

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SAMSUNG ELECTRONICS CO., LTD.,
Petitioner,

v.

ADVANCED CODING TECHNOLOGIES, LLC.
Patent Owner.

IPR2023-00910
Patent 9,445,041 B2

Before BART A. GERSTENBLITH, NATHAN A ENGELS, and
RUSSELL E. CASS, *Administrative Patent Judges*.

ENGELS, *Administrative Patent Judge*.

DECISION
Granting Institution of *Inter Partes* Review
35 U.S.C. § 314
Denying Motion for Joinder
35 U.S.C. § 315(c); 37 C.F.R. § 42.122

I. INTRODUCTION

A. Background

Samsung Electronics Co., Ltd. (“Petitioner”) filed a Petition (Paper 3, “Pet.”) requesting *inter partes* review of claims 1–6 of U.S. Patent No. 9,445,041 B2 (Ex. 1001, “the ’041 patent”). Petitioner also filed a Motion for Joinder requesting joinder with IPR2022-01548 (Paper 2), but IPR2022-01548 has since terminated due to settlement (IPR2022-01548, Paper 18). Therefore, we deny the Motion as moot. Patent Owner Advanced Coding Technologies, LLC filed a Preliminary Response. Paper 7 (“Prelim. Resp.”).

An *inter partes* review may not be instituted unless it is determined that “the information presented in the petition filed under section 311 and any response filed under section 313 shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.” 35 U.S.C. § 314 (2018). For the reasons provided below and based on the record currently before us, we determine that Petitioner has demonstrated a reasonable likelihood that it would prevail in showing the unpatentability of at least one of the challenged claims. Patent Owner has not persuaded us that we should exercise our discretion to deny institution of trial. Accordingly, we institute an *inter partes* review on all grounds set forth in the Petition.

B. Real Parties in Interest

Petitioner states that the real parties-in-interest are Samsung Electronics Co., Ltd, and Samsung Electronics America, Inc. Pet. 57. Patent Owner states that Advanced Coding Technologies, LLC is the real party-in-interest. Paper 5, 1.

C. Related Proceedings

Petitioner states that the '041 patent is the subject of *Advanced Coding Technologies LLC v. ByteDance, Ltd.*, No. 2-22-cv-00129-JRG (E.D. Tex.); *ByteDance Inc. v. Advanced Coding Technologies LLC*, No. 4-23-cv-01412 (N.D. Cal.); and *Advanced Coding Technologies LLC v. Samsung Electronics Co.*, No. 2-22-cv-00499 (ED Tex.). Pet. 57; *see* Paper 5, 2.

D. The Challenged Patent

The '041 patent relates to methods and systems for processing moving image data “to easily play back moving image data generated at various frame rates at a predetermined frame rate and playback speed.” Ex. 1001, 1:21–24. The patent states that general frame rates such as 30 or 60 frames per second (“fps”) are used to capture video images of travel scenes and birthday parties, that high frame rates of 300 or 600 fps are used for scenes with quick movements such as sporting events, and that low frame rates such as 1/20 or 1/80 fps are used for subtle changes over long periods of time such as plant growth. Ex. 1001, 1:32–49. “[I]t is desirable that imaging data generated at various frame rates at the image capturing can be played back at various frame rates and playback speeds” Ex. 1001, 1:50–53.

Some playback devices can display only a limited frame rate, such as 60 fps. Ex. 1001, 1:65–67. To account for such display devices or other considerations such as playback speed and playback time, the '041 patent describes a frame rate conversion unit that “changes the frame rate of the moving image data to be output by changing the total number of frames of the input moving image data by a known decimation or interpolation method.” Ex. 1001, 14:28–31; *accord id.* at 1:67–2:2, 9:20–23 (“conversion

of the frame rate is performed based on a known method such as interpolation in addition to decimation”), 15:57–62. For example, the ’041 patent describes processing image data that was captured at 600 fps over 10 minutes by decimating the total number of frames by 1/10 (one frame for every 10 frames) so that a playback speed and playback time remains the same as the original captured image data and a display device can play back the processed image data at 60 fps. Ex. 1001, 1:65–2:5.

E. Illustrative Claims

Of the challenged claims, claims 1 and 6 are independent claims. Claim 1 is illustrative of the challenged claims and is reproduced below with bracketed labels mirroring those used in the Petition.

- [1.0] A moving image data processing apparatus comprising:
 - [1.1] a moving image data input unit configured to be input of first moving image data generated at a first frame rate and second image data generated at a second frame rate that is different from the first frame rate;
 - [1.2] an input frame rate specification unit configured to specify the first frame rate of the first moving image data and the second frame rate of the second moving image data, the first and second moving image data having been input into the moving image data input unit;
 - [1.3] an output frame rate specification unit configured to specify
output frame rate of the first moving image data and
output frame rate of the second moving image data that have
been input into the moving image data input unit;
 - [1.4] a playback speed specification unit configured to specify a
same playback speed for the first moving image data and
the second moving image data;
 - [1.5] a frame rate conversion unit configured to

change a frame rate of the first moving image data based on the first frame rate, the output frame rate, and the playback speed, and

change a frame rate of the second moving image data based on the second frame rate, the output frame rate, and the playback speed; and

[1.6] a moving image data output unit that outputs the first and second moving image data whose frame rates have been converted by the frame rate conversion unit.

Ex. 1001, 19:52–20:13.

F. Asserted Grounds of Unpatentability

Petitioner asserts that claims 1–6 would have been unpatentable on the following grounds:

Claim(s) Challenged	35 U.S.C. §	Reference(s)/Basis
1, 2, 4, 6	103(a) ¹	Morikawa ²
3	103(a)	Morikawa, Takabe ³
5	103(a)	Morikawa, Walpole ⁴
1, 6	103(a)	Suzuki ⁵
3	103(a)	Suzuki, Takabe

¹ The Leahy-Smith America Invents Act (“AIA”) included revisions to 35 U.S.C. § 103 that became effective on March 16, 2013. The ’041 patent claims priority to an application filed prior to the effective date of the AIA. On the present record, the priority date of the ’041 patent is not challenged and, thus, we assume (without deciding) that the ’041 patent is entitled to its claimed priority date. Therefore, we apply the pre-AIA version of § 103; however, our analysis would be the same under the current version of the statute.

² US 2010/0226622 A1; published Sept. 9, 2010. Ex. 1004.

³ WO 2004/090703 A1; published Oct. 10, 2004. Ex. 1005 (certified translation).

⁴ Jonathan Walpole et al., *A Player for Adaptive MPEG Video Streaming Over the Internet*, Proc. SPIE 3240, 26th AIPR Workshop: Exploiting New Image Sources and Sensors, 270 (Mar. 1, 1998).

⁵ US 2012/0314967 A1; published Dec. 13, 2012. Ex. 1007.

Claim(s) Challenged	35 U.S.C. §	Reference(s)/Basis
4	103(a)	Suzuki, Sekiguchi ⁶
5	103(a)	Suzuki, Walpole

Pet. 2–3. Petitioner also supports its challenge with a Declaration of David B. Lett. Ex. 1003.

II. DISCUSSION

A. Level of Ordinary Skill in the Art

In determining the level of skill in the art, we consider the type of problems encountered in the art, the prior art solutions to those problems, the rapidity with which innovations are made, the sophistication of the technology, and the educational level of active workers in the field. *Custom Accessories, Inc. v. Jeffrey-Allan Indus., Inc.*, 807 F.2d 955, 962 (Fed. Cir. 1986); *Orthopedic Equip. Co. v. U.S.*, 702 F.2d 1005, 1011 (Fed. Cir. 1983).

Petitioner contends a person of ordinary skill in the art at the time of the invention would have had “at least a [b]achelor’s degree in computer science, electrical engineering, computer engineering, or a related field, with 2–3 years of experience in digital video processing, or a related field, or equivalent research or professional experience.” Pet. 7 (citing Ex. 1003 ¶ 26). Patent Owner states that it applies Petitioner’s proposed level of ordinary skill for the purposes of its Preliminary Response. Prelim. Resp. 29.

For the purposes of this Decision, we apply Petitioner’s level of ordinary skill, with the exclusion of “at least” in defining the education

⁶ US 2011/0097059 A1, published Apr. 28, 2011. Ex. 1008. Petitioner refers to “Sekiguchi” as “Seikiguchi.” See, e.g., Pet. 3.

level, which would render the definition open-ended and inclusive of persons of expert-level skill.

B. Claim Construction

We construe claims using the principles set forth in *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312–17 (Fed. Cir. 2005) (en banc), and related cases. 37 C.F.R. § 42.100(b) (2021). Under that precedent, the words of a claim are generally given their “ordinary and customary meaning,” which is the meaning the term would have to a person of ordinary skill at the time of the invention, in the context of the entire patent including the specification. *Phillips*, 415 F.3d at 1312–13.

Petitioner does not identify any terms for construction. Pet. 7. Patent Owner contends “specify[ing] [the] output frame rate” as used in claims 1 and 4–6 means “specify[ing] the variable output frame rate.” Prelim. Resp. 3. Patent Owner also argues that limitations [1.2], [1.3], [1.4], and [1.6] in claim 1 are means-plus-function limitations subject to 35 U.S.C. § 112 ¶ 6. Prelim. Resp. 1–29. According to Patent Owner, these limitations recite no specific structure and a person of ordinary skill would understand the corresponding structures to be software algorithms performing the recited steps and functions. Prelim. Resp. 1–29. Patent Owner also contends the term “operating unit” in claim 2 is a means-plus-function limitation subject to § 112 ¶ 6 with the corresponding structure being “[b]uttons, dials, or equivalents thereof for accepting various inputs related to the moving image data” and the function being “accept [an] input[s].” Prelim. Resp. 27–29 (second and third alterations in original).

At this stage, we determine it is not necessary to construe any terms expressly for the purposes of this Decision. *See Realtime Data, LLC v.*

Iancu, 912 F.3d 1368, 1375 (Fed. Cir. 2019) (“The Board is required to construe ‘only those terms . . . that are in controversy, and only to the extent necessary to resolve the controversy.’” (quoting *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999))). The parties are encouraged to further address claim construction in future briefing. *See Zeroclick, LLC v. Apple Inc.*, 891 F.3d 1003, 1007–08 (Fed. Cir. 2018) (holding that where a limitation does not use the term “means,” evidence must be presented to rebut the presumption that § 112, ¶ 6 does not apply); *Williamson v. Citrix Online, LLC*, 792 F.3d 1339, 1349 (Fed. Cir. 2015) (en banc).

C. Principles of Law

A claim is unpatentable under 35 U.S.C. § 103 if “the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.” *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations, including (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of skill in the art; and (4) where in evidence, objective evidence of non-obviousness.⁷ *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966). When evaluating a combination of teachings, we must also “determine whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue.” *KSR*, 550 U.S. at 418 (citing *In re*

⁷ At this stage of the proceeding, Patent Owner has not presented objective evidence of non-obviousness.

Kahn, 441 F.3d 977, 988 (Fed. Cir. 2006)). Whether a combination of prior art elements would have produced a predictable result weighs in the ultimate determination of obviousness. *Id.* at 416–17.

In an *inter partes* review, the petitioner must show with particularity why each challenged claim is unpatentable. *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1363 (Fed. Cir. 2016); 37 C.F.R. § 42.104(b). The burden of persuasion never shifts to Patent Owner. *Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015).

D. Discretionary Denial

Patent Owner argues the Petition should be denied under 35 U.S.C. § 314(a) because (1) “Petitioner’s inability to commit to non-duplicative efforts between the District Court Litigation and this proceeding weighs in favor of discretionary den[ial]” (Prelim. Resp. 59), and (2) Petitioner failed to request a conference call prior to filing its Motion for Joinder (Prelim. Resp. 59–60). Petitioner asserts that no trial date has been set in the parallel district court litigation, which Patent Owner does not dispute. Pet. 55; Prelim. Resp. 59–60. Additionally, the Patent Trial and Appeal Board Consolidated Trial Practice Guide (CTPG) states that “[a] party who files a motion for joinder *should* arrange a conference call . . . within five business days of filing the motion.” CTPG 76 (Nov. 2019) (emphasis added).⁸ In light of the termination of the earlier proceeding, Petitioner’s failure to request a conference call is harmless error. Thus, we find Patent Owner’s arguments unpersuasive and decline to exercise our discretion to deny the Petition under § 314(a).

⁸ Available at <https://www.uspto.gov/TrialPracticeGuideConsolidated>.

E. Ground 1A – Alleged Obviousness over Morikawa

1. Claim 1

[1.0] “A moving image data processing apparatus comprising:”

Petitioner states that it does not believe the preamble is limiting.

Pet. 9. Petitioner also states, however, that Morikawa discloses a video playing apparatus that satisfies the language of the preamble. Pet. 9 (citing Ex. 1004 ¶¶ 9, 22, Fig. 1).

Patent Owner does not address the preamble, and on this record, Petitioner has made a sufficient showing for the preamble.

[1.1]: “a moving image data input unit configured to be input of first moving image data generated at a first frame rate and second image data generated at a second frame rate that is different from the first frame rate;”

Petitioner contends Morikawa teaches that its video player apparatus includes an input unit that is an input interface of video contents. Pet. 9–10 (citing Ex. 1004 ¶¶ 9, 23, Fig. 1). Petitioner also states that Morikawa describes “multi-frame rate contents” as video contents composed of at least a first ordinary-frame-rate portion and a second high-frame-rate portion, citing examples of contents having multiple frame rates such as 60 fps, 120 fps, and 300 fps. Pet. 10–13 (citing Ex. 1004 ¶¶ 5, 23, 28, 29, Figs. 2, 8).

Patent Owner contends a person of ordinary skill “would not understand a multi-frame rate content to be multiple moving image data inputs.” Prelim. Resp. 31 (citing Ex. 2003 ¶ 79). According to Patent Owner, in Morikawa there is only “one piece of content” even if “a certain portion of the content is one frame rate and another portion of the same content is another frame rate.” Prelim. Resp. 31–32 (citing Ex. 1004 ¶ 24, Fig. 5).

On the current record, Patent Owner cites nothing in the claim language or the '041 patent's specification to support its argument that claim 1 excludes a single "piece of content" or stream of data in which one portion of the content was generated at one frame rate and a second portion of the content was generated at a second frame rate. The claim recites "first moving image data generated at a first frame rate" and "second moving image data generated at a second frame rate," but nothing in the claims requires that the first and second moving image data are separate "pieces of content." At this stage, we do not agree with Patent Owner's argument that the claims require separate pieces of content, and for the purposes of institution, we preliminarily agree with Petitioner that Morikawa's teaching of multi-frame-rate content satisfies this limitation.

[1.2]: "an input frame rate specification unit configured to specify the first frame rate of the first moving image data and the second frame rate of the second moving image data, the first and second moving image data having been input into the moving image data input unit;"

Petitioner contends Morikawa provides that its video playing apparatus includes a rate analysis unit for calculating playback time in respective playback modes by analyzing frame rates of multi-frame-rate contents. Pet. 13–14 (citing Ex. 1004 ¶ 23, Fig. 1, code (57)). More specifically, Petitioner contends Morikawa describes that its rate analysis unit analyzes video data based on metadata and frame rate information attached to video data as header information. Pet. 14–15 (citing Ex. 1004 ¶¶ 23, 25, 26, 28, 29, 36, Figs. 2, 3, 8).

Referring to its argument addressed above with limitation [1.1], Patent Owner argues Morikawa cannot disclose the claimed "input frame rate specification unit" limitation "which requires 'first moving image data' and

‘second moving image data.’” Prelim. Resp. 32 (citing Ex. 2003 ¶ 80). We disagree with that argument for the reasons explained above.

Patent Owner also states, with reference to its arguments advanced for limitation [1.5], that “Morikawa also does not disclose ‘transmitting specified input frame rate to frame rate conversion unit’ or the ‘frame rate conversion unit,’ which is required by the software algorithm structure of the ‘input frame rate specification unit.’” Prelim. Resp. 32. We address this argument below with the discussion of limitation [1.5].

On the current record, we preliminarily determine Petitioner has sufficiently shown that Morikawa satisfies this limitation for the purposes of institution for the reasons explained with limitations [1.1] and [1.5].

[1.3]: “an output frame rate specification unit configured to specify output frame rate of the first moving image data and output frame rate of the second moving image data that have been input into the moving image data input unit;”

Petitioner contends that Morikawa provides that its rate analysis unit calculates a first playback time when the entire video contents are played back by applying a first frame decimating process to video in a second portion of inputted video contents having a higher frame rate than video in a first portion of the contents based on a predetermined playback frame rate. Pet. 16. According to Petitioner, Morikawa explains that its “playback frame rate is set based on a display frame rate of a display device.” Pet. 16 (quoting Ex. 1004 ¶ 25) (citing Ex. 1004 ¶¶ 9, 25, 26; Ex. 1001, 8:40–58).

In addition to the arguments addressed above regarding limitation [1.1] and below regarding limitation [1.5], Patent Owner contends Morikawa does not satisfy limitation [1.3] because Morikawa’s output frame rate is fixed at 60 Hz rather than variable. Prelim. Resp. 33–34 (citing

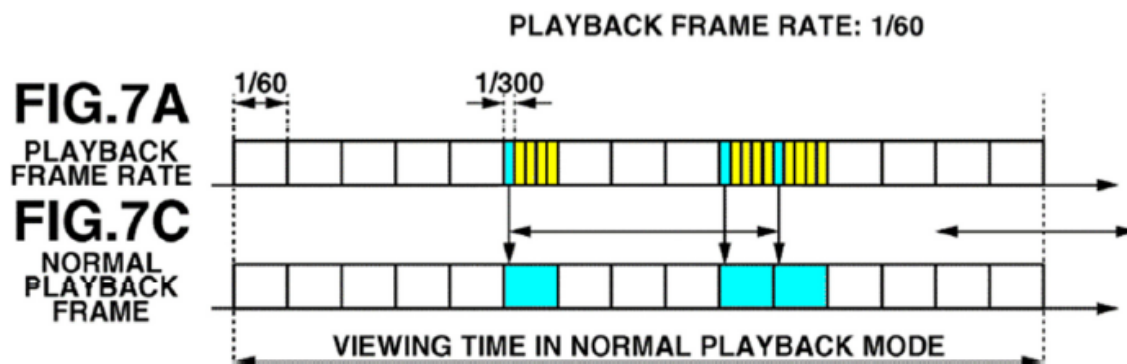
Ex. 1004 ¶ 26; Ex. 2003 ¶ 85). Patent Owner acknowledges that Morikawa “states that the output frame rate is ‘set based on a display frame rate of a display device,’” but Patent Owner argues that Morikawa does not explain how or why multiple output frame rates are possible or necessary when the next sentence of Morikawa states that “when the display frame rate is 60 Hz, 120 Hz, 240 Hz, the p[l]ayback frame rate is set to 60 Hz.” Prelim. Resp. 33–34, 38 (quoting Ex. 1004 ¶¶ 25, 26).

We consider the prior art for all that it teaches, and Morikawa expressly states that “[t]he playback frame rate *is set based on* a display frame rate of a display device.” Ex. 1004 ¶ 25 (emphasis added). Even the language highlighted by Patent Owner—“when the display frame rate is 60 Hz, 120 Hz, 240 Hz, the playback frame rate is set to 60 Hz”—refers to *setting* the playback frame rate to 60 Hz in certain circumstances, i.e., when the display frame rate is 60 Hz, 120 Hz, 240 Hz. Ex. 1004 ¶ 26. Although Morikawa does not explicitly provide other examples of setting the playback frame rate based on a display frame rate of a display device, Morikawa need not do so since it already discloses that the playback frame rate is set *based on* a display frame rate of a display device. Thus, even if we were to construe limitation [1.3] as requiring a variable output frame rate, as argued by Patent Owner, on the current record we preliminarily determine that Morikawa satisfies this requirement by disclosing that its playback frame rate is set based on a display frame rate of a display device.

[1.4]: “a playback speed specification unit configured to specify a same playback speed for the first moving image data and the second moving image data;”

Petitioner contends that Morikawa provides that its video playing apparatus includes an operation unit that allows a user to select different

playback modes, such as a normal playback mode or a slow playback mode, and that the control unit adjusts the playback time accordingly. Pet. 17–18 (citing Ex. 1004 ¶¶ 6, 27, 33, 34, 36). Petitioner contends Morikawa describes an example in which a user selects normal playback mode for multi-frame rate contents and that playback time is adjusted by decimating out frames in the high frame-rate portion of the video contents such that the entire contents can be played back at a normal speed. Pet. 17–20 (citing Ex. 1004 ¶¶ 6, 25, 27, 36, Figs. 7A, 7C). Copied below is Petitioner’s annotated version of Morikawa’s Figures 7A and 7C that Petitioner contends illustrate such an example.



Morikawa’s Figures 7A and 7C depict multi-frame rate content with frames of 1/60th of a second (60 fps) and 1/300th of a second (300 fps) to be played back in the normal playback mode at a frame rate of 1/60 (60 fps or 60 Hz). Ex. 1004 ¶ 30. According to Petitioner, Morikawa teaches that portions of the high frame-rate content are decimated out or skipped (depicted by the yellow frames in Petitioner’s annotated version of Figure 7A) so that only one out of every five frames is displayed (depicted in teal), thereby making the playback time in the normal mode the same as the time over which the video content was captured. Pet. 19 (citing Ex. 1004 ¶¶ 28–30, 43). According to Petitioner, if the decimation process is not

performed and each of the 300 fps-encoded frames is displayed at the 60 fps playback frame rate, the displayed video data for the 300 fps frames would appear to be in slow motion. Pet. 20 (citing Ex. 1004 ¶¶ 4, 5, 27, 29, 40, Figs. 7A, 7B).

Patent Owner contends Morikawa cannot teach the software algorithm related to the playback speed specification unit that performs the step of “transmitting the specified playback speed to the frame rate conversion unit” because, according to Patent Owner, Morikawa “is directed toward offering the user the choice to specify the playback speed of a singular multi-frame rate content *after* any alleged frame rate conversion occurs.” Prelim. Resp. 34–35 (citing Ex. 1004 ¶¶ 36–38). Patent Owner contends “[t]he benefit to which the ’041 [p]atent is directed is sequentially or continuously playing back multiple moving image data so as to have a same playback speed between the first and second moving image data, despite being generated at different frame rates.” Prelim. Resp. 35 (citing Ex. 1001, 15:11–19; Ex. 2003 ¶ 89). Patent Owner suggests that contrasts with Morikawa “where, because there is only one content, the end result is a choice provided to the user: a ‘Normal’ playback time applied to the entire content based on the normal or slower frame rate portion of the content or a ‘Slow’ playback time applied to the entire content based on the faster or ‘higher frame-rate portion.’” Prelim. Resp. 35 (citing Ex. 1004 ¶¶ 36–38; Ex. 2003 ¶ 89).

At this stage, we do not understand Patent Owner’s arguments to be commensurate with the scope of limitation [1.4], and on the current record, we preliminarily determine Petitioner has adequately shown that Morikawa satisfies limitation [1.4] with its teachings relating to a playback unit that

calculates the playback time of multi-frame-rate content to be played back at a same playback speed, e.g., normal speed or slow speed. To the extent the differences in the parties' positions turn on the scope of this limitation, we encourage the parties to address this issue as a matter of claim interpretation.

[1.5]: “a frame rate conversion unit configured to change a frame rate of the first moving image data based on the first frame rate, the output frame rate, and the playback speed, and change a frame rate of the second moving image data based on the second frame rate, the output frame rate, and the playback speed; and”

Petitioner contends Morikawa provides that its video playing apparatus includes an image processing unit that selectively provides a frame decimating process to video data based on a predetermined playback frame rate, the selected playback speed, and the content's encoded frame rate. Pet. 20–24 (citing Ex. 1004 ¶¶ 9, 25–29, 32–34, 39, 44). According to Petitioner:

Morikawa describes “applying a first frame decimating process to video in the second portion [of the video contents during normal playback mode] . . . based on a predetermined playback frame rate” and avoiding the “frame decimating process or . . . applying a second frame decimating process having a smaller number of frames to be decimated out than the first frame decimating process [during slow playback mode] . . . based on [the] predetermined playback frame rate.”

Pet. 21 (alterations by Petitioner) (emphasis omitted) (quoting Ex. 1004 ¶ 9).

Further, Petitioner quotes Mr. Lett's testimony regarding Morikawa's decimation process as follows:

The extent to which the image processing unit 107 changes the frame rate of the different scenes in the video contents is based on the initial frame rate of the respective scene, the set output frame rate of the second scene (e.g., which may be set to the same output frame rate based on the display frame rate), and the

playback speed set for the video contents, e.g., the operation mode. . . .

. . . .
. . . [a] POSITA would have understood or at least found it obvious to apply the decimation technique described in Morikawa to video data encoded at other frame rates, such as ‘Scene 4’ of ‘content A’ shown in FIGS. 2 and 8, which has an input frame rate of 120 fps.

Pet. 21–23 (quoting Ex. 1003 ¶¶ 46, 49) (citations omitted).

Patent Owner contends Morikawa discloses neither the structure or function corresponding to the claimed “frame rate conversion unit.” Prelim. Resp. 37. Also, according to Patent Owner, “the changed frame rates of the first and second moving image data in the Challenged Claims are based, at least in part, on the specified output frame rates of the first and second moving image data.” Prelim. Resp. 37–38. “Therefore, a [person of ordinary skill in the art] would understand that the changed output frame rates are not necessarily the same as the specified output frame rates.” Prelim. Resp. 38. Further, Patent Owner contends that, “at best, [Morikawa] just changes the multiple input frame rates of a single piece of content into changed output frame rates.” Prelim. Resp. 38.

On the current record, it is not clear that Patent Owner’s arguments are commensurate with the scope of limitation [1.5], and we are persuaded that Petitioner has sufficiently shown for the purposes of institution that Morikawa teaches limitation [1.5] with its teachings of an image processing unit that converts the frame rates of different scenes of video content based on the initial frame rate, the output frame rate, and the playback speed.

[1.6]: “a moving image data output unit that outputs the first and second moving image data whose frame rates have been converted by the frame rate conversion unit.”

Petitioner contends Morikawa provides that its video playing apparatus includes an image processing unit that transmits video data that has been processed to a display device. Pet. 24 (citing Ex. 1004 ¶¶ 32–34). Petitioner also states that Morikawa’s rate analysis unit provides the functionality of the claimed frame rate conversion unit and the claimed moving image data output unit. Pet. 24 (citing Ex. 1004 ¶¶ 32–34, Fig. 1).

Patent Owner does not address this limitation, and on this record, Petitioner has made a sufficient showing for this limitation for the purposes of institution.

2. Conclusion Regarding Claim 1

Although we make no final determinations, based on our review of the current record, we determine Petitioner has sufficiently shown that Morikawa satisfies each limitation of claim 1 at this stage of the proceeding. Thus, we determine that Petitioner has demonstrated a reasonable likelihood that it will prevail in showing the unpatentability of at least one challenged claim.

Because Petitioner has shown a reasonable likelihood of prevailing with respect to claim 1, we institute *inter partes* review on all claims and all grounds raised in the Petition. See *SAS Inst., Inc. v. Iancu*, 138 S. Ct. 1348, 1359–60 (2018); *AC Techs. S.A. v. Amazon.com, Inc.*, 912 F.3d 1358, 1364 (Fed. Cir. 2019) (“[I]f the Board institutes an IPR, it must . . . address all grounds of unpatentability raised by the petitioner.”). Below we provide additional guidance regarding the parties’ contentions pertaining to the remaining claims and grounds.

3. *Claims 2, 4, and 6*

Independent claim 6 includes limitations substantially similar to independent claim 1, and Petitioner's contentions regarding claim 6 refer to Petitioner's contentions regarding claim 1. Pet. 27–28. Regarding claim 2's requirement of an operating unit configured to accept an input to specify the playback speed, Petitioner contends Morikawa satisfies this limitation with its teaching of a video playing apparatus that accepts playback instructions from a user, including the user's selection of a normal playback or a slow playback. Pet. 25–26 (citing Ex. 1004 ¶¶ 6, 33, 34, 39, Figs. 1, 4; Ex. 1003 ¶¶ 52–53). Regarding claim 4's requirement of an output frame rate that is specified based on information of an external device receiving the moving image data, Petitioner contends Morikawa satisfies this limitation with its teaching that the output frame rate is set based on a display frame rate of a display device. Pet. 26–27 (citing Ex. 1004 ¶¶ 25, 26; Ex. 1003 ¶¶ 54–55).

Patent Owner does not separately address Petitioner's contentions for claims 2, 4, and 6, and on the current record, Petitioner has made a sufficient showing for these claims for the purposes of institution.

F. *Ground 1B – Alleged Obviousness over Morikawa & Takabe*

1. *Claim 3*

[3.0]: *“The moving image data processing apparatus according to claim 1, further comprising a display unit, wherein the operating unit accepts the inputs continuously, and the moving image data output unit makes the display unit display the first frame rate, second frame rate, or the playback speed thereon arranged in a circular ring shape, makes the display unit display the circular ring shape of the first frame rate, second frame rate, or the playback speed in a rotating manner in accordance with the input*

of the operating unit, and specifies the first frame rate, the second frame rate, or the playback speed.”

In relevant part, Takabe describes a digital camera that superimposes an interface of various settings in a circle or ring over captured images on the camera’s display. Ex. 1005, 1:10–13; *see* Pet. 31–32. In addition to its showings for claim 1, Petitioner contends it would have been obvious to a person of ordinary skill to use a circular ring shape interface component as taught by Takabe to display and enable a user to specify the moving image data parameters described in the apparatus of Morikawa, such as the frame rates and playback speeds. Pet. 29 (citing Ex. 1005, 4:1–3, 5:13–17, 7:17–22, 9:14–15, Fig. 11; Ex. 1003 ¶ 65). Among other things, Petitioner cites Takabe’s teachings that its circular ring shape interface component is “easy to understand” and makes it easy to determine “where within the selectable range the selected value is.” Pet. 29 (quoting Ex. 1005, 4:1–3, 7:17–22) (citing Ex. 1005, 5:13–17, 9:14–15).

Patent Owner contends “Takabe is silent regarding displaying input frame rates, output frame rates, or playback speeds on its circular display.” Prelim. Resp. 39 (citing Ex. 2003 ¶ 94). Further, Patent Owner states that “Takabe is merely directed towards ‘set values for the shutter speed and aperture on a digital camera’ to capture input and therefore cannot disclose a circular display for features like frame rate and playback speed.” Prelim. Resp. 39.

Patent Owner also argues Petitioner’s proposed combination relies entirely on hindsight. Prelim. Resp. 40. Further, Patent Owner contends a person of ordinary skill in the art “would not have looked to combine Morikawa, which deals with multi-frame rate content . . . and the digital camera or video camera of Takabe in order to pick one of the two alleged

playback speeds of Morikawa (‘Normal’ or ‘Slow’) in a circular display.” Prelim. Resp. 42 (citing Ex. 1005, 1:10–13). Further still, Patent Owner argues “[a] person of skill in the art would not find the technical combination feasible because Takabe’s video camera would not likely be able to manipulate multi-frame rate content after it has already been received.” Prelim. Resp. 42.

On the current record, Petitioner’s reliance on Takabe’s teaching of the benefits of an “easy to understand” user interface appears sufficient to support Petitioner’s proposed combination of Morikawa and Takabe. Even if Morikawa’s express disclosures are limited to a binary selection of two playback speeds (*cf.* Ex. 1004 ¶ 40 (describing “Slow,” “Slow x2,” and “Slow x3”)), on the current record, Petitioner persuasively argues that the proposed combination of Morikawa and Takabe amounts to incorporation of known techniques to achieve the predictable benefits described in Takabe (*see* Pet. 30). Further, at this stage we question whether the content of the information displayed on Takabe’s display constitutes printed subject matter, and we encourage the parties to address this issue in future briefing. We also question Patent Owner’s contention that combining Morikawa and Takabe would be technically unfeasible, as an obviousness determination does not require bodily incorporation of the references’ teachings.

G. Ground 1C – Alleged Obviousness over Morikawa & Walpole

1. Claim 5

[5.0]: “The moving image data processing apparatus according to claim 1, wherein the output frame rate specification unit is configured to specify the output frame rate based on network band

information of an external device receiving the moving image data output by the moving image data output unit.”

Walpole describes a video streaming player that provides dynamic adaptation in response to factors such as available bandwidth, latency, quality of service requirements, and content complexity. Ex. 1006, 270. In particular, Walpole states that “when available network bandwidth becomes scarce, an adaptive video player could reduce presentation quality in the frame rate dimension . . . in order to preserve real-time play out at a given spatial resolution.” Ex. 1006, 270; *see* Pet. 32.

Petitioner contends that it would have been obvious to a person of ordinary skill “to modify Morikawa to specify the output frame rate based on currently available network bandwidth, as taught by Walpole.” Pet. 32–33. According to Petitioner, Walpole’s adaptive scheme would provide a better user experience by maintaining full motion video at a lower frame rate instead of lagging or providing choppy video at a higher frame rate. Pet. 33 (citing Ex. 1006, 270, 276; Ex. 1003 ¶ 72). Further, Petitioner contends Walpole’s approach would reduce the number of packets sent over the network during times of network congestion. Pet. 33 (citing Ex. 1006, 276–79; Ex. 1003 ¶ 72). Petitioner contends the combination would entail applying the known solutions of Walpole to improve similar systems and methods in Morikawa and that the combination would have been a simple arrangement of old elements performing their known functions to yield predictable results. Pet. 33–34 (citing Ex. 1003 ¶¶ 73–74).

Patent Owner argues Walpole only discloses “specifying the output frame rate based on network band information on the device from which the moving image data output originated or in *real-time streaming* from remote servers,” not based on network band information of an external device.

Prelim. Resp. 44 (citing Ex. 1006, 13). Further, Patent Owner argues a person of ordinary skill in the art would not have been motivated to combine Morikawa and Walpole to arrive at the invention of claim 5 because Morikawa does not disclose outputting information over a network to an external device. Prelim. Resp. 44–46. “Because there is no disclosure of the system in Morikawa outputting information over a network, there would have been no need for [a person of ordinary skill] to look to the rate-limiting disclosure in Walpole to solve the non-existent problem of fluctuating network bandwidth, except through application of impermissible hindsight.” Prelim. Resp. 46.

We note that the ’041 patent’s earliest possible priority date is December 28, 2012 (Ex. 1001, code (30)), and Morikawa expressly discloses providing video content from a server over a network. Ex. 1004 ¶ 23 (“Input sources include . . . a contents server via a network.”). On the current record, we understand a person of ordinary skill reading Morikawa and Walpole would have recognized Petitioner’s proposed combination as an adaptation of known techniques with predictable results and with the benefits stated in Walpole. *See Muniauction, Inc. v. Thomson Corp.*, 532 F.3d 1318, 1326–27 (Fed. Cir. 2008) (recognizing that it was commonplace to incorporate Internet technology in existing electronic processes). The parties are encouraged to further develop this issue during trial.

H. Ground 2A–2D – Alleged Obviousness over Suzuki

Petitioner contends Suzuki describes an image apparatus that can change the frame rate of moving image data, and the Petition’s comparisons of the Suzuki-based Grounds 2A–2D to claims 1–6 present similar arguments to the Petition’s Grounds 1A–1C. Pet. 35–55. Patent Owner

addresses Grounds 2A–2D with arguments similar to those addressed above for Grounds 1A–1C. Prelim. Resp. 46–58. For the reasons explained above, we determine on the current record that Petitioner has sufficiently shown that it is likely to prevail in its challenges presented in Grounds 2A–2D. *See* IPR2022-01548, Paper 7 at 19–26.

III. CONCLUSION

For the reasons set forth above, we determine that Petitioner has demonstrated a reasonable likelihood that it will prevail with respect to at least one claim of the '041 patent. Accordingly, we institute an *inter partes* review.

IV. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that, pursuant to 35 U.S.C. § 314(a), *inter partes* review is instituted as to claims 1–6 of the '041 patent on each of the grounds set forth in the Petition;

FURTHER ORDERED that, pursuant to 35 U.S.C. § 314(c) and 37 C.F.R. § 42.4(b), *inter partes* review of the '041 patent shall commence on the entry date of this Decision, and notice is hereby given of the institution of a trial; and

FURTHER ORDERED that Petitioner's Motion for Joinder (Paper 2) is denied as moot.

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