or else recites 'function without reciting sufficient structure for performing that function.'" *Id.* (internal citations omitted). In determining whether a claim recites sufficient structure, the standard is "whether the words of the claim are understood by persons of ordinary skill in the art to have a sufficiently definite meaning as the name for structure." *Id.* at 1349.

On this record, a module does not identify any specific structure. The Federal Circuit has expressly noted that "'[m]odule' is a well-known nonce word that can operate as a substitute for 'means' in the context of § 112, para 6." *Id.* at 1350. It further stated:

> Generic terms such as "mechanism," "element," "device," and other nonce words that reflect nothing more than verbal constructs may be used in a claim in a manner that is tantamount to using the word "means" because they "typically do not connote sufficiently definite structure" and therefore may invoke § 112, para. 6.

Id. Petitioner's expert, Dr. Kevin C. Almeroth, has not testified that to one with ordinary skill in the art, "module" denotes a specific known structure or class of structures. We recognize that the Manual of Patent Examining Procedure is not binding on the Board, but note that it regards "module for" as a possible non-structural generic placeholder that is, for all intents and purposes, a substitute for "means." Manual of Patent Examining Procedure § 2181 I.A (9th ed. 2014 rev. July 2015). In order to determine whether the recited term "module" is a nonce word, we look to the specification to see how "module" is used, e.g., whether a specific structural definition has been provided.

We find no specific structural definition in the specification for the term "module" or "signal conversion module." Outside of the claims, the specification uses the term "signal conversion module" six times. In three of those instances, "signal conversion module" is encompassed within a larger term "mobile terminal signal conversion module." The '492 patent describes:

> In the illustrated embodiment [of Figure 1], a mobile terminal signal conversion module (MTSCM) 112 resides within a separate housing 110, outside the cellular telephone 108.

Ex. 1001, 3:52–54.

> Fig. 2 is a block diagram illustrating an example of a mobile terminal signal conversion module in accordance with the present invention.
>
> Fig. 3 is a block diagram illustrating another example of a mobile terminal signal conversion module in accordance with the present invention.

Id. at 2:45–50. Thus, the mobile terminal signal conversion module or MTSCM is not itself the "signal conversion module," because the mobile terminal signal conversion module includes each of a "signal conversion

module," a mobile terminal interface module, and an external device interface module. *Id.* at 5:9–11.

In the three instances where "signal conversion module" by itself is used, the first is where signal conversion module is described as being included within the MTSCM. *Id.* That does not convey anything meaningful about the structural limitations of the signal conversion module, particularly when the MTSCM, which includes the signal conversion module, is described as capable of being "provided as software, firmware, hardware, or any combination thereof." *Id.* at 4:44–47. The other two instances where "signal conversion module" by itself is mentioned are: "The *signal conversion module* 204 is in communication with the mobile terminal interface module 202 and thus accesses the received multimedia signal. The *signal conversion module* 204 recognizes the multimedia signal format, and processes the multimedia signal to provide a converted signal." *Id.* at 5:22–27 (emphasis added). In neither case does the reference indicate anything about the structural limitations of the signal conversion module. Rather, only the function of such a module is described.

We look for further additional clues in Figures 2 and 3, which illustrate a MTSCM that includes a signal conversion module. Figures 2 and 3 of the '492 patent are reproduced below:

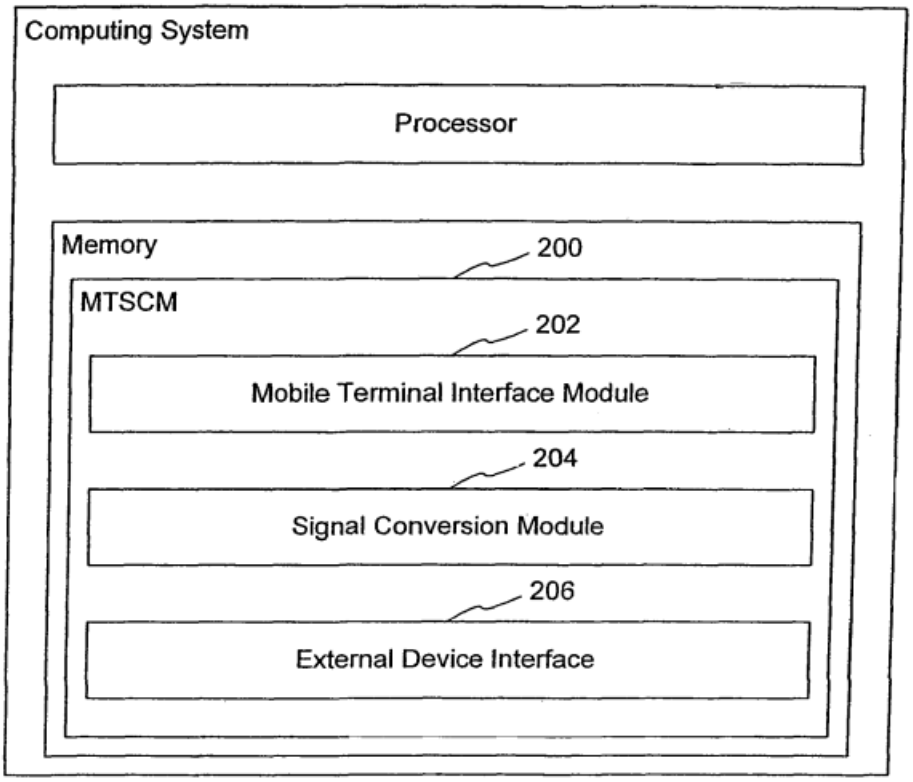

FIG. 2

Figure 2 is a block diagram illustrating an example of a mobile terminal signal conversion module (MTSCM) according to the '492 patent. *Id.* at 2:45–47.

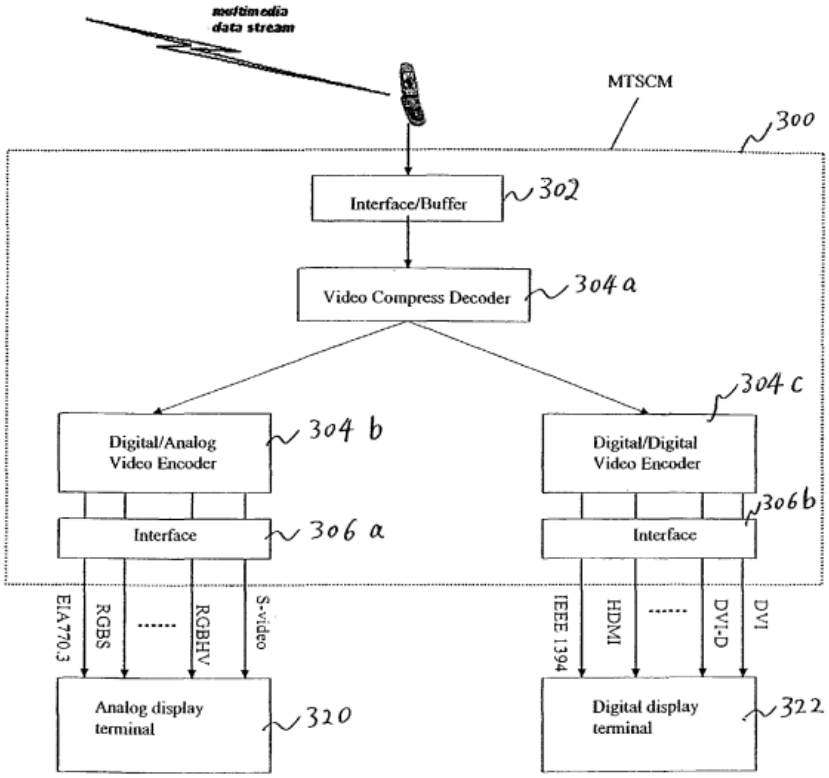

FIG. 3

Figure 3 is a block diagram illustrating another example of a mobile terminal signal conversion module (MTSCM) according to the '492 patent. *Id.* at 2:48–50. Figures 2 and 3 illustrate separate examples of the MTSCM.

Although Figure 3 may illustrate a specific structural example of a signal conversion module comprising Video Compress Decoder 304a, Digital/Analog Video Encoder 304b, and Digital/Digital Video Encoder 304c, Figure 2 illustrates an open-ended signal conversion module 204 that is not limited to anything. Indeed, the Figure 2 example of a signal conversion module is merely a black box. The open-ended nature of the Figure 2 example of "signal conversion module" and the fact that the '492 patent describes MTSCM, which includes the "signal conversion module," as "software, firmware, hardware, or any combination thereof," inform us

that "module" in the term "signal conversion module" of claim 23 is used as a nonce word, and the term "signal conversion module" recited in claim 23 is merely a generic placeholder meant to cover any structure that performs the recited function. That function is *converting the video signal from a compression format appropriate for the mobile terminal to a display format for the alternative display terminal that is different from the compression format, such that the converted video signal comprises a display format and a power level appropriate for driving the alternative display terminal*. Within the term "signal conversion module," the words "signal conversion" before "module" reflect merely an abbreviated reference to the lengthy description of the function being performed, as defined by the rest of the claim phrase, and not any specific structure. We further observe that we do not discern from the majority opinion anything that would be excluded as a covered structure of the recited "signal conversion module."

For the foregoing reasons, we find that the presumption of non-means-plus-function nature of "signal conversion module" has been overcome by the above-noted description in the specification.

Accordingly, the phrase reproduced above, i.e.,

> "*signal conversion module, in operative communication with the interface module, which processes the video signal to produce a converted signal for use by the alternative display terminal, wherein processing by the signal conversion module includes converting the video signal from a compression format appropriate for the mobile terminal to a display format for the alternative display terminal that is different from the compression format, such that the converted video signal comprises a display format and a power level appropriate for driving the alternative display terminal,*"

is subject to treatment under 35 U.S.C. § 112, sixth paragraph, as a means-plus-function element.

Claim 1 recites the following two phrases collectively setting forth a conversion module that performs certain functions:[4]

> *"receiving by a conversion module a video signal appropriate for displaying a video content on a mobile terminal, the video signal being received by the conversion module from a cellular network communication that is sent to the mobile terminal and then received by the conversion module*
>
> and
>
> *"processing by the conversion module the video signal to produce a converted video signal for use by the alternative display terminal, wherein the processing by the conversion module includes converting the video signal from a compression format appropriate for the mobile terminal to a display format for the alternative display terminal that is different from the compression format, such that the converted video signal produced by the conversion module comprises a display format and a power level appropriate for driving the alternative display terminal"*

Neither party explains the scope of a conversion module recited as such and, in particular, what structure is required. In reviewing the Petition, however, we must determine the proper scope of this recitation.

We find no specific structural definition in the specification for the term "module" or "conversion module." Outside of the claims, the specification does not use the term "conversion module" by itself. As discussed above, the Federal Circuit has expressly noted that "'[m]odule' is a well-known nonce word that can operate as a substitute for 'means' in the context of § 112, para 6." *Williamson* 792 F.3d at 1350. In our view, that is

[4] Claims 2, 4, 6, 7, and 11 each depend directly from claim 1, and therefore each incorporate all limitations of claim 1.

the case here, particularly in light of the fact that the word "conversion" immediately preceding "module" merely reflects the converting function that is expressed in the second phrase.

If "conversion module" refers to the disclosed MTSCM, mobile terminal signal conversion module, we have explained above how the specification of the '492 patent does not limit the structure of a MTSCM, but describes that it may be "provided as software, firmware, hardware, or any combination thereof." Ex. 1001, 4:44–47. If "conversion module" refers to the disclosed signal conversion module, we have explained above why the specification of the '492 patent does not limit the structure of a signal conversion module. If "conversion module" refers to something more generic, then it is even more so that the term is not structurally limiting. We further observe that we do not discern from the majority opinion anything that would be excluded as a covered structure of the recited "conversion module."

For reasons similar to those discussed in connection with the means-plus-function element in claim 23, the presumption of non-means-plus-function nature of "conversion module" in claim 1 has been overcome. In the two phrases jointly reciting a conversion module, reproduced above, everything other than "conversion module" represents the functions the conversion module is to perform. We find that the two phrases reproduced above collectively are subject to treatment under 35 U.S.C. § 112, sixth paragraph, as a means-plus-function element.

B. Why the Petition is Deficient

As discussed above, each of independent claims 1 and 23 includes a means-plus-function element under 35 U.S.C. § 112, sixth paragraph, the

scope of which is defined by corresponding structure, material, or acts described in the specification and equivalents thereof. Claims 2, 4, 6, 7, 11, 24, 26, 28, 29, and 33 each depend, directly or indirectly, from claim 1 or claim 23, and, therefore, each include the same means-plus-function element that is within claim 1 or claim 23, respectively.

Petitioner, however, did not treat any element in claims 1 and 23 as a means-plus-function recitation under 35 U.S.C. § 112, sixth paragraph. In particular, Petitioner did not identify corresponding structure in the specification that corresponds to the above-noted means-plus-function elements in the claims, and also did not explain how such corresponding structure or its equivalent is met by the applied prior art.

We considered whether Petitioner should have known to address a possible construction of the above-noted claim element as a means-plus-function recitation under 35 U.S.C. § 112, sixth paragraph, regardless of whichever position it takes. We conclude the answer is "yes."

Under the procedure governed by rules applicable to *inter partes* review, there is not a bifurcated proceeding, either prior or subsequent to institution of trial, in which the Board first determines a proper construction of the claims, and then the parties submit their contentions based on the Board's claim construction. Indeed, it is an express requirement of 37 C.F.R. § 42.104(b)(3) that a petition must set forth "[h]ow the challenged claim is to be construed." In that regard, the case involving a means-plus-function element is no different from the situation relating to any other claim element. For example, consider the situation where a means-plus-function element is not at issue, but petitioner proposes and relies on a construction that is excessively broad, whether (1) through an explicit claim construction

set forth in the petition, or (2) implicitly without an explicit construction, and applies that excessively broad construction to the prior art. In that situation, because the petitioner has not applied a properly narrower construction to the prior art, it normally leads to a denial of the petition, and not to, for example, submission of a revised petition or supplemental briefing that applies the properly narrow construction, as determined by the Board. And in situations involving a means-plus-function element, petitioner's failure to address claim construction is even more significant, because 37 C.F.R. § 42.104(b)(3) specifically addresses the situation involving a means-plus-function element. It states: "Where the claim to be construed contains a means-plus-function or step-plus-function limitation as permitted under 35 U.S.C. § 112(f), [petitioner's] construction of the claim must identify the specific portions of the specification that describe the structure, material, or acts corresponding to each claimed invention."

Several other factors further support our determination that Petitioner should have addressed the issue in its Petition. The *Williamson* en banc decision was issued by the Federal Circuit on June 15, 2015, more than nineteen months prior to filing of the Petition, and specifically identified "module" as a nonce word which may trigger means-plus-function treatment under 35 U.S.C. § 112, sixth paragraph. Section 2181 of the Manual of Patent Examining Procedure (9th ed. 2014 rev. July 2015) identifies "module for" as a generic placeholder that may trigger means-plus-function treatment under 35 U.S.C. § 112, sixth paragraph, and was published in 2015, more than one year prior to filing of the Petition. Also, on April 1, 2014, the Board designated as "Informative" these three expanded panel decisions: *Ex parte Lakkala*, Appeal No. 2011-001526, slip op. at 9–13

(PTAB March 13, 2013) (determining that a "processor in communication with the memory device and configured with the program to" perform certain functions is a means-plus-function recitation under 35 U.S.C. § 112, sixth paragraph); *Ex parte Erol*, Appeal No. 2011-001143 slip op. at 14–18 (PTAB March 13, 2013) (determining that a "processor adapted to" perform several steps is a means-plus-function recitation under 35 U.S.C. § 112, sixth paragraph); *Ex parte Smith*, Appeal No. 2012-007631 slip op. at 12–16 (PTAB March 14, 2013) (determining that a "processor in communication with the memory and programmed to" perform certain functions is a means-plus-function recitation under 35 U.S.C. § 112, sixth paragraph).[5]

C. Conclusion

Petitioner did not comply with 37 C.F.R. § 42.104(b)(3) and did not adequately explain how structure described in the specification and corresponding to the above-noted means-plus-function elements is met by the applied prior art. Accordingly, we conclude that Petitioner has not shown a reasonable likelihood that it would prevail in establishing the unpatentability of any of claims 1, 2, 4, 6, 7, 11, 23, 24, 26, 28, 29, and 33. Trial should not be instituted for any claim on any alleged ground of unpatentability.

[5] They are accessible by link posted on the Board's website under the heading "Decisions" and subheading "Key Decisions Involving Functional Claiming."

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