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Paper 40
Entered: March 5, 2020

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

AMAZON.COM, INC.,
Petitioner,

v.

CUSTOMPLAY, LLC.,
Patent Owner.

Case IPR2018-01497
Patent 9,124,950 B2

Before J. JOHN LEE, JESSICA C. KAISER, and JOHN R. KENNY, *Administrative Patent Judges.*

KENNY, *Administrative Patent Judge*.

JUDGMENT

Final Written Decision
Determining All Challenged Claims Unpatentable
Denying Patent Owner's Motion to Exclude
35 U.S.C. § 318(a)

I. INTRODUCTION

This *inter partes* review, instituted pursuant to 35 U.S.C. § 314, challenges the patentability of claims 2, 4, 6, 14, 16, and 19 ("challenged claims") of U.S. Patent No. 9,124,950 B2 (Ex. 1001, "the '950 patent" or "the challenged patent"), owned by CustomPlay, LLC ("Patent Owner"). We have jurisdiction under 35 U.S.C. § 6. This Final Written Decision is issued pursuant to 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73.

For the reasons discussed below, Petitioner (Amazon.com Inc.) has shown by a preponderance of the evidence that all challenged claims are unpatentable.

A. Procedural Background

Petitioner filed a Petition for *inter partes* review of the challenged claims. Paper 1 ("Pet."). Patent Owner filed a Preliminary Response. Paper 6 ("Prelim. Resp."). Pursuant to our authorization, Petitioner filed a Reply to the Preliminary Response, and Patent Owner filed a Sur-Reply to that Reply. Papers 8 and 10. We instituted an *inter partes* review of all challenged claims on all asserted grounds. Paper 13 ("Institution Decision," "Inst. Dec."). Patent Owner filed a Corrected Patent Owner's Response (Paper 20, "PO Resp."), to which Petitioner filed a Reply (Paper 24, "Pet. Reply"), to which Patent Owner filed a Sur-Reply (Paper 27, "Sur-Reply"). Patent Owner also filed a Motion to Exclude (Paper 29), which is addressed below. An oral hearing was held on December 18, 2019. Paper 39 ("Tr.").

B. Related Proceedings

The parties identify the following related proceedings: *CustomPlay, LLC v. Amazon.com, Inc.*, No. 9:17-cv-80884 (S.D. Fla.); IPR2018-01496; and IPR2018-01498. Pet. 1; Paper 4, 1.

C. The Challenged Patent

The challenged patent relates to identifying, during the playing of a video, an indication that information is available for a depicted item. Ex. 1001, 2:12–16. In accordance with the claimed invention, as shown in Figure 1B (reproduced below), an indication identifies an item for which information is available:

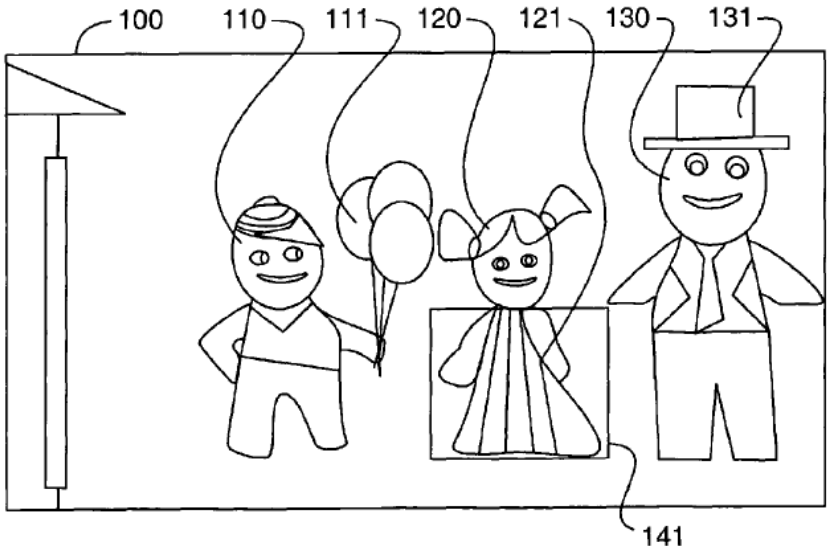

FIG. 1B

Figure 1B depicts an embodiment of the claimed invention where a "video frame within a motion picture" and a "display of an indication that information is available for an item being depicted." Ex. 1001, 3:7–9. In particular, outline 141 (an indication) identifies that information is available regarding dress 121 (an item). *Id.* at 7:42–46.

Further, in accordance with the claimed invention, after a user requests information about an item or items, information about that item or items can be displayed, as shown in Figure 1C, reproduced below:

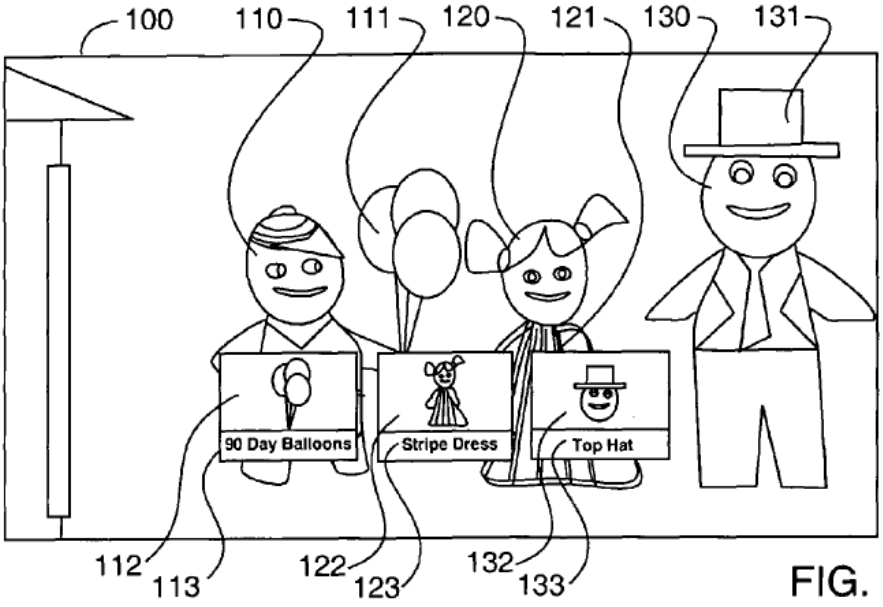

FIG. 1C

Figure 1C depicts the display of item information 112 and 113 for balloons 111, item information 122 and 123 for dress 121, and item information 132 and 133 for hat 131. Ex. 1001, 3:13–14. Information 112, 122, and 123 are images, and information 113, 123, and 133 are text. *Id.* at 10:5–10.

Figures 1B and 1C display the same frame 100 because a user activated the item identification routines when the target item was on the screen. Ex. 1001, 9:35–38. The challenged patent, however, recognizes that this often is not the case. *Id.* at 9:39–40. According to the patent, a user may request item information for an item that was just depicted but is no longer depicted. *Id.* at 9:40–44. To accommodate those situations, the system considers a request location and predetermined play period prior to the request location. *Id.* at 9:44–47. "For example, the request location (e.g., a frame within the video) may be adjusted to include the request location and a predetermined play period prior to the request location, for example, 10 seconds." *Id.* at 9:47–51.

Figure 1D (reproduced below) illustrates the display of item information for items that do not appear in the video frame:

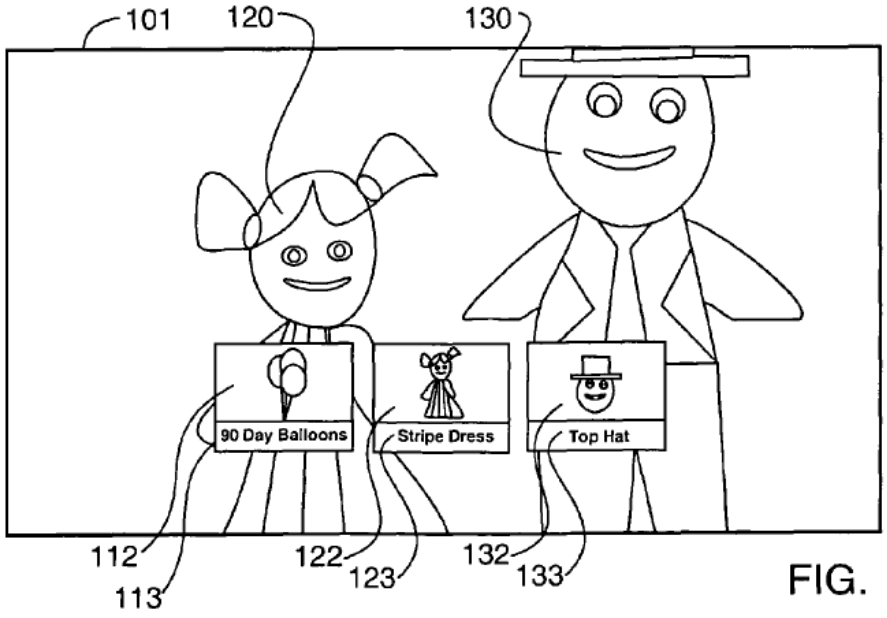

FIG. 1D

Figure 1D depicts video frame 101, which follows frame 100, which is shown in Figure 1C. Ex. 1001, 3:15–16. Frame 101 depicts girl 120 and man 130, only partially depicts hat 131, and does not depict boy 110 or balloons 111. *Id.* at 9:63–67. Frame 101, however, still displays item information 112 and 113 for balloons 111 and item information 132 and 133 for hat 131, which were displayed for frame 100. *Id.* at 10:1–10.

D. Challenged Claims

Petitioner challenges 2, 4, 6, 14, 16, and 19 of the '950 patent. Claims 2, 6, 14, 16 and 19 are independent claims. Claim 6 is illustrative and is reproduced below:

> 6. An apparatus capable of processing data and instructions executable by a processor; the apparatus, when executing the instructions, performs the steps of:

retrieving, from a plurality of video frame identifiers, a video frame identifier that is responsive to a play location within a playing of a video;

displaying, responsive to the video frame identifier, an initial indication that information is available that is responsive to the play location;

retrieving a subsequent video frame identifier that is responsive to a subsequent play location;

displaying, responsive to the subsequent video frame identifier and contemporaneously with the displaying of the initial indication, a subsequent indication that information is available that is responsive to the subsequent play location;

receiving, following the displaying of the subsequent indication, a request responsive to the initial indication, for information; and

displaying information associated with the initial indication that information is available.

E. Asserted Prior Art and Declarations

Petitioner relies on the following references:

Reference		**Publication/ Issue Date**	**Exhibit**
Rakib	U.S. Patent Application Publication No. 2009/0327894 A1	Dec. 31, 2009	1013
Rangan	U.S. Patent No. 6,154,771	Nov. 28, 2000	1014
Armstrong	U.S. Patent Application Publication No. 2007/0003223 A1	Jan. 4, 2007	1021
Livesey	U.S. Patent Application Publication No. 2008/0253739 A1	Oct. 16, 2008	1022

Reference		Publication/ Issue Date	Exhibit
Abecassis	U.S. Patent No. 6,038,367	Mar. 14, 2000	1024

Petitioner also relies on two declarations by its proffered expert witness, Dr. Alan C. Bovik (Exs. 1002 and 1102). Likewise, Patent Owner relies on a declaration from its proffered expert witness, Dr. Clifford Reader (Ex. 2021).

F. Instituted Grounds

Trial was instituted on the following grounds of unpatentability asserted in the Petition:

Claims Challenged	35 U.S.C. §	Reference(s)/Basis
6, 19	103(a)	Rangan[1]
2, 14, 16	103(a)	Rangan, Rakib
4	103(a)	Rangan, Rakib, Abecassis
2, 6, 14, 16, 19	103(a)	Armstrong, Livesey
4	103(a)	Armstrong, Livesey, Abecassis
2, 4, 6, 14, 16, 19	103(a)	Rakib, Livesey

Pet. 13.

G. Level of Ordinary Skill in the Art

Petitioner asserts that an ordinarily skilled artisan with respect to the challenged patent would have a bachelor's degree in Electrical Engineering,

[1] For this ground, Petitioner also expressly relies on the knowledge of an ordinarily skilled artisan. Pet. 13.

Computer Engineering, or Computer Science, and at least three years of experience in the design of digital video systems. Pet. 11 (citing Ex. 1002 ¶¶ 24–26). Patent Owner does not dispute Petitioner's formulation of the level of ordinary skill in the art. Based on the information and testimony presented in the Petition, we adopt Petitioner's formulation.

II. CLAIM CONSTRUCTION

For petitions filed before November 13, 2018, claim terms in an unexpired patent are given their broadest reasonable construction in light of the specification of the patent in which they appear.[2] 37 C.F.R. § 42.100(b); *see Cuozzo Speed Techs., LLC v. Lee*, 136 S. Ct. 2131, 2144–46 (2016). Petitioner contends no express claim constructions are necessary to resolve the issues presented in the Petition. Pet. 12. Patent Owner contends the inventor acted as his own lexicographer in presenting a number of definitions in the Specification of the '950 Patent, and asserts that these definitions "should be followed and adopted by the Board." PO Resp. 6.

In our Institution Decision, we noted that Petitioner relies on implicit constructions for the terms "retrieve" and "item" for its showing of the asserted obviousness of claims 14 and 19. Inst. Dec. 11–12; *see also* Pet. 17, 26. Therefore, we construed "retrieve" and "item" as they are defined in the Specification. Specifically, we construed "retrieve" as comprising "obtain, acquire, procure, download, transfer, extract, and to come into possession by any means or methodology." Inst. Dec. 12; *see also*

[2] The Petition in this proceeding was filed on August 1, 2018.

Ex. 1001, 15:4–8. And we construed "item" as "(i) items, products, objects, properties, acts, or information, whether or not they offer a commercial or purchase opportunity; (ii) items, products, objects, properties, acts, or information that constitute actual or potential product placements, whether prior to or after production of the video; (iii) product placements; and (iv) items, products, objects, properties, acts, or information, that offer informational or entertainment opportunities." Inst. Dec. 12; *see also* Ex. 1001, 4:48–55. For our construction for "item," we included the Specification's definition of "product placement," which is "(i) items, products, objects, properties, acts, or information that offer a commercial or purchase opportunity; (ii) items, products, objects, properties, acts, or information that constitute actual or potential product placements, whether prior to or after production of the video; and (iii) product placements." Inst. Dec. 13; *see also* Ex. 1001, 4:55–61.

Neither party objected to our preliminary constructions of these terms. PO Resp. 6; Pet. Reply, generally. We maintain these constructions and determine that we do not need to expressly construe any other claim term. *See Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999).

III. ALLEGED OBVIOUSNESS

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 skill in the art; and (4) if in evidence, objective evidence of nonobviousness, i.e., secondary considerations. *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

Additionally, the obviousness inquiry typically requires an analysis of "whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue." *KSR*, 550 U.S. at 418 (citing *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006) (requiring "articulated reasoning with some rational underpinning to support the legal conclusion of obviousness")); *see In re Warsaw Orthopedic, Inc*., 832 F.3d 1327, 1333 (Fed. Cir. 2016) (citing *DyStar Textilfarben GmbH & Co. Deutschland KG v. C. H. Patrick Co.*, 464 F.3d 1356, 1360 (Fed. Cir. 2006)).

Neither party presents any evidence or argument regarding secondary considerations of non-obviousness relating to any challenged claim. Thus, we do not address any such considerations in this Decision.

A. Alleged Obviousness Based on Rangan

Petitioner asserts that claims 6 and 19 would have been obvious over Rangan. Pet. 15–26.

1. Overview of Rangan

Rangan discloses "Video On Web Video Cassette Recorder" software ("VOW VCR") that operates within a personal computer system, a digital television, or a television enhanced by a set-top box, of a client subscriber user-viewer ("client"). Ex. 1014, 12:15–24, 57–60. This software's functionality is analogous to a video cassette recorder. *Id.* at 10:51–53, 24:46–58. The VOW VCR receives streaming digital

hypervideo that contains hyperlinks, which are displayed as embedded hotspots that can be clicked on with a mouse. *Id.* at 9:1–8, 12:18–22.

As shown in Figure 4 (reproduced below), the VOW VCR can display hypervideo with an embedded hotspot:

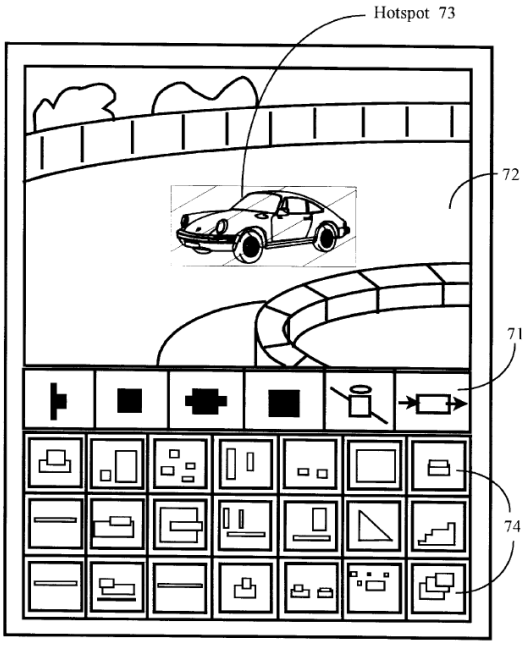

Fig. 4

Figure 4 is a screen display of a VOW VCR playing hypervideo. Ex. 1014, 18:25–26, 25:55–57. The VOW VCR displays controls 71; screen 72; hotpot 73; and thumbnail images 74, which are also termed keyframes. *Id.* at 22:60–62, 25:12–21, 25:55–26:30. A text annotation that is not shown in Figure 4 preferably appears about the object when the user does a mouse-over. *Id.* at 25:57–59. The text annotation can impart additional, supplemental information about the scene, the objects in the scene, or the hotspot. *Id.* at 25:60–63. For example, the annotation can identify a particular person or a depicted group of persons. *Id.* "More commonly,

however, the annotation is, [ ] includes, or indirectly links [to] a Universal Resource Locator (URL)." *Id.* at 25:57–65.

Rangan notes that the displayed objects and events, and their associated hyperlinks, may be transitory. Ex. 1014, 16:1–2. Rangan further discloses that the purpose of interactive video is compromised if the user must remain tensely poised on the unfolding video, ready to both make near instantaneous judgments and to physically spring like a cat when the hyperlink presents itself. *Id.* at 16:2–8.

To avoid that problem, Rangan discloses displaying about twenty-one of the most recent thumb-nail images 74, representing the twenty most recent scenes. Ex. 1014, 16:18–27, 26:29–31. Rangan further discloses displaying the same hotspots in the thumbnails as displayed on the screen. *Id.* at 10:5–9. Thus, a user can click on a hyperlink in a thumbnail image at the user's leisure. *Id.* at 16:49–52.

As illustrated in Figure 7 (reproduced below), the VOW VCR can display hypervideo with a hotspot:

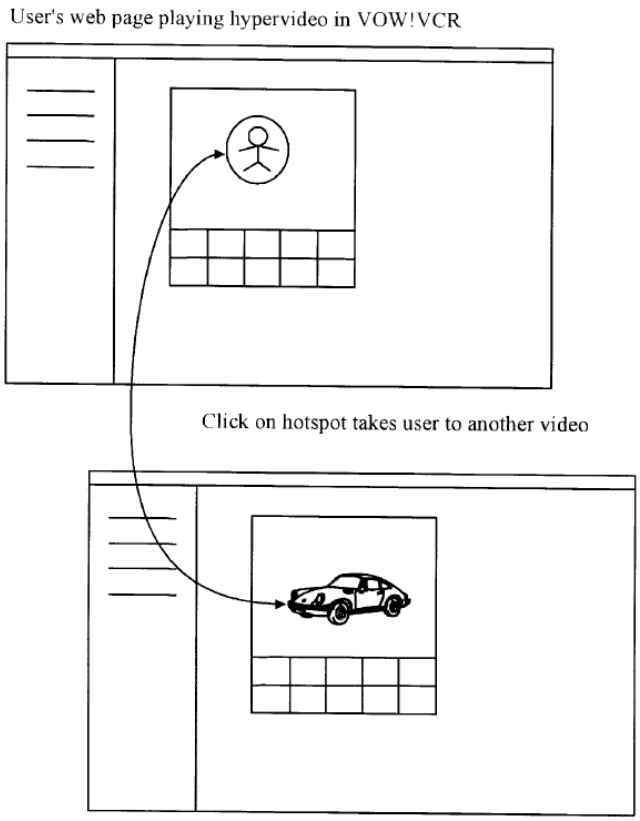

Fig. 7

Figure 7 illustrates a VOW VCR playing a hypervideo with a hotspot, where clicking on the hotspot takes the user to another video or hypervideo. Ex. 1014, 18:42–46.

Further, Rangan discloses that its video frames have frame numbers. Ex. 1014, 30:15–16 ("When recording from current playback position, the decoder provides the current video frame number."); *see id.* at 29:58–64.

2. Independent Claim 6

We start our analysis with claim 6, the broadest, challenged claim.

a. An apparatus capable of processing data and instructions executable by a processor; the apparatus, when executing the instructions, performs the steps of

According to Petitioner, Rangan teaches the above preamble recitation by disclosing a computer or set-top box. Pet. 16; Ex. 1002 ¶ 46. Patent Owner does not dispute that Rangan teaches the above recitation. PO Resp. 11. Based on the evidence and arguments in the Petition, we find that Rangan teaches the preamble recitation of claim 6.

b. retrieving, from a plurality of video frame identifiers, a video frame identifier that is responsive to a play location within a playing of a video

The parties dispute whether Rangan teaches or suggests several recitations in the above limitation. Pet. 17–19; PO Resp. 11–20. In particular, the parties dispute whether Rangan teaches or suggests (i) a video frame identifier, (ii) retrieving that video frame identifier from a plurality of video frame identifiers, and (iii) whether that video frame identifier is responsive to a play location within a playing of a video. We address each issue in turn.

i. a video frame identifier

According to Petitioner, Rangan's keyframe thumbnails are video frame identifiers because each keyframe thumbnail identifies a single frame, e.g., the first frame in each scene. Pet. 17; Pet. Reply 1–2; *see* Ex. 1002 ¶¶ 48–51; Ex. 1102 ¶¶ 9–13, 23. Further, Petitioner argues that Rangan's frame numbers are video frame identifiers. Pet. 17–18; Pet. Reply 1–4. Patent Owner asserts that Rangan's keyframe thumbnails are not video frame identifiers because they can have identical images and, thus, would not each identify a single frame. PO Resp. 13–14. Patent

Owner also argues that Rangan's keyframe thumbnails are not video frame identifiers because they are reduced images of whole frames. Sur-Reply 3. Further, in its Sur-Reply, Patent Owner argues that Rangan's keyframe thumbnails do not have frame numbers. *Id*. at 4. Considering both parties' arguments and the complete record after trial, we agree with Petitioner and find that Rangan's keyframe thumbnails and frame numbers are video frame identifiers.

First, we agree with Petitioner that Rangan's keyframe thumbnail is a video frame identifier. Rangan creates its keyframe thumbnails from the first frame in each scene. Ex. 1014, 29:8–10 ("A detected scene change is represented by a keyframe (thumbnail image), which is a reduced image of the first frame in the scene."); Ex. 1102 ¶ 9. Further, Rangan uses the keyframe thumbnails to identify from which frame to initiate playback or recording. Ex. 1102 ¶ 9; Ex. 1014, 9:15–20 ("By point-and-click reference to these historical thumbnail scene images, the SUV [subscriber/user/ viewer] may initiate on demand the retrospective replay of past hypervideo . . ."); 30:7–27 ("a click on a keyframe (a thumbnail image) will initiate recording from start of corresponding scene"). Therefore, we credit Dr. Bovik's testimony that Rangan's thumbnails images each identify a single frame and are video frame identifiers. Ex. 1102 ¶ 9.

Second, Patent Owner argues that keyframe thumbnails are not video frame identifiers because they can have identical images. PO Resp. 13–14. Petitioner, however, has not mapped the video frame identifier to the image within the keyframe thumbnail, but rather to the keyframe thumbnail itself. Pet. 17. As discussed above, each keyframe thumbnail corresponds to the first frame in a scene and can initiate playback from that frame. Ex. 1014,

29:8–10, 30:8–14, 9:15–20. Therefore, even keyframe thumbnails with identical images would identify and initiate playback from different frames and thus identify different frames. Further, Rangan discloses another way of distinguishing keyframe thumbnails, other than merely by their images (e.g., by position in a display). For example, Rangan teaches displaying the sequential keyframe thumbnail images in separate positions. *See* Ex. 1014, Fig. 4, 74. Therefore, even if two frames had identical images, the thumbnails could be distinguished by their positions in the display, as well as the frames they identify and retrieve. *See* Ex. 1102 ¶¶ 19–21; Ex. 1101, 28:7–10, 33:3–6. Thus, Rangan's keyframe thumbnails are video frame identifiers regardless of whether two keyframe thumbnails may have identical images.

Third, Patent Owner argues that Rangan's keyframe thumbnail is not a video frame identifier because Rangan's keyframe thumbnail is a reduced image of the first frame of the scene. Sur-Reply 3. Patent Owner, however, offers no reason why the fact that Rangan's keyframe thumbnail is a reduced image of the first frame of a scene means that thumbnail cannot be a video frame identifier, nor does Patent Owner offer any expert testimony or other evidence to support that contention. *Id.* We credit Dr. Bovik's testimony to the contrary. Ex. 1002 ¶ 55.

Fourth, Patent Owner argues that Dr. Bovik could not explain why Rangan's system would be able to identify a frame from the generated thumbnail images. Sur-Reply 4. Patent Owner cites four pages of deposition testimony, but provides no explanation as to why that testimony purportedly supports this argument. *Id.* (citing Ex. 2031, 39:3–43:3). We find it does not.

Fifth, we find that Rangan teaches or suggests frame numbers for its keyframe thumbnails and those frame numbers also are video frame identifiers. As discussed above, Rangan discloses that its video frames have frame numbers. Ex. 1014, 29:58–64; 30:34–35 ("When recording from current playback position, the decoder provides the current video frame number."); Ex. 1002 ¶ 51. In the Patent Owner Response, Patent Owner does not address or dispute that Rangan's keyframe thumbnails have frame numbers or that those frame numbers are video frame identifiers. PO Resp. 11–17; *see also* Pet. 18 (arguing that Rangan's keyframe thumbnails have frame numbers and that those frame numbers are video frame identifiers). In its Sur-Reply, however, Patent Owner raises the issue of whether Rangan's keyframe thumbnails have frame numbers. Sur-Reply 4–5. Patent Owner presents no good cause for waiting until the Sur-Reply to raise this issue, and has waived this argument as a result. Accordingly, we will not consider Patent Owner's argument that Rangan's keyframe thumbnails do not have frame numbers. Office Patent Trial Practice Guide, August 2018 Update, 83 Fed. Reg. 39989 (August 13, 2018), at 14 ("Sur-replies should only respond to arguments made in reply briefs, comment on reply declaration testimony, or point to cross-examination testimony."), 15 (A "sur-reply that raises a new issue or belatedly presents evidence may not be considered.").

Further, if were to consider that argument, we would not find it persuasive. Patent Owner cites no testimony from Dr. Reader or any passage from Rangan to support this argument. Sur-Reply 4. Instead, Patent Owner relies solely on unsupported attorney argument, which is not evidence. *Id*. Petitioner, on the other hand, provides persuasive support for

its contention that Rangan's frame numbers are video frame identifiers. Pet. 17–18 (citing Ex. 1014, 14:45–63, 30:15–36; Ex. 1002 ¶ 51; Ex. 1021, Fig. 2B; Ex. 1013 ¶ 76).

In sum, we find that Rangan's keyframe thumbnails and frame numbers are video frame identifiers.

Because we find that Rangan's keyframe thumbnails and frame numbers are video frame identifiers, we need not address Petitioner's alternative argument that something other than a keyframe thumbnail or frame number in Rangan would be a video frame identifier. Pet. 18–19. Consequently, Patent Owner's arguments specific to that alternative argument do not show Rangan fails to teach this claim limitation. PO Resp. 17–18.

ii. retrieving, from a plurality of video frame identifiers, a video frame identifier within a playing of a video

According to Petitioner, Rangan discloses the above limitation by displaying a keyframe thumbnail on its storyboard and moving that thumbnail through the storyboard in a first-in-first-out fashion. Pet. 17. Petitioner argues that Rangan uses frame numbers to retrieve the thumbnails in its storyboard. *Id.* Patent Owner argues that Petitioner has failed to establish that Rangan's system must determine and retrieve the claimed video frame identifier to display the keyframe thumbnails in the storyboard. PO Resp. 11–16. Considering both parties' arguments and the complete record after trial, we agree with Petitioner and find that Rangan teaches or suggests the above limitation.

First, Rangan discloses displaying keyframe thumbnails in a storyboard and moving them through the storyboard in a first-in first-out

fashion. Rangan teaches: "[k]eyframes, or thumbnail images, for all scenes appear in a storyboard below the playback window." Ex. 1014, 29:62–64. Further, Rangan states: "At any time a certain number, normally about twenty-one, of the most recent such thumb-nail images 74, representing twenty most recent scenes will displayed." *Id.* at 26:29–32; *see id*. at Fig. 4. Rangan further discloses that, when a new scene appears, the oldest scene is discarded in a first-in, first-out fashion. *Id.* at 26:32–36; *see id.* at 17:48–54.

Second, Rangan discloses storing the keyframe thumbnails that are displayed in local cache storage in a first-in first-out manner: "a plurality of keyframes, part of the multiplicity ultimately generated and which are indicative of the received streaming digital hypervideo most recently previously displayed, are at least temporarily displayed as still images, normally in a first-in, first-out (FIFO) file of such scene images." Ex. 1014, 17:48–54. Similarly, when addressing keyframe thumbnails 74, Rangan states: "[t]he video corresponding to these twenty scenes is also buffered in FIFO fashion on local storage." *Id.* at 26:34–36.

Third, Rangan describes obtaining the keyframe thumbnails from the cache. Ex. 1014, 34:66–35:5 ("a display, obtaining . . . keyframes from the cache, displaying . . . a plurality of keyframes that are indicative of scenes of streaming digital hypervideo most recently previously displayed.").

Fourth, obtaining key frame thumbnails constitutes retrieving those keyframe thumbnails. As described in Section II, we construe retrieving as encompassing obtaining.

Fifth, we credit Dr. Bovik's testimony that: "[i]n order to display an image, it necessarily must be retrieved from wherever the image is stored (e.g., the data cache)." Ex. 1102 ¶ 17. We note that Dr. Reader testified:

> Q. And if I had information that was responsive to a play location, I would have to store and retrieve it in order to display it; correct?
>
> A. I think that's correct.

Ex. 1101, 119:20–120:1.

Sixth, Rangan obtains and displays the keyframe thumbnails in its storyboard during the playing of a video. Ex. 1014, 17:48–54 ("received streaming digital video is also displayed in normal time . . . a plurality of keyframes . . . are at least temporarily displayed as still images"), 26:29–38 ("At any time . . . most recent such thumbnail images 74 representing the twenty most recent scenes will [be] displayed.")

Accordingly, Rangan obtains (retrieves) keyframe thumbnails from its data cache (which contains a plurality of keyframe thumbnails) within the playing of a video.

Patent Owner argues that Petitioner fails to establish that an ordinarily skilled artisan "would have understood Rangan's system, which operates on displaying thumbnail images that are 'cached in a digital data cache,' retrieves, from a plurality of video frame identifiers, a video frame identifier." PO Resp. 16. To support this argument, Patent Owner cites the testimony of Dr. Reader, which is conclusory and, thus, entitled to little weight. *Id.*; Ex. 2021 ¶ 79. As set forth above, we credit Dr. Bovik's contrary testimony because it is supported by Rangan's disclosures.

Because we find that the disclosures of Rangan discussed above regarding the storage and display of keyframe thumbnails in the storyline teach or suggest the above limitation, we need not address Petitioner's alternative arguments for this limitation, including the arguments that (i) generating a keyframe thumbnail and (ii) extracting a keyframe thumbnail from the hypervideo stream when a scene changes also constitute the recited retrieving. Pet. 17. Further, we need not consider whether the knowledge of an ordinarily skilled artisan without the above disclosures in Rangan would have rendered the above limitation obvious. *Id.* at 18–19. Consequently, Patent Owner's arguments specific to those positions are insufficient to defeat Petitioner's showing. PO Resp. 14–16.

iii. a video frame identifier responsive to a play location within a playing of a video

According to Petitioner, Rangan teaches the above limitation because Rangan's keyframe thumbnails are responsive to a play location within a playing of a video. In particular, Petitioner asserts Rangan's keyframe thumbnails are responsive to each of the following: (i) the frame from which they are generated, (ii) the scene associated with the frame from which they are generated; and (iii) scene changes, all of which Petitioner asserts are play locations within the playing of a video. Pet. 18; Pet. Reply 3. Patent Owner argues that nothing in the Petition establishes that Rangan's keyframe thumbnails are responsive to anything other than scene changes, which Patent Owner argues are not play locations. PO Resp. 17; Sur-Reply 3–4. Patent Owner further argues that Rangan's data cache from which the keyframe images are sourced demonstrates that its keyframe thumbnails are not responsive to a play location within the playing of a

video. *Id.* Considering both parties' arguments and the complete record after trial, we agree with Petitioner and find that Rangan's keyframe thumbnails are responsive to the (i) the frame from which they are generated, (ii) the scene associated with the frame from which they are generated; and (iii) scene changes, and that all of these are play locations within the playing of a video.

First, Rangan's keyframe thumbnails are responsive to the frames from which they are generated. Rangan expressly discloses generating the keyframe thumbnail from the first frame of a scene: "A keyframe for the scene is generated by mathematically reducing its first frame." Ex. 1014, 29:61–64. Dr. Bovik testifies that, as a result, the key frame thumbnail is responsive to the first frame of a scene, and Dr. Reader acknowledges that the keyframe thumbnail is responsive to the frame it was generated from. Ex. 1102 ¶ 18; Ex. 1101, 118:10–19.

Second, Rangan's keyframe thumbnails are responsive to the scene associated with the frame from which they are generated and scene changes. Ex. 1102 ¶ 18. Rangan describes its keyframe thumbnails as "representing . . . scenes." Ex. 1014, 26:29–31; *see id.* at 22:60–62. Further, Rangan teaches that its keyframe thumbnails are generated in response to scene changes. *Id.* at 9:12–15, 9:51–53; Ex. 1102 ¶ 18; Ex. 2021 ¶ 80.

Third, we credit Dr. Bovik's testimony that frames, scenes, and scene changes are play locations within the playing of the video. Ex. 1102 ¶ 18. Rangan teaches its frame numbers identify locations (positions) in its video. Ex. 1014, 30:14–15 ("When recording from current playback position, the decoder provides the current video frame number."). Similarly, the scenes and scene changes occur at particular locations in the video. *Id*. at 30:16–

18 ("When recording from a scene transition, the SCD [scene change detection] engine provides the starting video frame number."), 22:60–62 ("delimited by the scene's start and end frames").

Fourth, Patent Owner argues that Rangan's keyframe thumbnails are not responsive to a play location within the playing of a video because these thumbnails are generated by detecting scene changes and, thus, are only responsive to scene changes. PO Resp. 17. Patent Owner, however, presents no analysis why generating keyframe thumbnails by detecting scene changes means the keyframe thumbnails are not responsive to play locations. *Id.* Patent Owner cites Dr. Reader's testimony, but Dr. Reader does not provide sufficient analysis of the issue. *See* Ex. 2021 ¶ 80. As described above, scene changes occur at particular locations in the playing of the video, and the thumbnails represent the first frame of a scene, which is also at a particular location. Further, as described above, the scene itself is at a particular location within the playing of a video.

Fifth, Patent Owner argues Rangan's cache from which the keyframe thumbnails are sourced demonstrates that Rangan's keyframe thumbnails are not responsive to a play location within the playing of a video. PO Resp. 17. Patent Owner, however, cites no evidence to support that argument, other than the testimony of Dr. Reader, which is conclusory.[3] *Id.*

[3] Patent Owner provides citations to Rangan to demonstrate that Rangan has a data cache, but these cites do not support its argument that Rangan's use of a data cache means that Rangan's keyframe thumbnails are not responsive to a play location. PO Resp. 17 (citing Ex. 1014, 33:36–39, 34:64–67, 35:36–44, 36:12–15, 37:3–6).

We credit Dr. Bovik's contrary testimony, which is supported. Ex. 1102 ¶ 17.

In summary, we find that Rangan discloses that its keyframe thumbnails are responsive to a play location within the playing of a video. Thus, we find Rangan teaches retrieving, from a plurality of video frame identifiers, a video frame identifier that is responsive to a play location within a playing of a video.

c. displaying, responsive to the video frame identifier, an initial indication that information is available that is responsive to the play location

According to Petitioner, Rangan displays hotspots on its keyframe thumbnails. Pet. 19. Further, Petitioner argues that (i) Rangan's hotspots are responsive to Rangan's keyframe thumbnails (video frame identifiers) and Rangan's hotspots are indications that information is available that is responsive to a keyframe thumbnail. *Id.* Patent Owner argues that Rangan's hotspots are not responsive to a play location. PO Resp. 20–21. Patent Owner further argues that Petitioner improperly maps both the recited video frame identifier and the recited indication that information is available to Rangan's keyframe thumbnails. *Id*. at 12. Considering both parties' arguments and the complete record after trial, we agree with Petitioner and find that Rangan teaches or suggests the above limitation.

First, Rangan's hotspots are frame-specific and are, therefore, responsive to the video frame identifier (e.g., keyframe thumbnail, frame number). Ex. 1002 ¶ 54. Rangan discloses that "[t]he overlaying of the hotspots is preferably done for individual hypervideo frames by use of a rendering filter responsive to the hotspot data." Ex. 1014, 15:41–47. Further, Rangan discloses displaying the same hotspots in the keyframe

thumbnails. *Id.* at 10:5–9 ("The same hotspots will normally also be shown within historic static thumbnail scenes."), Fig. 4; Ex. 1002 ¶ 54.

Second, Rangan's hotspots are indications that information is available that is responsive to a keyframe thumbnail. Rangan discloses that its hotspots are visual indications of its hyperlinks. Ex. 1014, 12:18–24 ("'hotspots' (which are visual manifestations of hyperlinks)"). Further, "clicking where a hotspot is . . . will result in hyperlinking." *Id.* at 10:2–5; *see id.* at 9:1–7, 15:23–33. In addition, hyperlinking provides additional information to the user, such as the information contained in a webpage or video. *Id.* at Figs. 6–8. Further, Dr. Bovik testified that Rangan's hotspots are indications that information is available, and Dr. Reader reached the same opinion. Ex. 1002 ¶¶ 31, 54–55; Ex. 1101, 111:6–8.

Third, Patent Owner argues that Rangan does not teach that its hotspot (the indication) is responsive to a play location. PO Resp. 20–21. Patent Owner provides no reason why the above limitation should be interpreted to require that the *indication* be responsive to the play location, rather than that the available *information* be responsive to the play location. *Id.* The wording of the limitation does not suggest that the phrase "responsive to the play location" modifies "initial indication." Instead, "responsive to the play location" appears to modify the term "information." And both experts have interpreted the limitation as specifying that the recited indication must be responsive to the video frame identifier and not to the play location. Ex. 1101, 63:19–64:2; Ex. 1102 ¶¶ 27–28.

Further, Patent Owner has identified nothing in the Specification that supports the contrary interpretation. PO Resp. 20–21. The Specification, in fact, emphasizes that the information to be provided to the user should be

responsive to what is displayed at a particular play location. Ex. 1001, 6:33–35 ("an indication that information is available for an item being depicted"), 9:3–6 ("a display of item information 112 113 for the balloons 111, display of item information 122 123 for the dress 121, and a display of item information 132 133 for the hat 131"), Fig. 1C. Patent Owner's interpretation is inconsistent with that disclosure. Further, even if we were to construe the phrase as requiring that the indication be responsive to the play location, the hotspot in Rangan depends on the displayed keyframe thumbnail and keyframe, which, as discussed above, represent a location in the playing of the video. Therefore, Rangan's hotspot is responsive to a play location. Ex. 1102 ¶ 28.

Fourth, Patent Owner argues that Petitioner improperly maps both the recited video frame identifier and the recited indication that information is available to Rangan's keyframe thumbnails. PO Resp. 11–12. Patent Owner offers no expert testimony to support that argument, and we do not agree with that argument. *Id.* Rangan's hotspot is a distinct grid, coloration, or some other visually perceptible clue that can be overlaid on the thumbnail. Ex. 1014, 10:14, 15:27–60, 9:63–10:9, Fig. 4; Ex. 1102 ¶ 29. It is not the thumbnail itself. Further, as Dr. Bovik testifies, the Specification of the challenged patent discloses overlaying indications on video frames. Ex. 1102 ¶ 29; Ex. 1001, 7:38–48, Fig. 1B. But the Specification still describes indication 141 and frame 100 as separate elements. Ex. 1001, 6:33–39 ("frame 100"), 7:43–46 ("outline 141"); *see also* Ex. 1102 ¶ 29 (explaining that outline 141 is the recited indication). Thus, Petitioner does not improperly map both the video frame identifier and the recited indication to Rangan's keyframe thumbnails.

In summary, we find that Rangan teaches the above limitation.

d. retrieving a subsequent video frame identifier that is responsive to a subsequent play location

According to Petitioner, Rangan discloses retrieving a subsequent keyframe thumbnail that is responsive to a subsequent play location for its storyboard. Pet. 21–23. Petitioner argues that Rangan discloses displaying twenty recent scenes as thumbnails and that, when thumbnails are displayed for two play locations, the later of the two locations is a subsequent play location and its thumbnail or its frame number is a subsequent video frame identifier. *Id.* at 21. Petitioner further explains that the thumbnail or frame number is retrieved by generation, extraction, or retrieval from storage. *Id.* Aside from reiterating its argument regarding Rangan's disclosure of "retrieving a video frame identifier," which is discussed in Section III.A.2.b. above, Patent Owner presents no counterarguments for the above limitation. PO Resp. 21. Considering both parties' arguments and the complete record after trial, we agree with Petitioner and find that Rangan teaches or suggests the above limitation.

e. displaying, responsive to the subsequent video frame identifier and contemporaneously with the displaying of the initial indication, a subsequent indication that information is available that is responsive to the subsequent play location

According to Petitioner, Rangan discloses the above limitation by disclosing the display of multiple keyframe thumbnails at once (e.g., in Rangan's storyboard). Pet. 21. Petitioner argues that the hotspots for two of the displayed keyframe thumbnails correspond to the recited initial and subsequent indications. *Id.* at 21–23. In particular, Petitioner argues that the hotspot for the keyframe thumbnail for the earlier play location

constitutes the recited initial indication and that the hotspot for the keyframe thumbnail corresponding to the later play location corresponds to the subsequent play location. *Id.* Aside from repeating its argument that Rangan's hotspots are not responsive to play locations (addressed in Section III.A.2.c. above), Patent Owner does not present any additional arguments for the above limitation.[4] PO Resp. 22. Considering both parties' arguments and the complete record after trial, we agree with Petitioner and find that Rangan teaches or suggests the above limitation.

f. receiving, following the displaying of the subsequent indication, a request responsive to the initial indication, for information

According to Petitioner, Rangan teaches this limitation by disclosing that a user can: (i) exercise a hyperlink by clicking on a hotspot and (ii) mouse over a hotspot to see an annotation. Pet. 23–24. Petitioner argues that a user can click or mouse-over a hotspot to make an annotation appear even after subsequent thumbnails have been displayed. *Id.* Patent Owner does not dispute that Rangan teaches this limitation. PO Resp. 11–22. Based on the evidence and arguments in the Petition, we find that Rangan teaches the above limitation.

g. displaying information associated with the initial indication that information is available

According to Petitioner, Rangan teaches the above limitation by disclosing that when a user clicks on a hotspot, information associated with that hotspot is displayed. *Id.* Therefore, Petitioner asserts that when a user

[4] Patent Owner asserts that Rangan does not display indications contemporaneously. PO Resp. 22. That assertion, however, is based solely on Rangan's alleged lack of display of an indication. *Id.*; Ex. 2021 ¶ 90.

clicks on the hotspot (the initial indication), information associated with that hotspot (the initial indication) is displayed. *Id.* Patent Owner does not dispute that Rangan teaches this limitation. PO Resp. 11–22. Based on the evidence and arguments in the Petition, we find that Rangan teaches the above limitation.

h. Summary

For the reasons discussed above, we determine that Petitioner has shown by a preponderance of the evidence that Rangan teaches or suggests each limitation of claim 6. Consequently, Petitioner has demonstrated by a preponderance of the evidence that claim 6 would have been obvious over Rangan.

3. Independent Claim 19

Independent claim 19 recites substantially the same elements as claim 6, but restricts the "information" recited in claim 6 to "item information." Ex. 1001, 34:21–41, 37:13–38:10. Claim 19 also does not recite that the retrieving of a video frame identifier is from a plurality of video frame identifiers as claim 6 does. *Id.*

According to Petitioner, Rangan discloses the indication of, and the display of, item information by disclosing an indication and display of the car shown in its Figure 4. Pet. 26. Petitioner argues the term "item" encompasses items, such as a car. *Id.* (citing Ex. 1001, 4:48–61). Patent Owner does not dispute that to the extent Rangan teaches or suggests the limitations of claim 6, Rangan also teaches the additional "item information" limitation of claim 19. Based on the parties' arguments and full record after trial, we agree with Petitioner, and find that Rangan teaches or suggests all limitations of claim 19.

Consequently, we determine that Petitioner has demonstrated by a preponderance of the evidence that claim 19 would have been obvious over Rangan.

B. Alleged Obviousness Based on Rangan and Rakib

Petitioner asserts that claims 2, 14, and 16 would have been obvious over the combination of Rangan and Rakib. Pet. 26–31.

1. Overview of Rakib

Rakib describes a system with a remote control device that allows the user to interact with the interactive video. Ex. 1013, Abstr. As shown in Figure 10 (reproduced below), Rangan discloses a server that provides video to a media router that provides it to a primary display and a remote control:

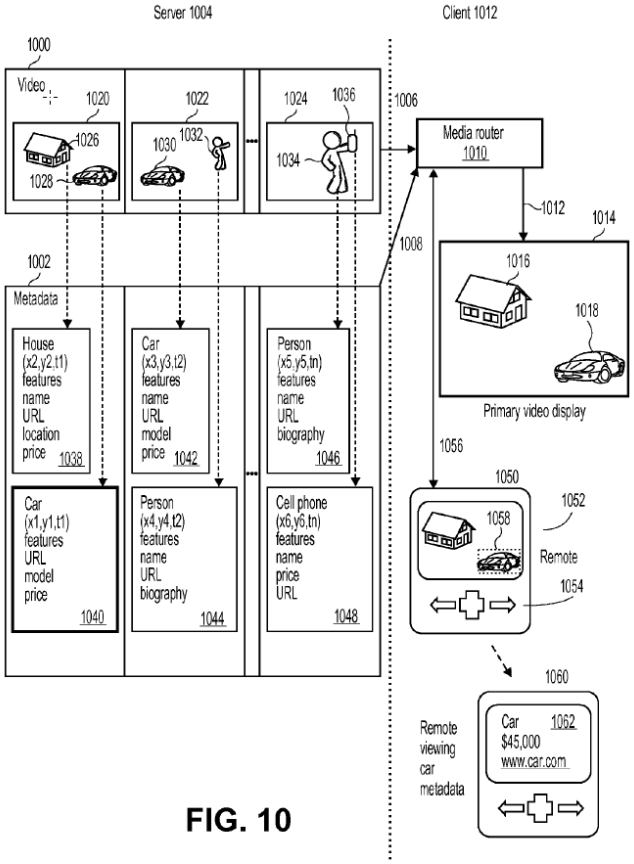

FIG. 10

Figure 10 shows remote server 1004, which contains video file 1000 and metadata file 1002. Ex. 1013 ¶¶ 108–118. Client 1012 has media router 1006, primary video display 1014, and remote control 1050. *Id.* Rakib discloses sending video file 1000 to media router 1014, primary video display 1014, and remote control 1050. *Id.* ¶¶ 108, 117. Video file 1000 contains image 1020, which is displayed in the primary video display and remote control's display. *Id.* at Fig. 10. Image 1020 shows house 1016 and car 1018, the latter of which has associated metadata 1040. *Id.* ¶ 111. Media router 101 informs remote control 1050 that car 1018 has associated metadata 1040 and, based on that metadata, remote control 1050 indicates to the viewer that additional information for the car is available by surrounding car 1018 with box 1058. *Id.* ¶ 117. The user can request more information 1040 about car 1018 using controls 1054 on remote control 1050. After such a request, updated display 1060 is shown, which contains the price of car 1018 and hyperlink 1062 for that car. *Id.* ¶ 118.

Figure 13 (reproduced below) illustrates how the remote control, the media router, and a remote video and metadata servers can interact:

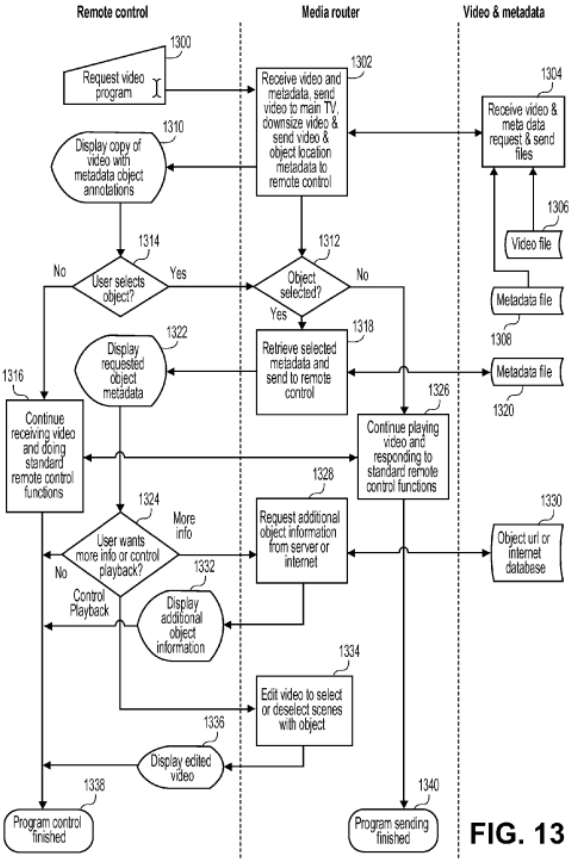

FIG. 13

Figure 13 shows communications between a remote control, a media router, and a remote video and metadata server. Ex. 1013 ¶ 30. As illustrated, software 1314 in the remote control detects whether a user has selected a metadata linked object. *Id.* ¶ 133. If the user makes that selection, the remote control informs media routine 1312, which instructs software 1318 in the media router to retrieve the corresponding metadata. *Id.* ¶ 134. Software 1318 provides the metadata to routine 1322, which displays that metadata on the remote control's display. *Id.* ¶ 135. After reviewing the metadata, the user can request additional information regarding the displayed object. *Id.* ¶ 136. Routine 1324 detects this request and instructs the remote control to request additional object information from the media

router. *Id.* Media router routine 1328 receives this request, retrieves the requested additional information, and sends the additional information to remote control routine 1332, which displays it. *Id.*

2. Independent Claim 2

Independent claim 2 recites substantially the same elements as claim 6, but adds the limitations of "receiving a request for additional information relating to a displayed information; and displaying, responsive to the request for additional information, the additional information." Ex. 1001, 33:45–34:2.

a. receiving a request for additional information relating to a displayed information

According to Petitioner, Rangan teaches the above limitation by disclosing that users can see a text annotation by mousing over a displayed object and by disclosing that those text annotations can include URLs that will cause the VOW VCR to jump to another video or webpage when clicked on. Pet. 26–27. Further, Petitioner asserts that the above limitation would have been obvious over Rangan and Rakib and that an ordinarily skilled artisan would have been motivated to combine those references. *Id.* at 27. Patent Owner contends that (i) Rakib fails to remedy the deficiencies of Rangan regarding the above limitation and (ii) modifying Rangan with Rakib would impermissibly change the principle of operation of Rangan. PO Resp. 24. Further, Patent Owner asserts that Petitioner improperly maps both the above limitation and the limitation of "displaying information associated with the initial indication" to Rangan's hotspots. *Id.* at 23–24. Considering both parties' arguments and the complete record after trial, we agree with Petitioner and find: that Rangan teaches or

suggests the above limitation, that the combination of Rangan and Rakib also teaches or suggests that limitation, and that an ordinarily skilled artisan would have combined the pertinent disclosures in Rangan and Rakib.

First, Rangan teaches the above limitation by disclosing text annotations that typically appear when the user "mouses over" an object. Ex. 1014, Abstract, 13:64–14:7. These text annotations "serve to impart additional, supplemental, information" about the objects in the scene. *Id.* Further, these text annotations can include a URL and if a user "clicks on an object having a URL annotation then the [system] will jump to another video or web page or image." *Id.*; *see id*. at 11:64–66 ("The inserted hyperlinks will . . . serve to access still further, other, digital (hyper)video clips, particularly commercials."), 1:55–61, 3:19–22, 18:43–46, 19:42–45, 26:60–63. The user may access additional information by "branching" from the original hyperlink. *Id.* at 9:1–30, 10:15–19, 10:40–44 ("[The user] may indulge himself or herself to follow all hyperlinks" to "any network place or resource that is desired."), 22:1–10. These disclosures teach or suggest a user requesting information (a text annotation) responsive to the initial indication (the hotspot indicating that additional information is available) by mousing-over the object, and requesting additional information (video, web page, or image) relating to the displayed information. Ex. 1002 ¶ 69

Second, the combination of Rangan and Rakib teaches or suggests the above limitation. Rakib discloses that a user can request additional information about a displayed object, which in turn causes the remote control to request additional information about the displayed object. Ex. 1013 ¶ 136 ("If . . . the user determines that still more additional

information is desired (for example the user wishes to purchase a displayed product, and wants access to an internet store), then routine 1324 directs the remote control hardware to send a request for additional object information to the media/router set-top box hardware."); Ex. 1002 ¶ 69. Rakib further discloses that a user can request additional information about a displayed object by clicking on a hyperlink in the displayed text annotation, which will provide a video or webpage containing additional information. Ex. 1014, 11:64–66; 1:55–61, 3:19–22, 14:52–64 (the user may continue "clicking on objects within successive videos"), 18:43–46, 19:42–45, 26:60–63; Ex. 1002 ¶ 69.

Third, an ordinarily skilled artisan would have been motivated to modify Rangan's apparatus to permit requests for additional information as taught by Rakib for the following reasons: (i) Rangan discloses providing a unique customized experience for numerous users, and an ordinarily skilled artisan would recognize this goal would be best accomplished by providing a portion of the related information and then allowing each user to decide what additional information should be disclosed; (ii) disclosing all information that users may be interested in would be onerous; (iii) Rangan suggests that the user would be able to branch to additional information after selecting the hotspot; and (iv) this modification would be a simple substitution of one known element for another known element to obtain predictable results. Ex. 1002 ¶¶ 71–80. We also find that an ordinarily skilled artisan would have a reasonable expectation of making such a modification. *Id.* ¶ 80.

Fourth, we do not agree with Patent Owner that this modification would impermissibly change Rangan's principle of operation. PO Resp. 24.

The proposed combination would not require that any change in the basic operation of Rangan's system because Rangan's system already requests information. *See supra* Section III.A.2.f.; Ex. 1102 ¶¶ 39–40. The modification would simply involve making another request. Ex. 1102 ¶ 40. We also credit Dr. Bovik's testimony that Rangan and Rakib do not have incompatible operating structures. *Id.*

Fifth, we do not agree with Patent Owner that Petitioner impermissibly maps both the above limitation and the limitation of "displaying information associated with the initial indication that information is available" to Rangan's hotspots. PO Resp. 23–24. Petitioner maps the recited request for additional information to mousing-over the hotspot and clicking on a link shown in a text annotation, not to the hotspot itself. Pet. 26–27.

In conclusion, we find that Rangan teaches or suggests the above limitation, the combined teachings of Rangan and Rakib also teach or suggest the above limitation, and that an ordinarily skilled artisan would have combined Rangan and Rakib.

b. displaying, responsive to the request for additional information, the additional information

According to Petitioner, Rangan teaches displaying the information requested by mousing-over an object in its display and teaches displaying the information requested by clicking on a URL in its text annotations. Pet. 30. Petitioner also argues that Rakib suggests this limitation by disclosing that "additional information" is "displayed." *Id.* (citing Ex. 1013 ¶ 136, Fig. 13 (step 1332); Ex. 1002 ¶¶ 82–83.) Patent Owner does not dispute that to the extent Rangan or the combination of Rangan and Rakib

teach or suggest "receiving a request for additional information relating to a displayed information," Rangan and Rakib also teach or suggest the above limitation. PO Resp. 23–26. Considering both parties' arguments and the complete record after trial, we agree with Petitioner and find that Rangan teaches or suggests the above limitation and that the combined teachings of Rangan and Rakib also teach or suggest that limitation.

Consequently, Petitioner has demonstrated by a preponderance of the evidence that claim 2 would have been obvious over Rangan and Rakib.

3. Independent Claims 14 and 16

Independent claim 14 recites substantially the same elements as claim 2, but does not require the video frame identifiers to be retrieved "from a plurality of video frame identifiers." Ex. 1001, 33:45–34:2, 36:8–32. Independent claim 16 recites substantially the same elements as claim 14, but restricts the "information" recited in claim 14 to "item information." *Id.* at 36:8–32, 40–63.

For claim 14, Petitioner relies on its showing for claim 2. Pet. 31. For claim 16, Petitioner relies on its showing for claim 19 that Rangan discloses item information and on its showing for claim 14. *Id.*

Patent Owner reiterates the arguments it presents for claim 2. PO Resp. 26. Further, Patent Owner argues that Rakib does not teach "retrieving a video frame identifier that is responsive to a play location within a playing of a video." *Id.* In addition, Patent Owner asserts that an ordinarily skilled artisan would have had additional reasons for not combining Rangan and Rakib: (i) Rangan's requirement for accurate assessment of objects and shapes to place annotations in a video and (ii)

that Rakib's method, for retrieving frames, would be tedious and burdensome. *Id.* at 27.

Petitioner responds that it does not rely on Rakib for retrieving a video frame identifier. Pet. Reply 12. Further, Petitioner argues that it does not propose using Rakib's methodology to receive requests for additional information. *Id*. at 11.

Considering both parties' arguments and the complete record after trial, we agree with Petitioner and find that Rangan teaches or suggests the limitations of claims 14 and 16, that Rangan and Rakib also teach or suggest those limitations, and that an ordinarily skilled artisan would have combined Rangan and Rakib.

As mentioned above, Patent Owner argues that Rakib does not disclose "retrieving, from a plurality of video frame identifiers, a video frame identifier that is responsive to a play location within a playing of a video." Petitioner, however, does not rely upon Rakib for that limitation. Pet. 17–19, 26, 31.

Patent Owner also argues that Rakib's requirement for the accurate assessment of object shapes and sizes to place annotations in the video to alert the user to information is prone to error, particularly when it analyzes multiple objects that have similar sizes or shapes as other objects. PO Resp. 27. Petitioner, however, does not propose using Rakib's system to place annotations in the video. Pet. 16–31.

Petitioner further argues that Rakib's method, if used to retrieve frames, would be tedious and burdensome. PO Resp. 27. Petitioner, however, does not propose using Rakib's method to retrieve frames. Pet. 16–31.

Consequently, Petitioner has demonstrated by a preponderance of the evidence that claims 14 and 16 would have been obvious over Rangan and Rakib.

C. Alleged Obviousness Based on Rangan, Rakib, and Abecassis

Petitioner asserts that dependent claim 4 would have been obvious over Rangan, Rakib, and Abecassis. Pet. 31–38.

1. Overview of Abecassis

Abecassis is directed to a system for automatically customizing a viewer-selected video responsive to the application of the viewer's video content preferences to a segment map of the video. Ex. 1024, 1:34–37. Abecassis discloses that when a content-on-demand video is paused, Abecassis's video map identifies the beginning point of the segment in which the pause occurred, thus automatically identifying a suitable prior point in the video to restart the delivery of the video. *Id.* at 5:6–10. Abecassis states that "[b]y automatically replaying the segment in which the pause occurred, the viewer may re-engage the video without the loss of continuity." *Id.* at 5:10–12.

2. Dependent Claim 4

Claim 4 depends from claim 2 and recites the additional limitations set forth below.

a. pausing the playing in response to a request for additional information.

According to Petitioner, Rangan teaches or suggests the above limitation by disclosing (i) text annotations that appear with a mouse over, (ii) that the primary video does not need to pause when displaying annotations unless a hyperlink dictates pausing, and (iii) if a user clicks on a

hyperlink, pausing the video while the link jumps to another video or web page. Pet. 31–32.

Patent Owner does not dispute that Rangan teaches or suggests the above limitation. PO Resp. 27–31. Based on the evidence and arguments in the Petition, we find that Rangan teaches or suggests that limitation.

b. resuming the playing at a beginning of a video clip that is responsive to the location of the request for additional information, the video clip comprises a plurality of contiguous shots.

According to Petitioner, Abecassis's disclosure of identifying the beginning of a segment in which a pause occurred and resuming the video at that location suggests the above limitation. Pet. 36. Petitioner argues that an ordinarily skilled artisan would have modified Rangan's apparatus to resume play at the beginning of a video clip as taught by Abecassis because Abecassis discloses the benefit of replaying the segment in which the pause occurred. *Id.* Petitioner also argues that this combination is a simple substitution of one known element for another known element to obtain predictable results. *Id.* Further, Petitioner argues that the combination applies a known technique to a known device and method and yields predictable results.[5] *Id.* at 37. Patent Owner disputes that Abecassis's segment is a video clip. PO Resp. 27–31.

[5] Petitioner also asserts that, to the extent Patent Owner argues that the above limitation requires resuming playing of the primary video at a location responsive to the location of the request for additional information, that would have been obvious in view of Rangan and Abecassis. Pet. 35–36. Patent Owner, however, does not make that argument. PO Resp. 27–31.

Considering both parties' arguments and the complete record after trial, we agree with Petitioner and find that Rangan and Abecassis teach or suggest the above limitation and that an ordinarily skilled artisan would have combined Rangan, Rakib, and Abecassis. As mentioned above, the only issue in dispute regarding this limitation is whether Petitioner has shown that Abecassis discloses a segment that is a video clip.

Patent Owner argues that the challenged patent defines the term "video clip" to be narrower than a generic segment, that Petitioner has merely relied on Abecassis's use of the word "segment" to establish that Abecassis's segment is a video clip, and that Abecassis's segment is not a video clip. PO Resp. 30–31. We agree with Patent Owner that the challenged patent defines the term "video clip" to be narrower than a generic segment, but we do not agree that Petitioner merely relies on Abecassis's disclosure of a generic segment or that Abecassis's segment is not a video clip.

Petitioner and Dr. Bovik assert that Abecassis's segment is a video clip because Abecassis's segment is smaller than a chapter and is defined by the individuals appearing on screen. Pet. Reply 16; Ex. 1102 ¶ 53. Dr. Bovik testifies that the challenged patent "provides that a 'clip's definition is responsive to a material change in the participation of the principal characters[.]" Ex. 1102 ¶ 53 (quoting Ex. 1001, 3:62–64). Dr. Bovik explains why he believes Abecassis's segment satisfies that criteria: "Abecassis clarifies that the segment disclosed therein may be defined by the individuals appearing on screen (e.g., an individual panelist)." *Id.* (citing Ex. 1024, 39:64–40:11).

Dr. Bovik further explains that the cited passage in Abecassis (Ex. 1024, 39:64–40:11) discusses an embodiment where segments are defined by individual panelists such that a viewer may skip a panelist by skipping a segment. Ex. 1102 ¶ 53. Dr. Bovik equates these disclosures in Abecassis with a clip's definition that is responsive to a material change in the participation of the principal characters. *Id.* Therefore, in rendering his opinion that "Abecassis' 'segment' is a 'clip' as defined by the [challenged] patent," Dr. Bovik (and Petitioner) does not merely equate a generic segment with a video clip. And Patent Owner offers no testimony from Dr. Reader or any other evidence that contradicts the above testimony by Dr. Bovik. PO Resp. 30–31; Sur-Reply 16–17. Therefore, we find that Abecassis teaches or suggests the above limitation.

Patent Owner does not dispute that an ordinarily skilled artisan would have combined the teachings of Rangan and Abecassis. PO Resp. 30–31. Based on the arguments and evidence set forth in the Petition, we find that an ordinarily skilled artisan would have made that combination. Pet. 36–38; Ex. 1002 ¶¶ 100–104; Ex. 1024, 5:6-12; Ex. 1026, 210.

Because of the above findings, we need not consider Petitioner's alternative contention that the limitation would have been suggested based on Rangan alone. Pet. 35–36. Consequently, Patent Owner's arguments specific to that contention are insufficient to defeat Petitioner's showing. PO Resp. 28–29; Sur-Reply 15–16.

We determine that Petitioner has shown by a preponderance of the evidence that claim 4 would have been obvious over Rangan, Rakib, and Abecassis.

D. Alleged Obviousness Based on Armstrong and Livesey

Petitioner asserts that claims 2, 6, 14, 16, and 19 would have been obvious over Armstrong and Livesey. Pet. 38–56.

1. Overview of Armstrong

Armstrong discloses a system for allowing "viewers of video content to access more information about specific items in [the] video." Ex. 1021, Abstr. Armstrong plays a movie and, in response to a user pressing a "menu" button on a remote control, displays a menu (#104) listing items for which supplemental information is available. *Id.* ¶ 19. Figure 1A of Armstrong is reproduced below:

FIGURE 1A

Figure 1A is a view of suspended video/audio stream primary video content with a menu for retrieving information for the scene. Ex. 1021 ¶ 6. This view was generated by pressing the pause or menu button on a remote and suspending the playback of the movie. *Id.* ¶ 19. Display 100 displays frame 102 above menu 104, which has the following buttons/selections: 1. light jacket, 2. scarf, 3. sweater, 4. restaurant, 5. wine, 6. hotel, and 7. wrist watch. *Id.* If, for example, the user highlights and selects button #5, information about the wine in the scene information is displayed to the user (e.g., information describing the manufacture, year, grape variety, type of wine, cost, and where/how to purchase the wine, such as from a restaurant or store). *Id.*

Figure 2A of Armstrong is reproduced below:

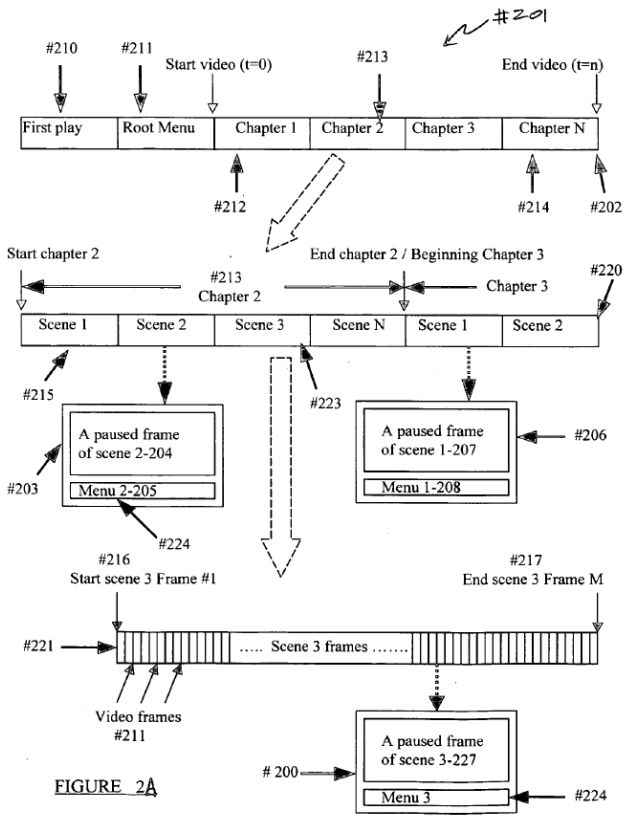

FIGURE 2A

Figure 2A is a hierarchical description of menus and video chapters, scenes and frames. Ex. 1021 ¶ 30. Armstrong discloses that depicted menus 1-208, 2-205, and 3-227 correspond to, respectively, scene 1 and/or frame 227, scene 2 and/or frame 204, and scene 3 and/or frame 227. *Id.* ¶ 31.

2. Overview of Livesey

Livesey discloses a "method of providing additional information to a viewer of a moving image file." Ex. 1022, Abstr. Figure 1 of Livesey is reproduced below:

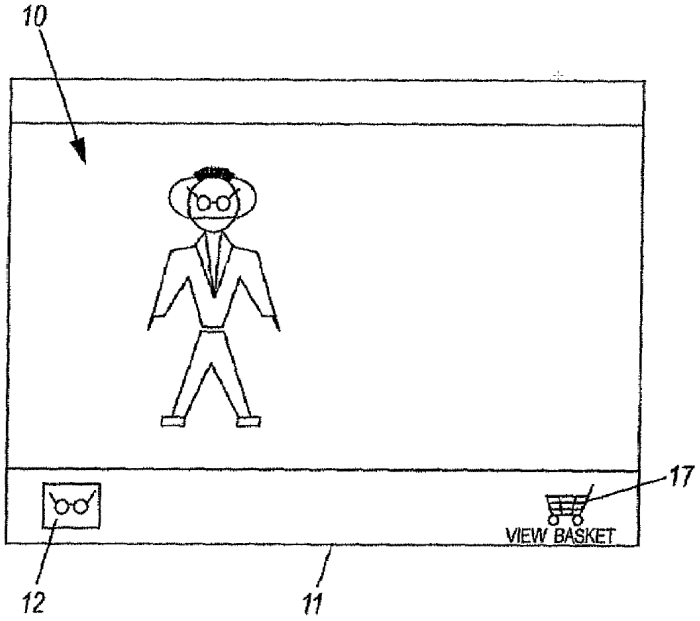

Figure 1 shows exemplary scene 10, from a moving image, on a display with icon bar 11 and shopping cart icon 17. Ex. 1022 ¶¶ 47, 50. If a tagged item appears in a scene, selectable icon 12 appears in icon bar 11. *Id.* ¶ 47. In Figure 1 and in Figure 2 (reproduced below), the tagged item is spectacles, and icon 12 physically represents those spectacles (*id.*):

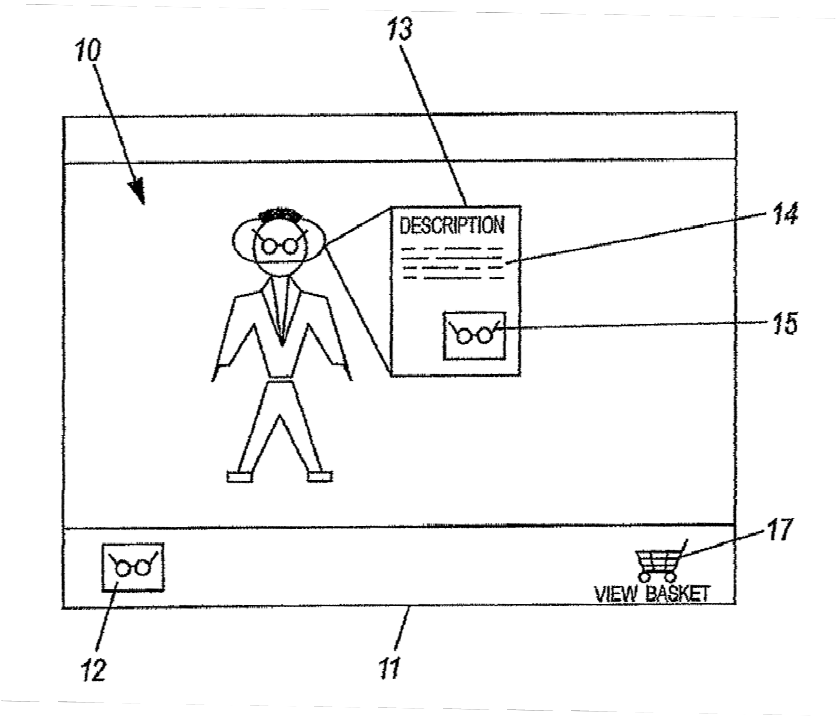

Figure 2 illustrates the effect of selecting icon 12 in Figure 1. In particular, if icon 12 is selected, pop up window 13 appears, which includes description 14 of the qualities of the product spectacles and image 15 of the product. Ex. 1022 ¶ 49.

3. Independent Claim 6

a. An apparatus capable of processing data and instructions executable by a processor; the apparatus, when executing the instructions, performs the steps of

According to Petitioner, Armstrong teaches an "apparatus capable of processing data and instructions executable by a processor" by disclosing personal computers and DVD players. Pet. 31. Patent Owner does not dispute that Armstrong teaches the above recitation. PO Resp. 31. Based on the evidence and arguments in the Petition, we find that Armstrong teaches the preamble recitation of claim 6.

b. retrieving, from a plurality of video frame identifiers, a video frame identifier that is responsive to a play location within a playing of a video

Petitioner argues that Armstrong teaches or suggests the above limitation by (i) identifying frames by frame number, and (ii) when a viewer presses a menu button, retrieving the frame number of the current frame and displaying the corresponding menu. Pet. 41–42. Patent Owner argues that Petitioner has not proven this assertion. PO Resp. 33–35.

Considering both parties' arguments and the complete record after trial, we agree with Petitioner and find that Armstrong teaches or suggests the above limitation.

First, we credit Dr. Bovik's testimony that Armstrong retrieves a frame number to compare it to an index to identify the corresponding menu structure. Ex. 1102 ¶ 57. Armstrong discloses that it counts frames to determine the menu structure to display when the primary video has been paused. Ex. 1021 ¶ 49. Further, Armstrong discloses incrementing or decrementing the frame count by one count for each frame being played during video playback. *Id.* In addition, Armstrong discloses that a sequence of frame counting where the frame count is compared to a range of frames and when that condition is satisfied, a menu associated with the appropriate scene number is linked. *Id.* ¶ 53. We agree with Dr. Bovik that these disclosures teach retrieving (e.g., obtaining or identifying) the frame number (video frame identifier) in order to compare it to the index and identify the corresponding menu structure. Ex. 1102 ¶ 57; *see also* Ex. 1002 ¶¶ 110–112; Ex. 1101, 151:17–152:2.

Second, Patent Owner argues that a frame number cannot represent a play location because a play location in the challenged patent is functionally

different from a video frame identifier. PO Resp. 33–34. According to Patent Owner, identifying the play location within a video is a precondition for retrieving a video frame identifier. *Id.* For these assertions, Patent Owner cites the testimony of Dr. Reader, but that testimony is conclusory. *Id.* (citing Ex. 2021 ¶¶ 106–107). We credit the contrary testimony of Dr. Bovik. Ex. 1102 ¶ 55. The challenged patent, in fact, discloses that "a location within the video may be identified by . . . frame identifiers." Ex. 1001, 18:13–24.

Third, Patent Owner argues that Armstrong does not necessarily determine the frame number of a frame being displayed because Armstrong's DVD authorizing process does not require retrieving a frame number or video frame identifier. PO Resp. 34–37. Patent Owner asserts that Armstrong discloses that its "DVD authorizing process" has "authoring, menu structure, indexing, and/or functionality of the DVD data" "where the current menu may be described as a portion of sub-menu of the menu structure . . . and the like may be displayed for the current scene." *Id.* at 36 (citing Ex. 1021 ¶¶ 30, 40). Patent Owner cites Dr. Reader's testimony that an ordinarily skilled artisan would understand that such a structure would not teach or suggest the above limitation. *Id.* at 37 (citing Ex. 2021 ¶¶ 109–110). Patent Owner also relies on Dr. Reader's testimony that Armstrong's identification of the menu and scene precedes identification of the suspension point of the video and does not disclose first identifying the play location and then retrieving a frame identifier. *Id.* at 37–38 (citing Ex. 2021 ¶¶ 111–112). Patent Owner also argues that Petitioner has not shown that Armstrong retrieves a video frame identifier during the playing of a video. Sur-Reply 18–19. Further, Patent Owner

argues that Dr. Bovik admitted that he did not opine on whether the retrieving in Armstrong occurs within the playing of a video. *Id.* at 19 (citing Ex. 2031, 83:2–6).

We credit Dr. Bovik's testimony that Armstrong's DVD authorizing disclosure does not indicate that Armstrong does not retrieve or have to retrieve a video frame identifier. Ex. 1102 ¶¶ 57–62. Further, Patent Owner and Dr. Reader have not explained adequately why it does. PO Resp. 37–38; Ex. 2021 ¶¶ 111–112. Armstrong discloses comparing each viewed frame to a range of frames associated with the menus to determine the appropriate menu to display. Ex. 1102 ¶ 57. Patent Owner and Dr. Reader have not explained how Armstrong could do that without retrieving a video frame identifier. PO Resp. 37; Ex. 2021 ¶¶ 108, 110. We credit Dr. Bovik's testimony that retrieving a frame identifier is necessary in that process. Ex. 1102 ¶ 57.

Regarding whether Armstrong's retrieval of a video frame identifier occurs during the playing of a video or the above limitation should be construed as having such a requirement, Patent Owner did not timely raise such an issue in the Patent Owner Response. PO Resp. 31–38. Further, Patent Owner presents no good cause for waiting until its Sur-Reply to raise that. Sur-Reply 18–19. Therefore, we will not consider Patent Owner's argument on that issue. Office Patent Trial Practice Guide, August 2018 Update at 15 (a "sur-reply that raises a new issue or belatedly presents evidence may not be considered."). Further, if we were to consider it, we would not construe the above limitation to require that the recited retrieval occur during the playing of a video. The phrase "within a playing of a video" modifies the term "play location," not the word "retrieving." In

addition, Dr. Bovik has explained how Armstrong discloses that a video would continue playing during the retrieval of a video frame identifier and display of the initial indication that information is available. Ex. 1002 ¶ 151 (discussing the retrieval of a higher menu level that would not involve pausing of the video).

In summary, Armstrong teaches or suggests the above limitation.

c. displaying, responsive to the video frame identifier, an initial indication that information is available that is responsive to the play location

According to Petitioner, Armstrong teaches the above limitation by disclosing the display of its menu items, which Petitioner argues are responsive to the frame number and are initial indications that information is available that is responsive to the play location. Pet. 43–44. Patent Owner argues that that Petitioner has only shown that Armstrong's display of menu items is responsive to the play location. PO Resp. 39. Patent Owner argues that Petitioner has failed to show that Armstrong's display of menu items is also responsive to Armstrong's video frame identifier, which is required by the above limitation. *Id.*

Considering both parties' arguments and the complete record after trial, we agree with Petitioner and find that Armstrong teaches or suggests the above limitation. Armstrong discloses that a menu overlay allows "viewers of video content to access more information about specific items in a video segment." Ex. 1021 ¶¶ 15, 19–20. An annotated copy of Figure 1A (reproduced below) illustrates that menu overlay:

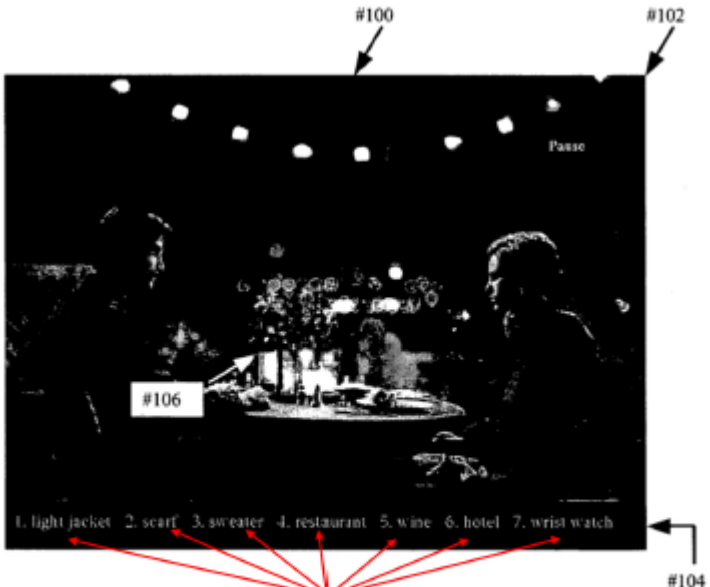

FIGURE 1A

The above figure shows the video content of a DVD with a menu overlay that allows the traversal of a menu structure hierarchy to retrieve secondary information for the scene with annotations by Petitioner. Ex. 1021 ¶ 6; Ex. 1002 ¶ 114. The annotations identify menu items, for example, "1. light jacket" and "2. scarf," which indicate that information is available for these items. Ex. 1021 ¶ 19, Fig. 2A; *see* Ex. 1002 ¶ 114. Armstrong discloses that "if the user highlights and then selects item #5 of menu #104 in FIG. 1A for the wine in the scene, information about the wine is displayed to the user (e.g., information describing the manufacture, year, grape variety, type of wine, cost, and where/how to purchase the wine, such as from a restaurant or store)." Ex. 1021 ¶ 19.

Further, Armstrong discloses that the menu displayed (hence the menu items displayed) is determined based on frame number. Ex. 1002 ¶ 115. Armstrong states: "One purpose for counting frames (e.g., by time, count, and/or registers) to index the beginning and end of the scene, is that

indexing will determine which menu structure to display when the primary video has been paused." Ex. 1021 ¶ 49. Similarly, Armstrong shows a menu with a corresponding scene/frame in its Figure 2A. Armstrong describes that figure as displaying "scene 2 of chapter 2 and corresponding menu 205 (e.g., corresponding to scene 2 and/or frame 204 . . . ." Ex. 1021 ¶ 31.

We further credit Dr. Bovik's testimony that by choosing a menu (and hence menu items) based on the frame numbers, Armstrong discloses displaying initial indications (menu items) responsive to a video frame identifier (frame number). Ex. 1002 ¶¶ 113–115; Ex. 1102 ¶ 63. And, as set forth in Section III.D.3.b, we find that Armstrong discloses retrieving frame numbers.

Thus, we find that Armstrong teaches or suggests the above limitation.

d. retrieving a subsequent video frame identifier that is responsive to a subsequent play location

According to Petitioner, Armstrong teaches the above limitation by disclosing that its menus can be used for multiple frames, in which case Armstrong would retrieve subsequent frame numbers that are responsive to subsequent play locations. Pet. 44. Petitioner argues that each frame after the first frame would be subsequent to the first frame. *Id.* According to Petitioner, therefore, as Armstrong's apparatus plays a video, it would retrieve subsequent frame numbers (video frame identifiers) that are responsive to subsequent play locations. *Id.* Patent Owner argues that Armstrong does not teach the above limitation for the same reasons

Armstrong does not teach "retrieving . . . a video frame identifier." PO Resp. 40; *see also* Ex. 2021 ¶ 114.

Considering both parties' arguments and the complete record after trial, we agree with Petitioner and find that Armstrong teaches or suggests the above limitation. *See supra* Section III.D.3.b.

e. displaying, responsive to the subsequent video frame identifier and contemporaneously with the displaying of the initial indication, a subsequent indication that information is available that is responsive to the subsequent play location

According to Petitioner, Armstrong teaches the above limitation by disclosing that, as new items are introduced in a video, menu indices can be added and by disclosing that earlier menu items can be displayed when new menu items are added. Pet. 45–46. Patent Owner disputes that Armstrong displays earlier menu items when it adds new menu items, arguing that Armstrong deletes indices for items that are no longer present. PO Resp. 42–44.

Considering both parties' arguments and the complete record after trial, we agree with Petitioner and find that Armstrong teaches or suggests the above limitation. Armstrong discloses adding indices to the menu when new items appear in a video: "[a]s new items are introduced in the primary video, indices to them can be added as they appear in the scenes." Ex. 1021 ¶ 23. And Armstrong does not disclose deleting any previously displayed indices. *Id.* As a result, this disclosure at least suggests adding the indices for the new items while preserving the indices for the previously displayed items.

Patent Owner argues that Armstrong must delete the previously displayed menu items because Armstrong discloses that its displayed menu

only contains an index of items in the current scene. PO Resp. 45. We do not agree with this argument, however. If an item is added to a scene, and no items are deleted from the scene, displaying only indices for the items in the current scene would display indices for the previously displayed items (that are still in the scene) as well as the indices for the added items.

Thus, we find that Armstrong teaches or suggest the above limitation. Because of this finding, we need not consider Petitioner's alternative contention that Armstrong in combination with Livesey would teach or suggest this limitation.[6] Pet. 47–52. Consequently, Patent Owner's arguments specific to that contention are insufficient to defeat Petitioner's showing. PO Resp. 46–50; Sur-Reply 21–22.

f. receiving, following the displaying of the subsequent indication, a request responsive to the initial indication, for information

Petitioner argues that Armstrong teaches or suggests adding indices to its displayed menu for subsequent items while retaining prior indices. Pet. 52. Further, Petitioner asserts that a user could request information using the retained prior indices. *Id.* Therefore, according to Petitioner, "Armstrong discloses or renders obvious (alone or with Livesey) that a user can request information responsive to the initial indication (e.g., index for

[6] Petitioner argues that Armstrong alone teaches or suggests this limitation. Pet. 47 ("Armstrong therefore teaches . . . it would have been obvious to a POSITA in view of Armstrong.") Petitioner also argues alternatively that the combination of Armstrong and Livesey teach or suggest the limitation "[t]o the extent CustomPlay argues that contemporaneously displaying the initial and subsequent indications would not have been obvious in view of Armstrong, it would have been obvious in further view of Livesey." Pet. 47.

item #5 associated with the wine) following the display of the subsequent indication (indices added to the menu in subsequent frames)." *Id.* Patent Owner does not dispute that Armstrong receives a request responsive to the initial indication following what Petitioner has identified as the display of the subsequent indication. PO Resp. 50–51. Patent Owner, however, disputes that Armstrong teaches or suggests "displaying . . . a subsequent indication." *Id.*

Considering both parties' arguments and the complete record after trial, we agree with Petitioner and find that Armstrong teaches or suggests the above limitation. *See supra* Section III.D.3.d. Because of this finding, we need not consider Petitioner's alternative contention that Armstrong in combination with Livesey would teach or suggest this limitation.[7] Pet. 47–52. Consequently, Patent Owner's arguments specific to that contention are insufficient to defeat Petitioner's showing. PO Resp. 46–50; Sur-Reply 21–22.

g. displaying information associated with the initial indication that information is available

Petitioner argues that Armstrong teaches the above limitation by disclosing that, when a user clicks on a menu item, more detailed

[7] Petitioner argues that Armstrong alone teaches or suggests this limitation, and in the alternative that Armstrong in combination with Livesey teach or suggest this limitation: "maintaining the indices throughout the scene (and therefore contemporaneously displaying a first and second indication associated with different frames) would have been obvious in view of *Armstrong, alone or in combination with Livesey*." Pet. 51 (emphasis added).

information about the menu item is displayed. Pet. 53–54. Patent Owner does not dispute that Armstrong teaches this limitation. PO Resp. 31–51.

Based on the evidence and arguments in the Petition, we find that Armstrong teaches the above limitation.

As set forth above, Armstrong teaches or suggests every limitation of claim 6. Because we find that Armstrong teaches or suggests every limitation of claim 6, we need not consider the parties' arguments and evidence regarding whether an ordinarily skilled artisan would have combined Armstrong's and Livesey's teachings. Nevertheless, we have considered those arguments and evidence and find that an ordinarily skilled artisan would have combined those teachings for the reasons set forth in the Petition. Pet. 48–51; Ex. 1002 ¶¶ 128–136. Patent Owner argues that the proposed combination would change Armstrong's principle of operation or require undue experimentation to implement. PO Resp. 49–50; Ex. 2021 ¶¶ 116, 119. We, however, credit Dr. Bovik's testimony that no changes to Armstrong's basic functioning would be required. Ex. 1002 ¶ 135; Ex. 1102 ¶ 70. Armstrong already displays indications. To the extent that it is argued that Armstrong does not display a subsequent indication, Armstrong would merely need to repeat its earlier step of displaying an indication. Ex. 1002 ¶ 135; Ex. 1102 ¶ 70. Further, Dr. Bovik sets forth the analysis and evidence that underlies his opinion that the combination would require no change to Armstrong's basic functioning (Ex. 1002 ¶ 135; Ex. 1102 ¶ 70), whereas Dr. Reader's contrary testimony is conclusory (Ex. 2021 ¶ 116), and thus of little weight.

Consequently, we determine that Petitioner has demonstrated by a preponderance of the evidence that claim 6 would have been obvious over Armstrong and Livesey.

4. Independent Claim 2

Petitioner argues that Armstrong discloses the receiving-a-request-for additional information limitation of claim 2 by disclosing that its information pages may contain links to additional information. Pet. 54–55. Petitioner provides as an example that "Armstrong discloses that information about an Armani shirt may show locations and websites where the item can be purchased." *Id.* at 54. Petitioner argues that clicking on a link to those websites would constitute "receiving a request for additional information (e.g., clicking a link to the video/website) relating to displayed information." *Id.* at 55.

Petitioner asserts that Armstrong discloses the displaying-additional-information limitation of claim 2 by displaying websites where items can be purchased or video clips associated with products. Pet. 55.

Patent Owner does not dispute that Armstrong teaches these limitations of claim 2. PO Resp. 31–51. Based on the evidence and arguments in the Petition, we find that Armstrong teaches the above limitations.

For the limitations that claim 2 shares with claim 6, both parties rely on their arguments and evidence for claim 6. As set forth in Section III.D.3., we find that Armstrong teaches or suggests all of those limitations. Consequently, we determine that Petitioner has demonstrated by a preponderance of the evidence that claim 2 would have been obvious over Armstrong and Livesey.

5. Independent Claims 14, 16, and 19

For independent claim 14, Petitioner relies on its showing for claim 2. Pet. 56. For independent claims 16 and 19, Petitioner argues that items disclosed in Armstrong (e.g., clothing, wine, location) are "item information." *Id.* Petitioner further relies on its showings for claim 14 and 6, respectively. *Id.* Patent Owner does not dispute that Armstrong discloses item information. PO Resp. 31–51. Instead, Patent Owner presents the same counterarguments for claims 14, 16, and 19 as for claim 6. *Id.*

Considering both parties' arguments and the complete record after trial, we agree with Petitioner and find that Armstrong teaches or suggests all limitations of claims 14, 16, and 19. *See supra* Section III.D.3. Consequently, we determine that Petitioner has demonstrated by a preponderance of the evidence that claims 14, 16, and 19 would have been obvious over Armstrong and Livesey.

E. Alleged Obviousness Based on Armstrong, Livesey, and Abecassis

Petitioner asserts that dependent claim 4 would have been obvious over Armstrong, Livesey, and Abecassis. Pet. 56–61.

a. pausing the playing in response to a request for additional information.

Petitioner argues that Armstrong teaches or suggests the above limitation by disclosing (i) that its video can continue playing with menu items overlaid on the screen and further disclosing that pausing of the video can occur prior to display of a sub-menu and (ii) the use of a partial overlay and access to a video. Pet. 56–57. Patent Owner disagrees. PO Resp. 52–53. Considering both parties' arguments and the complete record after trial,

we agree with Petitioner and find that Armstrong teaches or suggests the above limitation.

First, Armstrong teaches or suggests the above limitation by disclosing that its primary video can continue playing with menu items overlaid on the screen and that pausing can occur prior to display of a sub-menu. Armstrong discloses that "the [primary] video does not have to pause but can keep playing" with the menu of indices overlaid on the screen. Ex. 1021 ¶ 23. Armstrong further discloses that "asserting a button will suspend play of the primary video content and activate or display a portion or sub-menu of the menu structure corresponding the [sic] a scene or frame other than the current scene or frame being played or displayed." *Id.* ¶¶ 47–48. We credit Dr. Bovik's testimony that in order to reach a sub-menu, the viewer would have need to make an initial request for information (i.e., to access a higher menu level) and then make a subsequent request for additional information (i.e., to access the sub-menu) which would pause the video. Ex. 1002 ¶¶ 50–51. As a result, Armstrong discloses pausing the primary video as a result of a request for additional information (e.g., access to the sub-menu). *Id.*

Second, Armstrong teaches or suggests the above limitation by disclosing the use of a partial overlay and access to a video. Armstrong discloses using a partial overlay, illustrated in its Figure 1A. Ex. 1021 ¶ 20, Fig. 1A. We credit Dr. Bovik's testimony that an ordinarily skilled artisan would recognize that with that overlay (particularly, with its illustrated position and size), the primary video need not be paused while a user views the overlaid menu. Ex. 1002 ¶ 153; Ex. 1021 ¶¶ 20, Fig. 1. Armstrong also discloses that its displayed links can take a user to a video. Ex. 1021 ¶ 62

("At video screen button (#513), a separate video clip can be activated that would demonstrate a process or a product of display 500 in use."), Fig. 5. Further, Armstrong teaches expanding the portion of the screen with the menu linked to the video so the linked video can be seen. *Id.* ¶ 62 ("On screen button could also be a motion button (#513), which shows a running video clip and can become expanded when asserted such as a 'play' button that expands to show video content."). We credit Dr. Bovik's testimony that the expansion of this portion of the screen to play a video and the playing of a second video would suggest pausing the primary video due to its obstruction and the distraction of having a user otherwise simultaneously watch two videos. Ex. 1002 ¶¶ 153–157.

Third, Patent Owner argues that claim 4 requires that at the time of displaying information, the video is not paused, but is paused when displaying additional information. PO Resp. 51. Patent Owner argues that Petitioner has not shown how that requirement is satisfied. PO Resp. 51; Sur-Reply 21–22. But Petitioner explains and Dr. Bovik testifies, that to reach a sub-menu in Armstrong, a user would need to request access to a higher menu level (an initial request for information). Pet. 56; Ex. 1002 ¶ 151. After that higher level menu is displayed (the information), the user can request access to the sub-menu, which would cause the primary video to pause. Pet. 56; Ex. 1002 ¶ 151. Thus, Petitioner has explained how the pausing of the video in Armstrong due to display of the sub-menu would occur after the display of information (the higher level of the menu) and with the display of the additional information (the sub-menu).

In summary, we find that Armstrong teaches or suggests the above limitation. Because of this finding, we need not consider Petitioner's

alternative contention based on Livesey. Pet. 56–59. Consequently, Patent Owner's arguments specific to that contention are insufficient to defeat Petitioner's showing. PO Resp. 52–53; Sur-Reply 21–22.

b. resuming the playing at a beginning of a video clip that is responsive to the location of the request for additional information, the video clip comprises a plurality of contiguous shots.

Petitioner argues that Abecassis's disclosure of identifying the beginning of a segment in which a pause occurred and resuming the video at that location suggests this limitation, and that an ordinarily skilled artisan would have combined this teaching from Abecassis with Armstrong. Pet. 59–61; Pet. Reply 23. Petitioner argues that Abecassis discloses the benefit of doing so. Pet. 60.

Patent Owner disputes only that Abecassis discloses a video clip, presenting the same arguments regarding this limitation as it presents for Rangan, Rakib, and Abecassis (i.e., that Abecassis does not teach a video clip). PO Resp. 55–56. As discussed in Section III.C.2.b, we find that Abecassis teaches a video clip. Considering both parties' arguments and the complete record after trial, we agree with Petitioner and find that Abecassis teaches or suggests the above limitation.

Patent Owner does not dispute that an ordinarily skilled artisan would have combined the teachings of Armstrong and Abecassis. PO Resp. 55–56; Sur-Reply 22. Based on the arguments and evidence set forth in the Petition, we find that an ordinarily skilled artisan would have made that combination. Pet. 36–38; Ex. 1002 ¶¶ 100–104, 160–161; Ex. 1024, 5:6-12; Ex. 1026, 210.

Because of the above findings, we need not consider Petitioner's alternative contention that the limitation would have been suggested based

on Armstrong alone. Pet. 59–60; Sur-Reply 22. Consequently, Patent Owner's arguments specific to that contention are insufficient to defeat Petitioner's showing. PO Resp. 53–55; Sur-Reply 15–16.

We determine that Petitioner has demonstrated by a preponderance of the evidence that claim 4 would have been obvious over Rangan, Rakib, and Abecassis.

F. Alleged Obviousness Based on Rakib and Livesey

Petitioner asserts that all challenged claims would have been obvious over Rakib and Livesey. Pet. 61.

1. Independent Claim 6

a. An apparatus capable of processing data and instructions executable by a processor; the apparatus, when executing the instructions, performs the steps of

According to Petitioner, Rakib teaches the above preamble recitation by disclosing remote device 150 with processing unit 800. Pet. 61–62. Patent Owner does not dispute that Rakib teaches the above preamble recitation. PO Resp. 56–63. Based on the evidence and arguments in the Petition, we find that Rakib teaches that recitation.

b. retrieving, from a plurality of video frame identifiers, a video frame identifier that is responsive to a play location within a playing of a video

Petitioner argues that Rakib teaches the above limitation by disclosing retrieving, from all frame numbers associated with the video, a frame number (t) that is responsive to a play location within a playing of a video. Pet. 61–66. Patent Owner disagrees, arguing that Rakib's subset of video data used to construct a video signature is not the recited video frame

identifier. PO Resp. 60. Patent Owner further argues that Livesey does not teach the above limitation. *Id.* at 61.

Considering both parties' arguments and the complete record after trial, we agree with Petitioner and find that Rakib teaches or suggests the above limitation. Rakib discloses that each object with supplemental information is linked to a metadata file using spatio-temporal coordinates (x, y, t), which denote an object's location on the screen (x, y) and in time (t). Ex. 1013 ¶ 87. Rakib further discloses that the time coordinate, t, may be a frame number. *Id.* ¶ 76. Further, we credit Dr. Bovik's testimony that when a video is displayed, (i) Rakib's media router and the remote control retrieve a video frame identifier (frame number, t), (ii) the media router uses the frame number to determine whether linked metadata should be sent to the remote, and (iii) the remote uses the frame number to at least determine when objects shown in the video have linked metadata that the remote should highlight. Ex. 1002 ¶¶ 165–172 (citing Ex. 1013 ¶¶ 52, 67–68, 75–76, 87, 91–94, 113, 117, 132–33, 141, Fig. 10). We further credit Dr. Bovik's testimony to make these determinations, namely that Rakib retrieves the frame number of the current play location. *Id.* Thus, Rakib discloses retrieving, from a plurality of video frame identifiers (all frame numbers associated with the video), a video frame identifier (frame number, t) that is responsive to a play location within a playing of a video. *Id.* ¶ 171.

Patent Owner argues that Rakib's subset of video data around coordinates (x,y,t) used to construct a video spatio-temporal coordinates are not video frame identifiers. PO Resp. 60. Dr. Reader testifies in support of this proposition. Ex. 2021 ¶ 120. But neither Patent Owner nor Dr. Reader address Rakib's disclosure that the time coordinate, t, may be a frame

number. PO Resp. 60; Ex. 2021 ¶ 120. Therefore, we credit Dr. Bovik's contrary testimony, which accounts for that teaching. Ex. 1002 ¶ 171.

In sum, we find that Rakib teaches or suggests the above limitation.

c. displaying, responsive to the video frame identifier, an initial indication that information is available that is responsive to the play location

retrieving a subsequent video frame identifier that is responsive to a subsequent play location

Petitioner argues that Rakib discloses the displaying-an-initial-indication limitation above by disclosing metadata alert signals that indicate that information responsive to a play location is available. Pet. 66. According to Petitioner, the car and the house shown in picture-in-picture display 1122 in Figure 11 of Rakib are such indications. *Id.*

Petitioner further asserts that Rakib discloses the retrieving-a-subsequent-video-frame-identifier limitation above by disclosing images 1020, 1022, and 1024 and metadata associated with those images. Pet. 67. According to Petitioner, the frame numbers associated with images 1022 and 1024 are subsequent video frame identifiers that are responsive to a subsequent frame location as compared to the frame with image 1020. *Id.* at 68.

Patent Owner argues that Rakib and Livesey do not teach or suggest either of the above limitations because Rakib and Livesey do not teach or suggest video frame identifiers. PO Resp. 62. Considering both parties' arguments and the complete record after trial, we agree with Petitioner and find that Rakib teaches or suggests the above limitations. *See supra* Section III.F.1.b.

d. displaying, responsive to the subsequent video frame identifier and contemporaneously with the displaying of the initial indication, a subsequent indication that information is available that is responsive to the subsequent play location

According to Petitioner, Rakib teaches the above limitation by disclosing the display of the metadata alert signal for the car shown in image frame 1020 (which is displayed at t1) when image frame 1022 is displayed (at time t2). Pet. 69. According to Petitioner, at "t2, which is subsequent to t1, an alert signal for a person, responsive to a subsequent video frame identifier (t2), is displayed (subsequent indication), and it is displayed contemporaneously with the displaying of the initial indication (car signal)." *Id.* Petitioner also argues that displaying the alert signal for the person contemporaneously with the alert signal for the car would have been obvious in view of Livesey because Livesey discloses displaying an icon indicating that supplemental information is available until the end of a scene. *Id.* at 69–72.

Patent Owner argues that Rakib and Livesey do not teach or suggest the above limitation because Rakib and Livesey do not teach or suggest displaying an initial indication. PO Resp. 63. Considering both parties' arguments and the complete record after trial, we agree with Petitioner and find that Rakib teaches or suggests the above limitations. *See supra* Section III.F.1.c.

e. receiving, following the displaying of the subsequent indication, a request responsive to the initial indication, for information

displaying information associated with the initial indication that information is available

Petitioner argues that Rakib discloses the receiving limitation above because Rakib permits a user to make a request responsive to the car

displayed in image frame 1020 when image frame 1022 is displayed. *Id.* at 72–73. In addition, Petitioner asserts that it would have been obvious to modify Rakib in view of Livesey to maintain icons when an object is no longer on display and allow a user to make a request responsive to the initial indication following the display of the subsequent indication. *Id.* at 73.

Petitioner argues that Rakib teaches the displaying limitation above by disclosing the display of information (price and a URL hyperlink) associated with the picture-in-picture of a car, which is an initial indication that information is available. Pet. 74.

Patent Owner argues that Rakib and Livesey do not teach or suggest either of the above limitations because Rakib and Livesey do not teach or suggest retrieving a subsequent video frame identifier. PO Resp. 63. Considering both parties' arguments and the complete record after trial, we agree with Petitioner and find that Rakib teaches or suggests the above limitations. *See supra* Section III.F.1.c.

As set forth above, Rakib teaches or suggests every limitation of claim 6.[8] Because we reach that finding, we do not need to consider the parties' arguments and evidence regarding whether an ordinarily skilled artisan would have combined Rakib's and Livesey's teachings.

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[8] Petitioner asserts that Rakib teaches or suggests each limitation of claim 6. Pet. 61–75. Petitioner further presents the alternative argument that, if we do not find that Rakib teaches or suggests the limitations of "displaying, responsive to the subsequent video frame identifier . . . responsive to the subsequent play location" and "receiving . . . a request responsive to the initial indication," the combination of Rakib and Livesey would teach or suggest those limitations. *Id.* at 69–74.

Nevertheless, we have considered those arguments and evidence and find that an ordinarily skilled artisan would have combined those teachings for the reasons set forth in the Petition. Pet. 70–72; Ex. 1002 ¶¶ 182–189. Patent Owner argues that the proposed combination would change Rakib's principle of operation or require undue experimentation to implement. PO Resp. 61–62; Ex. 2021 ¶ 119. We, however, credit Dr. Bovik's testimony that no changes to Rakib's basic functioning would be required. Ex. 1102 ¶ 76. Rakib already displays indications. To the extent that it is argued that Rakib does not display a subsequent indication, Rakib would merely need to repeat its earlier step of displaying an indication and contemporaneously display the indications. Ex. 1102 ¶ 76. Further, Dr. Bovik sets forth his analysis and the evidence that sets forth his opinion that the combination would require no change to Rakib's basic functioning (Ex. 1002 ¶¶ 180–188; Ex. 1102 ¶ 76), whereas Dr. Reader's contrary testimony is conclusory (Ex. 2021 ¶ 119), and thus of little weight.

Consequently, we determine that Petitioner has demonstrated by a preponderance of the evidence that claim 6 would have been obvious over Armstrong and Livesey.

2. Independent Claim 2

Petitioner argues that Rakib discloses the limitation of receiving a request for additional information because Rakib discloses, with the algorithm of Figure 13, that, if the user determines that more information is desired, the remote control "send[s] a request for additional object information to the media/router set-top box hardware." Pet. 76 (quoting Ex. 1013 ¶ 136).

Petitioner argues that Rakib discloses the limitation of displaying additional information because Rakib discloses, with the algorithm of Figure 13, that the additional information sent to the remote control is handled and displayed. Pet. 77.

Patent Owner presents the same counterarguments for claim 2 as for claim 6. PO Resp. 64. Considering both parties' arguments and the complete record after trial, we agree with Petitioner and find that Rakib teaches or suggests the above limitations, as well as the limitations claim 2 shares with claim 6. *See supra* Section III.F.1. Consequently, Petitioner has demonstrated by a preponderance of the evidence that claim 2 would have been obvious over Rakib and Livesey.

3. Dependent Claim 4

a. pausing the playing in response to a request for additional information.

Petitioner argues that Rakib and Livesey would have disclosed or rendered obvious the additional limitations recited by claim 4. Pet. 78–82. Petitioner asserts that Rakib teaches that a video playback may be stopped so that the primary video on a remote control is no longer played. *Id*. at 79. Petitioner further argues that Livesey discloses pausing video after a request for information, but discloses its steps can occur in a different order. *Id.* Further, Petitioner contends that an ordinarily skilled artisan would have understood that a partial overlay could be used to display information, such as that contained in Figure 10 of Rakib, while continuing to play a video. *Id.* Petitioner asserts that, with a partial overlay, an ordinarily skilled artisan would recognize that the video need not be paused. *Id.* Petitioner further asserts that Rakib discloses that the pertinent additional information

could be a website, which would motivate an ordinarily skilled artisan to pause the primary video. *Id.* Petitioner also argues that pausing in response to a request for additional information would have been obvious because it simply arranges old elements (requests for information and pausing control instructions), with each performing the same function it had been known to perform, and yields no more than predictable results. *Id.* Further, Petitioner contents that an ordinarily skilled artisan would have had a reasonable expectation of success in adding this feature to Rakib. *Id.*

Patent Owner argues that Rakib and Livesey do not teach the above limitation, and Petitioner's argument that Rakib suggests the above limitation rests on impermissible hindsight. PO Resp. 64.

Considering both parties' arguments and the complete record after trial, we agree with Patent Owner and do not find that Rakib and Livesey teach or suggest the above limitation. Petitioner's obviousness theory for this limitation rests on its arguments about what an ordinarily skilled artisan *could* have done. According to Petitioner, an ordinarily skilled artisan would have understood that a partial overlay *could* be used to display information. Then Petitioner argues what an ordinarily skilled artisan would have been motivated to do if the artisan decided to use a partial overlay. But Petitioner provides no persuasive evidence that an ordinarily skilled artisan would have been motivated to choose the partial overlay—the predicate act in Petitioner's analysis. And obviousness cannot be established by merely proving what an ordinarily skilled artisan *could* have done. *Personal Web Techs., LLC v. Apple, Inc*., 848 F.3d 987, 993 (Fed. Cir. 2017); *Belden Inc. v. Berk-Tek LLC*, 805 F.3d 1064, 1073 (Fed. Cir. 2015).

Further, Petitioner's argument and Dr. Bovik's testimony that the above limitation simply arranges old elements (requests for information and pausing control instructions), with each performing the same function it had been known to perform, and yields no more than predictable results, are conclusory. Pet. 80–81; Ex. 1002 ¶¶ 202–203. For that reason, we are not persuaded by that argument or that testimony.

b. resuming the playing at a beginning of a video clip that is responsive to the location of the request for additional information, the video clip comprises a plurality of contiguous shots.

Petitioner argues that Rakib teaches the above limitation by disclosing that if, after obtaining information, the user decides no further information is needed, the remote control can be sent a short optional catch-up clip to quickly review missed video at higher than normal speeds. Pet. 81–82.

Patent Owner argues that Rakib's playing of a catch-up clip at higher than normal speeds and resuming the regular video at a later location is not the claimed resuming. PO Resp. 65. Patent Owner also argues that Petitioner has not shown that the catch-up clip is a video clip. *Id.*

Petitioner responds that resuming play at normal speeds is not a claim limitation. Pet. Reply 26–27. Petitioner further argues that Dr. Reader did not testify that Rakib's clip is not a video clip, whereas Dr. Bovik testifies it is. *Id.* at 27.

Considering both parties' arguments and the complete record after trial, we agree with Patent Owner that Petitioner has not proven the playing of the catch-up clip at higher speeds constitutes the recited resuming. Thus, we do not find that Rakib and Livesey teach or suggest the above limitation.

Petitioner has not persuasively explained why playing a new video clip at a higher rate of speed than the old video was shown at would constitute "resuming" the play of the video previously displayed. Petitioner's argument that the limitation recites no absolute speed requirement is unavailing. Pet. 81–82; Pet. Reply 26–27. Petitioner may be correct that the above limitation could be satisfied by the playing and pausing of a video that is shown at higher than normal speeds. For example, showing a video at double speed, pausing, and then resuming the play of that video at double speed may satisfy the above limitation. But that is different from playing a video at normal speed, pausing, and then displaying a catch-up clip at a higher speed. Petitioner has not persuasively explained why the latter constitutes resuming the play of the recited video. Pet. 81–82; Pet. Reply 26–27.

Consequently, we determine that Petitioner has not demonstrated by a preponderance of the evidence that claim 4 would have been obvious over Rakib and Livesey

4. Independent Claims 14, 16, and 19

Referencing its arguments for Grounds 1 and 2, Petitioner argues that "claims 14, 16, and 19 are invalid for the same reasons as claims 2, 4, and 6, respectively." Pet. 82. Patent Owner responds that "[t]he Petition fails with respect to claims 14, 16, and 19 for the same reasons discussed with respect to claims 2 and 6." PO Resp. 66.

As discussed in Section III.B.3., claim 14 is broader than claim 2. Therefore, Petitioner's showing for claim 2 establishes the unpatentability of claim 14. Claims 16 and 19, however, recite "item information," which claims 2 and 6 do not. Dr. Bovik addresses this additional limitation of

claims 2 and 6, testifying that the challenged patent "'defines item' to refer to, among other things, items, products, and objects." Ex. 1002 ¶ 208 (citing Ex. 1001, 4:48–61). Dr. Bovik opines that "[t]his definition encompasses the items disclosed in Rakib." *Id.* Patent Owner has not challenged this evidence regarding Rakib's disclosure of "item information" or Petitioner's showing regrading item information. PO Resp. 66. Instead, Patent Owner merely challenges Petitioner's proof regarding claims 2 and 6. *Id.* Considering both parties' arguments and the complete record after trial, we agree with Petitioner and find that Rakib teaches or suggests the above limitations. *See supra* Section III.F.1.

We determine that Petitioner has demonstrated that claims 14, 16, and 19 would have been obvious over Rakib and Livesey.

IV. PATENT OWNER'S MOTION TO EXCLUDE

Patent Owner moves to exclude certain portions of Dr. Reader's testimony during his deposition (*see* Ex. 1101) under Rule 403.[9] Paper 29 ("Mot.") 1–2. More specifically, Patent Owner alleges the testimony to be excluded is "prejudicial."[10] *Id.* at 1; *see* Paper 33 ("Mot. Reply") 1.

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[9] In its Reply in support of the Motion, Patent Owner further invokes Rule 611(b) as a basis for excluding the evidence in question. Mot. Reply 1. We determine this argument was untimely and waived because it was not included in the Motion, and, as a result, Petitioner did not have a reasonable opportunity to address it. *See* 37 C.F.R. §§ 42.5(a), 42.23(b), 42.64(c).

[10] Patent Owner also alleges this testimony is "irrelevant," but the Motion does not assert an objection based on Rule 402. *See* Mot. 1; Mot. Reply 1–3. Indeed, Rule 403 explicitly addresses *relevant* evidence by definition. *See* Fed. R. Evid. 403 ("The court may exclude relevant evidence if its

According to Patent Owner, Petitioner's questions were purportedly vague, ambiguous, and/or beyond the scope of Dr. Reader's direct examination (i.e., his Declaration). *Id*.

Rule 403 has limited applicability, if any, to bench trials like this proceeding. *See*, *e.g.*, *Schultz v. Butcher*, 24 F.3d 626, 632 (4th Cir. 1994) (holding that "in the context of a bench trial, evidence should not be excluded under 403" because the court can "hear relevant evidence, weigh its probative value and reject any improper inferences"). We also note that none of the testimony at issue directly formed part of the basis for any determination made in this Decision.

In sum, we determine that there is no appreciable risk of unfair prejudice, confusion of issues, or other reason to exclude this evidence under Rule 403. Rather, the panel is capable of assessing and weighing this evidence appropriately (and has done so). For the above reasons, we are not persuaded that any of the testimony at issue should be excluded and, thus, we deny Patent Owner's Motion to Exclude.

V. CONCLUSION[11]

For the foregoing reasons, Petitioner has shown by a preponderance of the evidence that the challenged claims of the '950 Patent are unpatentable, as summarized in the following table:

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probative value is substantially outweighed . . . ."). To the extent Patent Owner intends to challenge the relevance of any of the testimony in question, we are not persuaded as a result.

[11] Should Patent Owner wish to pursue amendment of the challenged claims in a reissue or reexamination proceeding subsequent to the issuance of this

Claims	35 U.S.C. §	Reference(s)	Claims Shown Unpatentable	Claims Not Shown Unpatentable
6 and 19	103(a)	Rangan	6 and 19	
2, 14, and 16	103(a)	Rangan and Rakib	2, 14, and 16	
4	103(a)	Rangan, Rakib, and Abecassis	4	
2, 6, 14, 16, and 19	103(a)	Armstrong and Livesey	2, 6, 14, 16, and 19	
4	103(a)	Armstrong, Livesey, and Abecassis	4	
2, 4, 6, 14, 16, and 19	103(a)	Rakib and Livesey	2, 6, 14, 16, and 19	4
Overall Outcome			2, 4, 6, 14, 16, and 19	

VI. ORDER

It is:

ORDERED that the challenged claims of the ’950 Patent are held unpatentable in view of the following asserted grounds:

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decision, we draw Patent Owner’s attention to the April 2019 *Notice Regarding Options for Amendments by Patent Owner Through Reissue or Reexamination During a Pending AIA Trial Proceeding. See* 84 Fed. Reg. 16,654 (Apr. 22, 2019). If Patent Owner chooses to file a reissue application or a request for reexamination of the challenged patent, we remind Patent Owner of its continuing obligation to notify the Board of any such related matters in updated mandatory notices. *See* 37 C.F.R. § 42.8(a)(3), (b)(2).

Claims 6 and 19 as unpatentable under 35 U.S.C. § 103(a) over Rangan;

Claims 2, 14, and 16 as unpatentable under 35 U.S.C. § 103(a) over Rangan and Rakib;

Claims 4 as unpatentable under 35 U.S.C. § 103(a) over Rangan, Rakib, and Abecassis;

Claims 2, 6, 14, 16, and 19 as unpatentable under 35 U.S.C. § 103(a) over Armstrong and Livesey;

Claim 4 as unpatentable under 35 U.S.C. § 103(a) over Armstrong, Livesey, and Abecassis; and

Claims 2, 6, 14, 16, and 19 as unpatentable under 35 U.S.C. § 103(a) over Rakib and Livesey;

FURTHER ORDERED that claim 4 is not held to be unpatentable under 35 U.S.C. § 103(a) over Rakib and Livesey;

FURTHER ORDERED that Patent Owner's Motion to Exclude (Paper 24) is *denied* as set forth above;

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

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