

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

LIGHTRICKS LTD.,
Petitioner,

v.

PLOTAGRAPH, INC. and SASCHA CONNELLY,
Patent Owner.

IPR2023-00568
Patent 11,182,641 B2

Before PATRICK R. SCANLON, CHARLES J. BOUDREAU, and
IFTIKHAR AHMED, *Administrative Patent Judges*.

SCANLON, *Administrative Patent Judge*.

DECISION
Granting Institution of *Inter Partes* Review
35 U.S.C. § 314

I. INTRODUCTION

Lightricks Ltd. (“Petitioner”) filed a Petition (Paper 1, “Pet.”) requesting an *inter partes* review of claims 1–4, 8–15, 19, and 20 of U.S. Patent No. 11,182,641 B2 (Ex. 1001, “the ’641 patent”). Plotagraph, Inc. and Sascha Connelly (collectively, “Patent Owner”) filed a Preliminary Response (Paper 6, “Prelim. Resp.”).

We have authority to determine whether to institute an *inter partes* review. *See* 35 U.S.C. § 314 (2018); 37 C.F.R. § 42.4(a) (2022). To institute an *inter partes* review, we must determine that the information presented in the Petition shows “a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.” 35 U.S.C. § 314(a). For the reasons set forth below, we determine that Petitioner has demonstrated a reasonable likelihood that it would prevail with respect to at least one challenged claim. Accordingly, we institute an *inter partes* review of the challenged claims on the grounds set forth in the Petition.

Our factual findings and conclusions at this stage of the proceeding are based on the evidentiary record developed thus far. This is not a final decision as to patentability of the challenged claims. Any final decision will be based on the full trial record, including any response to the Petition timely filed by Patent Owner.

II. BACKGROUND

A. *Real Parties in Interest*

Petitioner identifies itself as the real party in interest. Pet. 1. Patent Owner identifies Plotagraph, Inc. and Sascha Connelly as the real parties in interest. Paper 4, 1.

B. Related Matters

The parties identify the following proceeding as a related matter involving the '641 patent: *Plotagraph, Inc. v. Lightricks Ltd.*, Case No. 4:21-cv-03873 (S.D. Tex.), the dismissal of which is on appeal in *Plotagraph, Inc. v. Lightricks Ltd.*, No. 23-1048 (Fed. Cir.). Pet. 1 (citing Ex. 1021); Paper 4, 2. Patent Owner further identifies the following Board proceedings involving patents related to the '641 patent: IPR2023-00152 (challenging U.S. Patent No. 10,558,342), IPR2023-00153 (challenging U.S. Patent No. 10,346,017), IPR2023-00154 (challenging U.S. Patent No. 10,621,469), and IPR2023-00569 (challenging U.S. Patent No. 11,301,119). Paper 4, 2. On June 20, 2023, we denied institution of *inter partes* review in IPR2023-00152. IPR2023-00152, Paper 7. On September 5, 2023, we instituted *inter partes* review in IPR2023-00153 and IPR2023-00154. IPR2023-00153, Paper 9; IPR2023-00154, Paper 9.

C. The '641 Patent

The '641 patent, titled “Automated Pixel Shifting within a Video File,” issued November 23, 2021, with claims 1–20. Ex. 1001, codes (45), (54), 15:65–19:3. The '641 patent discloses “systems, methods, and computer-readable media that automate the shifting of pixels within a digital video file.” *Id.* at 3:12–14. In one embodiment, a user selects portions of a frame in a video file to automate the shifting of pixels and controls the speed, magnitude, direction, and other attributes of the pixel shifting. *Id.* at 3:21–26. The user also applies masks to the movie frame to prevent pixels within specific portions of the frame from moving. *Id.* at 3:26–28.

Figures 5A–5D of the '641 patent are reproduced below.

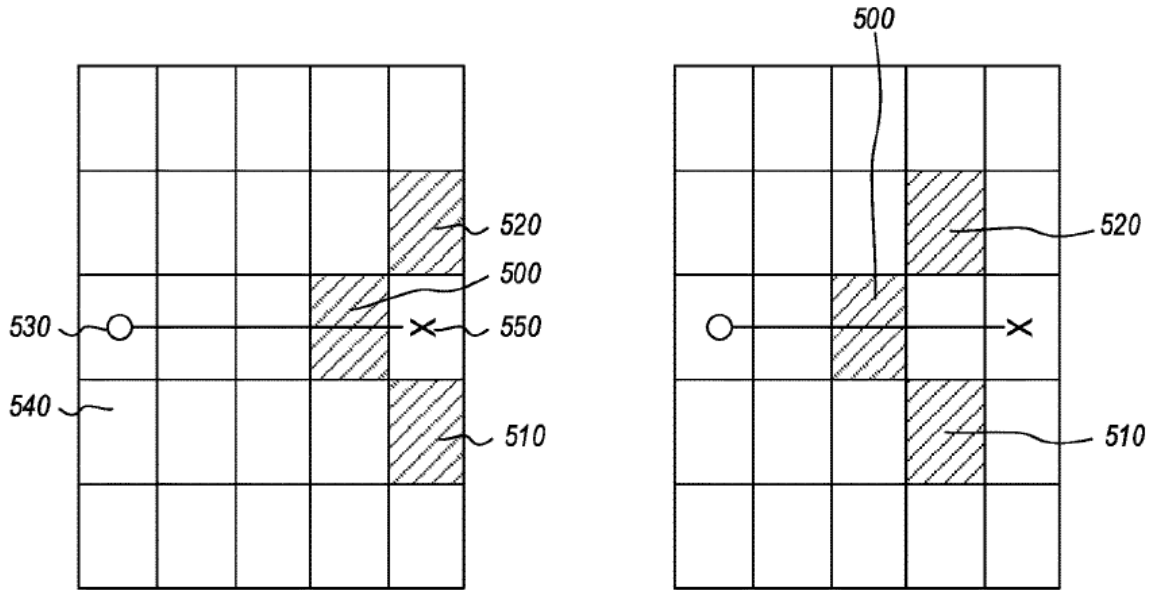


Fig. 5A

Fig. 5B

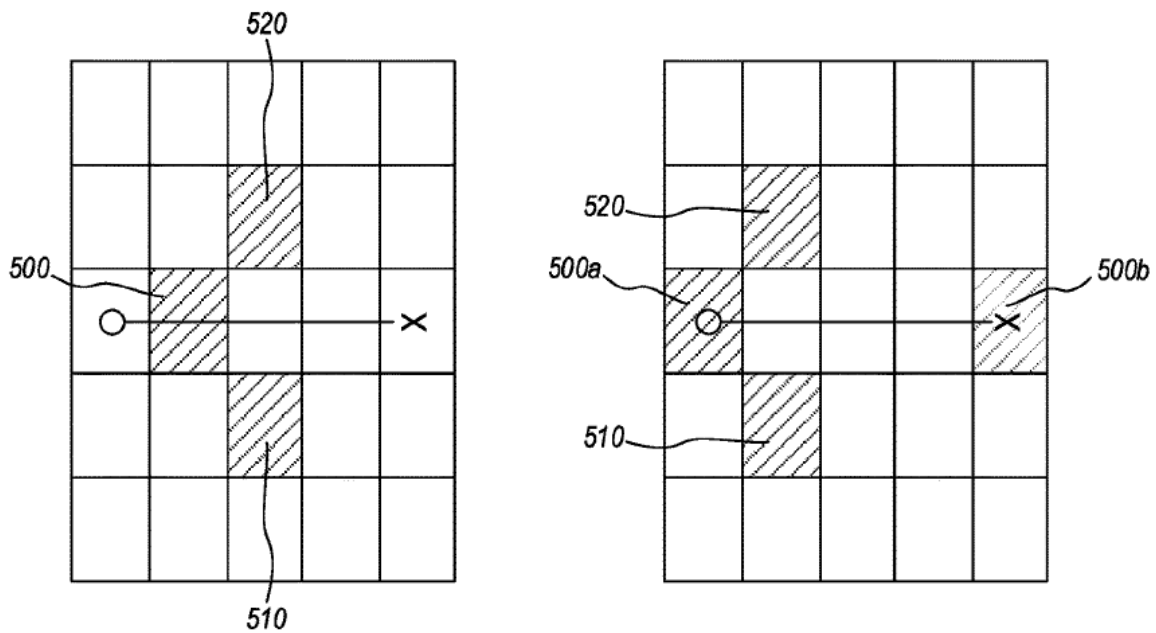


Fig. 5C

Fig. 5D

Figures 5A–5D illustrate embodiments of individual pixels being shifted.
 Ex. 1001, 2:64–65. Figure 5A depicts starting point 550, ending point 530,

and associated link 540, as well as exemplary pixels 500, 510, and 520 in their original state within the video frame. *Id.* at 7:61–67.

Figure 5B depicts pixels 500, 510, 520 after being shifted one space left, along the direction of the link, and Figure 5C depicts pixels 500, 510, 520 after being shifted one more space left. *Id.* at 8:5–8, 8:53–54. “In FIG. 5D the pixels 500, 510, 520 are shown at yet another step along the shift, but in this step the pixels 500, 510, 520 are beginning to loop around.” *Id.* at 8:54–56.

D. Challenged Claims

As noted above, Petitioner challenges claims 1–4, 8–15, 19, and 20 of the ’641 patent. Claims 1, 12, and 19 are independent. Claim 1 is illustrative of the claimed subject matter and is reproduced below:

1. [1pre] A computer system providing, to a client computing device, software for automating a shifting of pixels within a video file, the computer system comprising:

one or more processors; and

one or more computer-readable media having stored thereon executable instructions that are transmitted to the client computing device for execution by one or more client processors on the client computing device, the executable instructions comprising instructions that when executed by the one or more client processors configure the client computing device to perform at least the following:

- [1a] access, from memory, a digital image file, wherein the digital image file comprises information that corresponds to individual pixels within a frame of the digital image file;
- [1b] receive a first starting point through a user interface, wherein the first starting point is received through a user selection of a first beginning portion of a first image frame;

- [1c] receive a first ending point through the user interface, wherein the first ending point is received through a user selection of a first ending portion;
- [1d] create a first digital link between the first starting point and the first ending point, wherein the first digital link comprises:
 - a first direction extending from the first starting point to the first ending point; and
 - a first length between the first starting point and the first ending point;
- [1e] identify a first set of pixels that lie along the first digital link between the first starting point and the first ending point; and
- [1f] shift the first set of pixels in the first direction.

Ex. 1001, 15:65–16:32 (Petitioner’s annotations added); Pet. x–xi.

E. Asserted Grounds of Unpatentability

Petitioner contends that the challenged claims are unpatentable based on the following grounds:

Claims Challenged	35 U.S.C. § ¹	Reference(s)/Basis
1–4, 8–15, 19, 20	102(a)(1)/103	AEM ²

¹ Because the challenged claims of the ’641 patent have an effective filing date after March 16, 2013, patentability is governed by the AIA versions of 35 U.S.C. §§ 102, 103.

² Adobe After Effects Help and tutorials, Adobe (2013) (Ex. 1003).

Claims Challenged	35 U.S.C. § ¹	Reference(s)/Basis
1–4, 8–14, 19, 20	103	IMU, ³ Okabe ⁴
13–15	103	IMU, Okabe, Li ⁵

Pet. 3. Petitioner relies on the Declaration of Philip Greenspun, Ph.D. (Ex. 1002) to support its challenges.

³ Wayback Machine Capture dated Mar. 27, 2012 of Anthony Thyssen, *Examples of ImageMagick Usage (Version 6)*, ImageMagick (Mar. 15, 2011), <http://www.imagemagick.org/Usage/> (retrieved from <https://web.archive.org/web/20120327064501/http://www.imagemagick.org/Usage/> (see Pet. vii)) (Ex. 1004); WayBack Machine Capture dated Mar. 29, 2012 of Anthony Thyssen, *ImageMagick v6 Examples -- Distorting Images*, ImageMagick (Mar. 21, 2012), <http://www.imagemagick.org/Usage/distorts/> (retrieved from <https://web.archive.org/web/20120329131929/http://www.imagemagick.org/Usage/distorts/> (see Pet. vii)) (Ex. 1005); Wayback Machine Capture dated Sept. 28, 2012 of Anthony Thyssen, *ImageMagick v6 Examples -- Masks*, ImageMagick (Mar. 10, 2011), <http://www.imagemagick.org/Usage/masking/> (retrieved from <https://web.archive.org/web/20120928070642/http://www.imagemagick.org/Usage/masking/> (see Pet. vii)) (Ex. 1006); Wayback Machine Capture dated Mar. 10, 2012 of Anthony Thyssen, *ImageMagick v6 Examples -- Animation Basics*, ImageMagick (Feb. 8, 2011), http://www.imagemagick.org/Usage/anim_basics/ (retrieved from https://web.archive.org/web/20120310193613/http://www.imagemagick.org/Usage/anim_basics/ (see Pet. vii)) (Ex. 1007); Wayback Machine Capture dated Apr. 5, 2012 of Anthony Thyssen, *ImageMagick v6 Examples -- Usage under Windows*, ImageMagick (Mar. 21, 2012), <http://www.imagemagick.org/Usage/windows/> (retrieved from <https://web.archive.org/web/20120405151502/http://www.imagemagick.org/Usage/windows/> (see Pet. vii–viii)) (Ex. 1008). Petitioner asserts that Exhibits 1004–1008 comprise a single reference, which Petitioner refers to as IMU. Pet. 4 n.3 (citing Ex. 1002 ¶ 50 n.7).

⁴ Makoto Okabe et al., *Creating Fluid Animation from a Single Image using Video Database*, 30 Computer Graphics Forum 7 (2011) (Ex. 1009).

⁵ Yin Li et al., *Lazy Snapping*, 23 ACM Transactions on Graphics 303 (2004) (Ex. 1010).

III. ANALYSIS

A. Level of Ordinary Skill in the Art

In determining whether an invention would have been obvious at the time it was made, 35 U.S.C. § 103 requires us to resolve the level of ordinary skill in the pertinent art at the time of the invention. *Graham v. John Deere Co.*, 383 U.S. 1, 17 (1966). The person of ordinary skill in the art is a hypothetical person who is presumed to have known the relevant art at the time of the invention. *In re GPAC, Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995). Factors that may be considered in determining the level of ordinary skill in the art include, but are not limited to, the types of problems encountered in the art, the sophistication of the technology, and educational level of active workers in the field. *Id.* In a given case, one or more factors may predominate. *Id.*

Petitioner contends that a person having ordinary skill in the art “would have had at least a bachelor’s degree in computer science, electrical engineering, or a related field, and at least one 1–2 years of experience in image processing and animation,” and “[l]ess education could have been compensated with more experience, and vice versa.” Pet. 5 (citing Ex. 1002 ¶¶ 23–24). Petitioner adds that one of ordinary skill in the art “would have also been familiar with existing systems for image processing and animation and understood how to implement such systems.” *Id.* (citing Ex. 1002 ¶¶ 23–24). Patent Owner does not address the level of ordinary skill in the art in its Preliminary Response.

Based on our review of the record before us, we determine that Petitioner’s stated level of ordinary skill in the art is reasonable because it appears consistent with the evidence of record, including the asserted prior

art. Accordingly, for the purposes of this Decision, we adopt Petitioner’s definition.

B. Claim Construction

In *inter partes* reviews, the Board interprets claim language using the district-court-type standard, as described in *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc). See 37 C.F.R. § 42.100(b). Under that standard, we generally give claim terms their ordinary and customary meaning, as would be understood by a person of ordinary skill in the art at the time of the invention, in light of the language of the claims, the specification, and the prosecution history. See *Phillips*, 415 F.3d at 1313–14. Although extrinsic evidence, when available, may also be useful when construing claim terms under this standard, extrinsic evidence should be considered in the context of the intrinsic evidence. See *id.* at 1317–19.

Petitioner contends that all claim terms should be given their plain and ordinary meaning at this stage of the proceeding. Pet. 8 (citing Ex. 1002 ¶ 48). Patent Owner does not propose any claim construction. Prelim. Resp. 16.

On the present record, we do not discern a need to construe explicitly any claim language because doing so would have no effect on our analyses below of Petitioner’s asserted grounds and will not assist in resolving the present controversy between the parties. See *Realtime Data, LLC v. Iancu*, 912 F.3d 1368, 1375 (Fed. Cir. 2019) (“The Board is required to construe ‘only those terms . . . that are in controversy, and only to the extent necessary to resolve the controversy.’”) (quoting *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999)).

C. Asserted Obviousness Based on IMU and Okabe

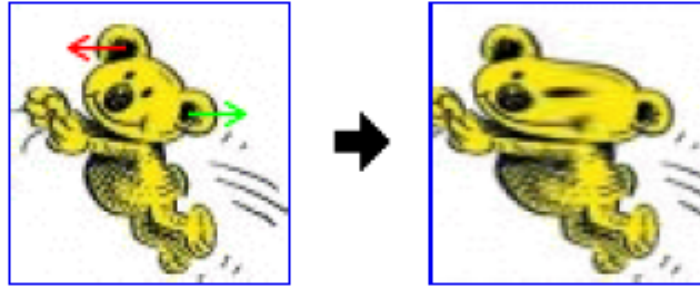
Petitioner asserts that claims 1–4, 8–14, 19, and 20 are unpatentable based on IMU and Okabe. Pet. 55–85. Patent Owner provides arguments addressing this asserted ground of unpatentability. Prelim. Resp. 17–26.

1. IMU

IMU is a collection of Wayback Machine captures of the ImageMagick.com website pertaining to the ImageMagick Version 6 (“IMV6”) open-source image-processing software. Pet. 4 (citing Ex. 1004, 1; Ex. 1002 ¶ 49). According to Petitioner, “[t]he section’s homepage (IMU-Home [Ex. 1004]) links to different subpages explaining how to use IMV6’s various effects and capabilities, including ‘Distorting Images’ (IMU-Distorting [Ex. 1005]), ‘Masking and Background Removal’ (IMU-Masking [Ex. 1006]), ‘Animation Basics’ (IMU-Animating [Ex. 1007]), and ‘Usage under Windows’ (IMU-Windows [Ex. 1008]).”⁶ *Id.* (citing Ex. 1004, 1–2; Ex. 1002 ¶ 49).

IMU describes features and capabilities of IMV6, including Scale-Rotate-Translate (“SRT”) distortion (Ex. 1005, 16–18) and Shepard’s distortion (*id.* at 59–62). IMU explains that Shepard’s method “uses the movement of the given control points to distort the image in terms of ‘local’ effects.” Ex. 1005, 59. IMU discloses an example of applying the distortion to stretch an image as shown in the figure reproduced below.

⁶ According to Petitioner, these five exhibits comprise a single reference. Pet. 4 n.3 (citing Ex. 1002 ¶ 50 n.7). Patent Owner does not challenge this assertion in its Preliminary Response.



Id. The above figure includes two cartoon-like images of a koala, where the first image includes a control point located at each of the koala's ears, and the second image depicts the koala's head as if stretched by pulling the ears apart from each other. IMU explains that as shown in the figure above, "the parts of the image between the two control points were stretched out because of the control point movement," but "all the other parts of the image w[ere] left pretty much intact." *Id.* IMU states that the IMV6 software "is designed for batch processing of images," and "is not a [graphical user interface ("GUI")] image editor." Ex. 1004, 2.

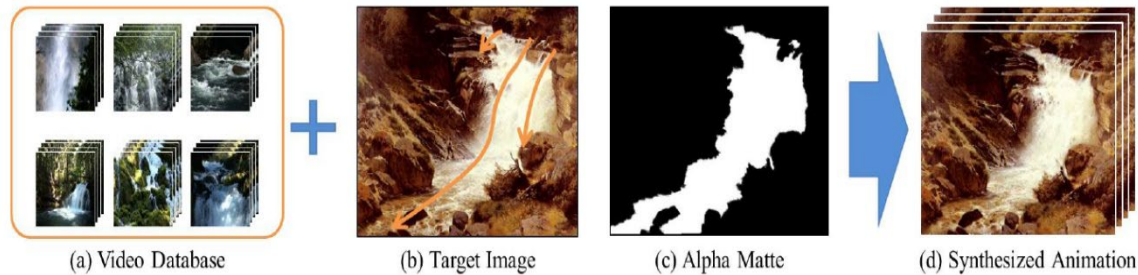
2. *Okabe*

Okabe is a technical article describing a method and system for synthesizing fluid animation in a single image using a fluid video database.

Ex. 1009, 1. Okabe's system consists of three components:

- 1) construction of a video database of fluids . . . , where each video example is cut into small pieces, 2) a best-match search for an appropriate video example piece and assignment of this to a part of the target image, and 3) synthesis of the final animation through seamless integration of all the assigned pieces and adjustment of the overall appearance.

Id. at 3. Figure 1 of Okabe is reproduced below.



Okabe explains that as shown in Figure 1,

[Okabe] employs a database of video examples of fluids (a). The user specifies a target image (b) with a few optional suggestions about fluid motion, e.g., sketches of flow direction, shown as orange arrows. The user also provides an alpha matte of the region of interest (c). The system synthesizes an animation (d).

Id. at 2; *see also id.* at 6, Fig. 8 (discussing user-specified motion field).

Okabe also discloses that “several methods are available to synthesize an infinitely flowing fluid animation,” such that the synthesized animation can permit infinite repetition. *Id.* at 8.

3. Independent Claim 1

Petitioner contends that the proposed combination of IMU and Okabe discloses the limitations of claim 1. Pet. 68–76. To support its arguments, Petitioner identifies certain passages in the cited references and explains the significance of each passage with respect to the corresponding claim limitation. *Id.* Petitioner also articulates reasons to combine the relied-upon aspects of IMU and Okabe. *Id.* at 63–68. Patent Owner argues that Petitioner’s proposed combination does not teach or suggest limitation [1e] (“identify a first set of pixels that lie along the first digital link between the first starting point and the first ending point”) or limitation [1f] (“shift the first set of pixels in the first direction”). Prelim. Resp. 17–23.

We have reviewed Petitioner’s contentions with respect to the limitations of claim 1, and for the reasons discussed below, we determine

that the Petition shows a reasonable likelihood that Petitioner would prevail with respect to the contention that claim 1 would have been obvious based on IMU and Okabe. *See* Pet. 63–76. We address Patent Owner’s arguments below.

a) Limitation 1[e]

Petitioner contends that in the IMU-Okabe combination, a user applies a matte specifying a region of interest for animation and also adds a stroke that specifies the direction and speed of a Shepard’s Distortion control point across the animation. Pet. 74 (citing Ex. 1006, 2; Ex. 1007, 7–8; Ex. 1009, 1, 3, 7; Ex. 1002 ¶¶ 194–195). Petitioner contends that a user would have been allowed to select any or all pixels of the image to be included in this region of interest, including pixels that lie along the stroke between the starting and ending points of the stroke, by using a matte. *Id.* (citing Ex. 1009, 1; Ex. 1002 ¶ 195). According to Petitioner, “Okabe’s Figure 1 confirms this by depicting a matte specifying a to-be-animated region of interest (in white) that includes pixels that lie along three user-drawn strokes between each stroke’s starting and ending points.” *Id.* at 74–75 (citing Ex. 1009, 2, Fig. 1; Ex. 1002 ¶ 195).

Patent Owner argues that “selecting ‘any or all pixels of the image’ is not sufficient to disclose the claim elements of selecting or identifying a first set of pixels that lie along or are along a digital link between the first starting and ending points.” Prelim. Resp. 21 (citing IPR2023-00152, Paper 7 at 12). This argument is not persuasive. First, the portion of the decision in IPR2023-00152 cited by Patent Owner addresses a challenge in that proceeding that was based on AEM—not the IMU-Okabe combination. *See* IPR2023-00152, Paper 7 at 12. As such, we are not persuaded that that portion of the IPR2023-00152 decision has much if any relevance to

Petitioner’s challenge based on the IMU-Okabe combination in this proceeding. Second, the claim limitation at issue in the cited portion of the IPR2023-00152 decision significantly differs from limitation [1e] in that it involves selecting a first set of pixels extending along a *non-linear* pathway. *See* IPR2023-00152, Paper 7 at 5, 12. In this case, claim 1 requires that the first set of pixels lie along the first digital link, and there is no requirement that the first digital link defines a non-linear pathway. *See* Ex. 1001, 15:65–16:32.

For the above reasons, we do not find Patent Owner’s argument persuasive. Instead, at this stage of the proceeding and on the current record, we determine that Petitioner has made a sufficient showing that the proposed combination of IMU and Okabe teaches limitation [1e].

b) Limitation 1[f]

Petitioner asserts that the ’641 patent states that the claimed shifting can be performed using “a warping function, such as Shepard’s distortion,” and that IMU explicitly teaches performing “Shepard’s Distortion” and, therefore, the claimed pixel shifting. Pet. 75 (citing Ex. 1001, 9:27–29; Ex. 1005, 59; Ex. 1002 ¶ 196). Petitioner contends that “IMV6’s user shifts pixels as claimed by using Shepard’s Distortion to place and incrementally move a ‘control point’ on a frame image in the user-specified direction and speed.” *Id.* (citing Ex. 1005, 17–20, 59; Ex. 1007, 7–8; Ex. 1002 ¶ 196).

Petitioner also contends that in its proposed IMU-Okabe combination, a user specifies a Shepard’s Distortion control point’s direction and speed by drawing a corresponding stroke on the image. *Id.* (citing Ex. 1009, 2, 3, 7; Ex. 1002 ¶ 197). According to Petitioner, the IMU-Okabe combination automatically generates animation frames by shifting the selected pixels in

the stroke's direction using IMV6's Shepard's Distortion. *Id.* at 76 (citing Ex. 1009, 1–2; Ex. 1002 ¶ 197).

Patent Owner argues that the IMU-Okabe combination does not disclose limitation [1f]. Prelim. Resp. 23. Specifically, Patent Owner argues that although “Petitioner argues that the ‘641 patent states that the claimed shifting can be performed using ‘a warping function, such as Shepard’s distortion,’ and that ‘IMU explicitly teaches that IMV6 performs “Shepard’s Distortion” and, therefore, the claimed pixel shifting,’” “[t]he ‘641 patent actually discloses that ‘software architecture 200 uses alpha blending when shifting the pixels from the starting point to the ending point,’ and ‘[a]dditionally, in at least one embodiment, the software architecture uses a warping function, such as Shepard’s distortion.’” *Id.* (citing Pet. 75; Ex. 1001, 9:23–29). According to Patent Owner, “[t]his fleeting reference to Shepard’s distortion in the ‘641 patent does not suggest that Shepard’s distortion is the only technique for performing the claimed shifting of the first set of pixels, nor is it sufficient to establish that any prior art disclosure of Shepard’s distortion would teach the claimed shifting.” *Id.* (citing IPR2023-00152, Paper 7 at 21).

This argument is not persuasive. Although Patent Owner is correct that the decision in IPR2023-00152 indicated the reference to Shepard’s distortion in the challenged patent does not suggest that Shepard’s distortion is the only technique for performing the claimed shifting of the first set of pixels and is not sufficient to establish that any prior art disclosure of Shepard’s distortion would teach the claimed shifting, this point was not the sole basis for determining that Petitioner had failed to meet its burden in that proceeding. *See* IPR2023-00152, Paper 7 at 21–22. Instead, the IPR2023-00152 decision also indicated that Petitioner’s reliance on Okabe as

allegedly teaching specifying a control point's non-linear direction was not persuasive. *Id.*

Furthermore, we are not persuaded that the IPR2023-00152 decision is applicable to this proceeding given the different scope of the claim limitations at issue. Namely, limitation [1f] recites “shift[ing] the first set of pixels in the first direction” and is thus broader than the claim limitation at issue in IPR2023-00152, which recites “shifting the first set of pixels along the non-linear pathway.” *Compare* Ex. 1001, 16:32, *with* IPR2023-00152, Paper 7 at 5. Here, Petitioner's assertion that IMU discloses using Shepard's distortion to shift multiple pixels (e.g., a set of pixels) is sufficiently persuasive at this point in the proceeding. *See* Pet. 75 (“IMV6's user shifts pixels as claimed by using Shepard's Distortion to place and incrementally move a ‘control point’ on a frame image in the user-specified direction and speed.”) As discussed above, IMU discloses the example of applying Shepard's distortion to a cartoon-like image of a koala in which one control point is moved in one direction and another control point is moved in an opposite direction. Ex. 1005, 59. IMU discloses that “the parts of the image between the two control points were stretched out because of the control point movement.” *Id.* At this stage of the proceeding, we are persuaded that at least some of these stretched-out parts correspond to pixels that move in the same direction (i.e., a first direction) as one of the control points, while other parts correspond to pixels that move in the direction of the other control point.

For the above reasons, we determine on the current record that Petitioner has made a sufficient showing that the proposed combination of IMU and Okabe teaches limitation [1f].

c) The Remaining Aspects of Petitioner's Contentions

Patent Owner does not offer any arguments specifically addressing the remaining limitations of claim 1. *See generally* Prelim. Resp. We have reviewed Petitioner's contentions with respect to the remaining limitations of claim 1 and determine that the Petition provides a sufficient showing, at this stage of the proceeding, that the proposed combination of IMU and Okabe satisfies each limitation. *See* Pet. 68–74.

d) Preliminary Determination as to Claim 1

Based on our review and consideration of the current record, we determine that the information presented sufficiently supports, for purposes of institution, Petitioner's assertions that the combination of IMU and Okabe teaches each of the limitations of claim 1. We further determine that Petitioner provides an adequate reason why one of ordinary skill in the art would have combined the teachings of IMU and Okabe in the manner asserted by Petitioner, with a reasonable expectation of success. We therefore determine Petitioner has met its burden to show a reasonable likelihood it would prevail in demonstrating that claim 1 is unpatentable over the combination of IMU and Okabe.

4. Dependent Claims 2–4 and 8–11

Claims 2–4 and 8–11 depend from claim 1. Ex. 1001, 16:33–42, 16:62–17:24. Because Petitioner has demonstrated a reasonable likelihood of success in proving that at least one claim of the '641 patent is unpatentable, we institute on all grounds and all claims raised in the Petition. *See SAS Inst., Inc. v. Iancu*, 138 S. Ct. 1348, 1359–60 (2018); *see also PGS Geophysical AS v. Iancu*, 891 F.3d 1354, 1360 (Fed. Cir. 2018) (interpreting 35 U.S.C. § 314 to require “a simple yes-or-no institution choice respecting a petition, embracing all challenges included in the petition”); 37 C.F.R.

§ 42.108(a) (“When instituting inter partes review, the Board will authorize the review to proceed on all of the challenged claims and on all grounds of unpatentability asserted for each claim.”). Therefore, it is not necessary for us to assess every claim challenged by Petitioner.

Nevertheless, we note that Petitioner provides reasonable and detailed explanations, supported with the testimony of Dr. Greenspun, indicating where the references teach or suggest the limitations of claims 2–4 and 8–11. Pet. 76–81 (citing Ex. 1002 ¶¶ 198–209). Patent Owner argues that AEM does not disclose the subject matter of dependent claim 8 (Prelim. Resp. 24–26) but offers no particular arguments regarding claims 2–4 and 8–11 with respect to the IMU-Okabe combination for us to consider at this stage of the proceeding. We have reviewed Petitioner’s contentions with respect to these claims and determine that the information presented in the Petition establishes that there is a reasonable likelihood that Petitioner would prevail in its assertion that claims 2–4 and 8–11 are unpatentable over the combination of IMU and Okabe.

5. Independent Claim 12 and Dependent Claims 13 and 14

Claim 12 recites “[a] computer program product comprising one or more non-transitory computer storage media having stored thereon computer-executable instructions that, when transmitted to a remote computer system for execution at a processor, cause the remote computer system to perform a method for automating a shifting of pixels within an image file” and also recites other limitations that are similar to those in claim 1. Ex. 1001, 17:25–44. Petitioner relies on its contentions related to claim 1 to argue that claim 12 is unpatentable over the combination of IMU and Okabe. Pet. 81–83 (citing Ex. 1002 ¶¶ 210–215). For the reasons discussed above, we find that Petitioner has met its burden to show a

reasonable likelihood that claim 12 is unpatentable over the combination of IMU and Okabe.

Regarding claims 13 and 14, which depend from claim 12, Petitioner provides reasonable and detailed explanations, supported with the testimony of Dr. Greenspun, indicating where the references teach or suggest the limitations of claims 13 and 14. Pet. 83–84 (citing Ex. 1002 ¶¶ 217–218); Ex. 1001, 17:45–57. We have reviewed Petitioner’s contentions with respect to these claims and determine that the information presented in the Petition establishes that there is a reasonable likelihood that Petitioner would prevail in its assertion that claims 13 and 14 are unpatentable over the combination of IMU and Okabe.

6. Independent Claim 19 and Dependent Claim 20

Claim 19 recites “[a] method for transmitting to a client computing device instructions for shifting pixels within a video file,” and additional limitations that are similar to limitations in claim 1. Ex. 1001, 18:38–67. Petitioner relies on its contentions related to claim 1 to argue that claim 19 is unpatentable over the combination of IMU and Okabe. Pet. 84–85 (citing Ex. 1002 ¶¶ 219–220). For the reasons discussed above, we find that Petitioner has met its burden to show a reasonable likelihood that claim 19 is unpatentable over the combination of IMU and Okabe.

Regarding claim 20, which depends from claim 19, Petitioner provides reasonable and detailed explanations, supported with the testimony of Dr. Greenspun, indicating where the references teach or suggest the limitations of claim 20. Pet. 85; *see also id.* at 76 (citing Ex. 1002 ¶ 199); Ex. 1001, 19:1–3. We have reviewed Petitioner’s contentions with respect to these claims and determine that the information presented in the Petition establishes that there is a reasonable likelihood that Petitioner would prevail

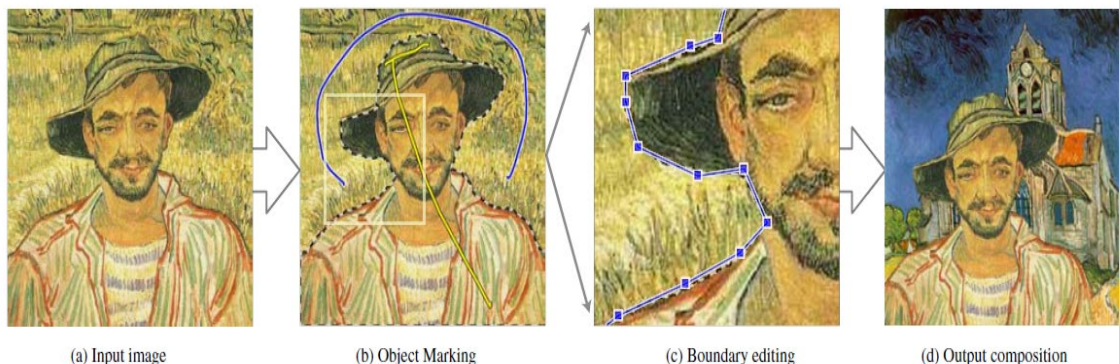
in its assertion that claim 20 is unpatentable over the combination of IMU and Okabe.

D. Asserted Obviousness Based on IMU, Okabe, and Li

Petitioner asserts that claims 13–15 are unpatentable based on IMU, Okabe, and Li. Pet. 86–93.

1. Li

Li is a technical article titled “Lazy Snapping” and describes “an interactive image cutout tool.” Ex. 1010, 1. Li explains that image cutout is “the technique of removing an object in a picture or photograph from its background” by “specifying which parts of the image are ‘foreground’ (the part you want to cut out) and which belong to the background.” *Id.* Figure 1 of Li, reproduced below, illustrates how its tool may be used.



Id. at 1. Figure 1 illustrates that

Lazy Snapping is an interactive image cutout system, consisting of two steps: a quick object marking step and a simple boundary editing step. In [object marking step (b)], only 2 (yellow) lines are drawn to indicate the foreground, and another (blue) line to indicate the background. All these lines are far away from the true object boundary. In [boundary editing step (c)], an accurate boundary can be obtained by simply clicking and dragging a few polygon vertices in the zoomed-in view.

Id. at 1–2. Li discloses that “[t]o specify an object, a user marks a few lines on the image by dragging the mouse cursor while holding a button,” and that

its user interface “does not require very precise user inputs.” *Id.* at 2. “The segmentation process is triggered once the user releases the mouse button after each marking line is drawn.” *Id.* “The user then inspects the segmentation result on screen and decides if more lines need to be marked.” *Id.*

2. Claim 13

Claim 13 recites “[t]he computer program product as recited in claim 12, further comprising receiving an indication to generate a first mask over a second portion of the first image frame, wherein pixels under the first mask are prevented from shifting.” Ex. 1001, 17:45–48.

Petitioner argues that the combination “allows a user to create a matte that specifies regions of an extracted frame image to animate (foreground) and not to animate (background).” Pet. 91 (citing Ex. 1010, 1–2; Ex. 1002 ¶ 239). Petitioner further argues that Li teaches an “object marking” step of drawing marker lines on the image indicating the foreground or background, and receiving these marker lines from the user meets the claimed “receiving.” *Id.* (citing Ex. 1010, 2; Ex. 1009, 1, 7; Ex. 1002 ¶ 240).

3. Claim 14

Claim 14 recites:

The computer program product as recited in claim 13, further comprising computer-executable instructions that, when transmitted to the remote computer system for execution at the processor, cause the remote computer system to perform a method for automating the shifting of pixels within the image file, the method comprising receiving through a user interface a selection of the second portion of the first image frame around which the first mask should be generated.

Ex. 1001, 17:49–57.

Petitioner contends that Li teaches that the “object marking” step of drawing marker lines comprises drawing marker lines over the pixels forming the foreground and background. Pet. 91 (citing Ex. 1010, 2; Ex. 1002 ¶ 241). Petitioner further contends that Li specifically discloses that “[o]nce the user marks the image, two sets of pixels intersecting with the foreground and background markers are defined as *foreground seeds* $\mathcal{F}$ and *background seeds* $\mathcal{B}$ respectively.” *Id.* at 91–92 (citing Ex. 1010, 2–3, Fig. 2; Ex. 1002 ¶ 241). According to Petitioner, receiving these “pixels” or “seeds” satisfies claim 14. *Id.* at 92 (citing Ex. 1010, 2–3; Ex. 1002 ¶ 241).

4. Claim 15

Claim 15 recites:

The computer program product of claim 14, further comprising computer-executable instructions that, when transmitted to the remote computer system for execution at the processor, cause the remote computer system to perform a method for automating the shifting of pixels within the image file, the method comprising:

identifying one or more edges that form a first boundary around the second portion; and

generating the first mask to cover area within the first boundary.

Ex. 1001, 17:58–67. Petitioner asserts that “Li teaches that, in the ‘object marking’ step, a user draws marker lines over the particular ‘pixels’ or ‘seeds’ that form the foreground and background,” and these “‘pixels’ or ‘seeds’ are used by the IM-Okabe-Li Combination to detect the boundary between the foreground and background for generating the matte.” Pet. 92–93 (citing Ex. 1010, 2–3; Ex. 1002 ¶ 242).

5. *Motivation to Combine*

Petitioner contends that the prior art contains reasons for combining Li's "Lazy Snapping" tool with the combination of IMU and Okabe. Pet. 88. In particular, Petitioner argues that "in the IMU-Okabe Combination, a user applies a matte that specifies a to-be-animated region of interest in an extracted frame image (shown in white), as well as a region not desired to be animated (shown in black)." *Id.* (citing Ex. 1009, 1–2; Ex. 1002 ¶ 233). Petitioner contends that Okabe teaches that its matte can be created "using a scribble-based image segmentation tool," specifically Li's Lazy Snapping tool, and therefore, contains an explicit teaching for using Li's Lazy Snapping tool to create a matte in Okabe and in the IMU-Okabe combination. *Id.* (citing Ex. 1009, 7, 10; Ex. 1002 ¶ 234). Moreover, Petitioner contends, Li itself teaches that its Lazy Snapping tool allows a user to easily perform image cutout by using a "novel image segmentation algorithm" to detect a boundary between the foreground and background based on "a quick *object marking* step" and "a simple *boundary editing* step" performed by the user. *Id.* at 88–89 (citing Ex. 1010, 1–2; Ex. 1002 ¶ 235). Given the ease of use, efficiency, and quality of results of Li's tool, Petitioner argues, a person of ordinary skill in the art would have been motivated to utilize Li's tool in the IMU-Okabe combination to create a matte to specify regions in an image to be or not to be animated. *Id.* at 89 (citing Ex. 1006, 2; Ex. 1007, 7–8; Ex. 1009, 1; Ex. 1010, 1–2; Ex. 1002 ¶ 236).

6. *Preliminary Determination as to Claims 13–15*

Patent Owner does not respond to the substance of Petitioner's contentions with respect to the combination of IMU, Okabe, and Li in its Preliminary Response. Based on our review and consideration of the current

record, we determine that the information presented sufficiently supports, for purposes of institution, Petitioner's assertions that the combination of IMU, Okabe, and Li teaches each of the limitations of claims 13–15. We further determine that Petitioner provides an adequate reason why one of ordinary skill in the art would have combined the teachings of Li with IMU and Okabe in the manner asserted by Petitioner, with a reasonable expectation of success. We therefore determine Petitioner has met its burden to show a reasonable likelihood it would prevail in demonstrating that claims 13–15 are unpatentable over the combination of IMU and Okabe, and Li.

E. Asserted Anticipation or Obviousness Based on AEM

Petitioner asserts that claims 1–4, 8–15, 19, and 20 are anticipated by AEM or, alternatively, are rendered obvious by AEM. Pet. 8–55. Patent Owner provides arguments addressing this ground of unpatentability. Prelim. Resp. 17–26. Because we have determined above that the information presented in the Petition shows that there is a reasonable likelihood that Petitioner will prevail with respect to at least one of the claims challenged based on the IMU–Okabe and IMU–Okabe–Li grounds, we need not address Petitioner's additional challenges based on AEM at this stage of the proceeding. *See* 35 U.S.C. § 314(a).

IV. CONCLUSION

After considering the evidence and arguments presented in the Petition and Preliminary Response, we determine that Petitioner has demonstrated a reasonable likelihood of prevailing with respect to at least one of the challenged claims. Thus, we institute an *inter partes* review of all challenged claims on all presented challenges. *SAS*, 138 S. Ct. at 1359–60; *PGS Geophysical*, 891 F.3d at 1360.

V. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that, pursuant to 35 U.S.C. § 314(a), an *inter partes* review is instituted for claims 1–4, 8–15, 19, and 20 of the '641 patent on the unpatentability grounds asserted in the Petition; and

FURTHER ORDERED that pursuant to 35 U.S.C. § 314(c) and 37 C.F.R. § 42.4, notice is hereby given of the institution of a trial, which commences on the entry date of this decision.

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