

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

ARASHI VISION (U.S.) LLC (D/B/A INSTA360)
Petitioner,

v.

GOPRO, INC.
Patent Owner.

Case No. IPR2024-00984
U.S. Patent No. 10,015,413

PATENT OWNER'S PRELIMINARY RESPONSE

PUBLIC VERSION

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EXHIBIT LIST

No.	Exhibit
2001	Declaration of Hassan Foroosh, Ph.D.
2002	<i>Curriculum vitae</i> of Hassan Foroosh, Ph.D.
2003	“What is GoPro SuperView?”, available at https://actioncamphotographer.com/gopro-superview/
2004	U.S. Pat. No. 7,893,985
2005	U.S. Pat. App. Pub. 2011/0187903 A1
2006	Complaint, <i>In the Matter of Certain Cameras, Camera Systems, and Accessories Used Therewith</i> , Inv. No. 337-TA-1400
2007	E-mail from Alex S. Yap on October 9, 2024
2008	“Hands-on with the GoPro Hero 3+ Black Edition,” February 20, 2014, available at https://www.dpreview.com/reviews/hands-on-with-the-gopro-hero-3-black-edition
2009	“Stabilization,” available at https://onlinemanual.insta360.com/x4/en-us/faq/feature/stabilization
2010	“What Is SuperView?,” produced as GOPRO_00009577 in <i>In the Matter of Certain Cameras, Camera Systems, and Accessories Used Therewith</i> , Inv. No. 337-TA-1400
2011	“Niek / superview,” available at https://github.com/Niek/superview
2012	“meekaah / SuperViou” available at https://github.com/meekaah/SuperViou
2013	“GoPro Hero4 vs. GoPro Hero3+”, October 5, 2014, available at https://newatlas.com/gopro-hero4-vs-gopro-hero3plus/34090/
2014	“About New Atlas,” available at https://newatlas.com/about

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2015	“Here it is – the GoPro Hero 3+ Review from our #GoProAdventures,” available at https://www.littlestuff.co.uk/here-it-is-the-gopro-hero-3-review-from-our-goproadventures/
2016	“Superview-like mode,” available at https://forum.dji.com/thread-198395-1-1.html
2017	“Next Firmware what would you like to see corrected added,” available at https://forum.dji.com/forum.php?mod=viewthread&tid=196725
2018	████████████████████ produced as GOPRO_00019926 in <i>In the Matter of Certain Cameras, Camera Systems, and Accessories Used Therewith</i> , Inv. No. 337-TA-1400
2019	████████████████████ produced as GOPRO_00063381 in <i>In the Matter of Certain Cameras, Camera Systems, and Accessories Used Therewith</i> , Inv. No. 337-TA-1400
2020	“Digital Camera D5200 Reference Manual,” produced as INSTA360_1400-PA00001186 in <i>In the Matter of Certain Cameras, Camera Systems, and Accessories Used Therewith</i> , Inv. No. 337-TA-1400
2021	“RAW POV SURFING GLASSY BARRELS OVER SHALLOW REEF!! (MINI SLAB),” available at https://www.youtube.com/watch?app=desktop&v=yz3-tlL4dvo

I. INTRODUCTION

Founded in 2002 in San Mateo, California, Patent Owner GoPro, Inc. (“Patent Owner” or “GoPro”) is a pioneer in developing cameras and digital imaging techniques, particularly for mountable and wearable use cases. As a company built on innovation, GoPro has received numerous patents protecting its technological improvements, including on wide-angle views and horizon-leveling. GoPro has become a leader in the industry, receiving scores of industry praise from professionals and consumers alike. Petitioner is a recent entrant into this market that has found significant success by copying GoPro’s designs and innovations, including the patent at issue in this proceeding.

U.S. Patent No. 10,015,413 (the “’413 patent”) discloses a novel camera system for performing conversion of the aspect ratio to display it on the camera’s miniature LCD screen. Prior to the invention of the ’413 patent, cameras sought to remove any distortion in the display of images, because still images tended to have objects across the field of view, and distortions caused them to look unnatural and were undesirable. In designing its wearable action cameras, GoPro realized two aspects that differed from conventional cameras: (1) that users tended to focus on central objects (such as faces) or views when

shooting with action cameras, and (2) that using a sensor with an aspect ratio of 4:3 allowed for a larger (*i.e.*, taller) field of view. However, because videos almost universally used a wider aspect ratio than 4:3 (such as 16:9 or 16:10), GoPro introduced the novel idea of ***introducing*** distortion by determining a central portion with less distortion and peripheral areas with greater distortion. This also created a “barrel” effect that allowed for a more immersive feel. In other words, GoPro ***intentionally*** introduced distortion when displaying an image on a camera, whereas prior art techniques sought to eliminate it.

Petitioner relies on three alternative grounds using three primary references: Fleming, Obara, and Meulen. At the outset, each of Petitioner's combinations suffer from a fatal defect, in failing to identify a reasonable expectation of success. This is required in an obviousness analysis, and failure to argue why a POSITA would have a reasonable expectation of success in the combination alone warrants denial of institution. Petitioner's theory for each reference is also missing a limitation: “a determination of the portion of an image where distortion is minimal.” This limitation was added to the claims to distinguish the prior art relied on by the examiner.

Moreover, neither Fleming nor Obara disclose that its system is incorporated entirely within a camera having a sensor that captures images at

one aspect ratio (*e.g.*, a 4:3 sensor that permits a taller image to be captured), and with a display that allows the user to view the image at the aspect ratio at which it will ultimately be displayed (*e.g.*, 16:9 if the user intends to post the video on YouTube) as several of the claims require. Instead, Petitioner relies on a conclusory obviousness analysis that is unsupported by any evidence that digital cameras at the time of the '413 patent needed to perform aspect ratio conversion. As for Meulen, Petitioner admits it does not disclose the recited pixel shifting, yet neither does Petitioner's secondary reference Chao.

II. LEVEL OF ORDINARY SKILL IN THE ART

Petitioners propose that the level of a POSITA at the time of the '413 patent “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” or “four years of experience working on image or video processing, or digital cameras.” Pet. 6.

For purposes of this preliminary response, Patent Owner applies Petitioner's proposed level of skill. Ex. 2001, ¶¶19-20. Patent Owner's expert, Dr. Hassan Foroosh, was a POSITA under Petitioner's definition at the time of the '832 patent. *Id.*, ¶21.

III. CLAIM CONSTRUCTION

In an *inter partes* review, claim terms receive their plain and ordinary meaning in light of the specification of the patent in which they appear, the same standard as used in district court. 37 C.F.R. § 42.100(b); *see Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005). While there are several terms in dispute in the parallel ITC litigation (Pet. 8), none of them need to be resolved by the Board. Ex. 2001, ¶34.

IV. APPLICANTS ADDED THE “DETERMIN[ING] A PORTION” LIMITATION TO THE CLAIMS TO OVERCOME PRIOR ART

The '413 patent's original claims were similar to the allowed claims with one significant difference: instead of reciting a step of “determin[ing] a portion within the input image, the portion including a subset of the pixels,” the claims instead merely required that “the input image includes a portion including a subset of the pixels.” Ex. 1003, 135-36. However, the claims still required that the pixel shift within the image portion was less than the pixel shift outside of that portion. *Id.*; Ex. 2001, ¶¶35-36.

During the prosecution of the '413 patent, the examiner issued one rejection, that the submitted claims were obvious over U.S. Pat. 8,218, 895 (“Gleicher”) in view of U.S. Pat. No. 7,496,243 (“Oosawa”). Ex. 1003, 46-

50. The examiner stated that while Glecher did not show non-uniform pixel shifting, Oosawa “teaches an image display apparatus and method wherein the amount of shift ... is smaller in the center of the image than in the peripheral of the image.” *Id.* at 48.

Following the rejection, applicant amended the independent claims to add the step of “determin[ing] a portion within the input image, the portion including a subset of the pixels,” and remove the language that “the input image includes a portion including a subset of the pixels.” Ex. 1003, 32. In other words, applicant amended the claims to require a step of “determin[ing] a portion within the input image.” The applicant then argued that, while Oosawaga may “show[] the amount of shifting to be applied to the center of the image is smaller than the peripheral of the image,” it does not disclose “determining a portion (including a subset of pixels) within an input image and non-uniformly shifting the pixels of the input image such that differences between input positions and output positions are less for the subset of the pixels than other pixels of the input image.” Ex. 1003, 39; Ex. 2001, ¶¶37-39.

Following this amendment, the examiner allowed the claims. Ex. 1003, 13.

V. PETITIONER HAS FAILED TO ESTABLISH A REASONABLE LIKELIHOOD OF SUCCESS OF UNPATENTABILITY FOR ANY CLAIM¹

As an initial matter, despite relying on obviousness theories for each ground of challenge, Petitioner fails to assert a reasonable expectation of success beyond, at best, merely uttering the phrase. Petitioner's obviousness combinations also suffer from an articulated and rational motivation to combine beyond mere assertion of improvement. *Second*, for all grounds, Petitioner fails to establish or even allege that any of the prior art "determine[s] a portion within the input image." Instead, Petitioner merely notes that the prior art discloses that it performs distortion on an image where some portions are less distorted than other portions without explaining how those portions are determined by the required processors. *Third*, for the Meulen-Chao combination of Ground 4, neither of the references discloses the recited non-uniform pixel shifting. While both describe shrinking or

¹ Patent Owner presently intends to disclaim claims 2-5 and 8-20 (*i.e.*, all claims **except** for claims 1, 6, and 7). After that disclaimer, each of the arguments set forth in this Preliminary Response apply to Petitioner's challenge of **all** remaining claims, claims 1, 6, and 7.

compressing an image (such as by turning every 4 pixels into one pixel), Petitioner provides no explanation for how compression would constitute pixel-shifting. *Finally*, for claims 1 and 6-7, Petitioner's theory that it would be obvious to incorporate the prior art's teachings into a camera provides no evidence that digital cameras used a different aspect ratio to display the image, presents a generic motivation to combine that is unrelated to the teachings, and does not assert a reasonable expectation of success.

A. All Grounds, All Claims: The Petition Either Fails to Allege Any Reasonable Expectation of Success or Simply Parrots the Words With No Analysis

As an initial matter, the Petition fails to address reasonable expectation of success. This is a failing across all grounds, and on this basis alone merits denial of institution. Indeed, for one ground, Petitioner failed to even ***assert*** a reasonable expectation of success, while for the rest, Petitioner merely uttered the phrase with no analysis. A reasonable expectation of success is a necessary and indispensable element of showing obviousness, and a failure to establish it requires denial. *Regents of Univ. of Cal. v. Broad Inst., Inc.*, 903 F.3d 1286, 1291 (Fed. Cir. 2018) (“An obviousness determination requires finding that a POSITA would have been motivated to combine or modify the teachings in the prior art and would have had a reasonable expectation of

success in doing so.”). A reasonable expectation of success is Petitioner’s burden to establish, and it **must** be set forth with a reasoned analysis in the Petition. *Eli Lilly & Co. v. Teva Pharms. Int’l GmbH*, 8 F.4th 1331, 1344 (Fed. Cir. 2021) (“A finding by the Board that a patent challenger has demonstrated a motivation to combine references does not necessarily imply that the challenger has also met its burden of showing a reasonable expectation of success”). Failure to assert a reasonable expectation of success requires denial of institution. *NJOY, LLC et al. v. JUUL Labs, Inc.*, IPR2024-00267, Paper 15 at 38-39 (June 12, 2014) (denying institution because “Petitioner never mentions a reasonable expectation of success”).

In particular, Petitioner fails to even **mention** a reasonable expectation of success in its proposed obviousness theory for Ground 1. For example, although Petitioner argues for limitation 2[f] that it “would have been obvious,” Petitioner nowhere discusses how its proposed modification to Fleming would have a reasonable expectation of success. Pet. 25. Similarly, for Petitioner’s argument that “[i]t would have been obvious for Fleming’s data processing system ... to be included within a camera,” Petitioner once again does not assert such a modification would have a reasonable expectation

of success. Pet. 28-29. This failure to argue the reasonable expectation of success is fatal to Petitioner's Ground 1 obviousness theories. Ex. 2001, ¶65.

And while Grounds 2 through 4 mention the words “reasonable expectation of success,” they fare no better than ground 1, as the analysis goes no further beyond mere recitation of the words. Ex. 2001, ¶¶66, 75. For Ground 2, Petitioner merely asserts that the combination of Fleming and Liu “involves known techniques to improve similar and/or known methods/devices to yield predictable results and a reasonable expectation of success.” Pet. 46; *see also* Pet. 47. For Ground 3, Petitioner again summarily states, with no analysis, that the combination of Obara and Liu “would have had a reasonable expectation.”“ Pet. 62-63. And for Ground 4, Petitioner again states that in a conclusory fashion that, for Meulen and Chao combination, “there would have been a reasonable expectation of success.” Pet. 92. Notably, this is not a situation where the Petitioner included further analysis in the expert declaration—Dr. Katsaggelos's declaration is likewise conclusory. Ex. 1002, ¶¶147, 180, 264.

None of these conclusory assertions are preceded or followed by any explanation as to why a POSITA would have reasonably expected the combination to succeed. This is simply an insufficient basis to find that any

of the challenged claims are unpatentable, for “[r]ejections on obviousness grounds *cannot be sustained by mere conclusory statements*; instead, there must be some *articulated reasoning with some rational underpinning* to support the legal conclusion of obviousness.” *KSR Intern. Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007); *see also Qiagen North American Holdings, Inc. v. HandyLab, Inc.*, 2021 WL 5024387, at *2-4 (Fed. Cir. 2021) (affirming Board’s denial of obviousness when “Petitioners offered only a single statement regarding the POSA’s alleged reasonable expectation of success”). Petitioner does not provide a single articulation or rational underpinning to support its bare assertion of reasonable expectation of success.

B. All Grounds, All Claims: Petitioner’s Alleged Obviousness Motivations Are Similarly Conclusory

The Petition should be denied because Petitioner’s alleged motivations for all grounds are likewise conclusory. As with reasonable expectation of success, Petitioner’s obviousness theories lack the required articulation of some motivation or rationale. As the courts have emphasized, “there must be some *articulated reasoning with some rational underpinning* to support the legal conclusion of obviousness.” *KSR*, 550 at 418; *see also Adidas AG v. Nike, Inc.*, 963 F.3d 1355, 1359 (Fed. Cir. 2020) (“The obviousness inquiry

does not merely ask whether a skilled artisan could combine the references, but instead asks whether “they would have been motivated to do so.”).

For Grounds 1 and 2, Petitioner’s argument that limitation 2[f] “would have been obvious” simply lacks any rationale beyond Petitioner and its expert’s say-so. Pet. 25; Ex. 1002, ¶86. Similarly, for Petitioner’s argument that it “would have been obvious for Fleming’s data processing system ... to be included within a camera,” both Petitioner and its expert provide a single sentence that the modification “would have been less burdensome, cheaper, and saves time.” Pet. 28; Ex. 1002, ¶100. Yet this explanation is not in any way related to Fleming’s teachings of aspect-ratio conversion—for example, Petitioner does not articulate how Fleming’s non-linear distortion would be “less burdensome, cheaper, and save[] time” compared to using conventional means that either do not convert the aspect-ratio or do not distort the image. Ex. 2001, ¶¶60-65.

As for Ground 3, Petitioner alleges that the Obara combined with Liu’s teaching of “scaling according to the distribution direction of the main objects helps prevent distortion of the target area ... and reduce[s] the distortion of the scaled image.” Pet. 62 (quoting Ex. 1005, 2:30-34); Ex. 1002, ¶179. However, this alleged motivation is not tied to the claimed non-uniform

distortion along both axes of the image. Indeed, Liu is clear that it does not perform distortion along the image's distribution direction. Ex. 1005, 3:62-65 ("An image may be scaled in the horizontal direction **or** the vertical direction, **whichever** makes the scaling direction of the image vertical [*i.e.* perpendicular] to the distribution direction of the main objects.").

And for Petitioner's argument that it would have been obvious "for Obara's image processing unit and CPU 111 to be included within a camera," Petitioner provides the same, flawed arguments as given for Fleming. Pet. 71-72; Ex. 2001, ¶66.

Finally, for Ground 4, Petitioner merely states that for the Meulen-Chao combination, "[i]t would have been obvious that when performing image scaling, pixels from the input to output positions are shifted based on a scaling factor" and that a POSITA would have known about shifting pixel positions for scaling. Pet. 91; Ex. 1002, ¶¶262-64. Petitioner provides no motivation to combine Chao with Meulen. Ex. 2001, ¶75.

C. All Grounds, All Claims: Petitioner Fails To Establish That Any Ground Renders Obvious "Determine a Portion Within the Input Image"

All challenged claims recite machine-readable instructions or a method step that "determine[s] a portion within the input image, the portion including

a subset of the pixels” **prior** to transformation wherein following the application of a non-uniform shift transformation, pixels within the determined portion have less shift than pixels outside of the portion. For simplicity, Patent Owner will refer to the claimed determined portion as the “less distorted portion.” Notably, as discussed above in Section IV, the claims were amended to add this “determination” limitation and remove the limitation that the image need simply contain such a portion. Ex. 2001, ¶¶40-41.

Petitioner has failed to provide **any explanation** in any of the grounds as to how the prior art discloses a machine-readable instruction or method step that “determine[s] a portion within the input image,” that is less distorted than other portions of the image, after which the determined portions are applied to the image as a transformation. Instead, the Petition merely points to teachings of an alleged portion **existing within the image** when the image is transformed, not that it was determined by any machine-readable instruction or method step **prior** to transformation. Ex. 2001, ¶42.

This is in sharp contrast to the ’413 patent’s specification, which provides numerous examples of the system determining the less distorted portion prior to transformation. Ex. 2001, ¶43. For example, the less distorted

portion can be “the center of the image ... 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.” Ex. 1001, 4:19-22. For instance, a user-selected mode can configure a warping function so that less distortion occurs in the center portion, such as in GoPro’s commercial embodiments which allow a user to select between different modes (*e.g.*, Superview or Wide view) that results in a warping grid that determines different less distorted portions. ’413 patent at Abstract (“In one embodiment, the output image is non-linearly warped relative to the input image such that a distortion in the output image relative to the input image is greater in a corner region of the output image than a center region of the output image.”), 2:15-20 (same); Ex. 2001, ¶43. In addition, the portion “may dynamically change between images.” Ex. 1001, 4:32-36.

Accordingly, the Petition has failed to establish even a *prima facie* case of unpatentability.

1. Grounds 1 and 2: Fleming

For Ground 1, Petitioner relies on Fleming’s “graphics processing unit” and “central processing unit” as performing the claimed steps. Pet. 12. Yet for the “determin[ing]” step, Petitioner provides ***no explanation*** as to how the

GPU or CPU “determine a portion within the input image” prior to transformation. Pet. 14-15. Instead, the entirety of Petitioner’s analysis is reproduced below:

Fleming discloses “maintain[ing] the original aspect ratio in an area of interest (e.g., at the center of the image).” (EX1004, 4:39-40.) In Figure 2 (below), for example, “a square region at the center of image 271 is mapped (or scaled).” (EX1004, 5:1-2, 5:17-66, Figs. 2, 3.) A POSITA would have understood that a region at the center of the image includes a subset of the pixels within the input image. (EX1002, ¶¶59-62.)

Pet. 15.

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.

Accordingly, Petitioner has failed to establish that Fleming teaches or renders obvious “determin[ing] a portion” that will be less distorted.

2. Ground 3: Obara

For Ground 3, Petitioner relies on Obara’s “CPU” as performing the claimed steps. Pet. 51. Yet as with Ground 1, Petitioner does not provide any explanation as to how the CPU “determine[s] a portion within the input image.” Pet. 55-58; Ex. 2001, ¶¶50-51. . Petitioner merely quotes Obara’s disclosure that the “non-linear scaling module 215 vertically divides the original image data (A) into, for example, eight image blocks” where “blocks 3, 4, 5 and 6 which belong to the central area.” Pet. 56. Petitioner then asserts that “blocks 3-6 at the central area” is the claimed portion. Pet. 56. No discussion is given as to how Obara’s CPU determines that those blocks are the claimed portion. Ex. 2001, ¶51. Again, this is in sharp contrast to the disclosures of the ’413 patent wherein the less distorted portion and the more distorted portion are determined as a “resolution map[]” based on a number

of factors which is then applied as a transformation to the image, and that the remapping can change depending on said factors. Ex. 1001, 3:39-45.

Accordingly, Petitioner has failed to establish that Obara teaches or renders obvious “determin[ing] a portion” that will be less distorted.

3. Ground 4: Meulen

Finally, for Ground 4, Petitioner relies on Meulen’s “processors, controllers, encoder devices” of a mobile device as performing the claimed steps. Pet. 86-87. Petitioner’s analysis for the “determin[ing]” step is even more cursory than the other grounds, with Petitioner merely quoting Meulen’s disclosure of “central display region 140-3” which “comprise[s] 200 pixels and require[s] the media source content to undergo no image compression.” Pet. 88 (quoting Ex. 1007, 6:27-31). Once again, Petitioner fails to show how Meulen discloses that the CPU *determines* the central display region *prior* to image transformation. Ex. 2001, ¶¶52-53.

D. All Grounds, All Claims: Petitioner Fails to Establish that Any Ground Renders Obvious Performing Non-Uniform Shifting on an “image capture apparatus” or “camera”

Claims 1 and 6-7 require that the claimed machine-readable instructions be performed by “physical processors” within an “image capture apparatus” with an “image sensor” (claim 1) or “physical processors ... within

a camera” (claims 6-7). For all grounds, Petitioner focuses on claim 6 first, and then relies on its claim 6 analysis for claim 1’s limitations of “image capture apparatus” and “image sensor.” For Grounds 1 through 3, Petitioner asserts that it would have been obvious to incorporate the teachings of Fleming and Obara into a camera, yet provides no evidence that a digital camera in 2013 would output an image with a different aspect ratio. Ex. 2001, ¶55. Petitioner’s “motivation” is similarly flawed for not being rationally related to the teachings in Fleming or Obara. *Id.* As for Ground 4, neither Meulen nor Chao disclose physical processors ***within*** a camera. *Id.*

1. Ground 1: Fleming

Petitioner does not contend that Fleming discloses a “camera” or an “image capture apparatus.” Pet. 28-29 (analyzing claim 6), 37 (relying on claim 6 analysis). Instead, Petitioner asserts “[i]t would have been obvious for Fleming’s data processing system (including its GPU and CPU) to be included within a camera.” Pet. 28. In particular, Petitioner asserts it would have been obvious to use Fleming’s non-linear distortion in order to convert the aspect ratio of the captured image to the aspect ratio of the image as a stored file or when displayed on an LCD included with the camera. *Id.* However, Petitioner’s obviousness theory is fundamentally flawed for several

reasons. Ex. 2001, ¶¶56-58. *First*, Petitioner provides no evidence that any camera in 2013 used a different aspect ratio to store images as files or display on an LCD. *Second*, Petitioner's alleged "motivation" is conclusory and not in any way related to non-linear distortion. *Third*, Petitioner does not contend that the combination would have a reasonable expectation of success.

First, Petitioner does not provide a single shred of evidence that any cameras in 2013 had an "aspect ratio of the captured image [that] was different than the aspect ratio of the stored file or the LCD display included in the camera." Pet. 28. Without such a difference in aspect ratio, there would be simply no reason to use Fleming's system for converting aspect ratios. Ex. 2001, ¶59. Yet it would be nonsensical to design a camera to capture images in one aspect ratio and store or display them in a different aspect ratio—it would, in fact, be "less burdensome, cheaper, and save[] time" to use the same aspect ratio. *Id.* Petitioner's lack of evidence on this fundamental point is fatal to its obviousness theory. *See Arendi S.A.R.L. v. Apple Inc.*, 832 F.3d 1355, 1363 (Fed. Cir. 2016) ("[W]hile 'common sense' can be invoked, even potentially to supply a limitation missing from the prior art, it must still be **supported by evidence** and a reasoned explanation. ... [O]ur search for a reasoned basis for resort to common sense **must be searching.**").

Second, Petitioner's terse and conclusory "motivation"—that "hav[ing] on-camera processing and display capabilities because it would have been less burdensome, cheaper, and saves time"—is not in any way tied to the teachings of Fleming that Petitioner relies on, specifically its use of non-linear distortion to convert aspect ratios from an image on a camera to an external display device such as a television. Ex. 2001, ¶60. It is Petitioner's burden to prove some motivation for a POSITA to incorporate Fleming's non-linear distortion into a camera, not generic "on-camera processing and display capabilities" which a conventional digital camera from 2013 almost certainly already had. Petitioner provides no such motivation. Indeed, it would have been "less burdensome, cheaper, and save[more] time" to not perform any aspect ratio conversion, or if performing an aspect ratio conversion, not to perform a non-linear distortion. Ex. 2001, ¶60.

At the time the '413 patent was filed in 2013, it was understood that performing non-linear distortion was undesirable for a device like Fleming that took still images of scenery. Ex. 2001, ¶61. This is because non-linear distortion results in distortions that would make the scene look unnatural—especially if there are persons in the field of view. *Id.* For example, Exhibit 2003, which is a discussion of the feature that is embodied by the '413 patent,

GoPro SuperView, provides examples of how the distortion from SuperView can look unnatural for still images. For example, the first image below does not use non-linear distortion, whereas the second one does, which has highly visible and jarring distortions. Ex. 2001, ¶61.





The article concludes that this functionality is “not especially useful for ... any time that the highly distorted and compressed look is going to appear strange,” such as “standard people shots.” Ex. 2003, 6. Instead, the non-linear distortion is more appropriate for “body- and gear-mounted shots” where one may be “shooting in a tight space” or “want to make sure that your subject remains in the frame.” *Id.*; Ex. 2001, ¶62.

In addition, it was well-known that wide angle shots were typically shot with fish-eye lenses, which resulted in distorted images. Ex. 2001, ¶63. There are numerous prior art references that discuss processing such images to **remove** such distortions. *See, e.g.*, Ex. 2004, Abstract (“A wide angle lens system **distorts the image** and conveys it to an image sensor, which converts

the image to an electronic signal and conveys it to image processing circuitry. The image processing circuitry ***corrects the distortion*** or transforms it to human recognizable image forms.”); Ex. 2005, Abstract (“A digital photographing apparatus for ***correcting image distortion*** performs an image distortion correcting method.”). Thus, a POSITA would have understood that distortions were undesirable. Ex. 2001, ¶63.

Thus, not only would the claimed non-linear distortion not be “less burdensome, cheaper, and saves time” as Petitioner asserts, it would instead result in a highly distorted, unnatural look to the still photographs of scenery that Fleming contemplates. Ex. 2001, ¶64.

Third, as discussed above, Petitioner does not assert nor provide any evidence that a POSITA would have had a reasonable expectation of success incorporating Fleming’s teachings into a camera. Ex. 2001, ¶65. As a result, Petitioner has not provided a *prima facie* case for obviousness and this ground must be denied. *Regents of Univ. of Cal. V. Broad Inst., Inc.*, 903 F.3d 1286, 1291 (Fed. Cir. 2018) (“An obviousness determination requires finding that [a POSITA] would have been motivated to combine or modify the teachings in the prior art and ***would have had a reasonable expectation of success in doing so.***”); *NJOY, LLC et al. v. JUUL Labs, Inc.*, IPR2024-00267, Paper 15

at 38-39 (June 12, 2014) (denying institution because “Petitioner never mentions a reasonable expectation of success”).

For these reasons, Petitioner's rationale to incorporate Fleming's system into a camera is fundamentally flawed and should be rejected.

2. Ground 3: Obara

Petitioner's assertions for Obara are largely identical as its assertions for Fleming. Petitioner does not contend Obara discloses a “camera” or an “image capture apparatus.” Pet. 71-72 (analyzing claim 6), 78-79 (relying on claim 6 analysis). Petitioner argues it would have been obvious “for Obara's image processing unit and CPU 111 to be included within a camera” for the same reasons as given for Fleming. Pet. 71-72. These arguments fails for the same reasons discussed for Ground 1—namely, that Petitioner does not provide any evidence of cameras that performed aspect ratio conversion on-camera, and that a POSITA would not find it desirable to perform non-linear distortion on the still images captured by Obara's device. Ex. 2001, ¶66. And Petitioner again fails to assert that the combination would have a reasonable expectation of success. *Id.* Accordingly, Petitioner's arguments are flawed for the same reasons discussed for Ground 1.

3. Ground 4: Meulen

Neither Meulen nor Chao disclose “physical processors are included within a camera” or “image capture apparatus.” For Meulen, it expressly describes a “wireless device 100” that “*comprise[s] ... a camera*” but does not state that the processors are *within* the camera. Pet. 97; Ex. 1007, 4:55-60. And for Chao, it merely describes outputting the image to a camera screen, but provides no disclosure of processors within a camera performing any scaling of images. Pet. 97; Ex. 1008, ¶32; Ex. 2001, ¶¶67-68.

E. Ground 4, All Claims: Petitioner Fails to Establish that the Combination of Meulen and Chao Renders Obvious Non-Uniform Pixel Shifting

All of the challenged claims recite a transformation that “non-uniformly shifts the pixels” between input and output image. Petitioner alleges that the combination of Meulen and Chao would render obvious non-uniform pixel shifting. Yet neither Meulen nor Chao describe pixel shifting, and thus the combination fails to render it obvious. Ex. 2001, ¶69. Moreover, Petitioner and its expert merely assert in a conclusory fashion that there would be a reasonable expectation of success but provides no further explanation. *Id.*

Meulen describes a method for non-uniformly compressing an image, wherein a central region is not compressed, whereas the periphery of the image has increasingly higher compression ratios. Ex. 1007, 6:27-37; Tables 2-4. Thus, as described by Petitioner, a central region of 200 pixels is not compressed, whereas the edge regions of 40 pixels are compressed into 10 pixels. Pet. 89-90 (annotating Table 1, reproduced below); Ex. 2001, ¶70.

TABLE 1

	Region					Total
	1	2	3	4	5	
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

As Petitioner admits, Meulen does not describe how to perform this compression—it certainly does not mention pixel shifting. Pet. 91; Ex. 2001, ¶71. Petitioner instead makes two arguments: (1) obviousness in view of the knowledge of a POSITA, and (2) obviousness when Meulen is combined with Chao.

As for the first, Petitioner merely states that “[i]t would have been obvious that when performing image scaling, pixels from the input to output positions are shifted based on a scaling factor” and that a POSITA would have

known about shifting pixel positions for scaling. Pet. 91. However, Petitioner does not provide any motivation or reasonable expectation of success, nor does Petitioner cite to any evidence regarding the knowledge of a POSITA beyond its own expert's say-so. *Id.*; Ex. 2001, ¶72.

Petitioner then shifts to combining Meulen with Chao's teaching of scaling, specifically Chao's disclosure that a "background element [of an image] is re-sized by stretching or shrinking" which "mean[s] the resizing of an element without regard to the original aspect ratio of the image." Pet. 91-92 (quoting Ex. 1008, ¶¶28, 63). Petitioner asserts that "[a] POSITA would understand that stretching/shrinking means shifting the pixels' positions." Pet. 92. However, Chao never discusses shifting pixels, and Petitioner does not cite to anything beyond its expert's conclusory opinion. Ex. 2001, ¶73. In addition, Chao does not disclose non-uniform pixel shifting, nor does Petitioner allege that it does. *Id.* Thus, the combination cannot disclose non-uniform pixel shifting.

Indeed, another problem with Petitioner's combination is that neither Petitioner nor either of the references provides an explanation for how to perform pixel shifting when compressing portions of an image as required by Meulen's teachings. Ex. 2001, ¶74. For example, Petitioner does not explain

how compressing four pixels into one pixel would involve a shift of pixels. Neither Meulen or Chao explain which pixel if any is shifted, and which pixels are not, when performing compression. *Id.*

Petitioner's combination also fails because Petitioner provides no required rationale for combining the two references. *See KSR Intern. Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007) ("Rejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some **articulated reasoning with some rational underpinning** to support the legal conclusion of obviousness."); *Adidas AG v. Nike, Inc.*, 963 F.3d 1355, 1359 (Fed. Cir. 2020) ("The obviousness inquiry does not merely ask whether a skilled artisan could combine the references, but instead asks whether 'they would have been motivated to do so.'"). Petitioner provides no motivation to combine Meulen and Chao, and merely asserts that it "involves combining prior art elements and known techniques." Pet. 92; Ex. 2001, ¶75. In addition, Petitioner does not at all discuss how the combination would reasonably expect to succeed, beyond a conclusory statement that is parroted by its expert. Pet. 92; Ex. 1002, ¶264. Without a rationale explaining a motivation and reasonable expectation of success, Petitioner's combination fails. *Regents of Univ. of Cal. v. Broad Inst., Inc.*, 903 F.3d 1286, 1291 (Fed. Cir. 2018) ("An

obviousness determination requires finding that [a POSITA] would have been motivated to combine or modify the teachings in the prior art and ***would have had a reasonable expectation of success in doing so.***”).

VI. OBJECTIVE EVIDENCE FURTHER DEMONSTRATES THAT THE '413 PATENT WAS NOT OBVIOUS

Objective indicia of non-obviousness “may often be the most probative and cogent evidence in the record.” *Medtronic, Inc. v. Teleflex Innovations Sarl*, 70 F.4th 1331, 1342 (Fed. Cir. 2023). In considering such evidence, the Board should conduct a “a reasoned, collective weighing of its evidence of secondary considerations,” and not rely on “overly vague and ambiguous” “assignments of weight to different considerations.” *Volvo Penta of the Americas v. Brunswick Corp.*, 81 F.4th 1202, 1213-16 (Fed. Cir. 2023). Objective evidence includes “(1) commercial success, (2) copying, (3) industry praise, (4) skepticism, (5) long-felt but unsolved need, and (6) failure of others.” *Id.*, 81 F.4th at 1212.

Patent Owner GoPro markets and sells wearable action cameras. For over a decade, these products have included the SuperView functionality, which embodies the '413 patent. Ex. 2006, ¶20; Ex. 2008; Ex. 2001, ¶¶76-77. SuperView allows users to capture an immersive, wide-angle perspective through dynamic and non-uniform stretching of the video frame aspect ratio.

Id. The result is a unique and immersive perspective, providing more content within the output frame than the camera could have captured directly with the desired aspect ratio. *Id.* SuperView is particularly useful for activities where the camera is facing towards or away from the user and mounted on the user's head, chest, or bike, such as in the cases of skiing, biking, motocross, or other active use cases. *Id.*

There is strong and indisputable objective evidence of nonobviousness directed to the SuperView functionality found in GoPro's cameras.

First, there is significant evidence of copying, including by Petitioner.² Petitioner's products use a remarkably similar-sounding feature called

² Patent Owner understands that in the ITC litigation, Petitioner served an interrogatory response requesting Patent Owner's contentions regarding secondary considerations. On October 3, 2024, Lead Counsel for Patent Owner emailed Petitioner, asking that Petitioner produce any documents relevant to secondary indicia under Petitioner's self-executing obligation to produce any "relevant information that is inconsistent with" its obviousness grounds, including evidence of secondary considerations. 37 C.F.R. § 42.51(b)(1)(iii); Ex. 2007; *see Becton, Dickinson & Co. v. B. Braun*

ActionView, which Petitioner describes as “optimized specifically for action PoV shots, with a taller height” and that it should be used for shots that have an “immersive first-person view, ideal for skiing, cycling and more.” Ex. 2009; Ex. 2001, ¶77. This description is quite similar to how GoPro describes the SuperView functionality, such advertising that it is optimized for

Melsungen AG, IPR2017-01586, Paper 20 at 2-5 (PTAB Feb. 28, 2018) (finding that documents demonstrating copying and long-felt need must be produced as “routine discovery” because they are inconsistent with Petitioner’s obviousness positions). Petitioner responded on October 9, 2024, that it was aware that Patent Owner had responded to the interrogatory by “cit[ing] to some Arashi documents in arguing secondary considerations of non-obviousness.” Ex. 2007. However, Petitioner disagreed that it was obligated to produce those identified documents and has, at the time this POPR has been filed, refused to produce those documents. *Id.* If Petitioner and Patent Owner are unable to come to agreement, Patent Owner will seek guidance from the Board. Patent Owner further may request that the Board grant authority to Patent Owner to file additional briefing once those documents are produced.

immersive first-person views, such as for skiing and biking: “When to use SuperView... Activities with the camera mounted on your head or chest, such as biking, skiing, motocross, etc., all work great—anything without a lot of important focal items around the edges of the frame.” Ex. 2010, 1; Ex. 2001, ¶¶77-78.

Others have also copied GoPro's SuperView. Ex. 2001, ¶79. For example, a “superview” project is described as “[a] small program that takes a 4:3 aspect ratio video file, and transforms it to a 16:9 video using the GoPro SuperView method.” Ex. 2011. Another called “SuperViou” is similarly described. Ex. 2012.

Second, GoPro has received significant industry praise for its cameras and SuperView functionality. Ex. 2001, ¶80. For example, in an industry article dated October 5, 2014, it characterizes SuperView as a “clever” feature that “is designed to capture a more immersive wide angle perspective.” Ex. 2013. The article's publisher, New Atlas, is a significant presence in the industry, having a readership of “approximately four million unique visitors a month” and covers “advances in technology, science, transportation, architecture, design, and many other disciplines.” Ex. 2014.

Users of GoPro's products have also provided significant praise for the SuperView functionality. Ex. 2001, ¶81. One reviewer described "GoPro's unique Superview lens" which provides "a ridiculously wide angle which allowed even a selfie taken from just arms reach to capture all six of our family!" Ex. 2015. Users of a competitor product have also expressed a desire for competitors to copy GoPro's SuperView feature, such as the follow quotations from September 2019 through 2022. Ex. 2001, ¶82.

- "Hello, is there **any chance on getting a Superview-like mode** like the one in the Hero 7? Asking this because i bought the Osmo Action but since i'm a biker i think **it's a very important feature** and now i feel like i want to send the osmo back and buy a Hero 7." (Post #1)
- "Hi, thank you for bringing this query for us. **As of the moment, we don't have this feature for the DJI Osmo Action.**" (Post #2)
- "Can you explain what 'superview mode' is?" (Post #4)
- "**It's the famous GoPro mode** that enable the camera to record video in 4:3 to gain FOV and then stretch the image to reach the 16:9 ratio." (Post #5)
- "Thanks very much for the info and links. **Technology is amazing** - they stretch out the sides or edges to fill the frame - **neat trick.**" (Post #7)
- "**2020 already, please for Superview Mode**" (Post #19)
- "**Any updates of when the superview like feature for Osmo action might land? That would be a game changer** and many

of my friends want to buy Osmo action but are retreating because of this missing feature” (Post #21)

- “Hi, **wondering if this was ever considered?** I ended up buying a few of the original Osmo Action cameras and **this would be an awesome feature.** Converting in post is just torture. **A superview for motovlogging is a must.**” (Post #26)

Ex. 2016. Another post from the same forum describes SuperView as “essential” for the competitor add to the next firmware. Ex. 2017 (post #28 and 30); Ex. 2001, ¶83.

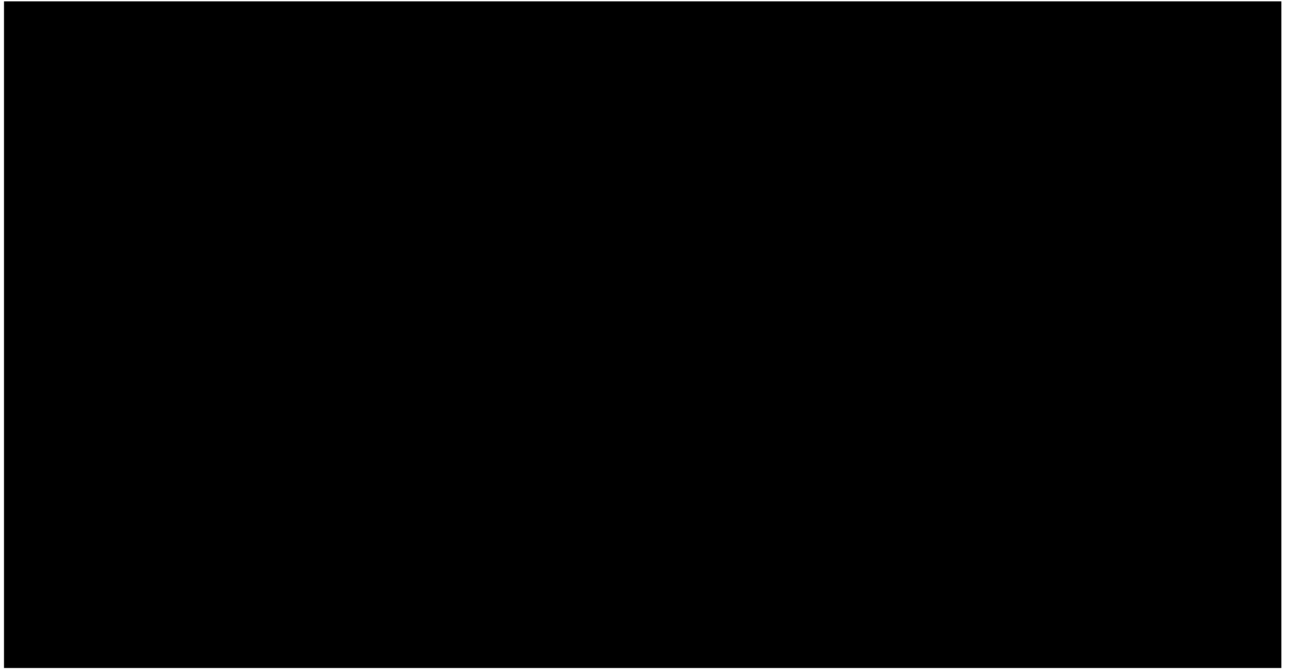
Third, there is also evidence of commercial success. Ex. 2001, ¶84.

[REDACTED]

[REDACTED]

[REDACTED]

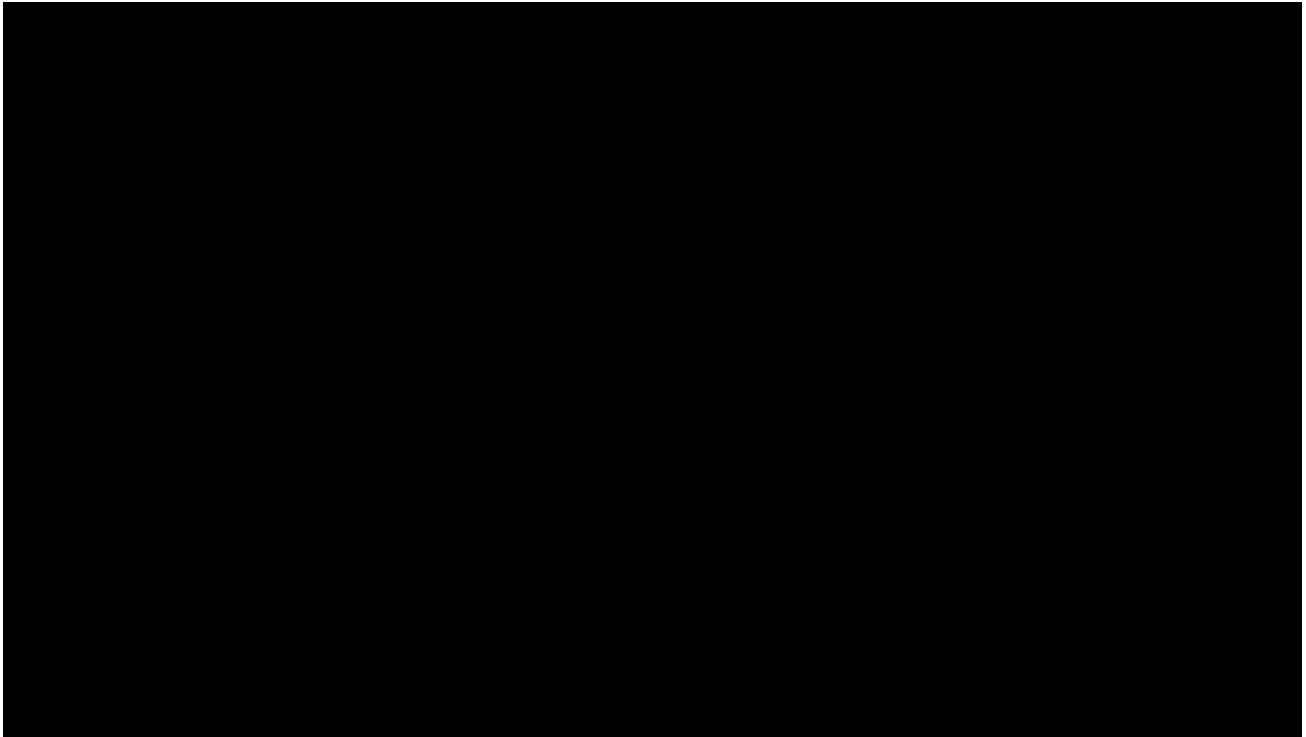
[REDACTED]



Ex. 2018, 23.

[Redacted text line]

[Redacted text line]



Ex. 2019, 14.

Fourth, there is also evidence of a long-felt need and unexpected results with respect to the claimed SuperView functionality. Ex. 2001, ¶86. The '413 patent states that prior to its invention “[c]onverting between aspect ratios [was] a common problem in the field of image and video processing.” Ex. 1001, 1:6-7. “Conventional conversion techniques such as cropping, linearly scaling, and padding each result[ed] in a perceivable reduction in the quality of an image or video.” *Id.*, 1:11-13. For example, cropping would “remove[] content from the image and reduce[] the field of view of the image.” *Id.*, 1:14-15. “Linear scaling,” on the other hand could “maintain[] the full field of

view” but would “introduce[] perceivable distortion into the image.” *Id.*, 1:16-18.

At the time of the '413 patent, conventional wisdom was that introducing distortion into images was undesirable. Ex. 2001, ¶87. For instance, distortion, particularly geometric distortion, can stretch or compress parts of the image in an uneven way, making faces or bodies look elongated, squished, or warped. *Id.* This effect is especially undesirable in personal or group photos, where people expect to see a realistic representation of themselves. Because of these reasons, photographers and camera designers traditionally seek to avoid or minimize distortion to maintain the integrity, realism, and appeal of their photos. *Id.* Indeed, GoPro explains on its website that Superview should not be used in conventional camera settings: “Avoid using SuperView when people are on the edges of the frame since they will be stretched a bit.” Ex. 2010, 1.

Given these challenges, a user of a camera was generally limited to capturing images with an output field of view having the same aspect ratio of the intended display or if aspect ratio conversion was performed it was done so as to avoid distortion. Ex. 2001, ¶88. For instance, in the ITC litigation, Petitioner relies on the Nikon D5200 Digital Camera as prior art. The D5200

manual is consistent with the '413 patent's description of the art. It applies conventional cropping based on user selection to create an associated image for a preview function (for video files), or a rote aspect ratio change (for image file). Ex. 2020, 120-21 ("Rotate the command dial to switch between aspect ratios of ratio 3:2, 4:3, 5:4, 1:1, and 16:9."; "Use multi selector to position the crop."); Ex. 2001, ¶88. In other words, the D5200 reflects the conventional understanding of how cameras should perform aspect ratio conversion when displaying images on the camera by teaching the type of conventional cropping that the specification of the '413 patent improves upon. Ex. 1001, Abstract, 1:7-25, 5:9-13.

While conventional cameras seeks to eliminate distortion when displaying on the preview screen, GoPro took a 180-degree approach: introducing distortion when displaying on the screen. Ex. 2001, ¶89. In particular, GoPro's SuperView invention utilizes a sensor that captured an image in one aspect ratio (4:3) so that the image can be "taller," and then allowed it to be displayed and previewed on the screen in aspect ratios that are more commonly used in video settings (*e.g.*, 16:9). To do this, however, GoPro had to intentionally introduce distortion into the image. SuperView thus applies a warping function that distorts the edges while eliminating

distortion in the center. GoPro's unconventional approach arises from the fact that GoPro's cameras are directed at action sports, not conventional photography. Ex. 2001, ¶89. GoPro recognized that video for certain action sport scenes, like skiing, surfing and bicycling, result in persons being centered in the middle of the shot, with no persons on the edges. This means that the periphery can be distorted in an acceptable manner.

Consider surfing as one example. Ex. 2001, ¶90. A surfer capturing himself in a "barrel" benefits from a taller image because he or she can see more of the wave, and the distortion at the periphery is acceptable because persons are not located at the periphery when surfing waves, as can be seen in the image below taken with SuperView:



Ex. 2021.

Thus, the SuperView functionality met the long-felt need of producing high-quality, wide-angle video for wearable action cameras through the use of non-linear distortion, which was an unexpected result. Ex. 2001, ¶91.

VII. CONCLUSION

For the foregoing reasons the Board should deny institution of this petition.

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CERTIFICATE OF LENGTH (37 C.F.R. §§ 42.24)

The undersigned hereby certifies that, according to the word-processing system used to prepare the foregoing document, this document has 7,459 words and thus complies with the applicable word limit.

Date: October 16, 2024

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CERTIFICATE OF SERVICE (37 C.F.R. §§ 42.6(E), 42.105(A))

The undersigned hereby certifies that the foregoing document was served in its entirety on October 16, 2024 upon the following parties via Electronic Mail:

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