[redacted]

UNITED STATES INTERNATIONAL TRADE COMMISSION

Washington, D.C.

In the Matter of **CERTAIN CAMERAS, CAMERA SYSTEMS, AND ACCESSORIES USED THEREWITH**	**Inv. No. 337-TA-1400**

INITIAL DETERMINATION ON VIOLATION OF SECTION 337 AND RECOMMENDED DETERMINATION ON REMEDY AND BOND

Administrative Law Judge Doris Johnson Hines

(July 10, 2025)

Appearances:

For Complainant GoPro, Inc.:

S. Alex Lasher of Quinn Emanuel Urquhart & Sullivan, LLP, Washington, D.C., Sean S. Pak of Quinn Emanuel Urquhart & Sullivan, LLP, San Francisco, California, Patrick T. Schmidt of Quinn Emanuel Urquhart & Sullivan, LLP, Los Angeles, California, Nathan Hamstra of Quinn Emanuel Urquhart & Sullivan, LLP, Chicago, Illinois, and Jason C. Williams of Quinn Emanuel Urquhart & Sullivan, LLP, New York, New York.

For Respondents Arashi Vision Inc. d/b/a Insta360 and Arashi Vision (U.S.) LLC d/b/a Insta360.:

Mark L. Whitaker, Mary Prendergast, Jenna H. Seleznick, Maryrose F. McLaughlin of Morrison & Foerster LLP, Washington, D.C., Lily Li, Stella Mao, Evelyn Li-Jin Chang of Morrison & Foerster LLP, Palo Alto, California, Alex S. Yap, Ryan Malloy of Morrison & Foerster LLP, Los Angeles, California, Richard S. J. Hung of Morrison & Foerster LLP, San Francisco, California, and Nishi Tavernier of Morrison & Foerster LLP, New York, New York.

[redacted]

TABLE OF CONTENTS

I. Introduction 1
A. Procedural History 1
B. The Parties 3
1. Complainant 3
2. Respondents 3
C. The Asserted Patents and Claims 3
1. U.S. Patent No. 10,574,894 4
2. U.S. Patent No. 10,958,840 6
3. U.S. Patent No. 11,336,832 8
4. U.S. Patent No. 10,529,052 10
5. U.S. Patent No. 10,015,413 11
6. U.S. Patent No. D789,435 12
D. The Accused Products 13
E. The Domestic Industry Products 15
II. Statutory Authority 16
III. Ownership Rights in the Asserted Patents 17
IV. Importation 18
V. Level of Skill 19
VI. The ’894 Patent 19
A. Claim Construction 23
1. Legal Standard 23
2. Disputed Term 24
a) Indefiniteness 25
b) Construction 26
B. Infringement 27
1. Claim 1 29
a) Undisputed Elements 29
b) Element 1[e] 29
a) Element 1[f] 30
b) Element 1[g(i)] 32

[redacted]

c) Element 1[g(ii)] 38

d) Element 1[g(iii)] 39

2. Claim 5 52

3. Redesigns 52

4. Indirect Infringement 53

C. Technical Prong 54

1. Claim 1 55

2. Claim 5 56

D. Validity 57

1. Pixel 2 and Kwatra 59

a) Overview 59

b) Obviousness 61

(1) Claim 1 61

(2) Claim 5 73

2. Bell and Kwatra 73

a) Overview 73

b) Obviousness 74

(1) Claim 1 74

(2) Claim 5 75

VII. The ’840 Patent 75

A. Claim Construction 76

1. Disputed Terms 76

a) Temporal Horizon 77

b) Approximation of Intentional Motion 79

c) Punchout 81

d) Minimized 83

B. Infringement 84

1. Claim 1 84

a) Undisputed Elements 84

b) Element 1[e] 84

c) Element 1[f] 85

[redacted]

d) Element 1[g(i)] 86

(1) Look-Ahead 87

(2) Weight-Balance Parameter 87

(3) Low-Light High-Pass Parameter 89

e) Element 1[g(ii)] 93

f) Element 1[g(iii)] 94

2. Claim 13 96

3. Claim 14 97

4. Redesigns 97

5. Indirect Infringement 98

C. Technical Prong 98

1. Claim 1 99

a) Undisputed Elements 99

b) Element 1[g(iii)] 99

2. Claim 13 100

3. Claim 14 101

D. Validity 101

1. Pixel 2 and Kwatra 101

a) Overview 101

b) Anticipation 101

(1) Claim 1 102

(2) Claim 14 105

c) Obviousness 106

2. Bell and Zhou or Shi, and Kwatra 107

a) Overview 107

b) Obviousness 108

(1) Element 1[g(i)] and Claim 14 109

(2) Claim 13 111

VIII. The ’832 Patent 112

A. Claim Construction 113

1. Horizon Terms 113

[redacted]

2. Capture Duration and Progress Length 116
3. Function of Progress through Progress Length/Capture Duration 120
4. In or Near Real Time Horizon Leveling 121

B. Infringement 123
1. Claim 1 123
a) Undisputed Elements 123
b) Element 1[b] 123
c) Element 1[c] 125
d) Element 1[d] 127
e) Element 1[e] 130
2. Claim 3 133
3. Claim 4 134
4. Claim 7 134
5. Claim 8 135
6. Redesigns 136

C. Technical Prong 137
1. Claim 1 137
a) Undisputed Elements 137
b) Element 1[b] 137
c) Element 1[d] 138
2. Claims 3 and 4 140
3. Claims 7 and 8 140

D. Validity 140
1. Insta360 Go Alone and With Thomason 140
a) Overview 141
b) Anticipation 141
(1) Claim 1 141
(2) Claims 3 and 4 144
(3) Claim 7 144
(4) Claim 8 145
c) Obviousness 146

[redacted]

2. ReelSteady Go 152
   a) Overview 152
   b) Anticipation 152
      (1) Claim 1 153
      (2) Claims 3 and 4 156
      (3) Claims 7 and 8 157
   c) Obviousness 159
3. Thomason Alone and With Watanabe 159
   a) Overview 159
   b) Anticipation 160
      (1) Claim 1 160
      (2) Claims 3 and 4 162
      (3) Claim 7 162
      (4) Claim 8 162
   c) Obviousness 163
4. Patent-Eligible Subject Matter 166
5. Written Description 166

IX. The ’052 Patent 167

A. Claim Construction 169
1. Disputed Claim Terms 169
   a) Desired Lens Distortion 169
   b) Portions of the Scene 173

B. Infringement 175
1. Claim 1 175
   a) Undisputed Elements 175
   b) Element 1[b] 176
   c) Element 1[d] 178
   d) Element 1[f] 179
   e) Element 1[g] 186
2. Claim 2 189
3. Claim 3 190

[redacted]

4. Claim 5 191
5. Claim 6 192
6. Indirect Infringement 192

C. Technical Prong 192

D. Validity 194

1. Okubo and Sokeila 194

a) Overview 194

b) Obviousness 195

(1) Claim 1 195

(a) Element 1[e] 196

(b) Element 1[f] 198

(2) Claims 2, 3, 5, and 6 203

2. Eder 203

a) Overview 204

b) Claim 1 204

c) Claims 2, 3, 5, and 6 207

3. Patent-Eligible Subject Matter 207

X. The ’413 Patent 207

A. Claim Construction 208

B. Infringement 212

1. Undisputed Elements 212

2. Element 1[e] 212

3. Element 1[f] 219

4. Element 1[g] 222

5. Element 1[i] 224

6. Redesigns 225

C. Technical Prong 225

D. Validity 226

1. Meulen Alone and With Chao 226

a) Overview 227

b) Meulen 227

(1) Element 1[e] 228

[redacted]

(2) Element 1[g] 230

c) Meulen and Chao 233

d) Secondary Considerations 234

2. Fleming 234

a) Overview 235

b) Analysis 235

3. Patent-Eligible Subject Matter 238

4. Written Description 239

XI. The D'435 Patent 240

A. Claim Construction 240

B. Infringement 240

1. Legal Standard 240

2. Analysis 241

3. Accused Products 242

4. Redesigns 257

C. Technical Prong 257

D. Validity 258

1. Overview 260

2. Hero4 263

3. The Combination of Hero4 with Huang or Heo 267

4. Motivation to Combine 269

5. Secondary Considerations 272

XII. Economic Prong 274

XIII. Conclusions of Law 274

XIV. Recommended Determination on Remedy and Bond 275

A. Limited Exclusion Order 275

B. Cease and Desist Order 276

C. Bond During Presidential Review Period 277

XV. Initial Determination on Violation 282

XVI. Order 283

[redacted]

This is the final initial determination in *Certain Cameras, Camera Systems, and Accessories Used Therewith*, United States International Trade Commission Investigation No. 337-TA-1400. 89 Fed. Reg. 37242 (May 6, 2024) and 19 C.F.R. §§ 210.10(b) and 210.42(a)(1)(i).

I. INTRODUCTION

A. Procedural History

GoPro, Inc. filed a complaint alleging violations of section 337 based on the importation into the United States, the sale for importation, and the sale within the United States after importation of certain cameras, camera systems, and accessories used therewith. *See* 89 Fed. Reg. 37242 (May 6, 2024) and Complaint (EDIS Doc. ID 817181).

The Commission instituted this investigation to determine:

> whether there is a violation of subsection (a)(1)(B) of section 337 in the importation into the United States, the sale for importation, or the sale within the United States after importation of certain products identified in paragraph (2) by reason of infringement of one or more of claims 1–12 of [U.S. Patent No. 10,015,413]; claims 1–10 of [U.S. Patent No. 10,529,052]; claims 1–20 of [U.S. Patent No. 10,574,894]; claims 1–21 of [U.S. Patent No. 10,958,840]; claims 1–10 of [U.S. Patent No. 11,336,832]; and the claim of [U.S. Patent No. D789,435], and whether an industry in the United States exists as required by subsection (a)(2) of section 337.

89 Fed. Reg. 37243.

The plain language description of the accused products or category of accused products defines the scope of the investigation and is "action and 360-degree cameras and systems, as well as camera-mounting systems, frames, and camera wearable systems used therewith." *Id*. and 19 C.F.R. § 210.10(b)(1).

The notice of investigation named Arashi Vision Inc. d/b/a Insta360 and Arashi Vision (U.S.) LLC d/b/a Insta360., collectively, Insta360, as respondents. 89 Fed. Reg. 37243. The Office of Unfair Import Investigations is not a party to this investigation. *Id.*

[redacted]

The target date for this investigation was initially set at sixteen months making this final initial determination due no later than May 8, 2025. Order No. 3 (EDIS Doc. ID 821973). The target date was later extended to approximately eighteen months, with this final initial determination due no later than July 10, 2025. Order No. 26 (EDIS Doc. ID 848762), *unreviewed by* Comm'n Notice (5/5/2025) (EDIS Doc. ID 850339).

The parties filed several joint stipulations regarding representative accused products, representative domestic industry products, and importation. Accused Product Stipulation (EDIS Doc. ID 834447); Domestic Industry Product Stipulation (EDIS Doc. ID 834747); and Importation Stipulation (EDIS Doc. ID 839235).

GoPro's complaint asserted infringement of 74 claims across the six asserted patents. *See* Complaint. GoPro moved twice for partial termination of the investigation by withdrawal of certain claims, which motions were granted. *See* Order No. 9 (Initial Determination) (EDIS Doc. ID 833647), *unreviewed by* Comm'n Notice (Oct. 25, 2024) (EDIS Doc. ID 835699); Order No. 24 (Initial Determination) (EDIS Doc. ID '840928), *unreviewed by* Comm'n Notice (Jan. 31, 2025) (EDIS Doc. ID 842351). GoPro continues to assert claim 1 of the '413 patent, claims 1–2 and 5–6 of the '052 patent, claims 1 and 5 of the '894 patent, claims 13 and 14 of the '840 patent, claims 4 and 8 of the '832 patent, and the claim of the D'435 patent. Order No. 24 at 1.

The parties filed prehearing briefs. GoPro Prehearing Br. (EDIS Doc. ID 839280) and Insta360 Prehearing Br. (EDIS Doc. ID 839275). I held a technology tutorial (EDIS Doc. ID 841039) and prehearing conference (EDIS Doc. ID 841038), and the evidentiary hearing was

[redacted]

held from January 13–17, 2025.[1] The parties filed post-hearing briefs. GoPro Br. (EDIS Doc. ID 842385); Insta360 Br. (EDIS Doc. ID 842398); GoPro Reply (EDIS Doc. ID 843665); and Insta360 Reply (EDIS Doc. ID 843669).

B. The Parties

1. Complainant

GoPro, Inc. is a Delaware corporation with its principal place of business in San Mateo, California. Complaint at ¶ 12. GoPro designs, develops, and sells handheld action cameras. *See id.* at ¶ 13.

2. Respondents

Arashi Vision Inc. d/b/a Insta360 is a Chinese corporation with its principal place of business in Shenzhen, China. Insta360 Br. at 7. Arashi Vision (U.S.) LLC d/b/a Insta360 is a Delaware company and a subsidiary of Arashi Vision Inc. *Id.* Insta360 designs, develops, and sells handheld action cameras. Response to Complaint at ¶¶14–17 (EDIS Doc. ID 823751) and Tr. at 50:17–51:3.

C. The Asserted Patents and Claims

The asserted patents are generally directed to digital image and video correction techniques, as well as the exterior ornamental design of a handheld camera.

---

[1] The public transcript of the corrected evidentiary hearing is available as EDIS Doc. IDs 843376 (day 1), 843379 (day 2), 843383 (day 3), 843385 (day 4), and 843387 (day 5). The confidential transcript is available as EDIS Doc. IDs 843375 (day 1), 843378 (day 2), 843381 (day 3), 843384 (day 4), and 843386 (day 5). The transcript is collectively referred to as "Tr."

[redacted]

1. U.S. Patent No. 10,574,894

The ’894 patent,[2] JX-0005, is titled “Systems and Methods for Stabilizing Videos” and relates to generating a capture trajectory, which reflects virtual positions of a camera from which video content may be generated. The capture trajectory is based on an observed trajectory of the camera and, in particular, on a subsequent (later) portion of the observed trajectory. ’894 patent at Abstract. Because cameras in motion may “cause the video to appear jerky/shaky,” the patent explains that “[t]he [generated] capture trajectory may have smoother changes in the positions of the image capture device than the [measured] observed trajectory” so that video stabilization based on the capture trajectory will appear less shaky. *Id.* at 1:11–14 and 2:42–44. GoPro asserts claims 1 and 5, which recite:

> 1. 1[pre] A system that stabilizes videos, the system comprising:
>
> 1[a] a housing of an image capture device;
>
> 1[b] an optical element carried by the housing and configured to guide light within an optical field of view to an image sensor, the optical field of view being greater than a capture field of view for generating video content;
>
> 1[c] the image sensor carried by the housing and configured to generate an image output signal based on light that becomes incident thereon during a capture duration, the image output signal conveying image information that defines images with the optical field of view;
>
> 1[d] a position sensor carried by the housing and configured to generate a position output signal based on positions of the housing during the capture duration, the position output signal conveying position information that characterizes the positions of the housing at different moments within the capture duration, the positions of the housing including rotational positions of the housing; and
>
> 1[e] one or more physical processors configured by machine-readable instructions to:

---

[2] Because the application that issued as the 894 patent has an effective filing date after March 16, 2013, it is subject to the AIA version of the statute. Leahy-Smith America Invents Act, Pub. L. No. 112-29, sec. 4(c), 125 Stat. 284, 296 (2011).

[redacted]

1[f] determine an observed trajectory of the housing during the capture duration based on the position information, the observed trajectory reflecting the positions of the housing at the different moments within the capture duration, the observed trajectory including a first portion corresponding to a first moment within the capture duration and a second portion corresponding to a second moment subsequent to the first moment within the capture duration;

1[g(i)] determine a capture trajectory of the housing based on a look ahead of the observed trajectory, the capture trajectory reflecting actual and/or virtual positions of the housing from which orientations of the capture field of view with respect to the optical field of view of the images are determined,

1[g(ii)] the look ahead of the observed trajectory including use of a subsequent portion of the observed trajectory to determine a preceding portion of the capture trajectory such that a portion of the capture trajectory corresponding to the first portion of the observed trajectory, which corresponds to the first moment within the capture duration, is determined based on the second portion of the observed trajectory, which corresponds to the second moment within the capture duration, the capture trajectory having smoother changes than the observed trajectory,

1[g(iii)] wherein the capture trajectory is determined to include a path that minimizes a combination of rotational velocity and rotational acceleration of the housing, the combination of the rotational velocity and the rotational acceleration of the housing weighing the rotational velocity and the rotational acceleration equally or differently;

1[h] determine the orientations of the capture field of view for the images with respect to the optical field of view of the images based on the capture trajectory of the housing; and

1[i] generate the video content based on a punch-out of visual content of the images within the capture field of view, wherein use of the visual content of the images within the capture field of view to generate the video content provides stabilization that creates a more stable view than use of entire visual content of the images.

. . . .

5. The system of claim 1, wherein the position sensor includes a gyroscope, an accelerometer, and/or an inertial measurement unit, and the position information is determined independent of the image information.

[redacted]

’894 patent at claims 1, 5 and GoPro Br. at 39-40.[3]

2. U.S. Patent No. 10,958,840

The ’840 patent,[4] JX-0007, is titled “Systems and Methods for Stabilizing Videos.” Though not related through a common application, the ’894 and ’840 patents contain overlapping, though not identical disclosures. The ’840 patent discloses that the trajectory of the image capture device is smoothed based on a look-ahead of the trajectory and that a “punchout” of the visual content is determined based on the smoothed trajectory. The punchout is used to generate stabilized content.’840 patent at Abstract. The patent states that “[t]he smoothed trajectory may have smoother changes in the rotational positions of the image capture device than the trajectory. A viewing window for the visual content may be determined based on the smoothed trajectory of the housing and/or other information.” *Id*. at 1:38-42. GoPro asserts claims 13 and 14, which recite (along with intervening claim 1):

> 1. 1[pre] An image capture system that stabilizes videos, the image capture system comprising:
>
> 1[a] a housing of an image capture device;
>
> 1[b] an optical element carried by the housing and configured to guide light within a field of view to an image sensor;
>
> 1[c] the image sensor carried by the housing and configured to generate a visual output signal conveying visual information based on light that becomes incident thereon during a capture duration, the visual information defining visual content having the field of view, the field of view being larger than a size of a viewing window for generating stabilized visual content;

---

[3] As with the asserted claims listed below, the claim element lettering has been added.

[4] Because the application that issued as the ’840 patent has an effective filing date after March 16, 2013, it is subject to the AIA version of the statute.

[redacted]

1[d] a position sensor carried by the housing and configured to generate a position output signal based on positions of the housing during the capture duration, the position output signal conveying position information that characterizes rotational positions of the housing at different moments within the capture duration; and

1[e] one or more physical processors configured by machine-readable instructions to:

1[f] determine a trajectory of the housing during the capture duration based on the position information, the trajectory reflecting the rotational positions of the housing at the different moments within the capture duration, the trajectory including a first portion corresponding to a first moment within the capture duration and a second portion corresponding to a second moment subsequent to the first moment within the capture duration;

1[g(i)] determine a smoothed trajectory of the housing based on a look-ahead of the trajectory and one or more of a weight-balance parameter, a low-light high-pass parameter, and/or a stickiness parameter,

1[g(ii)] the look-ahead of the trajectory including use of a subsequent portion of the trajectory to determine a preceding portion of the smoothed trajectory such that a portion of the smoothed trajectory corresponding to the first portion of the trajectory is determined based on the second portion of the trajectory, the smoothed trajectory having smoother changes in the rotational positions of the housing than the trajectory,

1[g(iii)] wherein the determination of the smoothed trajectory based on the look-ahead of the trajectory includes use of a temporal horizon of motion experienced by the image capture device, the temporal horizon enabling approximation of intentional motion of the image capture device while causing a delay in the determination of the smoothed trajectory;

1[h] determine placement of the viewing window for the visual content with respect to the field of view of the visual content based on the smoothed trajectory of the housing, the viewing window defining one or more extents of the visual content to be included within a punchout of the visual content; and

1[i] generate the stabilized visual content of a video based on the viewing window, the stabilized visual content including the punchout of the one or more extents of the visual content within the viewing window, wherein inclusion in the stabilized visual content of the one or more extents of the visual content within the viewing window effectuates stabilization of the visual content via selective cropping.

. . . .

[redacted]

> 13. The image capture system of claim 1, wherein the weight-balance parameter controls types of motion that are minimized in smoothed trajectory generation, the types of motion including rotational velocity and rotational acceleration.
>
> 14. The image capture system of claim 1, wherein the low-light high-pass parameter controls amount or strength of smoothing performed in smoothed trajectory generation and an extent of motion blur compensation applied in determination of the smoothed trajectory.

'840 patent at claims 1, 13, 14 and GoPro Br. at 69–71.

3. U.S. Patent No. 11,336,832

The '832 patent,[5] JX-0009, is titled "Systems and Methods for Horizon Leveling Videos" and generally relates to "a horizon-level view of [a] video" generated by providing a punchout of the video that compensates for rotation of the camera during recording. '832 patent at Abstract. The patent discloses that "the size of the viewing window may change as the function of progress length to simulate changes in zoom for the visual content." *Id.* at 3:9-12 and Figs. 5A and 5B. GoPro asserts claims 4 and 8, which recite (with intervening claims 1, 3, and 7):

> 1. 1[pre] A system for horizon leveling videos, the system comprising:
>
> 1[a] one or more physical processors configured by machine-readable instructions to:
>
> 1[b] obtain video information defining a video, the video including video content captured by an image capture device during a capture duration, the video content having a progress length, the video content including visual content captured at different moments within the capture duration, the visual content viewable as a function of progress through the progress length, the visual content having a field of view;
>
> 1[c] obtain rotational position information for the video, the rotational position information characterizing rotational positions of the image capture device as a function of progress through the capture duration;

---

[5] Because the application that issued as the '832 patent has an effective filing date after March 16, 2013, it is subject to the AIA version of the statute.

[redacted]

1[d] determine a viewing window for the visual content as a function of progress through the progress length based on the rotational positions of the image capture device as the function of progress through the capture duration, the viewing window defining extents of the visual content to be included within horizon-leveled visual content as the function of progress through the progress length, wherein determination of the viewing window includes determination of a placement of the viewing window within the field of view of the visual content as the function of progress through the progress length based on the rotational positions of the image capture device as the function of progress through the capture duration; and

1[e] generate the horizon-leveled visual content based on the viewing window, the horizon-leveled visual content including a punchout of the extents of the visual content defined by the viewing window, wherein inclusion of the extents of the visual content defined by the viewing window within the horizon-leveled visual content effectuates horizon leveling of the visual content.

. . . .

3. The system of claim 1, wherein the visual content includes a distortion such that a straight line within a scene depicted within the visual content appears as a curved line, the distortion of the visual content reducing impact of an off-axis horizon depicted within the horizon-leveled visual content.

4. The system of claim 3, wherein the distortion includes a barrel distortion or a pincushion distortion.

. . . .

7. The system of claim 1, wherein the determination of the viewing window further includes determination of a size of the viewing window as the function of progress through the progress length based on the rotational positions of the image capture device as the function of progress through the capture duration.

8. The system of claim 7, wherein the size of the viewing window changes as the function of progress through the progress length to simulate changes in zoom for the visual content.

’832 patent at claims 1, 3, 4, 7, 8 and GoPro Br. at 102–103.

[redacted]

4. U.S. Patent No. 10,529,052

The ’052 patent,[6] JX-0003, is titled “Virtual Lens Simulation for Video and Photo Cropping” and relates generally to simulating a lens distortion effect when applying a crop or zoom effect to an input video. ’052 patent at Abstract. The patent teaches that it is undesirable when the cropped portion of the input video has “a different overall distortion effect than the original image,” with that negative effect heightened “when combining cropped sub-frames corresponding to different regions of a video (*e.g.*, to track movement of a subject of interest), or combining cropped sub-frames with uncropped frames (e.g., to produce in zoom effect).” *Id.* at 1:30–37. GoPro asserts claims 1, 2, 5, and 6, which recite (with intervening claim 3):

> 1. 1[pre] A system that simulates image distortion of a virtual lens in a video, the system comprising:
>
> 1[a] one or more processors; and
>
> 1[b] a non-transitory computer-readable storage medium storing instructions that when executed cause the one or more processors to perform steps including:
>
> 1[c(i)] accessing input images, the input images including fields of view of a scene captured through a lens of a camera,
>
> 1[c(ii)] the input images depicting the scene with an input lens distortion centered in the fields of view;
>
> 1[d] selecting sub-frames representing portions of the input images, the sub-frames including reduced fields of view of the scene smaller than the fields of view of the input images,
>
> 1[e] the sub-frames including different lens distortion effects as a function of the input lens distortion present in the input images, different positions of areas of the input images included within the reduced fields of view, and a size of the areas of the input images included within the reduced fields of view; and
>
> 1[f] generating output images based on a desired lens distortion and the different lens distortion effects in the sub-frames, the desired lens distortion and the input

[6] Because the application that issued as the ’052 patent has an effective filing date after March 16, 2013, it is subject to the AIA version of the statute.

[redacted]

> lens distortion exhibiting consistent lens characteristics,
>
> 1[g] wherein the output images include the sub-frames remapped from the input lens distortion centered in the fields of view of the input images to the desired lens distortion centered in the reduced fields of view to transform the different lens distortion effects present in the sub-frames to the desired lens distortion such that portions of the scene depicted in the sub-frames appear to have been captured using the reduced fields of view.
>
> 2. The system of claim 1, wherein image stabilization is applied to the input images.
>
> 3. The system of claim 1, wherein the sub-frames are selected based on metadata associated with the input images.
>
> . . . .
>
> 5. The system of claim 3, wherein the metadata indicates orientation of the camera that captured the input images.
>
> 6. The system of claim 1, wherein the output images are combined as video frames of an output video.

’052 patent at claims 1, 2, 3, 5, 6 and GoPro Br. at 148–149.

5. U.S. Patent No. 10,015,413

The ’413 patent,[7] JX-0001, is titled “Conversion Between Aspect Ratios in Camera” and relates generally to applying transformations to input images to match different aspect ratios. ’413 patent at Abstract. The patent teaches non-linear warping or distortion of an image to overcome problems with traditional linear compression/stretching and cropping/padding techniques. *Id.* at 1:16-25. GoPro asserts claim 1:

> 1. 1[pre] An image capture apparatus, comprising:
>
> 1[a] an image sensor configured to capture an input image having a source aspect ratio, the input image including pixels located at input positions defined along a first axis and a second axis, the first axis perpendicular to the second axis;

---

[7] Because the application that issued as the ’413 patent has an effective filing date after March 16, 2013, it is subject to the AIA version of the statute.

[redacted]

1[b] a display coupled to one or more physical processors; and

1[c] the one or more physical processors configured by machine-readable instructions to:

1[d] obtain the input image;

1[e] determine a portion within the input image, the portion including a subset of the pixels; and

1[f] apply a transformation to the input image to generate an output image, the output image having a target aspect ratio different than the source aspect ratio, the output image including the pixels located at output positions defined along the first axis and the second axis, wherein:

1[g] the transformation non-uniformly shifts the pixels from the input positions to the output positions based on (1) the input positions along the first axis, and (2) the input positions along the second axis; and

1[h] the transformation non-uniformly shifts the pixels such that differences between the input positions and the output positions of the subset of the pixels within the portion are less than differences between the input positions and the output positions of others of the pixels; and

1[i] present the output image on the display.

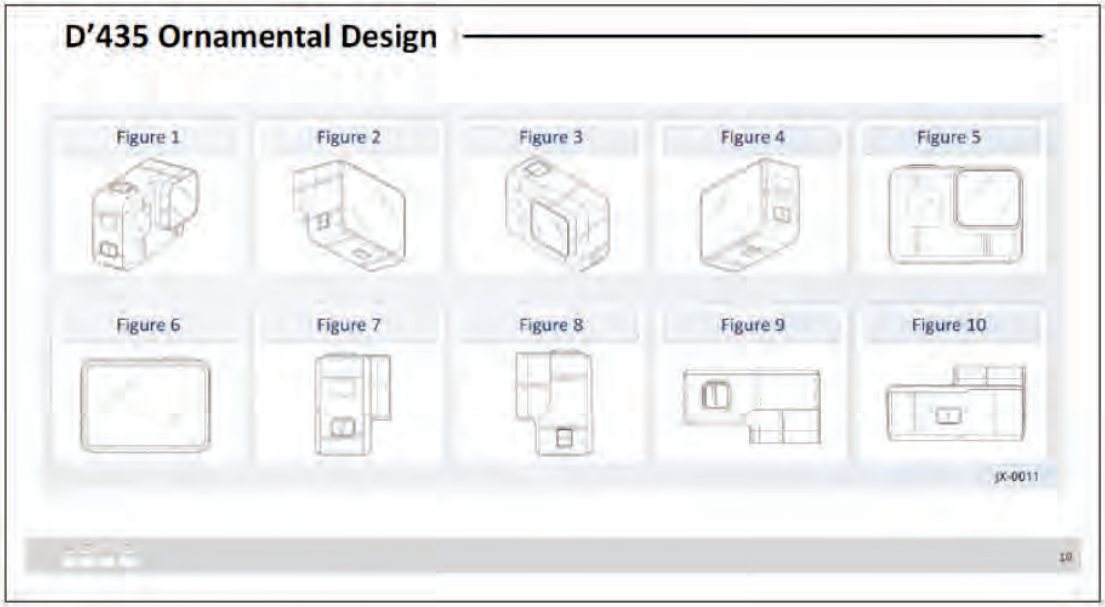
’413 patent at claim 1 and GoPro Br. at 179–180.

6. U.S. Patent No. D789,435

The D’435 patent,[8] JX-0011, is titled “Camera” and claims an ornamental design for a camera. The claim of the D’435 patent is shown in the below figures:

[8] Because the application that issued as the D’435 patent has an effective filing date after March 16, 2013, it is subject to the AIA version of the statute.

[redacted]



D'435 patent; GoPro Br. at 3.

D. The Accused Products

GoPro groups the accused products as follows:

Patent	Accused Product Models
'894 patent '840 patent '052 patent	One X, One R, One R 1-inch, One X2, One RS, One RS 1-inch 360, X3, X4, Go 3, Go3S, Ace, Ace Pro, and Ace Pro 2, and their redesigns "Also accused are the aforementioned Insta360 camera systems used in connection with each of the Insta360 device control applications for (1) Android and iOS, (2) the Studio desktop editing software for Windows and MacOS, and (3) the redesigns of the Android, iOS, Mac, and Windows."
'832 patent '413 patent	One X, One R, One R 1-inch, One X2, One RS, One RS 1-inch 360, X3, X4, Go 3, Go3S, Ace, Ace Pro, and Ace Pro 2, "and their redesigns"
D'435 patent	Ace, Ace Pro, and Ace Pro 2

GoPro Br. at 9–10. Insta360 does not dispute GoPro's identification of accused products. *See*

[redacted]

Insta360 Br. at 7–8.

The parties agree that for the five asserted utility patents, the X4 is representative of all accused cameras. GoPro Br. at 46 (’894 patent), 78 (’840 patent), 116 (’832 patent), 155 (’052 patent), 184 (’413 patent) and Insta360 Br. at 7–8. This is reflected in the parties’ stipulation on representative accused products. Accused Product Stipulation at ¶¶ 4(a) and (b).[9] The representative X4 product is shown below:

RDX-0002C.7. For the D’435 patent, the parties do not rely on a representative product.

For the ’894,’840, and ’052 patents, in which off-camera software systems are accused in combination with the accused cameras, GoPro contends the Mac Editing system is representative, which is also reflected in the parties’ representative product stipulation. GoPro Br. at 46 (’894 patent), 78 (’840 patent), and 155 (’052 patent); and Representative Product Stipulation at ¶4(c). For the ’052 patent, GoPro refers to Insta360 Studio. *See, e.g.*, GoPro Br. at 160, 161, 164, and 166. The parties’ representative product stipulation states that “[t]he Mac version of the Insta360 device control application” is representative with respect to the ’894,’840, and ’052 patens. *See*

[9] One exception involves the cameras’ lenses, which relates to the ’052 patent. *See* Accused Product Stipulation at ¶ 4(b) and Insta360 Br. at 56.

[redacted]

Representative Product Stipulation at ¶4(c).

Insta360 identifies redesign products for the '894, '840, '832, and D'435 patents. Insta360 Br. at 3–5. Insta360 contends, and GoPro does not dispute, that its redesigns are subject to adjudication in this investigation under the Commission's analysis in *Certain Human Milk Oligosaccharides and Methods of Producing the Same*, Inv. No. 337-TA-1120, Comm'n Op. at 18 (June 8, 2020) (EDIS Doc. ID 712205). *See* Insta360 Br. at 271–274 (arguing the redesigns are within the noticed scope of the investigation, have been imported, are sufficiently fixed in design, and have been the subject of sufficient discovery during the fact discovery period) and GoPro Reply at 8, 31, 40–41, and 63 (not disputing redesign adjudication for the D'435 patent, '894 patent, '840 patent, and '832 patent, respectively). The redesigns will be considered for infringement, as detailed below.

E. The Domestic Industry Products

GoPro groups the domestic industry products as follows:

Patent	Practicing Product Models
'894 patent '840 patent	HERO7 Black; MAX; HERO8 Black; HERO9 Black; HERO10 Black; HERO11 Black; HERO11 Black Mini; HERO12 Black
'832 patent	HERO9 Black, HERO10 Black, HERO11 Black, HERO11 Black Mini, HERO12 Black
'052 patent	HERO7 Black, MAX, HERO8 Black, HERO9 Black, HERO10 Black, HERO11 Black, HERO11 Black Mini, HERO12 Black
'413 patent	HERO5 Black, HERO6 Black, HERO7 Black/Silver/White, MAX, HERO8 Black, HERO9 Black, HERO10 Black, HERO11 Black, HERO11 Black Mini, HERO12 Black
D'435 patent	HERO5 Black, HERO6 Black, HERO7 Black/Silver/White, HERO8 Black, HERO9 Black, HERO10 Black, HERO11 Black, and HERO12 Black

GoPro Br. at 10-11. Insta360 does not dispute GoPro's identification of domestic industry

[redacted]

products. *See generally* Insta360 Br.; Insta360 Reply.

The parties agree that for the ’894, ’840, ’413, and ’052 patents, the Hero7 Black is representative of all domestic industry products. GoPro Br. at 44 (’894 patent), 76 (’840 patent), 153 (’052 patent), 182 (’413 patent); Insta360 Br. at 7–8; and Domestic Industry Product Stipulation at ¶¶ 4(a)–(b) and (d). For the ’832 patent, the parties agree the Hero9 Black is representative. GoPro Br. at 112; Insta360 Br. at 8; and Domestic Industry Product Stipulation at ¶ 4(e). For the D’435 patent, the parties agree the Hero5 Black is representative of the HERO5 Black, HERO6 Black, and HERO7 (Black, Silver, White) and that the Hero8 Black is representative of the HERO8 Black, HERO9 Black, HERO10 Black, HERO11 Black, and HERO12 Black. GoPro Br. at 15; Insta360 Br. at 8; and Domestic Industry Product Stipulation at ¶ 4(f). The Hero5 and Hero8 products are shown below:

CDX-0005.10.

II. STATUTORY AUTHORITY

Congress directs that “[t]he Commission shall investigate any alleged violation of this section on complaint under oath or upon its initiative.” 19 U.S.C. § 1337(b)(1). Section 337(a)(1)(A) declares unlawful “[t]he importation into the United States, the sale for importation, or the sale within the United States after importation by the owner, importer, or

[redacted]

consignee, of articles that – (i) infringe a valid and enforceable United States patent . . .." 19 U.S.C. § 1337(a)(1)(B).

The Commission has "statutory authority to investigate an alleged violation by the named respondents pursuant to section 337 [when] such respondents have allegedly imported, sold for importation, or sold after importation articles that are alleged to infringe a U.S. patent." *Certain Liquid Transfer Devices with an Integral Vial Adapter*, Inv. No. 337-TA-1362, Comm'n Op. at 7 (Jul. 26, 2024) (EDIS Doc. ID 827305). The Commission has authority over "accused products based on their alleged importation, sale for importation, or sale after importation into the United States." *Id*. at 8. "Thus, for purposes of establishing the Commission's authority to investigate an alleged violation under section 337(a)(1)(B), a complainant must allege that a violation of section 337 has occurred, *i.e.*, that a respondent imported, sold for importation, or sold after importation an article that infringes a claim of a U.S. patent and that a domestic industry exists or is in the process of being established, among other statutory requirements." *Id*. at 9.

GoPro alleges a violation of section 337 by the importation, sale for importation, or sale after importation of Insta360's accused products that are alleged to infringe the asserted claims of the asserted patents. GoPro also asserts that a domestic industry exists for certain asserted claims of the asserted patents. *See* GoPro Br. I therefore conclude that the Commission has statutory authority with respect to this investigation.

III. OWNERSHIP RIGHTS IN THE ASSERTED PATENTS

"To bring a complaint before the International Trade Commission, at least one complainant must be the owner or exclusive licensee of the subject intellectual property." *Certain Active Matrix Organic Light-Emitting Diode Display Panels and Modules for Mobile Devices, and Components*

[redacted]

Thereof, Inv. No. 337-TA-1351, Comm'n Op. at 14 (May 15, 2024) (EDIS Doc. ID 821542), *quoting Roku, Inc. v. Int'l Trade Comm'n*, 90 F.4th 1367, 1372 (Fed. Cir. 2024) (cleaned up).

The evidence demonstrates that GoPro is the owner by assignment of the asserted patents. CX-1548–1553 (recorded assignment documents). Recording "creates a presumption of validity as to the assignment and places the burden to rebut such a showing on one challenging the assignment." *SiRF Tech., Inc. v. Int'l Trade Comm'n*, 601 F.3d 1319, 1328 (Fed. Cir. 2010). Insta360 does not dispute that GoPro is the owner by assignment of the asserted patents. *See generally* Insta360 Br. and Insta360 Reply.

Because the evidence demonstrates that GoPro is the owner by assignment of the asserted patents, I conclude that GoPro was entitled to file its complaint in this investigation.

IV. IMPORTATION

To prove a violation of section 337, the complainant must show that the respondent engaged in "[t]he importation into the United States, the sale for importation, or the sale within the United States after importation by the owner, importer, or consignee" of products accused of infringement. 19 U.S.C. §§ 1337(a)(1)(A)–(B). Insta360 stipulated that its accused products have been imported into the United States and does not dispute that the importation requirement of section 337 has been satisfied with respect to those products. Importation Stipulation at ¶ 2[10] and Insta360 Br. at 8. I therefore find that the importation requirement of section 337 has been satisfied with respect to the accused Insta360 products.

[10] The parties' Importation Stipulation states that "the Accused Products referenced herein do not include redesigned versions of the products." *Id*. at ¶ 2, n.1. GoPro has not disputed importation of the redesign products.

[redacted]

V. LEVEL OF SKILL

One of ordinary skill in the art is a hypothetical person who is presumed to be aware of all pertinent prior art. *Custom Accessories, Inc. v. Jeffrey-Allan Industries, Inc.*, 807 F.2d 955, 962 (Fed. Cir. 1992). Determining the appropriate level of skill for this person involves considering the types of problems encountered in the art, prior art solutions to those problems, rapidity with which innovations are made, sophistication of the technology at issue, the educational level of active workers in the field, and the level of education of the inventors themselves. *Daiichi Sankyo Co. v. Apotex, Inc.*, 501 F.3d 1254, 1256 (Fed. Cir. 2007).

GoPro contends that one of skill at the time of the inventions of the asserted utility patents:

> would have a bachelor's degree in engineering or computer science, or equivalent field, and two years of experience working on image or video processing, or digital cameras. Alternatively, [one of skill] would have four years of experience working on image or video processing, or digital cameras. An advanced graduate degree in the disciplines cited above may make up [for less] work experience.

GoPro Br. at 11. Insta360 agrees. Insta360 Br. at 8.

For the D'435 patent, Insta360 states that the level of skill is not in dispute and that "[a]n ordinary designer would have a bachelor's degree in industrial design or an equivalent field, or two years of experience designing cameras or camera housings." Insta360 Br. at 8–9. GoPro does not address the level of skill for the D'435 patent. *See* GoPro Br. at 11.

Because there is no dispute as to the levels of ordinary skill for the asserted patents, I adopt the above definitions.

VI. THE '894 PATENT

The '894 patent is titled "Systems and Methods for Stabilizing Videos" and relates generally to stabilizing video footage through electronic, as opposed to mechanical or optical, means. *See* '894 patent at Abstract. The patent warns that video captured by a camera device while

[redacted]

in motion "may cause the video to appear jerky/shaky." *Id.* at 1:11–14. To ameliorate this, the patent teaches using a position sensor within the camera including "one or more of a gyroscope, an accelerometer, and/or an inertial measurement unit" to supply position information corresponding to captured image frame data. *See id.* at 2:5–14. The measured or tracked position information, which may be jerky/shaky, is referred to as the "observed trajectory" of the camera or its housing. *Id.* at 2:24–35.

The patent discloses creating a modified version of the observed trajectory, called the "capture trajectory." *Id*. at 2:36–44. The capture trajectory is created to be smoother than the observed trajectory and more accurately reflect what the camera operator actually intended. *Id.* at 8:29–35. To achieve this, the patent teaches applying a low-pass filter to the observed trajectory and then a "lookahead" technique, which uses future observed positions to generate positions for the capture trajectory. The patent explains that the capture trajectory may have smoother changes in the positions of the camera housing than the observed trajectory. *Id.* at 2:36–44.

Fig. 4 illustrates an example of an observed trajectory:

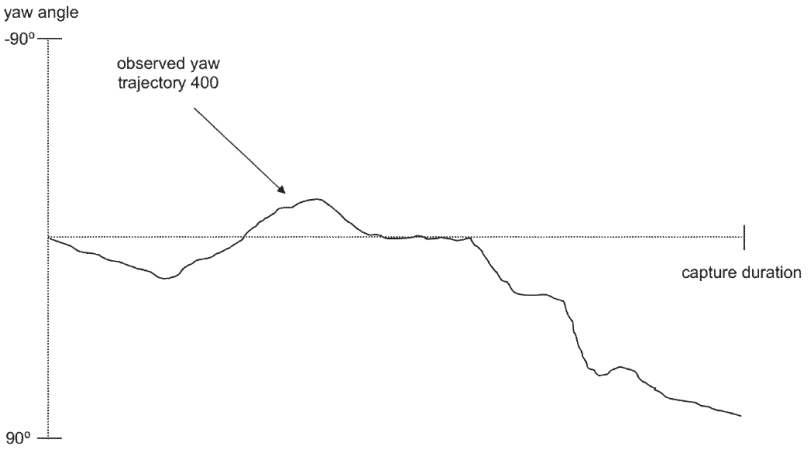


FIG. 4

[redacted]

Id. at 3:25. The observed trajectory may include an observed yaw trajectory 400 of the image capture device. *Id*. at 7:38–40. The yaw trajectory shows yaw angle positions over time and may show various yaw rotations that are shaky or appear to include unintended camera motion. *Id*. at 7:41–67.

Fig. 5B shows that by applying a low-pass filter to the observed yaw trajectory 400, a smoothed yaw trajectory 516 may be determined:

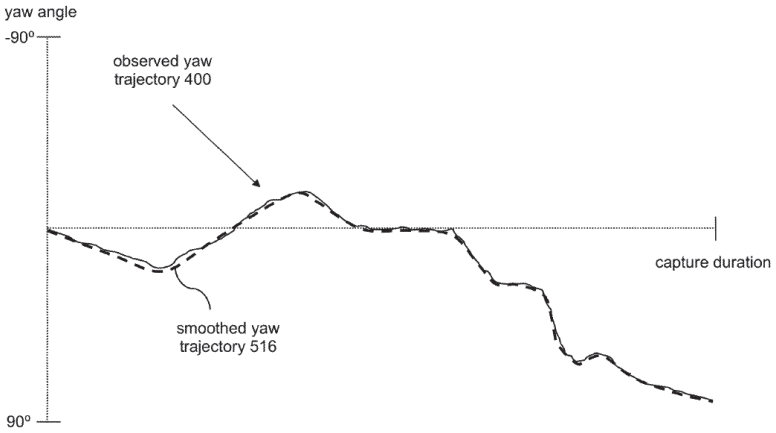


FIG. 5B

Id. at 8:60–62. Fig. 5C shows capture yaw trajectory 532, which is determined based on subsequent portion of the observed trajectory such that the capture yaw trajectory 532 "preserves a user's intended motion for the image capture device," as shown below:

[redacted]

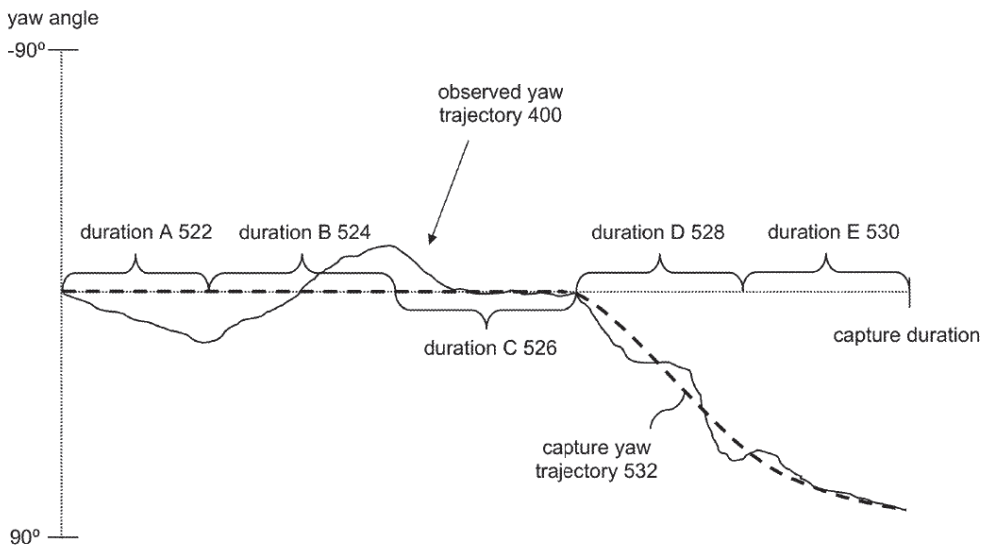


FIG. 5C

Id. at Fig. 5C and 10:26–60. The final capture trajectory is used to determine orientations for new viewing windows within each video frame, and those viewing windows are selected and combined to form stabilized video content, as shown below:

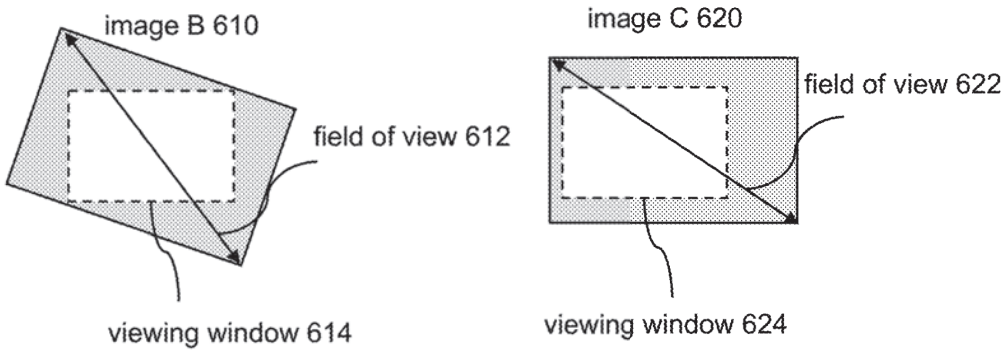


FIG. 6B

Id. at Fig. 6B; *see id.* at 3:65–4:4. The patent states that the capture trajectory may be "based on minimization of a rotational velocity of the housing and a rotational acceleration of the housing while respecting a set of constraints. The set of constraints may include a margin constraint, a trajectory constraint, a target constraint, and/or other constraints." *Id.* at 2:50–55.

[redacted]

A. Claim Construction

1. Legal Standard

It is a bedrock principle of patent law that the claims of a patent define the invention to which the patentee is entitled the right to exclude. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312 (Fed. Cir. 2005). "[T]here is no magic formula or catechism for conducting claim construction." *Id.* at 1324. Instead, weight may be attached to appropriate sources "in light of the statutes and policies that inform patent law." *Id.*

The terms of a claim are generally given their ordinary and customary meaning, which is the meaning that the term would have to one of skill in the art at the time of the invention. *Id.* at 1312–13. The ordinary meaning of a claim term is its meaning to one of skill in the art after reading the entire patent. *Id.* at 1321. The patent specification "is always highly relevant to the claim construction analysis. Usually, it is dispositive; it is the single best guide to the meaning of a disputed term." *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996).

In addition to the specification, a court "should also consider the patent's prosecution history, if it is in evidence." *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 980 (Fed. Cir. 1995), *aff'd*, 517 U.S. 370 (1996). The prosecution history, which is intrinsic evidence, is "the complete record of the proceedings before the PTO and includes the prior art cited during the examination of the patent." *Phillips*, 415 F.3d at 1317. "[T]he prosecution history can often inform the meaning of the claim language by demonstrating how the inventor understood the invention and whether the inventor limited the invention in the course of prosecution, making the claim scope narrower than it would otherwise be." *Id*. "[B]ecause the prosecution history represents an ongoing negotiation between the PTO and the applicant, rather than the final product of that negotiation, it

[redacted]

often lacks the clarity of the specification and thus is less useful for claim construction purposes." *Id.*

In some situations, a "court will need to look beyond the patent's intrinsic evidence and to consult extrinsic evidence in order to understand, for example, the background science or the meaning of a term in the relevant art during the relevant time period." *Teva Pharmaceuticals USA, Inc. v. Sandoz, Inc.*, 574 U.S. 318, 331 (2015). Extrinsic evidence is "all evidence external to the patent and prosecution history, including expert and inventor testimony, dictionaries, and learned treatises." *Markman*, 52 F.3d at 980.

While expert testimony can be useful "to ensure that the court's understanding of the technical aspects of the patent is consistent with that of a person of skill in the art," such testimony is "generated at the time of and for the purpose of litigation and thus can suffer from bias that is not present in intrinsic evidence." *Phillips*, 415 F.3d at 1318. Further, while extrinsic evidence may be useful, it is less reliable than intrinsic evidence, and its consideration "is unlikely to result in a reliable interpretation of patent claim scope unless considered in the context of the intrinsic evidence." *Id*. at 1319. Where the intrinsic record unambiguously describes the scope of the patented invention, reliance on extrinsic evidence is improper. *See Pitney Bowes, Inc. v. Hewlett-Packard Co.*, 182 F.3d 1298, 1308 (Fed. Cir. 1999), *citing Vitronics*, 90 F.3d at 1583.

2. Disputed Term

The parties dispute the meaning of "the capture trajectory is determined to include a path that minimizes a combination of rotational velocity and rotational acceleration of the housing," in claim 1. GoPro Br. at 42–44; GoPro Reply at 14–16; Insta360 Br. at 90–92; and Insta360 Reply at 17–18. GoPro contends it means "minimized, while respecting any constraints." GoPro Br. at 43, *citing* CDX-0002.21. Insta360 contends the word "minimizes" is indefinite, but if not, the phrase

[redacted]

means "the smoothed path is generated by finding a path by performing minimization calculation on an objective function that includes one term expressing angular velocity and another term expressing angular acceleration." Insta360 Br. at 90.

a) Indefiniteness

Patents are presumed valid, and a party asserting invalidity must prove it by clear and convincing evidence. *See* 35 U.S.C. § 282; *Spansion, Inc. v. Int'l Trade Comm'n*, 629 F.3d 1331, 1344 (Fed. Cir. 2010). "A patent is invalid for indefiniteness if its claims, read in light of the specification delineating the patent, and the prosecution history, fail to inform, with reasonable certainty, those skilled in the art about the scope of the invention." *Certain Bio-Layer Interferometers and Components* Thereof, Inv. No. 337-TA-1344, Comm'n Op. at 11 (Aug. 24, 2023) (EDIS Doc. ID 803150), *quoting Nautilus, Inc. v. Biosig Instruments, Inc.*, 572 U.S. 898, 901 (2014). As the Supreme Court noted in *Nautilus*, language has "inherent limitations." 572 U.S. at 909. The "reasonable certainty" standard exists to strike a "delicate balance," "afford[ing] clear notice of what is claimed," while recognizing those inherent limitations. *Id.*, *quoting Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.*, 535 U.S. 722, 731 (2002). The definiteness requirement thus "mandates clarity, while recognizing that absolute precision is unattainable." *Nautilus*, 572 U.S. at 910. "As long as claim terms satisfy this test, relative terms and words of degree do not render patent claims invalid." *One-E-Way, Inc. v. Int'l Trade Comm'n*, 859 F.3d 1059, 1066–67 (Fed. Cir. 2017) (reversing Commission's determination that claims reciting "virtually free from interference" were indefinite). Thus, "a patentee need not define his invention with mathematical precision in order to comply with the definiteness requirement." *Invitrogen Corp. v. Biocrest Mfg., L.P.*, 424 F.3d 1374, 1384 (Fed. Cir. 2005).

[redacted]

Insta360 has not provided clear and convincing evidence that "minimizes" in the phrase "the capture trajectory is determined to include a path that minimizes a combination of rotational velocity and rotational acceleration of the housing" is indefinite. The intrinsic evidence supports that one of skill would understand that "minimizes" is relative to the observed trajectory. The patent teaches that the observed trajectory may be shaky or jittery. '894 patent at 7:55–65. The capture trajectory reduces or minimizes the shakiness or jitters. *Id*. at 9:10–37. The patent also explains how to do so. The patent explains:

> a smooth path defining yaw angle position, pitch angle position, and/or roll angle position may be generated by finding a path of the image capture device/housing of the image capture device that minimizes a combination of a time derivative, a second time derivative, and/or other time derivative(s) of the yaw angle position, pitch angle position, and/or roll angle position while respecting the set of constraints

Id. at 11:2–15. The evidence thus supports that the patent provides objective guidance to one of skill as to what "minimizes" means, which is, "while respecting a set of constraints." *Sonix Technology Co. Ltd v. Publications, Int'l, Ltd.*, 844 F.3d 1370, 1380 (Fed. Cir. 2017) (claim term "visually negligible" not indefinite because the specification provided "guidance on how to create visually-negligible indicators, and specific examples that provide points of comparison for the result."). In view of the claim language and the specification's teachings of minimization, the evidence supports that one of skill would understand "minimizes" with reasonable certainty. The term is not indefinite.

b) Construction

For the phrase, "the capture trajectory is determined to include a path that minimizes a combination of rotational velocity and rotational acceleration of the housing," the parties propose:

[redacted]

Insta360's Construction	GoPro's Construction
Indefinite If not indefinite: "the smoothed path is generated by finding a path by performing minimization calculation on an objective function that includes one term expressing angular velocity and another term expressing angular acceleration"	"minimizes" means "minimized, while respecting any constraints" Otherwise, plain and ordinary meaning; no construction necessary

Insta360 Br. at 90. GoPro's proposed construction tracks the language of the claim and identifies the meaning of "minimizes" as explained in the specification. GoPro Br. at 43–44. By contrast, Insta360's proposed construction seeks to restrict minimization to the specific example given in the patent. *Id*. This is not particularly disputed by Insta360, which states that the "specification describes that minimization is performed on an objective function (equation 54) and provides no other explanation on how minimization is performed." Insta360 Br. at 91.

The Federal Circuit cautions that a claimed invention ordinarily should not be limited to "preferred embodiments or specific examples in the specification." *Littelfuse, Inc. v. Mersen USA EP Corp.* 29 F.4th 1376, 1381 (Fed. Cir. 2022) (citations and quotation omitted). Nothing in the specification here indicates that the specific function identified there must be used or is essential to the invention. As a result, Insta360's proposed construction is not adopted.

Accordingly, the evidence supports a construction of "[t]he capture trajectory is determined to include a path that minimizes a combination of rotational velocity and rotational acceleration of the housing" as "the capture trajectory is determined to include a path that minimizes through calculation, while respecting a set of constraints, a function that combines rotational velocity and rotational acceleration of the housing."

B. Infringement

In a section 337 investigation, the complainant bears the burden of proving infringement of the asserted claims by a preponderance of the evidence. *See Spansion*, 629 F.3d at 1349. This

[redacted]

standard "requires proving that infringement was more likely than not to have occurred." *Warner-Lambert Co. v. Teva Pharm. USA, Inc.*, 418 F.3d 1326, 1341 n.15 (Fed. Cir. 2005).

"[W]hoever without authority makes, uses, offers to sell, or sells any patented invention, within the United States or imports into the United States any patented invention during the term of the patent therefor, infringes the patent." 35 U.S.C. § 271(a). "Literal infringement requires the patentee to prove that the accused device contains each limitation of the asserted claim(s). If any claim limitation is absent, there is no literal infringement as a matter of law." *Bayer AG v. Elan Pharm. Research Corp.*, 212 F.3d 1241, 1247 (Fed. Cir. 2000). For method claims, "infringement under § 271(a) occurs where all steps of a claimed method are performed by or attributable to a single entity." *Akamai Techs., Inc. v. Limelight Networks, Inc.*, 797 F.3d 1020, 1022 (Fed. Cir. 2015), *citing BMC Res., Inc. v. Paymentech, L.P.*, 498 F.3d 1373, 1379–81 (Fed. Cir. 2007). To "prove direct infringement, a patentee must either point to specific instances of direct infringement or show that the accused device necessarily infringes the patent in suit." *Acco Brands, Inc. v. ABA Locks Mfrs. Co., Ltd.*, 501 F.3d 1301, 1313 (Fed. Cir. 2007). "Direct infringement can be proven by circumstantial evidence," which "must show that at least one person directly infringed an asserted claim." *Toshiba Corp. v. Imation Corp.*, 681 F.3d 1358, 1364 (Fed. Cir. 2012) (citations omitted). Direct infringement may be found where "an alleged infringer designs a product for use in an infringing way and instructs users to use the product in an infringing way." *Id*. at 1365. Literal infringement is a question of fact. *Finisar Corp. v. DirecTV Grp., Inc.*, 523 F.3d 1323, 1332 (Fed. Cir. 2008).

"[A] violation of Section 337 may arise from an act of induced infringement." *Suprema, Inc. v. Int'l Trade Comm'n*, 796 F.3d 1338, 1351 (Fed. Cir. 2015). Section 27l(b) of the Patent Act states: "Whoever actively induces infringement of a patent shall be liable as an infringer."

[redacted]

35 U.S.C. § 27l(b). "To prevail on a claim of induced infringement, in addition to inducement by the defendant, the patentee must also show that the asserted patent was directly infringed." *Epcon Gas Sys., Inc. v. Bauer Compressors, Inc.*, 279 F.3d 1022, 1033 (Fed. Cir. 2002). "Section 27l(b) covers active inducement of infringement, which typically includes acts that intentionally cause, urge, encourage, or aid another to directly infringe a patent." *Arris Group v. British Telecomms. PLC*, 639 F.3d 1368, 1379 n.13 (Fed. Cir. 2011). Liability for inducement requires proof that the party had "knowledge that the induced acts constitute patent infringement." *Global-Tech Appliances, Inc. v. SEB S.A.*, 563 U.S. 754, 766 (2011).

1. Claim 1

GoPro contends the Insta360 accused products infringe claims 1 and 5. GoPro Br. at 46–62 and GoPro Reply at 16–25.

a) Undisputed Elements

GoPro states that Insta360 does not dispute the accused products meet elements 1[pre]–1[d], 1[h], and 1[i]. GoPro Br. at 46–47 and 53–54. Insta360's briefing confirms there is no dispute for these elements, aside from source code issues, addressed below. *See* Insta360 Br. at 92–114 and Insta360 Reply at 18–28. The evidence supports that elements 1[pre]–1[d], 1[h], and 1[i] are met in the accused products. *See* GoPro Br. at 46–47, *citing* Schonfeld Tr. at 241:7–242:17 and 245:17–248:23 and *id.* at 53–54, *citing* Schonfeld Tr. at 239:8–241:6 and 254:20–256:8.

b) Element 1[e]

Element 1[e] recites, "one or more physical processors configured by machine-readable instructions to" perform operations recited in the remainder of the claim. '894 patent at claim 1. GoPro contends that the accused products meet element 1[e] in two ways: first, through a processor within a camera, called an on-camera system and represented by the X4, and second, through a

[redacted]

processor within the external device, called an off-camera system and represented by the Mac application. GoPro Br. at 47–48. Insta360 does not dispute that there is a processor in the X4 camera, or that a processor is required to run the Mac application. Insta360 nevertheless argues that: 1) GoPro has not alleged that the off-camera processor on its own infringes; and 2) GoPro has not argued that a camera and editing application perform video stabilization together. Insta360 Br. at 93 and Insta360 Reply at 18. GoPro generally agrees but states that the accused cameras satisfy all elements and the accused off-camera systems satisfy the "machine-readable instructions" elements (discussed below) under an induced infringement theory. *See* GoPro Reply at 17–18.

With that understanding, the evidence supports that the accused cameras include a processor with machine-readable instructions, and the off-camera systems include a processor with machine-readable instructions. Schonfeld Tr. at 248:24–249:17; JX-0120C ([redacted]); CX-1007C.10 (X4 technical presentation). The evidence supports that element 1[e] is met in the on-camera and off-camera accused products.

a) Element 1[f]

Element 1[f] recites, "determine an observed trajectory of the housing during the capture duration based on the position information, the observed trajectory reflecting the positions of the housing at the different moments within the capture duration, the observed trajectory including a first portion corresponding to a first moment within the capture duration and a second portion corresponding to a second moment subsequent to the first moment within the capture duration." '894 patent at claim 1. GoPro contends that this element is met in the accused cameras because [redacted], and

[redacted]. GoPro Br. at 48. For the off-camera systems, GoPro contends that "the representative Mac editing software similarly processes recorded video to determine the observed trajectory from stored positional data, [redacted] *Id.* GoPro contends that "[t]he sequence of IMU data at a collection of times forms the observed trajectory." *Id.*

Insta360 argues the IMU data cannot form the claimed "observed trajectory" because the IMU data has already been identified as the claimed "position output signal" in element 1[d]. Insta360 Br. at 93–95, *citing Becton, Dickinson & Co. v. Tyco Healthcare Grp., LP*, 616 F.3d 1249, 1254 (Fed. Cir. 2010) and Insta360 Reply at 19. When a claim lists elements as separate components, there is a rebuttable presumption that those elements are distinct components of the patented invention. *Certain Vaporizer Devices, Cartridges Used Therewith, and Components Thereof*, Inv. No. 337-TA-1368, Comm'n Op. at 82 (addressing *Kyocera Senco Industrial Tools Inc. v. Int'l Trade Comm'n*, 22 F.4th 1369 (Fed. Cir. 2022) and *Becton, Dickinson & Co. v. Tyco Healthcare Group, LP*, 616 F.3d 1249 (Fed. Cir. 2020)) (Feb. 19, 2025) (EDIS Doc. ID 843889). The Commission has called that the *Becton* presumption. *Id*. at 84. Insta360 also argues IMU data cannot form the "observed trajectory" because there is an additional, distinct operation within the accused cameras called [redacted] *See* Insta360 Br. at 95. Insta360 also faults Dr. Schonfeld for citing "non-existent" source code exhibits during his testimony. *See* Insta360 Br. at 95; Insta360 Reply at 19; *see generally* Insta360 Br. at 92–93.

The evidence supports that the accused camera systems determine an observed trajectory [redacted]. Schonfeld Tr. at 210:17–214:3 ([redacted]), 231:2–9 ([redacted]); CX-1195C (Sang Dep.) at 45:13–19 (same).

[redacted]

This is the purpose of collecting gyroscope and accelerometer information. CX-0767C.10 (Insta360 technical presentation).

Insta360 does not dispute that the accused cameras [redacted], as GoPro alleges, [redacted]. *See* Insta360 Br. at 93–95; Insta360 Reply at 19; and Goodin Tr. at 1156:6–25. The evidence supports that the resulting sequence of IMU data is a path or trajectory. ’894 patent at 7:14–16 (“The observed trajectory may reflect positions of the image capture device/housing of the image capture device at different moments within the capture duration.”). In the accused products, the time-based sequence of IMU data is therefore distinct from the raw IMU data. As a result, contrary to Insta360’s argument, GoPro does not assert that the same things meet the requirements of elements 1[d] and 1[g]. The *Becton* presumption, therefore, does not apply.

As for source code, and according to GoPro, the citation error appearing on each of Dr. Schonfeld’s slides was to RPX-0063 when it should have been RPX-0061. GoPro Reply at 19. Dr. Schonfeld’s explanation for this mistake during the hearing was credible. Schonfeld Tr. 1471:11–1472:18 (explaining that there was a change in exhibit numbers). Insta360 does not address or dispute this testimony. In this instance, there was a mistake. GoPro’s explanation was credible and Insta360’s argument to the contrary is not persuasive.

The evidence supports that element 1[f] is met in the accused products.

b) Element 1[g(i)]

Element 1[g(i)] recites, “determine a capture trajectory of the housing based on a look ahead of the observed trajectory, the capture trajectory reflecting actual and/or virtual positions of the housing from which orientations of the capture field of view with respect to the optical field of view of the images are determined.” ’894 patent at claim 1. GoPro contends that the accused cameras implement a [redacted]

[redacted] GoPro Br. at 49. For the off-camera systems, GoPro contends "the representative Mac editing system similarly applies a [redacted]" *Id.*

Insta360 argues that Dr. Schonfeld's source code analysis was cursory and therefore deficient. Insta360 Br. at 96, *citing TQ Delta, LLC v. Cisco Sys., Inc.*, 942 F.3d at 1352, 1358 (Fed. Cir. 2019). For the cameras, Insta360 argues the [redacted], such that there is no "look ahead of the observed trajectory," as claimed. Insta360 Br. at 96 and Insta360 Reply at 21. Insta360 argues the off-camera systems apply [redacted]. *Id.* and Insta360 Reply at 19–20.

The evidence supports that the accused cameras meet element 1[g(i)]. There is no dispute that in a process called [redacted] Schonfeld Tr. at 234:24–237:12; CX-0767C.10 (Insta360 presentation); Goodin Tr. at 1158:1–1159:7; and Insta360 Br. at 96. This is shown in Dr. Schonfeld's demonstrative reflecting his source code analysis:

CDX-0002C.100 and Schonfeld Tr. at 235:13–237:14. The evidence supports that the that capture trajectory is "based on a look ahead," as claimed.

[redacted]

There is also no dispute that the accused cameras use a [redacted], as shown below:

[redacted]

CDX-0002C.105 and Schonfeld Tr. at 235:13–236:21. Insta360 does not dispute this operation, making its complaints over typographical errors in Dr. Schonfeld's source code citations immaterial. Insta360 Br. at 96 and Insta360 Reply at 20–21.

Insta360 further argues, and there is no dispute, that the quaternion data [redacted] Goodin Tr. at 1158:1–1159:7 (discussing [redacted]); GoPro Reply at 21, *citing* Schonfeld Tr. at 235:7–237:12 and 1487:4–17. Insta360 argues that because [redacted], it cannot be the claimed "look ahead of the observed trajectory." Insta360 Br. at 96. GoPro contends that the capture trajectory is [redacted]

[redacted]

[redacted], as shown below:

[redacted]

GoPro Reply at 21; CDX-0017C.14; and GoPro Br. at 56 and 58.

GoPro persuasively argues that "'observed trajectory' is a broad concept, that need only be 'based on the position information' and that it 'may reflect positions of the image capture device/housing of the image capture device at different moments within the capture duration.'" GoPro Br. at 57, *citing* '894 patent at 7:3–29. Further, the capture trajectory need only be "based on" the observed trajectory and the evidence supports that even with [redacted], it is. *See* Insta360 Br. at 97 ([redacted] . . . determine[s] the 'observed trajectory.'").

This interpretation of the claim language is supported by the specification, which states, "[t]he observed trajectory component 102 may be configured to determine an observed trajectory of the image capture device/housing of the image capture device during the capture duration based on the position information *and/or other information*." '894 patent at 7:3–8 (emphasis added). Insta360, on the other hand, cites no evidence, intrinsic or extrinsic, to support its narrow reading that "observed trajectory" cannot have undergone any intermediate smoothing in order for the

[redacted]

capture trajectory to be "based on" a look ahead of the observed trajectory. The evidence supports that the accused cameras meet element 1[g(i)]. Insta360 Br. at 96 and Insta360 Reply at 20–21.

The evidence also supports the accused off-camera systems meet element 1[g(i)]. Evidence outlining operation of the off-camera systems states, [redacted]," as shown below:

[redacted]

CX-0983C.1. The evidence thus supports the use of a [redacted], which is consistent with Dr. Schonfeld's unrebutted source code analysis that: the off-camera system "[redacted]" Schonfeld Tr. at 237:16–20. The evidence supports the off-camera sliding window is like the camera sliding window in that it includes and interpolates across at least a previous, current, and future time instance. Thus, it involves a "look ahead," just as in the on-line camera system.

Insta360's argument that [redacted], Insta360 Br. at 96 and Goodin Tr. at 1157:14–24, is true, but irrelevant. The evidence supports that [redacted]. The [redacted]. Schonfeld Tr. at 237:13–17. The off-camera system, on the other hand, has all image data available. Regardless, the "look-ahead" in element 1[g(i)] is met, but not because of [redacted]. It

is met based on [redacted]—a feature shared by the off-camera system.

The evidence supports that element 1[g(i)] is met in the camera and off-camera systems.

c) Element 1[g(ii)]

Element 1[g(ii)] recites, "the look ahead of the observed trajectory including use of a subsequent portion of the observed trajectory to determine a preceding portion of the capture trajectory such that a portion of the capture trajectory corresponding to the first portion of the observed trajectory, which corresponds to the first moment within the capture duration, is determined based on the second portion of the observed trajectory, which corresponds to the second moment within the capture duration, the capture trajectory having smoother changes than the observed trajectory." '894 patent at claim 1.

GoPro contends that the accused products meet element 1[g(ii)] through [redacted] outlined above, with th[redacted]. GoPro Br. at 50. Dr. Schonfeld credibly testified that [redacted]." Schonfeld Tr. at 251:9–13. The evidence supports [redacted] is used in both camera and off-camera systems, as discussed above. Insta360 does not offer any dispute apart from that presented for element 1[g(i)]. *See* Insta360 Br. at 96 and Insta360 Reply at 19–21.

The evidence supports that element 1[g(ii)] is met in the camera and off-camera systems.

[redacted]

d) Element 1[g(iii)]

Element 1[g(iii)] recites, "wherein the capture trajectory is determined to include a path that minimizes a combination of rotational velocity and rotational acceleration of the housing, the combination of the rotational velocity and the rotational acceleration of the housing weighing the rotational velocity and the rotational acceleration equally or differently." '894 patent at claim 1.

GoPro contends that the accused products meet element 1[g(iii)] through a [redacted] (also referred to as [redacted]) in the cameras and an [redacted] function in the off-camera systems. GoPro Br. at 50 and 52. According to GoPro, and not disputed by Insta360, these functions occur within the [redacted] step before [redacted] involved in [redacted] discussed above for elements 1[g(i)] and 1[g(ii)]:

[redacted]

CX-0767C.4; Schonfeld Tr. at 212:2–9 (introduction to [redacted]), 230:8–22 (introduction to video frame correspondence), 232:4–9 (introduction to [redacted]

[redacted]), and 1510:6–1511:1; *see* GoPro Reply at 19. Insta360 disputes that element 1[g(iii)] is met because: GoPro failed to identify any relevant source code for the off-camera systems, Insta360 Br. at 97, [redacted] and [redacted] determine the "observed trajectory" not "capture trajectory," *id.* at 97–99, [redacted] and [redacted] do not "measure, calculate, or consider 'rotational acceleration,'" *id.* at 99–110, and [redacted] and [redacted] do not minimize a combination of "rotational velocity and rotational acceleration," *id.* at 110–113.

Dr. Schonfeld testified, based on his analysis of the source code, [redacted]. Schonfeld Tr. at 213:17–214:3. Then, an [redacted]—"[[redacted]." *Id.* at 215:14–16. This appears in the following lines of code as shown in Dr. Schonfeld's demonstrative:

[redacted]

CDX-0002C.68. At line 189, there is a function called [redacted] in which [redacted] and [redacted] are inputs. The first input, [redacted] is the [redacted] and the

[redacted]

second input, [redacted] is [redacted] Schonfeld Tr. at 216:2–5 and Goodin Tr. 1166:11–21. The value [redacted] is the output of the [redacted] function. Schonfeld Tr. at 334:3–4 and Goodin Tr. at 1166:25.

GoPro summarizes, "it is undisputed that the '894 Accused Products use rotational velocity data from the gyroscope to predict a rotational position, and then use accelerometer data to calculate a correction to that rotational position." GoPro Br. at 60. There is no dispute from Insta360 up to this point in the process. *See* Insta360 Br. at 100–101, *citing* Goodin Tr. at 1176:3–10 and Sang Tr. at 827:9–828:9. Dr. Goodin explained that this correction is needed because of error when a gyroscope is tilted:

Q. So to summarize, what is the purpose of this source code?

[redacted]

Goodin Tr. at 1176:3–10. This explanation is consistent with two technical documents describing [redacted] an internal Insta360 document (CX-1588C) and an open-source third-party paper (CX-1539). *See* CX-1588C at 2 ("[redacted]") and CX-1539 at 4 ("The basic filter update consists of gyroscope-based prediction, followed by accelerometer correction and, in 9D IOE, by magnetometer correction. . . . to obtain a vertical reference, we transform the measured accelerations into the almost-inertial frame Ii . . . the use of a linear low-pass filter in the Ii frame more effectively and robustly separates the gravitational acceleration component from the acceleration caused by velocity changes.").

[redacted]

The first dispute is whether the [redacted] function involves "rotational acceleration" so that, later on, when data from this function is further filtered, it can be said that "wherein the capture trajectory is determined to include a path that minimizes a combination of rotational velocity and rotational acceleration of the housing" (element 1[g(i)]) has occurred. GoPro argues that [redacted] is "used to calculate a correction rotation, angle 'alpha,' due to acceleration" and "inherently factor[s] rotational acceleration into the estimation of rotational position." GoPro Br. at 61, *citing* Schonfeld Tr. at 1474:20–1481:3, 1483:2–1485:8; GoPro Reply at 23 ("Using instantaneous linear acceleration data to determine a correction to an estimated rotational position is inherently a consideration of rotational acceleration.").

The evidence does not support that a consideration or a calculation of rotational acceleration is involved in [redacted] Mr. Goodin persuasively testified that the output of [redacted] is a three-dimensional vector just like the input [redacted] but in a different reference frame so it is compatible with later calculations. Goodin Tr. 1165:25–1168:7. He explained, that [redacted] needs to be [redacted] to become [redacted] but that they otherwise are the same data type designated [redacted] *See id.* at 1167:4–22. He explained this with specific reference to source code showing [redacted] and [redacted] with the same three-dimensional structure:

[redacted]

Id. at 1167:1–10, *citing* RDX-0013C.69 and RPX-0063C-SC ([redacted]); *see* Goodin Tr. at 1170:22–1173:18 (discussing a [redacted], and then a

[redacted]

second round of [redacted] to produce new [redacted] Mr. Goodin testified that "[redacted] and "[redacted] have the same units of m/s^2, which expresses linear acceleration, not angular acceleration. *Id.* at 1167:11–12 and 1172:8–12. Angular acceleration is generally expressed as rad/sec^2.

This testimony and evidence outweigh Dr. Schonfeld's direct testimony, which was largely a generalization that [redacted]—as a combination of integrated angular velocity with linear acceleration—somehow becomes "rotational acceleration":

[redacted]

Schonfeld Tr. at 215:25–216:17.

Dr. Schonfeld offered this opinion without any reference to source code. Instead, he relied on a characterization of the process in a translation of an internal Insta360 document, in a section titled "[redacted]":

[redacted]

CX-1588C.1; *see* GoPro Br. at 51 and Schonfeld Tr. at 217:16–218:19.

The words "[redacted]" in the header certainly on their own suggest a device that measures rotational acceleration. But GoPro does not argue that rotational acceleration is measured, or calculated as a derivative of rotational velocity, which is striking. *See* GoPro Br. at 61 (rotational acceleration is inherent) and GoPro Reply at 23 (same). The text below the header also makes no reference to measured angular acceleration, or a derivative of angular velocity, and GoPro does not identify where the record indicates what device/sensor in the accused products measures rotational acceleration as opposed to, for example, gyroscopes that detect rotational velocity and accelerometers that detect linear acceleration.

In addition, challenging the "[redacted]" header, Insta360 presented evidence that GoPro's translation was wrong and should read "[redacted] per its alternate certified translation:

[redacted]

RX-1453C.1; *see* Goodin Tr. at 1167:23–1168:7. Unlike "[redacted]," "[redacted]" supports that the accelerometer is rotated, which is consistent with the [redacted]

Dr. Schonfeld also testified that the "job" of the linear accelerometer is to "extract ultimately in this application, the rotational acceleration." Schonfeld Tr. at 1478:7-9. This testimony, however, is contrary to GoPro's briefing in which it argues that rotational acceleration is inherent in the process and need not be explicitly shown. GoPro Br. at 61 ("These calculations inherently factor rotational acceleration into the estimation of rotational position.'); *see id.* at 59 ("To the extent Insta360 and Mr. Goodin require an explicit measurement or calculation of rotational acceleration, they are importing an element that does not exist."). Even if one of those is true, GoPro has not presented evidence or explained how rotational acceleration, once "ultimately" obtained, is used by the camera. Additionally, Dr. Schonfeld presented a demonstrative purporting to show rotational acceleration (A_R) as explicitly produced from the [redacted] function, but then backtracked on the accuracy of his notation:

[redacted]

CDX-0002C.88 and Schonfeld Tr. at 1483:5–20 ("I agree that my notation may not have been the best . . . this is a combination of both rotational acceleration information as well as angular velocity . . the original acceleration is now represented in this new space.").

Apart from the specifics of [redacted] Dr. Schonfeld additionally suggests that anytime linear acceleration is considered, there is inherently a consideration of rotational acceleration based on the equation that linear acceleration times a radius equals angular acceleration. Schonfeld Tr. at 1475:12–23; *see id.* at 1478:10–15. The equation $\alpha = r \times a$ is true for a fixed body rotating about a point in space, but neither GoPro nor Dr. Schonfeld ever identified the point of the camera housing about which such rotation occurs, or its radius value, in any source code or other document. Without defining these values, the equation $\alpha = r \times a$ is inapplicable as persuasively explained by Mr. Goodin:

> Q. Mr. Goodin, do you recall counsel showed you earlier an equation, A equals r multiplies alpha, "A" represents linear acceleration, "r" represents radius, and "alpha" represents rotational acceleration.
>
> A. Yes. I remember that.

[redacted]

> Q. How would this equation apply in the camera movement environment, if at all?
>
> A. It wouldn't. So basically, what this equation is, is if you have a solid object anchored at one position, like picture a rod with it anchored rotationally at one position, and then you're pushing down with an acceleration at another position. So as I say, there's much more information in terms of the orientation of the rod, the fact that it's anchored, and all of that for that equation to apply. In terms of just raw acceleration value, like we were discussing, there is no relationship between a raw acceleration value and the rotational acceleration.
>
> Q. Now, for this equation, if you are applying the camera -- in the camera movements, would you know what the radius is?
>
> A. You would not. You would also have to know where the center of mass of the camera is, and a bunch of other information to even try to set up the physics' problem to do that.
>
> Q. Why you would not know what the radius is in the camera movements environment?
>
> A. Because there essentially is no radius in the camera movement environment. The accelerometer is just producing linear acceleration values detected at the sensor.

Goodin Tr. at 1376:10–1377:16

Dr. Schonfeld's statement that "[a]ll linear acceleration measurements provide some rotational information" (*id.* at 1480:25–1481:1) is not persuasive. It is also contradicted by his description of the prior art Kwatra reference in which "everything is linear" such that nothing is rotational. *Id.* at 1492:20–1493:3 ("Q. But is P there in Kwatra, is that a linear value or is that a rotational value? A. No. that's – everything is linear in Kwatra. Q. So here if P is linear, if I took a derivative, would I get rotational velocity? A. No. Q. If I took the second derivative of P, would I get rotational acceleration? A. No. It's different criteria.").

The evidence does not support that [redacted] calculates or considers "rotational acceleration." As GoPro offers no other reason to find "rotational acceleration" in the [redacted] or [redacted] processes, the evidence supports that element 1[g(iii)] is not met.

[redacted]

The evidence supports that element 1[g(iii)] is not met for a second reason. Even if rotational acceleration is somehow inherent in the output of the quatRotate function, GoPro has not shown a combination of rotational acceleration and rotational velocity is minimized, as the claim requires.

GoPro contends that "both [redacted] in the online system and [redacted] in the offline system [redacted]." GoPro Br. at 52, *citing* Schonfeld Tr. at 225:5–12, 246:3–247:10, and 253:8–12. Dr. Schonfeld explained that the [redacted] is applied right after a "[redacted] function:

[redacted]

CDX-0002C.88 and Schonfeld at 226:7–12. According to Dr. Schonfeld, [redacted] acts as a low pass filter with a programmable threshold that filters angular velocity and angular rotation at the same time (*i.e.*, a weighted combination). *Id.* at 226:19–227:4. Thus, according to Dr. Schonfeld, when the [redacted]." *Id.* at 227:5–9.

The evidence, however, does not support that a Kalman filter "minimizes" a combination of rotational velocity and rotational acceleration. Mr. Goodin persuasively testified that .” Goodin Tr. at 1182:2–5.

GoPro recasts the argument several ways in its reply brief. It first states, .” GoPro Reply at 24, *citing* Schonfeld Tr. at 226:13–228:5. This might be true, but the cited testimony does not mention noise or high-frequency elimination, so all that is left is unsupported attorney argument.

Second, GoPro argues "[t]o the extent Insta360 seeks to frame minimization as requiring an explicit minimization on first- and second-derivatives of positional information, that is an improper attempt to limit the claim to a disclosed embodiment." GoPro Reply at 24. Not so. Angular velocity is by definition the first derivative with respect to time of angular position and acceleration is the second derivative. *See* Schonfeld Tr. at 220:20–221:9, 295:7–11, 1492:23–1493:3 and Goodin Tr. at 1202:12–20. These are the literal words of the claim.

The evidence does not support that element 1[g(iii)] is literally met because the identified has not been shown to "minimize" a weighted combination of angular velocity and angular acceleration, as claimed.

Even though the element is not literally met, GoPro asserts this element is under the doctrine of equivalents, contending:

> To the extent the aforementioned analysis does not establish literal infringement of limitation 1[g(iii)], the ’894 Accused Products infringe under the doctrine of

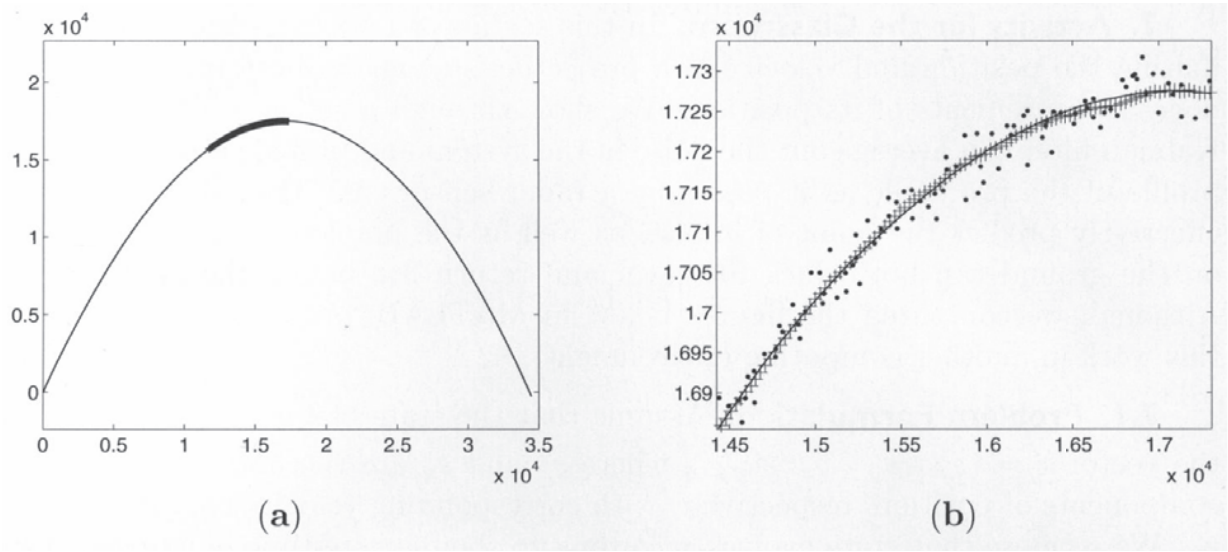
[redacted]

> equivalents because they perform substantially the same function (reducing rotational velocity and acceleration changes in a measured trajectory), in substantially the same way (performing a minimization operation, albeit via a [redacted]), to achieve substantially the same result "a smooth version of the positional rotation estimate). Tr. (Schonfeld) 253:21-254:19; *see also* CDX-00002.128.

GoPro Br. at 53.

The evidence does not support the accused features within [redacted] and [redacted] are equivalent to the "rotational acceleration" and "minimization" requirements of element 1[g(iii)]. Dr. Schonfeld's explanation is, simply, [redacted]" Schonfeld Tr. at 254:7–10. This opinion presupposes that rotational acceleration is calculated or considered in any way by the programmed instructions, which, as determined above, it is not. Similarly, Dr. Schonfeld states, [redacted]" *Id.* at 254:11–16. Again, this opinion presupposes that Kalman filters act to minimize the first and second derivatives of a data set, when according to both experts, and the public literature cited by GoPro (CX-1703.315 (Adaptive Filter Theory Third Edition); CX-1704.2 ("A Fresh Look at the Kalman Filter"); CX-1705.3 ("A New Approach to Linear Filtering and Prediction Problems")), Kalman filters actually minimize error between original and estimated data sets such as in the below images:

[redacted]



. . . .

Fig. 7.1 *A plot of* (a) *the trajectory, the measurement points, and the estimates given by the Kalman filter. The dark region on the upper-left part of the trajectory corresponds to the part of the profile where measurement and state estimations are made. In* (b) *a zoom of the previous image is given. The measurements are peppered dots with* (+) *denoting the estimated points from the Kalman filter and the dotted line being the true profile. Note that the estimated and true positions are almost indistinguishable. In* (c) *a plot of errors produced by measurements and the Kalman filter is given. Notice that the estimation error is much smaller than the measurement error. Finally, in* (d) *a plot of the predicted trajectory is given. These lines are close, with the estimation error at the point of impact being roughly half a percent.*

(*id.* at .17; *see, e.g.*, CX-1704.2 ("[Kalman filters] recursively estimates the state variables—for example, the position and velocity of a projectile—in a noisy linear dynamical system by minimizing the mean-squared estimation error of the current state as noisy measurements are received and as the system evolves in time.")). Equivalence between these accused features and the claim language has not been shown.

As for the off-camera systems, and [redacted] GoPro contends it meets the limitation for the same reasons as [redacted] *See* GoPro Br. at 52, *citing* Schonfeld Tr. at 246:3–247:10 and 253:8–12; *see generally* GoPro Reply at 22–25. Because the evidence does not support infringement by [redacted] it does not support infringement by [redacted] either,

[redacted]

setting aside Dr. Schonfeld's admission that many of the relevant software blocks are not even present in [redacted] *See* Schonfeld Tr. at 1515:24–1517:14 and Insta360 Br. at 97.

The evidence does not support that element 1[g(iii)] is met in any of the accused products and therefore the evidence does not support that claim 1 is infringed.

2. Claim 5

Claim 5 recites, "[t]he system of claim 1, wherein the position sensor includes a gyroscope, an accelerometer, and/or an inertial measurement unit, and the position information is determined independent of the image information." '894 patent at claim 5. Although claim 5 is not disputed by Insta360, it depends from claim 1, which is not infringed for the reasons explained above. The evidence supports that claim 5 is not infringed by the accused products.

3. Redesigns

The parties agree that Insta360 has introduced two versions of redesigned products into the investigation pertaining to the '894 patent. One is camera redesign and one off camera system redesign. GoPro Br. at 63–64 and Insta360 Br. at 140–141. The parties agree that in the camera redesign, [redacted] has been removed, and consequently, GoPro does not contend that this product infringes. GoPro Br. at 63–64 and Insta360 Br. at 140–141. Accordingly, the redesign camera (*see* Sang Tr. at 843:19–845:14; Goodin Tr. at 1192:12–1194:7; and RPX-0068C-SC.632, 633, 407–428) does not infringe the '894 patent.

There appears to be no dispute as to the off-camera systems as well. According to Insta360, the off-camera application has been modified to "remove[] [redacted]." Insta360 Br. at 140–141. As determined above, it is the consideration of at least one future frame within [redacted] which satisfies element 1[g(ii)]. With that frame removed, there is no infringement and GoPro does not contend

the future frame is otherwise present. *See* GoPro Br. at 63. Accordingly, the redesign off-camera system (*see* Sang Tr. at 843:19–845:14; Goodin Tr. at 1192:12–1194:7; RPX-0068C-SC.632, 633, 407–428) does not infringe the ’894 patent.

4. Indirect Infringement

“To establish liability under section 271(b), a patent holder must prove that once the defendants knew of the patent, they ‘actively and knowingly aid[ed] and abett[ed] another’s direct infringement.’” *DSU Med. Corp. v. JMS Co., Ltd.*, 471 F.3d 1293, 1305 (Fed. Cir. 2006), *quoting Water Techs. Corp. v. Calco, Ltd.*, 850 F.2d 660, 668 (Fed. Cir. 1988) (emphasis omitted). “While proof of intent is necessary, direct evidence is not required; rather, circumstantial evidence may suffice.” *DSU*, 471 F.3d at 1306, *quoting Water Techs.*, 850 F.2d at 668.

The Commission has found that “service of a section 337 complaint can be adequate to provide knowledge of the asserted patents.” *Certain Television Sets, Television Receivers, Television Tuners, & Components Thereof*, Inv. No. 337-TA-910, Comm’n Op. at 41 (Oct. 30, 2015) (finding contributory infringement) (EDIS Doc. ID 568157). The Commission has also found “an affirmative intent to infringe the patent” based on instructions provided to customers coupled with the respondents’ knowledge of the patent. *Certain Gas Spring Nailer Prods. & Components Thereof*, Inv. No. 337-TA-1082, Comm’n Op. at 62 (Apr. 28, 2020) (EDIS Doc. ID 709073) (“Accordingly, we can infer from [Respondent’s] instructions, along with [Respondent’s] knowledge of the ’718 patent, ‘an affirmative intent to infringe the patent,’” *quoting Takeda Pharms. U.S.A., Inc. v. West-Ward Pharm. Corp.*, 785 F.3d 625, 631 (Fed. Cir. 2015)), *vacated on other grounds sub nom. Kyocera Senco Indus. Tools Inc. v. Int’l Trade Comm’n*, 22 F.4th 1369 (Fed. Cir. 2022)).

[redacted]

GoPro contends, "Insta360 indirectly infringes claims 1 and 5 of the '894 Patent by actively inducing their customers to infringe by using the '894 Accused Products, including inducing infringing use of the offline functionality." GoPro Br. at 62. Because the accused products do not directly infringe, there is no indirect infringement.

C. Technical Prong

For a patent-based complaint, a violation of section 337 can be found "only if an industry in the United States, relating to the articles protected by the patent . . . exists or is in the process of being established." 19 U.S.C. § 1337(a)(2). The complainant bears the burden of establishing a domestic industry. *John Mezzalingua Assocs., Inc. v. Int'l Trade Comm'n*, 660 F.3d 1322, 1331 (Fed. Cir. 2011); *Certain Toner Cartridges, Components Thereof, and Systems Containing Same*, Inv. No. 337-TA-1174, Initial Determination at 84 (Jul. 23, 2020) (EDIS Doc. ID 716848), *unreviewed by*, Comm'n Notice (Sept. 8, 2020) (EDIS Doc. ID 719096).

The technical prong of the domestic industry requirement in a patent-based section 337 investigation is satisfied when the complainant establishes that it or its licensee is practicing or exploiting the asserted patent. *See* 19 U.S.C. §§ 1337(a)(2) and (3); *Certain Microsphere Adhesives, Process for Making Same, and Products Containing Same, Including Self-Stick Repositionable Notes*, Inv. No. 337-TA-366, USITC Publ'n No. 2949, Comm'n Op. at 8 (Jan. 1996) (EDIS Doc. ID 162915). "The test for satisfying the 'technical prong' of the industry requirement is essentially [the] same as that for infringement, *i.e.*, a comparison of domestic products to the asserted claims." *Alloc, Inc. v. Int'l Trade Comm'n*, 342 F.3d 1361, 1375 (Fed. Cir. 2003). To prevail, the patentee must establish by a preponderance of the evidence that its domestic product practices one or more valid claims of the patent. *Certain Vision-Based Driver Assistance*

[redacted]

System Cameras, Components Thereof, and Products Containing the Same, Inv. No. 337-TA-907, Comm'n Op. at 36, USITC Publ'n No. 4866 (Feb. 2019) (EDIS Doc. ID 673954).

GoPro contends the domestic industry products, as represented by the Hero7 Black, practice claims 1 and 5.

1. Claim 1

GoPro contends the domestic industry products practice claim 1. GoPro Br. at 44–46. Insta360 does not dispute this practice. *See generally* Insta360 Br. and Insta360 Reply.

The evidence supports that the domestic industry products are systems that stabilize videos, including a housing of a camera, an optical element within the housing which directs light to an image sensor, wherein that light has a larger field of view than the captured field of view (elements 1[pre]–1[b]). Schonfeld Tr. at 287:15–290:24; CX-0521.1 (GoPro webpage); CX-0522.49 and .53 (Hero7 Black user manual); and CX-0609C.1 (Hypersmooth technical document).

The evidence supports that the domestic industry products' image sensors are within the camera housing and generate a signal based on the light that is incident thereupon during a capture time period, and the signal defines images with the optical field of view (element 1[c]), that a position sensor within the camera housing generates a rotational position output signal during the capture period (element 1[d]), and that a processor with machine-readable instructions exists within the camera (element 1[e]). Tr. Schonfeld at 290:14-291:23; CX-0520.1; CX-0522.48; CX-0609.1 and .9; and CX-528.1 (GoPro webpage).

The evidence supports that the domestic industry products: determine an observed trajectory of the camera housing during the capture duration based on signals from the position sensor (element 1[f]), and determine a capture trajectory based on a look ahead of the observed trajectory via a "overlapped windowed," or sliding window, approach (element 1[g(i)]) and

[redacted]

creating a capture trajectory having smoother changes in position than the observed trajectory (element 1[g(ii)]). Tr. Schonfeld at 291:24–294:21; CX-0609C.2–3; and CPX-1 (Hypersmooth source code). More specifically, the evidence supports that the capture trajectory includes a path that minimizes a combination of rotational velocity and rotational acceleration and weighs the two in the combination the same or differently (element 1[g(iii)]). Schonfeld Tr. at 294:22-295:23 and 296:16-20; CX-0609C.3; and CPX-0001.

The evidence supports that the domestic industry products determine orientations of the capture field of view with respect to the optical field of view based on the generated capture trajectory, (element 1[h]), and generate video content based on punch-outs from the captured field of view with that video presenting a more stable view than use of the entire available visual content, (element 1[i]). Schonfeld Tr. at 295:24-297:11; CX-0609C.9–10; and CPX-0001.

The evidence supports that claim 1 is practiced by the domestic industry products.

2. Claim 5

GoPro contends the domestic industry products, as represented by the Hero7 Black, practice claim 5. GoPro Br. at 46. Insta360 does not dispute this practice. *See generally* Insta360 Br. and Insta360 Reply. The evidence supports that the position sensor inside the domestic industry products includes a gyroscope and an inertial measurement unit, with these sensors generating position information without reference to captured image information. Schonfeld Tr. at 297:12-23 and CX-0609C.2. The evidence supports that claim 5 is practiced by the domestic industry products.

[redacted]

D. Validity

Patents are presumed valid. *See* 35 U.S.C. § 282; *Microsoft Corp. v. i4i Ltd. P'ship*, 131 S. Ct. 2238, 2242–43 (2011). A party asserting patent invalidity has the burden of overcoming this presumption by clear and convincing evidence. *See Microsoft*, 131 S. Ct. at 2243.

Anticipation requires that a single reference disclose each and every element of the claimed invention. *In re Smith Int'l, Inc.*, 871 F.3d 1375, 1381 (Fed. Cir. 2017) ("A patent claim is anticipated 'only if each and every element is found within a single prior art reference, arranged as claimed,'" *quoting Summit 6, LLC v. Samsung Elecs. Co.*, 802 F.3d 1283, 1294 (Fed. Cir. 2015). "Prior art that must be modified to meet the disputed claim limitation does not anticipate the claim." *Enplas Display Device Corp. v. Seoul Semiconductor Co., Ltd*, 909 F.3d 398, 405 (Fed. Cir. 2018), *citing In re Chudik*, 851 F.3d 1365, 1374 (Fed. Cir. 2017) ("a prior art reference that must be distorted from its obvious design does not anticipate a patent claim") (internal quotations omitted); *In re Wells*, 53 F.2d 537, 539 (C.C.P.A. 1931); *accord Topliff v. Topliff*, 145 U.S. 156, 161 (1892) ("It is not sufficient to constitute an anticipation that the device relied upon might, *by modification*, be made to accomplish the function performed by the patent in question, if it were not designed by its maker, nor adapted, nor actually used, for the performance of such functions.").

A claim is invalid as obvious if "the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains." 35 U.S.C. § 103(a). Obviousness is a determination of law based on underlying questions of fact. *Star Scientific*, 655 F.3d at 1374. The factual determinations behind a finding of obviousness include: (1) the scope and content of the prior art, (2) the level of skill in the art, (3) the differences between the claimed invention and the prior art, and (4) secondary considerations

[redacted]

of non-obviousness. *KSR*, 50 U.S. at 399, *citing Graham v. John Deere Co.*, 383 U.S. 1, 17 (1966). Secondary considerations of non-obviousness include commercial success, long felt but unresolved need, copying and the failure of others. *Id.* When present, secondary considerations "give light to the circumstances surrounding the origin of the subject matter sought to be patented," but they are not necessarily dispositive on the issue of obviousness. *Geo. M. Martin Co. v. Alliance MachSys. Int'l*, 618 F.3d 1294, 1304–06 (Fed. Cir. 2010). For secondary considerations to be given substantial weight in an obviousness determination, there must be a nexus between the evidence and the merits of the claimed invention. *See W. Union Co. v. MoneyGram Payment Sys. Inc.*, 626 F.3d 1361, 1372–73 (Fed. Cir. 2010), *citing In re GPAC Inc.*, 57 F.3d 1573, 1580 (Fed. Cir. 1995).

When a claim is challenged as obvious, the critical inquiry in determining the differences between the claimed invention and the prior art is whether there is an apparent reason to combine known elements in the fashion claimed by the patent at issue. *See KSR Int'l Co. v. Teleflex, Inc.*, 550 U.S. 398, 417–418 (2007). Thus, when a respondent relies on a combination of multiple prior art references to show obviousness, "the burden falls on the patent challenger to show by clear and convincing evidence that a person of ordinary skill in the art would have had reason to attempt to make the composition or device, or carry out the claimed process, and would have had a reasonable expectation of success in doing so." *PharmaStem Therapeutics, Inc. v. ViaCell, Inc.*, 491 F.3d 1342, 1360 (Fed. Cir. 2007) (citations omitted). Because obviousness is not determined at the time of litigation, "[t]he great challenge of the obviousness judgment is proceeding without any hint of hindsight." *Star Scientific, Inc. v. R.J. Reynolds Tobacco Co.*, 655 F.3d 1364, 1375 (Fed. Cir. 2011).

[redacted]

1. Pixel 2 and Kwatra

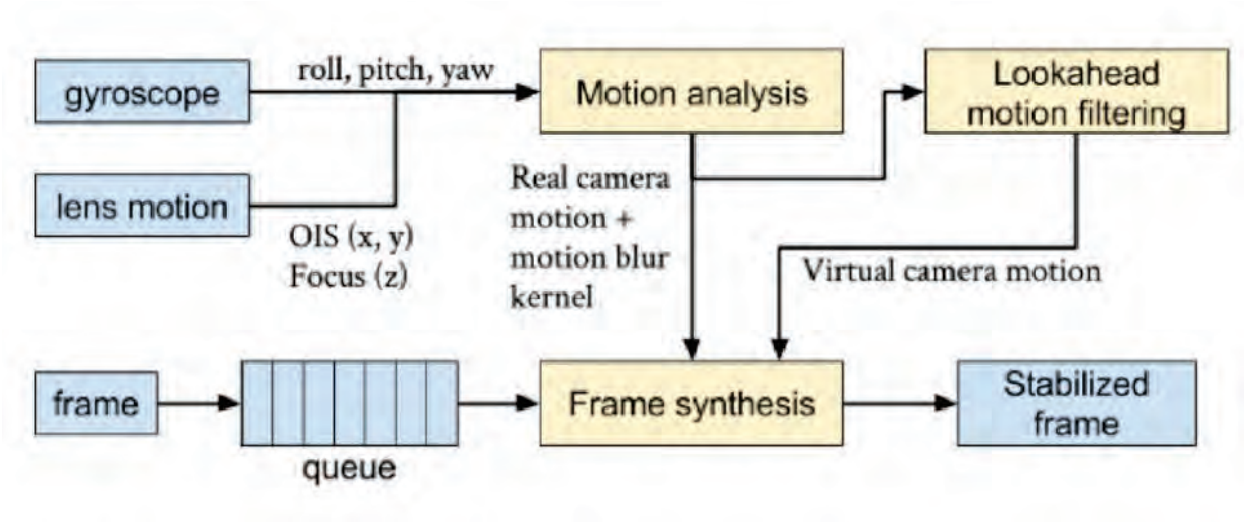
Insta360 contends that claims 1 and 5 are invalid as obvious in view of the combination of Pixel 2 (RPX-0052; RX-1660; and RX-1363C) and Kwatra (U.S. Patent No. 8,531,535, RX-1565). Insta360 Br. at 115–129.

a) Overview

Insta360 argues that Pixel 2 is a smartphone publicly released in the U.S. by Google on October 4, 2017. Insta360 Br. at 115. Insta360 focuses on a "Fused Video Stabilization" technique used in Pixel 2, which Insta360 states was disclosed in a Google Blog post on November 10, 2017. *Id.*, *citing* RX-1567. Given GoPro's assertion that the priority date of the '894 patent is May 18, 2018, based on the filing of a provisional application, GoPro Br. at 3, the evidence supports that Pixel 2 is prior art under 35 U.S.C. § 102(a). This is not disputed by GoPro. *See generally* GoPro Br. and GoPro Reply.

According to a web publication, the Pixel 2 used "Fused Video Stabilization" "based on both optical image stabilization (OIS) and electronic image stabilization (EIS)." RX-1567.5. Pixel 2 relied on these two stabilization techniques to address "camera shake . . . if you are walking or running while recording, the camera motion can make videos almost unwatchable." *Id.* The following diagram explains Fused Video Stabilization:

[redacted]



RX-1567.7. As shown above, Pixel 2 Fused Video Stabilization involves a gyroscope taking roll, pitch, and yaw measurements and "lookahead motion filtering." The evidence supports that the "lookahead" is reflective of the camera operator's intention: "The first processing stage, motion analysis, extracts the gyroscope signal, the OIS motion, and other properties to estimate the camera motion precisely. Then, the motion filtering stage combines machine learning and signal processing to predict a person's intention in moving the camera." *Id.* In addition:

> The motion filtering stage takes the real camera motion from motion analysis and creates the stabilized virtual camera motion. Note that we push the incoming frames into a queue to defer the processing. This enables us to *lookahead* at future camera motions, using machine learning to accurately predict the user's intention. Lookahead filtering is not feasible for OIS or any mechanical stabilizes, which can only react to previous or present motions.

Id.

Given GoPro's assertion that the priority date of the '894 patent is May 18, 2018, the evidence supports that Kwatra, which was filed on February 8, 2011, and issued on September 10, 2013, is prior art under 35 U.S.C. § 102(a). Insta360 Br. at 116. This is not disputed by GoPro. *See generally* GoPro Br. and GoPro Reply.

[redacted]

Kwatra discloses a method for video stabilization and "retargeting" in which "[a] recorded video may be stabilized by removing shake introduced in the video, and a video may be retargeted by modifying the video to fit to a different aspect ratio." RX-1565 at Abstract. Kwatra states:

> In one example, a video may be processed to estimate an original path of a camera that recorded the video, to estimate a new camera path, and to recast the video from the original path to the new camera path. To estimate a new camera path, a virtual crop window can be designated. A difference transformation between the original and new camera path can be applied to the video using the crop window to recast the recorded video from the smooth camera path.

Id. The figures below show how camera motion is recorded and then smoothed to inform the cropping of stabilized video frames:

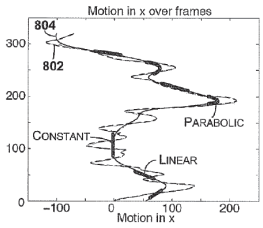


FIGURE 8A

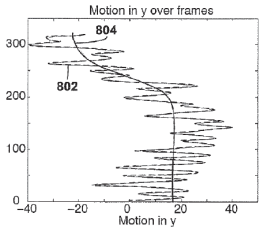


FIGURE 8B

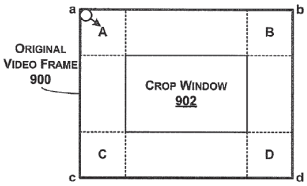


FIGURE 9A

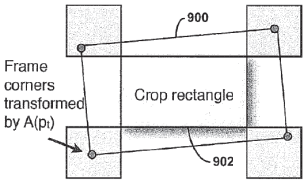


FIGURE 9B

Id. at Figs. 8A–9B; *see id.* at 19:4–38 and 21:60–22:2.

b) Obviousness

Insta360 contends that the combination of Pixel 2 and Kwatra renders claims 1 and 5 of obvious. Insta360 Br. at 115–129.

(1) Claim 1

Insta360 argues that Pixel 2 discloses all elements of claim 1 except element 1[g(iii)], which it contends would have been obvious in view of Kwatra. Insta360 Br. at 117–129. Insta360

[redacted]

states that there is no dispute that Pixel 2 teaches all elements except 1[g(iii)]. *Id.* at 115. GoPro's briefing confirms there is no dispute for those elements. *See* GoPro Br. at 64–65 and GoPro Reply at 26–28. The evidence supports that all elements except element 1[g(iii)] are disclosed in Pixel 2. *See* Insta360 Br. at 117–129, *citing* Goodin Tr. at 1195:23–1199:22 and 1207:23–1209:20.

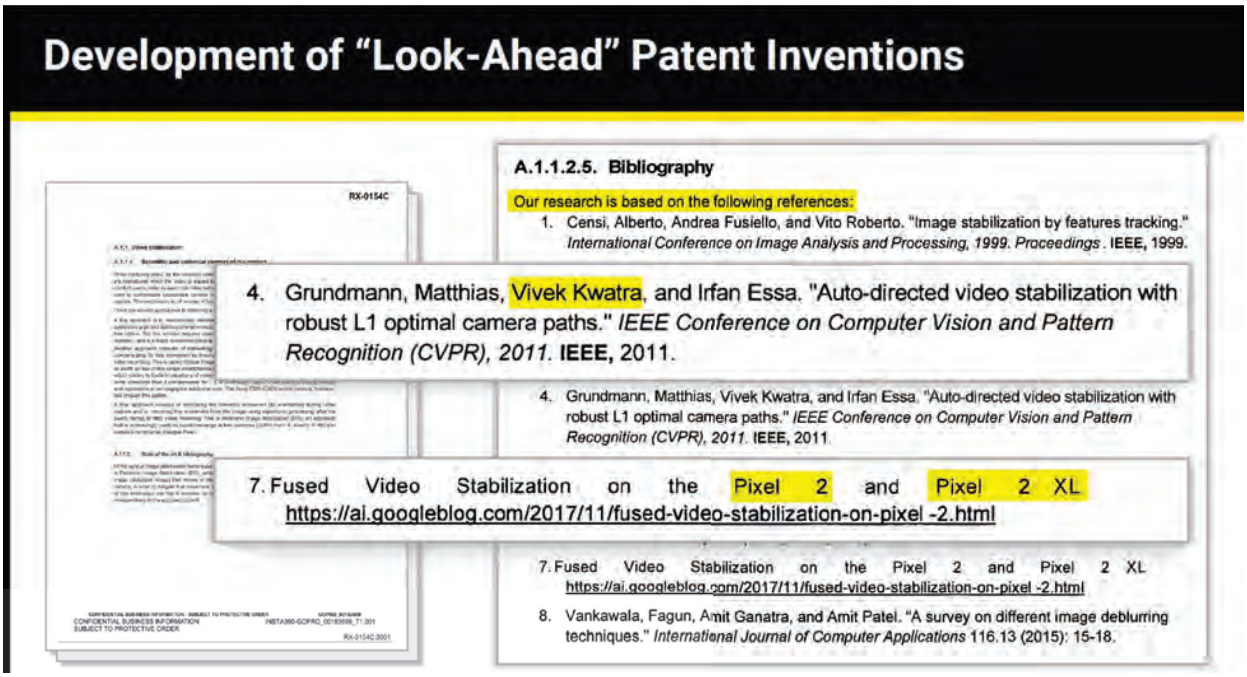
Regarding element 1[g(iii)], Insta360 contends that "Pixel 2 and Kwatra disclose this limitation under either party's construction" (Insta360 Br. at 121) which, based on Insta360's following discussion, is understood to mean that Kwatra discloses element 1[g(iii)] (*see id.* at 122–124; Insta360 Reply at 29–30; and Goodin Tr. at 1202:4–20). Insta360 highlights Kwatra's disclosure of "'[a] smooth camera path [that] can be estimated using minimization of derivatives of the original camera path as estimated by the path estimation engine'" and Kwatra's disclosure of "rotational movement." Insta360 Br. at 122. Insta360 adds that one of skill "would have been motivated to combine Pixel 2's look-ahead and Kwatra's minimization to achieve better smoothing results." *Id.* at 124.

The evidence supports that Pixel 2 included video stabilization. RX-1567 (Pixel 2 Fused Video Stabilization). Kwatra states that "[v]ideo stabilization techniques generally attempt to render recorded video as the video would have been recorded from a smooth or stable camera path" and discloses that its minimization function provides a smoother curve function (*i.e.*, camera path). RX-1565 at 1:37–39 and 5:64–66. The minimization function disclosed in Kwatra is like that disclosed in the '894 patent. Compare RX-1565 at 13:66–14:7 and equation (7) with '894

[redacted]

patent at 11:2–15 and equation (54).[11] The evidence thus supports that Pixel 2 and Kwatra are analogous art.

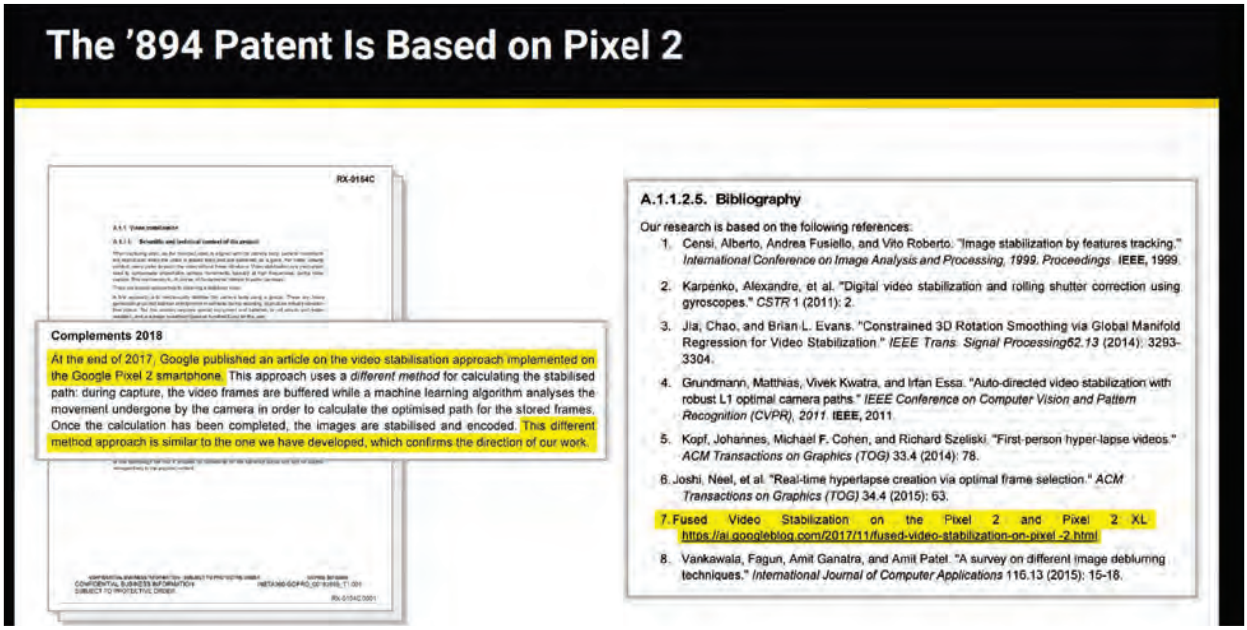
However, in addressing the combination of Pixel 2 and Kwatra, Insta360 repeatedly engages in impermissible hindsight. Insta360 calls the ’894 and ’840 patents the “’Look-Ahead’ Patents.” RDX-0013C.8 and *see* Tr. at 60:25–26 and 65:15. In a slide titled “Development of ‘Look-Ahead’ Patent Inventions,” Mr. Goodin, Insta360’s expert, pointed out that a GoPro paper describing Hypersmooth (technology embodying the ’894 and ’840 patents) cited to a document describing Pixel 2 (item 7 below) and cited a Kwatra paper (item 4 below):



[11] Equation (7) in Kwatra operates on the variable P, while equation (54) in the ’894 patent operates on the variable θ (theta), which is a rotational variable. ’894 patent at 10:61–11:15 and Goodin Tr. at 1352:18–24 (identifying theta as a rotational variable).

[redacted]

RDX-0013C.10; Goodin Tr. at 1137:6–19;[12] and RX-0154C (Hypersmooth architecture). In addressing Pixel 2, Mr. Goodin presented a slide titled, "The '894 Patent is Based on Pixel 2" and showed again the Hypersmooth architecture and its reference to a Pixel 2 document (item 7, below):



Goodin Tr. at 1194:21–1195:9 *and see* RDX-0013C.114.[13]

In addressing element 1[g(iii)], Insta360 relies on Pixel 2 and the Kwatra patent. Goodin Tr. at 1199:23–1200:3 ("Q. Moving on to 1[g(iii)], do you have an opinion regarding the

---

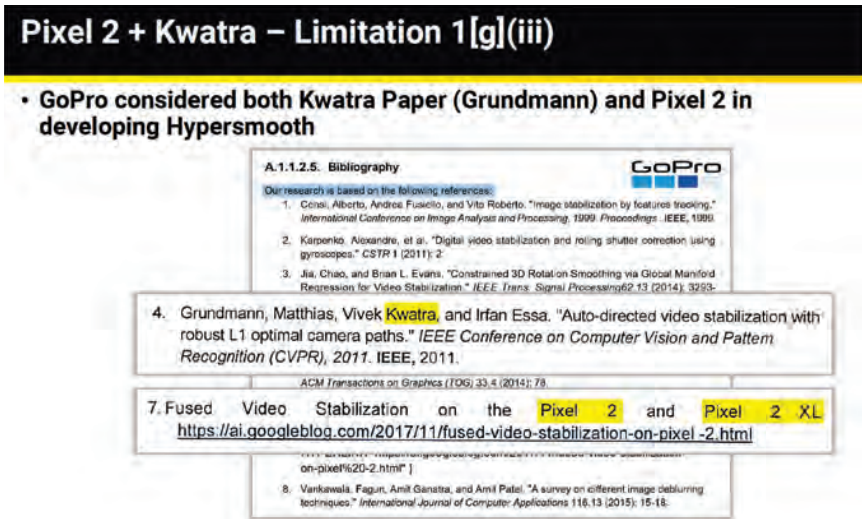
[12] This is referred to in the transcript as slide 13, Tr. at 1137:5, but is shown in slide 10 of the Goodin demonstratives provided by Insta360.

[13] "[A]dditional evidence showing GoPro's research of Pixel 2" was, according to Mr. Goodin, shown in a GoPro presentation from 2018 titled "Hypersmooth Benchmark," "where they describe that Google Pixel 2 uses look-ahead EIS similar to Hypersmooth" and an e-mail in 2017 in which one of the '894 patent inventors "talks about how does the Pixel 2 score on our objective matrix." Goodin Tr. at 1195:10–22, *citing* RX-0168C.3 (GoPro presentation) and RX-0165C (Go Pro e-mail).

[redacted]

obviousness combination of Pixel 2 and Kwatra? A. Yes, it's my opinion that the combination of Pixel 2 and Kwatra discloses limitation 1[g(iii)] under either parties' constructions.")

In testifying about motivation to combine Pixel 2 and Kwatra, Mr. Goodin presented the following slide, stating that "GoPro considered both Kwatra Paper (Grundmann) and Pixel 2 in developing Hypersmooth," as shown below:



RDX-0013C.l36. Mr. Goodin again pointed out that the Hypersmooth architecture referenced a Pixel 2 document (item 7) and the Kwatra paper (item 4). Mr. Goodin testified that:

> GoPro considered both the Kwatra paper and Pixel 2 in developing HyperSmooth. GoPro itself, by combining these two references and basing their HyperSmooth technology on these two references made the combination that we have been talking about between the Kwatra paper and Pixel 2.

Goodin Tr. at 1206:5–1207:8.

Likewise, in arguing that there is a motivation to combine, Insta360 contends that "GoPro's own consideration of Pixel 2 and Kwatra's related and similar paper in developing Hypersmooth further confirms that it would have been obvious to combine Pixel 2 and Kwatra." Insta360 Br. at 124–125 and *see* Insta360 Reply at 32 (identifying motivation to combine as "Hypersmooth itself combined Pixel 2 and Kwatra"). In making its arguments, Insta360 relies on the "Kwatra paper."

[redacted]

While the "Kwatra paper," RX-1607, [14] is different from the Kwatra patent, RX-1565, it appears undisputed that they have overlapping subject matter.[15]

From start to finish, Insta360's obviousness arguments, including the testimony of its expert, are undergirded by the fact that GoPro itself considered Pixel 2 and Kwatra when developing the invention. RDX-0013C.10 and .136. The statute, however, instructs that in considering obviousness, "[p]atentability shall not be negated by the manner in which the invention was made." 35 U.S.C. § 103. This means that how GoPro itself came up with the invention, including by citing both Pixel 2 and the so-called Kwatra paper, is irrelevant. Indeed, "[t]he inventor's own path itself never leads to a conclusion of obviousness; that is hindsight." *Otsuka Pharm. Co. v. Sandoz, Inc.*, 678 F.3d 1280, 1296 (Fed. Cir. 2012) and *see Life Techs., Inc. v. Clontech Labs., Inc.*, 224 F.3d 1320, 1325 (Fed.Cir.2000) ("[T]he path that leads an inventor to the invention is expressly made irrelevant to patentability by statute.") "It does not matter whether the ['894 patent] inventors reached their invention after an exhaustive study of [Pixel 2 and the Kwatra paper], or developed their [systems and methods for stabilizing videos] in complete isolation. The only inquiry is whether the teachings of [Pixel 2 and the Kwatra patent] would have rendered the claimed invention obvious to one of ordinary skill in the art; this inquiry, as a matter of law, is independent of the motivations that led the inventors to the claimed invention." *Lifetech*, 224 F.3d at 1325. The evidence supports that Mr. Goodin's testimony on the combination of Pixel

---

[14] There is no publication information included with RX-1607, but given the same title, it is assumed that bibliography item 4 in RX-0154C.7 is the same as RX-1607.

[15] The first author of the "Kwatra paper" is actually Grundmann, so by all rights it should be called the "Grundmann paper." *See* RX-1607.

[redacted]

2 and Kwatra, and Insta360's arguments, are not reliable because they are suffused with hindsight bias based on GoPro's consideration of Pixel 2 and the Kwatra paper, which is legally improper.

On the substance of what the prior art discloses, GoPro disputes that Kwatra discloses element 1[g(iii)] because its minimization function is applied to a path that is strictly linear/translation motion. GoPro Br. at 64–65. The parties argue extensively over the nature of the path subjected to Kwatra's minimization function. GoPro argues it is purely linear, and thus does not teach element 1[g(iii)], which requires minimizing a combination of rotational velocity and rotational acceleration of the housing. GoPro Reply at 27, *citing* RX-1565 at 9:57–62, 11:3–5, and 12:30–43. Insta360 argues that Kwatra acknowledges that rotational movement/position of a camera is common and thus necessarily involved in its calculated path, thereby meeting element 1[g(iii)]. *See* Insta360 Br. at 122–124 and Goodin Tr. at 120:13–1201:12, and 1202:12–15.

The evidence supports that the minimization function in Kwatra, as shown by equation (7), represents a linear path model. *See* RDX-0013C.132, *citing* RX-1565 at 13:62–14:37 and equation (7). At the evidentiary hearing, Mr. Goodin stated that the variable "P" in equation (7) represents a "combination of linear and rotational motion." Goodin Tr. at 1167:19–1168:11. At his deposition, however, Mr. Goodin testified that Figs. 8A and 8B in Kwatra relate to translational (*i.e.*, linear as opposed to rotational) motion. *Id*. at 1168:12–1369:7. The evidence supports that the path in Kwatra's Figs. 8A and 8B is represented by the parameter P, the same parameter subject to the function in its equation (7). RX-1565 at 13:61–14:5 and 19:4–38. That Kwatra is focused on linear motion is supported not only by Mr. Goodin's deposition testimony, but by its disclosure that "[l]inear motion models (e.g., translation, similarity, affine) may be fit to the tracked features to estimate a motion of the camera between two frames, and the motion models can be transformed to a common coordinate system and concatenated to yield an estimated original camera path over

[redacted]

all frames of the video." RX-1565 at 5:47–53 and *see* GoPro Reply at 27 (noting that original camera path C(t) in Kwatra, which is described as the cost function of the "smooth or optimal camera path (P)" is described in terms of a linear motion model). Dr. Schonfeld credibly testified that the minimization function Insta360 relies on is directed to linear velocity and linear acceleration and not rotational velocity and rotational acceleration, as claimed. Schonfeld Tr. at 1492:12–1493:13. As a result, the evidence supports that even if Pixel 2 and Kwatra were combined, the claimed invention, which requires "a path that minimizes a combination of rotational velocity and rotational acceleration," would not result.

GoPro contends that objective indicia of non-obviousness, namely commercial success, industry praise, long-felt but unmet need, failure of others, skepticism, unexpected results, and copying support that claim 1 would not have been obvious. GoPro Br. at 68 and 199–211.

Secondary considerations may overcome a prima facie showing of obviousness. *Certain Wearable Electronic Devices with ECF Functionality*, Inv. No. 337-TA-1266, Comm'n Op. at 47 (Jan. 20, 2023) (EDIS Doc. ID 788332). "Objective indicia of non-obviousness must be considered in every case where present." *Apple Inc. v. Samsung Elecs. Co.*, 839 F.3d 1034, 1048 (Fed. Cir. 2016). Evidence of such indicia "may often be the most probative and cogent evidence in the record," *id.* at 1052, *quoting Stratoflex, Inc. v. Aeroquip Corp.*, 713 F.2d 1530, 1538 (Fed. Cir. 1983), and "guard against slipping into use of hindsight." *Id*., *quoting Graham v. John Deere Co.*, 383 U.S. 1, 36 (1966). Such evidence can include "commercial success enjoyed by devices practicing the patented invention, industry praise for the patented invention, copying by others, and the existence of a long-felt but unsatisfied need for the invention." *Id.*

To accord substantial weight to secondary considerations, the evidence must have a nexus to the claims. That is, there must be a legally and factually sufficient connection between the

[redacted]

evidence and the patented invention. The patentee bears the burden of showing that a nexus exists. *Fox Factory, Inc. v. SRAM, LLC*, 944 F.3d 1366, 1373 (Fed. Cir. 2019). "A showing of nexus can be made in two ways: (1) via a presumption of nexus, or (2) via a showing that the evidence [of secondary considerations] is a direct result of the unique characteristics of the claimed invention." *Volvo Penta of the Americas, LLC v. Brunswick Corp.*, 81 F.4th 1202, 1210 (Fed. Cir. 2023).

As to presumptive nexus, the Federal Circuit has said that "a patentee is entitled to a rebuttable presumption of nexus between the asserted evidence of secondary considerations and a patent claim if the patentee shows that the asserted evidence is tied to a specific product and that the product '*is* the invention disclosed and claimed.'" *Teva Pharms. Int'l GmBH v. Eli Lilly & Co.*, 8 F.4th 1349, 1360 (Fed. Cir. 2021). The presumption applies "when the patentee shows that the asserted objective evidence is tied to a specific product and that product 'embodies the claimed features, and is coextensive with them.'" *Id.* (internal citations omitted). "Conversely, '[w]hen the thing that is commercially successful is not coextensive with the patented invention—for example, if the patented invention is only a component of a commercially successful machine or process,' the patentee is not entitled to a presumption of nexus." *Id.* (internal citations omitted).

"[T]he degree of correspondence between a product and a patent claim falls along a spectrum. At one end of the spectrum lies 'perfect or near perfect correspondence,' and at the other end lies 'no or very little correspondence.'" *Id.* at 1361 (internal citations omitted). "Although we do not require the patentee to prove perfect correspondence to meet the coextensiveness requirement, what we do require is that the patentee demonstrate that the product is essentially the claimed invention." *Id.* "Whether a product is coextensive with the patented invention, and therefore whether a presumption of nexus is appropriate in a given case, is a question of fact." *Id.*

[redacted]

"A patent claim is not coextensive with a product that includes a 'critical' unclaimed feature that is claimed by a different patent and that materially impacts the product's functionality." *Fox Factory*, 944 F.3d at 1375. Insta360 contends that GoPro has admitted that other unclaimed features are critical, making a presumptive nexus inappropriate. Insta360 Br. at 137–138. This is essentially conceded by GoPro, which argues that its "utility patents work together, as a package, to amplify the user experience." GoPro Br. at 200. GoPro details the importance of each of its utility patents and concludes that its "patented technologies work together and enhance one another to create an action camera experience whose whole is greater than the sum of its parts." *Id*. GoPro's own arguments support that there is no presumptive nexus.

"A finding that a presumption of nexus is inappropriate does not end the inquiry into secondary considerations. To the contrary, the patent owner is still afforded an opportunity to prove nexus by showing that the evidence of secondary considerations is the direct result of the unique characteristics of the claimed invention." *Fox Factory*, 944 F.3d at 1373–1374 (citation and quotations omitted). GoPro contends that it "provided extensive evidence demonstrating that the stabilization innovations of the '894 and '840 patents were core drivers of Hypersmooth's success." GoPro Reply at 29.

The record supports that evidence of secondary considerations were the direct result of the unique characteristics of the '894 and '840 patents. In particular, the evidence shows that GoPro's sales jumped 170 percent from Hero6 to Hero7 Black, in large part because of the commercialization of Hypersmooth. GoPro Br. at 203 and Lema Tr. at 363:9–364:7. A report from J.P. Morgan states that the Hero7 specifications are similar to Hero6, "though stabilization is the key selling point, in our view." JX-0320.1. It goes on to state that "[t]he gimbal like hypersmooth stabilization (developed in-house software and hardware) is a significant upgrade, in our view,

[redacted]

judging by the side by side preview provided on the website and reviews online." *Id*. "Initial reviews from tech websites Mashable, Engadget, Trustedreveiws etc are skewing positive owing to the image stabilization feature." *Id*. The evidence also supports that Hypersmooth was the number one ranked feature driving consumer purchase. Lema Tr. at 372:11–373:19 and CX-0649C.14 (identifying feature drivers). The evidence thus supports that there is a nexus.

Two objective indicia are especially persuasive: commercial success and industry praise. In short, the motivation to combine Kwatra's minimization with Pixel 2's camera path is allegedly to make the calculated path "smoother." Yet that is exactly what GoPro experienced notable commercial success and industry praise for through Hypersmooth.

The evidence supports that Hypersmooth, which embodies the '894 and '840 patents, was first introduced in GoPro's product line with the Hero7 Black. CX-0618.1 (CES 2019 press release); CX-0644.1 (2018 Hero7 Black press release); CX-1388.3 (Hero 8 Black CNET article); RX-0168C.10–13 (GoPro internal benchmarking with Hero 6); Lema Tr. at 363:2–8; and Woodman Tr. at 83:8–13. GoPro's CEO, Mr. Woodman, and its Director of Product, Mr. Lema, both testified that Hypersmooth and the Hero7 Black marked a turning point in GoPro's product line. Woodman Tr. at 83:14–84:12 (introduction of Hypersmooth was a "before and after event" for the company) and Lema Tr. at 362:24–363:8 ("The marquis moment was Hero7 Black. So this is when we introduced HyperSmooth"). The evidence supports significant commercial success due to Hypersmooth—and by extension, the invention of the '894 patent. Mr. Lema, testified to a 170% jump in sales between the Hero6 and Hero7 models, with Hypersmooth being the critical feature difference between the two. Lema Tr. at 363:9–364:7. This testimony is consistent with an internal GoPro presentation from the relevant time period, noting the difference between the models with respect to stabilization is "look-ahead." RX-0168C.3. Mr. Lema added, "so when we put up the

[redacted]

site, launched, start to sell, Hero7 Black became the fastest selling camera in a one-month period after launch in our history. It was an incredible moment for us," *id.* at 364:24–365:2, and noted the Hero line of cameras "[has] been the top-selling action camera in the United States for nine consecutive quarters. I believe we have millions and millions of very happy customers that use our products every year," *id.* at 360:17–23. He also testified the Hero line commands "80 to 85 percent market share of action cameras" in the U.S., *id.* at 361:4–10, with Hypersmooth being implemented in each since the fall of 2018. GoPro Br. at 4–5 and 10.

Insta360 does not challenge the commercial success of the Hero7 Black and later models. Instead, it challenges that there is a nexus between that success and the '894 patent claims. Insta360 Br. at 138 and Insta360 Reply at 33–34. As detailed above, however, the evidence supports a nexus between the evidence of secondary considerations and the '894 patent. On that point, it is also worth noting that it is undisputed that GoPro's domestic industry products meet the claims of the '894 patent. The evidence demonstrates that the secondary consideration of commercial success supports nonobviousness of claim 1 of the '894 patent.

The evidence also supports industry praise for Hypersmooth—and thus, the '894 patent. A press release shortly after the launch primarily credits Hypersmooth for Hero7 Black's "multiple awards and industry accolades," CX-0618.1, and this was borne out by additional award evidence. Mr. Lema testified about and showed a 2022 Technology & Engineering Emmy for "in camera sensor and software image stabilization" "which would have been in Hero7 Black." Lema Tr. at 376:1–6 and *see* CX-0020 (photo of Emmy) and CX-0636 ("This Emmy® is in recognition of the technology powering GoPro's industry-leading HyperSmooth video stabilization"). Mr. Lema also testified about a CES Innovation award in 2019 that was specifically for the Hero7 Black. Lema Tr. at 376:18–377:15 and CX-0016 (photo of CES award). Last, he testified about GoPro winning

[redacted]

two Lucie Technical awards, in 2018 and 2019, for excellence in photography and photography technology. Lema Tr. at 377:24–18. The 2019 award was specifically for the Hero7 as "best special purpose compact camera." *Id.* and CX-0026. Insta360's response is that GoPro has not shown nexus between these awards and the '894 patent, but as determined above, the '894 patent has a close connection to Hypersmooth, and Hypersmooth has a close connection to the Hero7 Black model of camera—the recipient of so much industry praise. The evidence demonstrates that the secondary consideration of industry praise supports nonobviousness of claim 1 of the '894 patent.

(2) Claim 5

Because the evidence supports that claim 1 is not obvious, claim 5 is not obvious as well.

2. Bell and Kwatra

Insta360 argues the claims are invalid as obvious in view of Bell (U.S. Patent No. 10,027,893, RX-2026) and Kwatra (RX-1565). *Id.* at 129–137.

a) Overview

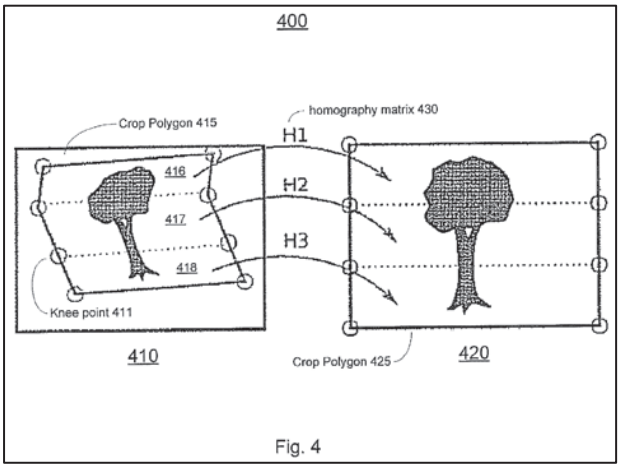
Given GoPro's assertion that the priority date of the '894 patent is May 18, 2018, based on the filing of a provisional application (GoPro Br. at 3), the evidence supports that Bell, which was filed on May 10, 2016, and published on November 16, 2017, is prior art under 35 U.S.C. § 102(a). Insta360 Br. at 129. This is not disputed by GoPro. *See generally* GoPro Br. and GoPro Reply.[16]

Bell teaches "[r]eal-time video stabilization for mobile devices based on on-board motion sensing." RX-2026 at Abstract. Bell's system considers initial and subsequent video frames and identifies "[a] crop polygon around scene content common to the first image frame and the second image frame." *Id.* at 1:49–51. The polygon is "warped" to remove "distortions" based on the

[16] The prior art status of Kwatra is addressed above.

[redacted]

movement information from the sensor. *See id.* at 1:51–55. According to Bell, the below figure "illustrates exemplary real-time video stabilization 400 for mobile devices based on on-board motion sensing in accordance with embodiments of the present invention":



Id. at Fig. 4 and 10:38–40. Image 410 "suffers from distortions due to camera motion" and image 420 is the corrected image. *Id.* at 10:41–50. The motion sensing enabling this correction is expressed "as a rotation in a global coordinate frame. The motion sensing system provides a series of angular velocity measurements with timestamps, which are interpolated and integrated to produce a function that describes the device orientation at any time t, expressed as the quaternion $q_g(t)$." *Id.* at 7:40–46. To ensure cropped portions do not exceed the borders of the original image, Bell employs a "look-ahead buffer to calculate a smoother path." *See id.* at 10:8–16.

b) Obviousness

Insta360 contends that the combination of Bell and Kwatra renders claims 1 and 5 obvious. Insta360 Br. at 129–136.

(1) Claim 1

Insta360 argues that Bell discloses all elements of claim 1 except element 1[g(iii)], which it contends would have been obvious in view of Kwatra. *See id.* Insta360 states that there is no dispute that Bell teaches all elements except element 1[g(iii)]. *Id.* at 129. GoPro's briefing confirms

[redacted]

there is no dispute for these limitations. *See* GoPro Br. at 67–68 and GoPro Reply at 26–28. The evidence supports that all elements except element 1[g(iii)] are disclosed in Bell. *See* Insta360 Br. at 129–136, *citing* Goodin Tr. at 1211:1–1214:9 and 1216:8–1217:1.

For element 1[g(iii)], Insta360's theory is essentially the same as for Pixel 2 and Kwatra—Bell discloses everything except minimization of rotational velocity and rotational acceleration in the capture trajectory, and that "it would have been obvious to combine Bell's 'look ahead' with Kwatra's minimization to achieve better smoothing in step 2 of EIS, motion smoothing." Insta360 Br. at 133, *citing* Goodin Tr. at 1215:7–18. GoPro's opposition is the same as well—Kwatra fails to disclose rotational camera movement subject to its minimization, and there is no otherwise no motivation to combine "computationally intensive" Kwatra with the "mobile device" of Bell. GoPro Br. at 67–68.

For the same reasons detailed above as to Kwatra, the evidence supports that even if combined, Bell and Kwatra do not disclose minimization of a combination of rotational velocity and rotational acceleration, as claimed. The evidence also demonstrates secondary indicia of nonobviousness, supporting that claim 1 is not invalid as obvious. The evidence does not support that claim 1 is obvious over the combination of Bell and Kwatra.

(2) Claim 5

Because claim 1 is not obvious in view of the combination of Bell and Kwatra, neither is claim 5.

VII. THE '840 PATENT

The '840 patent is titled "Systems and Methods for Stabilizing Videos" and relates to similar subject matter as the '894 patent—stabilizing video footage through electronic, as opposed to mechanical or optical, means. *See* '840 patent at Abstract. The patent teaches the same technique

[redacted]

of measuring actual camera motion, the trajectory, and, from that, generating virtual camera motion, called the smoothed trajectory, with the aim of approximating a user's intended motion, as shown below:

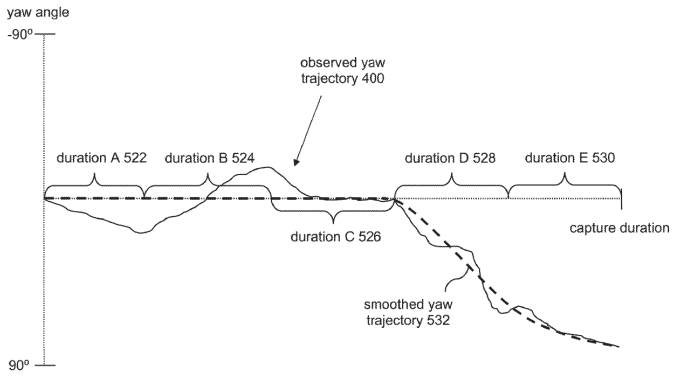


FIG. 5C

Id. at Fig. 5C. The '840 patent differs from the '894 patent in that it additionally teaches various parameters to "influence and/or direct how the smooth path/smoothed trajectory is generated" including, for example, a "weight-balance parameter," a "low-light high-pass parameter," and a "stickiness parameter." *Id.* at 21:17–25. The patent explains that: "[a] weight-balance parameter may refer to a parameter that controls the types of motion that are minimized in generation of the smoothed trajectory" such as rotational velocity and rotational acceleration; a "low-light high-pass parameter" can vary between 0 and 1 depending on whether low-light conditions exist, and if they exist, smoothing strength is reduced; and "stickiness" refers to "a parameter that control[s] the extent by which preceding portion(s) of the (observed) trajectory impacts determination of the smoothed trajectory." *Id.* at 21:25–22:41.

A. Claim Construction

1. Disputed Terms

The parties identify several claim construction disputes: (1) "a temporal horizon of motion experienced by the image capture device" (claim 1); (2) "the temporal horizon enabling

[redacted]

approximation of intentional motion of the image capture device while causing a delay in the determination of the smoothed trajectory" (claim 1); (3) "the punchout of the one or more extents of the visual content" (claim 1); and (4) "minimized" (claim 13). GoPro Br. at 71–76 and Insta360 Br. at 142–145. They are addressed below.

a) Temporal Horizon

The parties dispute the construction of "a temporal horizon of motion experienced by the image capture device" in claim 1. GoPro Br. at 71–72; GoPro Reply at 31–32; Insta360 Br. at 142; and Insta360 Reply at 35. GoPro contends "temporal horizon" means "the interval of the [trajectory] used to determine the smoothed trajectory." GoPro Br. at 71. Insta360 contends that "temporal horizon" and "temporal horizon of motion" are indefinite, but if not, then the entire phrase means "motion experienced by the image capture device in a duration that corresponds to successive future frames and is subsequent to a moment." Insta360 Br. at 142.

As to indefiniteness, Insta360's entire argument is:

> This term is indefinite. It is undisputed that "temporal horizon" and "temporal horizon of motion" are coined terms used only internally at GoPro. Tr. (Goodin) 1143:6-10 (citing RX-0331C (Derbanne) 210:20-22). The specification mentions each phrase only once without explaining their meanings. *Id*. 1143:11-14 (citing JX-0007, 9:20-28). It provides no "objective boundaries to the scope" of such coined terms. *Iridescent Networks, Inc. v. AT&T Mobility, LLC*, 933 F.3d 1345, 1353 (Fed. Cir. 2019).

Insta360 Br. at 142. Insta360's almost-boilerplate indefiniteness argument does not support anything close to the required clear and convincing evidence. As a matter of plain English, temporal, in the context of the '840 patent, means "time." This is clear from the specification, which explains that the temporal horizon relates to an interval over which motion may be assessed. '840 patent at 9:20–28. This is confirmed in claim 5, which specifically recites that the temporal horizon relates to an interval. This was persuasively explained by Dr. Schonfeld. Schonfeld Tr. at

[redacted]

186:8–188:16 ("The look-ahead is the portion of the original data in some time interval, and that time interval is the temporal horizon, which is depicted in green. It's how far into the future did the look-ahead look in order to make it -- in order to perform the filtering") and CDX-0002C.27. The evidence does not support that "temporal horizon" or the larger phrase in which it appears is indefinite.[17]

As for the proper construction, neither party's proposal is appropriate. There CAN BE no real dispute that "temporal horizon" refers to an interval, or duration, of time. *See* GoPro Br. at 72 and Insta360 Br. at 142. This is consistent with the specification. '840 patent at 9:20–28 ("To identify intentional motion, which is characterized by low frequencies, a sufficiently long temporal horizon of experienced motion may need to be used. . . . Longer intervals of the temporal horizon may enable better approximation of the intentional motion while causing longer delays (longer wait to determine smoothed trajectory)."). Thus, in a plain and ordinary sense, a "temporal horizon" of "motion experienced by the image capture device" is a time duration/interval of motion experienced by the image capture device.

GoPro's proposed construction includes terms that go well beyond this simple language including the purpose of the experienced motion. GoPro Br. at 71 ("…used to determine the smoothed trajectory"). It is improper to include this language as it is unrelated to the meaning of the phrase identified for construction. *See Phillips*, 415 F.3d at 1312-13 (claim construction is a matter of determining the meaning of selected terms). Insta360's construction similarly fails, seeking to specify relative timing between the motion and some other, unrecited, time periods.

---

[17] In reply, Insta360 criticizes GoPro for addressing the "wrong term" of "temporal horizon." Insta360 Reply at 35. This argument is rejected. To the extent Insta360 made a cogent argument, it argued that "temporal horizon" was indefinite. Insta360 Br. at 142.

[redacted]

Insta360 Br. at 142 (". . . corresponds to successive future frames and is subsequent to a moment."). This too goes beyond the meaning of any of the actual words in the claim element.

The phrase "a temporal horizon of motion experienced by the image capture device" is construed as "a time interval of motion experienced by the image capture device."

b) Approximation of Intentional Motion

The parties dispute the construction of the phrase "the temporal horizon enabling approximation of intentional motion of the image capture device while causing a delay in the determination of the smoothed trajectory" in claim 1. GoPro Br. at 72–74; GoPro Reply at 32–34; Insta360 Br. at 142–144; and Insta360 Reply at 35. Insta360 again contends "temporal horizon" is indefinite, but if not, then the entire phrase means "determining and preserving a user's intended motion for the image capture device at the moment while causing the determination of the smoothed path to wait for the image capture device to experience the motion, wherein the intended motion is not determined or preserved solely by applying any low-pass filter." Insta360 Br. at 143.GoPro refers to its proposed construction of "temporal horizon" and disputes Insta360's proposed construction. GoPro Br. at 72–74.

In context, the phrase reads, "wherein the determination of the smoothed trajectory based on the look-ahead of the trajectory includes use of a temporal horizon of motion experienced by the image capture device, *the temporal horizon enabling approximation of intentional motion of the image capture device while causing a delay in the determination of the smoothed trajectory*." '840 patent at claim 1 (emphasis added). The disputed phrase concerns how the temporal horizon has two effects: (1) "approximation of intentional motion of the image capture device"; and (2) "causing a delay in the determination of the smoothed trajectory." This is consistent with the specification. '840 patent at 9:20–28 ("To identify intentional motion, which is characterized by

[redacted]

low frequencies, a sufficiently long temporal horizon of experienced motion may need to be used. . . . Longer intervals of the temporal horizon may enable better approximation of the intentional motion while causing longer delays (longer wait to determine smoothed trajectory).”).

GoPro’s proposed construction is limited to “temporal horizon.” As a result, it does not address either of these two effects and can be discarded. The additional commentary in its reply brief regarding the frequency differentiation means by which the system “enabl[es] approximation of intentional motion” is beyond the meaning of the words of this phrase and is not accepted. GoPro Reply at 33 (“the ‘temporal horizon’ enables approximation of intentional motion not by explicitly ‘determining’ or ‘preserving’ the user’s intent, as Insta360 contends, but by enabling the system to distinguish between different frequencies of motion.”); *Phillips*, 415 F.3d at 1312-1313; *Kyocera*, 22 F.4th at 1378 (“Claim terms are generally given their plain and ordinary meaning, which is the meaning one of ordinary skill in the art would ascribe to a term when read in the context of the claims, specification, and prosecution history.”).

Insta360’s construction is a complete re-writing of the phrase that changes its meaning. To “enabl[e] approximation” is different from “determining and preserving.” Further, the reason the system experiences the delay, which Insta360’s construction states as “causing . . . to wait for the image capture device to experience the motion,” is obviously narrower than the actual claim language which recites, “causing a delay.” As to Insta360’s final construction language, “wherein the intended motion is not determined or preserved solely by applying any low-pass filter,” Insta360 justifies its inclusion based on the ’840 patent specification and GoPro’s statements before the PTAB. *See* Insta360 Br. at 143–144. Insta360 is correct that the specification discloses that a simple low-pass filter makes a smoother path but may not preserve a user’s intended motion.

[redacted]

’840 patent at 13:36–52. But the specification suggests this may be solved by combining the low-pass filter with a “look-ahead” technique of sufficient duration:

> Intentional motion may be characterized by lower frequency motion than unintentional motion. Unintentional motion may be characterized by higher frequency motion (e.g., jitter, shake) than intentional motion. *To identify intentional motion, which is characterized by low frequencies, a sufficiently long temporal horizon of experienced motion may need to be used*. Thus, to stabilize visual content, a subsequent portion of the trajectory is used to determine the smoothed trajectory. Longer intervals of the temporal horizon may enable better approximation of the intentional motion while causing longer delays (longer wait to determine smoothed trajectory).

Id. at 9:17–28 (emphasis added); *see id.* at 14:36–58. The language of the claim and the specification do not support the specific exclusion of a low-pass filter.

Insta360 points to GoPro’s arguments at the PTAB that the claimed invention enables the system to distinguish between intentional and unintentional movements, while the prior art “simply enables a form of low-pass filtering to reduce jitter and is not used for identifying intentional motion versus unintentional motion.” Insta360 Br. at 144 and RX-2043.21. That the prior art “enables a form of low-pass filtering,” however, does not support a disclaimer of all low-pass filtering, as Insta360 proposes.

Based on the intrinsic evidence, “the temporal horizon enabling approximation of intentional motion of the image capture device while causing a delay in the determination of the smoothed trajectory” is not indefinite and will be accorded its plain and ordinary meaning of “the interval of time enabling approximation of intentional motion of the image capture device while causing a delay in the determination of the smoothed trajectory.”

c) Punchout

The parties dispute the construction of “the punchout of the one or more extents of the visual content,” in claim 1. GoPro Br. at 74–76; GoPro Reply at 34–35; Insta360 Br. at 144; and

[redacted]

Insta360 Reply at 35. GoPro contends it means "one or more portions of the visual content." GoPro Br. at 74–76. Insta360 contends that "punchout" is indefinite. Insta360 Br. at 144.

The evidence does not support that "punchout," by itself, or the longer phrase, "the punchout of the one or more extends of the visual content," is indefinite. A plain and ordinary meaning of "punchout" is a portion of a whole that is punched out, as in removed from its surroundings (e.g., a 3-hole puncher for paper). The fact that GoPro inventor, Mr. Derbanne, stated that GoPro coined term is not particularly relevant and does not support that it is indefinite. *See* Insta360 Br. at 144, *citing* RX-0331C (Derbanne Tr.) at 61:23–62:3.

Further, the fact that claim 1 introduces "the punchout" with "a punchout of the visual content," and then uses it a second time as "the punchout of the one or more extents of the visual content" does not mean the term is indefinite. *In re Downing*, 754 Fed. Appx 988, 996 (Fed. Cir. 2018) ("[T]he lack of an antecedent basis does not render a claim indefinite as long as the claim apprises one of ordinary skill in the art of its scope and, therefore, serves the notice function required by § 112 ¶ 2."). When read in context, it is clear both recitations of "the punchout" refer to the same region of the image defined by extents of a viewing window:

> determine placement of the viewing window for the visual content with respect to the field of view of the visual content based on the smoothed trajectory of the housing, *the viewing window defining one or more extents of the visual content to be included within a punchout* of the visual content; and
>
> generate the stabilized visual content of a video based on the viewing window, the stabilized visual content including *the punchout of the one or more extents of the visual content within the viewing window*, wherein inclusion in the stabilized visual content of the one or more extents of the visual content within the viewing window effectuates stabilization of the visual content via selective cropping.

'840 patent at claim 1 (emphasis added). To the extent there is an antecedent basis issue, it is minor and does not meet the clear and convincing standard needed for indefiniteness. *Microsoft*, 131 S. Ct. at 2243.

[redacted]

Insta360 does not otherwise offer a construction. *See* Insta360 Br. at 144. GoPro's proposal of "one or more portions of the visual content for presentation" is not inconsistent with the overall claim, but the concept of presentation is how the punchout is used and not what it is.

Based on the intrinsic evidence, "the punchout of the one or more extents of the visual content" will be given its plain and ordinary meaning which is best expressed as written. *US Surgical Corp. v. Ethicon, Inc.*, 103 F.3d 1554, 1568 (Fed. Cir. 1997) (claim construction "is not an obligatory exercise in redundancy").

d) Minimized

The parties dispute the proper construction of the word "minimized" in dependent claim 13, which recites, "wherein the weight-balance parameter controls types of motion that are minimized in smoothed trajectory generation, the types of motion including rotational velocity and rotational acceleration." GoPro Br. at 76; GoPro Reply at 35; Insta360 Br. at 144–145; and Insta360 Reply at 36. GoPro relies on its discussion in the context of the '894 patent. GoPro Br. at 76. Insta360 contends the word is indefinite, but if not, it must include "based on an objective function that consists of groups of terms," as in the '894 patent. Insta360 Br. at 144–145.

The evidence supports that "minimized" is not indefinite. In a plain and ordinary sense, "minimized" means made smaller. The '840 patent specification discusses minimization in the context of the camera path estimates the system calculates, with the same mathematical function in the '894 patent. '840 patent at 17:40–60. As does the '894 patent, the '840 patent explains that "the smoothed trajectory may be determined based on minimization of a rotational velocity of the image capture device/housing of the image capture device and a rotational acceleration of the image capture device/housing of the image capture device while respecting a set of constraints."

[redacted]

’840 patent at 17:32–37. The specification thus provides objective guidance to one of skill as to what “minimized” means, which is “while respecting a set of constraints.”

The evidence supports that the word “minimized” is not indefinite and means “minimized while respecting a set of constraints.”

B. Infringement

GoPro contends that the accused products infringe claims 13 and 14, along with intervening claim 1. GoPro Br. at 79–90 and GoPro Reply at 35–40.

1. Claim 1

a) Undisputed Elements

GoPro states that Insta360 does not dispute that the accused products meet elements 1[pre]–1[d], 1[h], and 1[i]. GoPro Br. at 79, 84–85. Insta360’s briefing confirms there is no dispute for these elements. *See* Insta360 Br. at 145–152 and Insta360 Reply at 36–41. The evidence supports that these elements are met in the accused products. *See* GoPro Br. at 79, *citing* Schonfeld Tr. at 239:13–242:17, 245:17–248:11, 258:6–15, and 261:7–262:15.

b) Element 1[e]

Element 1[e] recites, “one or more physical processors configured by machine-readable instructions to” perform certain operations. ’840 patent at claim 1. GoPro contends that the accused products meet this claim element in two ways: first, through a processor located within the camera (represented by the X4), and second, through a processor located within an external device (represented by devices running the representative Mac application). GoPro Br. at 79. Insta360 disputes the limitation is met and refers to its arguments on the ’894 patent. Insta360 Br. at 146 (“no ‘physical processors’ for the ‘off-line system’”). In response, GoPro similarly incorporates its ’894 patent arguments (GoPro Reply at 35) in which it contends that the accused cameras satisfy

[redacted]

all elements concerning the camera, and the accused off-camera systems satisfy the "machine-readable instructions" elements in an induced infringement theory (*see id.* at 17–18).

With that understanding, as determined above for the '894 patent, the evidence supports that the accused cameras include a processor with machine-readable instructions, and the off-camera systems include a processor with machine-readable instructions. Schonfeld Tr. at 248:24–249:17. The evidence supports that element 1[e] is met.

c) Element 1[f]

Element 1[f] recites, "determine a trajectory of the housing during the capture duration based on the position information, the trajectory reflecting the rotational positions of the housing at the different moments within the capture duration, the trajectory including a first portion corresponding to a first moment within the capture duration and a second portion corresponding to a second moment subsequent to the first moment within the capture duration" '840 patent at claim 1. GoPro contends that the accused products meet this element by [redacted]. GoPro Br. at 79. Then, according to GoPro, the cameras [redacted], and the off-camera systems "similarly process[] recorded video to determine the observed trajectory from stored positional data, [redacted]." *Id.* at 79–80. GoPro contends that "[t]he sequence of IMU data at a collection of times forms the observed trajectory for both the online and offline systems." *Id.* at 80. Insta360 disputes this element is met by referring to its arguments on the '894 patent. Insta360 Br. at 146 ("no 'determine a trajectory' for the 'on-line' and 'off-line' systems").

As determined above, the evidence supports that the camera systems determine an observed trajectory based on [redacted]. Schonfeld Tr. at

[redacted]

210:17–214:3 ([redacted])) and 231:2-9 ([redacted]); and CX-1195C (Sang Dep.) at 45:13–19. This is the natural purpose of collecting gyroscope and accelerometer information. CX-0767C.10 (Insta360 technical presentation). The evidence supports element 1[f] is met.

d) Element 1[g(i)]

Element 1[g(i)] recites, "determine a smoothed trajectory of the housing based on a look-ahead of the trajectory and one or more of a weight-balance parameter, a low-light high-pass parameter, and/or a stickiness parameter." '840 patent at claim 1. GoPro contends that the accused products meet this element by using a [redacted], as discussed for the '894 patent, and then also by using a weight-balance parameter and a low-light high-pass parameter. GoPro Br. at 80–82. For the weight-balance parameter in the cameras, GoPro refers to [redacted] for minimizing a combination of rotational velocity and rotational acceleration" in addition to [redacted] and [redacted] parameters implemented in the [redacted] function. *Id.* at 81-82. For the off-camera systems, GoPro contends the operations are "basically similar in principle." *Id.* at 82 (internal quotes omitted). For the low-light high-pass parameter, GoPro points to [redacted] and [redacted] in both the camera and off-camera systems. *Id.* at 82.

Insta360 disputes this element for a variety of reasons. It first incorporates its argument concerning a similar limitation of the '894 patent. Insta360 Br. at 146 ("no 'determine a smoothed trajectory' based on 'a look-ahead of the trajectory' for 'on-line' and 'off-line' systems"). Then, specific to the '840 patent, it contends there is no "weight-balance parameter" or "low-light high-pass parameter" in either the cameras or off-camera systems. Insta360 Br. at 147–150.

[redacted]

(1) Look-Ahead

As discussed above, Insta360 is not persuasive with respect to use of a look-ahead. The evidence supports that both the cameras and off-camera systems apply [redacted] and because [redacted], the resulting "smoothed trajectory" is "based on a look-ahead." *See, e.g.*, Schonfeld Tr. at 234:24–237:12; CX-0767C.10 (Insta360 presentation); Goodin Tr. at 1158:1–1159:7; and CX-0983C.1.

(2) Weight-Balance Parameter

As for "weight-balance parameter," it is not initially clear which parameters GoPro accuses, as its initial brief mentions both "[redacted] for minimizing a combination of rotational velocity and rotational acceleration" and then also the cutoff frequency for the low-pass filter ([redacted] "[redacted] GoPro Br. at 81–82, *citing* Schonfeld Tr. at 258:24–260:8, 219:3–220:9. GoPro's reply brief does not mention [redacted] (*see* GoPro Reply at 35–36) and Insta360 does not seem to understand any particular parameter within the [redacted] as being accused (*see* Insta360 Br. at 147 ("As Dr. Schonfeld conceded that [redacted] . . . He identified no other parameters or functions in the editing applications.")). It therefore seems likely that GoPro mentions Kalman filters for element 1[g(i)] because "weight-balance parameter" also appears in dependent claim 13, in which the parameter must "control[] types of motion that are minimized in smoothed trajectory generation, the types of motion including rotational velocity and rotational acceleration." '840 patent at claim 13. This condition is not recited in 1[g(i)] and GoPro's argument is not clear. Accordingly, only the cutoff

[redacted]

frequency involved in the low-pass filter of [redacted] will be considered for the "weight-balance parameter" of claim 1.[18, 19]

Turning to the cut-off frequency value (a.k.a. [redacted]"), there is no real dispute from Insta360 that it is a "weight-balance parameter" and that it exists in the accused cameras through [redacted] Instead, Insta360 argues a more global point that the cut-off frequency, by virtue of being involved in [redacted] contributes to the "observed trajectory" and not the "smoothed trajectory," as required in element 1[g(i)]. *See* Insta360 Br. at 147 and Insta360 Reply at 37. This is not persuasive. Element 1[g(i)] requires only that that smoothed trajectory be "based on" the weight-balance parameter. '840 patent at claim 1 ("determine a smoothed trajectory of the housing based on a look-ahead of the trajectory and one or more of a weight-balance parameter . . ."). If the parameter is used to clean-up, correct, or adjust raw gyroscope data (as Insta360 alleges), then the eventual "smoothed trajectory" is "based on" that parameter.[20] The evidence supports that the "weight-balance parameter" and element 1[g(i)], overall, is met in the accused cameras.

---

[18] It may also be that GoPro mentions Kalman filters for limitation [1g(i)] because the parties at one point had a claim construction dispute over the meaning of "weight-balance parameter." *See, e.g.*, Schonfeld Tr. at 258:24–259:19 and CDX-0002C.138. Yet this dispute, and the parties' competing constructions, are not included in any post-hearing brief and are waived under Ground Rule 13.1. Order No. 2.

[19] Insta360 similarly presents several non-infringement arguments that [redacted] cannot be the "weight-balance parameter" because it does not "modify any motion, let alone minimize motion including rotational velocity and rotational acceleration." Insta360 Reply at 37 ("Nor does it show minimizing rotational velocity and rotational acceleration."). Rotational velocity and rotational acceleration are not in the language of element 1[g(i)], however, so these arguments are not relevant.

[20] This is like Insta360's argument for element 1[g(i)] of the 894 patent. Insta360 Br. at 96 ("The code shows [redacted]").

[redacted]

For the off-camera systems, the evidence does not support that a "weight-balance" parameter exists. Dr. Schonfeld admitted that [redacted] and by extension the cut-off frequency expressed by [redacted] is not included in the off-camera systems. Schonfeld Tr. at 1514:25–1517:19; and *see* Goodin Tr. at 1183:16–24. GoPro suggests that Dr. Schonfeld identified other parameters are a "weight-balance parameter." GoPro Br. at 87 ("Mr. Goodin, however, ignores the other parameters identified by Dr. Schonfeld.") and GoPro Reply at 36 ("Dr. Schonfeld identified other components within the editing application, and opined that the[ir] systems satisfy the claim [redacted]."). But he did not. Schonfeld Tr. at 219:13–222:6 (discussing [redacted] 258:24–260:8 (discussing [redacted]). An [redacted] document stating that "[redacted]," is not sufficient to show a weight-balance parameter. GoPro Br. at 82, *citing* CX-1588C.4. In fact, the same document supports that the [redacted] is a difference between the cameras and off-camera systems. CX-1588C.1 ("[redacted]"). The evidence does not support that there is a "weight-balance parameter" in the accused off-camera systems.

(3) Low-Light High-Pass Parameter

As for "low-light high-pass parameter," Insta360 is correct that [redacted] does not appear in GoPro's prehearing brief as an alleged "low-light high-pass parameter," meaning that theory is waived under Ground Rule 9.2. Insta360 Reply at 38 and *see* GoPro Prehearing Br. at 89 and Order No. 2. Contrary to GoPro's argument in its reply brief, Dr. Schonfeld did not discuss this parameter either. *Compare* GoPro Reply at 36, *citing* Schonfeld Tr. at 264:6–9 *with* Schonfeld

[redacted]

Tr. at 264:6–9 ("[redacted]."). For the accused cameras, GoPro contends that [redacted] because it "can be configured to [redacted]." GoPro Br. at 82, *citing* Schonfeld Tr. at 263:12–264:12; RPX-0063C-SC.181; and RPX-0061C-SC.336. The evidence supports [redacted] has this effect and is therefore a "low-light high-pass parameter" based on the source code excerpt explained by Dr. Schonfeld:

[redacted]

RPX-0063C (showing [redacted]); *see* Schonfeld Tr. at 263:16–23 (explaining the code [redacted]).

Insta360 contends that Dr. Schonfeld "cites to no code or other evidence," but as noted above, that is not correct. *See* Insta360 Br. at 150. Mr. Goodin testified that "[redacted]). Goodin Tr. at 1185:4–7. However, he offers no alternative explanation for why "[redacted] exists or for its purpose.

Insta360 argues that "low-light high-pass parameter" should have a narrow scope based on arguments made by GoPro to the PTAB in an IPR of the '840 patent. Insta360 Br. at 150, *citing*

[redacted]

RX-2018.22; *see* Insta360 Reply at 39. GoPro's arguments, however, do not rise to the level of disclaimer. When read in context, GoPro distinguished a "coefficient to handle motion blur" in the prior art because it had no connection to low-light conditions:

> [Shi's] coefficient is applied generally to reduce the perception of unnatural blur, without addressing conditions like low-light environments. . . By contrast, the low-light high-pass parameter in the '840 Patent is proactively triggered by detecting low-light conditions that would lead to increased exposure times and, consequently, greater potential for motion blur.

RX-2018.20–21. GoPro's surrounding argument on the "low-light high-pass parameter," such as it being "a proactive and finely turned control mechanism," is reasonably interpreted as an explanation, as opposed to limiting the claim language.

Insta360 further argues that [redacted] is never actually used because the function that generates it [redacted] (shown above in RPX-0063C). Insta360 Br. at 149. GoPro does not dispute this is the case with the current version of software as represented by the X4 camera. But GoPro counters that the prior model, X3, "[redacted]" GoPro Reply at 36–37, *citing* RPX-0061C-SC.584. Thus, the issue is whether this source code, present but practically disabled, is sufficient for infringement.

In similar circumstances, the Federal Circuit has held that disabling otherwise infringing code via a flag or other means does not avoid infringement of a limitation reciting instructions for causing a computer to perform actions:

> In this case, Finjan's non-method claims describe capabilities without requiring that any software components be "active" or "enabled." The system claims recite software components with specific purposes: "a logical engine for preventing execution" ('194 patent claim 32), "a communications engine for obtaining a Downloadable" ('780 patent claim 9), or "a linking engine ... for forming a sandbox package" ('822 patent claim 12) (emphases added). The storage medium claims similarly cover capability. Claim 65 of the '194 patent recites a "computer-readable storage medium storing program code for causing a server that serves as a gateway

[redacted]

> to a client to perform the steps of: receiving ...; comparing ...; and preventing execution....” This language does not require that the program code be “active,” only that it be written “for causing” a server (′194 patent claim 65) or a computer (′780 patent claim 18) to perform certain steps.

Finjan, Inc. v. Secure Computing Corp., 626 F.3d 1197, 1204-5 (Fed. Cir. 2010). The court in *INVT SPE LLC v. Int’l Trade Comm’n*, cited by Insta360, described the *Finjan* outcome as “the claims described capabilities and did not require software components be active or enabled” and “the claims recite a device with the capability of performing the recited functions when in operation without any modification or further programming.” 46 F.4th 1361, 1373–74 (Fed. Cir. 2022). The court added, “‘[w]here claim language recites ‘capability, as opposed to actual operation, an apparatus that is ‘reasonably capable’ of performing the claimed functions ‘without significant alterations’ can infringe those claims.’” *Id.* at 1376, *citing ParkerVision, Inc. v. Qualcomm Inc.*, 903 F.3d 1354, 1362 (Fed. Cir. 2018).

Claim 1 of the ’840 patent recites, “one or more physical processors configured by machine-readable instructions to . . .” ’840 patent at claim 1. Per the claim language, the issue is whether the claimed one or processors have a certain configuration via their machine-readable instructions. This reflects a capability rather than actual operation, as was the case in *Finjan* in which the claim recited a “computer-readable storage medium” for performing claimed methods. 626 F.3d at 1201 (discussing U.S. Patent No. 6,092,194); *see* U.S. Patent No. 6,092,194 at claim 65 (“A computer-readable storage medium storing program code for causing a server that serves as a gateway to a client to perform the steps of:”). Even the claim in *INVT*, which used “simple-present-tense” verbs and recited no instructions or storage medium-like elements, was held to require only capability and not actual operation. *See* 46 F.4th at 1365–66, 1373–74.

The evidence supports that the accused cameras include code that uses

[redacted]

[redacted]. The fact that [redacted]. The evidence supports that the "low-light high-pass parameter" is met in the accused cameras. For this additional reason, the evidence supports that the accused cameras meet element 1[g(i)].

The evidence also does not support that there is a "low-light high-pass" parameter in the off-camera systems. With [redacted] waived, that leaves [redacted] and Dr. Schonfeld admitted on cross-examination that [redacted] is not present in any of the source code cited for the accused off-camera systems. Schonfeld Tr. at 1517:21–1518:18. His direct testimony, in which he stated that [redacted]" is based on the same source code file explored during cross [redacted] and is unsupported. *Id.* at 264:6–9. The evidence does not support that a "low-light high-pass parameter" is present in the accused off-camera systems. Without either a weight-balance parameter or a low-light parameter, the evidence supports that the accused off-camera systems do not meet element 1[g(i)].

e) Element 1[g(ii)]

Element 1[g(ii)] recites, "the look-ahead of the trajectory including use of a subsequent portion of the trajectory to determine a preceding portion of the smoothed trajectory such that a portion of the smoothed trajectory corresponding to the first portion of the trajectory is determined based on the second portion of the trajectory, the smoothed trajectory having smoother changes in the rotational positions of the housing than the trajectory." '840 patent at claim 1. Insta360 does

not dispute this element is met apart from its dispute for element 1[g(i)]. *See* Insta360 Br. at 146 and Insta360 Reply at 36.

GoPro contends that the accused products meet this element through process discussed above, with GoPro Br. at 82. Dr. Schonfeld credibly testified that "." Schonfeld Tr. at 251:9–13.

The evidence supports that this element is met in both the camera and off-camera systems.

f) Element 1[g(iii)]

Element 1[g(iii)] recites, "wherein the determination of the smoothed trajectory based on the look-ahead of the trajectory includes use of a temporal horizon of motion experienced by the image capture device, the temporal horizon enabling approximation of intentional motion of the image capture device while causing a delay in the determination of the smoothed trajectory." '840 patent at claim 1. GoPro contends that the accused products meet element 1[g(iii)] through the [which] enables the '840 Accused Products to approximate intentional user motion." GoPro Br. at 83, *citing* Schonfeld Tr. at 260:9–18; *see id.* at 90, *citing* Schonfeld Tr. at 260:9–261:3; and GoPro Reply at 39, *citing* Schonfeld Tr. at 237:13–25 and 260:9–261:3. Insta360 challenges whether GoPro has shown how the alleged "temporal horizon" "enables approximation of intentional motion." Insta360 Br. at 151 and Insta360 Reply at 39.

[redacted]

GoPro has not shown how [redacted] in the accused products "enabling approximation of intentional motion," as claimed. In addressing this claim element, Dr. Schonfeld presented the following slide:

[redacted]

CDX-0002.141. The entirety of his testimony was:

> Q. So turning to slide 140, did you find 1[g(iii)] to be satisfied with -- under the proposed construction by GoPro?
>
> A. So, again, the construction here relates to temporal horizon, and this is about enabling the approximation of intentional motion and looking at that time interval of the look-ahead process. Under both constructions, Insta360 and GoPro's proposed construction, in my view, this is satisfied because if you go to the next slide, number 142 –
> Q. 141?

[redacted]

[redacted]

Q. Turning to 1[i], or Claim 1, this is the double-cropping issue; is that correct?

Schonfeld Tr. at 260:9–261:8. Dr. Schonfeld does not explain how a [redacted] in the accused products enables the approximation of intentional motion. It appears he may have assumed that to be true, but he did not explain why this is so in the accused products. A specific requirement of element 1[g(iii) is "enabling approximation of intentional motion." Through its expert, GoPro did not present substantial evidence that this requirement is met in the accused products because its expert did not address it. GoPro has the burden of establishing infringement and has not met its burden. *Certain Electrical Connectors and* Cages, Inv. No. 337-TA-1241, Comm'n Op. at 31 (Sept. 30, 2022) (EDIS Doc. ID 781376). The evidence does not support that element 1[g(iii)] is met in the accused products.

2. Claim 13

Claim 13 depends from claim 1 and further recites, "wherein the weight-balance parameter controls types of motion that are minimized in smoothed trajectory generation, the types of motion including rotational velocity and rotational acceleration." '840 patent at claim 13. As discussed above, only the low-pass filter cutoff frequency [redacted] is considered as the "weight-balance parameter," and the evidence supports that the cutoff frequency is applied as part of the [redacted] *See* Goodin Tr. at 1170:22–1173:18. This is consistent with the translated Insta360 [redacted] document cited by GoPro. CX-1588C.3 ("[redacted]") and GoPro Br. at 85. So the cutoff frequency, at most, impacts rotational velocity values coming from the IMU's gyroscope, but not rotational acceleration as required by claim 13. This is in

[redacted]

addition to the fact that claim 13 is not met because it is dependent on claim 1 which is not infringed.

The evidence does not support that claim 13 is not infringed by the accused products.

3. Claim 14

Claim 14 depends from claim 1 and further recites "wherein the low-light high-pass parameter controls amount or strength of smoothing performed in smoothed trajectory generation and an extent of motion blur compensation applied in determination of the smoothed trajectory." '840 patent at claim 14. As determined above, Dr. Schonfeld's testimony that [redacted]" (Schonfeld Tr. at 263:12–264:12) goes effectively unrebutted in the accused cameras. GoPro has not shown a "low-light high-pass parameter" in the off-camera systems, however. The evidence supports that claim 14 is met in the accused cameras. However, because claim 14 depends from claim 1 which is not infringed, claim 14 is not infringed either.

4. Redesigns

The parties agree that Insta360 has introduced several versions of redesigned products into the investigation pertaining to the '840 patent: redesigns regarding look-ahead, for both cameras and off-camera systems and redesigns for the "low-light high-pass parameter," for both cameras and off-camera systems. Insta360 Br. at 169 and GoPro Br. at 91–92.

GoPro does not contend the look-ahead redesign in the cameras infringes claim 1. GoPro Br. at 91. As for the look-ahead redesign in the off-camera systems, as discussed, consideration of [redacted] meets element 1[g(ii)]. GoPro does not appear

[redacted]

to contend the future frame remains in the redesign. GoPro Br. at 91. As a result, the look-ahead redesign for the off-camera systems does not infringe.

As for the low-light high-pass parameter redesign in the cameras, Insta360 explains, "the X4 redesigns removed [redacted], which is the alleged 'low-light high-pass parameter' in 1[g](i)." Insta360 Br. at 169, *citing* Goodin Tr. at 1193:1–1194:7. GoPro does not contend this change continues to infringe claim 14. GoPro maintains that the redesign "continue[s] to infringe claim 13," and by extension, claim 1, as alleged for the accused products. As the evidence does not support that claims 1 or 13 are infringed by any accused product, the camera redesigns also do not infringe any asserted claim.

As for the low-light high-pass parameter redesign in the off-camera systems, Insta360 explains that "the Mac Studio redesigns removed [redacted] Insta360 Br. at 69. GoPro disputes that a deletion of [redacted] has any effect on the accused [redacted] and therefore infringement (GoPro Br. at 91–92), but, regardless, the evidence does not support that claims 1, 13, or 14 are infringed by any accused off-camera product, so these redesigns likewise do not infringe.

5. Indirect Infringement

GoPro contends, "As demonstrated above in the context of the '894 Patent . . . Insta360 induces infringement by encouraging and instructing its customers and distributors to infringe by using its FlowState stabilization feature." GoPro Br. at 91. Because the accused products do not directly infringe, there is no indirect infringement.

C. Technical Prong

GoPro contends that the domestic industry products, represented by the Hero7 Black, practice claims 1, 13, and 14.

[redacted]

1. Claim 1

a) Undisputed Elements

GoPro states that Insta360 does not dispute that the domestic industry products meet all elements of claim 1 except for element 1[g(iii)]. GoPro Br. at 76. This is confirmed by Insta360's briefing. *See* Insta360 Br. at 152–153 and Insta360 Reply at 41. The evidence supports that the domestic industry products meet these elements. *See* GoPro Br. at 76–78, *citing* Schonfeld Tr. at 294:3–296:15, 298:4–17, 287:15–292:12, and 299:12–303:11.

b) Element 1[g(iii)]

Element 1[g(iii)] recites, "wherein the determination of the smoothed trajectory based on the look-ahead of the trajectory includes use of a temporal horizon of motion experienced by the image capture device, the temporal horizon enabling approximation of intentional motion of the image capture device while causing a delay in the determination of the smoothed trajectory." GoPro contends this element is met in the domestic industry products based on a document [redacted] GoPro Br. at 77 and GoPro Reply at 40. Insta360 argues that there is no evidence as to how intentional motion is approximated, and the domestic industry products have two stabilizers that do not work together and do not meet the language of this element. Insta360 Br. at 152–153.

The evidence supports that the domestic industry products identify a sufficiently long temporal horizon as approximating intentional motion of the camera during recording. GoPro Hypersmooth documentation states: [redacted] CX-0609C.2. Dr. Schonfeld also identified a

[redacted] as reflecting this functionality, which was not disputed by Insta360's expert. Schonfeld Tr. at 302:3–6 and Goodin Tr. at 1218:9–1220:18.

Insta360 identifies a Hypersmooth document that identifies a [redacted] (JX-0051C.3–4 ([redacted]) does not take away from the otherwise clear description of the first stabilizer. Further, Mr. Goodin's opinion that the minimization formula presented in the Hypersmooth documents [redacted] (Goodin Tr. at 1219:3–10, *citing* CX-0611C.4) may be true, but GoPro does not contend that that equation accomplishes [redacted] and Insta360 does not reconcile its position with the clear disclosure that "a sufficiently long temporal horizon is needed to detect the intentional motion."

The evidence supports that element 1[g(iii)] and claim 1 are practiced by the domestic industry products.

2. Claim 13

GoPro contends the domestic industry products practice claim 13. GoPro Br. at 78. Insta360 does not dispute this practice apart from its disputes as to claim 1. *See* Insta360 Br. at 152–153 and Insta360 Reply at 41. The evidence supports that the domestic industry products include weight-balance parameters within a rotational velocity and rotational acceleration minimization function, and thereby contribute to a smoothed camera path. Schonfeld Tr. at 303:12-304:7 and CX-0609C.3. The evidence supports that claim 13 is practiced by the domestic industry products.

[redacted]

3. Claim 14

GoPro contends the domestic industry products practice claim 14. GoPro Br. at 78. Insta360 does not dispute this practice apart from its disputes as to claim 1. *See* Insta360 Br. at 152–153 and Insta360 Reply at 41. The evidence supports that the domestic industry products include a "motion blur masking control" parameter that is responsive to exposure time (*i.e.*, low-light conditions) and controls the gain of a high-pass filter. JX-0051C.2 and Schonfeld Tr. at 304:8–18. The evidence supports that claim 14 is practiced by the domestic industry products.

D. Validity

Insta360 contends the asserted claims are invalid based on the prior art.

1. Pixel 2 and Kwatra

Insta360 contends that the Pixel 2, discussed above for the '894 patent, anticipates claims 1 and 14, and when combined with Kwatra, renders claim 13 obvious. Insta360 Br. at 153–161.

a) Overview

Given GoPro's assertion that the priority date of the '840 patent is September 19, 2018, GoPro Br. at 5, the evidence supports that Pixel 2 is prior art under 35 U.S.C § 102(a) based on its release date of October 4, 2017. Insta360 Br. at 153–161 and Insta360 Reply at 41–44. The evidence supports that Kwatra issued on September 10, 2013, and is prior art to the '840 patent under 35 U.S.C § 102(a). This is not disputed by GoPro. *See id*.

An overview of Pixel 2 and Kwatra was provided in connection with the '894 patent.

b) Anticipation

Insta360 contends that Pixel 2 anticipates claims 1 and 14. Insta360 Br. at 153–159 and 161.

[redacted]

(1) Claim 1

Insta360 argues that Pixel 2 discloses all elements of claim 1. Insta360 Br. at 153–160. Of these, GoPro disputes elements 1[g(i)] and 1[h]. GoPro Br. at 92–94 and GoPro Reply at 41–44. For those limitations not in dispute, the evidence supports they are disclosed in Pixel 2. *See* Insta360 Br. at 153–159, *citing* Goodin Tr. at 1234:17–1237:4 and 1240:19–1245:3.

Element 1[g(i)] recites, "determine a smoothed trajectory of the housing based on a look-ahead of the trajectory and one or more of a weight-balance parameter, a low-light high-pass parameter, and/or a stickiness parameter." Insta360 contends that a lookahead is explicitly identified in the Pixel 2 description and that a [redacted] Insta360 Br. at 155–156. GoPro does not dispute the disclosure of "lookahead," but argues that [redacted]. GoPro Reply at 42–44.

The evidence supports that lookahead is present in Pixel 2. Documentation describing Pixel 2 states "we push the incoming frames into a queue to defer the processing. This enables us to *lookahead* at future camera motions, using machine learning to accurately predict the user's intention." RX-1567.7 (emphasis in original) and Goodin Tr. at 1198:4–23 (discussing similar requirement in '894 patent) and 1237:9–16.

The evidence also supports a "low-light high pass parameter" is present in Pixel 2. [redacted]. RX-1362C.1. One way to address this problem is to [redacted]." *Id.* "[redacted]

[redacted]

[redacted]." *Id*. Thus, the solution in Pixel 2 is to add [redacted]

[redacted] (1)

Id. [redacted], [redacted]. *Id*. at 2. Mr. Goodin persuasively explained that:

[redacted]

Goodin Tr. at 1239:6–15.

Dr. Schonfeld testified that the claimed low-light high-pass parameter must be part of the entire smoothing operation. He contended that this is not the case in the Pixel 2 because first the [redacted] Schonfeld Tr. at 1490:9–24.

The claim, however, does not require that the low-light high-pass parameter be part of the entire smoothing operation. Instead, the claim requires that the smoothed trajectory be based on a low-light high-pass parameter. This parameter must be used to output what is the smoothed trajectory, in the case on Pixel 2, [redacted] In Pixel 2, [redacted] *See* Goodin Tr. at 1239:6–15. The evidence supports that element 1[g(i)] is disclosed in Pixel 2.

[redacted]

Element 1[h] recites, "determine placement of the viewing window for the visual content with respect to the field of view of the visual content based on the smoothed trajectory of the housing, the viewing window defining one or more extents of the visual content to be included within a punchout of the visual content." Insta360 contends that this element is met in Pixel 2 because it uses virtual camera motion (*i.e.*, "smoothed trajectory") to create a punchout of the total image frame for each frame, shown in a publicly available video explaining the technique. Insta360 Br. at 158, *citing* RX-1569. GoPro contends that "the video itself shows that the purported 'viewing window' maintains a *fixed position*, with the background field of view panning within its fixed-placement and fixed-size boundaries." GoPro Br. at 93 (emphasis by GoPro).

The evidence supports that element 1[h] is met in Pixel 2. The sample video shows on the right a viewing window, defining the stabilized punchout, having a narrower field of view than the total captured content, and moving constantly *with respect to* that total captured content based on the underlying smoothing algorithms, as shown in example screenshots below:

[redacted]

RX-1569 at 0:00–0:03. That the viewing window remains fixed with respect to the teal border is irrelevant. The evidence supports that element 1[h] is disclosed in Pixel 2 and that claim 1 is invalid as anticipated.

(2) Claim 14

Claim 14 depends from claim 1 and recites, “wherein the low-light high-pass parameter controls amount or strength of smoothing performed in smoothed trajectory generation and an

[redacted]

extent of motion blur compensation applied in determination of the smoothed trajectory." Insta360 argues that Pixel 2 discloses the additional elements of claim 14. *See* Insta360 Br. at 161. Aside from the issues it raises as to claim 1, GoPro does not substantively dispute that Pixel 2 discloses claim 14. *See* GoPro Br. at 95–96 and GoPro Reply at 41–44.

Instead, GoPro argues that Insta360 waived an anticipation argument for claim 14 because "[a]t the hearing, Insta360 only argued that claim 14 is obvious over Pixel 2 and Kwatra, making no assertion that Pixel 2 alone anticipates the claim." GoPro Br. at 42, *citing* Goodin Tr. at 1249:3–15. While GoPro is correct that Insta360 only explicitly sought testimony from its expert under an obviousness theory based on the combination of Pixel 2 and Kwatra, Tr. at 1249 at 3–5, the record supports that Mr. Goodin specifically addressed the content of claim 14 in addressing anticipation with respect to claim 1. In addressing a document describing Pixel 2's motion blur masking, Mr. Goodin testified that [redacted] the low-light high-pass parameter, which because [redacted]. RX-1362C.1–2 and Mr. Goodin Tr. at 1239:6–15. The record supports that though not presented in the clearest way, Insta360 demonstrated that Pixel 2 discloses the elements of claim 14. The evidence supports that claim 14 is anticipated by Pixel 2.

c) Obviousness

Claim 13 depends from claim 1 and recites "wherein the weight-balance parameter controls types of motion that are minimized in smoothed trajectory generation, the types of motion including rotational velocity and rotational acceleration," Insta360 argues that claim 13 is obvious over Pixel 2 combined with Kwatra. Insta360 Br. at 159–160. As explained with respect to the '894 patent, the combination of Pixel and Kwatra does not result in the minimized rotational

[redacted]

velocity and acceleration. In addition, the secondary indicia of commercial success and industry praise support nonobviousness.

The evidence does not support that claim 13 is obvious based on the combination of Pixel 2 and Kwatra.

2. Bell and Zhou or Shi, and Kwatra

Insta360 contends Bell (U.S. Patent No. 10,027,893, RX-2026) in combination with Zhou (U.S. Patent No. 9,674,438, RX-1584) or Shi (U.S. Patent No. 10,462,370, RX-1576) renders claims 1 and 14 obvious, and that Bell, when further (or alternatively) combined with Kwatra, renders claim 13 obvious. *See* Insta360 Br. at 161–169.[21]

a) Overview

Based on the September 19, 2018, priority date of the ’840 patent, GoPro Br. at 3, based on a provisional application, the evidence supports that Bell, which was filed on May 10, 2016, and published on November 16, 2017, is prior art under 35 U.S.C. § 102(a). Insta360 Br. at 129. This is not disputed by GoPro. *See generally* GoPro Br. and GoPro Reply.

Based on the September 19, 2018, priority date of the ’840 patent, the evidence supports that Shi (RX-1576), which was filed on October 3, 2017, is prior art under 35 U.S.C § 102(a). GoPro does not dispute this status. *See generally* GoPro Br. and GoPro Reply.

Shi is titled “Video Stabilization” and generally discloses a two-step stabilization process. Image frames are captured by a recording device (*i.e.*, camera) with an optical image stabilization (OIS) feature. RX-1576 at Abstract. The first step of stabilization transforms image frames based on OIS position data, and then a second step transforms frames further based on recording device

---

[21] Insta360 appears to combine Bell with Zhou/Shi for claim 1, and then drops Zhou/Shi for a combination with Kwatra, despite claim 13 depending from claim 1.

[redacted]

position data. *Id.* The recording device position data may include future position data as compared to the current frame. *Id.* at 17:5–14. The reference further teaches that if the transformations result in too much motion blur, a third transformation can be applied to partially track the frame back to the real camera position which "hide[s] the blur to an extent." *See id.* at 17:59–18:6.

Based on the September 19, 2018, priority date of the '840 patent, the evidence supports that Zhou (RX-1584), which was filed on August 25, 2014, and issued on June 6, 2017, is prior art under 35 U.S.C § 102(a). This is not disputed by GoPro. *See generally* GoPro Br. and GoPro Reply.

Zhou is titled "Low Light Video Image Stabilization Strength Modulation" and discloses techniques "to stabilize a video stream in low light capture conditions." RX-1584 at Abstract. In some techniques, "past" and "future" frames can be used to inform the stabilization strength for a "current" frame (*id.*), and the reference discloses the phenomena of greater motion blur typically existing in "darker images with longer integration times" and less motion blur existing in "brighter images with shorter integration times" (*id.* at 6:38–54). Thus, Zhou teaches that less-stabilization may be employed to mitigate this blur in these environmental scenarios. *See id.*

b) Obviousness

Insta360 indicates that GoPro does not dispute that Bell discloses elements 1[pre], 1[a]–1[f], 1[g(ii)], 1[g(iii)], 1[h], and 1[i]. Insta360 Br. at 96–98. GoPro Disputes that the combination of Bell and Zhou/Shi discloses element 1[g(i)] and claim 14. GoPro Br. at 96–98. For those elements not disputed, the evidence supports that they are disclosed in Bell. *See* Insta360 Br. at 96–98.

[redacted]

(1) Element 1[g(i)] and Claim 14

Element 1[g(i)] recites, "determine a smoothed trajectory of the housing based on a look-ahead of the trajectory and one or more of a weight-balance parameter, a low-light high-pass parameter, and/or a stickiness parameter." Claim 14 depends from claim 1 and further recites "wherein the low-light high-pass parameter controls amount or strength of smoothing performed in smoothed trajectory generation and an extent of motion blur compensation applied in determination of the smoothed trajectory"

Insta360 contends that Bell discloses using a look-ahead buffer to calculate a smoother path. Insta360 Br. at 163. This is not disputed by GoPro. GoPro Br. at 97–98 and GoPro Reply at 44–46.

As for the low-light high-pass parameter in element 1[g(i)], Insta360 contends that Bell discloses a parameter "α" that is a mixing weight. According to Insta360, this parameter is used to "control the amount/strength of smoothing performed to generate the smoothed trajectory." Insta360 Br. at 164 and *see* RX-2026 at 9:43–65. The evidence supports that the portion of Bell relied on by Insta360 relates to a parameter for controlling the angular change of a crop polygon in relation to the physical camera's rate of change to avoid collision with a frame edge. *See* RX-2026 at 9:43–65. Insta360 has not demonstrated by clear and convincing evidence that Bell discloses a low-light high-pass parameter, as recited in element 1[g(i)].

As for claim 14, Insta360 argues claim 14 is obvious in view of Bell when combined with Zhou and/or Shi. Insta360 Br. at 168–169. More specifically, Insta360 contends that it would be obvious to adjust Bell's parameter α based on motion blur as caused by low-light conditions as in Zhou or Shi. *See id.* at 163–164 and 169. The evidence does not support that one of skill would have used Bell's parameter α to accommodate for motion blur caused by low-light conditions. Bell

[redacted]

already uses α for a different purpose, namely, as an adjustment of stabilization strength based on how close an intended cropped portion of an image frame comes to crossing the frame edge. If the crop polygon 340 is close to the size of the inner region 310, α is allowed to remain near 1, which permits stabilization, and if the crop polygon is close to the edge of the frame 330, α is set to 0 to match actual camera motion (*i.e.*, no stabilization):

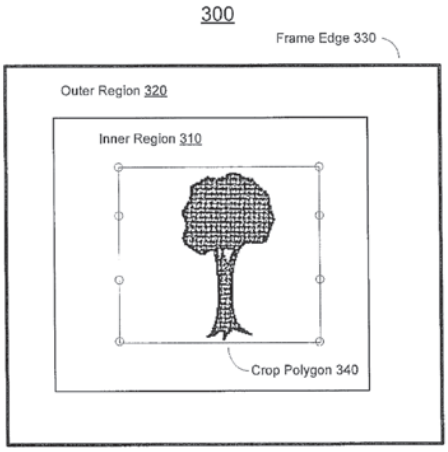


Fig. 3

RX-2026 at Fig. 3 and 9:56–10:16. Although Mr. Goodin testified that it would have been obvious "for a [one of skill] to apply Bell's mixing weight, alpha, to address motion blur" and apply the knowledge from Zhou/Shi "to control[] the parameter A – sorry, alpha, already in Bell," Goodin Tr. at 1256:16–20 and 1259:4–6, that would compromise Bell's ability to avoid going outside the frame edge because α would then also be responsive to low-light motion blur. The evidence supports that this would frustrate the purpose of Bell's system, not improve it. *See* GoPro Br. at 98 and GoPro Reply at 45 ("Mr. Goodin also did not consider the extent to which modifying Bell's mixing weight would impact Bell's ability to keep the crop polygon within frame boundaries, which was the purpose of the mixing weight."). The evidence supports that to achieve the benefits of low-light motion-blur avoidance, an additional parameter would have to be added to Bell, not

[redacted]

in lieu of or combined with an already existing parameter with a different role. The evidence supports that Mr. Goodin did not identify any such parameter in Zhou or Shi. *See* Goodin Tr. at 1255:16–1257:4; RX-1576 at 17:59–67; RX-1584 at 6:41–54; RDX-0013C.202; Schonfeld Tr. at 1494:9–14; and GoPro Br. at 97.

The evidence does not support that element 1[g(i)] or claim 14 is disclosed in the combination of Bell and Zhou and/or Shi. The evidence thus does not support that claim 1 or claim 14 is invalid over Bell alone or the combination of Bell and Zhou and/or Shi. Evidence of secondary considerations discussed with respect to the ’894 patent supports this determination although it would not be different without secondary considerations.

(2) Claim 13

Claim 13 depends from claim 1 and further recites “wherein the weight-balance parameter controls types of motion that are minimized in smoothed trajectory generation, the types of motion including rotational velocity and rotational acceleration.” Insta360 argues that claim 13 would have been obvious over Bell in combination with Kwatra. Insta360 Br. at 168. As with the ’894 patent, Insta360 argues that using Kwatra’s minimization formula, with multipliers “a” and “b” corresponding to first and second derivatives of camera path, to Bell’s lookahead. *See id.* and Insta360 Reply at 45. For the same reasons explained as to the ’894 patent, because the evidence does not support that Kwatra discloses minimizing rotational velocity or rotational acceleration, the combination of Bell and Kwatra does not disclose claim 13. The evidence does not support that claim 13 is obvious based on Bell in combination with Kwatra. Evidence of secondary considerations discussed with respect to the ’894 patent supports this determination although it would not be different without secondary considerations.

[redacted]

VIII. THE ’832 PATENT

The ’832 patent is titled “Systems and Methods for Horizon Leveling Videos” and relates to punching out a portion of a field of view from a video to create a horizon-leveled video. ’832 patent at Abstract. The punchout is described as a “viewing window” that is generated, sized, and placed within each frame of originally captured video. *Id.* at 1:23–31. Characteristics of the viewing window are determined based on rotational position information of the camera that captured the video. The rotational position information will indicate to the degree to which the original image has an off-axis (non-level) horizon because the camera was tilted when the video was shot. *Id.* at 1:31–44. The patent explains:

> For example, the placement (rotation, location, shape, and/or size) of the viewing window within the field of view of the visual content may be determined to compensate for rotation (e.g., tilt) of the image capture device 302 during capture such that the video appears to have been captured from an image capture device 302 with less rotation. That is, the visual content captured by the image capture device 302 may be cropped to generate horizon-leveled visual content.

Id. at 6:52–60. The figures below show how compensating for rotation can affect the size of the viewing window, and the amount of captured image data that is cropped as a result:

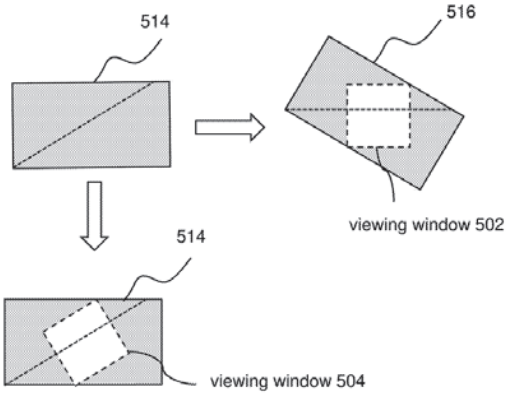


FIG. 5A

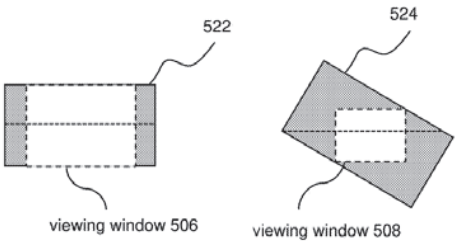


FIG. 5B

[redacted]

Id. at Figs. 5A, 5B; *see id.* at 10:52–67. A stated benefit of the invention is to "eliminate the need to manually level images post capture and/or the need to level the image capture device during visual content capture." *Id.* at 10:27–31.

A. Claim Construction

The parties identify several claim construction disputes: (1) horizon/horizon leveling/ horizon-leveled content (claims 1 and 3); (2) capture duration (claims 1 and 7); (3) progress length (claims 1, 7, and 8); (4) function of progress through the progress length (claims 1, 7, and 8); (5) function of progress through the capture duration (claims 1 and 7); and (6) whether the asserted claims require post-capture, as opposed to in or near real-time horizon leveling. GoPro Br. at 103–112; Insta360 Br. at 171–175; GoPro Reply at 46–48; and Insta Reply at 46–48. These disputes are addressed below.

1. Horizon Terms

Claims 1 and 3 recite "horizon leveling" and "horizon-leveled visual content." The parties dispute the constructions of those terms and the word "horizon" within them. GoPro Br. at 103–106; GoPro Reply at 46–47; Insta360 Br. at 171–172; and Insta360 Reply at 46–47. The crux of the initial dispute surrounds what a horizon is. GoPro contends that horizon refers "to 'a line where the earth (*e.g.*, ground, sea) appears to meet the sky'" such that horizon-leveled visual content "depict[s] a scene that is leveled with respect to the horizon." GoPro Br. at 105.[22] Insta360 contends that the word horizon is indefinite for lack of objective boundaries but that if not indefinite, then: (1) horizon it is "the plane perpendicular to the direction of gravity," (2) horizon

[22] Insta360 claims that GoPro has waived any argument that these terms are not indefinite by not addressing this argument in its pre-hearing brief. Insta360 Reply at 46. GoPro, however, did so. GoPro Prehearing Br. at 111–112 (addressing claim construction) and 143–144 (specifically addressing indefiniteness).

[redacted]

leveling is "leveling to the plane perpendicular to the direction of gravity," and (3) horizon-leveled visual content is "visual content depicting a scene leveled to the plane perpendicular to the direction of gravity." Insta360 Br. at 171–172.

Insta360 has not presented a clear and convincing case of indefiniteness with respect to the word horizon. The word horizon has a known and understood meaning both inside and outside of the camera arts and is the imaginary line in a field of view where the sky meets the earth and that one cannot see past due to the curvature of the earth. *See* Schonfeld Tr. at 196:16–23 (Horizon means "where the sky meets the earth or ocean"). It is inconceivable that one of skill, with a bachelor's degree in engineering or computer science, or equivalent field, and two years of experience working on image or video processing, or digital cameras, would not have understood what a horizon is. The patent makes this clear as well. '832 patent at 6:27–41 ("a horizon may refer to a line where the earth (e.g., ground, sea) appears to meet the sky") and 21:14–24 ("depiction of a scene that is leveled with respect to ground, sea, earth, and/or horizon") and *see* Stimm Tr. at 121:1–7 (horizon is "what you would perceive as level if you're standing in a natural, upright position").

The patent does not support that horizon is a plane, and Insta360 provides no supporting argument on the issue. *See* Insta360 Br. at 171–172 and Insta360 Reply at 46–47. As noted, the intrinsic evidence and lay meaning support that the horizon is a line.

Mr. Goodin's opinion supporting indefiniteness is based on scenarios in which the line between the earth and sky is visually blocked by landmarks and/or structures. Insta360 Br. at 172, *citing* Goodin Tr. at 1272:4–1273:23 ("I have particular difficulty with this term because I used to live in Salt Lake City where the ground meets the sky tended to be the sides of mountains."). This

[redacted]

argument is meritless. One of skill, or anyone, really, knows the horizon exists and knows where and what it is. The evidence does not support that the word horizon is indefinite.

The parties' next dispute concerns whether the horizon terms should be construed relative to gravity. The patent explains:

> The visual content captured by the image capture device may be leveled as the function of progress through the progress length based on the rotational positions of the image capture device as the function of progress through the capture duration and/or other information. That is, the visual content captured by the image captured device may be rotated to compensate for rotation of the image capture device during the capture duration such that a view of the visual content includes depiction of leveled scene. For example, readings from the position sensor may be used to determine the direction of gravity when visual content is captured at different moments within the capture duration. The direction of gravity may be used to determine the amount of rotation that needs to be applied to the visual content to level the depiction within the visual content. For example, the visual content may be rotated so that the direction of gravity is pointed downwards.

'832 patent at 9:48–64. The patent's figures show a gravity vector 404 illustrating how far a camera device 402 is tilted with respect to the horizon 450:

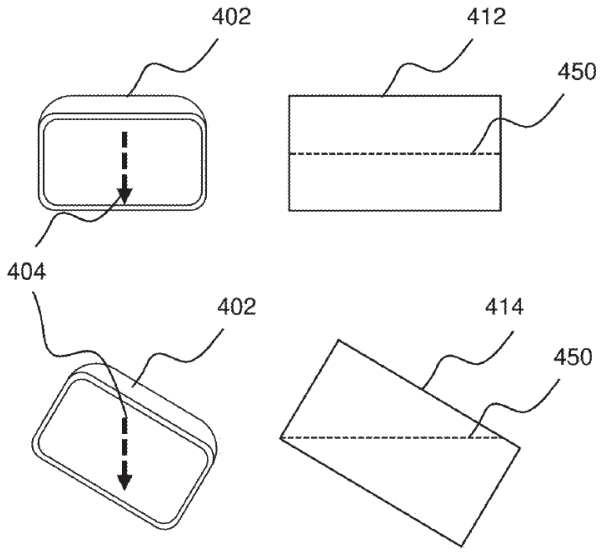


FIG. 4A

[redacted]

Id. at Fig 4A and 9:25–35. The horizon line 450 is shown perpendicular to the direction of gravity 404, which it necessarily is.

GoPro resists any reference to gravity in the constructions because "the fact that a gravity vector may be a helpful data point in horizon leveling does not render the gravity vector definitional." But GoPro agrees to "the fact that the leveling must ultimately be performed with respect to the horizon." GoPro Br. at 105–106, *citing* Schonfeld Tr. at 200:3–201:3. Fig. 4A, the above disclosures, and common sense support that gravity is perpendicular to the horizon. If, as GoPro contends, leveling must be performed with respect to the horizon, it will be performed perpendicular to gravity. GoPro does not contend otherwise.

The evidence supports that horizon leveling means "leveling to a line perpendicular to the direction of gravity" and horizon-leveled visual content means "visual content that has been leveled to a line perpendicular to the direction of gravity."[23] This construction is based on the fact that the horizon and gravity are necessarily perpendicular. It does not suggest that a gravity vector or a reference to gravity must be used to perform horizon leveling or achieve horizon-leveled visual content.

2. Capture Duration and Progress Length

The parties next dispute constructions of the terms capture duration and progress length, which are in claim 1. GoPro Br. at 106–109; GoPro Reply at 47; Insta360 Br. at 172–173; and Insta360 Reply at 47–48. GoPro states there is no dispute over the meaning of capture duration, which it contends is "the period of time over which the device is capturing content," or as Insta360

[23] The construction of horizon-leveled visual content omits "depicting a scene" because it is unnecessary and Insta360 offers no argument for its inclusion. *See* Insta360 Br. at 171–172 and Insta360 Reply at 46–47.

[redacted]

puts it, "duration during which the image capture device captures the video content." GoPro Br. at 106. The patent states that the capture duration "may be measured/defined in terms of time durations and/or frame numbers." *Id.* at 5:31–32 and 8:6–14 (providing an example of camera position information stored "per individual video frames").[24] Consistent with the specification, capture duration is construed as duration over which the device captures content, not necessarily limited to time.

As for progress length, GoPro argues it "refers to the progress that the system has made within processing frames for horizon leveling." GoPro Br. at 106. Insta360 argues that progress length means "duration of the video content when played back." Insta360 Br. at 173 and Insta360 Reply at 47.

Claim 1 recites:

> one or more physical processors configured by machine-readable instructions to:
>
> obtain video information defining a video, the video including video content captured by an image capture device during a capture duration, the video content having a progress length, the video content including visual content captured at different moments within the capture duration, the visual content viewable as a function of progress through the progress length, the visual content having a field of view;

'832 patent at claim 1. The claim language supports that progress length is an extent of video content. This is supported by the specification, which uses the term progress length approximately sixty times, the vast majority of those in the context of the system taking an action as a function of progress through the progress length. For example, the system "may be configured to determine a viewing window for the visual content as a function of progress though the progress length," and

[24] A useful analogy here may be that duration is the amount of time for an audiobook and the number of pages of a physical book.

may "level the visual content as the function of progress through the progress length." '832 patent at 15:4–6 and 16:53–54. The patent also states, "[t]he visual content is viewable as a function of progress through the progress length." *Id.* at 4:21–23. The patent discloses video content being defined by one or more video frames, and that "[a] video frame may include an image of the video content at a moment within the progress length of the video." *Id.* at 5:16–26. These uses support that progress length is an of through visual content.

The patent further explains that, in one scenario, progress length may be the same, longer, or shorter than capture duration based on the speed of video content playback:

> The video may include video content captured by an image capture device during a capture duration. The video content may have a progress length. The progress length of the video content may correspond to the capture duration. The progress length of the video content may be determined based on the capture duration. The progress length of the video content may be same as the capture duration, shorter than the capture duration (e.g., playback rate of the video content is faster than the capture rate of the video content), and/or longer than the capture duration (e.g., playback rate of the video content is slower than the capture rate of the video content).

'832 patent at 14:12–23.[25] This comparison between playback rate and capture rate supports that progress length refers to extent in terms of capture duration. As noted, the patent is clear that capture duration "may be measured/defined in terms of time durations and/or frame numbers." *Id.* at 5:31–32. That is, duration is not limited to time. Likewise, too, progress length is not limited to time and is instead the extent, by for example, time or frame number, of visual content.

In addition, the patent identifies frames as an extent of the progress length. *Id.* at 23:55–24:3. As with "capture duration," "progress through a progress length" may be considered in terms

[25] GoPro omits the faster and slower options out of its discussion of this passage. *See* GoPro Br. at 107, *citing* '832 patent at 14:12–23.

[redacted]

of time and frame number. *See* Schonfeld Tr. at 343:1–13 ("Q. I believe your view is that the input for that function is a timestamp or a frame number; right? A. Yeah. Either one.").

Further, Figs. 6A–6C depict zoom curves 600, 602, and 604, as shown below:

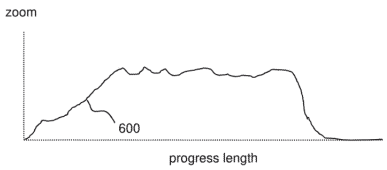


FIG. 6A

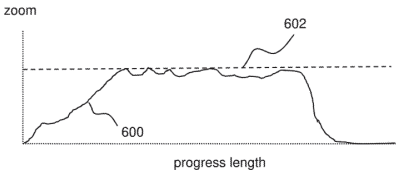


FIG. 6B

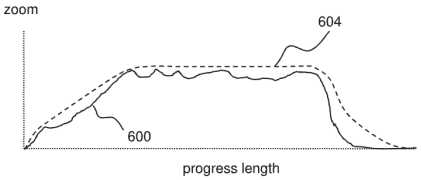


FIG. 6C

Id. at Figs. 6A–6C and 18:4–19:54.

The patent explains that the values of zoom curve 600 include "values as a function of the progress length, where the values reflect the amount of minimum zoom of the visual content (maximum size of the viewing window) that includes sufficient information to provide a leveled view of a captured scene." *Id*. at 18:12–16. The values "reflect the maximum size of the viewing window that may be used with the viewing window not extending beyond the field of view of the visual content." *Id*. at 18:12–21. If, as shown in Fig. 6A, there is a lot of rotation of the camera, the "zoom effect may be very pronounced within the horizon-leveled visual content." *Id*. at 18:34–37. Zoom curve 602 in Fig. 6B "includes a single value over the progress length, where the single value reflects the maximum cropping size of the visual content that allows horizon leveling over the entire progress length with the viewing window not extending beyond the field of view of the visual content." *Id*. at 18:46–51. Using a single value results in no zooming effects. *Id*. at 18:53–56. Fig. 6C shows a smoothed zoom curve in which rapid changes in zoom, as shown in Fig. 6A, are replaced by "smoothed zooms." *Id*. at 19:27–54.

In each of Figs. 6A–6C, progress length is shown on the x-axis and no units are provided. Based on the above disclosures, a point halfway between zero on the x-axis and the point at which curves 600 in each of Figs. 6A–6C again touch the x-axis, the progress length may represent a

[redacted]

period of time or a number of frames. The specification thus supports that progress length is an extent of video content.

3. Function of Progress through Progress Length/Capture Duration

Claim 1 recites that "the visual content viewable as a function of progress through the progress length" and "rotational position information characterizing rotational positions of the image capture device as a function of progress through the capture duration." The parties dispute the meaning of "function of progress" in both of these phrases. GoPro Br. at 109–112; GoPro Reply at 47–48; Insta360 Br. at 174–175; and Insta360 Reply at 48.

GoPro contends that this language "merely requires a correspondence between the rotational positions of the image capture device and the video information (*e.g.*, frame numbers or time stamps) that is captured and processed" and argues that progress is not limited to the passage of time. GoPro Br. at 110 and 112 and *see* Schonfeld Tr. at 1495:6–1496:19. Insta360 argues that "function of progress through the progress length" is indefinite. Insta360 Br. at 174. The entirety of Mr. Goodin's testimony on indefiniteness was:

> It's my opinion that the function of progress -- through the progress length is both indefinite and lacking in written description. There's no explanation of what a function of progress through the progress length is. There's further, no explanation of how to determine as a function of progress through the progress length.
>
> Here, I have quoted passages from the '832 patent at columns 27, 2 and 9. The first simply states a function of progress through the progress length "may be."
>
> The second just states a function of progress length through the progress length "based.
>
> Finally, it discloses the progress -- or the function of progress through the progress length of the visual content.

Goodin Tr. at 1276:15–1277:5 and *see* RDX-0013C.228, excerpting '832 patent at 27:51–55, 2:51–56 and 9:1-14. This testimony is conclusory and fails to address Figs. 6A–6C and or the

[redacted]

disclosures noted above with respect to progress length. Insta360 has not demonstrated that "function of progress" is indefinite.

Insta360 contends that function of progress in both phrases means the passage of time. Insta360 Br. at 174. As noted, the specification supports that both capture duration and progress length are not limited to time. This portion of Insta360's proposed constructions is therefore rejected. The evidence supports that function of progress through progress length/capture duration has its plain and ordinary meaning, which is corresponding to a location within the progress length/capture duration.

4. In or Near Real Time Horizon Leveling

The parties dispute whether the asserted claims are limited to post-capture, as opposed to real-time, horizon leveling. Insta360 argues the claims exclude real time horizon leveling because "'progress length' refers to a playback duration and does not exist until post-capture." Insta360 Br. at 175, *citing* Goodin Tr. at 1277:14–15. GoPro disagrees. GoPro Reply at 48.

Claim 1 recites that the video content to be horizon leveled is that which was captured by an image capture device. '832 patent at claim 1. This makes sense—video must be captured before it can be stabilized, leveled, or manipulated. The specification, as Insta360 acknowledges, however, supports that its horizon-leveling techniques may be performed in or near real time. '832 patent at 25:10–11 (disclosing that in some implementations, horizon leveling may not be performed in or near real time, supporting that in others it is) and Insta360 Br. at 175 ("the specification describes real-time and post-capture horizon leveling"). Insta360 frames this as a binary issue, namely horizon leveling can be either post-capture or in or near real time. In doing so, Insta360 equates post capture with playback, that is, not in or near real time. That is where Insta360's argument fails. The patent discloses that "[i]n some implementations, the visual content

[redacted]

may not be horizon leveled in/near real time." This happens when "the image capture device may not have sufficient resource[s] to apply the horizon leveling technique described herein in real-time and/or may be devoting its resources to other tasks." 832 patent at 25:10–14. In those instances, "horizon leveling of the visual content may be performed by the image capture device once sufficient resource becomes available" or "may be performed by the remote processor" where "the remote processor may be one or more processors of a remote computing device (e.g., mobile device, desktop, server)." *Id*. at 25:14–20. The patent thus clearly contemplates that horizon leveling may be performed in real time or not in real time. What the patent does not do is equate post-capture with not in real time. Instead, in describing non-real-time horizon leveling, the patent explains that non-real-time operations may performed by a remote processor, post-capture. *Id*. at 25:17–32. But in describing real-time horizon leveling, the patent also explains that images are captured and then horizon leveled. *Id*. at 9:52–56 ("the visual content captured by the image captured device may be rotated to compensate for rotation of the image capture device during the capture duration such that a view of the visual content includes depiction of leveled scene") and 10:27–39 ("automatic horizon leveling of the visual content may enable a user to "capture" horizon-level visual content with image capture devices without a viewfinder and/or a display showing a preview of visual content to be captured"). As a result, whether horizon leveling is performed in real time or not in real time, it is always performed post-capture.

As a result, while the claim language states that horizon leveling is post-capture, that does not preclude in or real time horizon leveling. Insta360's arguments to the contrary are rejected as contrary to the express teachings of the specification.

[redacted]

B. Infringement

GoPro contends the accused products infringe claims 4 and 8, along with intervening claims 1, 3, and 7.

1. Claim 1

a) Undisputed Elements

GoPro states and Insta360's briefing confirms that Insta360 does not dispute that the accused products meet elements 1[pre] and 1[a]. GoPro Br. at 116–117; Insta360 Br. at 176–183; and Insta360 Reply at 48–53. The evidence supports that these elements are met. GoPro Br. at 117, *citing* Schonfeld Tr. at 232:4–234:22 and 265:23–266:8.

b) Element 1[b]

Element 1[b] recites, "obtain video information defining a video, the video including video content captured by an image capture device during a capture duration, the video content having a progress length, the video content including visual content captured at different moments within the capture duration, the visual content viewable as a function of progress through the progress length, the visual content having a field of view." '832 patent at claim 1. GoPro contends that the accused products meet this claim element through an "[redacted]" mode which has two sub-modes: FreeFrame and MeMode. GoPro Br. at 116. GoPro explains, "[i]n FreeFrame mode the field of view is captured by a single lens, while MeMode utilizes two camera lenses to capture the field of view." *Id.* at 117, *citing* Schonfeld Tr. at 266:9–267:16 and CX-0994C (Insta360 X4 8K 360 Action Cam presentation). Insta360 responds that GoPro fails to show what constitutes the "progress length" and "as a function of progress through the progress length" in the accused products, and "made no attempt to show how MeMode practices this limitation." Insta360 Br. at 176.

The evidence supports that the accused products capture video information, over time, with

[redacted]

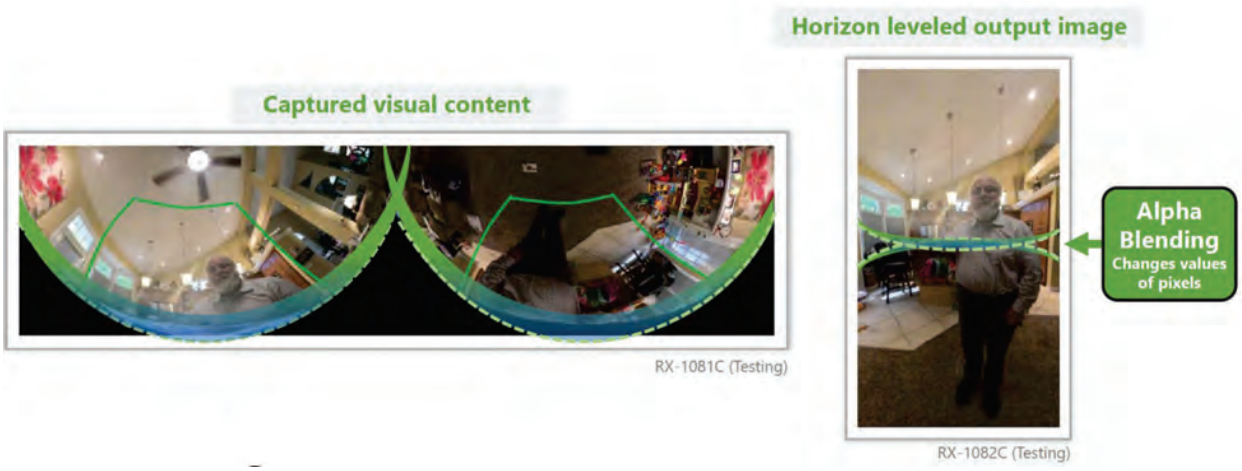
that video content having an overall size/duration (*i.e.*, "progress length") and being viewable as a video (*i.e.*, viewed as a sequence of frames through the end of the progress length). CX-0994C.6 ("[redacted]"), .47 (recording "fps" at various resolutions). There is no real dispute that these operations take place in FreeFrame. CX-0994C.15 (Single Lens Mode in 4K60fps) and CX-0752 (testing image). The evidence supports that these operations take place in MeMode as well:

[redacted]

CX-0994C at .16. Given the evidence reproduced above, it is unclear why Insta360 contends that "Dr. Schonfeld identified no captured 'visual content' for Me Mode, let alone the 'field of view' for the captured 'visual content.'" Insta360 Br. at 176. Captured visual content is shown above as is a field of view. In fact, in its reply brief, Insta360 describes the MeMode operation in a way that satisfy all elements of element 1[b]:

[redacted]

[redacted]



Insta360 Reply at 49, *citing* RDX-0013C.239. That Dr. Schonfeld later relied on the same MeMode testing image that had already been stitched together and/or horizon leveled (RX-1082C) does not take away from the fact that visual content had been captured during a capture duration, and that content has a field of view.

The evidence supports that element 1[b] is met in the accused products in both FreeFrame and MeMode.

c) Element 1[c]

Element 1[c] recites, "obtain rotational position information for the video, the rotational position information characterizing rotational positions of the image capture device as a function of progress through the capture duration." '832 patent at claim 1. GoPro contends that the accused products meet this element through data gathered from an IMU (gyroscope and accelerometer) which is "synchronized with each frame that was captured." GoPro Br. at 119. Insta360 disputes that this element is met because the accused products [redacted] and, "modifying the frame timestamp to obtain the rotational position does not meet this limitation." *See* Insta360 Br. at 178 and Insta360 Reply at 51.

The evidence supports that the sensors of the accused products' IMUs are and that—along with the exposure time of the camera—causes uncertainty as to which IMU data set corresponds to which video frame for stabilization purposes. Schonfeld Tr. at 230:12–22; CX-0767C.4; JX-0105C.6 ; and CX-0761C.2 ((" Thus, to determine this correspondence, additional processing is needed, which generally takes the form of " ." CX-0761C.3; *see id.* at .2 (" .").

There appears to be no real dispute on this operation. GoPro Reply at 50 (The gyroscope . . . .'") and Insta360 Br. at 177 ("the accused gyro and frame data c .").

The evidence supports that camera rotational position information , and that *See* CX-0761C.4–8 (discussing). This meets the construction of "as a function of progress through the capture duration" as a location within the capture duration. Mr. Goodin's contradictory

[redacted]

testimony is conclusory and of little value. Goodin Tr. at 1278:3–14 (stating only "I have seen no evidence myself" of a function).

Insta360's dispute on this point is that GoPro applies a different construction in the context of validity, and that there is no infringement if that construction is applied in the context of infringement. *See* Insta360 Br. at 177–178 and Insta360 Reply at 51–53. This is addressed when considering the parties' validity arguments.

The evidence supports that the accused products meet element 1[c].

d) Element 1[d]

Element 1[d] recites:

> determine a viewing window for the visual content as a function of progress through the progress length based on the rotational positions of the image capture device as the function of progress through the capture duration, the viewing window defining extents of the visual content to be included within horizon-leveled visual content as the function of progress through the progress length, wherein determination of the viewing window includes determination of a placement of the viewing window within the field of view of the visual content as the function of progress through the progress length based on the rotational positions of the image capture device as the function of progress through the capture duration.

'832 patent at claim 1. GoPro contends that the accused products meet this element through use of the timestamp-matched quaternion to "determine the size and placement of a viewing window that does not exceed the boundaries of the visual content and which can be punched out to generate the horizon-leveled visual content." GoPro Br. at 121.

The evidence supports that [redacted] is used to create and define a horizon-leveled viewing window for each frame. *See, e.g.*, CX-1195C (Sang Dep.) at 46:8–15; CX-0761C.2–5, 8; JX-0105C.6 [redacted]

[redacted]

[redacted].") and Schonfeld Tr. at 267:17–268:12. Insta360 does not dispute this operation.

Insta360 disputes that this element is met for several reasons. First, it argues that GoPro "identified no 'function' that receives a frame number (such as a [redacted]) as an input and outputs the viewing window." Insta360 Br. at 179. The evidence supports, however, that the accused products determine [redacted], with that [redacted], with those [redacted], which therefore serve to [redacted]. Schonfeld Tr. at 268:13–21 and CX-773C at 1 ([redacted]).[26]

Insta360 next argues that "[redacted]." *Id.* at 181. Insta360 recognizes, however, that if this element is satisfied by determining a viewing window on a frame-by-frame basis, then it is met in the accused products. *Id.* at 180. As detailed above in addressing construction of "progress length," the specification is clear that it can be considered based on time or frame length. In addition, as detailed above, claim 1 is not limited to non-real time playback.

Pertinent only to MeMode, Insta360 claims GoPro has not identified a "viewing window." Insta360 Br. at 180. Insta360 admits that [redacted] in MeMode, and Dr. Schonfeld's testimony supports that the same techniques are used between FreeFrame and MeMode, a point Insta360 does not dispute. *See* Insta360 Br. at 182

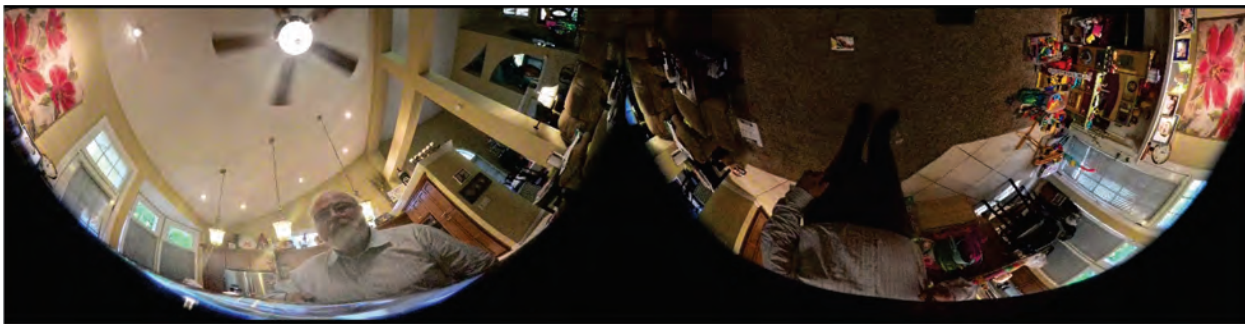
---

[26] In contending that GoPro has not identified a function that that receives a frame number or [redacted] it appears that Insta360 *may* be arguing that a specific computer function is required though it does not outright say so. As explained above, however a "function of progress" recited in the claim refers to a correspondence. No computer function is required.

[redacted]

("Rather, as Mr. Goodin explained, after obtaining the virtual positions of the camera required to correct horizon . . ."); Schonfeld Tr. at 265:20–22, *citing* CX-0994C.16 and .23; Insta360 Br. at 182–183; and Insta360 Reply at 50. The evidence supports that the same camera-rotation based techniques are used between FreeFrame and MeMode.

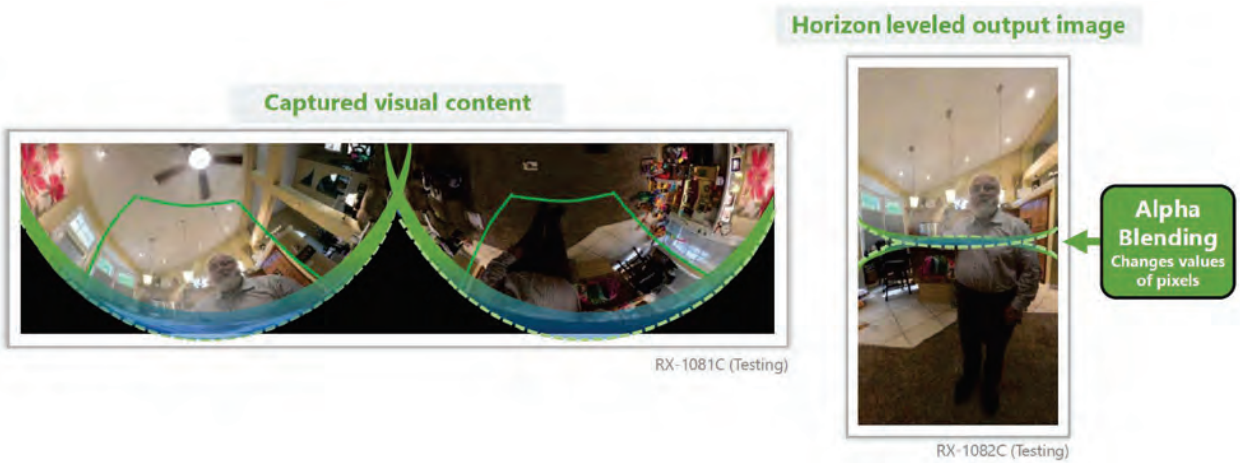
The evidence also supports that MeMode uses a viewing window. In particular, MeMode acquires and combines two "wide field of view image[s]," Goodin Tr. at 1281:22–1282:9, and outputs a single, narrower field of view image, *id.* at 1282:10–18. Snapshots from Mr. Goodin's testing videos show this acquisition and output:



RX-1081C at 0:01 (acquisition).

RX-1082C at 0:01 (output). In his demonstrative of this evidence, Mr. Goodin applied green trapezoid-like shapes to the two input images on the left:

[redacted]



RDX-0013C.239. These annotations correspond to the viewing window. Indeed, the record contains no other explanation for how the system arrived at the boundary of the smaller field-of-view output image.

The evidence supports that element 1[d] is met in the accused products.

e) Element 1[e]

Element 1[e] recites, "generate the horizon-leveled visual content based on the viewing window, the horizon-leveled visual content including a punchout of the extents of the visual content defined by the viewing window, wherein inclusion of the extents of the visual content defined by the viewing window within the horizon-leveled visual content effectuates horizon leveling of the visual content." '832 patent at claim 1.

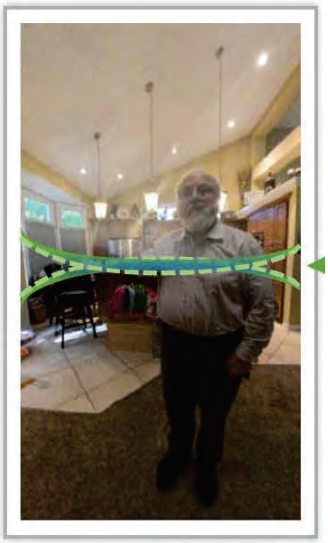
GoPro contends that the accused products meet this claim element by punching out the content defined by the viewing window for each frame; more specifically, in FreeFrame mode "the punchout is of the visual content captured by a single lens" and in MeMode, "the visual content is punched out from the top half and bottom half of the two lenses, respectively." GoPro Br. at 123. Insta360 disputes that this element is met, contending that Dr. Schonfeld failed to identify the "punchout" in FreeFrame or Mode, and that in MeMode the blending of the two input images, known as [redacted]. Insta360 Br. at 182–183. According to

[redacted]

Insta360, [redacted] means the "horizon-leveled content [] is not 'a punchout of the extents of the visual content defined by the viewing window' required by 1[e]." *Id.* at 183.

As an initial matter I agree with GoPro that the only real dispute as to this element raised by Insta360 relates to MeMode. GoPro Br. at 123. While Insta360 mentions FreeFrame, the substance of its arguments is directed to whether there is a viewing window in the two halves of the fisheye lens of MeMode. *See* Insta360 Br. at 181–182. In any event, the evidence supports that in FreeFrame mode, the accused products meet element 1[e]. Schonfeld Tr. at 268:22–269:5 and CX-0984C at 2.

With respect to MeMode, the evidence supports that the pixels that were within the extents of the viewing window as applied to the input images, identified by the green trapezoid-like shapes above, are included in the creation of the horizon-leveled output image due to [redacted]. RX-1082C and Goodin Tr. at 1282:10–1283:5 (describing [redacted]). This is shown by the overlapping green arcs of the horizon-leveled image in Mr. Goodin's demonstrative:



RDX-0013C.293, *citing* RX-1082C. Mr. Goodin described the [redacted] function as "[redacted]."

[redacted]

Goodin Tr. at 1282:10–14; *see id.* at 1283:2–5 ("[redacted]"). Though not cogently explained by Mr. Goodin at the hearing, Insta360 contends that because [redacted], MeMode does not meet element 1[e]. Insta360 Br. at 182–183 and *see* Goodin Tr. at 182:10–183:5 and RDX-0013C.239.

The claim, however, does not address pixel values of the visual content and does not state or infer that pixel values of the visual content cannot be changed when performing horizon leveling. Instead, element 1[e] recites "extents of the visual content defined by the viewing window" as being included in the horizon-leveled visual content. The plain language of the claim and the specification support that the "extents of visual content defined by the viewing window" relates to the size of the visual content and not specific pixel values of the visual content. '832 patent at 11:13–18 ("The size of the viewing window may be expressed in terms of field of view (field of view of visual content versus field of view of the viewing window), in terms of megapixels (megapixel of the visual content versus megapixel of the viewing window), and/or in other terms") and *see id*. at 4:31–40, 6:16–19, 11:1–18; 15:32–39, 16:8–19, and Fig. 5B. In addition, the patent expressly discloses that distortions may be added to visual content to "enable use of horizon leveling with less accuracy/precision to produce acceptable results." *Id*. at 22:4–25. The addition of distortions would necessarily involve changing pixel values. Insta360's argument that [redacted] in MeMode means that there is not a "punchout of the extents of the visual content defined by the viewing window" is therefore rejected.

The evidence supports that element 1[e] is met in the accused products in both FreeFrame and MeModes. In addition, as the evidence supports that all elements of claim 1 are met by the accused products, the evidence supports that claim 1 is infringed by the accused products.

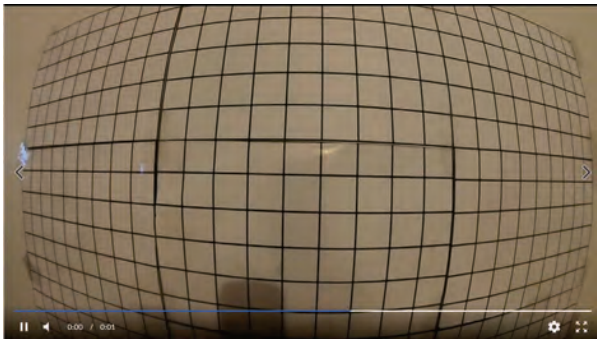
[redacted]

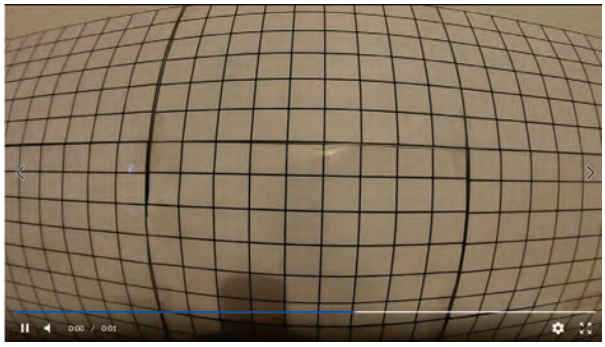
2. Claim 3

Claim 3 depends from claim 1 and recites, "wherein the visual content includes a distortion such that a straight line within a scene depicted within the visual content appears as a curved line, the distortion of the visual content reducing impact of an off-axis horizon depicted within the horizon-leveled visual content." '832 patent at claim 3.

GoPro contends that the accused products meet this claim in UltraWide and ActionView field of view modes as demonstrated in screenshots of rectilinear grids appearing curved. GoPro Br. at 124–125. Insta360 disputes this claim is met because "Dr. Schonfeld made no mention of how the limitation 'the distortion of the visual content reducing impact of an off-axis horizon' is met." Insta360 Br. at 184.

The evidence supports that in the identified modes, straight lines appear curved:





CX-1578 and CX-1580. That this curvature hides off-axis horizon tilt is self-evident—a principle taught in the patent itself. '832 patent at 22:15–18. Dr. Schonfeld used the following additional images to demonstrate this phenomenon, albeit in the domestic industry context:

[redacted]

Schonfeld Tr. at 313:2–16, *citing* CDX-0002.228. Insta360 suggests that GoPro "cannot rely" on domestic industry products evidence to show this natural effect (Insta360 Reply at 53), but as determined above, the effect is a matter of physics and observable through any appropriately distorted image. The evidence supports that the additional elements of claim 3 are met by the accused products.

3. Claim 4

Claim 4 depends from claim 3 and recites, "wherein the distortion includes a barrel distortion or a pincushion distortion." '832 patent at claim 4. GoPro contends that the accused products meet this claim based on the same evidence identified for claim 3. *See* GoPro Br. at 124–125. Insta360 does not dispute that claim 4 is met apart from its dependence on claims 1 and 3. Insta360 Br. at 184 and Insta360 Reply at 53. The evidence supports that the accused products implement barrel distortion in "UltraWide" and "ActionView" field of view modes. Schonfeld Tr. at 269:10–20. The evidence supports that the additional elements of claim 4 are met by the accused products.

4. Claim 7

Claim 7 depends from claim 1 and recites, "wherein the determination of the viewing window further includes determination of a size of the viewing window as the function of progress

[redacted]

through the progress length based on the rotational positions of the image capture device as the function of progress through the capture duration." '832 patent at claim 7. GoPro contends that the accused products meet this claim based on a [redacted] that is influenced by the [redacted] *See* GoPro Br. at 125. Insta360 does not dispute that claim 7 is met apart from its dependence on claim 1. Insta360 Br. at 184 and Insta360 Reply at 53. The evidence supports that the accused products determine a size of the viewing window for each video frame (*i.e.*, progress through the progress length). Schonfeld Tr. at 239:13–25, 240:16–25, 268:13–21, and 269:21–270:6. The evidence supports that the additional elements of claim 7 are met by the accused products.

5. Claim 8

Claim 8 depends from claim 7 and recites, "wherein the size of the viewing window changes as the function of progress through the progress length to simulate changes in zoom for the visual content." '832 patent at claim 8. GoPro contends that the accused products meet this claim when the viewing window changes size based on the [redacted] GoPro Br. at 125. Insta360 disputes this claim is met because "Dr. Schonfeld failed to show how the 'simulating changes in zoom' limitation is met." Insta360 Br. at 184.

The evidence supports that when a smaller field-of-view image is stretched to fill a larger field-of-view viewing space, the features in that image will appear larger (*i.e.*, zoomed in). Conversely, when a larger field-of-view image is shrunk to fill that same sized viewing space, the features in that image will appear smaller (*i.e.*, zoomed out). This is necessarily so, as shown in Dr. Schonfeld's demonstrative:

[redacted]

Schonfeld Tr. at 270:2–6, *citing* CDX-0002.174. There is no dispute the accused products' viewing window size is "dynamic," meaning that it is capable of change between frames of the video (i.e., progress length). *See* Schonfeld Tr. at 239:13–25, 240:16–25, 268:13–21, and 269:21–270:6. The evidence supports that the additional elements of claim 8 are met by the accused products.

6. Redesigns

The parties agree that Insta360 has introduced two versions of redesigned products into the investigation pertaining to the '832 patent: [redacted] in FreeFrame mode, and [redacted] in MeMode. [27] Insta360 Br. at 221; GoPro Br. at 126. GoPro does not contend the redesign for FreeFrame infringes. *Id.*

As for MeMode, the evidence supports that it continues to implement the same horizon-leveling as in the accused products as part of its real-time presentation of camera activity. *See* RPX-0019C (physical sample, turned on, MeMode selected, horizon leveling occurs); Schonfeld Tr. at 318:20–319:9 (identifying low resolution option[28]); and Goodin Tr. at 1336:4–1337:14 (non-real time stabilization is changed to [redacted]). For the reasons discussed above, the claims of the '832 patent do not exclude real-time presentation of camera activity. As a result, the evidence supports that the MeMode redesign continues to infringe the '832 patent claims in the same way as the accused products.

---

[27] Insta360 refers to its redesign for MeMode as "post-capture." Insta360 Br. at 221 and RDX-0013C.320. As noted in addressing claim construction, what Insta360 means by post-capture is during playback or not in real time. In real time operations, images are captured before they are leveled so horizon leveling is always post-capture. To avoid confusion, Insta360's MeMode redesign is referred to as non-real time.

[28] It is assumed that low resolution in MeMode refers to the video frames viewable on the camera's display in, effectively, real-time (*i.e.*, preview screen).

[redacted]

C. Technical Prong

GoPro contends that its domestic industry products, as represented by the Hero9 Black, practice claims 1, 3, 4, 7, and 8.

1. Claim 1

a) Undisputed Elements

GoPro states, and Insta360's briefing confirms, that Insta360 does not dispute that the domestic industry products meet elements 1[pre], 1[a], 1[c], and 1[e]. GoPro Br. at 112; Insta360 Br. at 184–185; and Insta360 Reply at 54. The evidence supports that these elements are met in the domestic industry products. *See* GoPro Br. at 112–115, *citing* Schonfeld Tr. at 305:7–306:6, 308:2–309:17, and 311:11–22.

b) Element 1[b]

GoPro contends that the domestic industry products practice this element because they "obtain[] video information." GoPro Br. at 112. Insta360 disputes this element is practiced because the domestic industry products "perform horizon leveling in real-time, not during post-capture. . . . *i.e.*, after the video has finished capturing." Insta360 Br. at 184 and Insta360 Reply at 54.

The evidence supports that the domestic industry products capture video information that is viewable by a user as a series of image frames, and that video information has a length/size (*i.e.*, a progress length). Schonfeld Tr. at 306:7–308:1. Insta360's main dispute is based on its claim construction argument precluding real-time horizon leveling. As explained above, '832 patent claim 1 is not limited to non-real-time horizon leveling.

Insta360 also argues that only horizon-leveled visual content is available for playback, and not the original non-leveled content and thus the domestic industry products do not meet the requirement in element 1[b] of "the visual content viewable as a function of progress through the progress length." Insta360 Br. at 185; Insta360 Reply at 54; and'832 patent at claim 1. Mr. Goodin

[redacted]

testified that it was his opinion "that for patent Claim 1[b], you must have the visual content viewable as a function of progress through the progress length. In the tech DI products, the originally captured visual content is not viewable, and the user can only view horizon-leveled visual content." Goodin Tr. at 1285:1015. In terms of "viewability, however, the claim does not distinguish visual content that is horizon leveled from originally captured visual content. Instead, a characteristic of visual content, whether original or horizon-leveled, is that it must be viewable, which makes sense as it is, after all *visual* content. *See* Schonfeld Tr. at 205:11–14 (opining that "viewable" is "characteristic of the nature of the data that if you wanted to view it, you could view it. There is no requirement that you must view it, and that there is no requirement that you view it now or later.") In addition, because the claim recites "the viewing window defining extents of the visual content to be included within horizon-leveled visual content," the claim language itself supports that "original" visual content is, in fact, viewable as part of the horizon-leveled visual content.

The evidence supports that element 1[b] is practiced by the domestic industry products.

c) Element 1[d]

GoPro contends that the domestic industry products practice this element because they determine a viewing window for each frame of the video content based on the rotational data provided by the IMU. GoPro Br. at 114. Insta360 disputes this element is practiced because the domestic industry products "perform horizon-leveling in real time." As detailed above, claim 1 is not limited to non-real-time horizon leveling. As a result, Insta360's argument is rejected.

Insta360 also argues that GoPro has not shown that the domestic industry products "determine the 'placement' and 'size' of the viewing window' as the *same* 'function of progress through the progress length' as required by the asserted claims." Insta360 Br. at 185 (emphasis in

[redacted]

original) and *see* Insta360 Reply at 54.

The entirety of Mr. Goodin's testimony on this point is:

> So it's my opinion that the tech DI products would need to show the same function as a function of progress through the progress length for each of Claims 1, 7, and 8. And GoPro has presented no evidence that the determinations of placement and size of the viewing window actually use the same function.

Goodin Tr. at 1285:22–1286:3.

Based on this testimony, Insta360 appears to be arguing that GoPro has not identified a function, similar to its argument asserting non-infringement. To the extent Insta360 argues that a specific computer function is required, a "function of progress" in the claim refers to a correspondence. No computer function is required.[29]

The evidence supports that within the domestic industry products, a viewing window is generated, sized, and placed within each video frame of the video content (*i.e.*, "as a function of progress through the progress length"). Schonfeld Tr. 309:18–311:10. Insta360's opposition regarding the "same function" is not persuasive as it too depends on a meaning of "as a function of progress" that conflicts with the intrinsic evidence—requiring (perhaps) some sort of strict mathematical input/output function (*see* RDX-0013C.234) as opposed to an indication of where within the total progress length the system is while taking an action (*see, e.g.*, '832 patent at 5:16–26, 8:6–14, 23:55–24:3).

The evidence supports that element 1[d], and all elements of claim 1, are practiced by the domestic industry products.

---

[29] In this and its similar point on non-infringement, Insta360's argument is unclear and undeveloped. It has been addressed as best understood.

[redacted]

2. Claims 3 and 4

GoPro contends the domestic industry products practice claims 3 and 4. GoPro Br. at 115–116. Insta360 does not dispute this practice apart from their dependence from claim 1. *See* Insta360 Br. at 184–185 and Insta360 Reply at 54. The evidence supports that a SuperView mode in the domestic industry products introduces a barrel distortion that makes straight lines appear curved, and that this curvature reduces the impact of off-axis horizon lines. Schonfeld Tr. at 312:5–313:23. The evidence supports that claims 3 and 4 are practiced by the domestic industry products.

3. Claims 7 and 8

GoPro contends the domestic industry products practice claims 7 and 8. GoPro Br. at 116. Insta360 does not dispute this practice apart from its dependence from claim 1. *See* Insta360 Br. at 184–185 and Insta360 Reply at 54. The evidence supports that an AutoFoV algorithm adjusts the size of the viewing windows generated for each frame of the video content, with those sizes based on the IMU rotation data. The evidence also supports that when the size of the viewing window changes between frames of the video content, a zoom effect occurs, as explained above when addressing infringement. Schonfeld Tr. at 314:1–21. The evidence supports that claims 7 and 8 are practiced by the domestic industry products.

D. Validity

Insta360 contends that claims 1, 3, 4, 7, and 8 are invalid based on prior art, ineligibility under § 101, and lack of written description under § 112. Insta360 Br. at 185–221 and Insta360 Reply at 54–63.

1. Insta360 Go Alone and With Thomason

Insta360 argues that an earlier of its camera products, called Insta360 Go, (RPX-0005 (Insta360 Go camera); RPX-0051 (phone with Insta Go app installed); JX-0271; RX-3672; and Tr. at 1305:3–18) anticipates claims 1, 3, 4, 7, and 8, renders obvious claims 3 and 4 when

[redacted]

combined with the knowledge of one of skill, and renders claims 7 and 8 obvious when combined with Thomason (RX-1597). Insta360 Br. at 187–199.

a) Overview

The evidence supports that "[t]he Go camera and iOS v.1.2.0 app were publicly released in the U.S. on August 28, 2019." Insta360 Br. at 186, *citing* Goodin Tr. at 1300:22–1301:5 and RPX-0005. Given GoPro's assertion that the priority date of the '832 patent is August 30, 2019, based on the filing of a provisional application, GoPro Br. at 6, the evidence supports that the Insta360 Go is prior art under 35 U.S.C. § 102(a). This is not disputed by GoPro. *See generally* GoPro Br. and GoPro Reply. Insta360 argues that Insta360 Go is a "thumb-size camera that a user can mount anywhere and shoot hands free" with an "ultra-wide lens." Insta360 Br. at 186, *citing* Goodin Tr. at 1300:22–1301:5 and RPX-0005.

With a priority date of August 30, 2019, GoPro Br. at 6, the evidence supports that Thomason (U.S. Pub. No. 2005/0168583, RX-1597), which published on August 4, 2005, is prior art to the '832 patent under 35 U.S.C. § 102(a). This is not disputed by GoPro. *See generally* GoPro Br. and GoPro Reply. Insta360 argues that Thomason "discloses systems that 'allow the captured image to be rotated for display to have the true horizontal displayed as horizontal.'" Insta360 Br. at 208, *citing* RX-1597 at Abstract.

b) Anticipation

Insta360 contends that Insta360 Go anticipates claims 1, 3, 4, 7, and 8. Insta360 Br. at 187–199 and Insta360 Reply at 54–58.

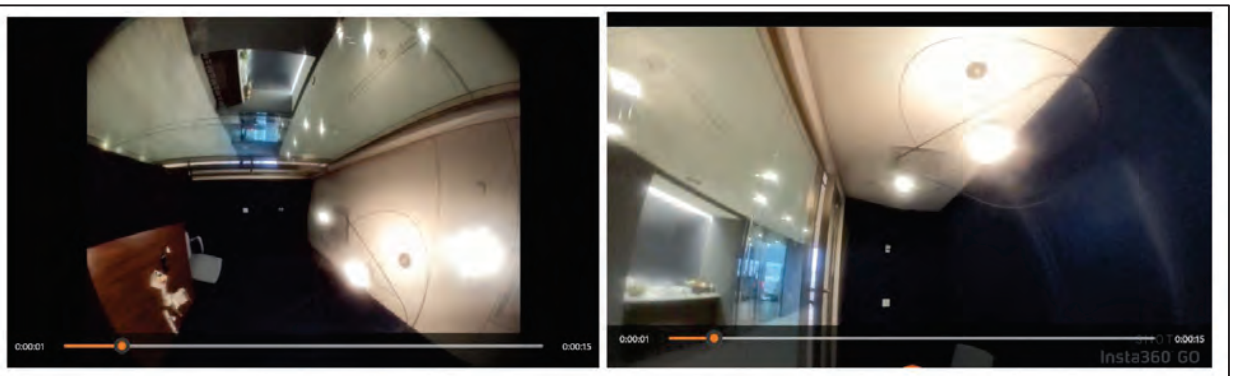
(1) Claim 1

Insta360 argues that Insta360 Go discloses all limitations of claim 1. *See* Insta360 Br. at 185. Of these, GoPro disputes limitations 1[pre], 1[d], and 1[e]. GoPro Br. at 134–137 and GoPro

[redacted]

Reply at 54–56. For the limitations not in dispute, the evidence supports that they are disclosed in the Insta360 Go. *See* Insta360 Br. at 188–194, *citing* Goodin Tr. at 1305:22–1307:25.

GoPro's dispute as to each of elements 1[pre], 1[d], and 1[e] is that the Insta360 Go does not perform horizon leveling and instead performs general stabilization. *See* GoPro Br. at 134; CDX-0017C.44 (identifying disputed claim elements); and GoPro Reply at 56. The evidence supports that the Insta360 Go performs horizon leveling. As shown in Dr. Schonfeld's testing videos, horizon leveling is performed. CX-1218 and CX-1219 are two such videos, one leveled, CX-1218, and one not, CX-1219. Schonfeld Tr. at 1500:11–1501:6; *see* Insta360 Reply at 56 (explaining the mislabeling of the raw and leveled videos in CDX-0017C.47). CX-1219C shows several intentional rotations of the camera that create an off-axis horizon, and CX-1218C shows those rotations undone—even when the camera drifts towards the ceiling. This is shown in, at least, two screenshots presented in Insta360's reply brief representing the same moment in time:



CX-1219, 0:00:01 (90° rotation) CX-1218, 0:00:01 (horizon leveled)

Insta360 Reply at 56. This is more than mere stabilization.

Further, and significantly, that horizon leveling was performed by the Insta360 Go device—before the August 30, 2019, priority date of the '832 patent—is unequivocally demonstrated in product review videos and websites. RX-0028 at 4:17–25 (product review video: "you can move the camera in any direction and it will always keep the horizon leveled, which is

[redacted]

pretty handy"); RX-1615 (showing RX-0028 (product review video) posted August 28, 2019); RX-0122.7 (August 29, 2019, product review: "Image stabilization works very well, automatically leveling the horizon"). And Mr. Goodin provided essentially unrebutted testimony on the Insta360 Go rendering process, including [redacted]. Insta360 Br. at 190–194, *citing* Goodin Tr. at 1308:1–1309:19 and 1311:1–1315:25. Clear and convincing evidence demonstrates that the Insta360 Go performed horizon leveling.

GoPro's dispute appears to be based on a claim construction that defines horizon leveling as only when a horizon line is expected to be present in the field of view, and if it levels when the horizon is not visible, then some other, non-horizon leveling technique, must occur. *See* GoPro Br. at 136, *citing* Schonfeld Tr. at 1499:18–1501:6 ("Insta360 Go blindly reverses rotations without regard to whether a horizon line is expected to be present in the field of view (*e.g.*, the camera was pointed straight upwards to the sky).") and GoPro Reply at 54–55 ("undisputed testing shows that the system continues to reverse camera roll when pointing straight upwards."). This is not supported by the video evidence, however, which does not show a camera pointed up but instead vigorously shaken. *See* Schonfeld Tr. at 1499:18–1501:6 (discussing CX-1216 and CX-1217). Even then, the two videos show successful horizon leveling. CX-1218 (stabilized) and CX-1219 (raw). And the documentary evidence supports that the Insta360 Go performed horizon leveling.

Insta360 has demonstrated by clear and convincing evidence that the Insta360 Go and its associated Go app performed horizon leveling. The evidence thus supports that claim 1 is anticipated by the Insta360 Go and its associated Go app.

[redacted]

(2) Claims 3 and 4

Insta360 argues that Insta360 Go anticipates claims 3 and 4. Insta360 Br. at 194. GoPro's disagreement is based on its assertion that no horizon-leveling occurs in the Insta360 Go. GoPro Br. at 134–137 and GoPro Reply at 54–56. As explained above, the evidence supports that horizon-leveling was performed in the Insta360 Go and its associated app. The evidence also supports that the additional elements of claims 3 and 4 are disclosed in the Insta360 Go. *See* Insta360 Br. at 194–195, *citing* Goodin Tr. at 1316:1–1318:21; RX-1618 (product review video, showing a straight line in a scene depicted as a curved line, and showing barrel distortion); RX-1656 (showing RX-1618 (product review video) posted August 28, 2019). The clear and convincing evidence supports that claims 3 and 4 are anticipated by the Insta360 Go and its associated Go app.

(3) Claim 7

Claim 7 depends from claim 1 and recites, "wherein the determination of the viewing window further includes determination of a size of the viewing window as the function of progress through the progress length based on the rotational positions of the image capture device as the function of progress through the capture duration." Insta360 argues that Insta360 Go meets claim 7 because it alters the size of its viewing window "as the camera's rotational position changes." Insta360 Br. at 195. For support, Insta360 points to the viewing window's [redacted]. *See id.* at 195–196, *citing* Goodin Tr. at 1318:22–1320:21 ("[redacted]").

The evidence does not support that the Insta360 Go alters the size of its viewing window which would indicate a determination of a size of the viewing window as the function of progress through the progress length based on rotational positions of the image capture device. For example,

the testing video demonstrating the Insta360 Go's horizon-leveling does not show a perceptible change its viewing window size in terms of field of view even though the rotations during the capture duration are extreme. CX-1218C. The third-party demonstration video shows no perceivable change either. *See* RX-0028 at 4:17–24. In addition, Insta360 witness, Mr. Jiang, confirmed that CX-1188C (Jiang Dep.) at 117:24–118:8. It is likely for this reason, Insta360's argument depends on defining "size" in terms of pixel count/density and not the extent of the viewing window. Insta360 Br. at 195–196. Claim 1 recites that the viewing window "defin[es] extents of the visual content to be included within the horizon-leveled visual content." '832 patent at claim 1. As used in the claim, "extents" relates to the field of view, not the number of pixels. As a result, in reciting "determination of a size of the viewing window," claim 7 addresses the field of view, not the density of pixels. Because Insta360 Go does not show a change in field of view from the videos in evidence, there is no indication that there is a "determination of a size of the viewing window," as claimed. Insta360 points to no other evidence supporting that such a determination is made and the testimony from Mr. Jiang supports it is not.

The evidence does not support that claim 7 is anticipated by the Insta360 Go.

(4) Claim 8

Claim 8 depends from claim 7 and recites, "wherein the size of the viewing window changes as the function of progress through the progress length to simulate changes in zoom for the visual content." Insta360 argues that as the Insta360 Go alters the size of its viewing window, it simulates changes in zoom for the visual content. Insta360 Br. at 196, *citing* Goodin Tr. 1320:22–1321:14. Claim 8 depends from claim 7, which, as explained above, is not anticipated by the Insta360 Go. For this reason, claim 8 is not anticipated either. In addition, Insta360 has not shown

[redacted]

that the tilted house images relied on by Mr. Goodin are from an actual Insta360 Go camera. Goodin Tr. at 1320:22–1321:14, *citing* RDX-0013C.296 (no exhibit number identified). In addition, the tilted house images are inconsistent with Mr. Jiang's testimony, [redacted] CX-1188C (Jiang Dep.) at 117:24–118:8.

The evidence does not support that claim 8 is anticipated by the Insta360 Go.

c) Obviousness

Insta360 contends that it would have been obvious to combine Insta360 Go with Thomason and that the combination renders claims 7 and 8 obvious. Insta360 Br. at 198. Thomason is titled "Image Rotation Correction for Video or Photographic Equipment" and generally describes measuring the angle of a camera's orientation using a sensor and rotating the captured image "to have the true horizontal displayed as horizontal." RX-1597 at Abstract. Thomason teaches on- and off-camera correction, *id.* at [0008]–[0009] and recording image data and orientation data "as separate pieces of data," *id.* at [0017]. Thomason further discloses the use of cropping so that the "final image frame 44 is the same size as the original image frame 40." *Id.* at [0037].

Insta360 argues that in Thomason, "[t]he size of the viewing window is determined based on the rotational position—a more tilted camera angle would result in a smaller viewing window as there is less visual content that can be horizon-leveled." *Id.* at 215. GoPro challenges whether Thomason teaches "that the crop size may differ from frame-to-frame" and whether one of skill would have been motivated to combine Insta360 Go and Thomason. GoPro Br. at 139–140.

The evidence supports that Thomason teaches the requirements of claim 7, namely, adjusting the size of a viewing window (*i.e.*, punchout) on a frame-by-frame basis based on the camera's rotation orientation on that same frame-by-frame basis:

[redacted]

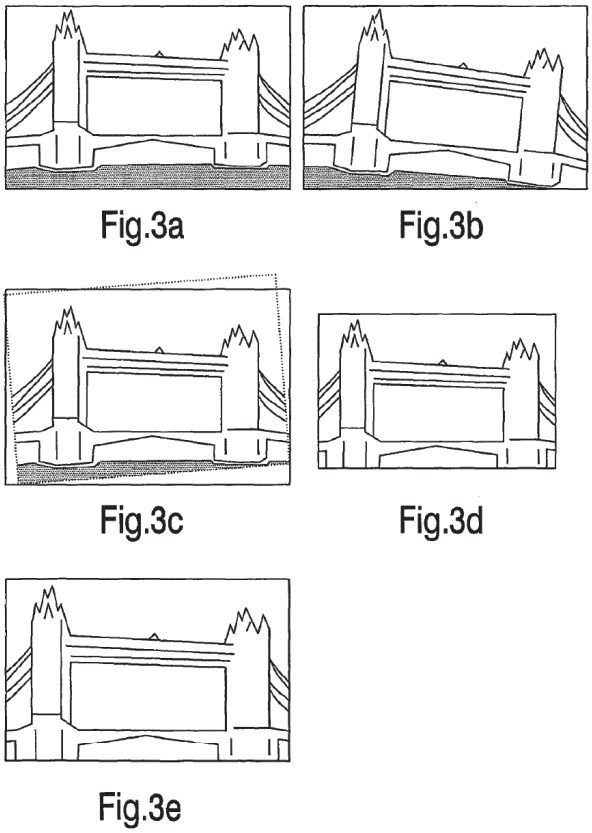
The camera may record either still images or moving images, in the latter case by capturing a sequence of items of image data 8 representing sequential frames of the moving image.

. . . .

FIG. 3 *a* shows the image that the user should have taken i.e. with the camera horizontally aligned. FIG. 3 *b* shows the image taken with a camera angle at an angle of about 10° to the vertical.

. . . .

On replay, the processor 22 calculates the image on display 24 as shown in FIG. 3 *c*, with a rotation correction applied using the camera item data angle by replay processor 22 so that true horizontals appear as horizontal. Some of the image frame of the rotation corrected image is blank, as may be seen. Accordingly, the image is cropped to eliminate blank space as illustrated in FIG. 3 *d*. Frame 40 represents the recorded image and frame 42 represents the image frame of the displayed image.



RX-1597 at [0008], [0027], [0036], and Figs. 3a–3e.

[redacted]

Mr. Goodin testified that Fig. 3a of Thomason shows captured visual content, Fig. 3d shows the viewing window, and Fig. 3e shows horizon-leveled visual content. The operations in Thomason take place frame-by-frame and images and data are "recorded in the memory together with the data item that records the camera angle," meeting the requirement of "determination of a size of the viewing window as the function of progress through the progress length based on the rotational positions of the image capture device as the function of progress through the capture duration." Mr. Goodin pointed out that paragraph [0036] of Thomason discloses that a rotation correction is applied using the camera item data angle by a replay processor so that the true horizontals appear as horizontal and that the image is cropped to eliminate blank space as illustrated in Fig. 3d. Mr. Goodin explained that this disclosure in Thomason supports that Thomason determines the size of the viewing window. Mr. Goodin also explained that one of skill would understand that Thomason discloses determining the size of the viewing window as a function of progress through the progress length because based on the degree of rotation, "more or less image would be cropped as you proceed through the video to obtain the viewing window." Goodin Tr. at 1322:2–1323:7 and RDX-0013C.298.

The evidence also supports that Thomason teaches the limitations of claim 8. As noted above in addressing infringement, when the viewing window is smaller or larger, and then fitted to an output viewing space, this necessarily results in changes in zoom. This is shown in Figs. 3a–3e, above. The cropped figure is zoomed. This is also consistent with GoPro's arguments on the technical prong of domestic industry and infringement. *See* GoPro Br. at 116 ("Because the output image is rendered on a display of set size, changing the size of the viewing window will simulate change in zoom for the visual content."), 125 ("Changing the size of the viewing window (the output field of view) will simulate changes in zoom for the visual content.").

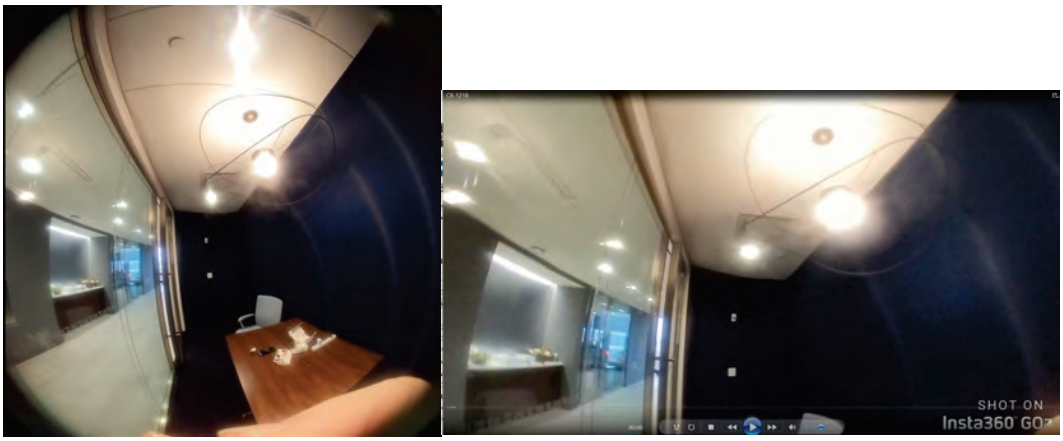
[redacted]

Mr. Goodin explained that Thomason discloses that the corrected image is resized so that the final image frame 44 is the same size as the original frame 30. Goodin Tr. at 1323:8–18 and RDX-0013C.299. The evidence thus supports that Thomason discloses that "the size of the viewing window changes as the function of progress through the progress length to simulate changes in zoom for the visual content," as recited in claim 8. According to Mr. Goodin, "Thomason shows more tilted camera angle results in a smaller viewing window making the object appear more zoomed in." Goodin Tr. at 1324:4–9 and RX-1597 at [4], [34], [36], and [37].

The evidence supports that one of skill would have been motivated to introduce re-sizing into the Insta360 Go. Mr. Goodin credibly testified that Insta360 Go and Thomason are "both in the same field" and disclose "[h]orizon leveling by rotating images and removing unwanted portions." The combined system "would achieve better image quality as it has the flexibility to preserve more pixels." Mr. Goodin testified that there is a reasonable expectation of success because "Thomason shows more tilted camera angle results in a smaller viewing window making the object appear more zoomed in." Goodin Tr. at 1323:19–1324:6.

Based on the Insta360 Go testing evidence provided by Dr. Schonfeld—in which the size of the viewing window does not change, CX-1218C and CX-1219C, it is clear that there are lost pixels which could have been captured during on-axis horizon periods and presented to the user (*i.e.*, the output field (bottom) of view is smaller than it needs to be):

[redacted]



CX-1219C at 0:00 and CX-1218C at 0:00. Clear and convincing evidence supports that one of skill would have understood that the Insta360 Go would benefit from re-sizing based on camera orientation, on a per-frame basis, as taught by Thomason

As to motivation, GoPro argues, "adding such a feature would introduce additional complexity such as the need to account for changes in zoom levels to avoid the pumping effect that GoPro solved with the '832 patent." GoPro Br. at 140, *citing* Stimm Tr. at 127:21–128:20, *citing* '832 patent at Fig. 6C. Avoiding a pumping effect, however, is not claimed. Moreover, the evidence supports that the Insta360 Go and Thomason are in the same field of endeavor and one of skill in the art would have understood that Thomason would have predictably improved the Insta360 Go. Schonfeld Tr. at 1323:19–1324:6.

GoPro also notes an alternate embodiment of Thomason in which the field of capture is large, and never used in its entirety, such that changes in viewing window are unnecessary. GoPro Br. at 140, *citing* RX-1597 at [0037]–[0041]. But this is an *alternate* embodiment, and a reference is fairly used for all it teaches, including the embodiment in which the viewing window size does change. *In re Mouttet*, 686 F.3d 1322, 1331 (Fed. Cir. 2012), *citing KSR*, 550 U.S. at 418–21. GoPro also argues that Insta360 did not implement its dynamic FoV algorithm until after the '832

[redacted]

patent's priority date, and after much labor, which indicates non-obviousness. GoPro Br. at 140. But GoPro has not shown the legal relevance of this timing. *See id.* (no citation).

Consideration of indicia of non-obviousness does not change this outcome. *See* GoPro Br. at 144 and 199–211. Unlike the advent of Hypersmooth motion stabilization, GoPro does not present specific evidence linking the techniques of claims 7 and 8 with the commercial success and industry praise found persuasive above. And as Insta360 notes, GoPro's discussion is largely focused on its Hero3, Hero5, and Hero7 models, all of which precede the Hero9 in which horizon-leveling was first implemented. *See generally* GoPro Br. at 199–204. GoPro highlights a technical Emmy award from 2020-21 credited to Hypersmooth but given the difference between motion stabilization and horizon-leveling, this industry praise has at best, an attenuated connection to the window re-sizing techniques of claims 7 and 8 of the '832 patent. CX-0020 (award); CX-0636 (press release); *see* Insta360 Reply at 62, *citing* GoPro Br. at 136; CX-0649C.14 (Hypersmooth and Horizon features are different lines of customer inquiry). Similarly, while the evidence supports that the Hero line of cameras was, overall, successful commercially, and that surveys show "horizon-leveling" is important to consumers (Lema Tr. at 372:11–375:25 and CX-0649C.14), claims 7 and 8 are not directed to just horizon leveling. If survey or other evidence indicated that dynamic window-size horizon-leveling was an important driver of commercial success or industry praise, that could have been a different matter. But there is no such evidence.

Beyond commercial success and industry praise, GoPro alludes to copying as relevant to the '832 patent. *See* GoPro Reply at 61. The evidence does not go beyond benchmarking, however. There are comparisons between horizon-leveling performance of Insta360 and GoPro, but no indication that Insta360 copied or reverse engineered GoPro's techniques/programming. CX-0845C ([redacted]); CX-0846C ([redacted]

[redacted]); CX-0892C ([redacted]). Similarly, that Insta360 filed a Chinese patent application in late 2020 involving anti-shake techniques that maximize FOV for each leveled frame, does not support that Insta360 copied GoPro's horizon-leveling. GoPro Br. at 208 and CX-0737. The evidence does not support copying.

Considering the *Graham* factors, clear and convincing evidence supports that claims 7 and 8 are obvious based on the combination of Insta360 Go and Thomason. The evidence supports that claims 7 and 8 are invalid as obvious over the combination of Insta360 Go and Thomason.

2. ReelSteady Go

Insta360 argues that ReelSteady Go (RX-1546; RX-1547; and RX-0191) anticipates claims 1, 3, 4, 7 and 8 and renders obvious claims 3 and 4 when combined with the knowledge of one of skill. Insta360 Br. at 199–208.

a) Overview

Insta360 argues that ReelSteady Go "is a post-processing desktop application that stabilizes and horizon levels videos from GoPro cameras" and "was on sale and released by Super Mega on May 14, 2019—months before the '832 patent's earliest priority date." Insta360 Br. at 199, *citing* Goodin Tr. at 1287:11-24; RX-2468 (ReelSteady blog); RX-3272 (webpage) at 5–6; and RX-0333C (McIntosh Dep.) at 14:9–15:8, 34:13-15, 37:24-38:4. Given GoPro's assertion that the priority date of the '832 patent is August 30, 2019, GoPro Br. at 6, the evidence supports that ReelSteady Go is prior art under 35 U.S.C. § 102(a). This is not disputed by GoPro. *See generally* GoPro Br. and GoPro Reply.

b) Anticipation

Insta360 contends that ReelSteady Go anticipates claims 1, 3, 4, 7, and 8. Insta360 Br. at 199–208 and Insta360 Reply at 59–60.

[redacted]

(1) Claim 1

Insta360 argues that ReelSteady Go discloses all elements of claim 1. *See* Insta360 Br. at 199–206 and Insta360 Reply at 59–60. Of these, GoPro disputes limitations 1[c], 1[d], and 1[e]. GoPro Br. at 127–133; CDX-0017C.31; and GoPro Reply at 58–59. For those limitations not in dispute, the evidence supports that that are disclosed in ReelSteady Go. *See* Insta360 Br. at 201–202, *citing* Goodin Tr. at 1287:25–1289:15.

GoPro's disagreements as to elements 1[c], 1[d], and 1[e] are based on its contention that that ReelSteady Go fails to "characteriz[e] rotational positions of the image capture device as a function of progress through the capture duration." GoPro Br. at 127. Thus, GoPro does not dispute that ReelSteady Go "determines a viewing window as a function of progress through the progress length," the viewing window "defin[es] extents of the visual content to be included within the horizon-leveled content," or that it "generate[s] the horizon-leveled content based on the viewing window." *See* GoPro Br. at 127–132. For these portions of elements 1[c], 1[d], and 1[e] that are not in dispute, the evidence supports that they are disclosed in ReelSteady Go. *See* Insta360 Br. at 202–206, *citing* Goodin Tr. at 1289:16–1297:21.

As for its dispute on "characterize[e] rotational positions of the image capture device as a function of progress through the capture duration,"[30] Insta360 argues that ReelSteady Go, as a post-capture program running on a user's personal computer, accesses gyroscope data from the camera and associates that data with a corresponding video frame. Insta360 Br. at 202. GoPro first appears to argue that no gyroscope data is used at all (GoPro Br. at 127 ("infers selected rotational position information post-hoc, after the capture duration, based on optical analysis of the image

[30] This argument is framed as anticipation. *See* Insta360 Br. at 202–204. Insta360 only suggests an obviousness argument as to element 1[c], but in just 3 lines with no substantive analysis.

[redacted]

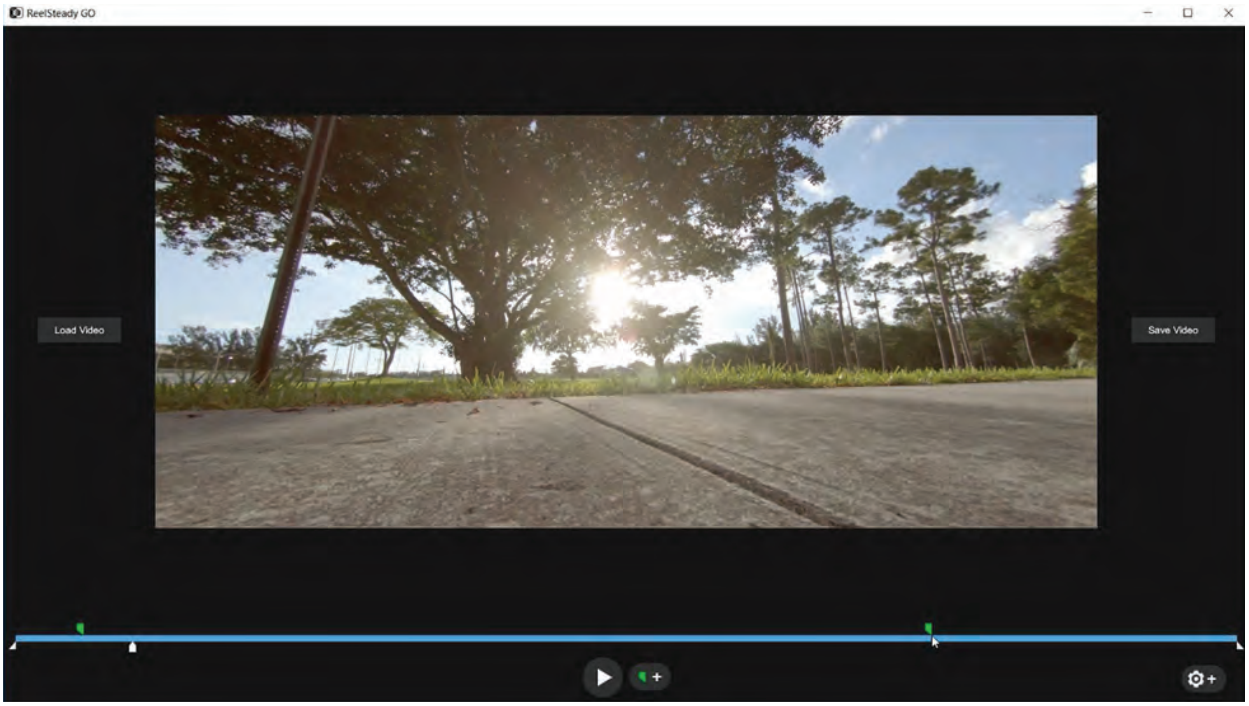
data itself"), 129 ("forced to rely upon 'sync points' that utilized 'computer vision' to estimate how the video is moving")) but then also argues that the gyroscope data, in existence, does not correspond to captured video frames because of different recording speeds (*see id.* at 128).

Whether there are different recording speeds is not relevant to element 1[c], which recites, "obtain rotational position information for the video, the rotational position information characterizing rotational positions of the image capture device as a function of progress through the capture duration." The claim does not require that ReelSteady Go matches or associates gyroscope data with a particular frame of the video. Claim 1 does not recite that rotational position information is characterized as a function of the same progress through the progress length (*i.e.*, same frame or timestamp) as the visual content. Rather, the rotational position information is characterized as a function of progress through the *capture duration*. *Compare* '832 patent at claim 1 (element 1[b]) *with* '832 patent at claim 1 (element 1[c]). And the claim does not recite that capture duration and progress length must be the same and the specification, as discussed above, supports that they may not be. '832 patent at 14:12–23. For this claim element, it is enough that ReelSteady Go obtains rotational position information characterized as a function of progress through a capture duration.

The evidence supports that gyroscope data is obtained by ReelSteady Go in a "track" which connotes an ordered sequence. A tutorial video provided by the ReelSteady Go developer, Super Mega, and cited by GoPro, is especially informative and no party disputes its accuracy. CX-0751. It explains that ReelSteady Go first obtains a "gyro track" alongside video and audio tracks from the GoPro camera memory. *Id.* at 00:28–39. It states that, unlike the video and audio tracks, the gyro track is not recorded at a "constant" or "consistent" speed; and, consequently, the speed of the track needs to be "retimed" or "adjusted" "in different places" for it to be consistent and then

[redacted]

"lined up exactly with the video track." *Id.* at 00:40–1:02. The video explains the use of "sync points," analogous to keyframes common in video editing software, which act as adjustable demarcation points within a track of data. *Id.* at 1:27–3:23 ("re-time the gyro track the same way you would re-time a video track in another editing program"). Moving these sync points along the progress length can speed up or slow down the track data rates in-between the points. *Id.* The screenshot below shows the location of sync points (green) within a video clip, with the white cursor indicating the current progress through the progress length:



Id. at 4:04. Importantly, the system automatically creates an initial set of sync points based on a visual analysis of the frame data to ascertain motion, then finds the gyroscope track data that appears to match that same motion. *Id.* at 4:05–29 ("compares what kind of shaking it sees to the shaking reported in the gyro track and it just uses the best match of those two to make it synch"). With those points set, the gyro data in between the points is, according to Mr. Stimm, "stretched or shrunk" to fill the allotted space of the clip. Stimm Tr. at 132:15–17. Super Mega employee,

[redacted]

and now GoPro employee, Mr. McIntosh, testified that the gyro track data "looked to us like time stamps." RX-0333 (McIntosh Dep.) at 61:2–17.

Clear and convincing evidence thus supports that ReelSteady Go characterizes rotational positions of the image capture device as a function of progress through the capture duration and thus meets element 1[c]. *See also* Goodin Tr. at 1289:16–1292:10 and cited source code.

To the extent a dispute remains, the evidence supports that elements 1[d] and 1[e] are met as well. Once the sync points are in place (if needed at all), the ReelSteady Go system associates gyroscope track data (transformed into quaternions) with a particular frame to effect horizon-leveling for that frame through counterrotation of the orientation data. This was confirmed by Mr. Goodin's analysis of source code, by Mr. McIntosh, and by relevant documents. Goodin Tr. at 1290:11–1291:7; RX-0333 (McIntosh Dep.) at 30:16–31:3, 34:13–35:15, and 83:21–84:10 ("we would get the gyro and accl track from the metadata an sync it with the video using optical flow motion estimation, and then the user has the option to turn on horizon leveling which would use that accelerometer accl track in combination with the gyro track to level the horizon."); and RX-1547.7 ("gyroscope metadata to stabilize the footage").

Clear and convincing evidence supports that all elements of claim 1 are anticipated by ReelSteady Go.

(2) Claims 3 and 4

Claim 3 depends from claim 1 and recites, "wherein the visual content includes a distortion such that a straight line within a scene depicted within the visual content appears as a curved line, the distortion of the visual content reducing impact of an off-axis horizon depicted within the horizon-leveled visual content." Claim 4 depends from claim 3 and recites, "wherein the distortion includes a barrel distortion or a pincushion distortion."

[redacted]

Insta360 argues that ReelSteady Go anticipates claim 3 because it "processes videos having wide-angle or fisheye distortions, in which straight lines appear to bend outward." *See* Insta360 Br. at 206–207. GoPro does not dispute that ReelSteady Go receives this content, but argues it removes that distortion from the output image displayed to the user and thus fails to satisfy the claim. GoPro Br. at 133 ("Rather than showing that ReelSteady Go *includes* a distortion to *reduce* the image of an off-axis horizon, Mr. Goodin has at best shown that ReelSteady Go *removes* distortions." (emphases by GoPro)).

The parties' dispute is over which "visual content" is referred to in dependent claim 3 as "includ[ing] a distortion." GoPro argues it must be the end-product, horizon-leveled visual content; while Insta360 argues it is the initially captured visual content. A plain and ordinary reading of the claim indicates GoPro is correct. Claim 3 requires "a scene depicted within the visual content" and "depicted" or a "depiction" means content is displayed such it is viewed by a user. This is supported by the specification, which explains how distortion in the final image can hide off-axis horizon lines due to "in accurate and/or imprecise" horizon leveling. '832 patent at 21:54–57. The parties cite no evidence, intrinsic or extrinsic, to find otherwise. *See generally* GoPro Br. at 133; GoPro Reply at 59; Insta360 Br. at 207; and Insta360 Reply at 60. And given that it is undisputed that ReelSteady Go removes distortion from the video before it is displayed (Goodin Tr. at 1298:16–20 and RX-1546.7–8), the evidence supports that claim 3 is not disclosed in ReelSteady Go. For the same reasons, claim 4, which further specifies the type of distortion, is not disclosed in ReelSteady. The evidence supports that claims 3 and 4 are not anticipated by ReelSteady Go.

(3) Claims 7 and 8

Claim 7, depends from claim 1 and recites, "wherein the determination of the viewing window further includes determination of a size of the viewing window as the function of progress

[redacted]

through the progress length based on the rotational positions of the image capture device as the function of progress through the capture duration." Claim 8 depends from claim 7 and recites "wherein the size of the viewing window changes as the function of progress through the progress length to simulate changes in zoom for the visual content."

Insta360 argues that ReelSteady Go anticipates claims 7 and 8 based on an online article stating, "ReelSteady dynamically crops the image in post to save as much resolution and field of view possible throughout the shot – it basically subtly zooms in and out based on how shaky the footage is at any given time." Insta360 Br. at 207–208, *citing* RX-1547.7. GoPro disputes this based on Insta360's alleged failure to show rotational position data as function of progress through the capture duration, discussed above, GoPro Br. at 133–134, and then based on Insta360's failure to show that this article in fact discusses the version of ReelSteady Go available before the '832 patent priority date, *id.* at 134. As detailed above, ReelSteady Go does obtain and use a track of rotational position data meaning that it is characterized as a function of progress through the capture duration. And Insta360 correctly argues that GoPro's challenge to RX-1547 as prior art was not included in is pre-hearing brief and is therefore waived. Insta360 Reply at 59; *see* GoPro Prehearing Br. at 139 and Order No. 2 at G.R. 9.2.

The evidence otherwise supports that ReelSteady Go chooses the size of the viewing window based on the rotational data associated with a particular frame of the video content and that the size of the viewing window changes to simulate changes in zoom. RX-1547.7 and Goodin Tr. 1299:14–1300:12.

The evidence supports that claims 7 and 8 are anticipated by ReelSteady Go.

[redacted]

c) Obviousness

Insta360 argues that claims 3 and 4 would have been obvious based on ReelSteady Go in view of the knowledge of one of skill. Insta360 Br. at 207, citing Goodin Tr. at 1298:21–1299:13. Specifically, Insta360 contends that one of skill "would have understood that a wide-angle or fisheye video has a barrel distortion and that the distortion of the visual content can reduce impact of an off-axis horizon." Insta360 Br. at 207. At trial, Mr. Goodin stated, "[i]f you don't believe [anticipation], then it certainly would have been obvious to a POSITA that an off-axis horizon is less noticeable in a distorted image than in a non-distorted image, in which case this would be obvious as a single-reference obviousness." Goodin Tr. at 1298:11–15.

Insta360 has not met its burden. The question posed by ReelSteady Go's removal of distortion before output to a display is whether it would have been obvious to a person of ordinary skill to add it back in. Insta360 does not address this question and instead argues that one of skill would have appreciated or known off-axis horizons are less noticeable in distorted images. Insta360 has not presented clear and convincing evidence that claims 3 and 4 would have been obvious based on ReelSteady Go.

3. Thomason Alone and With Watanabe

Insta360 argues Thomason (RX-1597): (1) anticipates claims 1, 3, 4, 7, and 8, (2) renders claims 3, 4, 7, and 8 obvious when combined with the knowledge of one of skill, and (3) renders claims 3 and 4 obvious when combined with Watanabe (RX-2003). Insta360 Br. at 208–216.

a) Overview

Thomason is prior art and is described above. Given GoPro's assertion that the priority date of the '832 patent is August 30, 2019, GoPro Br. at 6, the evidence supports that Watanabe

[redacted]

(U.S. Patent No. 10,778,896, RX-2003), with a filing date of April 16, 2018, is prior art under 35 U.S.C. § 102(a). This is not disputed by GoPro. *See generally* GoPro Br. and GoPro Reply.

b) Anticipation

Insta360 contends that Thomason anticipates claims 1, 3, 4, 7, and 8. Insta360 Br. at 208–216 and Insta360 Reply at 60–62.

(1) Claim 1

Insta360 argues that Thomason discloses all elements of claim 1. *See* Insta360 Br. at 208–212. Of these, GoPro disputes elements 1[c] and 1[d]. GoPro Br. at 141 and GoPro Reply at 59. For those elements not in dispute, the evidence supports that they are disclosed in Thomason. *See* Insta360 Br. at 209–212 and Goodin Tr. at 1324:11–1325:13 and 1327:12–1328:1.

GoPro's central disagreement as to elements 1[c] and 1[d] is that Thomason fails to "characteriz[e] rotational positions of the image capture device as a function of progress through the capture duration" because "Insta360 does not point to any disclosure teaching that these two 'separate' pieces of data are synchronized or aligned frame-to-frame, as a function of progress through the capture duration as required." GoPro Br. at 141 and *see* GoPro Reply at 59. As discussed previously, the claim does not require the type of synchronization GoPro demands. A characterization of data "as a function of progress *through the capture duration*" is different than a characterization of data "as a function of progress *through the progress length*." '832 patent at claim 1 (emphasis added). Even then, Thomason discloses, "[t]he image . . . is recorded in the memory together with the data item that records the camera angle." RX-1597 at [0035]. Naturally, image frames making up video content are recorded and stored in a sequence. The evidence supports that Thomason's rotational position information is also stored in a sequence (*i.e.*, as a

[redacted]

function of progress through the capture duration). Mr. Goodin credibly testified that Thomason discloses elements 1[c] and 1[d]. Goodin Tr. at 1325:15–1327:10.

GoPro also argues that Thomason "only discloses an 'accelerometer'" for the sensor that detects camera orientation and argues that accelerometers are "not recognized as an effective means to obtain accurate, frame-to-frame rotational position." GoPro Reply at 59.[31] This argument is rejected for several reasons. First, it is not supported by expert testimony. *See, e.g.*, GoPro Reply at 59 and Insta360 Br. at 210–211. Attorney argument is generally inadequate for such technical matters. *See Invista North America S.A.R.L. v. M & G USA Corp.*, 951 F. Supp 2d 626, 652 (D. Del. 2013) (where patent claims cover complex issues of technology, expert testimony is required to aid the fact finder). Second, the claim as written requires no degree of accuracy for the rotational information, only that it exist and be obtained by the processor running the machine-readable instructions. '832 patent at claim 1. Thomason explicitly discloses this, stating that a "rotation sensor 14 is provided that measures the angle of the camera to the vertical and outputs a corresponding measurement signal. This angle is recorded in the memory 12. The rotation sensor is an accurate accelerometer." RX-1597 at [0029]. Thomason adds that "[p]referably, the accuracy of the rotation sensor is much better than 5°, *i.e.*, 2° or better, or preferably 1° or better, or even 0.5° or better" (*id.* at [0007]). The evidence supports that Thomason characterizes rotational positions of the image capture device as a function of progress through the capture duration and thus discloses what GoPro contends is missing.

Clear and convincing evidence supports that claim 1 is anticipated by Thomason.

---

[31] GoPro states this means "Thomason does not contemplate limitation 1[b]," GoPro Reply at 59, but this appears to relate to element [1c], which introduces the concept of tracking rotational position information.

[redacted]

(2) Claims 3 and 4

Insta360 asserts "Thomason anticipates claims 3 and 4" in a section header but does not otherwise address Thomason as anticipating claims 3 and 4. *See* Insta360 Br. at 213. Insta360 has therefore not shown that Thomason anticipates claims 3 or 4.

(3) Claim 7

Insta360 argues that Thomason discloses claim 7 because "[t]he size of the viewing window is determined based on the rotational position—a more tilted camera angle would result in a smaller viewing window as there is less visual content that can be horizon-leveled." Insta360 Br. at 215. GoPro disputes this claim is met because "the disclosures Respondents identify in Thomason teach a fixed size viewing window that is punched out then scaled up, which is different from dynamically changing the viewing window from frame to frame." GoPro Br. at 143, *citing* Schonfeld Tr. at 1505:2–12 and GoPro Reply at 60.

As discussed with respect to the combination of Insta360 Go and Thomason, Thomason teaches the requirements of claim 7, namely, adjusting the size of a viewing window (*i.e.*, punchout) on a frame-by-frame basis based on the camera's rotation orientation on the same frame-by-frame basis. Goodin Tr. at 1331:25–1332:18; RDX-0013C.314; RX-1597 at [0035], [0036], and Fig. 3.

Clear and convincing evidence supports that claim 7 is anticipated by Thomason.

(4) Claim 8

Insta360 argues that Thomason discloses claim 8 because it states "'the corrected image 42 is resized so that the final image frame 44 is the same size as original frame 40.'" Insta360 Br. at 215. GoPro's dispute is the same as for claim 7. *See* GoPro Br. at 143 and GoPro Reply at 60. As discussed with respect to the combination of Insta360 Go and Thomason, Thomason teaches

the requirements of claim 8, namely, when the viewing window is smaller or larger, and then fitted to an output viewing space, this inherently results in changes in zoom—as shown in Thomason's figures 3a–3e. Goodin Tr. at 1332:19–1333:11; RDX-0013C.315, and RX-1597 at [0034] and [0037], and Figs. 3a–3e.

Clear and convincing evidence supports that claim 8 is anticipated by Thomason.

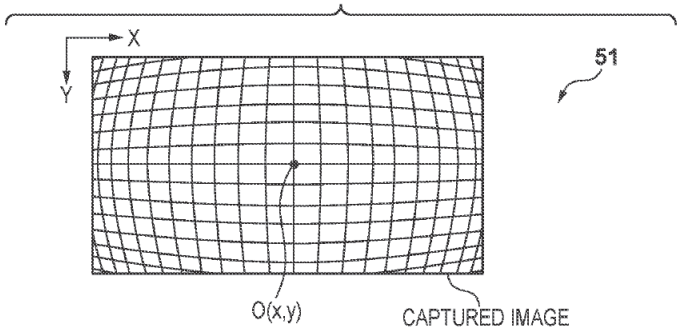
c) Obviousness

As to claims 3 and 4, Insta360 contends that they are obvious based on: (1) Thomason and the knowledge of one of skill and (2) Thomason in view of Watanabe. Insta360 br. at 213–215.

Insta360 contends one of skill would have understood that Thomason can receive visual content including barrel distortion, such as in a combination of Thomason and Watanabe. Insta360 Br. at 213–214. As discussed with respect to the ReelSteady Go, GoPro disputes that one of skill would have been motivated to introduce barrel distortion or otherwise have it present in the end-product horizon-leveled video. *See* GoPro Br. at 141–143 and GoPro Reply at 60.

Claim 3 requires distortion in the "visual content" that is displayed to a user. The record supports that this is taught in Watanabe. First, Watanabe discloses that barrel distortion in captured images was known, as shown in item 51 in Fig. 5, below:

FIG. 5

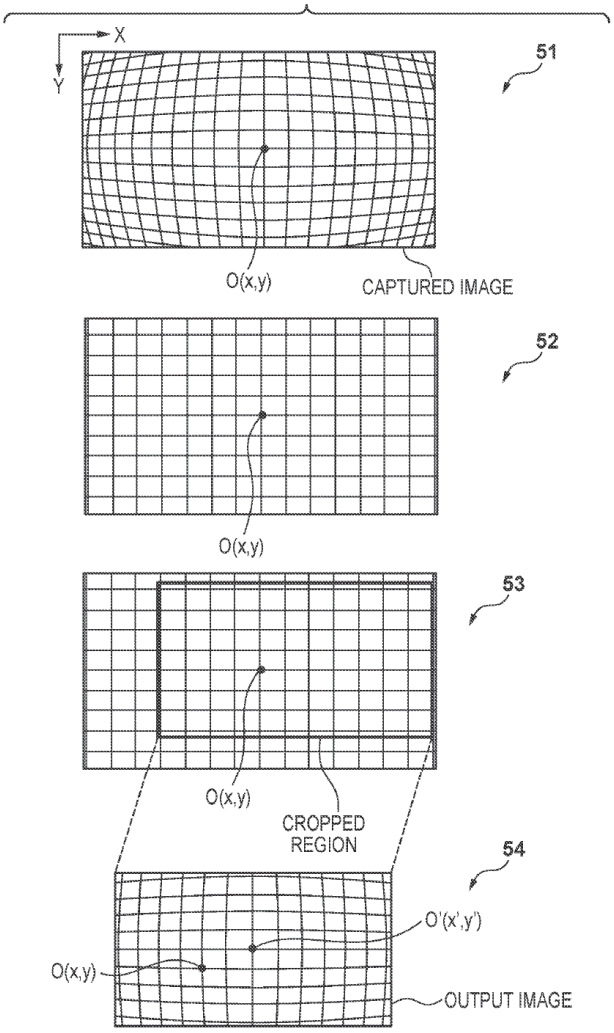


RX-2003 at Fig. 5 and *see id*. at 9:33–44 (recognizing an image shot with a "(super) wide-angle lens" as typical). Watanabe discloses that "barrel distortion that is centered on image coordinates

[redacted]

(x,y) corresponding to the intersection between an optical axis O and the image sensor (which is assumed here to match the center coordinates of the image) has occurred caused by aberration of the photographing lens 102." *Id*. at 11:7–14. Watanabe also discloses that while "it is preferred that image distortion caused by aberration does not exist for image shake correction, but, regarding an image shot with a wide-angle lens, it is actually natural that a certain degree of image distortion caused by aberration exists." RX-2003 at 9:33–44. Watanabe thus discloses that barrel distortion is retained in the displayed image, as shown in element 54, below:

FIG. 5



[redacted]

RX-2003 at Fig. 5. Watanabe discloses that a "distortion addition circuit 108" "add the effect of distortion caused by the photographing lens 102" to the image and stores the image in memory. The distortion addition circuit 108 is described as supplying "distortion addition processing." *Id*. at 5:36–42 and 11:55–61. Goodin Tr. at 1329:23–1331:3 and RDX-0013C.311–312. Mr. Goodin credibly testified that one of skill would understand an off-axis horizon is less noticeable in a distorted image." *Id*. at 1330:10–16.

GoPro argues that Thomason uses a lens without distortion and that it would not be obvious to add distortion per Watanabe. GoPro Br. at 142 and Schonfeld Tr. at 1503:13–1504:3. Watanabe discloses, however, that wide-angle lenses that introduce barrel distortion were known, RX-2003 at 9:33–44, and teaches that retaining that barrel distortion was desirable. *See* Insta360Br. at 215, *citing* RX-2003 at 11:7–9 and Insta360 Reply at 61). The evidence thus supports that obtaining video content with barrel distortion and ensuring that any outputted horizon-leveled video also included barrel distortion (claims 3 and 4) would have been, at the very least, obvious to try when implementing the techniques of Thomason in view of Watanabe. *KSR*, 550 U.S. at 421 ("Where there is a design need or market pressure to solve a problem and there are a finite number of identified, predictable solutions, a person of ordinary skill has good reason to pursue the known options within his or her technical grasp.").

That GoPro cameras were prevalent at the time of the invention of the '832 patent and included fisheye lenses (*i.e.*, lenses that cause barrel distortion) supports this conclusion. GoPro Br. at 203, *citing* Lema Tr. at 360:17–361:10 ("capturing 80 to 85 percent of the consumer market historically). Mr. Goodin's testimony that one of skill would have done this to "mak[e] the image appear natural" is persuasive in light of the explicit teachings of the art and despite testimony from GoPro founder Mr. Woodman that traditional camera companies tended to eliminate distortion.

[redacted]

Goodin Tr. at 1331:5–17 and Woodman Tr. at 78:3–23. The evidence thus supports that there is a motivation to combine Thomason and Watanabe (to use a wide-angle lens) and that the combination would predicably result in an output image with barrel distortion. Clear and convincing evidence supports that claims 3 and 4 are obvious in view of the combination of Thomason and Watanabe. *See* Goodin Tr. at 1328:8–1331:21.

Secondary indicia of non-obviousness do not alter this outcome. As addressed above, there is minimal evidence that GoPro's commercial success or industry praise have a nexus to its horizon-leveling feature. There is even less evidence showing a nexus between these indicia and GoPro's application of horizon-leveling to barrel distorted videos as opposed to non-distorted videos (*i.e.*, the subject matter of claims 3 and 4). The same is true for copying as shown, for example, by the Insta360 Go which is prior art included this common lens effect. *See, e.g.*, CX-1219C (testing video).

Considering the *Graham* factors, clear and convincing evidence supports that claims 3 and 4 are obvious based on the combination of Thomason and Watanabe. The evidence supports that claims 3 and 4 are invalid as obvious over the combination of Thomason and Watanabe.

4. Patent-Eligible Subject Matter

Because each of the asserted claims is invalid based on the prior art, it is unnecessary to consider invalidity under § 101.

5. Written Description

Under section 112, a patent claim is invalid for lack of written description if the patent's specification fails to "reasonably convey[] to those skilled in the art that the inventor had possession of the claimed subject matter as of the filing date." *Ariad Pharm., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336, 1351 (Fed. Cir. 2010) (in banc). "[T]he test requires an objective inquiry into

the four corners of the specification from the perspective of a person of ordinary skilled in the art" and "the level of detail required to satisfy the written description requirement varies depending on the nature and scope of the claims and on the complexity and predictability of the relevant technology." *Id.*, *citing Capon v. Eshar*, 418 F.3d 1349, 1357-58 (Fed. Cir. 2005).

Insta360 contends the asserted claims are invalid because "the term 'function of progress through the progress length' lacks written description." Insta360 Br. at 218. It continues, "Mr. Goodin's unrebutted testimony shows that the specification repeatedly uses this term without any explanation of what the function is or how it is determined." *Id.*, *citing* Goodin Tr. at 1276:11–1277:5. As discussed above in addressing claim construction and infringement, the intrinsic evidence supports that "function of progress through the progress length" refers to an indication of where within the total progress length the system is while taking an action as opposed to some strict mathematical input/output function. *See, e.g.*, '832 patent at 5:16–26, 8:6–14, 23:55–24:3. Mr. Goodin's opinion here is indistinguishable from his indefiniteness opinion, rejected above. *See* Goodin Tr. at 1276:11–1277:5. The evidence does not support that any of the asserted claims are invalid for lack of written description.

IX. THE '052 PATENT

The '052 patent is titled "Virtual Lens Simulation for Video and Photo Cropping" and relates to simulating a virtual lens by cropping an input video, with the cropped portion reflecting a diminished field of view, and then applying a new desired lens distortion to that cropped portion. *See* '052 patent at Abstract. The patent teaches that when input video includes distortion, cropping an image from a frame, without subsequent adjustment, can result in "significantly different distortion" which may be particularly undesirable when series of cropped frames are viewed in a video sequence. *See id.* at 1:20–37. This effect is shown in the figures below:

[redacted]

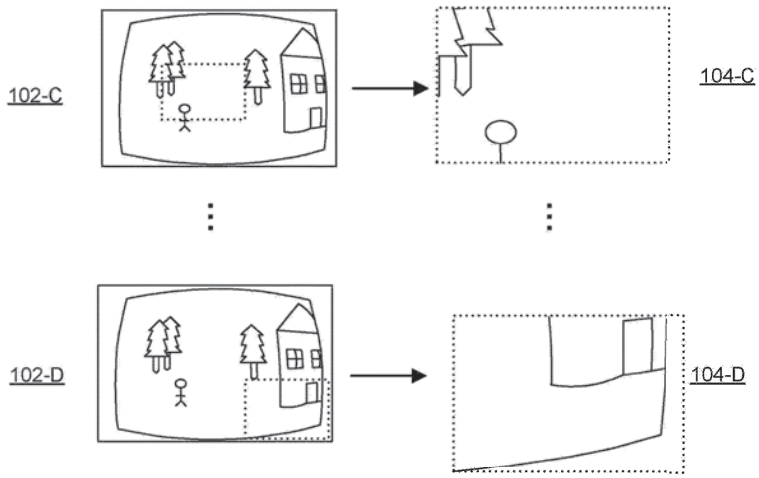


FIG. 1

Id. at Fig. 1. To avoid this undesirable effect, the patent discloses processing the cropped output images "so that the lens characteristics in the output images 104 match the characteristics naturally appearing in the original images 102." *Id.* at 3:29–32. This is shown in the figure below:

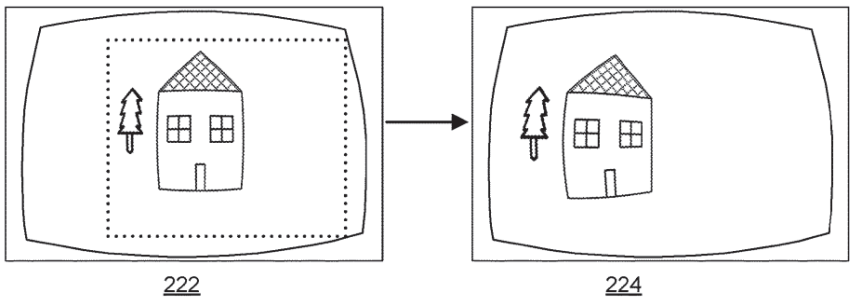


FIG. 2A

Id. at Fig. 2A. In sum:

> The image 224 may be generated from the image 222 and may simulate an image that would have been captured by the camera if the scene had been captured with the camera pointed to the location to the right of the house. As will be apparent, the virtual repointing of the camera creates a very different curvature effect than if original image 222 was simply cropped to re-center at the new location.

Id. at 3:63–4:3.

[redacted]

A. Claim Construction

1. Disputed Claim Terms

The parties identify claim construction disputes as to "the desired lens distortion and the input lens distortion exhibiting consistent lens characteristics" and "such that portions of the scene depicted in the sub-frames appear to have been captured using the reduced fields of view," both in claim 1. GoPro Br. at 152–153; Insta360 Br. at 47–49. These disputes are addressed below.

a) Desired Lens Distortion

The parties dispute whether "the desired lens distortion and the input lens distortion exhibiting consistent lens characteristics" (element 1[f]) is indefinite, and if not, the proper construction. GoPro contends it is not indefinite, that "consistent" means similar but not identical, and that the "input lens" does not mean the lens of the camera. *See* GoPro Br. at 150–151. Insta360 contends the limitation is indefinite because "consistent" cannot be evaluated in any objective way, but if not indefinite, it means "the desired lens distortion and the input lens distortion exhibiting distortion characteristics of the lens of the camera" based on the specification's focus on the technique of "lens repointing." *See* Insta360 Br. at 45–47.

Insta360 has not presented a clear and convincing case of indefiniteness. The intrinsic evidence supports that "consistent" in this context means "similar" or "having the same lens effect." The patent clearly describes "consistent" this way:

> When producing an output video or images from original content that includes cropping, zooming, re-pointing, and/or panning, it may be desirable for the output video or images to exhibit *consistent* lens characteristics. Thus, for example, it may be desirable for cropped sub-frames extracted from different portions of an original video to exhibit *similar* lens characteristics. Furthermore, it may be desirable for cropped sub-frames of different size to exhibit *similar* lens characteristics to each other and to the original uncropped video. Thus, to achieve this effect, a virtual lens model is applied to each of the extracted sub-frames 104 to produce *consistent* lens characteristics across each output image. As a result, the output images may simulate the *same effect* that would have been achieved by a camera operator

[redacted]

> manually re-orienting and/or physically moving the camera to produce the panning, re-pointing, cropping, and/or zooming effects.

’052 patent at 3:13–48 (emphases added). The patent contrasts the concept of “consistent” with “appear[ing] different[.]” *Id.* at 3:8–12 (“[A]bsent other processing, the distortion present in a given sub-frame 104 may appear differently depending on the size of the sub-frame and will not have the same lens characteristic (*e.g.*, fisheye effect) as the originally captured image 102 from which it was derived.”). The patent’s identification of conventional lenses, such as wide angle lenses, fisheye lenses, zoom lenses, hemispherical lenses, and flat lenses supports that two distortions are consistent if they both appear to be the same of these options.

Insta360’s assertions that “the specification provides no objective criteria for determining whether two lens distortions exhibit ‘consistent’ characteristics” (Insta360 Br. at 45) and “[t]he specification’s failure to mention barrel and pin-cushion distortion is powerful evidence that this limitation does not refer to them” (Insta360 Reply at 9) is not supported, based on the testimony of its expert. Darrell Tr. at 1100:21–1101:2 (one of skill would recognize Fig. 2B as showing barrel distortion), 1101:13–17 (Dr. Darrell’s expert report stated that “Barrel distortion and pincushion distortions are two [of the] most common types of lens distortion found in images captured by a wide-angle lens”), and 1103:17–1104:18 (Dr. Darrell was able to assess similar or dissimilar distortion effects in opining on infringement). Dr. Darrell’s testimony supports that one of skill would have been familiar with types and degrees of distortions. *Id.* at 1040:11–21 (“virtually all consumer lens[es] on consumer cameras have some barrel distortion . . . Any real, physical lens will have some degree of barrel distortion.”). The evidence supports that while “consistent” distortions may have a broad meaning, it “inform[s] those skilled in the art about the scope of the invention with reasonable certainty. *Nautilus*, 572 U.S. at 910. Insta360 has not presented clear and convincing evidence that the term “consistent” is indefinite.

[redacted]

As for its proper construction, the evidence supports that the recited "input lens distortion" refers to the distortion introduced by the lens of the camera capturing the images. This is supported by the language of the claim. Specifically, element 1[c(i)] recites, "accessing input images, the input images including fields of view of a scene captured through a lens of a camera, the input images depicting the scene with an input lens distortion centered in the fields of view." '052 patent at claim 1. Other distortion, applied or introduced through non-lens means and subsequent to the light passing through the lens, is not "input lens distortion." *Phillips*, 415 F.3d at 1313 ("the ordinary and customary meaning of a claim term is the meaning that term would have to a person of ordinary skill in the art at the time of the invention"). GoPro's expert, Dr. Villasenor, rightly agreed. Villasenor Tr. at 737:15–22 ("Q. You understand that the input lens distortion here means the distortion of the camera lens used to capture the input images; right? A. Yes, that's right.").

To the extent argued, the evidence does not support that the desired lens distortion and the input/camera lens distortion must be identical, however.[32] As noted above, the specification uses "consistent" in way that connotes general similarity or style, or to "simulate the same effect." *See* '052 patent at 3:13–48. Nevertheless, Insta360 argues that the specification's focus on "repointing" limits the scope of the claim to exact reproductions of what would be present if the camera was re-oriented to point directly at the visual content of the sub-frame. Insta360 Br. at 46 and Insta360 Reply at 10. The specification does not mandate strict identity and instead supports consistent lens characteristics. *See* Insta360 Br. at 46 and '052 patent at 3:13–16 ("When producing an output video or images from original content that includes cropping, zooming, re-pointing, and/or panning, it may be desirable for the output video or images to exhibit consistent lens

[32] Insta360's proposed construction could be read as allowing for approximate shared distortions as opposed to identical distortions.

characteristics"), 3:22–24 ("Thus, to achieve this effect, a virtual lens model is applied to each of the extracted sub-frames 104 to produce consistent lens characteristics across each output image"), and 3:39–43 ("In this way, a cohesive output video or set of images may be generated with consistent lens characteristics from frame-to-frame so that it is not apparent to the viewer that the panning, re-pointing, or zooming effects were created in post-processing instead of during capture").

Insta360's reliance on the prosecution history is unavailing. *See* Insta360 Reply at 10, *citing* JX-0238.79, JX-0237.42. As to its first citation, Insta360 contends that to overcome prior art in a grandparent application, "the applicant indicated the claimed invention requires repointing." What the application stated was that:

> Processing of images as recited in the claims provides for creating output images that simulate the distortion effect that would have been achieved by a user by manually re-orienting and/or physically moving the camera to capture the smaller scene included within the output image. That is, the claimed steps enable processing of smaller portions of an original image to have the same distortion effect as the original image as if the smaller portion of the image were natively captured in the same way as the original image.

JX-0238.79. The applicant was clear that distortion effects are simulated and nothing about the applicant referencing "re-orienting and/or physically moving the camera," supports that the claims require identical input and output distortion, especially given the specification's clear disclosure that they are consistent. Insta360's second citation is puzzling as it is just claim language. JX-0237.42. In addition, to the extent the claims require re-pointing, and if re-pointing means that the desired lens distortion and the input/camera lens distortion must be identical, re-pointing is recited in dependent claim 8, which is not asserted. *See* '052 patent at claim 8 ("wherein the different positions of the areas of the input images included within the reduced fields of view simulate virtual re-pointing of the camera using the reduced fields of view."). The doctrine of claim

[redacted]

differentiation creates a presumption that re-pointing, recited in dependent claim 8, is not required in independent claim 1. *GE Lighting Soln's., LLC, v. AgiLight, Inc.*, 750 F.3d 1304, 1310 (Fed. Cir. 2014).

The evidence supports that "the input lens distortion" means the distortion of the lens of the camera and the full limitation, "the desired lens distortion and the input lens distortion exhibiting consistent lens characteristics" does not require identical distortions.

b) Portions of the Scene

The parties dispute whether "such that portions of the scene depicted in the sub-frames appear to have been captured using the reduced fields of view" (element 1[g]) is indefinite, and if not, its proper construction. GoPro contends the phrase is not indefinite and rejects any attempt to read-in "lens of the camera" to the limitation, as in the above limitation reciting distortions. GoPro Br. at 152–153. Insta360 argues "appearance" is subjective and thus indefinite, and if not, then the phrase should be interpreted to require lens repointing. Insta360 Br. at 48–49.

Insta360 has not presented clear and convincing case of indefiniteness. This limitation follows from the one addressed above and recites generating output images with centered sub-frames with the desired lens distortion such that portions of the scene depicted in the sub-frames appear to have been captured using the reduced fields of view. In other words, the output images will appear as if the camera had captured the visual content in the sub-frame. This effect is shown in Fig. 2A:

[redacted]

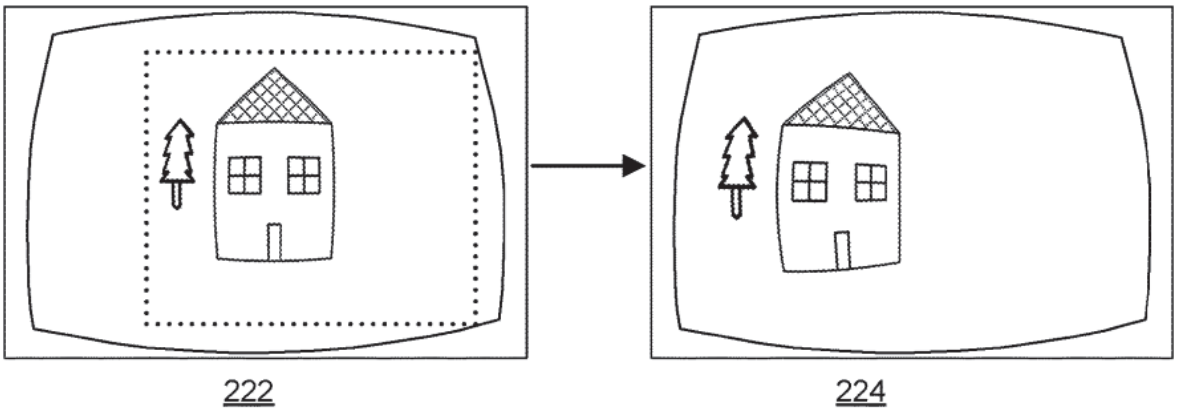


FIG. 2A

’052 patent at Fig. 2A. Insta360 contends that “[a]ppearance is subjective.” Insta360 Br. at 48. The claim itself, however, supports that “appear to have been captured” means with a desired lens distortion that has consistent lens characteristics with the input lens distortion. As GoPro argues, this requires no subjective judgment. GoPro Reply at 63–64.

As for the proper construction, there is no need to include “by the lens of the camera” given that “input lens distortion” in element 1[f] already means the lens of the camera. To the extent that Insta360 argues that this element requires lens repointing, that argument is rejected for the same reasons addressed above.

Accordingly, “such that portions of the scene depicted in the sub-frames appear to have been captured using the reduced fields of view” is given its plain and ordinary meaning, which is best expressed as written.

[redacted]

B. Infringement[33]

GoPro contends that the accused products infringe claims 1, 2, 5, and 6, along with intervening claim 3. GoPro separately contends that cameras with a wide-angle lens and cameras with a fisheye lens infringe. Cameras with a wide-angle lens are alleged to infringe through their use of FlowState stabilization. Cameras with a fisheye lens are accused to infringe in combination with Insta360 Studio or App, which are called the editing systems. GoPro Br. at 155. GoPro's expert, Mr. Villasenor, provided a demonstrative identifying models belonging to each group:

CDX-0006C.69.

1. Claim 1

a) Undisputed Elements

Insta360 does not dispute that the accused products, those with a wide-angle lens or those

[33] Insta360's non-infringement arguments were difficult to follow as they rarely specifically identified what claim element they were referring to. Insta360 Br. at 49–61.

[redacted]

with a fisheye lens, meet elements 1[pre]-1[a], 1[c(i)], 1[c(ii)], and 1[e]. GoPro Br. at 156–165; *see* Insta360 Br. at 49–61 and Insta360 Reply at 10–13. The evidence supports that these elements are met. *See* GoPro Br. at 156–165, *citing* Villasenor Tr. at 550:20–553:3, 554:8–562:7, and 564:10–567:17 and Schonfeld Tr. at 255:9–256:3.

b) Element 1[b]

Element 1[b] recites "a non-transitory computer-readable storage medium storing instructions that when executed cause the one or more processors to perform" the claimed steps.'052 patent at claim 1. GoPro contends that the accused products meet this element. GoPro Br. at 156. Insta360 does not dispute that this element is met in wide-angle lens cameras. Insta360 Br. at 59. The evidence supports that this element is met in wide-angle lens camera. GoPro Br. at 156, *citing* Villasenor Tr. at 553:19–554:7.

Insta360 argued that this element is not met in fisheye lens cameras because a combination of on-camera and off-camera storage media do not meet this claim element. Insta360 Br. at 59. According to Insta360, the fisheye cameras use instructions stored on camera in the accessing step and use instructions stored off-camera for the other claimed steps. *Id*. According to Insta360, because the claim recites "a" computer-readable storage medium, it is not met if more than one medium is used.

The Federal Circuit has held that, as a general rule, "a" means one or more. *01 Communique Lab., Inc. v. LogMeIn, Inc.*, 687 F.3d 1292, 1297 (Fed. Cir. 2012). The word "a" is restricted to the singular "where the language of the claims themselves, the specification, or the prosecution history necessitate a departure from the rule." *Id., citing Baldwin Graphic Sys., Inc. v. Siebert, Inc.*, 512 F.3d 1338, 1342 (Fed. Cir. 2008); *see Salazar v. AT&T Mobility LLC*, 64 F.4th 1311, 1315 (Fed. Cir. 2023), *citing Baldwin*, 512 F.3d at 1342–43.

[redacted]

The evidence supports that the general rule should be followed. This is not an instance, as in *Salazar*, in which there is a later reference in the claim to the initially recited "a" claim element as "the" or "said," which would support that "a" should not be construed as one or more. *Salazar*, 64 F.4th at 1317. In particular, the claimed "a non-transitory computer-readable storage medium" is not later referred to as "the" or "said" non-transitory computer-readable storage medium. The logic of *Salazar* thus does not apply here.

The specification also supports a conclusion that "a" should mean one or more. It states that the components of the system "can include one or more processors and a non-transitory computer-readable storage medium storing instructions therein that when executed cause the processor to carry out the functions attributed to the respective devices described herein." '052 patent at 6:61–67. The specification thus specifically recognizes that there can be more than one non-transitory computer-readable storage medium. In addition, the specification states that "use of the 'a' or 'an' are employed to describe elements and components of the embodiments herein. This is done merely for convenience and to give a general sense of the invention. This description should be read to include one or at least one and the singular also includes the plural unless it is obvious that it is meant otherwise." *Id.* at 12:61–67. The claim language and specification thus support that the general rule that "a" means one or more should be followed.

Insta360 does not otherwise assert that the accused fisheye lens cameras do not meet this element. *See* Insta360 Br. at 59[34] and Insta360 Reply at 13. The evidence supports that this element

---

[34] In the same section of its brief in which it argues that "a" should be limited to one in asserting noninfringement of the fisheye lens cameras, Insta360 states that "Any infringement theory based only on Editing Systems is outside the Investigation's scope and the ITC's jurisdiction." Insta360 Br. at 59, *citing* the Notice of Institution and *ClearCorrect Operating, LLC v. Int'l Trade Comm'n*, 810 F.3d 1283, 1286–1302 (Fed. Cir. 2015). This argument is not explained and is not understood. As a result, it has been waived. Ground Rule 13.1

[redacted]

is met in accused fisheye lens cameras. *See* GoPro Br. at 156 and Villasenor Tr. at 553:19–554:7.

c) Element 1[d]

Element 1[d] recites "selecting sub-frames representing portions of the input images, the sub-frames including reduced fields of view of the scene smaller than the fields of view of the input images." '052 patent at claim 1. GoPro contends that the accused products meet this claim element through FlowState in wide-angle lens cameras and through a keyframe process in the fisheye lens cameras. GoPro Br. at 158–159. Insta360 disputes that this element is met in any accused product because "selecting" must be based on the system identifying content of interest, as opposed to "computing." Insta360 Br. at 54–55 and Insta360 Reply at 11.

Insta360's position is not persuasive. The bases on which sub-frames are selected, desirable visual content or other, is not recited in the claim. This is supported by, for example, claim 3, which explicitly recites that the sub-frames "are selected based on metadata associated with the input images." '052 patent at claim 3. Further, Insta360's cited specification passages reflect only possible embodiments, include non-visual content bases for selection, and otherwise do not amount to lexicography or disavowal of claim scope. *See* Insta360 Br. at 54, *citing* '052 patent at 2:52–61 ("may be selected manually by a video editor in post-processing, or may be selected automatically to generate images or video likely to be of interest to a viewer based on various metadata"), 5:23–25 ("sub-frames may be selected from one or more input images or video frames to generate output images or video that tracks a path of a particular individual or object."), 5:43–53 ("In other embodiments, the media server 340 can automatically identify sub-frames of interest based on the image or video content itself *or an associated audio track*" (emphasis added)); *Kyocera*, 22 F.4th at 1378, *citing Thorner*, 669 F.3d at 1365. Insta360's overly narrow construction is rejected.

[redacted]

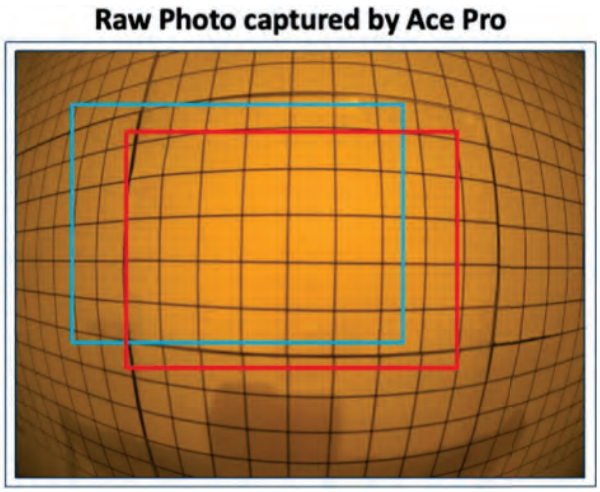
With no dispute that sub-frames are selected by the system in all accused products, the evidence supports that this element is met. GoPro Br. at 158–159 and Villasenor Tr. at 562:8–564:9.

d) Element 1[f]

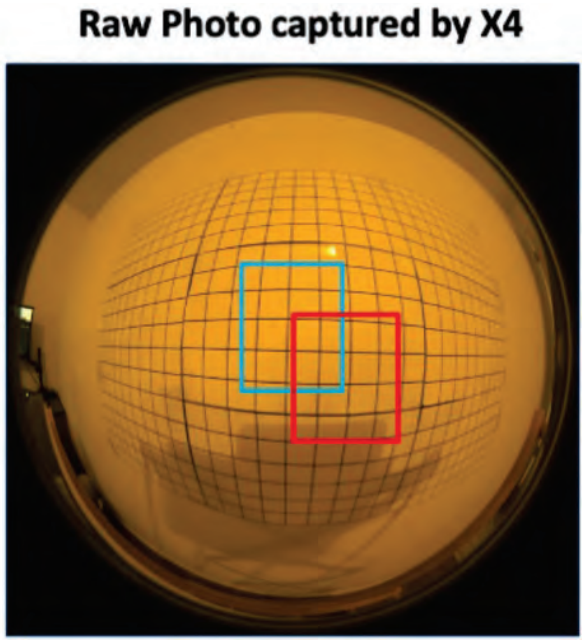
Element 1[f] recites, "generating output images based on a desired lens distortion and the different lens distortion effects in the sub-frames, the desired lens distortion and the input lens distortion exhibiting consistent lens characteristics." '052 patent at claim 1. As with the previous element, GoPro contends that the accused products with wide-angle lenses meet this element via FlowState, and the accused products with fisheye lenses meet this element through a keyframe process. *See* GoPro Br. at 158–159. Insta360 disputes that this element is because GoPro failed to: (1) apply Intsa360's construction of "consistent"; (2) show barrel or fisheye distortions would be the bases for "consisten[cy]" as opposed to other lens characteristics; (3) show the fisheye systems' use of two lenses results in "consistent" distortions; (4) produce evidence for any accused product outside of the X4 and Ace Pro representative products; and (5) show how any distortion in any product is "desired." *See* Insta360 Br. at 49–53, 56, and 58 and Insta360 Reply at 10–13.

By way of background, and despite some confusion for the fisheye systems, there is no dispute as to element 1[e], which recites that sub-frames of an image frame will have a different distortion effect than that overall image frame when, *inter alia*, the sub-frame is moved off-center (automatically in FlowState or manually in Keyframes). *See* '052 patent at claim 1 ("different lens distortion effects as a function of . . ."). GoPro relies on the below raw photo image (annotated) for the accused wide-angle cameras to show this effect, noticeable by the diminishing grid-square size from center:

[redacted]



CDX-0006C.2, *citing* CX-1268 (annotated); *see* Villasenor Tr. at 564:10–565:7. GoPro relies on a similar raw, annotated, image for the fisheye systems:

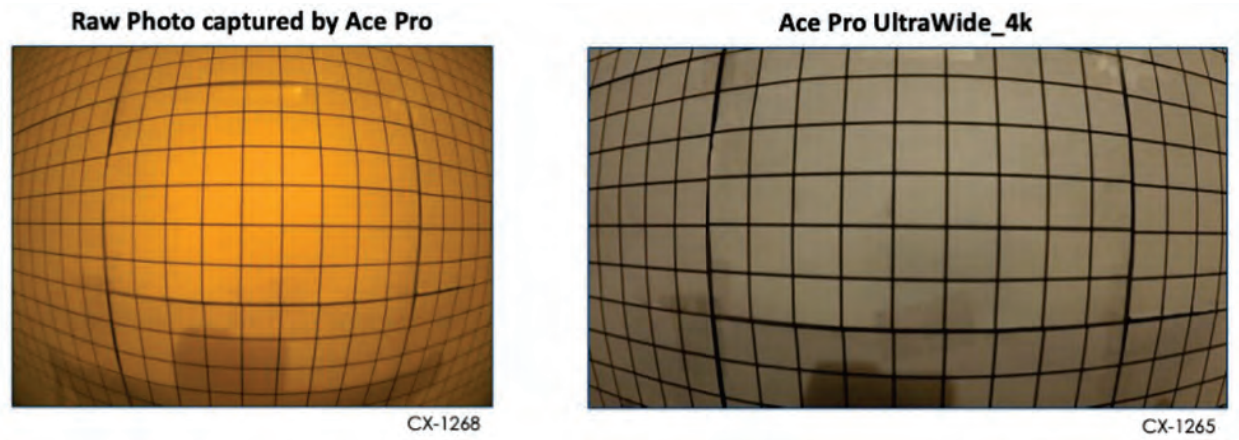


CDX-0006C.84, *citing* CX-1583 (annotated); *see* Villasenor Tr. at 566:8–567:13. Inst360 also does not dispute from that FlowState, through its motion-stabilization and/or horizon-leveling functions, will cause subframes similar to the annotations in red to be selected, at least in the accused wide-angle cameras. *See generally* Insta360 Br. at 49–53; Insta360 Reply at 10–11; CX-1439.1 (referring to FlowState in the X4 as stabilization and "Horizon Lock"); Villasenor Tr.

[redacted]

at 565:8–13 (in the accused wide-angle cameras, FlowState is "[redacted]"); *but see* Villasenor Tr. at 566:24–567:2 (in the accused fisheye systems "the person selects the particular area").

Thus, in this context, the evidence supports that the accused wide-angle cameras generate output images based on a lens distortion that is consistent with the initial lens distortion (shown above, CX-1268). GoPro provides the following two images, with the raw image on the left ("input lens distortion") and, on the right, "an UltraWide image that is resulting from when you take a picture in UltraWide mode" ("desired lens distortion"):

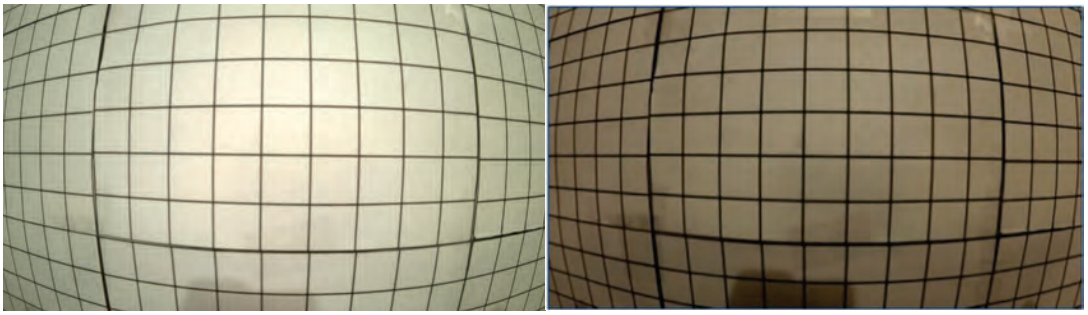


CDX-0006C.87; *see* Villasenor Tr. at 568:19–569:7 and GoPro Br. at 161. According to Dr. Villasenor, and not disputed by Insta360, both images reflect barrel distortion. Villasenor Tr. at 569:8–15. This supports that the desired lens distortion and the input lens distortion exhibit consistent lens characteristics, as one of skill would have understood the term, as discussed above. '052 patent at 3:13–48, 3:8–12 ("[A]bsent other processing, the distortion present in a given sub-frame 104 may appear differently depending on the size of the sub-frame and will not have the same lens characteristic (*e.g.*, fisheye effect) as the originally captured image 102 from which it was derived."). Insta360's insistence that additional details of the lens ("focal length, field of view, magnification, numerical aperture, aperture size, and lens materials") must be considered, is not

[redacted]

consistent with the claim language. *See* Insta360 Br. at 49, *citing* ’052 patent at 7:40–44. The specification mentions these lens traits, but only insofar as they influence distortion. If, however, any combination of focal length, aperture, lens material, etc., the lens characteristics are consistent, this claim element is satisfied. *See* GoPro Reply at 65.

Insta360 also argues that one of skill would not find the distortions “consistent” because “[t]here’s much more significant bowing of the straight lines in the world evidence in the image on the left than is on the image on the right.” Insta360 Br. at 50, *citing* Darrell Tr. at 1041:8–18. This argument is not persuasive. As shown below, once the images are cropped to the same extent, the curvature of the left (CX-1268 (input image, cropped)) is essentially identical to the right (CX-1265 (output image)):



CX-1268 (cropped) and CX-1265.

Insta360’s further complaint, that GoPro did not apply Insta360’s construction in its analysis, is immaterial. The only portion of Insta360’s construction that was adopted was that “input lens distortion” means the lens of the camera, and this is shown in the images above. The evidence supports the accused wide-angle cameras meet this portion of element 1[f].

Insta360’s remaining disputes as to element 1[f] and the accused wide-angle cameras are also not persuasive. Insta360 contends that “[t]he word ‘desired’ in a claim limitation ‘requires foreknowledge and even intent on the person practicing the invention.” Insta360 Br. at 58, *citing* *Datamize, LLC v. Plumtree Software, Inc.*, 417 F.3d 1342, 1356 (Fed. Cir. 2005). Insta360’s

[redacted]

suggestion that the Federal Circuit in *Datamize* forevermore defined the term "desired" in any issued patent is rejected. Instead, the meaning of desired is its meaning to one of skill in the art after reading the entire '052 patent. *Phillips*, 415 F.3d at 1312. The intrinsic evidence does not support a need to show separate "foreknowledge" or "intent" to satisfy "desired lens distortion." Insta360 Br. at 28. The specification teaches that "desired lens distortion" is simply the distortion intended for what is ultimately output. '052 patent at 3:13–16 ("When producing an output video or images from original content that includes cropping, zooming, re-pointing, and/or panning, it may be desirable for the output video or images to exhibit consistent lens characteristics."). And element 1[f] itself requires that distortion be "consistent" with the distortion of the lens of the camera. If the output distortion is consistent with the input lens distortion, as they are in the accused wide-angle cameras, the "desired" limitation is met. The evidence here supports that a user selecting UltraWide Mode in the accused wide-angle cameras can expect the output to have the same distortion as captured by the camera. CX-1439.1 ("UltraWide" mode has no mention of added distortion effect).

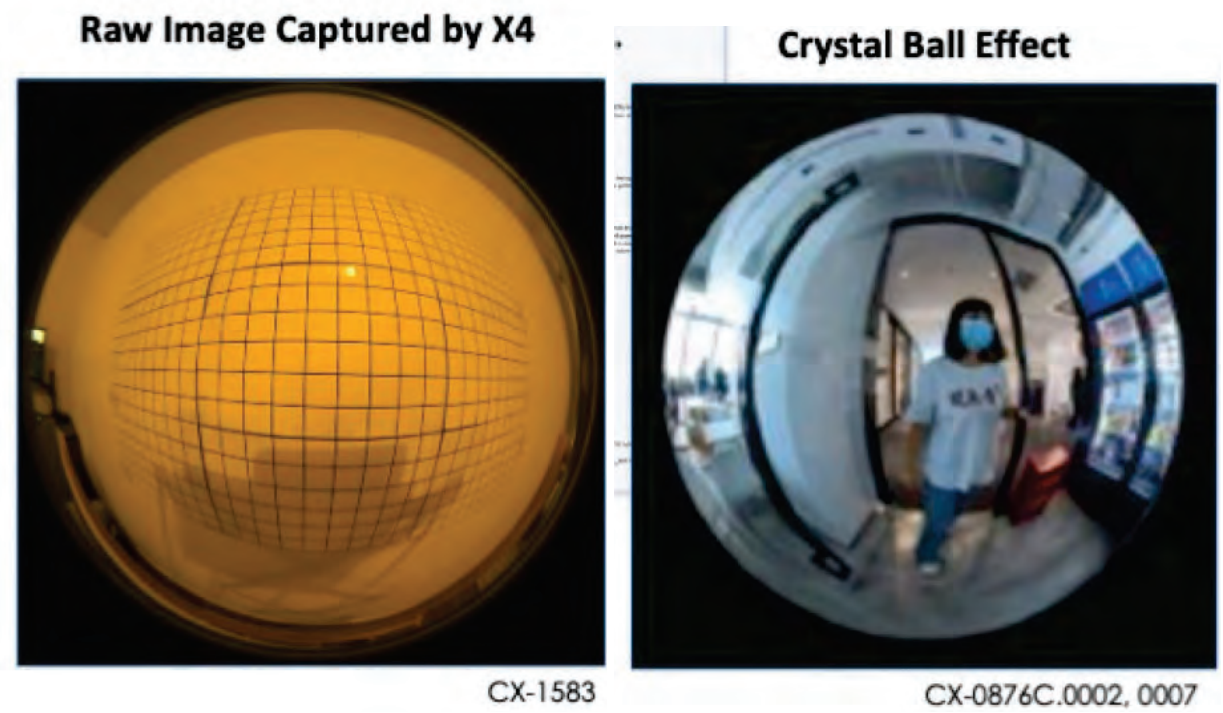
Insta360 also argues that GoPro only offered evidence regarding the "consistent" claim requirement for the X4 and Ace Pro and notes that the parties' representative product stipulation did not extend to lenses, so that GoPro "presented no evidence that lenses other than Ace Pro and X4 are consistent with FlowState FOV modes or the crystal-ball effect." Insta360 Br. at 56. GoPro is correct, however, that Insta360 never presented this challenge to GoPro's infringement theory in its pre-hearing brief. GoPro Reply at 69, *citing* Insta360 Prehearing Br. at 39–50. Insta360's argument has therefore been waived under Ground Rule 9.2.

The evidence supports that element 1[f] is met by the accused wide-angle cameras.

For the accused fisheye systems, GoPro refers specifically to a "Crystal Ball" effect

[redacted]

selectable within the Insta360 Studio off-camera application, which it contends "exhibits a circular fisheye distortion that is consistent with that of the input lens distortion shown in the example raw image captured by [an] X4." Insta360 Br. at 161, *citing* Villasenor Tr. at 570:2–21. Dr. Villasenor presents the following two images for this purpose:



CDX-0006C.88, *citing* CX-1583 and CX-0876C.2 and .7; *see* Villasenor Tr. at 569:23–570:21.

The evidence does not support that element 1[f] is met for the accused fisheye systems. Unlike the evidence and comparison made for the accused wide-angle cameras, GoPro did not present the actual output image associated with the raw input image of CX-1583 and did not explain why that image was not taken. When pressed during cross-examination, Dr. Villasenor opined that use of the image on the right "makes the point." Villasneor Tr. at 746:4–5.

There are several reasons why the image does not make the point. First, the technical datasheet from which the output image is taken is low-quality, with very small images. *See* CX-0876C. It also fails to mention the X4, or any other particular Insta360 camera, and does not

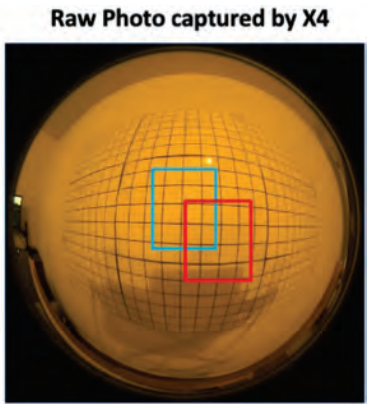
[redacted]

indicate what lens was used to produce it and, by extension, does not indicate what lens distortion was present. In fact, the document the image comes from addresses post-capture processing. *See id.* There is also testimony from Insta360 engineer, Mr. Sang, [redacted]. CX-0876C.1 and Sang Tr. at 842:14–843:13. Combined, these circumstances show the document is of limited probative value for the particular requirements of limtiation 1[f]. Why it was used as opposed to any other stock picture of Insta360's Crystal Ball applied to an X4-captured image is unclear.

Second, as pointed out during cross examination, GoPro's choice to rely on different input and output images is troubling. GoPro provides no reason why the corresponding gridded-visual content was unavailable as an output, even though that would have been the most probative evidence for element 1[f]. Indeed, Dr. Villasneor remarked that such tests were run. Villasenor Tr. at 745:1–20.

Third, and although not challenged explicitly by Insta360, a comparison of GoPro's images does not suggest that the output image represents any kind of "sub-frame" with a "field[] of view of the scene smaller than the fields of view" of any input image (CX-1583 or other), as recited in element 1[d]. Even if CX-0876.7 is considered to have come from something like CX-1583, the two appear to have the same field of view. *See* CX-1583 and CX-0876C.7. Indeed, GoPro's use of CX-0876.7 is incompatible with its explanation of element 1[e] in which the blue and red sub-frames are identified as examples of subframes "selected" during operation:

[redacted]



CDX-0006C.84, *citing* CX-1583 (annotated). The field of view of CX-0876C.7 goes way beyond either of these hypothetical subframes.

The evidence does not support that element 1[f] is met by the accused fisheye systems.

e) Element 1[g]

Element 1[g] recites, "wherein the output images include the sub-frames remapped from the input lens distortion centered in the fields of view of the input images to the desired lens distortion centered in the reduced fields of view to transform the different lens distortion effects present in the sub-frames to the desired lens distortion such that portions of the scene depicted in the sub-frames appear to have been captured using the reduced fields of view." '052 patent at claim 1.

GoPro contends that the accused products meet this claim element through FlowState for the wide-angle cameras and a manual process for the fisheye systems. GoPro Br. at 163–165. Insta360 disputes that this element is met because: (1) if Insta360's construction for "such that portions of the scene depicted in the sub-frames appear to have been captured using the reduced fields of view" is accepted, GoPro failed to apply that construction; (2) "such that" requires more than centered distortion, which is all that has been shown; and (3), for the wide-angle cameras, the accused sub-frames are actually further cropped before becoming output images, and GoPro has

[redacted]

not accused those sub-sub-frames. Insta360 Br. at 53–54, 57–58 and Insta360 Reply at 11–13.

The evidence does not support element 1[g] is met in the accused fisheye lens cameras. As noted above, the evidence does not show how the Crystal Ball output image (CX-0876C.7) represents a "reduced field of view" of any input image, as in recited in element 1[g]. Nor is there sufficient evidence as to what the original lens distortion would have been to assess consistency with the Crystal Ball effect, thereby satisfying "portions of the scene depicted in the sub-frames appear to have been captured using the reduced fields of view" in element 1[g]. Dr. Villasenor's testimony on this claim element is conclusory and relies entirely on the two images, CX-1583 and CX-0076C.7, which have reliability issues, as explained above. GoPro Br. at 164, *citing* Villasenor Tr. at 572:25–573:11.

On the other hand, the evidence supports that element 1[g] is met in the wide-angle lens cameras. As shown in the testing images above, the image produced by the UltraWide setting (CX-1265) appears to have the same distortion pattern, as centered, as the raw input image (CX-1268) such that it looks like what was originally captured.

Nevertheless, Insta360 argues the actual image data GoPro has accused as the "sub-frame" is the [redacted] as [redacted] based on an illustration (original and Dr. Darrell's demonstrative), below:

[redacted]

RX-1217C.7;

[redacted]

RDX-0014C.128; *see* Darrell Tr. at 1043:4–25. This is problematic, according to Insta360, because [redacted] Insta360 Br. at 57. Rather, "[redacted]," thereby producing the [redacted]." *Id.*, *citing* Darrell Tr. at 1003:23–1006:4. In this way, Insta360 argues, "[redacted]" in element 1[g] is not met. *Id.* at 57–58. GoPro does not contest these technical details but argues its infringement theory is [redacted]. *See* GoPro Reply at 70–71.

The record supports that GoPro's infringement theory is First, there is no indication that the , and if Insta360's technical explanation is followed, it must be the . Second, after GoPro made this argument in its initial brief, Insta360 replied, "GoPro now asserts a new theory that . . . This theory is waived, as GoPro did not previously advance it." Insta360 Reply at 12, *citing* GoPro Prehearing Br. at 180. GoPro's prehearing brief, however, shows this theory was disclosed:

> Respondents' non-infringement argument that fails here because the as marked out in the input image in Dr. Darrell's report nevertheless contains of the input images and are JX-0343 [Darrell Reb.] ¶159.

GoPro Prehearing Br. at 180; *see* Order No. 23 at 11-12 (Jan. 8, 2025) (EDIS Doc ID 840750).

Accordingly, with no dispute that the the evidence supports that element 1[g] is met in the wide-angle cameras, and that claim 1 is infringed by the accused wide-angle cameras.

2. Claim 2

Claim 2 depends from claim 1 and recites, "wherein image stabilization is applied to the input images." '052 patent at claim 2. GoPro contends that the accused products meet this claim though the stabilization provided by FlowState. GoPro Br. at 165–166. Insta360 does not dispute the claim is met in the wide-angle cameras. *See* Insta360 Br. at 60–61 and Insta360 Reply at 13. The evidence supports that the additional requirements of claim 2 are met by the wide-angle cameras and thus that claim 2 is infringed by them. GoPro Br. at 165–166, *citing* Villasenor Tr.

[redacted]

at 573:22–25, 574:1–8.

Insta360 disputes that this claim is met in the fisheye systems because the [redacted] used for claim 1 is incompatible with FlowState. *See* Insta360 Br. at 60–61. GoPro disputes the inconsistency, notes it is not supported by expert testimony, and did not appear in Insta360's pre-hearing brief and is therefore waived. *See* GoPro Reply at 7. GoPro's last point resolves the dispute. Insta360's pre-hearing discussion of claim 2 does not mention any theory incompatibility:

> Claim 2 states: "The system of claim 1, wherein image stabilization is applied to the input images." GoPro cannot show that FlowState applies image stabilization to the input images. JX-0343C-SC ¶¶ 203-206. GoPro has shown only that FlowState applies stabilization, which is insufficient. For example, image stabilization applied to the output images would not satisfy the claim language, which distinguishes between input mages and output images.

Insta360 Prehearing Br. at 46. A such, Insta360's challenge is waived under Ground Rule 9.2. The evidence supports that the requirements of this claim are met in the fisheye systems. However, as detailed above, claim 2 is not infringed by the fisheye systems because it depends from claim 1. GoPro Br. at 165–166, *citing* Villasenor Tr. at 573:22–25, 573:16–21.

3. Claim 3

Claim 3 depends from claim 1 and recites, "wherein the sub-frames are selected based on metadata associated with the input images." '052 patent at claim 3. GoPro contends that the accused products meet this claim based on [redacted]. GoPro Br. at 166. Insta360 disputes the claim is met in any accused product because a particular [redacted] Insta360 Br. at 55, *citing* CX-1439 and Insta360 Reply at 12. Insta360 further argues that FlowState [redacted] used for the fisheye systems. Insta360 Br. at 60–61 and *see generally* Insta360 Prehearing Br. at 46–47.

The evidence supports that FlowState . This is not disputed, as shown in the diagrams and discussed with respect to the ’894 and ’840 patents:

CX-1243C.4; *see* Schonfeld Tr. at 239:8–25 and 241:1–242:12; Villasenor Tr. at 551:7–13 (“ and 574:17–22. Insta360 cites no testimony from Dr. Darrell that is not used in this way. *See* Insta360 Br. at 55 and Darrell Tr. at 1046:21–25 (claims 2, 3, 5, and 6 not infringed because they depend from claim 1).

The evidence supports that claim 3 is met in the accused products, that the wide-angle cameras infringe claim 3, but that the fisheye systems do not due to noninfringement of claim 1.

4. Claim 5

Claim 5 depends from claim 3 and recites, “wherein the metadata indicates orientation of the camera that captured the input images.” ’052 patent at claim 5. GoPro contends that the accused

products meet this claim based on to *See* GoPro Br. at 166, *citing* Villasenor at 574:17–575:5. Insta360 disputes the claim for the same reasons as claim 3, which are not persuasive, as detailed above. Insta360 Br. at 55, 60–61 and Insta360 Reply at 12.

The evidence supports that claim 5 is met in the accused products, that the wide-angle cameras infringe claim 5, but that the fisheye systems do not due to noninfringement of claim 1.

5. Claim 6

Claim 6 depends from claim 1 and recites, "wherein the output images are combined as video frames of an output video." '052 patent at claim 6. GoPro contends that the accused products meet this claim through generation of stabilized videos. GoPro Br. at 166. Insta360 does not dispute this claim apart from its dependence from claim 1. *See generally* Insta360 Br. at 49–61 and Insta360 Reply at 10–13.

The evidence supports that claim 6 is met in the accused products, that the wide-angle cameras infringe claim 6, but that the fisheye systems do not due to noninfringement of claim 1. GoPro Br. at 166, *citing* Villasenor Tr. at 515:6–576:1.

6. Indirect Infringement

GoPro asserts indirect infringement only as to the fisheye systems. GoPro Br. at 167 and Insta360 Br. at 61 ("GoPro accuses Insta360 only of indirect infringement in its fisheye-lens theory . . ."). Because the fisheye systems do not directly infringe, there is no indirect infringement.

C. Technical Prong

GoPro contends its domestic industry products practice claims 1, 2, 5, and 6 and intervening claim 3. GoPro Br. at 153–154. Insta360 does not dispute this practice. *See generally* Insta360 Br.; and Insta360 Reply.

[redacted]

The evidence supports that the domestic industry products are systems that simulate distortion in images of a video and include a processor with memory (limitations 1[pre]–1[b]). Villasenor Tr. at 578:17–579:8. The evidence supports that the domestic industry products capture images through a wide-angle lens that introduces barrel distortion, and those images are of a scene with an inherent field of view (limitations 1[c(i)] and 1[c(ii)]). *Id.* at 579:4–20.

The evidence supports that the domestic industry products, having obtained images with the initial barrel distortion, select subframes, or viewing windows, within each frame as part of stabilization or horizon-leveling processes, with those subframes (when off-center) having a distortion that is different from the initial barrel distortion but also a function of that barrel distortion (limitations 1[d] and 1[e]). Villasenor Tr. at 581:3–582:13. The evidence supports that the domestic industry products output video content based on those subframes or viewing windows, with the distortion in the output consistent with the original barrel distortion so that the output video appears as if it was originally captured by the camera lens (limitations 1[f] and 1[g]). *Id.* at 582:14–584:11.

The evidence supports that the domestic industry products implement the Hypersmooth stabilization techniques to the captured video images, which is involved in the selection of subframes or viewing windows (claim 2). Villasenor Tr. at 584:1–20. The evidence also supports that the products use metadata, specifically rotational orientation data, when selecting the subframes (claims 3 and 5). *Id.* at 584:21–585:16. Lastly, the evidence supports that the subframes, once selected and transformed to be consistent with original barrel distortion, are combined and outputted as frames of an output video (claim 6). *Id.* at 586:3–14.

The evidence supports that the domestic industry products practice claims 1, 2, 3, 5, and 6 of the ’052 patent.

[redacted]

D. Validity

Insta360 contends that claims 1, 2, 3, 5, and 6 are invalid based on prior art and ineligibility under § 101. Insta360 Br. at 63–87 and Insta360 Reply at 14–16.

1. Okubo and Sokeila

Insta360 contends the claims are obvious in view of Okubo (U.S. Pub. No. 2006/0017817, RX-1269) alone and in combination with Sokeila (U.S. Patent No. 8,994,838, RX-1299).[35] Insta360 Br. at 64–76.

a) Overview

Given GoPro's assertion that the priority date of the '052 patent is May 20, 2015, based on the filing of a provisional application, GoPro Br. at 7, the evidence supports that Okubo (RX-1269), is prior art under 35 U.S.C. § 102(a). This is not disputed by GoPro. *See generally* GoPro Br. and GoPro Reply.

Insta360 argues that Okubo "discloses an image pickup-device (*e.g.*, a video camera) that stabilizes images by determining sub-frames and then adds barrel distortion back to those sub-frames to prevent a 'sense of incongruity.'" Insta360 Br. at 64, *citing* Darrell Tr. at 1057:14–21, 1060:17–1062:16, 1058:10–22, and 1063:18–1064:5; and RX-1269 at [0005], [0089], and [0112]. According to Insta360, "Okubo refers to the addition of barrel distortion back to the sub-frames as 'Distortion correcting 2,'" as shown in Figure 11D." *Id.*

---

[35] After making this assertion (on page 64 of its post-hearing brief), Insta360 contends that "Okubo alone discloses every limitation (and indeed anticipates the asserted claims) under GoPro's claim interpretations" and that it "asserts obviousness so that Sokeila's adaptive-cropping technique and the knowledge of [one of skill] can be considered in the analysis of certain limitations." Insta360 Br. at 65–66. But then Insta360 states that its arguments for element [1f], which it calls element 1[b][vi], are "based on obviousness, not anticipation." *Id*. at 71. Insta360 has not clearly presented an anticipation argument based on Okubo.

[redacted]

Given GoPro's assertion that the priority date of the '052 patent is May 20, 2015, GoPro Br. at 7, the evidence supports that Sokeila (RX-1299), which was filed on April 16, 2013, and issued on March 31, 2015, is prior art under 35 U.S.C. § 102(a). This is not disputed by GoPro. *See generally* GoPro Br. and GoPro Reply.

Insta360 argues that Sokeila "like Okubo, is directed to video stabilization." Insta360 Br. at 65, *citing* Darrell Tr. at 1057:10–22; Villasenor Tr. at 1451:9–15; and RX-1299. Insta360 contends that "Sokeila discloses adaptive cropping of sub-frames during stabilization to prevent cropping content of interest." *Id.*, *citing* Darrell Tr. at 1057:23–1058:8 and Villasenor Tr. at 1451:16–1452:4 and RX-1299 at 3:30–41.

b) Obviousness

(1) Claim 1

Insta360 contends that all limitations of claim 1 are obvious based on Okubo itself and in combination with Sokeila. *See generally* Insta360 Br. at 64–74. GoPro disputes that limitations 1[e] and 1[f] have been shown to be obvious because: Okubo does not disclose applying distortion to image frames of a video, Okubo's sub-frames do not have different sizes, one of skill would not have been motivated to address these deficiencies in Okubo, and any argument that Sokeila teaches variable-sized sub-frames has been waived. *See* GoPro Br. at 168–172 and GoPro Reply at 76–77. GoPro's briefing confirms there is no dispute for elements 1[pre]–1[d], and no dispute for element 1[g] that is not already subsumed in elements 1[e] and 1[f]. *See* GoPro Br. at 168–172 and GoPro Reply at 76–77. For those undisputed elements, the evidence supports that they are disclosed in Okubo. *See* Insta360 Br. at 66–74, *citing* Darrell Tr. at 1055:1–1056:17, 1057:3–1058:22, and 1062:18–1063:15.

[redacted]

(a) Element 1[e]

Insta360 argues that Okubo discloses sub-frames with different distortion effects based on their position within the original input image, as demonstrated by the distortion function in Fig. 11D, in which distances away from the center of an image experience greater distortion:

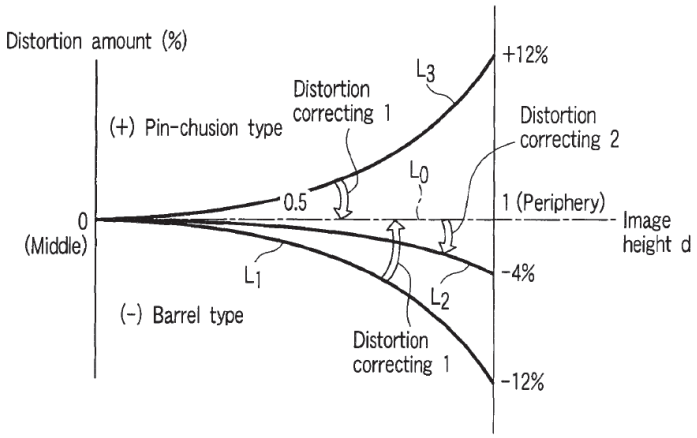


FIG. 11D

See Insta360 Br. at 70 and RX-1269 at Fig. 11D.

By way of background, and not disputed by GoPro, Okubo teaches image stabilization using image cutouts that are shifted amongst positions within the input image to counteract camera motion:

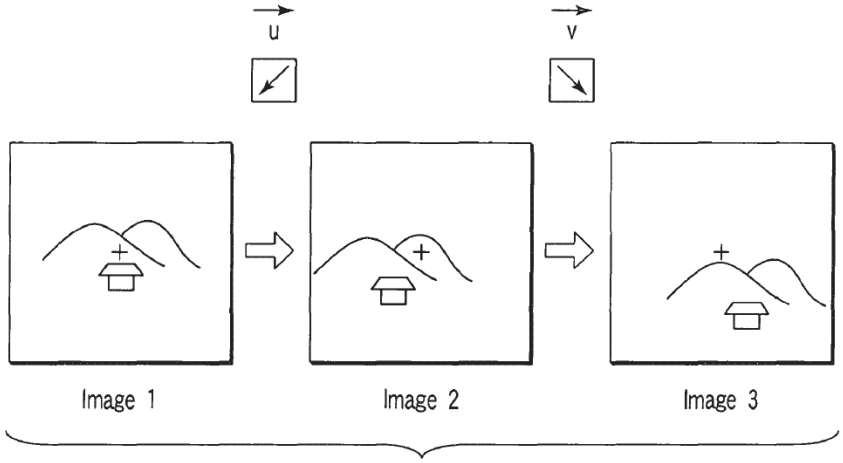


FIG. 5A

[redacted]

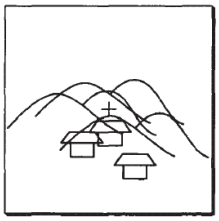


Image 1 + Image 2 + Image 3

FIG. 5B

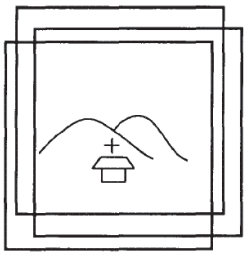


Image 1 + Image 2 * ($-\vec{u}$)
+ Image 3 * ($-\vec{u}$) * ($-\vec{v}$)

FIG. 5C

RX-1269 at Figs. 5A–5C; *see id.* at [0080], [0087]–[0089], and [0091]. GoPro argues that Okubo's sub-frames must also be capable of changing size to satisfy element 1[e], whereas the sub-frames for moving images (*i.e.*, video) in Okubo are fixed at a 70% size. GoPro Br. at 171, *citing* RX-1269 at Fig. 6B and Villasenor Tr. at 1434:1–11 and 1436:11–16; *see* GoPro Reply at 76.

Element 1[e] recites "the sub-frames including different lens distortion effects as a function of the input lens distortion present in the input images, different positions of areas of the input images included within the reduced fields of view, and a size of the areas of the input images included within the reduced fields of view." The language of element 1[e] does not require variable-sized sub-frames. Instead, it requires the sub-frames have different lens distortion from the input lens distortion "as a function of" (*i.e.*, based on) that input lens distortion, their different position within the original input image, and their size. Nothing in the claim language excludes the sub-frames from having the same size. In fact, the claim recites "*a* size of the areas of the input images included within the reduced fields of view" (emphasis added), supporting that the subframe size can be the same or different between subframes. In addition, the '052 patent supports that multiple sub-frames of the same size can have different distortion patterns by virtue of their positions within the input image, as shown in the last two rows of Fig. 1:

[redacted]

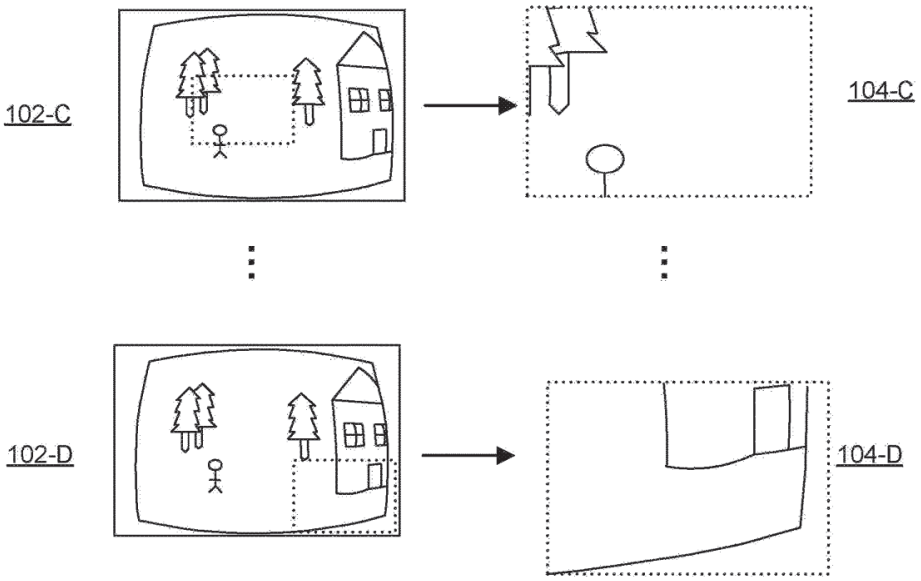


FIG. 1

’052 patent at Fig. 1; *see id.* at 2:37–42 (“For images or video captured using a wide angle lens, the projection of the captured images 102 onto a rectangular display may result in the appearance of increased distortion (*e.g.*, curvature) in the edge and corner regions of the images 102 relative to the center region.”). Element 1[e], therefore, does not require variable sized sub-frames, and there is no dispute that Okubo teaches sub-frames with *a* size (70% of total input field of view). *See* GoPro Reply at 76, *citing* RX-1269 at Fig. 6B. The evidence accordingly supports that element 1[e] is disclosed in Okubo.

(b) Element 1[f]

For element 1[f], Insta360 relies on Okubo’s disclosure of a two-step “distortion correction” process, shown in Figure 11D above, which zeroes-out or undoes the distortion in a captured image before adding back in an amount of barrel distortion for the final output. *See* Insta360 Br. at 71, *citing* RX-1269 at Fig. 12, [0113] and Darrell Tr. at 1060:17–1061:13. Insta360 tacitly acknowledges that Okubo discloses this technique only for still images, but argues it would

[redacted]

have been obvious to apply it to Okubo's capture, stabilization, and display of "moving images" (*i.e.*, video) as well. *Id.* at 71–72, *citing* Darrell Tr. at 1061:15–1062:16. GoPro questions how the change would be made and otherwise disputes that one of skill would be motivated to make the change or have an expectation of success. *See* GoPro Br. at 171, *citing* Villasenor Tr. at 1437:18–1438:16; *see also* GoPro Reply at 76–77.

The evidence supports that one of skill would have appreciated the benefits of two-step distortion as applied to still images and would have applied them to moving images. Okubo itself provides such a motivation, stating that barrel distortion effects are familiar to the human eye and reduce "incongruity":

> Even when the lens is formed of the same material on the same conditions, fluctuations are inevitably generated in lens properties. To restore the image correctly, differences of the lens properties need to be considered. Even when the image having the barrel type distortion as shown in FIG. 11B or the image having the pin-cushion type distortion as shown in FIG. 11C is brought close to the image whose distortion is zero as shown in FIG. 11A by electric correction, the distortion sometimes shifts from zero because of the fluctuations of the lens properties. For one thing, since an image by a fish-eye lens is familiar to human eyes, an observer does not have much sense of incongruity with respect to an image distorted like a barrel. On the other hand, the observer has a sense of incongruity with respect to an image distorted like a pin-cushion, and the image is conspicuously unnatural. Although the distortion is corrected into zero, the distortion shifts from zero by the influences of the fluctuations of the lens properties. In this case, it is preferable that a restored image turns to the image distorted like the barrel rather than the image distorted like the pin-cushion.

RX-1296 at [0110]. Okubo teaches that this technique—applying barrel distortion into the output image ("distortion correcting 2")—is principally used to guarantee there will be no pin-cushion effect resulting from the first distortion correction step:

> As described above, after the distortion correcting (distortion correcting 1) targeting at the zero distortion, the inverse correction into the barrel type is performed (distortion correcting 2). Consequently, even if the pin-cushion type image is produced in the distortion correcting 1 by the fluctuation of the distortion correcting, attributed to the differences of the lens properties, the pin-cushion type image is forcibly corrected into the barrel type image by the distortion correcting 2.

[redacted]

> *Therefore, the image distorted into the pin-cushion type is prevented from being produced*, and the image is restored without any sense of incongruity. . . .

Id. at [0112] (emphasis added). This mechanism of avoiding pin-cushion effects in still images would have been apparent to apply to Okubo's moving images because Okubo discloses applying the first step—zero-ing out all distortion ("distortion correcting 1")—to moving images. Okubo teaches that distortion correcting 1 occurs in Image distortion correcting circuit 172, which supplies the moving frame image for "shifting" (*i.e.*, stabilization):

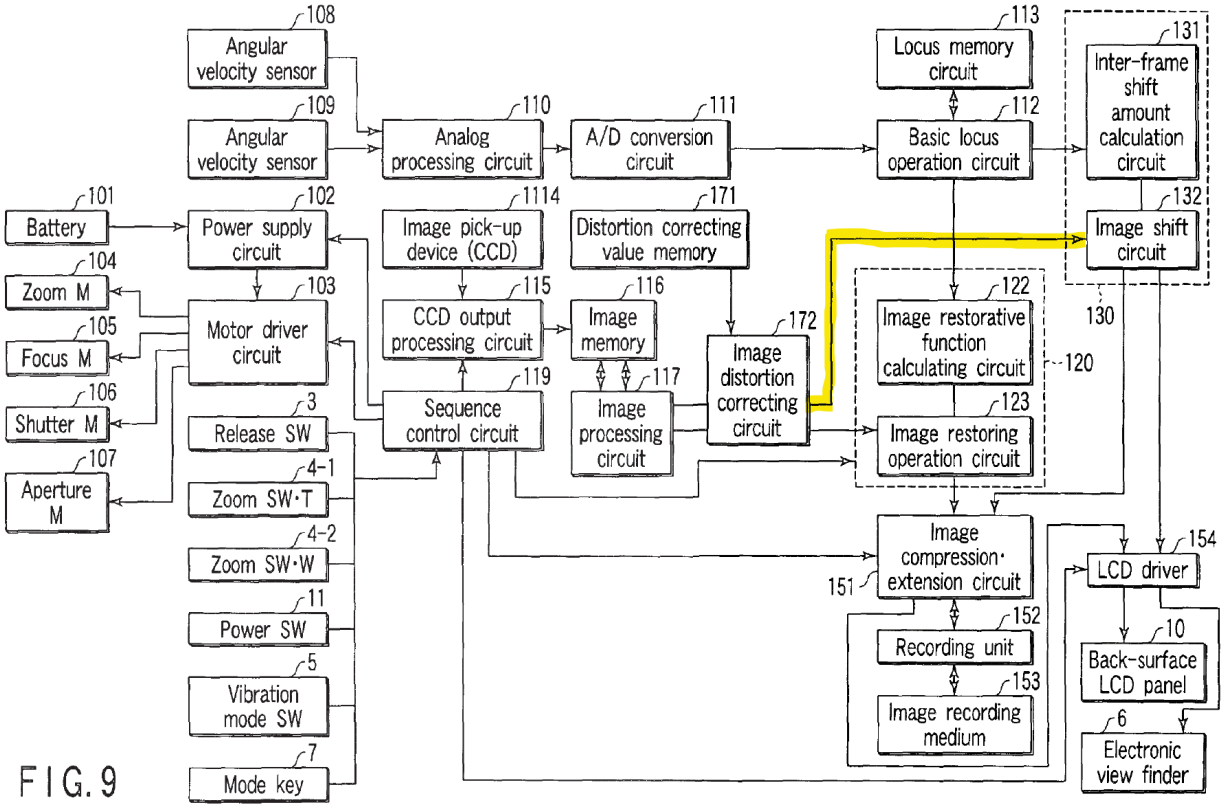


FIG. 9

RX-1269 at Fig. 9 (annotated); *see id.* at [0107] ("Furthermore, the image distortion correcting circuit 172 may be operated as a lens property correction circuit, and the aberration attributed to the properties of the photographing lens or the like may be corrected."); *see also id.* at [0080] ("The inter-frame shift amount calculation circuit 131 and the image shift circuit 132 form an electronic vibration correcting circuit 130 for the moving image."). The evidence supports that a

[redacted]

motivation (and need) for applying barrel distortion into the output images of a video are express in Okubo itself. This is compelling evidence and supported by the testimony of Dr. Darrell. *Optivus Tech., Inc. v. Ion Beam Applications S.A.*, 469 F.3d 978, 989–91 (Fed. Cir. 2006) (holding no issue of fact exists over a motivation to combine the prior art based, in part, on one reference expressly disclosing motivation to use proton therapy over neutron therapy) and Darrell Tr. at 1061:15–1602:16 ("A [person of ordinary skill] would have understood that Okubo's benefits apply equally to still and moving images.").

The evidence also supports a reasonable expectation of success. Okubo already applies the technique to still images, and video is effectively a series of still images. Moreover, GoPro's expert and GoPro witness, Mr. Newman, credibly testified that applying distortions through software to any image was well known by 2015 through programs such as Adobe Photoshop. Villasenor Tr. at 1451:5–8 and RX-0324C (Newman Dep.) at 96:14–22; *see generally* RX-0333C (McIntosh Dep.) at 105:9–25 (discussing Adobe After Effects). GoPro's response is that the modification "would be complicated and time-consuming" and that Okubo uses "two completely different circuits" (GoPro Br. at 171, *citing* Villasenor Tr. at 1437:18–1438:16), but the evidence supports that adding distortion was commonplace and, per to Okubo's Fig. 9 (reproduced above), much of the circuitry for still and moving images was already combined. Dr. Villasenor's remaining testimony—"the engineering work to [add distortion] would be complicated and time-consuming, and also there would be a computational complexity associated with it as well, since things that you can do with a still image, you know, one image on its own can be much harder to do it on video because there's many images coming per second" (Villasenor Tr. at 1438:2–8)—is simply at odds with the record evidence and is not credible. The evidence supports that claim 1 is obvious in view of Okubo.

[redacted]

Consideration of indicia of non-obviousness do not alter this outcome. GoPro describes the ’052 patent as “virtual lens technology” which “is a key enabler of its Hypersmooth stabilization technology.” GoPro Br. at 8, *citing* Lema Tr. at 362:4–14, 369:17–20 and Villasenor Tr. at 584:12–20; *see id.* at 200. While GoPro has presented a persuasive case for commercial success and industry praise of Hypersmooth, and even assuming the deliberate matching of output frame distortion to input lens distortion is a critical part of that feature set, the factors can only be afforded little weight given Okubo’s direct teaching of the distortion-matching technique. *Compare* RX-1269 at Fig. 11D *with* GoPro Br. at 207 (“Prior to GoPro’s inventions, camera manufactures attempted to reduce or eliminate distortion in captured video, believing it to be undesirable.”). Moreover, the success, praise, and other indicia identified by GoPro is more closely linked to the stabilizing-aspects of Hypersmooth, relating to the ’894 and ’840 patents, and not the distortion effects of the ’052 patent. *See generally* GoPro Br. at 202–207 and Lema Tr. at 369:17–20 (describing Virtual Lens as an “enabling technology” of Hypersmooth).

GoPro does not itself highlight any evidence specifically praising or attributing commercial success to distortion matching. *See generally id.* and Insta360 Br. at 84, *citing* RX-0322C (Lema Dep.) at 138:21–139:03 (did not review any documents “that speak specifically to virtual lens. . . . We wouldn’t market it to users. We’d market Hypersmooth, for example.”). To accord meaningful weight to secondary indicia, there must more of a connection to the claimed feature. *In re Huai-Hung Kao*, 639 F.3d 1057, 1068 (Fed. Cir. 2011) (“Where the offered secondary consideration actually results from something other than what is both claimed and novel in the claim, there is no nexus to the merits of the claimed invention.”) (internal citation omitted). Finally, GoPro’s evidence of alleged copying, appears more like benchmarking. *See* GoPro Br. at 207–

[redacted]

209, *citing* CX-0845C; CX-0846C; CZ-0892C; CX-0907C.[36] The same lack of nexus applies to the proposed indicia of long-felt need, skepticism of others, and unexpected results. *See* GoPro Br. at 204–205, 207.

Considering the *Graham* factors, clear and convincing evidence supports that claim 1 is obvious based on Okubo. The evidence supports that claim 1 is invalid as obvious over Okubo.[37]

(2) Claims 2, 3, 5, and 6

Insta360 contends that Okubo renders claims 2, 3, 5, and 6 obvious. *See generally* Insta360 Br. at 74–76. GoPro does not provide any argument as to these claims and thus does not dispute Insta360's obviousness contentions. *See* GoPro Br. at 168–172 and GoPro Reply at 76–77. The evidence supports that claims 2, 3, 5, and 6 are obvious in view of Okubo. *See* Insta360 Br. at 74–76, *citing* Darrell Tr. at 1063:15–1067:5.

2. Eder

Insta360 argues that claims 1, 2, 3, 5, and 6 are obvious based on Eder (U.S. Patent No. 9,238,434, RX-1300) and the knowledge of one of skill. Insta360 Br. at 76–83.[38]

---

[36] [redacted]

[37] Sokeila need not be considered. It appears to be used by Insta360 as evidence of visual-content based selection of sub-frames, which is not a requirement of the claim. *See* Insta360 Br. at 65 and 68–69 and Insta360 Reply at 65.

[38] In a section titled "Obviousness based on Eder," Insta360 contends that the asserted claims are obvious in view of Eder. Insta360 Br. at 76–82. As with its Okubo argument, Insta360 creates unnecessary confusion by then stating that "Eder discloses every claim limitation (and indeed anticipates the asserted claims)." *Id*. at 77. GoPro contends that Insta360 waived an anticipation argument by not raising it in its pre-hearing brief. GoPro Br. at 172. GoPro is correct that Insta360's pre-hearing brief asserted prior art invalidity based only on obviousness. Insta360 Prehearing Br. at 51. As a result, only an obviousness challenge is addressed here.

[redacted]

a) Overview

Given GoPro's assertion that the priority date of the '052 patent is May 20, 2015, GoPro Br. at 7, the evidence supports that Eder, which was filed on April 19, 2011, and issued on January 19, 2016, is prior art under 35 U.S.C. § 102(a). Insta360 Br. at 64. This is not disputed by GoPro. *See generally* GoPro Br. and GoPro Reply. Insta360 argues that Eder (RX-1300) "teaches a vehicle-mirror simulation system that replaces a vehicle's wide-angle mirrors with wide-angle-lens cameras and displays video with added wide-angle distortion." *Id*. at 76-77.

b) Claim 1

GoPro disputes that elements 1[e]–1[g] have been shown to be obvious because: (1) Insta360 alleges obviousness but fails to address any *Graham* factor; (2) Eder's sub-frames do not have different sizes; and (3) Eder's sub-frames do not receive additional distortion. *See* GoPro Br. at 172–175 and GoPro Reply at 78. GoPro's briefing confirms there is no dispute for limitations 1[pre]–1[d]. *See* GoPro Br. at 172–175 and GoPro Reply at 78. The evidence supports that the undisputed elements are disclosed in Eder. *See* Insta360 Br. at 77–82, *citing* Darrell Tr. at 1067:12–1070:5, 1466:9–1467:5.

Insta360 has not made a clear and convincing case of invalidity. Elements 1[e], 1[f], and 1[g] require that the visual content within the sub-frame be remapped to the input lens distortion, or some other "consistent" distortion, and then output. To show this in Eder, Insta360 points to Eder's Fig. 8 and a "selection of pixels A" shown below:

[redacted]

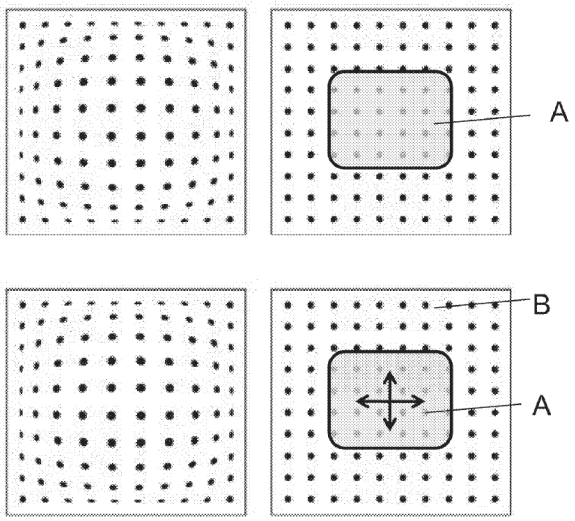


Fig. 8

Insta360 Br. at 80, *citing* RX-1300 at Fig. 8. Insta360 contends that the selection of pixels A also exists on the left-side of Figure 8, which is what it contends meets the sub-frame with a distortion pattern as a function of, *inter alia*, "different positions of areas of the input image[.]" *See id.* Insta360 implies, but does not outright state, that this selection of pixels A undergoes distortion removal and then a further "post-distortion, in order to give this image the same view as that of the desired mirror glass." *Id.* at 81, *citing* RX-1300 at 4:3–7, Fig. 6. Insta360 concludes that "Eder discloses that the desired mirror glass can have wide-angle distortion." *Id.*, *citing* RX-1300 at Figs. 2A–2B and 2:18–31.

The evidence does not support that the selection of pixels A, embodying a reduced field of view (*i.e.*, the claimed "sub-frame"), undergoes re-distortion. Eder only discloses that the selection of pixels A undergoes distortion removal to simulate a "plane mirror" (*i.e.*, flat):

> As a result of the rectification stage at 63, a low-error image is given at 64, which can be shown on the display device 20. The image obtained after rectification corresponds to the image of a plane mirror, whereby the simulated mirror surface would be larger than the usual mirror surface. If such a plane mirror is simulated, the further steps are eliminated and the data is displayed directly on the display according to FIG. 7. The image of a plane mirror is defined by a selection of pixels

[redacted]

> of the optical sensor. In this way, as shown in FIG. 8, only the pixels in the middle of the optical sensor are chosen. In order to simulate the plane mirror in a larger approximation on the hardware mirror, data must be cut, and the section is limited to a section in the middle of the image.

RX-1300 at 4:51–63, 5:4–9 ("In the next step 65, the post-distortion of the present image is carried out. For example, a plane mirror with a convex additional mirror is chosen according to Fig. 2B. For this purpose, a defined number of pixels is chosen for the display of the plane mirror surface. In FIG. 8, it is area A which shows plane surfaces in the middle of the optical sensor."). Indeed, when discussing shifting the selection of pixels A, as in Fig. 8, Eder notes the concept is not applicable for "convex mirror[s]" but rather "recalculation of the image" is necessary. *Id.* at 5:35–37. And, contrary to Insta360's suggestion, when a small convex mirror with a very wide viewing angle (feature 5, below) is simulated by the system, no sub-frame is used at all:

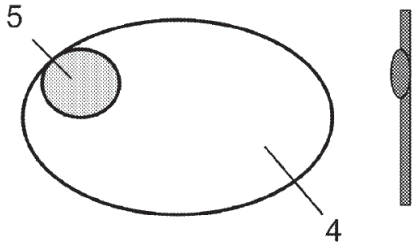


Fig. 2B

> For the display of information from the convex additional lens, all pixels of the sensor must be used, both area A as well as B, in order to provide data to the wide-angle representation of the image, which is situated in a defined area of the display. This is due to the fact that the additional convex mirror will produce an image of which a portion overlaps the image that is created by the plane mirror.

Id. at 5:9–17; *see id.* at Fig. 8 (showing pixel regions A and B).

Insta360 disputes this failure of Eder and argues, "[p]ost-distortion step 65 is applied to section A, which includes 'information from the convex additional lens,' and 'the image of *all pixels* is distorted.'" Insta360 Reply at 15, *citing* RX-1300 at 5:4–22 (emphasis by Insta360). Yet the cited passage relates only to the example hybrid mirror of Fig. 2B, and a plain reading indicates that it is the total pixel area slated for smaller convex mirror 5 which is re-distorted, and selection

[redacted]

of pixels A continues to be used to simulate a plane surface (*i.e.*, no distortion). *See* RX-1300 at 5:4–22.

The evidence does not support that claim 1 is obvious over Eder.

c) Claims 2, 3, 5, and 6

Because Eder has not been shown to render obvious claim 1, claims 2, 3, 5, and 6 have not been shown to be obvious.

3. Patent-Eligible Subject Matter

Because each of the asserted claims is invalid based on the prior art, it is unnecessary to consider invalidity under § 101.

X. THE ’413 PATENT

The ’413 patent is titled “Conversion Between Aspect Ratios in Camera” and generally relates to stretching or shrinking an image with a first aspect ratio to fit a second aspect ratio. *See* ’413 patent at Abstract. The patent describes conventional techniques of “cropping, linearly scaling, and padding” as resulting in “a perceivable reduction in the quality of the image or video.” *Id.* at 1:12–14. The patent teaches stretching, or warping, portions of the image to greater or lesser extents than other potions (*i.e.*, non-uniform shifting of pixels) to avoid distortion in areas of most interest to the user. *Id.* at 2:5–20; *see id.* at 5:10–19 (“Although some distortion may be introduced, the distortion is concentrated near the boundaries of the image (away from the center) and perceivable distortion is limited to an acceptable level.”). Figure 4 shows examples of an input image in a 4:3 aspect ratio, a cropped image to fit a 16:9 ratio, and the “non-linear warped” image of the invention to fit that same 16:9 ratio:

[redacted]

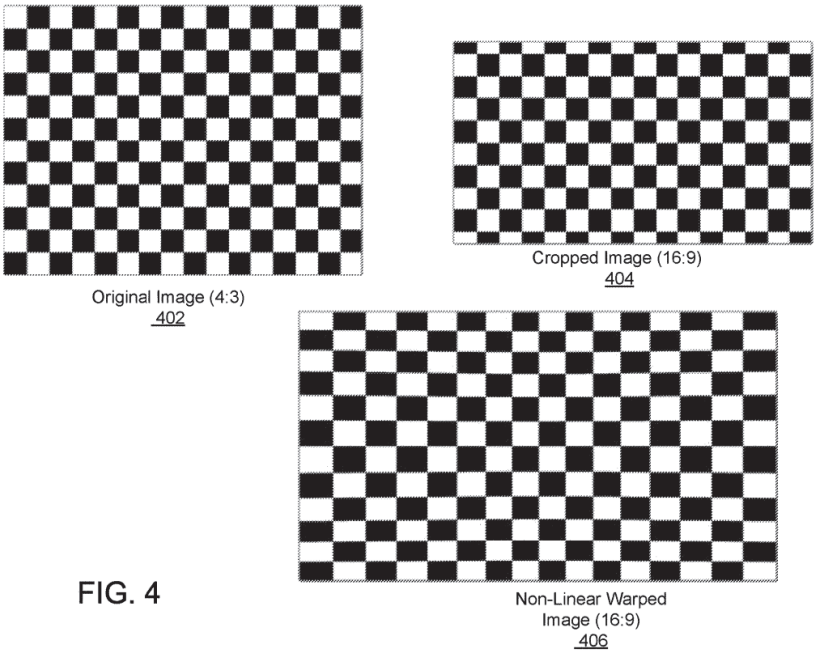


FIG. 4

’413 patent at Fig. 4.

A. Claim Construction

The parties dispute the meaning of “the output image having a target aspect ratio different than the source aspect ratio” in claim 1. GoPro Br. at 180–182 and Insta360 Br. at 10–13. Insta360 contends the term means, “the output image having a target aspect ratio different than the source aspect ratio while maintaining the same field of view as the input image,” with the phrase “while maintaining the same field of view as the input image” added because of the specification’s emphasis on retaining a full field of view. *See* Insta360 Br. at 10–12. GoPro does not offer a construction, but argues that Insta360’s construction improperly introduces an additional requirement into the claim. *See* GoPro Br. at 180–182.

The evidence does not support including “while maintaining the same field of view as the input image” in the construction. Considering the language of the claim, none of the words in the limitation as written, “the output image having a target aspect ratio different than the source aspect ratio,” have anything to do with field of view or whether that field of view must remain constant

[redacted]

between source and output. Indeed, there is no more basis to append this restriction to the limitation selected by Insta360 than any other limitation; for example: "the output image including the pixels located at output positions [*while maintaining the same field of view as the input image*]," "the transformation non-uniformly shifts the pixels from the input positions to the output positions [*while maintaining the same field of view as the input image*]," or "present the output image on the display [*while maintaining the same field of view as the input image*]," among others. Indeed, Insta360 contends that "[g]iven the specification's unequivocal disapproval of traditional aspect ratio conversion that results in loss of image FOV, claim 1 should be restricted to techniques that *do* maintain input image FOV, as the patentees intended." Insta360 Br. at 12 (emphasis by Insta360). Based on Insta360's argument, it is clear it seeks to add an unrecited feature to the claim.

The intrinsic evidence does not support adding this requirement to claim 1. Insta360's cited excerpts from the specification support that preservation of field of view is a benefit but di not support that it is an absolute requirement:

> The output image has the same field of view as the input image, maintains image resolution, and limits distortion to levels that do not substantially affect the viewing experience.

'413 patent at Abstract.

> The output image has the same field of view as the input image, maintains image resolution, and limits distortion to levels that do not substantially affect the viewing experience.

Id. at 2:12–14.

> Beneficially, since the aspect ratio conversion preserves the entire field of view of the image, the converted image can be reverted back to its original aspect ratio without any loss of field of view or resolution.

Id. at 2:34–37.

> In one embodiment, the conversion is achieved using a resolution remapping that applies a non-linear function across the image so as to minimize or reduce

[redacted]

> undesirable key feature aspect ratio distortions. Furthermore, in one embodiment, the aspect ratio conversion does not result in any loss of field of view.

Id. 3:42–47.

> As can be observed from Fig. 2B, the scaling and warping steps 204, 206 preserves the full field of view in the resulting image 216 relative to the original image 212.

Id. at 4:14–16.

> FIG. 3 illustrates example images illustrating the aspect ratio conversion technique described herein. Image 302 illustrates an original image captured with a 4:3 aspect ratio. Image 304 illustrates a conventional cropping of the image to fit it to a 16:9 aspect ratio. As can be seen, the field of view is reduced with this technique and a portion of the image is lost. Image 306 illustrates the original image converted according to the techniques described herein. As can be seen, the aspect ratio conversion is achieved while maintaining the full field of view. Although some distortion may be introduced, the distortion is concentrated near the boundaries of the image (away from the center) and perceivable distortion is limited to an acceptable level.

Id. at 5:6–19.

While the specification clearly identifies a benefit of maintaining the field of view and distinguishes prior art in which the field of view of the output image is cropped, in views 304 and 404, there is not "repeated[] disparag[ement]" as required by the Federal Circuit. *See* Insta360 Br. at 13, *citing Indivior Inc. v. Dr. Reddy's Labs., S.A.*, 930 F.3d 1325, 1337 (Fed. Cir. 2019) and *Chicago Bd.* Options *Exch., Inc. v. Int'l Sec. Exch., LLC*, 677 F.3d 1361, 1372 (Fed. Cir. 2012).[39]

---

[39] *Indivior* is distinguishable. The claim limitation there was "capable of being dried without loss of substantial uniformity." According to the court, the specification made clear that one type of drying—top air drying—does not produce "uniform" films. 930 F.3d at 1337. It was therefore appropriate, in view of the specification's clear disclosure, to exclude top air drying from the scope of the term "dried." *Id.* Similarly, in *Chicago Options*, regarding securities trading, the disavowal was of open-outcry or floor-based trading systems because the claim recited "automated exchange." 677 F.3d at 1371–72. The same is true for *Honeywell Intern., Inc. v. ITT Indus., Inc.*, cited by *Chicago Options*. 452 F.3d 1312, 1319–20 (Fed. Cir. 2006) (disavowing a class of fibers from "electrically conductive fibers").

[redacted]

In addition, "[t]here are no words of manifest exclusion or restriction." *Hill-Rom Servs.*,755 F.3d at 1372. The patent does not "describe the invention as limited to" maintaining the entire field of view of the input image. "There is no disclosure that, for example, the present invention 'is,' 'includes,' or 'refers to'" maintaining the entire field of view of the input image. *Id*. While maintaining the entire field of view is disclosed as a benefit, the specification does not identify that feature as essential or required.[40]

GoPro points out that in related patents with claims reciting that the output image has the same field of view as the input image. GoPro Br. at 181, *citing* CX-1328 at claim 8 ("wherein the output image has a same field of view as the input image") and CX-1327 at claim 15 ("the output image having a same field of view as the input image"). This supports that by not including that language in claim 1 of the '413 patent, the patentee did not intend to limit the claim in that way. *See E.I. du Pont De Nemours & Co. v. Unifrax I LLC*, 921 F.3d 1060, 1069–70 (Fed. Cir. 2019) (consideration of related application as intrinsic evidence); *Advanced Cardiovascular Sys., Inc. V. Medtronic, Inc.*, 265 F.3d 1294, 1305–06 (Fed. Cir. 2001) (the absence of a claim term in a related patent indicates intent to broaden scope). Insta360's argument that this underscores the need to construe claim 1 as including this requirement is not persuasive. *See* Insta360 Reply at 12.

The evidence supports that "the output image having a target aspect ratio different than the source aspect ratio" does not require maintaining the same field of view between input and output images and has its plain and ordinary meaning.

---

[40] It is also at least noteworthy that the specification states that "alternative embodiments of the structures and methods disclosed herein will be readily recognized as viable alternatives that may be employed without departing from the principles of what is claimed." *Id.* at 1:53–59.

[redacted]

B. Infringement

GoPro contends the accused products infringe claim 1. GoPro Br. at 184–192 and GoPro Reply at 83–87.

1. Undisputed Elements

Insta360 does not dispute the accused products meet elements 1[pre]–1[d] and 1[h]. GoPro Br. at 184 and *see* Insta360 Br. at 13–21 and Insta360 Reply at 2–5. The evidence supports that the accused products meet these elements. *See* GoPro Br. at 184–185, 191, *citing* Villasenor Tr. at 512:23–516:18 and 531:22–532:12.

2. Element 1[e]

Element 1[e] recites "determine a portion within the input image, the portion including a subset of the pixels." '413 patent at claim 1. GoPro contends the accused products meet this element through generation of a [redacted] which [redacted]. GoPro Br. at 185–186. Insta360 contends element 1[e] requires more, namely, "a deliberate identification of a portion within the input image," and that use of a [redacted] does not meet this element. Insta360 Br. at 19–21.

In being able to select various fields of view (FOV), such as MegaView, MaxView, ActionView, UltraWide, and Dewarp, the evidence supports that the accused products enable a user to change the aspect ratio of an output video from that of the input. CX-1439.1 Dr. Villasenor testified that the patent's discussion of "selecting the desired output video format" in terms of aspect ratio corresponds to the field of view choices in the accused products. Villasenor Tr. at 519:7–13, *citing* '413 patent at 2:34–44 and 521:7–15; *see* CDX-0006C.29. Dr. Villasenor presented the following illustration of an examplary [redacted]

[redacted]

JX-0232C.11; *see* Villasenor Tr. at 518:5–25. According to Dr. Darrell, and not rebutted by Dr. Villasenor, these [redacted]. Darrell Tr. at 999:15–20; *see* Villasenor Tr. at 751:21–752:5.

The evidence supports that the ’413 patent also applies [redacted] to its input images, described as [redacted] as shown in Figs. 5 and 6:

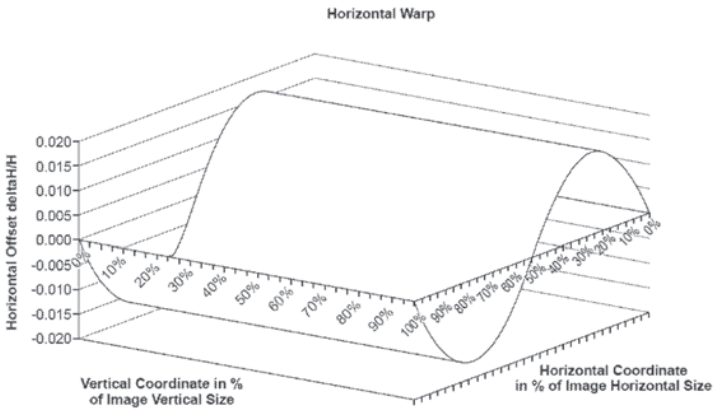


FIG. 5

[redacted]

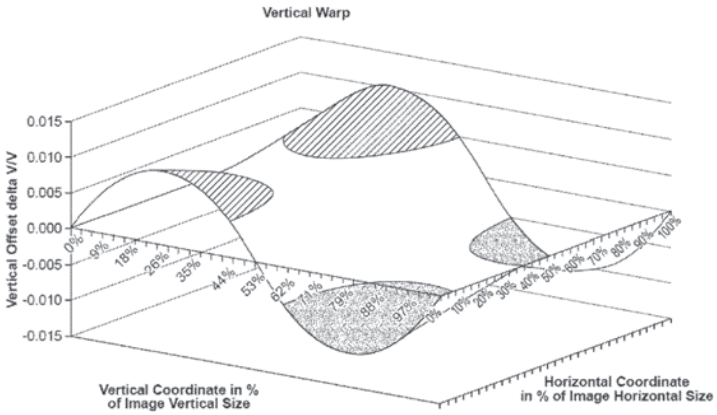


FIG. 6

’413 patent at Figs. 5, 6, 1:46–49, 5:38–43, and 6:12–23. The patent explains that the horizontal warp function may be “symmetric in one embodiment, with pixels on the left half of the image shifting to the right and pixels on the right half of the image shifting to the left to compensate for the horizontal stretching effect. Since the center receives the contributions of pixels from both sides, the center region of the image is corrected the most, while the geometry on the sides is distorted to a small extent,” with “corrected” meaning the absence of shift. *See id.* at Fig. 5 (pixels 50% from an edge (*i.e.*, center) receive zero offset). Similarly, the vertical warp function in Fig. 6 provides little offset for pixels in the center. *See id.* at Fig. 6. The patent provides exemplary input and output images that have undergone shifts similar to the warp functions of Figs. 5 and 6:

[redacted]

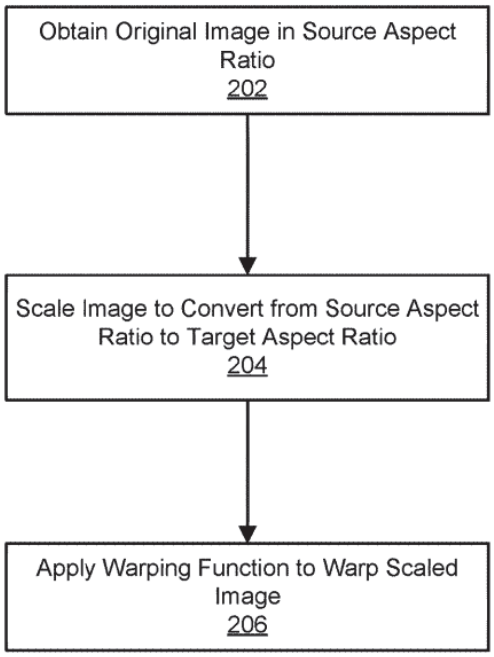


FIG. 2A

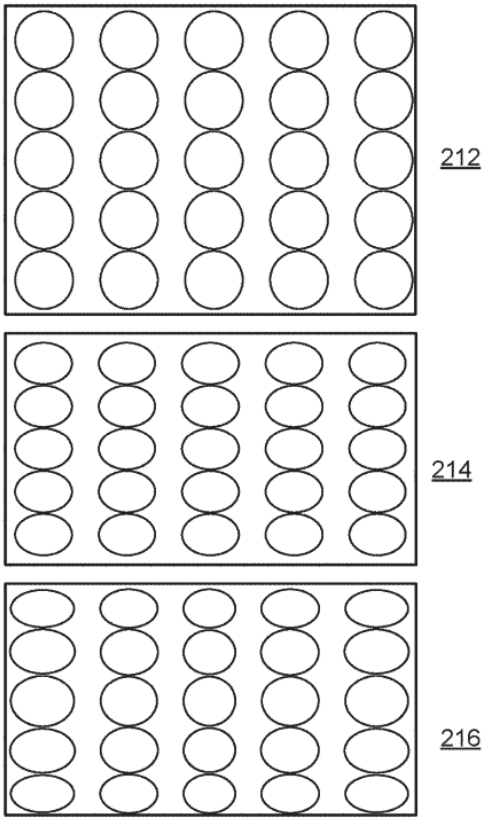


FIG. 2B

’413 patent at Figs. 2A and 2B. The patent teaches that the center of the image has been “chosen” as the region “most fully corrected” (*i.e.*, with little to no shift):

> As can be observed from Fig. 2B, the scaling and warping steps 204, 206 preserves the field of view in the resulting image 216 relative to the original image 212. To achieve this, the warp module is configured so that some areas of the image are fully corrected geometrically, while some other areas are distorted. In the illustrated example, the center of the image is chosen to be the region of interest that is most fully corrected and the distortion increases in each direction as the frame boundary is approached. Thus, in image 216, the center circle is fully corrected so that it maintains the original circular shape of the corresponding circle in the input image 212.

Id. at 4:14–25.

These disclosures from the ’413 patent are important because they explain what is meant by “determine a portion within the input image, the portion including a subset of the pixels” in

[redacted]

element 1[e]. The specification itself never uses the word "determine[]"and it only appears in claims 1, 2, 11, 13, and 19, all in the context of this limitation. And since claims are read in light of the specification, *Phillips*, 415 F.3d at 1312–13, the specification supports that "determine a portion within the input image, the portion including a subset of the pixels" in the claim covers warp functions, such as those in Figs. 5 and 6, which leave regions "fully corrected" or largely untouched by pixel shifting (*e.g.*, the center). GoPro agrees. *See* GoPro Br. at 186 [redacted] Given that the accused products' [redacted] operate the same way, the evidence supports that element 1[e] is met. Villasenor Tr. at 516:19–520:2.

Insta360 disagrees that a [redacted] meets element 1[e] because the element "requires a deliberate identification of a portion within the input image" and a [redacted] Insta360 Br. at 19, *citing* Darrell Tr. at 997:21–998:15. For support, Insta360 relies on the prosecution history and positions recently taken by GoPro before the PTAB. *See id.* at 19–20, *citing* JX-0002.39 and RX-1975.18, 20.

During prosecution, the patentee amended the claim that issued as claim 1 by adding the language "determine a portion within the input image, the portion including a subset of the pixels" and deleting other language, as follows:

[redacted]

21. (**Currently Amended**) An image capture apparatus, comprising:

an image sensor configured to capture an input image having a source aspect ratio, the input image including pixels located at input positions defined along a first axis and a second axis, the first axis perpendicular to the second axis;

a display coupled to one or more physical processors; and

the one or more physical processors configured by machine-readable instructions to:

obtain the input image;

determine a portion within the input image, the portion including a subset of the pixels; and

apply a transformation to the input image to generate an output image, the output image having a target aspect ratio different than the source aspect ratio, the output image including the pixels located at output positions defined along the first axis and the second axis, wherein:

the transformation non-uniformly shifts the pixels from the input positions to the output positions based on (1) the input positions along the first axis, and (2) the input positions along the second axis; and

~~the input image includes a portion including a subset of the pixels~~ the transformation non-uniformly shifts the pixels such that differences between the input positions and the output positions of the subset of the pixels within the portion are less than differences between the input positions and the output positions of others of the pixels; and

present the output image on the display.

JX-0002.39.[41] This change in language does not, on its own, clearly and unmistakably communicate that "determine a portion" must be more than application of a [redacted] or [redacted]. Insta360 provides no additional explanation or argument relating to this amendment, *see* Insta360 Br. at 19–21 and Insta360 Reply at 4–5, and on its own, it does not demonstrate a clear disavowal of "determine a portion" being [redacted].

[41] Although not mentioned by Insta360 one way or the other, none of the accompanying remarks are pertinent. *See* JX-0002.33–43.

[redacted]

Before the PTAB, GoPro argued that the prior art does not disclose element 1[e]:

> Notably missing from Petitioner's analysis is any discussion of how Fleming teaches that the GPU or CPU "determine[s]" the less distorted portion of the image prior to transformation. Ex. 2001, ¶¶44-47. Although Fleming discloses that an "area of interest" or a "square region at the center" has minimal or no distortion, that simply describes the effect of the transformation—Petitioner does not explain how that portion is ***determined*** by the CPU or GPU ***prior*** to transformation as recited in the claims, a limitation that was specifically added to overcome prior art during prosecution. Ex. 2001, ¶47. This is in sharp contrast to the disclosures of the '413 patent discussed above, where based on numerous factors such as characteristics of the image and desired overall distortion, the system creates a "resolution remapping" where some portions are less distorted and other portions are more, and the "remapping" is then applied as a transformation to the image. Ex. 1001, 3:39-45; Ex. 2001, ¶¶48-49.

RX-1975.18–19 (emphasis in original). While GoPro focused on the word "determine," it did not argue that "determine a portion" excludes the warp function disclosed in the patent. As a result, there is no clear and unmistakable surrender. *Aylus Networks*, 856 F.3d at 1363, *citing Biogen Idec, Inc. v. GlaxoSmithKline LLC*, 713 F.3d 1090, 1100 (Fed. Cir. 2013) (internal quotation omitted).

Insta360 further refers to a specification passage allegedly teaching, in Insta360's words, "identifying specific objects within the input image as determining a 'portion' within the image." Insta360 Br. at 19, *citing* '413 patent at 4:37–40. The cited passage, however, teaches that an object that moves laterally across the field of view may appear larger on the periphery of the image but smaller in the center, and because of that possibility "the warping function in step 206 is tuned to reduce this effect." '413 patent at 4:37–46. To the extent that supports recognizing moving objects in the image data and altering warping function 206 in response, this is described as an embodiment, and not a definition of "determine a portion" in element 1[e]. Further, this is recited in dependent claims 11 and 19,. '413 patent at claim 11 ("The system of claim 2, wherein the one or more physical processors are further configured by machine-readable instructions to determine the portion based on a location of an object within the input image such that the portion includes

the object."); *see id.* at claim 19. The doctrine of claim differentiation supports not including this feature in claim 1. *Curtiss-Wright Flow Control Corp. v. Velan, Inc.*, 438 F.3d 1374, 1380 (Fed. Cir. 2006) (The doctrine of claim differentiation creates a rebuttable presumption that an independent claim should not be construed as requiring a limitation added by a dependent claim).[42]

Insta360 also argues that Dr. Villasenor agreed that "determine a portion" cannot be Insta360 Br. at 19, *citing* Villasenor Tr. at 751:21–752:5. Dr. Villasenor testified, however, that Villasenor Tr. at 517:5–21. The evidence supports that element 1[e] is met in the accused products. Villasenor Tr. at 516:19–520:2.

3. Element 1[f]

Element 1[f] recites "apply a transformation to the input image to generate an output image, the output image having a target aspect ratio different than the source aspect ratio, the output image including the pixels located at output positions defined along the first axis and the second axis, wherein." '413 patent at claim 1. GoPro contends that the accused products meet this element through the capture of a 1:1 input image, transformation processing, and output of, as examples, 16:9 or 9:16 images. GoPro Br. at 188–189. Insta360 disputes this element is met because GoPro has accused only the as the *See* Insta360 Br. at 13–18.

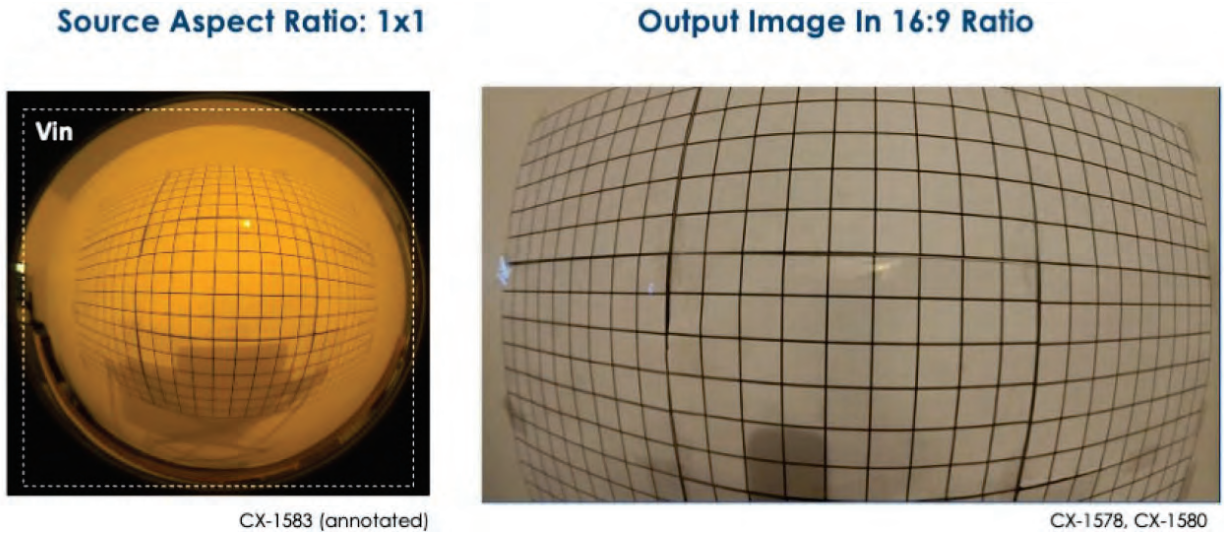
[42] While claim 11 depends from claim 2 and claim 19 depends from claim 13, claims 2 and 13 both recite the same element as element [1e].

The evidence supports that the accused products' application of is referred to as a Darrell Tr. at 1003:5–11 and Sang Tr. at 839:13–24. The evidence further supports that the does not change the 1:1 aspect ratio of the image to which it is applied. Darrell Tr. at 1004:4–17, 1005:12–25. This is particularly shown in the exchange discussed for the '052 patent, above, in which

RX-1217C.7. *Id.* at 6 ("\"). This was illustrated by Dr. Darrell as follows:

[redacted]

RDX-0014C.29; *see* Darrell Tr. at 1007:1–12. Thus, the evidence supports that the [redacted], alone, does not "generate an output image, the output image having a target aspect ratio different than the source aspect ratio." GoPro does not dispute this operation (*see generally* GoPro Br. at 189 and GoPro Reply at 83–84), nor can it. Its exemplary output image is obviously a crop of the input image:



See GoPro Br. at 188, *citing* CDX-0006C.33; CX-1583 (input); CX-1578 (output); *see also* Villasenor Tr. at 522:2–11.

[redacted]

To overcome the failure of [redacted] to alter the aspect ratio on its own, GoPro contends that the "transformation" process includes more than just the [redacted]. GoPro Br. at 190 (alleging Dr. Villasenor "identified the transformation as referring to the process of transforming the input image to the final output image, of which [redacted] was merely one 'part.'"). The problem, as Insta360 correctly points out, is that GoPro failed to provide notice of this theory during fact or expert discovery, and any reliance on processes outside of "[redacted] for the claimed "transformation" was struck in an order granting Insta360's motion in limine on this point. Order No. 23 at 13–14 (EDIS Doc. ID 840750); *see* Insta360 Br. at 13 n.3; Insta360 Reply at 2–3. GoPro does not address this order directly, GoPro Br. at 188–190 and GoPro Reply at 83–84, but in what appears to be an attempt to bypass it, argues in a final section of its reply brief that the claim does not actually require the transformation to provide the actual output image. *See* GoPro Reply at 84 ("The claim does not require a 'transformation that generates an output image' as argued by Respondents . . . it encompasses processes where the transformation is part of, but not the whole, of the process used to generate an output image from an input image."). This, however, is inconsistent with its position in its initial brief. GoPro Br. at 189 (identifying the "final user-facing output from the transformation process) and *id*. at 189 (identifying the "final output image"). The evidence does not support that element 1[f] is met in the accused products.

4. Element 1[g]

Element 1[g] recites, "the transformation non-uniformly shifts the pixels from the input positions to the output positions based on (1) the input positions along the first axis, and (2) the input positions along the second axis." '413 patent at claim 1. GoPro contends that the accused products meet this element because "the transformation, including [redacted], non-uniformly shifts the pixels from the input positions to the output positions based on positions of the pixels on

[redacted]

two axes." GoPro Br. at 191. Insta360 disputes this element because [redacted]. Insta360 Br. at 18–19.

The evidence supports that the pixels in [redacted] in accused products are [redacted], as shown in [redacted] reproduced above. JX-0232C.11. This is not disputed. The evidence supports that [redacted] *See* Darrell Tr. at 1008:17–1009:13, 1010:11–16. Insta360 relies on a demonstrative from Dr. Schonfeld, and related source code and testimony, illustrating this process via a red box:

[redacted]

Insta360 Br. at 18, *citing* RDX-0014C.36; Schonfeld Tr. at 241:17–242:17; CDX-0002C.110; Darrell Tr. at 1010:11–16. GoPro does not dispute this, but responds that as a matter of claim construction, [redacted] GoPro Br. at 190–191; GoPro Reply at 84–85; and Villasenor Tr. at 523:22–524:6, 531:7–18. GoPro argues that Insta360 applies an erroneous claim construction, in which the full field of view must be preserved throughout the claimed "transformation." GoPro Br. at 191.

[redacted]

The claim language does not support Insta360's position. Element 1[a] recites, "an image sensor configured to capture an input image having a source aspect ratio, the input image including pixels located at input positions defined along a first axis and a second axis, the first axis perpendicular to the second axis." '413 patent at claim 1. The limitation does not state or infer that the input image is defined by all of the pixels. Instead, pixels in the image are located at input positions along first and second axes. The claim further recites "the output image including the pixels located at output positions defined along the first axis and the second axis." '413 patent at element 1[f]. The correspondence recited in the claim is between the pixels at positions along the first and second axes. And in addressing transformation, the claim recites positions along the first and second axes, not necessarily the entirety of the input image. *Id*. at element 1[g].

Insta360 does not cite any intrinsic evidence to refute the claim's focus on the transformation of pixels other than to contend that "[t]he inventors make clear that where they intend to refer to anything less than the entire input image, they use the term 'a portion within the input image.'" Insta360 Br. at 17, *citing* Darrell Tr. at 1008:10–13 and Insta360 Reply at 3. The claim language, however, itself identifies the pixels that are transformed and does not preclude an input image containing additional non-transformed pixels.

The evidence supports that element 1[g] is met in the accused products. Villasenor Tr. at 530:8–531:21.

5. Element 1[i]

Element 1[i] recites, "present the output image on the display" '413 patent at claim 1. GoPro contends that the accused products meet this element because "in the end, [the product] displays the output image in either a 16:9 or 9:16 aspect ratio." GoPro Br. at 192. GoPro suggests that Insta360 may dispute this element (*see id.*), but Insta360's briefing does not explicitly identify

[redacted]

element 1[i] as disputed. *See* Insta360 Br. at 13–21 and Insta360 Reply at 2–5. The evidence supports that this element is met in the accused products. *See* GoPro Br. at 192, *citing* Villasenor Tr. at 532:13–24.

The evidence supports that the accused products do not infringe claim 1.

6. Redesigns

GoPro's initial brief notes certain "'413 Redesigns" (GoPro Br. at 192, stating that "[t]he [redacted]," but Insta360's post-hearing briefs do not mention them or argue that they do not infringe for any additional reason not addressed above. The same infringement analysis as above thus applies to the redesign products, that is, they do not infringe.

C. Technical Prong

GoPro contends the '413 patent domestic industry products, as represented by the Hero7 Black, practice claim 1. GoPro Br. at 182–184. Insta360 does not dispute this practice. *See generally* Insta360 Br. and Insta360 Reply.

The evidence supports that the domestic industry products are cameras and therefore image capture apparatuses (element 1[pre]), with image sensors capturing images in a 4:3 aspect ratio and in accordance pixels positioned along two axes (element 1[a]). Villasenor Tr. at 535:3–536:4. The evidence supports that the products include a display for displaying captured images, and a processor using machine-readable instructions (elements 1[b] and 1[c]). *Id.* at 536:5–14; CX-0614C.4 (Hero7 user manual); and CX-0631.1 (GoPro press release).

The evidence supports that the programmed instructions implemented by the domestic industry products cause the products to obtain an input image (element 1[d]) and determine a portion of fewer-than-all pixels within the input image based on a FOV mode through computation

[redacted]

of a pixel warp map (element 1[e]). Villasenor Tr. at 537:1–538:16; CX-0537.1 (GoPro SuperView support webpage); and CPX-0001C-SC.2399 and 0231–37. The evidence further supports that the instructions apply a transformation to the pixels of the image according to the warp map to output an image with a 16:9 aspect ratio, which is different from the initial 4:3 ratio (element 1[f]). Villasenor Tr. at 540:10–22 and CX-0537.1.

The evidence supports that the transformation effected by the instructions involves shifting pixels according to the warp map, with that warp map providing varying amounts of vertical and horizontal shift roughly according to how distant the pixel is from the center of the image (*i.e.*, non-uniformly and based on position along the two axes) (elements 1[g] and 1[h]). Villasenor Tr. at 540:23–541:121 and CPX-0001C-SC.231–37. Finally, the evidence supports that the output image is presented on the display of the camera (element 1[i]). Villasenor Tr. at 541:22–542:5 and CX-0614C.16 and 28.

The evidence supports that claim 1 is practiced by the domestic industry products.

D. Validity

Insta360 contends that claim 1 is invalid based on the prior art, lack of subject matter eligibility under § 101, and lack of written description under § 112. Insta360 Br. at 22–43 and Insta360 Reply at 5–8.

1. Meulen Alone and With Chao

Insta360 argues that claim 1 is obvious in view of Meulen (U.S. Patent No. 7,693,500, RX-1287) when combined with the knowledge of skill, and when combined with Chao (U.S. Pub. No. 2008/0095470, RX-1274). Insta360 Br. at 22–30.

[redacted]

a) Overview

Based on the filing of a provisional application, the evidence supports that the ’413 patent has a priority date of August 22, 2013. GoPro Br. at 7. With a filing date of June 5, 2006, the evidence supports that Meulen is prior art under 35 U.S.C. § 102(a). With a filing date of October 23, 2006, the evidence supports that Chao is prior art under 35 U.S.C. § 102(a). Insta360 Br. at 22. This is not disputed by GoPro. *See generally* GoPro Br. and GoPro Reply.

Insta360 argues that Meulen “sought to fit various type[s] of ‘media source content’ such as images and videos onto the display screen of a wireless device, such as Palm-style smartphone, without sacrificing image quality” and thus “provides a non-uniform scaling solution to fit an image with one aspect ratio on a display with a different aspect ratio.” Insta360 Br. at 23, *citing* Darrell Tr. at 1017:4–13, 1014:8–20, and 1012:14–21 and RX-1287 at 2:2–6, 3:33–43, 5:50–6:8, 1:16–20, and 4:13–23.

Insta360 argues that Chao “offers a non-uniform scaling method for ‘auto-resizing an original digital image from an original image to a resized image’ while ‘maintaining the original design intent of the image.’” Insta360 Br. at 23, *citing* Darrell Tr. at 1013:1–5 and RX-1274 at Abstract, [0001], and [0003].

b) Meulen

Insta360 contends that all elements of claim 1 obvious in view of Meulen and the knowledge of one of skill in the art. Insta360 Br. at 22–30. GoPro’s briefing confirms there is no dispute the Meulen discloses elements 1[pre]–1[d], 1[f], 1[h], and 1[i]. *See* GoPro Br. at 195–197 and GoPro Reply at 91–92. The evidence supports that those elements are disclosed in Meulen. *See* Insta360 Br. at 22–25, 27–28, and 30, *citing* Darrell Tr. at 1013:19–1016:14, 1017:3–1018:25, 1020:1–22, and 1022:2–4.

[redacted]

(1) Element 1[e]

Insta360 argues that Meulen discloses a central display region 140-3 that is not subject to compression as are the more peripheral regions 140-1, 140-2, 140-4, and 140-5. Insta360 Br. at 25–26, *citing* Darrell Tr. at 1016:15–1017:1 and 1019:19–25 and RX-1287 at 6:27–37. Insta360 argues that Meulen's number of compression regions "constitutes an affirmative 'determination' of a portion." Insta360 Reply at 6, *citing* Darrell Tr. at 1016:24–1017:2 and RX-1287 at 5:31–37.

Fig. 1 of Meulen shows an embodiment of a wireless device:

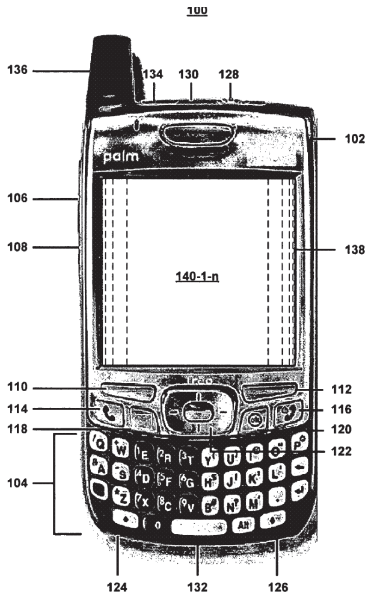


FIG. 1

RX-1287 at Fig. 1. Display 138 displays media source content received by the wireless device. *Id.* at 3:26–27. The media source content may have an aspect ratio that differs from the aspect ratio of the display. *Id.* at 4:13–15. For example, the media source content may have an aspect ratio of 3:2 while the display may have an aspect ratio of 1:1. *Id.* at 4:15–18. In that case, image compression and/or scaling may be applied to the media source content that is to be displayed on one or more of the display regions. *Id*. at 4:37–39. Meulen explains that its image compression or scaling "may be applied progressively to the media source content based on the proximity of the display region

[redacted]

to the edge of the display." *Id.* at 4:42–45. "For example, more image compression and/or scaling may be applied to the media source content that is to be displayed closer to the edges of the display 138, than to the media source content that is to be displayed closer the center of the display 138." *Id.* at 4:45–49.

Consistent with this explanation, Meulen discloses that the central inner portion 202-5 of the display region (corresponding to region 140-3 in Fig. 1) undergoes no compression as compared to peripheral regions 202-1 through 202-4 and 202-6 through 202-9, which experience increasing amounts of compression:

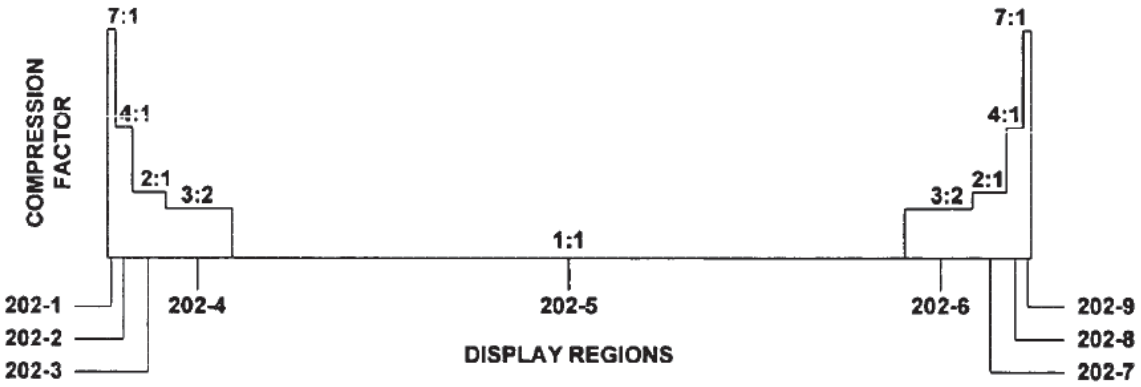


FIG. 3

Id. at Fig. 3; *see id.* at 7:1–28. Meulen explains the scheme shown in Figure 3 may be used for source content at a 3:2 aspect ratio displayed on a screen with a 1:1 aspect ratio. *Id.* at 7:46–49. The evidence supports that one of skill would understand that the pixels at the edges in Meulen are shifted more than the pixels at the center. Darrell Tr. at 1018:16–25.

GoPro argues element 1[e] is not met because Meulen's compression schemes are akin to a "'fixed static' table that is merely looked up." GoPro Br. at 196. But as addressed above with respect to infringement, element 1[e] is met through the application of a "static" or set flow map/warp function to the input image. To the extent variability is required to "determine a

[redacted]

portion," Meulen discloses a variable number of compression regions. *See* Insta360 Reply at 6, *citing* RX-1287 at 5:31–37. The evidence supports that element 1[e] is disclosed in Meulen.

(2) Element 1[g]

Element 1[g] recites "the transformation non-uniformly shifts the pixels from the input positions to the output positions based on (1) the input positions along the first axis, and (2) the input positions along the second axis. '413 patent at claim 1. Insta360 relies on tables in Meulen showing varying compression ratios for peripheral regions of the screen:

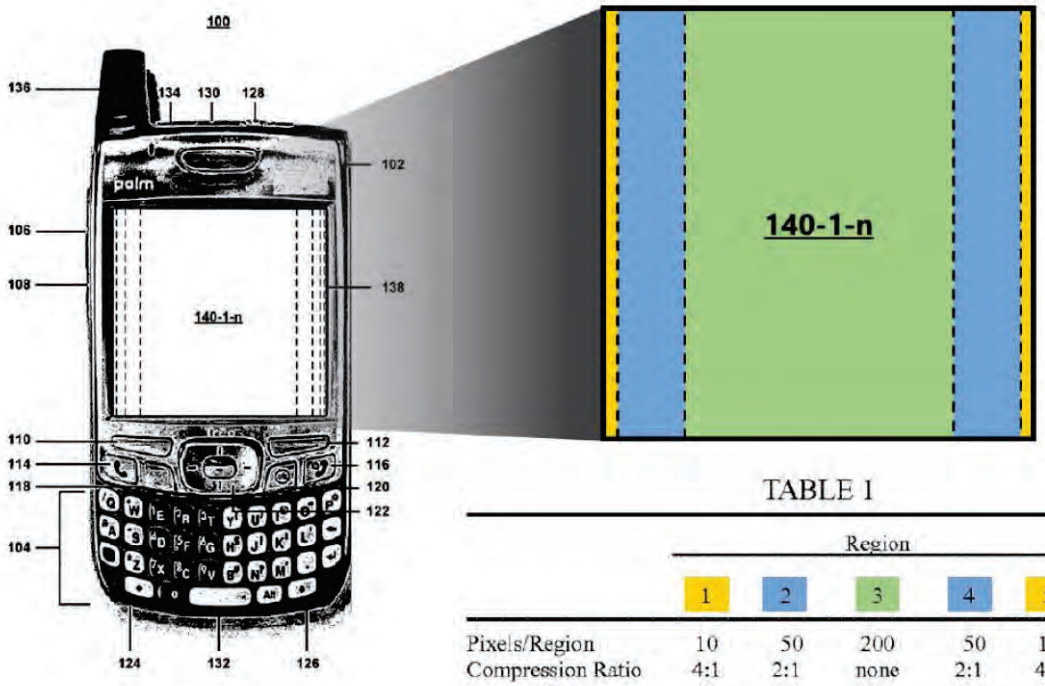


FIG. 1

TABLE 1

	Region					
	1	2	3	4	5	Total
Pixels/Region	10	50	200	50	10	320
Compression Ratio	4:1	2:1	none	2:1	4:1	
Source Pixels	40	100	200	100	40	480

RDX-0014C.50 and Insta360 Br. at 28–29, *citing* Darrell Tr. at 1017:14–1018:25; RX-1287 at 6:4–13. Insta360 argues that Meulen discloses compression in both the vertical and horizontal directions at the same time. *Id.* at 28, *citing* RX-1287 at 10:19–26. The cited passage from Meulen states:

> In some embodiments, image compression and/or scaling may be applied in a horizontal direction and/or in a vertical direction. When applied in both the

[redacted]

> horizontal and vertical direction, the image compression and/or scaling may allow expansion of the lateral display regions 202-1-4 and 202-6-9 to create a magnified effect or to simulate a video graphics array (VGA) having a resolution of 640×480 with a display having a resolution of 320×320.

RX-1287 at 10:19–26.

Pointing to RDX-0014C.50, shown above, GoPro contends that "Meulen discloses a shift based only on position on a single axis, which does not satisfy element 1[g]." GoPro contends that Fig. 1 and Table 1 and the corresponding disclosure in Meulen show that "Meulen is thus a function of the horizontal position." GoPro Br. at 196. GoPro characterizes Meulen's disclosure that image compression or scaling "may be applied in a horizontal and/or in a vertical direction" as a "throw-away statement" and criticizes Dr. Darrell for not explaining "what sort of horizontal/vertical scaling he understood Meulen to disclose here." GoPro Br. at 196.

Dr. Villasenor testified that the figure Dr. Darrell relied on "shows that any shifts in this figure here are a function only of the horizontal position of the pixel prior to the shift. They are completely independent of the vertical position. So it would fail to satisfy the requirement regarding those two axes that we just saw." Villasenor Tr. at 1427:3–8. The fact that the figures in Meulen do not *show* shifts in the vertical direction, however, does not eliminate that Meulen expressly teaches that image compression and scaling may be performed in both the horizontal and vertical direction. GoPro's argument that this express teaching in Meulen can be ignored as a "throw-away statement" is rejected.

Further, while Meulen discloses aspect ratios with the same heights[43] for both the media source and display in the examples in Fig.1 and Table 1 (media source aspect ratio of 480x320 and

---

[43] As GoPro explained at the technology tutorial, aspect ratio is a ratio with width being the first number and height being the second number. Tutorial Tr. at 56:22–24.

[redacted]

display aspect ratio of 320x320) and in the examples in Figs. 2 and 3 (media source aspect ratio of 480x320 and display aspect ratio of 320x320), *see* RX-1287 at 5:62–67 (Fig. 1), 7:48–48 (Figs. 2 and 3), and 8:12–15 (Figs. 2 and 3), Meulen expressly teaches that aspect ratio heights can vary between media source and display. *Id*. at 4:19–34, identifying media source aspect ratio of 640x320 and display aspect ratio of 480x480. As a result, consistent with Meulen's teaching that "image compression and/or scaling may be applied in a horizontal direction and/or in a vertical direction," Meulen teaches that scaling or compression in the height direction for different aspect ratios in the height direction as it shows with respect to the width direction in the examples shown in Figs. 1–3.

Further, Meulen consistently discloses progressive compression from the interior toward the outside edges of the display regions. For example, Meulen states that "[t]he image compression may be applied progressively to the media content that is to be displayed in one or more of the lateral display regions based on the proximity of the lateral display region to the edge of the display." RX-1287 at 1:62–65. Meulen also states, "[i]n various implementations, the image compression and/or scaling may be applied progressively to the media source content based on the proximity of a display region to the edge of the display 138. For example, more image compression and/or scaling may be applied to the media source content that is to be displayed closer to edges of the display 138, than to the media source content that is to be displayed closer to the center of the display 138." *Id*. at 4:42–50 and *see id*. at 1:65–2:7 ("For example, more image compression may be applied to the media content which is to be displayed at or near the edges of the display than to the media content which is to be displayed at or near the central region. In such implementations, a wireless device having a square or substantially square display may be arranged to emulate a non-square display and to better match the aspect ratio of typical video

[redacted]

content without cropping. Accordingly, a user may realize enhanced products and services.”). Given different aspect ratios in both the width and height directions between the input media and display, the consistent application of progressive scaling and compression, and Meulen’s expressed desire to avoid cropping, Meulen supports that progressive image compression and/or scaling may be performed in both the vertical and horizontal directions to avoid cropping.

It is correct, as Dr. Villasenor testified, that the figures in Meulen show that shifts “are a function only of the horizontal position of the pixel prior to the shift.” Villasenor Tr. at 1427:3–5. As detailed above, however, Meulen recognizes that there may be different height aspect ratios between an input image and an output display in addition to different vertical aspect ratios and specifically discloses that shifts may be in the height direction. Darrell Tr. at 1017:14–24. The evidence thus supports that Meulen discloses element 1[g].

Clear and convincing evidence supports that claim 1 is obvious based on Meulen and the knowledge of one of skill.

c) Meulen and Chao

Insta360 contends that claim 1 is obvious based on the combination of Meulen and Chao. Insta360 Br. at 28–29. The focus of the parties’ arguments is element 1[g]. *See id*. and GroPro Br. at 197.

The evidence supports that Chao discloses that both “horizontal and vertical scaling factors are determined.” Darrell Tr. at 1019:4–17 and RX-1274 at [61] (“if an element is a horizontal element, the method proceeds to block 304, where the horizontal and vertical scaling factors are determined. The horizontal scaling factor (Sh) is the ratio of the width of the new page (i.e. the width of the page on which the re-sized image will appear) to the width of the original page. The vertical scaling factor (Sv) is the ratio of the height of the new page to the original page.”) Chao,

[redacted]

like Meulen, recognizes the benefit of not cropping an image to be displayed. RX-1274 at [2]. To the extent not disclosed in Meulen, the evidence supports that based on Chao, one of skill would understand that the progressive compression and/or scaling of Meulen could be accomplished with both the horizontal and vertical scaling factors disclosed in Chao. Darrell Tr. at 1019:1–17.

The evidence supports that one of skill would have been motivated to combine Muelen and Chao because they relate to the same technologies, are directed to methods for resizing a digital image, "maintain the design intention of the original image and avoid the problems that cropping would have caused" and would have had an expectation of success. Darrell Tr. at 1019:19–1020:7. Clear and convincing evidence supports that claim 1 is obvious in view of the combination of Meulen and Chao.

d) Secondary Considerations

Secondary considerations do not support the nonobviousness of claim 1 based on either Meulin in view of the knowledge of one of skill or the combination of Meulin and Chao. While GoPro showed that there was praise for SuperView, that praise was not shown to be related to what is claimed in the '413 patent. Villasenor Tr. at 1446:2–1447:11; Woodman Tr. at 79:6–14 (very positive public response to SuperView); and CX-1435.25 ("Superview is a clever GoPro video mode which is designed to capture a more immersive wide angle perspective"); and CX-1511.3 ("GoPro's unique SuperView lens . . . has a ridiculously wide angle which allowed even a selfie taken from just arms reach to capture all six of our family."). The evidence does not support other secondary indicia relating to the '413 patent. *See* GoPro Br. at 199–211.

2. Fleming

Insta360 argues that claim 1 is obvious in view of Fleming (U.S. Patent No. 7,158,158, RX-1285) when combined with the knowledge of one of skill. Insta360 Br. at 30–37.

[redacted]

a) Overview

Given GoPro's assertion that the priority date of the '413 patent is August 22, 2013, GoPro Br. at 7, the evidence supports that Fleming, with a filing date of March 12, 2003, is prior art under 35 U.S.C. § 102(a). Insta360 Br. at 30. This is not disputed by GoPro. *See generally* GoPro Br. and GoPro Reply.

Insta360 contends that Fleming "seeks to 'match the aspect ratio of a video image and the target display area' to 'fit the entire video image onto the target display area'" in a way that "'the original aspect ratio of the video image is preserved near the center region (or strip) of the image and the image is gradually stretched (or compressed) as it is mapped to the edges.'" Insta360 Br. at 30, *citing* RX-1285 at Abstract, 1:24–26 and Darrell Tr. at 1021:1–11.

b) Analysis

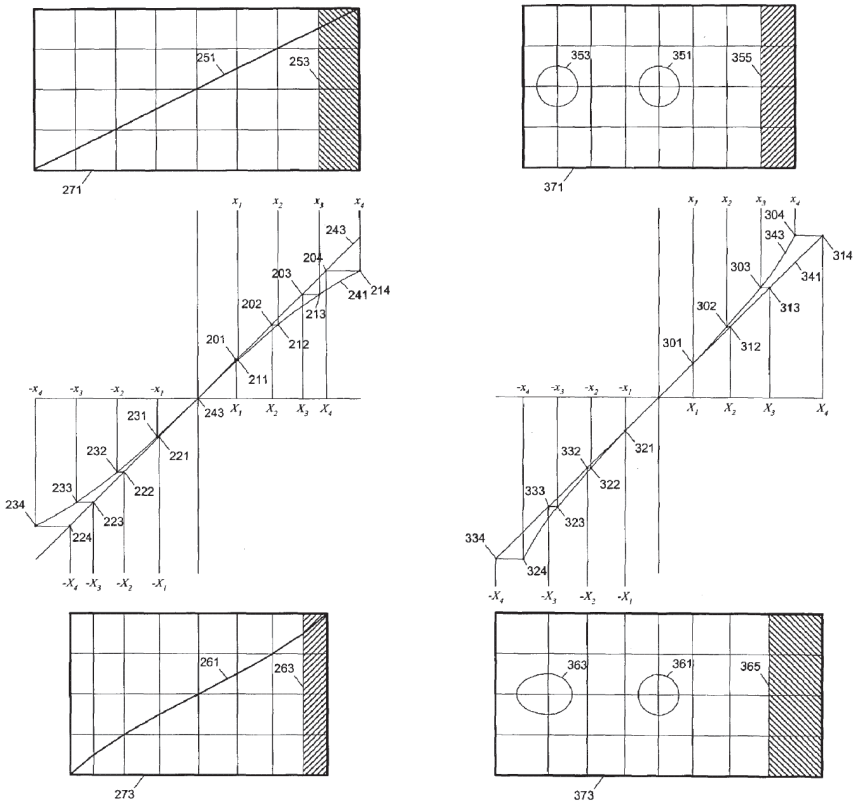
GoPro's briefing confirms there is no dispute for limitations 1[a]–1[c] and 1[g]–1[i]. *See* GoPro Br. at 193–195 and GoPro Reply at 87–91. The evidence supports that those elements are disclosed in Fleming. *See* Insta360 Br. at 32–33, 35–37, *citing* Darrell Tr. at 1021:23–1023:21, 1025:8–1027:14.

GoPro makes several arguments regarding Fleming, one of which is dispositive. In particular, GoPro contends that Fleming fails to disclose, or at least Insta360 fails to allege, that Fleming's video camera is the origin for the image thereafter transformed by Fleming's computer system, as required by limitations 1[d], 1[e], and 1[f]. *See* GoPro Br. at 195 and GoPro Reply at 89–90.[44]

---

[44] This relates to GoPro's contention that Insta360 only preserved an obviousness theory, but failed to provide an obviousness rationale. *See* GoPro Br. at 193–194 and GoPro Reply at 87 ("Although Respondents allege only obviousness, their expert offered no obviousness opinions at trial.").

The evidence supports that Fleming discloses receiving a video signal in a first aspect ratio and applying "non-linear scaling" to that video to arrive at a second, different, aspect ratio. RX-1285 at Fig. 9, 8:35–40. Fleming further discloses that "it is desirable to maintain the original aspect ratio in an area of interest (*e.g.*, at the center of the image) and gradually stretch the image in other areas." *Id.* at 4:38–41. This preservation of a central region is shown in Fleming's Figs. 2 and 3, below:



Id. at Figs. 2, 3; *see id.* at 4:49–5:40. Fleming also discloses that "[a]ccording to one embodiment of the present invention, nonlinear scaling is applied in both the vertical direction and the horizontal direction." *Id.* at 5:41–43; *see id.* at Fig. 4.

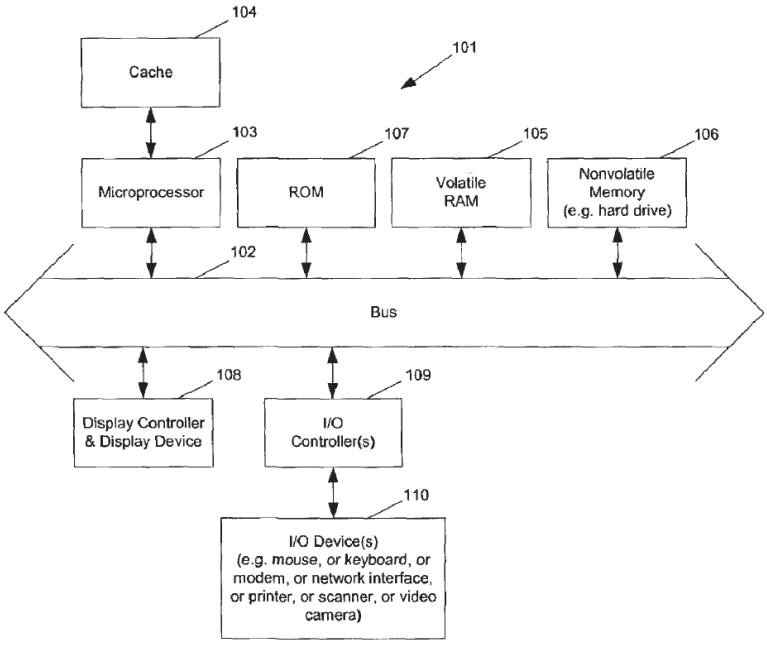
GoPro contends that Insta360 did not adequately allege that the camera disclosed in Fleming is what provides the images to which its nonlinear scaling is applied, as per limitations 1[a] ("capture an input image") and 1[d] ("obtain *the* input image."). *See* GoPro Br. at 195 and

[redacted]

GoPro Reply at 90–91. GoPro explains that this feature is not taught because Fleming only discloses that "video sources *other than* the peripheral device as the source of video subject to the alleged transformation." GoPro Br. at 195, *citing* Villasenor Tr. at 1423:13–1424:21 and RX-1285 at 8:12–27. In response, Insta360 notes Fleming's disclosures of a video camera among various input/output devices and that the processed video signal can originate from a "digital video source," and then argues a video camera is a "digital video source." *See* Insta360 Br. at 33–34, *citing* RX-1285 at 8:12–27.

The evidence does not support that Fleming discloses processing the images captured by its own camera. The word "camera" is mentioned only once in Fleming in a list of exemplary input/output devices attached to computer systems through a bus:

> The bus 102 interconnects these various components together and also interconnects these components 103, 107, 105, and 106 to a display controller and display device 108 and to peripheral devices such as input/output (I/O) devices which may be mice, keyboards, modems, network interfaces, printers, scanners, video cameras and other devices which are well known in the art. Typically, the input/output devices 110 are coupled to the system through input/output controllers 109.



[redacted]

RX-1285 at 3:25–34 and Fig. 1. And when introducing its aspect ratio transformation processes, Fleming broadly states the subject video signal can be, for example, "signals from an external source, a television tu[]ner, a high definition television tu[]ner, a digital video source, such as digital cable television, digital satellite television." *Id.* at 8:12–15. These two passages are not a disclosure that the system operates on an image captured by the video camera, even though, as Insta360 argues, video cameras can be a "digital video source." In other words, a video camera is a digital video source, but not all digital video sources are cameras.

The evidence supports that these aspects of claim 1 (capturing input images using an image sensor and obtaining the images for transformation as recited in limitations 1[a] and 1[d]) can only be obvious in light of Fleming. But Insta360 does not make this argument. Insta360 Br. at 32–34 and Darrell Tr. at 1021:1–1027:14. In its reply brief, Insta360 argues that Dr. Darrell "explained how every limitation is disclosed in Fleming or otherwise obvious to a [person of ordinary skill], making clear that there are no meaningful differences between the prior art and claim 1 of the '413 patent." Insta360 Reply at 7, *citing* Darrell Tr. at 1021:1–1027:14. To the extent this statement is meant to invoke a *Graham* analysis as to Fleming, it is not supported by the cited testimony in which Dr. Darrell only took the position that each element was disclosed. *See* Darrell Tr. at 1021:1–1027:14. Insta360 has not presented a clear and convincing case of obviousness based on Fleming.

The evidence does not support that claim 1 is obvious over Fleming.

3. Patent-Eligible Subject Matter

Because the asserted claim is invalid based on the prior art, it is unnecessary to consider invalidity under § 101.

[redacted]

4. Written Description

Insta360 contends claim 1 of the ’413 patent is invalid if the claim is not restricted to maintaining the field of view during the transformation. *See* Insta360 Br. at 38–39. Insta360 states that the patent specification “does not disclose a single embodiment of the invention in which aspect ratio is changed by such cropping or in which FOV is lost.” *Id.* at 39. Thus, it reasons, “claim 1, as interpreted by GoPro, exceeds the scope of the invention as described in the specification [and] is invalid for lack of written description.” *Id.*, *citing ICU Med., Inc. v. Alaris Med. Sys., Inc.*, 558 F.3d 1368, 1376–79 (Fed. Cir. 2009). GoPro argues that Insta360’s arguments are largely a rehash of its claim construction argument, and that specification explicitly identifies avoidance of loss of field of view as “one embodiment.” GoPro Reply at 93, *citing* ’413 patent at 3:45–47 and *Rexnord Corp. v. Laitram Corp.*, 274 F.3d 1336, 1345 (Fed. Cir. 2001).

The evidence does not support that claim 1 recites subject matter not sufficiently disclosed in the ’413 patent. As noted by GoPro, the specification acknowledges that “in one embodiment” the field of view is maintained when altering aspect ratio of images. Dr. Villasenor credibly testified that this statement would inform one of skill that the inventors did not exclude all cropping in generating a new aspect ratio. Villasenor Tr. at 1431:9–12.

In addition, Insta360’s cited case, *ICU Medical*, is distinct. There, the court held claims that did not recite a “spike” were invalid for lack of written description in large part because “the specification describes only medical valves with spikes.” *ICU Medical*, 558 F.3d at 1378. In *Allergan USA, Inc. v. MSN Labs. Private Ltd.*, the Federal Circuit revisited *ICU Medical* and explained that the “spike,” although unclaimed in certain claims, “had a particular function necessary to the disclosed in invention.” 111 F.4th 1358 (Fed. Cir. 2024). Preservation of field of view, by contrast is not identified as necessary to the claimed invention.

The evidence does not support that claim 1 is invalid for lack of written description.

XI. THE D'435 PATENT

A. Claim Construction

The Federal Circuit "has repeatedly held that tribunals should not treat the process of claim construction in design patent cases as requiring a detailed verbal description of the claimed design, as would typically be true in the case of utility patents. Rather, the tribunal is not obligated to issue a detailed verbal description of the design as a design is better represented by an illustration." *LKM Corp. v. GM Global Technology Operations LLC*, 102 F.4th 1280, 1301 (Fed. Cir. 2024) (in banc) (citations and internal quotations omitted). "Given the recognized difficulties in trying to describe a design in words, the preferable course ordinarily will be for a [tribunal] not to attempt to 'construe' a design patent claim by providing a detailed description of the claimed design." *Egyptian Goddess, Inc. v. Swisa, Inc.*, 543 F.3d 665, 679 (Fed. Cir. 2008) (in banc). A tribunal "may find it helpful to point out" "in the case of a bench trial by way of describing the [tribunal's] own analysis, various featured of the claimed design as they relate to the accused design and the prior art." *Id*. at 1380. As a result, I will not verbally describe the claimed design for purposes of claim construction, but will describe features when addressing infringement and the prior art.

B. Infringement

1. Legal Standard

The standard for infringement of a design patent differs from that of a utility patent because of the different nature of their claims. For a design patent, the test for assessing infringement is if, in comparing the accused product and the patent's figures, "in the eye of an ordinary observer, giving such attention as a purchaser usually gives, two designs are substantially the same, if the resemblance is such as to deceive such an observer, inducing him to purchase one supposing it to be the other, the first one patented is infringed by the other." *Gorham Co. v. White*, 81 U.S. 511,

[redacted]

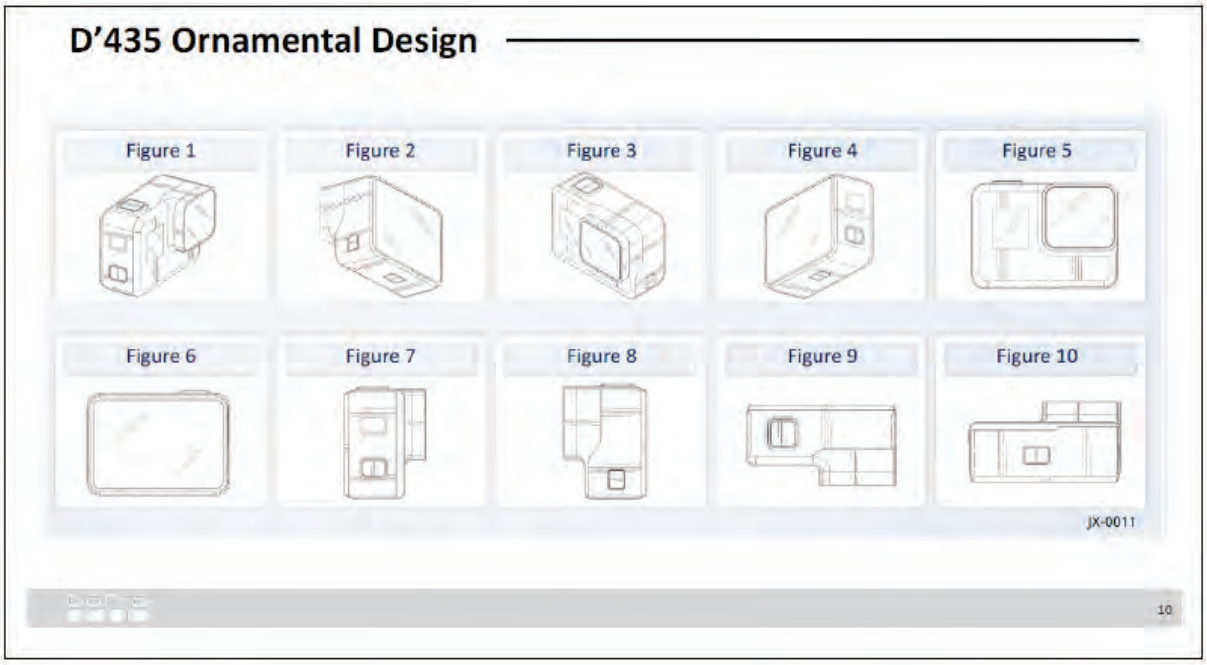
528 (1871). This is the "ordinary observer" test, which is "the sole test for determining whether a design patent has been infringed." *Egyptian Goddess*, 543 F.3d at 676–78. The Federal Circuit has stated:

> In some instances, the claimed design and the accused design will be sufficiently distinct that it will be clear without more that the patentee has not met its burden of proving the two designs would appear "substantially the same" to the ordinary observer, as required by *Gorham.* In other instances, when the claimed and accused designs are not plainly dissimilar, resolution of the question whether the ordinary observer would consider the two designs to be substantially the same will benefit from a comparison of the claimed and accused designs with the prior art . . . Where there are many examples of similar prior art designs, . . . differences between the claimed and accused designs that might not be noticeable in the abstract can become significant to the hypothetical ordinary observer who is conversant with the prior art.

Egyptian Goddess, 543 F.3d at 678.

2. Analysis

The claim of the D'435 patent is "the ornamental design for a camera" as shown in its figures:



[redacted]

D'435 patent at claim.

3. Accused Products

GoPro asserts that each of the accused products, Ace, Ace Pro, and Ace Pro 2, appears "substantially the same" as the design claimed in the D'435 patent. GoPro Br. at 16–17 and GoPro Reply at 2–8. GoPro contends that "the overall visual impression for each of the Ace, Ace Pro, and Ace Pro 2 is substantially the same as that of the D'435 Patent," and, while recognizing that "the Ace, Ace Pro, and Ace Pro 2 have some minor visual distinctions," contends that "these differences are trivial and not particularly noticeable when evaluating the overall design." GoPro Br. at 17–18; *see also id.* at 19–27.[45]

Insta360 characterizes the D'435 patent as including "five design features": (1) a "rectangular 'box-like' form"; (2) a rectangular body; (3) a rectangular lens cover flush with upper right corner; (4) rectangular buttons; and (5) rectangular displays. Insta360 Br. at 222–23. As Inst360 itself recognizes, however, the "infringement analysis focuses on 'the design as a whole' (overall visual impression) rather than 'particular features' of the design." *Id*. at 224.

Mr. Delman provided credible context within which an ordinary observer would compare the D'435 patent and the accused designs. Delman Tr. at 448:13–22 (considering size of products, type of customer, price points, how products viewed when purchased, where comparison made (on-line, in stores, or both)). Mr. Delman concluded that an ordinary observer "would bring a fairly low level of discernment or visual acuity to their comparison of the designs, which [would lead] them to be more readily confused by the similarities that they may find." *Id*. at 449:1–6.

---

[45] GoPro states that Insta360 improperly relies on expert reports. GoPro Reply at 2. Because the expert reports were not admitted into evidence, they will not be considered.

[redacted]

Mr. Delman concluded that the Ace, Ace Pro, and Ace Pro 2 would be "perceived as substantially the same as the appearance of the [D'435] patent to the degree that the ordinary observer would mistake one for the other in their purchasing decision." *Id.* at 450:15–19. As to Fig. 1 and the Ace, Ace Pro, and Ace Pro 2, Mr. Delman used the following demonstrative:

CDX-0005.19. He explained that an ordinary observer would see the "similarity in overall rectilinear form, and the very generously rounded radiuses along all of the edges. They would also see how this predominantly square lens with rounded corners extends forward from that rectilinear body" and "is flush or seamless in the way it extends from both the top surface" and "the side surface." "They would also see that there is this rectilinear screen with rounded corners just to the left of that lens." "They would see this shutter button or a control button on the top surface, which is very much an echo of the shape of the lens. It's a square with rounded corners, and how that's virtually identical in both its shape and location on the Ace and on the Ace Pro." Mr. Delman also noted that the upper button on the side in Fig. 1 is dashed, meaning it is not part of the claim so the "absence of such a detail or similar feature on the accused products isn't relevant for the analysis." Delman Tr. at 452:1–453:11.

As to Fig. 2, Mr. Delman used the following demonstrative:

[redacted]

CDX-0005.20. He testified that an ordinary observer would see an "overall rectilinear form with the rounded edges everywhere," and "how the lens is not just flush to that top surface, but extends organically and seamlessly" "from the side as well." "[T]he ordinary observer would also see that the back surface is really comprised virtually edge to edge with a flat, polished surface that" is "mimicked in the Insta360 accused products." *Id*. at 454:1–19.

As to Fig. 3, Mr. Delman used the following demonstrative:

CDX-0005.21. He testified that an ordinary observer would see a lens that "grows out of the rectangular body, its soft corners that are mimicked by the three accused products, the screen just to the left of the lens, the shape and location of the button on the top surface." He further testified

that "[a]lthough the button on the lower right side is a bit different on the accused products, there's still a feature, a rectilinear feature in the same location." Mr. Delman testified that this difference did not detract from the similarity an ordinary purchaser would perceive from the overall designs. *Id*. at 454:20–456:3.

As to Fig. 4, Mr. Delman used the following demonstrative:

CDX-0005.22. He testified that an ordinary observer would "see this rectilinear form with the rounded corners. They would see this nearly edge-to-edge, flat, polished surface across the back surface. They would see a control button on the lower right side. They would see certain details on the underside, rectilinear details." Mr. Delman testified that the details on the underside in the accused products "are a bit different in their nature and proportions related to the rest of the body, but nonetheless, the overall visual impression being more than substantially the same." Mr. Delman testified that in looking at the actual physical products, the bottom details in the accused products are "next to invisible" and do not "take away from the fact that the overall impression -- the prominent features that the ordinary observer would perceive are dominant here." *Id*. at 456:4–457:14.

[redacted]

As to Fig. 5, Mr. Delman used the following demonstrative:

CDX-0005.23. Mr. Delman testified that in this straight-on view, the ordinary observer "can see really well here not just the rounded corners on these rectilinear bodies that are really almost identically proportioned, with that lens in upper right-hand corner." There is a "screen to the left" and a "button on the top surface" "raised off of that top surface to virtually an identical height." Mr. Delman recognized "some minor surface features on the accused products at the bottom, at their base." In particular, there is "faceting and contoured features" on the Ace and Ace Pro 2 and a microphone on the Ace Pro 2. Mr. Delman testified that these are "very minor and hard-to-perceive features" and opined that "[t]o the extent the ordinary observer would notice them," they would not "influence their perception of overall substantial similarity." *Id*. at 457:15–459:4 and *see id*. at 460:11–18.

[redacted]

As to Fig. 6, Mr. Delman testified about the following demonstrative:

CDX-0005.26. From this "straight-on back view of the design," Mr. Delman testified that an ordinary observer would "see this virtually edge-to-edge, flat, polished surface on the back view," a control button "on the upper right-hand side," which "is nearly identical in the way that is perceived." To the extent hinges are viewable in the accused products, Mr. Delman testified that they are designed "not to be particularly obvious" and do not "overcome the substantial similarity of these prominent features that would be perceived." *Id*. at 460:19–461:15.

As to Fig. 7, Mr. Delman testified about the following demonstrative:

[redacted]

CDX-0005.27. From this side view, an ordinary observer would see "the rectilinear form with the rounded corners" and the lens that "is integrated into the body" and has "a generous radius" in the patent and accused products." *Id*. at 461:16–462:9.

As to Fig. 8, Mr. Delman testified about the following demonstrative:

CDX-0005.28. From this side view, Mr. Delman testified that an ordinary observer would see that the "lens is integrated on its bottom side" and "an analogous rectilinear type of control button or switch of some sort to be found on the same location on the three accused products." Mr. Delman testified that he took into account "the button that's at the top of this side view for each of the accused products," and that in the actual product, this button "blends into the side, and it's virtually unnoticeable." He further testified that "from this perspective, the prominent features and forms that the ordinary observer would perceive would be more than substantially the same as the [D'435] patent from this perspective." *Id*. at 462:10–463:19.

[redacted]

As to Fig. 9, Mr. Delman testified about the following demonstrative:

CDX-0005.29. Looking straight down on the camera, Mr. Delman testified that an ordinary observer would see "the way this lens seamlessly flows into the body here, from this direction as well as from its underside, you can see that curve where it leads into the rectilinear form, echoing those round edges that are seen everywhere else on this body of the camera." Mr. Delman also testified about the "nearly identical shape and location of the button on the top surface on the Ace and the Ace Pro, and same location but a round shape on the Ace Pro 2," which he testified were "minor differences." He recognized that "the hinge might be noticed," but it is "a minor parting line when you look at the actual product." He opined that the "overall form and prominent features that the ordinary observer would see are more than substantially the same." *Id*. at 463:20–464:15.

As to Fig. 10, Mr. Delman testified about the following demonstrative:

[redacted]

CDX-0005.30. Looking at the design from underneath, Mr. Delman testified that an ordinary observer would see similarities in "seeing how this lens is located, its proportions, the way it is integrated into the body," and the "rounded corners on the rectangular." He also recognized what he said were "the small -- the differences in the small rectilinear features that are on the base of the D'435] design versus what's on the Insta360 designs." Mr. Delman testified that in most views they are not visible and in those in which they are visible, an "ordinary observer would find them to be minor." *Id.* at 464:16–465:12. Mr. Delman's overall conclusion was that the ordinary observer would conclude that the designs of the accused products are the same as the D'435 patent. *Id*. at 465:13–19.

Mr. Delman also considered the prior art, which an "ordinary observer is assumed to be familiar with" in a "three-way comparison or three-way analysis." *Id*. at 466:4–14 and *see Egyptian Goddess*, 543 F.3d at 678. In particular, he considered Chen (JX-0281 and CDX-0005.32) and Hero4 (CPX-0038 and CDX-0005.33). *Id*. at 466:15–473:1. He testified that comparing the prior art reinforced his conclusions of the similarity of the design of the D'435 patent and the accused products. *Id*. at 470:3–9, 471:8–13, 472:11–18, and 472:24–473:1.

Insta360 contends that the pivoting rear display in its accused products, shown below, "is a significant visual element of the Accused D'435 Products that is not found in the D'435 [patent]."

[redacted]

Insta360 Ace	Insta360 Ace Pro	Insta360 Ace Pro 2

Insta360 Br. at 228–30.[46] Insta360 contends that "this moveable (pivoting) rear display motivates an ordinary purchaser to select the Ace Pro camera," and "[w]hether the display of an Accused D'435 Product is flipped up or down, the overall visual impressions of the Accused D'435 Products are substantially different from that of the D'435 (cannot be flipped up or down)." *Id.* at 228–29. While "referencing functionality to distinguish articles of manufacture is not categorically impermissible," *Columbia Sportswear N. Am., Inc. v. Seirus Innovative Accessories, Inc.*, 80 F.4th 1363, 1381 (Fed. Cir. 2023), the question is "whether the accused design has appropriated the claimed design as a whole." *Egyptian Goddess*, 543 F.3d at 677. The evidence supports that the accused designs have appropriated the claimed design as a whole.

The evidence supports that the flip-up screen configuration does not detract from the overall impression of visual similarity. Mr. Delman persuasively analogized the flipped-up screen to a car with its hood, doors, and trunk open. Even in that configuration, an ordinary observer would appreciate the design similarities in a configuration with the hood, trunk, and doors closed.

---

[46] The blue outlines in the images were added by Insta360.

[redacted]

Delman Tr. at 459:5–460:9 and CDX-0005C.25 and *see* Delman Tr. at 1401:17–1402:1. Insta360's expert, Mr. Bressler, agreed that visual similarity in one configuration is not negated by the mere capability of a product to operate in other possible configurations. Bressler Tr. at 975:19–977:8.

In addition, and importantly, while the screen in the Insta360 accused products can flip up, that is not a mandatory configuration of the products. Instead, the physical exhibits of the accused Insta360 cameras were provided *without* the screens flipped up. *See* CPX-003, RX-0813, and RX-0827 (Ace); CPX-005, RX-0203, and RX-0204 (Ace Pro); and CPX-007, RX-574C, RX-0575C (Ace Pro 2). The evidence supports that the striking similarity of the Ace, Ace Pro, and the Ace Pro 2 to the claimed design is not negated by the ability of their back screens to flip up.

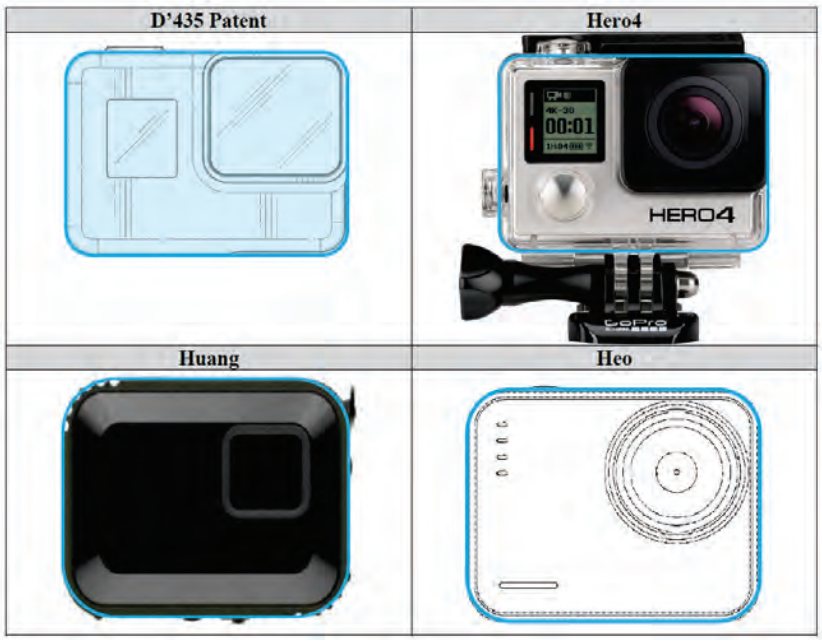
Insta360 also argues that when the screen is flipped down, the accused products "show noticeable pivotable top hinges and vertically-off centered (not edge-to-edge) rear displays" and "protruding latches." Insta360 Br. at 231–32. Mr. Delman credibly testified that the hinges were "actually designed not to be particularly noticeable." Delman Tr. 1404:6–18. In fact, what Insta360 points to is not "a hinge, per se, but rather the gaps in the parts between [the] moving part and the rest of the housing." *Id.* at 1404:9–11 and *see id*. at 460:19–461:15. This is confirmed by inspection of the physical exhibits. CPX-003(Ace), CPX-005(Ace Pro); and CPX-007(Ace Pro 2). As to the screen, Mr. Delman testified that an ordinary observer would "see this virtually edge-to-edge, flat, polished surface on the back view." The evidence also supports that the small release buttons do not "overcome the substantial similarity of these prominent features that would be perceived." *Id*. at 460:19–461:15 and CDX-0005C.26. is confirmed by inspection of the physical exhibits. CPX-003(Ace), CPX-005(Ace Pro); and CPX-007(Ace Pro 2).

Insta360 argues that other differences, such as a larger front display and "protruding features," including a microphone in the Ace Pro 2, support that there are significant differences

[redacted]

in the overall visual impressions between the Ace, Ace Pro, and the Ace Pro 2 and the D'435 patented design. Insta360 Br. at 232–36. "Minor differences between a patented design and an accused article's design cannot, and shall not, prevent a finding of infringement." *Crocs, Inc. v. Int'l Trade Comm'n*, 598 F.3d 1294, 1303 (Fed. Cir. 2010). Mr. Delman addressed these differences and explained that none of them detract from the overall conclusion of substantial similarity. *See above* and Delman Tr. at 458:14–459:4. In addition, the microphone in the Ace Pro 2 is designed to snap off the accused products, so it is not a permanent part of the design. Su Tr. at 897:15–24.

Insta360 also argues that "[c]omparing the D'435 to the closest primary reference, Hero4, an ordinary designer would notice that the differences are taught by the closest secondary references." Insta360 Br. at 236–38. Insta360 frames this as a "three-way visual comparison," but, in fact, Insta360 compares the D'435 patent to the Hero along with Huang and Heo, prior art references that will be discussed in more detail in the invalidity section below.



Insta360 Br. at 237. Insta360's comparison of the D'435 patent to the Hero4, Huang, and Heo is not a proper three-way comparison, because it is self-evidently not a three-way comparison between the D'435 patent, the accused product, and the closest prior art reference. Rather than performing a proper three-way comparison, Insta360 combines multiple references to argue that the accused products have not copied any individual feature from the D'435 patent that is not found in the prior art. Insta360 cites *Egyptian Goddess* as supporting that such a "three-way visual comparison[] show[s] that there are no novel differences between the D'435 and the closest prior art, and thus, no novel feature of the claimed design that the Accused D'435 Products can copy." Insta360 Br. at 238, *citing* 543 F.3d at 677. *Egyptian Goddess*, however, cuts against Insta360's argument, explaining that, even "[i]f the claimed design consists of a combination of old features that creates an appearance deceptively similar to the accused design, even to an observer familiar with similar prior art designs, a finding of infringement would be justified." 543 F.3d at 677–78.

Regarding the three-way analysis, Insta360 argues that Mr. Delman's opinions are conclusory and time-barred, Insta360 Br. at 225–26[47], but Mr. Delman described in detail how he conducted his analysis. *See* Delman Tr. at 470:10–472:18 and 1404:19–1405:9. In particular, Insta360 takes issue with Mr. Delman's explanation of why an ordinary observer would find the Ace, Ace Pro, and Ace Pro 2 more visually similar to the D'435 patent than to the prior art Hero4. Insta360 Br. at 225–26.

---

[47] Insta360 argues that "[t]he Court properly sustained Insta360's objection, since trial was the first time that Mr. Delman identified any similarities or differences between the D'435 and the closest primary reference, Hero4. Tr. (Delman) 470:10-472:4." Insta360 Br. at 225; *see also* Insta360 Reply at 68 ("ALJ Hines properly sustained Insta360's objection to Hero4 testimony because trial was the first time Mr. Delman identified any similarities or differences compared to the D'435. Tr. (Delman) 470:10-472:4."). Insta360 is wrong. At the hearing, Insta360's objections on this point were overruled. Delman Tr. at 468:10–472:4 (overruling two objections).

[redacted]

CDX-0005C.33.

The evidence supports that an ordinary observer would find the Ace, Ace Pro, and Ace Pro 2 substantially similar to the claimed design of the D'435 patent, and the context provided by the prior art Hero4 and other prior art only reinforces this conclusion, as shown above. An ordinary observer would see the Hero4 as substantially different from both the D'435 patented design and the Insta360 Ace, Ace Pro, and Ace Pro 2 because of such features as its large foot with significant knob and upper hinge. As Mr. Delman testified, "[A]dding this prior art to the comparison only further reinforces the ordinary observer's perception of similarity between [the D'435 patent] and [the Insta360 Ace]." Delman Tr. at 470:11–471:13.

Insta360 argues that Mr. Delman's analysis fails because "Mr. Delman did not determine whether the accused device appropriates the novelty of the patented device." Insta360 Br. at 226. Insta360 argues that *Egyptian Goddess* supports that "the accused design must [] appropriate the novelty of the claimed design in order to be deemed infringing." *Id.*, *citing* 543 F.3d at 670. In *Egyptian Goddess*, however, the Federal Circuit expressly rejected and overruled the "point of

[redacted]

novelty" test. *See* 543 F.3d at 678 ("[W]e hold that the 'point of novelty' test should no longer be used in the analysis of a claim of design patent infringement.").

Insta360 further argues that *Arminak & Assocs. v. Saint-Gobain Calmar, Inc.* supports that Mr. Delman's three-way analysis was deficient because he "failed[ed] to compare all views included in the design patent." Insta360 Br. at 226, *citing* 501 F.3d 1314, 1324 (Fed. Cir. 2007). Insta360's reliance on *Arminak* is misplaced. In that case, "there [was] essentially no question that a corporate buyer purchasing [the accused products] would be able to tell the difference easily" between the accused products and the patented design. 501 F.3d at 1324. Insta360 contends that *Arminak* mandates a three-way comparison regarding every drawing in the design patent, Insta360 Br. at 226, but the Federal Circuit has explained that "comparison prior art serves as background when comparing a claimed and accused design." *Columbia Sportswear*, 80 F.4th at 1369. There is no requirement that every single drawing from the patent must be subjected to a three-way analysis.

Insta360 also argues that the Ace and Ace Pro [redacted]. Insta360 Br. at 227–28. As Mr. Su testified, however, [redacted], Su Tr. at 901:1–16, and, when questioned on this point, Mr. Bressler could point to no documentary evidence of independent development. Bressler Tr. at 971:14–972:15. As detailed below in assessing copying, I find Mr. Su's testimony regarding independent development of the design of the Ace and Ace Pro lacks credibility.

The evidence supports that an ordinary observer would find that the designs of the Ace, Ace Pro, and Ace Pro 2 are substantially the same as that claimed in the D'435 patent. As a result, the claim of the D'435 patent is infringed by the Ace, Ace Pro, and Ace Pro 2.

[redacted]

4. Redesigns

Insta360's redesign Ace 2 and Ace Pro 2 (Next Generation) are redesigns of the accused products. Insta360 Br. at 241–46. GoPro does not dispute that the Insta360 redesigns should be adjudicated. *See* GoPro Br. at 12–30 and GoPro Reply at 1–8.

The evidence supports that the Insta360 redesigns are within the scope of the investigation because they are action cameras similar in design to the accused products. Su Tr. at 891:8–892:16 (describing redesigns). The evidence supports that the Insta360 redesigns are fixed in design and ready for commercial release. Sang Tr. at 843:21–848:16; Goodin Tr. at 1337:15–1338:18 and 1338:20–1339:19; RPX-0019C; RPX-0017C; RPX-0023C; RPX-0021C; RPX-0025C; JX-0248C; RX-0590C–0598C; and RX-1223C. The evidence supports that they have been imported. Sang Tr. at 846:9–11; Goodin Tr. at 1337:15–1338:18 and 1339:20–1340:4; RPX-0019C; RPX-0017C; RPX-0023C; RPX-0021C; RPX-0025C; RX-3654C and RX-3656C. The evidence supports that Insta360 provided sufficient discovery regarding the Insta360 redesigns because Insta360 disclosed the redesigns on August 30, 2024, and produced physical samples and further documentation on September 9 and 10, 2024. CX-1236C at 42–62.

Insta360 contends that its redesigns do not infringe the D'435 patent. Insta360 Br. at 240–48. Insta360 Br. at 246–47; RDX-0015C.76–.86; RX-0560C; RX-0567C; RX-0559C; and RX-0582C. GoPro does not disagree. GoPro Reply at 8. The evidence supports that the Insta360 redesigns do not infringe the D'435 patent.

C. Technical Prong

GoPro contends the D'435 patent domestic industry products, as represented by Hero5 Black and Hero8 Black, practice the claimed design. GoPro Br. at 15–16. This is not disputed by Insta360. *See generally* Insta360 Br. and Insta360 Reply. The evidence supports that the domestic

[redacted]

industry products practice the claim of the D'435 patent. *See* Delman Tr. at 451:1–24; Bressler Tr. at 980:8–10; and CDX-0005C.16–17.

D. Validity

"Design patents are subject to the same conditions on patentability as utility patents, including the nonobviousness requirement of 35 U.S.C. § 103." *In re Borden*, 90 F.3d 1570, 1574 (Fed. Cir. 1996); *see LKQ Corp. v. GM Glob. Tech. Operations LLC*, 102 F.4th 1280, 1291 (Fed. Cir. 2024). A party asserting invalidity of a design patent must prove it by clear and convincing evidence. *Microsoft Corp. v. I4I Ltd. P'ship*, 564 U.S. 91, 95 (2011). The Federal Circuit has held that the obviousness standard for design patents is the same as that for utility patents, namely application of the *Graham* factors. *LKQ Corp.*, 102 F.4th at 1295 ("[W]e agree with our precedent holding that 'invalidity based on obviousness of a patented design is determined [based] on factual criteria similar to those that have been developed as analytical tools for reviewing the validity of a utility patent under § 103, that is, on application of the *Graham* factors.'" *Id.* (internal citations omitted).

Insta360 contends that the design of the D'435 patent is obvious in view of a prior GoPro product, the Hero4 within a waterproof case, as depicted in a number of documents, JX-0259; JX-0272; JX-0273; JX-0284; JX-0285; JX-0303; JX-0307; JX-0308; RX-1782; JX-0292; and JX-0300, in combination with Huang (Chinese Pat. No. CN 303440022 S, JX-0291 or Heo (Korea Pat. No. 30-0792432, JX-0289). Insta360 Br. at 249–271 and Insta360 Reply at 71–75.

Insta360 begins its invalidity assertion by contending that "GoPro concedes that the D'435's design features and overall visual impression (rectangular 'box-like') were known before the D'435 claimed invention and taught by the prior art." Insta360 Br. at 248. If this were true, GoPro could not contest Insta360's validity challenge. But it does. GoPro Br. at 31–38 and GoPro

Reply 8–14. Insta360's citations for GoPro's alleged concession do not support it. In the portion of testimony cited by Insta360, Mr. Delman testified that rectangular camera buttons were known. Insta360 Br. at 248, *citing* Delman Tr. at 484:15–485:5. In the immediately following testimony, not cited by Insta360, Mr. Delman testified that while rectangular cameras were known, "this particular rectangle in the proportions and the rounded corners and edges that you see in this patent" was not known. *Id*. at 485:11–13. As for the portions of his testimony that Insta360 cites, Mr. Nguyen, first-named inventor on the D'435 patent, testified that individual elements of the D'435 patent design were known, Nguyen Tr. at 418:21–419:8, rectangular buttons were known, *id*. at 420:7–17 and RX-0334C (Nguyen Dep.) at 64:12–65:19, rectangular screens were known, RX-0334C (Nguyen Dep.) at 76:23–77:3 ("I'd imagine they did"), rectangular cameras were known, Delman Tr. at 421:5–17 and RX-0334C (Nguyen Dep.) at 75:9–24 and 116:4–9.[48] The evidence cited by Insta360 does not support that the design of the D'435 patent was known in the prior art.

Insta360 also contends that "GoPro agrees with Insta360's motivation to combine: an ordinary designer would have been motivated to create consistent rectangular features." Insta360 Br. at 249. Insta360 cites testimony from Mr. Nguyen, but what he said was that "consistent look and feel is the way of uniquely differentiating within your line, but also with our competitors as well." Nguyen Tr. at 419:19–21. And, as Insta360 itself recognizes, all Mr. Delman stated was that he agreed with Mr. Wen that "there are times consistent or harmonious features are desirable from a design standpoint." Delman Tr. at 1417:22–1418:2. In a portion of testimony not cited by

---

[48] RDX-0015.25 and 31, which Insta360 cites, Insta360 Br. at 249, are Mr. Bressler's demonstratives and simply repeat testimony from Mr. Nguyen that it already cites. The testimony of Mr. Bressler that Insta360 cites relates to those slides in his demonstratives and Mr. Nguyen's testimony. *See* Insta360 Br. at 249, *citing* Bressler Tr. at 941:10–16 and 943:8–12.

[redacted]

Insta360, Mr. Delman testified that "Mr. Wen was not addressing obviousness. He was simply speaking as a designer about the types of aesthetic directions that designers sometimes take, but that's not at all what I'm discussing with respect to obviousness." *Id*. at 1418:8–12.[49] The evidence does not support that GoPro agreed with Insta360's motivation to combine.

1. Overview

Insta360 relies on multiple publications describing the Hero4, which were publicly available by at least November 14, 2014. Insta360 Br. at 250, *citing* Bresseler Tr. at 939:1–6 and JX-0259; JX-0272; JX-0273; JX-0284; JX-0285; JX-0303; JX-0307; JX-0308; RX-1782; JX-0292; and JX-0300. Given GoPro's assertion that the priority date of the D'435 patent is November 17, 2015, GoPro Br. at 2, the evidence supports that the Hero4 is prior art under 35 U.S.C. § 102(a). This is not disputed by GoPro. *See generally* GoPro Br. and GoPro Reply.

There were two versions of the Hero4, the Hero4 Black and the Hero4 Silver. Both came with a waterproof case and from the front were virtually identical. JX-0271.12. The Hero4 Silver had a back LCD screen, JX-273.12–13, while the Hero4 Black did not, JX-0273.9. Because of its back screen, the Hero4 Silver waterproof case had an extra door, allowing access to the screen. JX-0273.11.

The Hero4 Black is shown below:

[49] Insta360 cites hearing testimony from Mr. Bressler in which he states his opinion on motivation to combine, Bressler Tr. at 941:25–942:7, and a page from his demonstratives in which he cited his own expert report, RDX-0015.27. Insta360 Br. at 249. These do not support that GoPro agreed with Insta360's motivation. Insta360 also cites JX-0337C, *id*. which is not an admitted exhibit.

[redacted]

JX-0303.2 (left) and JX-0273.9 (right). The Hero4 Silver is shown below:

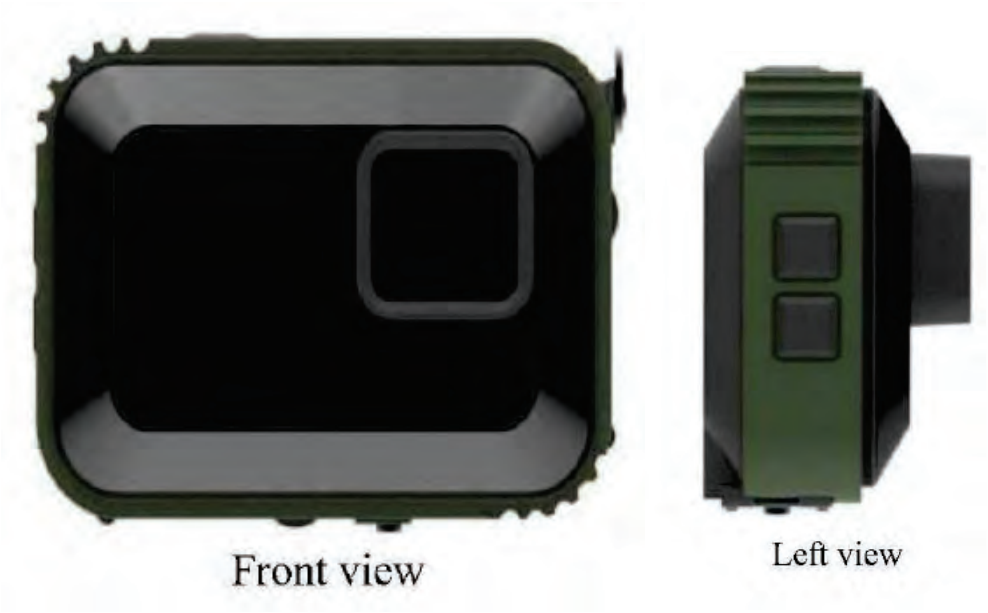
JX-0272.6. Front-on views of the Hero4 Silver and Black are shown below:

JX-0273.1

[redacted]

Given GoPro's assertion that the priority date of the D'435 patent is November 17, 2015, GoPro Br. at 2, the evidence supports that Huang, which published on November 11, 2015, from an application filed on February 11, 2015, is prior art under 35 U.S.C. § 102(a). This is not disputed by GoPro. *See generally* GoPro Br. and GoPro Reply.

Huang is directed to a "product [] used for recording videos or taking photos," as shown below:

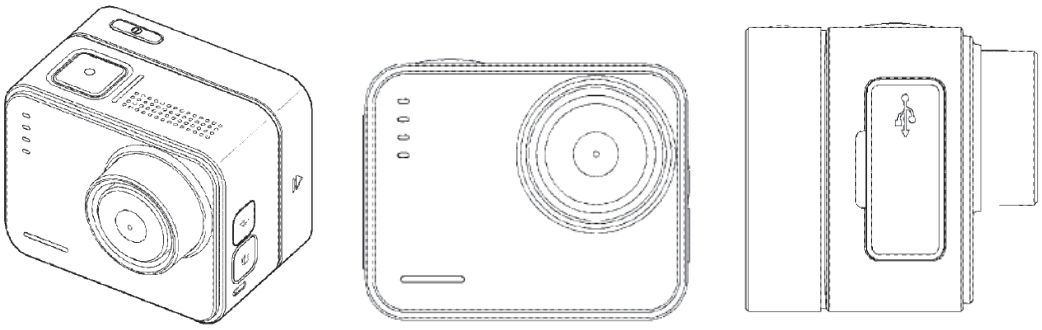


JX-0291.2–3.

Given GoPro's assertion that the priority date of the D'435 patent is November 17, 2015, GoPro Br. at 2, the evidence supports that Heo, which published on April 16, 2015, from an application filed on April 30, 2014, is prior art under 35 U.S.C. § 102(a). This is not disputed by GoPro. *See generally* GoPro Br. and GoPro Reply.

Heo is titled "Portable Balckbox [sic, Blackbox]" and discloses a "video recording device which is convenient to carry and used by a user who enjoys outdoor activities, in particular, sports activities," as shown below:

[redacted]



JX-0289.1–3.

2. Hero4

Insta360 argues that "[e]ach Hero4 Publication is a single reference that discloses a configuration (embodiment) of the Hero4 product (camera within its case) [] showing the D'435 design features." Insta360 Br. at 258–59. As noted, the documents Insta360 relies on disclose both the Hero4 Black and the Hero4 Silver. Insta360 relies on images of both and does not distinguish between them. GoPro argues that this is improper because as its primary reference, Insta360 must identify "something in existence" and that by relying on both the Black and Silver versions of the Hero4, Insta360 has not done so. GoPro Reply at 8–10.

It is true that Insta360 refers to both the Silver and Black collectively as the "Hero4" and includes images of both products without distinguishing them in its briefing. For example, Insta360 includes the below images in its brief:

front, top, left

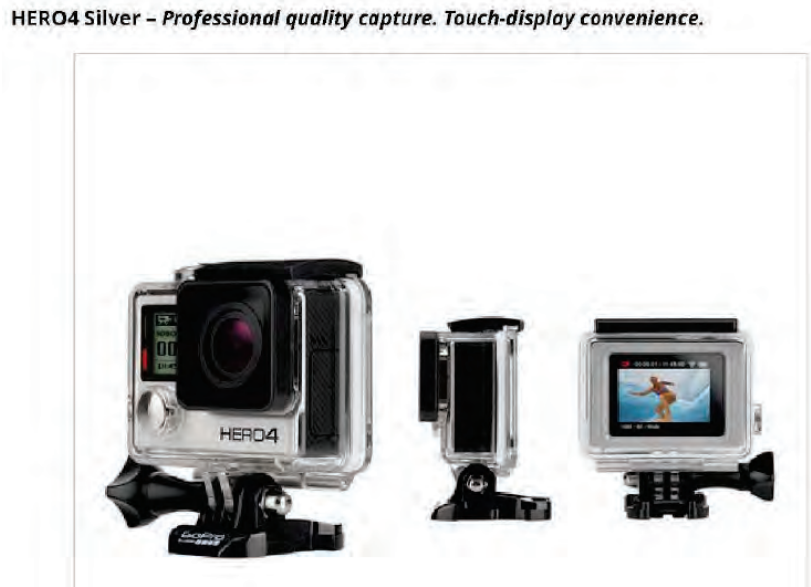
[redacted]

Insta360 Br. at 258–59, *citing* JX-0284 and JX-0300 and *see* Insta360 Br. at 253–254 (with identical images and citations). The image identified as "front, top, left," appears to be from JX-0284, depicting the Hero4 Black, as shown below:

HERO4 Black – *2x the performance, yet again.*

[redacted]

JX-0284.3. The images labeled "rear" and "right" are from JX-0284, depicting the Hero4 Silver, as shown below:



JX-0284.4.[50] Throughout its briefing, Insta360 relies on both the Black and the Silver, without distinguishing them.

In applying *Graham* factor one, the scope and content of the prior art, in considering whether a design patent claim is obvious, a primary reference must be identified, which "need only be something in existence, not something that might be brought into existence by selecting individual features from prior art and combining them, particularly where combining them would require modification of every individual feature." *LKQ Corp*., 102 F.4th at 1298, *quoting In re Jennings*, 182 F.2d 207, 208 (CCPA 1950) (cleaned up). GoPro contends that Insta360 has not identified "something in existence" because it is relying on both the Hero4 Black and the Hero4

[50] Insta360 identifies the images labeled "left," "top," and "bottom" on pages 234–254 and 259 of initial post-hearing brief as coming from JX-0284 or JX-0300 but they are not in either of those documents. *See also* Insta360 Br. at 261 (bottom), 262 (bottom), 263, 264, and 266.

[redacted]

Silver. It is certainly true that Insta360's arguments and its citations could have been clearer. The evidence supports, however, that but for the back screen, the Hero4 Black and Hero4 Silver were virtually identical. In relying on both, Insta360 has not brought something "into existence by selecting individual features" from the prior art and combining them, as the court in *LKQ* said was impermissible. In addition, a combination of Hero4 Black and Hero4 Silver would not "require modification of every individual feature." As a result, while Insta360's identification of Hero4 as prior art was muddled, it was not improper.

As to the comparison between the D'435 patent and the Hero4, Insta360 contends that both show "single layer rectangular 'box-like' forms," rectangular bodies with flat faces," "rectangular lens covers that are flush with the upper right hand corner," "rectangular access elements," and rectangular displays and rear" that are "stationary without a hinge." Insta360 Br. at 259–260. The evidence supports, however, that the Hero4 and the design of the D'435 patent are substantially different. GoPro's expert, Mr. Delman, detailed these differences with reference to CPX-38, as shown below:

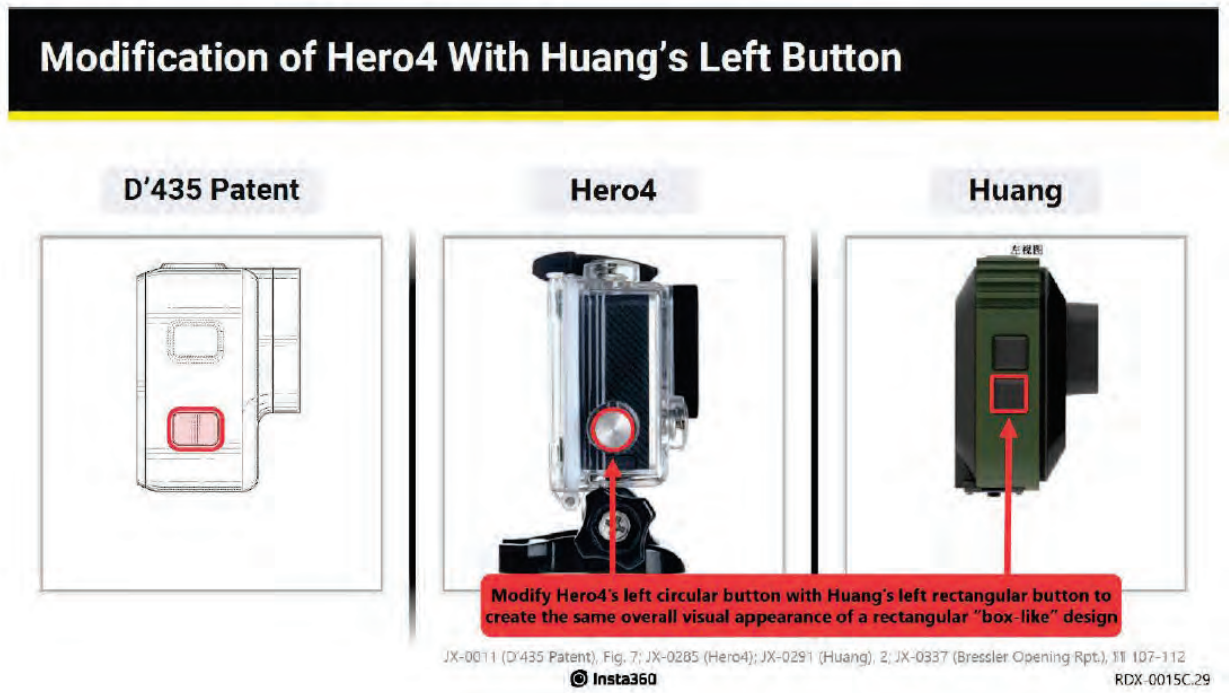
[redacted]

CDX-0016.17 and Delman Tr. at 1406:15–1408:9 (identifying the transparent design of the separate waterproof case as a "huge difference," identifying the sharp lens protrusion, prominent latch, prominent bottom hinge, step-out at rear of housing where halves come together, O-ring, screens visible through housing, prominent knob at bottom, and protruding circular buttons on top surface). The evidence supports that no ordinary designer would find the Hero4 to be substantially the same in overall appearance as the D'435 patent.

3. The Combination of Hero4 with Huang or Heo

Insta360 acknowledges that the Hero4 lacks certain features and contends that they may be supplied by either Huang or Heo. Insta360 Br. at 263–67. In particular, Insta360 argues that "Huang and Heo disclose designs for action cameras and teach the design features not taught by Hero4," such as "flat faces and lack [of] a top latch, bottom rear hinge, front protruding button, and bottom mount." Insta360 Br. at 263. For example, Insta360 argues that the rectangular button in Huang can be substituted for the round button in Hero4, as shown below:

[redacted]



Insta360 Br. at 264, *citing* RDX-0015C.29; *see also, e.g.*, *id.* (showing modification of Hero4 with Heo's left access element); *id.* at 265 (showing modification of Hero4 with Huang's right access element); *id.* at 265 (showing modification of Hero4 with Heo's right button).

Insta360 argues that what it characterizes as the differences between the Hero4 and the D'435 patent would be obvious based on modification with elements from either Huang or Heo. Insta360 Br. at 263–67. But "there must be some record-supported reason (without hindsight) that an ordinary designer in the field of the article of manufacture would have modified the primary reference with the feature(s) from the secondary reference(s) to create the same overall appearance as the claimed design." *LKQ Corp.*, 102 F.4th at 1299. When questioned about his methodology, Mr. Bressler testified that "[i]n an obviousness analysis, I have the choice of what prior art to pick and how to reference it, and how to put it together in the creation of a new design." Bressler Tr. at 969:21–23 and *see id*. at 969:25–970:2 ("Q. So since it was an obviousness analysis, you picked and chose the features that you chose -- A. Absolutely. That's my job."). Mr. Bressler's testimony

[redacted]

demonstrates that his analysis was guided by hindsight, because he focused on each design element in isolation, and how the claimed design of the D'435 patent can be stitched together from separate disclosures in the prior art. For instance, Mr. Bressler testified that "[an] ordinary designer would notice that the button on the HERO4 is significantly higher than it is in the D'435 patent; however, [the ordinary designer] would be motivated to modify the HERO4's top button with Huang's top button to create the same overall visual appearance of a rectangular box-like visual language." *Id.* at 940:21–941:1; *see also id.* at 942:17–24 ("An ordinary designer would notice that the HERO4 has circular buttons instead of a rectangular button, as is shown in the D'435 [patent], but an ordinary designer would be motivated because of the interest in creating a consistent language, would be motivated to replace HERO4's circular button with Huang's left rectangular button to create the same overall visual appearance of a rectangular box-like design language.").

Mr. Bressler's reliance on the disclosure of the D'435 patent itself was improper, because it "allow[ed] [Insta360] to use the challenged patent as a roadmap to reconstruct the claimed invention using disparate elements from the prior art—i.e., the impermissible ex post reasoning and hindsight bias that *KSR* warned against." *TQ Delta, LLC v. Cisco Sys., Inc.*, 942 F.3d 1352, 1361 (Fed. Cir. 2019). The evidence does not support that the changes to Hero4 that Insta360 proposes would have been obvious based on either Huang or Heo.

4. Motivation to Combine

Insta360 admits that "[t]he Hero4 product's top latch, bottom rear hinge, and bottom mount are not rectangular, and its front protruding button disrupts the front face from being flat," Insta360 Br. at 268, but argues that "the action cameras of Huang/Heo have rectangular buttons/access elements [], and rectangular bodies [] that lack a top latch, bottom rear hinge, bottom mount, and front protruding button," *id.*

[redacted]

Insta360 relies on the testimony of its expert, Mr. Bressler, as supporting that "[a]n ordinary designer would have been motivated to combine Hero4 with Huang/Heo." *Id.* at 268–70. Mr. Bressler testified that "[a]n ordinary designer would notice that [the D'435 patent] is basically a rectangular box that has a protruding rectangular lens cover in the upper-right corner flush with the side of the box, and that it has a rectangular display flush with the front of the camera," and that the "HERO4 has the same attributes." Bressler Tr. at 940:2–7. According to Mr. Bressler, "the goal of an ordinary designer [is] to create a consistent visual language," and this could be accomplished via "consistent rectangular features such as rectangular body, rectangular lens cover, rectangular displays, rectangular buttons and access elements." *Id.* at 942:2–6.

Mr. Bressler's testimony was conclusory and improperly guided by hindsight. *See Apple Inc. v. MPH Technologies Oy*, 28 F.4th 254, 262–63 (Fed. Cir. 2022). For example, Mr. Bressler testified that an ordinary designer "would be motivated to replace HERO4's circular button with Huang's left rectangular button to create the same overall visual appearance of a rectangular box-like design language." Bressler Tr. at 942:21–24. But as Mr. Delman testified, "From an aesthetic standpoint, there are many things that a designer would do to make something aesthetically pleasing, [and] creating simply a series of rectilinear forms is not necessarily one of them." Delman Tr. at 1411:22–25. Mr. Delman's credible testimony on this point is corroborated by an Insta360 presentation including [redacted]

[redacted]

CX-0800C.3.

Mr. Bressler further testified that "[a]n ordinary designer would have been motivated to modify HERO4 with Heo's right rectangular button to create the same overall visual impression," and that "[t]he ordinary designer would also notice that the button on top of HERO4 is round and would have been motivated to substitute Huang's square or rectangular button." Bressler Tr. at 944:6–23. Mr. Bressler failed to provide the necessary "articulated reasoning with some rational underpinning" to support his conclusion. *See KSR*, 550 U.S. at 418. As shown above, there were many designs combining rectangular and circular features, and Mr. Bressler fails to articulate a reason why a designer of ordinary skill would modify the Hero4 to arrive at the claimed design of D'435 patent. *See id.* The evidence supports that there was no such design need or market pressure, and that the design elements that Mr. Bressler proposes to eliminate, such as the hinge and latch, are critical to the Hero4. Delman Tr. at 1410:25–1411:5.

[redacted]

Insta360 points to "the knowledge of an ordinary designer and the prior art" as providing the motivation for Mr. Bressler's proposed combination. *See* Insta360 Reply at 74, *citing* Nguyen Tr. at 419:9–21; Delman Tr. at 1417:22–1418:2; and Bressler Tr. at 941:25–942:7, 942:14–24, 945:2–8. These cited portions of testimony demonstrate, at most, that designers may desire a consistent visual language, Bressler Tr. at 941:25–942:7, and that "there are times consistent or harmonious features are desirable from a design standpoint." Delman Tr. at 1417:22–1418:2. Yet both Huang and Heo include both circular and rectilinear features, and none of the cited testimony explains "why or whether a skilled artisan would have been motivated to combine" the prior art references as proposed by Mr. Bressler. *Virtek Vision Int'l ULC v. Assembly Guidance Sys., Inc.*, 97 F.4th 882, 888 (Fed. Cir. 2024).

Insta360 has not demonstrated by clear and convincing evidence that the Hero4, in combination with either Huang or Heo, renders the D'435 claim obvious.

5. Secondary Considerations

GoPro contends that the commercial success of the Hero line of cameras, along with copying, industry praise, and long-felt but unmet need, are objective indicia supporting non-obviousness of the D'435 patent. GoPro Br. at 37. I considered and weighed the objective indicia of non-obviousness before reaching all conclusions in the above obviousness analysis, and I discuss these objective indicia below. *Apple Inc. v. Samsung*, 839 F.3d at 1038. If GoPro had submitted no evidence of objective indicia, I would still find that the D'435 claim has not been proven obvious.

GoPro argues that it is entitled to a presumption of nexus because the product it relies on, its Hero5 Black, is a commercial embodiment and coextensive with the D'435 patent. GoPro Br. at 37. As detailed above with respect to technical domestic industry, the evidence supports that

[redacted]

GoPro's domestic industry products embody the claimed design. *See also* Delman Tr. at 1412:17–1416:5. Insta360 argues that GoPro is not entitled to a presumption of a nexus because "[GoPro's] evidence points to a myriad of non-patented features and functionalities that impact consumer interest, including 'great voice control functionality,' 'stereo sound,' 'more capacious battery,' and 'built-in touchscreen,' amongst others." Insta360 Br. at 270, *quoting* Bressler Tr. at 946:13–948:1.

As noted previously, in arguing that its "utility patents work together, as a package, to amplify the user experience" and that its "patented technologies work together and enhance one another to create an action camera experience whose whole is greater than the sum of its parts," GoPro Br. at 200, GoPro essentially conceded that it is not entitled to a presumptive nexus. That does not end the inquiry because GoPro "is still afforded an opportunity to prove nexus by showing that the evidence of secondary considerations is the direct result of the unique characteristics of the claimed invention." *Fox Factory*, 944 F.3d at 1373–1374.

GoPro contends that it won a coveted "Red Dot" award for its outstanding design. GoPro Br. at 202. Insta360 contends that the functional characteristics of GoPro's products, rather than their appearance, are the reason Hero5 received the Red Dot Award. Insta360 Br. at 271. As Mr. Delman testified, however, "the Red Dot Award [] was given to the HERO5 Black based upon its impressive, iconic, elegant design." Delman Tr. at 1412:21–23 and Cx-0066.1 (statement by jury: The GoPro HERO Black action camera is marked by an impressive design which achieves a new, iconic quality. Its elegant design idiom is the result of a perfectly thought-through user-friendly concept.) The evidence supports that the Red Dot is awarded for excellence in industrial design. *See id.* ("Red Dot Award: Product Design); *see also* Nguyen Tr. at 412:5–413:18 ("We were quite elated to see the comments from this jury that they mentioned that this was an impressive design with an iconic quality."). The evidence supports that industry praise of the Hero5 is the "direct

[redacted]

result of the unique characteristics of the claimed invention." *See Fox Factory*, 944 F.3d at 1373–74. The evidence of industry praise supports nonobviousness of the D'435 patent.

XII. ECONOMIC PRONG

Order No. 18 granted GoPro's motion for summary determination that the economic prong was satisfied for all asserted patents. Order No. 18 (Initial Determination) (EDIS Doc. ID 839670), *unreviewed by* Comm'n Notice (Jan. 21, 2025) (EDIS Doc. ID 841430).

XIII. CONCLUSIONS OF LAW

1. The Commission has statutory authority with respect to this investigation.
2. GoPro is the owner by assignment of the asserted patents.
3. The importation requirement is satisfied for the accused products.
4. Claims 1 and 5 of the '894 patent have not been shown to be infringed.
5. Claims 13 and 14 of the '840 patent have not been shown to be infringed.
6. Claims 4 and 8 of the '832 patent have been shown to be infringed.
7. Claims 1, 2, 5, and 6 of the '052 patent have been shown to be infringed.
8. Claim 1 of the '413 patent has not been shown to be infringed.
9. The claim of the D'435 patent has been shown to be infringed.
10. Claims 1 and 5 of the '894 patent have not been shown to be invalid.
11. Claim 14 of the '840 patent has been shown to be invalid.
12. Claim 13 of the '840 patent has not been shown to be invalid.
13. Claims 4 and 8 of the '832 patent have been shown to be invalid.
14. Claims 1, 2, 5, and 6 of the '052 patent have been shown to be invalid.
15. Claim 1 of the '413 patent has been shown to be invalid.
16. The claim of the D'435 patent has not been shown to be invalid.
17. The technical prong of the domestic industry requirement has been satisfied with respect to the '894 patent.

[redacted]

18. The technical prong of the domestic industry requirement has been satisfied with respect to the ’840 patent.

19. The technical prong of the domestic industry requirement has been satisfied with respect to the ’832 patent.

20. The technical prong of the domestic industry requirement has been satisfied with respect to the ’052 patent.

21. The technical prong of the domestic industry requirement has been satisfied with respect to the ’413 patent.

22. The technical prong of the domestic industry requirement has been satisfied with respect to the D’435 patent.

23. The economic prong of the domestic industry requirement has been satisfied with respect to the ’894, ’840, ’832, ’052, ’413, and D’435 patents.

XIV. RECOMMENDED DETERMINATION ON REMEDY AND BOND

The Commission has broad discretion in selecting the form, scope, and extent of any remedy. *Viscofan, S.A. v. Int’l Trade Comm’n*, 787 F.2d 544, 548 (Fed. Cir. 1986); *see also Hyundai Electronics Industries Co. Ltd. v. Int’l Trade Comm’n*, 899 F.2d 1204, 1209 (Fed. Cir. 1990). By Commission rule, the administrative law judge must issue a recommended determination on the appropriate remedy if the Commission finds a violation of section 337 and on the amount of bond to be posted by respondents during Presidential review of any Commission remedy. *See* 19 C.F.R. § 210.42(a)(1)(ii). I address these issues below.

A. Limited Exclusion Order

Section 337(d)(1) provides that “[i]f the Commission determines, as a result of an investigation under this section, that there is a violation of this section, it shall direct that the articles concerned, imported by any person violating the provision of this section, be excluded from entry into the United States, unless, after considering the [public interest], it finds that such articles should not be excluded from entry.” 19 U.S.C. § 1337(d)(1). The Commission is required to issue an exclusion order upon the finding of a section 337 violation absent a finding that the

effects of any of the statutorily-enumerated public interest factors counsel otherwise. *Spansion*, 629 F.3d at 1358. The issue of public interest was not delegated by the Commission, 89 Fed. Reg. 37243 (May 6, 2024), so it is not addressed here. *Certain Automated Put Walls and Automated Storage and Retrieval Systems, Associated Control Software, and Component Parts Thereof*, Inv. No. 337-TA-1293, Comm'n Op. at 29, n.25 (Jul. 31, 2023) (EDIS Doc. ID 802614).

In the event a limited exclusion order issues, Insta360 requests a certification provision "to certify products are not subject to exclusion, including because they incorporate a non-infringing redesign adjudicated by the Commission." Insta360 Br. at 274. As "it has been Commission practice for the past several years to include certification provisions in its exclusion orders to aid CBP" (*see Certain Road Milling Machines and Components Thereof*, Inv. No. 337-TA-1067, Comm'n Op. at 15, 15 n. 5 (Aug. 7, 2019) (EDIS Doc. ID 684600) (citations omitted)), and redesigns were at issue in this investigation, I recommend that any limited exclusion order include the Commission's standard certification provision. GoPro agrees. GoPro Reply at 95–96.

Insta360 also requests "service and repair exceptions to avoid impairing the utility of accused devices imported and/or purchased before any finding of violation. . . . The Commission routinely includes service and repair carve-outs to avoid harm to U.S. consumers." Insta360 Br. at 274–275. The request is noted but turns on public interest factors, which were not delegated in this investigation.

Accordingly, I recommend that the Commission issue a limited exclusion order for all claims for which there has been a violation.

B. Cease and Desist Order

Section 337(f)(1) provides that in addition to, or in lieu of, the issuance of an exclusion order, the Commission may issue a cease and desist order as a remedy for violation of section 337.

[redacted]

19 U.S.C. § 1337(f)(1). A cease and desist order is generally issued when a respondent maintains commercially significant inventories in the United States or has significant domestic operations that could undercut the remedy provided by an exclusion order. *Certain Table Saws Incorporating Active Injury Mitigation Technology and Components Thereof*, Inv. No. 337-TA-965, Comm'n Op. at 4–6 (Feb. 1, 2017) (EDIS Doc. ID 602496). "A complainant seeking a cease and desist order must demonstrate, based on the record, that this remedy is necessary to address the violation found in the investigation so as to not undercut the relief provided by the exclusion order." *Id*. at 5.

GoPro's expert, Ms. Carla Mulhern, testified that Insta360 holds around [redacted] units of accused products valued at [redacted]—approximately [redacted] of supply—and that this qualifies as a significant inventory. *See* GoPro Br. at 212–213, *citing* Mulhern Tr. at 763:16–21, 767:5–768:6. GoPro concludes, "[a] CDO against Respondents' U.S. entity—Arashi Vision (U.S.) LLC d/b/a Insta360—is therefore warranted." *Id.* at 213. Insta360 does not dispute this quantity of inventory, nor that a CDO should issue against the U.S. entity. *See* Insta360 Br. at 275 and Insta360 Reply at 76. Insta360's request that the CDO also include a service and repair carveout on public interest grounds is noted but not resolved at this time because public interest was not delegated.

Based on the evidence and arguments, I recommend issuance of a cease and desist order against Arashi Vision (U.S.) LLC d/b/a Insta360 for all claims for which there has been a violation.

C. Bond During Presidential Review Period

When the Commission enters an exclusion order or a cease and desist order, a respondent may continue to import and sell its products during the 60-day Presidential review period under an amount determined by the Commission to be "sufficient to protect the complainant from any injury." 19 U.S.C. § 1337(j)(3); *see also* 19 C.F.R. § 210.50(a)(3); and *Automated Put Walls*, Inv. No. 337-TA-1293, Comm'n Op. at 46. GoPro bears the burden of establishing the need for a bond

[redacted]

and its amount. *Id*. at 47; *see Certain Rubber Antidegradants, Components Thereof, and Products Containing Same*, Inv. No. 337-TA-533, Comm'n Op. at 40 (July 21, 2006) (EDIS Doc. ID 259120).

When reliable price information is in the record, the Commission often sets the bond by eliminating the differential between the domestic product and the imported product. *Automated Put Walls*, Comm'n Op. at 46. The Commission may also use a reasonable royalty rate to set the bond amount where one can be determined from the record. *Id*. Where the record establishes that the calculation of a price differential is impractical or there is insufficient evidence in the record to determine a reasonable royalty, the Commission has imposed a 100 percent bond. *Id*.

GoPro contends that "a bond is warranted because there is direct competition between GoPro's domestic industry products and Respondents' accused products, and there will thus be injury to GoPro during the Presidential review period." GoPro Br. at 215. GoPro notes, "[t]he parties' experts agree there is head-to-head competition." *Id.*, *citing* Mulhern Tr. at 770:3–772:17 and Vander Veen Tr. at 1395:10–20. As for amount, GoPro argues a 100% bond is justified because a price differential is impractical. *See id*. at 216, *citing* Mulhern Tr. at 772:18–773:5. Insta360 does not dispute direct competition, but argues its expert's price comparison, the only comparison attempted in the investigation, shows that Insta360's products are generally priced higher than GoPro's such that the bond should be 0%. *See generally* Insta360 Br. at 276–278.

The evidence supports that GoPro and Insta360 are direct competitors through the domestic industry and accused products. *See e.g.*, Mulhern Tr. at 770:23–772:17; CX-0939C (Internal Insta360 Competitor Analysis (software)); CX-0792C (same); CX-1030C (Internal Insta360 Competitive Assessment); JX-0324 (Morgan Stanley Newsletter); Vander Veen Tr. at 1395:10–20. An excerpt from a 2019 Bloomberg news report described Insta360 as "among a handful of

[redacted]

Chinese hardware upstarts gunning for GoPro Inc. in the sports camera business. Leveraging its proximity to the Chinese manufacturing hub of Shenzhen, it's launched a slew of products that's now siphoning away market share from its U.S. counterpart." CX-1381.2. The evidence supports that sales of the accused products during the presidential review period will cause economic harm to GoPro in the form of lost sales.

Nevertheless, the evidence supports that a price comparison between the domestic industry products and the accused products is possible, and it tends to show that Insta360 is not underselling GoPro. As part of his analysis, Dr. Vander Veen consulted supplier-level sales records from Insta360 and GoPro and calculated average selling prices for all products and classified those products into two groups: front-facing action cameras and 360-degree cameras. Vander Veen Tr. at 1390:4–1393:11 and RDX-0007C.12–15. According to Dr. Vander Veen, when the weighted average sales prices are compared, the Insta360 front-facing action cameras are more expensive than those of GoPro [redacted], and the Insta360 360-degree cameras are more expensive than the GoPro model [redacted]. Vander Veen Tr. at 1390:4–1393:11 and RDX-0007C.12–15; *see* JX-0247C (Insta360 revenue) and JX-0037C (GoPro revenue). In such circumstances, even when there is direct competition, the Commission typically sets the bond at zero percent. *See, e.g.*, *Certain Vaporizer Devices, Cartridges Used Therewith, and Components Thereof*, Inv. No. 337-TA-1368, Comm'n Op. at 133–135 (Jan. 29, 2025) (EDIS Doc. ID 843889) ("it is uncontested that JLI and NJOY are direct competitors and that the accused products and the domestic industry products are competitive alternatives. . . . the record evidence shows that the average wholesale price of NJOY ACE pods [] was higher than the average wholesale price of JUULpods . . ."); *but see* GoPro Reply at 97 ("Respondents do not address the fact that there is still injury to GoPro even if Respondents' products were priced higher.").

[redacted]

GoPro faults the reliability of the revenue data on two grounds. First, it argues neither company's sales records distinguish between sales direct to consumers (higher price) versus distributors (lower price). GoPro Br. at 217, *citing* Mulhern at 774:2–23; *see* GoPro Reply at 97 ("because consumer prices are higher than distributor prices"). Yet Dr. Vander Veen testified without opposition from Ms. Mulhern that GoPro and Insta360 both sell through both channels, and GoPro presents no evidence to show that GoPro and Insta360 otherwise have greatly disparate sales channel proportions—an important showing for this criticism to have any relevance. Vander Veen Tr. at 1385:12–1389:17. Moreover, Ms. Mulhern testified she was not provided and did not otherwise ask for this data even though it was potentially available as an ordinary business record, and may have even been produced in this investigation, for both GoPro and Insta360. *See* Mulhern Tr. at 780:15–784:8.

Second, GoPro argues Insta360's record, but not its own, fails to distinguish between individual cameras and cameras bundled with accessories. *Id.* at 217–218. GoPro argues, "[t]his is particularly problematic because Respondents sell a wide variety of bundles at a wide range of prices" (*id.* at 218, *citing* Mulhern Tr. at 775:20–776:12; *see* CDX-0007C.15) with the impetus being that "bundle prices are higher than standalone camera prices" (GoPro Reply at 97). Yet, again, GoPro also sells the domestic industry products in both standalone and bundle form, and Dr. Vander Veen's analysis took this into account by including GoPro standalone cameras *and* GoPro bundle pricing data. Vander Veen Tr. at 1391:18–1392:4; RDX-0016C.14 (including models ending with "CB" and "HB"); JX-0037C. Moreover, these calculations appear reasonable based on market value data GoPro itself relies on for its requested cease-and-desist order. In the domestic inventory table presented by Ms. Mulhern, if "market value" is divided by "units" for

[redacted]

each accused Insta360 model, the average price is consistently higher than Dr. Vander Veen's average price:

[redacted]

To the extent Insta360's data is reliable for purposes of a cease-and-desist order, it is reliable for evaluation of a bond. The record supports that Insta360's accused products are more likely than not more expensive than GoPro's thereby warranting a zero bond.

GoPro further argues that all the varied product features across the cameras render an apples-to-apples comparison infeasible. GoPro Br. at 216 and Mulhern Tr. at 772:18–773:20 (mentioning "camera lenses, to sensors, to the chips that are contained, the displays, battery capacity, and modularity"). There are certainly many features across the accused and domestic industry products. *See, e.g.*, CX-1450.11–14. That alone cannot mean, however, that a price comparison is not possible, and the evidence supports that one was.

Lastly, as a general matter, it is fair to say that Ms. Mulhern's testimony does not contain any indication of an earnest attempt to calculate a price differential using the available record, as

[redacted]

opposed to reasons why it would not be practical. *See generally* Mulhern Tr. at 770:3–778:5, and 790:22–792:8. For example, and despite bond calculations being a quantitative exercise, Ms. Mulhern's only reference to quantitative figures is the range of retail prices for bundles found on Insta360's website. *Id.* at 775:21–776:12. This is so despite multiple financial documents and related testimony being available in the record. *See id.* at 778:18–790:12. Even then, Ms. Mulhern dismissed those records as "meaningless" without explaining why. *Id.* at 774:2–23. In similar circumstances, the Commission has held the complainant did not meet its burden of showing that a bond was warranted. *Certain Liquid Crystal Display Devices and Products Containing the Same*, Inv. No. 337-TA-631, Comm'n Op. at 27–28 (July 14, 2009) (EDIS Doc. ID 406905) ("Samsung should not benefit from a lack of any effort to identify any of its prices, because this information is clearly within its possession. . . . To the contrary, Samsung has failed to meet its burden to establish that a 100% bond is appropriate.").

The evidence supports that Insta360 is not underselling GoPro and that as a result a bond is not warranted during the Presidential review period.

XV. INITIAL DETERMINATION ON VIOLATION

It is my initial determination that a violation of section 337 of the Tariff Act, as amended, has occurred by the importation into the United States, the sale for importation, or the sale within the United States after importation of certain cameras, camera systems, and accessories used therewith based on infringement of U.S. Patent No. D789,435. I hereby certify this Initial Determination and Recommended Determination to the Commission.

The Secretary shall serve the confidential version of this Initial Determination and Recommended Determination on counsel who are signatories to the Protective Order (Order No. 1

[redacted]

(EDIS Doc. ID 820518) and Order No. 6 (EDIS Doc. ID 823574)). A public version will be served on all parties of record later.

Under 19 C.F.R. § 210.42(h), this Initial Determination shall become the determination of the Commission unless a party files a petition for review under 19 C.F.R. § 210.43(a) or the Commission orders on its own motion a review of the Initial Determination or certain issues therein under 19 C.F.R. § 210.44.

XVI. ORDER

Within seven days of the date of this document, the parties shall jointly submit a single proposed public version with any proposed redactions indicated in red. If the parties submit excessive redactions, they may be required to provide declarations from individuals with personal knowledge, justifying each proposed redaction and specifically explaining why the information sought to be redacted meets the definition for confidential business information set forth in 19 C.F.R. § 201.6(a). The proposed redactions should be made electronically, in a single PDF file using the "Redact Tool" within Adobe Acrobat. The proposed redactions should be submitted as "marked" but not yet "applied." The proposed redactions should be submitted via email to my attorney-advisor, michael.turner@usitc.gov, and not filed on EDIS.

SO ORDERED.

Doris Johnson Hines
Administrative Law Judge