

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

TESLA, INC.

Petitioner,

v.

INTELLECTUAL VENTURES II LLC

Patent Owner.

Case No. IPR2025-00339

U.S. Patent No. 7,916,180

PATENT OWNER'S SUR-REPLY

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PATENT OWNER'S EXHIBIT LIST

Ex. 2001	Petitioner's Answer to Complaint and Counterclaim, dated June 20, 2024, in <i>Intellectual Ventures II LLC v. Tesla, Inc.</i> , C.A. 1:24-cv-00884-ADA (W.D. Tex.)
Ex. 2002	Docket from District Court Litigation, <i>Intellectual Ventures II LLC v. Tesla, Inc.</i> , C.A. 1:24-cv-00884-ADA (W.D. Tex.)
Ex. 2003	Scheduling Order from District Court Litigation, <i>Intellectual Ventures II LLC v. Tesla, Inc.</i> , C.A. 1:24-cv-00884-ADA (W.D. Tex.)
Ex. 2004	Defendant's Second Supplemental Preliminary Invalidity Contentions, dated January 9, 2025, in District Court Litigation, <i>Intellectual Ventures II LLC v. Tesla, Inc.</i> , C.A. 1:24-cv-00884-ADA (W.D. Tex.)
Ex. 2005	U.S. Patent No. 6,455,831 for "CMOS Foveal Image Sensor Chip"
Ex. 2006	U.S. Patent No. 8,068,140 (Avago)
Ex. 2007	U.S. Patent No. 7,804,536 for "Variable Pixel Clock Electronic Shutter Control"
Ex. 2008	Specifications for Cypress CMOS Image Sensor (2007)
Ex. 2009	EP 1 896 891 for "Adaptive Optical Plane With Rolling Shutter"
Ex. 2010	U.S. Patent No. 7,777,796 for "Solid-State Image Pickup Apparatus Including A Global Shutter Function And Control Method Therefor"
Ex. 2011	Cambridge Dictionary, definition of "during"
Ex. 2012	Uyttendaele, Matthew, Ashley Eden, and Richard Skeliski. "Eliminating ghosting and exposure artifacts in image mosaics." <i>Proceedings of the 2001 IEEE Computer Society Conference on Computer Vision and Pattern Recognition. CVPR 2001</i> . Vol. 2. IEEE, 2001.
Ex. 2013	Declaration of Eli Saber
Ex. 2014	Resume of Eli Saber
Ex. 2015	U.S. Patent Appl. Publ. No. 2005/0128509 (Tokkonen)
Ex. 2016	U.S. Patent No. 7,123,298 (Schroeder)
Ex. 2017	U.S. Patent No. 5,691,765 (Schieltz)
Ex. 2018	U.S. Patent No. 4,323,925 (Abell)
Ex. 2019	U.S. Patent No. 7,770,799
Ex. 2020	Declaration of Dr. Eli Saber In Support Of Patent Owner Response
Ex. 2021	Cambridge Dictionary, definition of "During or for?"
Ex. 2022	Collins Dictionary, definition of "during"
Ex. 2023	Merriam-Webster Dictionary, definition of "for"

Ex. 2024	McLauchlan et al., Image Mosaicing Using Sequential Bundle Adjustment, <i>Image and Vision computing</i> 20.9-10 (2002): 751-759
Ex. 2025	U.S. Patent No. 6,031,569
Ex. 2026	EP Patent Publication EP 0 792 494 B1
Ex. 2027	Davis, Mosaics of Scenes With Moving Objects, <i>Proceedings. 1998 IEEE Computer Society Conference on Computer Vision and Pattern Recognition (Cat. No. 98CB36231)</i> . IEEE, 1998
Ex. 2028	U.S. Patent No. 6,285,172
Ex. 2029	U.S. Patent No. 8,045,935
Ex. 2030	Resume of Eli Saber

I. INTRODUCTION

The Reply fails to remedy the deficiencies in the Petition and, as a result, the Petitioner has failed to carry its burden of demonstrating that any of the Challenged Claims are unpatentable.

II. CLAIM CONSTRUCTION

A. “Simultaneous”

“Simultaneous” means at the exact same time. The Reply argues that the plain meaning of “simultaneous” includes “nearly simultaneous,” but cites no dictionary or other authority that equates the two because none exists. When events occur “simultaneous” they happen at the exact same time; when events occur “nearly” simultaneously they happen almost but not at the exact same time.¹ Under controlling precedent, the fact that the specification refers to both “simultaneous or nearly simultaneous” image capture, but the claims refer only to “simultaneous” means that “nearly simultaneous” is outside the scope of the claims. *See*, POR, at 15-16. The Reply attempts to distinguish that precedent because, according to Petitioner, “nearly simultaneous” and “simultaneous” are not mutually exclusive.

¹ Ex. 1070, 10:5-17 (“nearly simultaneous” means that “[t]hey’re close in time. There’s some time instance between them. They’re not at the same time.”) (emphasis added); *Id.*, 11:7-18 and 12:12-20.

That is wrong. “Nearly” simultaneous means close to but not at the exact same time, while simultaneous means at the exact same time.

B. The Phrase “*during a frame*” In Claim 22 Is A Temporal Limitation That Applies To Controlling Simultaneous Data Acquisition “*with the first and second channels*” And Therefore Does Not Encompass Downstream Processing Of The Sensor Output

The Reply argues that, in the context of claim 22, the temporal limitation that recites “independently controlling simultaneous data acquisition with each of the first and second channels during a frame” includes “a read-out process that includes analog and digital processing, in addition to exposure.” Reply, 4 (emphasis added). That interpretation is incorrect, because it is at odds with not only the language of claim 22 and the specification, but also with the mappings in the Petition itself.

1. Claim 22 Recites “*during a frame*” In The Context Of Controlling Data Acquisition “*with the first and second channels*” Each Of Which Is Expressly Defined As Having Only An Optics Component And A Sensor

Claim 22 uses the phrase “during a frame” in the following context:

configuring a first optics component relative to a first image sensor to form a first channel having a first field of view (FOV) that comprises a first angular width of a scene;

configuring a second optics component relative to a second image sensor to form a second channel having a second FOV that comprises a second angular width of the scene, wherein the first and second angular widths are different;

independently controlling simultaneous data acquisition with each of the first and second channels during a frame; ...

Thus, in claim 22, the “data acquisition” that is being controlled “during a frame” is limited to “data acquisition with each of the first and second channels during a frame.” Both the claim language itself and the specification define each channel as being formed from an optics component and a sensor, rather than downstream circuitry that receives and processes output from the sensor. In this regard, the claim language recites that: (i) in order to “form a first channel,” a first optics component is configured relative to a first image sensor; and (ii) in order to “form a second channel,” a second optics component is configured relative to a second image sensor. Thus, the language of claim 22 makes clear that the “data acquisition with each of the first and second channels” that is being controlled “during a frame,” is limited to data acquisition with the optics portion and sensor that form each channel, rather than downstream read-out and signal processing performed by components that are not part of each channel.

2. The Specification Defines A Channel As Having Only An Optics Component And A Sensor, And Discloses Downstream Processing Circuitry As Being Distinct From A Channel

Just like the claim language itself, the specification discloses a “channel” as being an optics component and a sensor, rather than downstream circuitry that receives and processes output from the sensor. Ex. 1001, 6:19-21 (“Each of the camera channels 260A-260D includes an optics component or portion and a sensor

component or portion”), 13:42-45 (“[e]ach sensor array and the respective optics portion may define an optical channel. For example, an optical channel 1306A may be defined by the optics portion 1312A and the sensor array 1304A”).

The text of the specification also distinguishes an optical channel (i.e., the optics and sensor) from the downstream processing circuitry (or channel processors) that receive the output of the optical channels and generate an image based thereon. For example, the specification explains that channel processors are “coupled to” optical channels, which means that the channel processors (which do the downstream readout and processing) are not subsumed within the optical channels themselves:

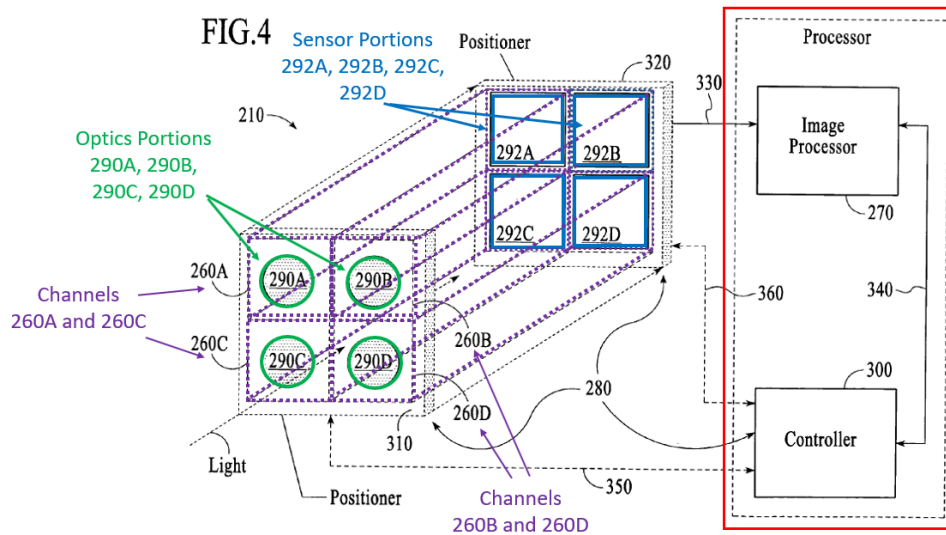
... the processor may include one or more channel processors, each of which is coupled to a respective one (or more) of the optical channels and generates an image based at least in part on the signal(s) received from the respective optical channel ... *Id.*, 14:41-45.

* * *

... the channel processor includes column logic, analog signal logic, and black level control and exposure control. The column logic is coupled to the sensor and reads the signals from the pixels. Each of the column logic, analog signal logic, black level control and exposure control ... the column logic may employ an integration time or integration times adapted to provide a particular dynamic range as appropriate to the corresponding optical channel. *Id.*, 19:59-20:7 (emphasis added).

The figures of the specification also depict an optical channel (i.e., the optics and sensor) as being separate from the processor that receives the output of the optical channels and generates an image based thereon. For example, Figure 4 of the

specification (reproduced below with colored annotations) depicts each of channels 260A, 260B, 260C and 260D (purple) as including a respective one of optics portions 290A, 290B, 290C and 290D (green) and a respective one of sensor portions 292A, 292B, 292C and 292D (blue). *Id.*, 6:14-26. Figure 4 depicts the processor (red) that receives the output of the sensors and performs image processing as being separate from the channels 260A, 260B, 260C and 260D (purple).



Thus, the specification confirms that, in the context of claim 22, the “data acquisition with each of the first and second channels” that is being controlled “during a frame,” is limited to data acquisition with the optics portion and sensor that form each channel, rather than downstream read-out and signal processing

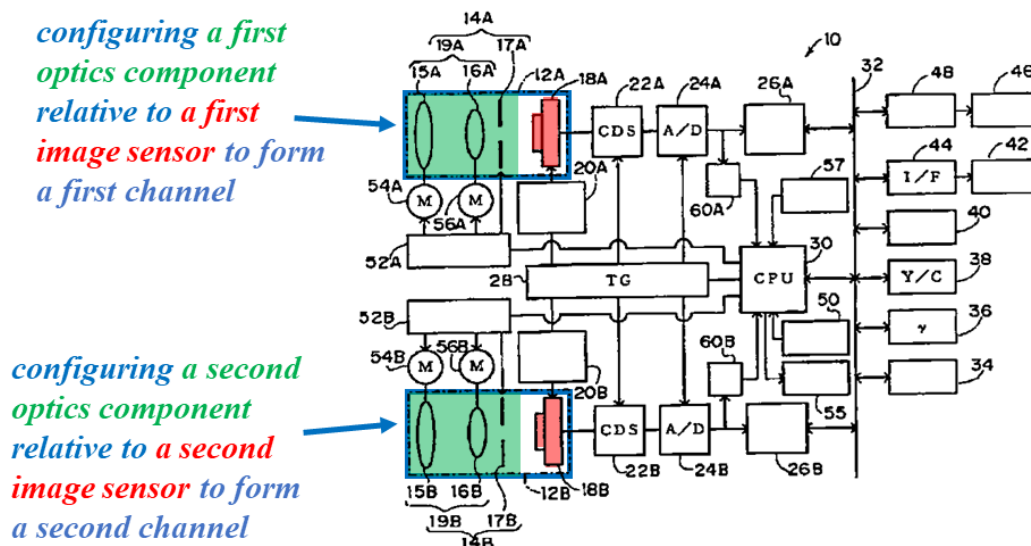
performed by components (such an image processor 270 above) that are not part of each channel.²

3. The Mappings In The Petition Similarly Identify A Channel As Having An Optics Component And A Sensor, Rather Than Downstream Read-out And Image Processing Circuitry

Perhaps even more significantly, the Petition itself maps “each of the first and second channels” to an optics component and a sensor in the prior art, rather than other components that perform downstream read-out and signal processing performed. In connection with Ground 1, the Petition (at 14-15) maps the claimed “first channel” to only Matsushima’s “first imaging system 12A” which is limited to “first lens group 19A” and “first image sensor 18A.” The mappings in the Petition do not include correlated double sample circuit (CDS) 22A, A/D converter 24A or other downstream processing within the claimed “first channel.” Similarly, the Petition (at 18-19) maps the claimed “second channel” to only Matsushima’s “second imaging system 12B” which is limited to “second lens group 19B” and “second image sensor 18B.” Again, the mappings in the Petition do not include

² The Reply cites the deposition testimony of Patent Owner’s expert for the proposition that data acquisition can include techniques like filtering and conversion. However, that testimony was in the context of data acquisition in general, rather than data acquisition with the channels, as claimed.

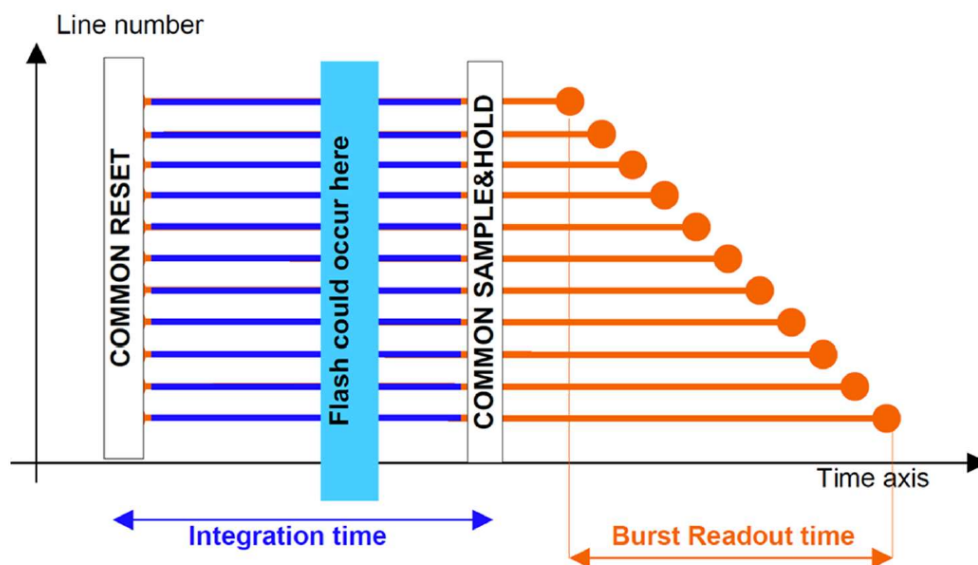
downstream read-out or image processing within the claimed “second channel.” The Petition (at 19) illustrates these mappings as depicted below.



Petition, 19. Thus, as demonstrated by *the Petition itself*, the claimed first and second channels do not include circuitry for performing downstream read-out or image processing. Thus, based on the Petition’s own mappings, the “data acquisition *with each of the first and second channels*” that is being controlled “during a frame” in claim 22, is limited to data acquisition *with the optics portion and sensor that form each channel*, rather than downstream read-out and signal processing performed by components that are *not identified by the Petition as part of each channel*.

The arguments the Petitioner’s declarant advances in his Supplemental Declaration are inconsistent with the Petition’s mappings of each of the claimed first and second channels to an optics portion and sensor portion, rather than circuitry for performing downstream read-out or image processing. For example, Petitioner’s

declarant argues the snapshot mode meets the claim language because in that mode “the frame period includes both integration and readout time,” and he provides the following diagram illustrating his position:



Ex. 1069, ¶69. Focusing on the components that the Petition maps to a channel (i.e., the optics and sensor), the diagram above illustrates that the sensor acquires the data during the integration time (blue) and provides it to a “Common Sample & Hold” component from which the data is read out. Clearly, by the time the data is stored in the “Common Sample & Hold” component, the acquisition of data by the sensor (and the channel) has concluded. Completely absent from the analysis of Petitioner’s declarant is an explanation of how the control of the “burst readout” -- which occurs after data acquisition by the sensor (and the channel) has concluded -- meets the claim language which requires controlling “data acquisition with each of the first

and second channels” (i.e., data acquisition with the optics and sensor that form each channel).

C. The Petitioner’s Proposed Construction Of “*during a frame*” In Claim 22 Renders The Limitation Meaningless

The Reply (at 5) proposes equating “during a frame” with a frame period corresponding to “the time lapsed between successive image readouts.” That proposed construction renders the phrase “during a frame” in claim 22 completely meaningless because essentially every moment that the camera is functioning is “between successive image readouts.” If the Applicant had intended to claim “independently controlling simultaneous data acquisition” at any moment that the camera was functioning, there would have been no reason to have included a temporal limitation (i.e., “during a frame”) in the claim.

D. The Petitioner’s Proposed Constructions For Claim 22 Collectively Do Violence To The Claim Language

As discussed above, the language of Claim 22 provides in pertinent part:

independently controlling simultaneous data acquisition with each of the first and second channels during a frame; ...

In connection with this claim language, the Petitioner first seeks to expand “simultaneous” to include “simultaneous or nearly simultaneous.” Next, the Petitioner expands the “data acquisition with each of the first and second channels” that is being controlled to include “data acquisition with any components regardless of whether such components form a portion of each channel.” Finally, the Petitioner

seeks to expand “during a frame” to mean any time “between successive image readouts” which is essentially *every moment* that the camera is functioning. Taken together, these proposed constructions effectively rewrite the claim language as follows:

independently controlling simultaneous or nearly simultaneous data acquisition with any components ~~each of the first and second channels at any time during a frame;~~

Had the Applicant intended such broad claim language, the Applicant would have worded the claim to simply say:

independently controlling simultaneous or nearly simultaneous data acquisition;

Collectively, Petitioner’s proposed constructions for claim 22 do violence to the claim language and therefore must be rejected.

E. Claim 22 Requires Controlling Data Acquisition “At Some Point Between The Beginning And The End Of The Exposure Interval During Which An Image Sensor Captures A Single Image”

The language in claim 22 that recites “independently controlling simultaneous data acquisition with each of the first and second channels during a frame” requires independently controlling simultaneous data acquisition “at some point between the beginning and the end of the exposure interval during which an image sensor captures a single image.” POR, 16-21. The Reply criticizes that construction, which is limited to operation in a rolling mode, because the patent discloses both rolling

mode and/or snap-shot mode. Reply, 9. That critique is premised on the false assumption that the claims must cover every embodiment disclosed in the specification, which is not the case. For example, while the specification discloses that “[t]he one or more optical channels may or may not be identical to one another,” it is clear that, e.g., claim 22 does not cover the disclosed embodiment where the first and second optical channels are “identical to one another,” because the claim recites that the first and second channels have different angular widths.” Ex. 1001, 14:1-2. As set forth in decisions cited in the POR (at 15-16), it is well settled that the claims need not cover every embodiment disclosed in the specification.

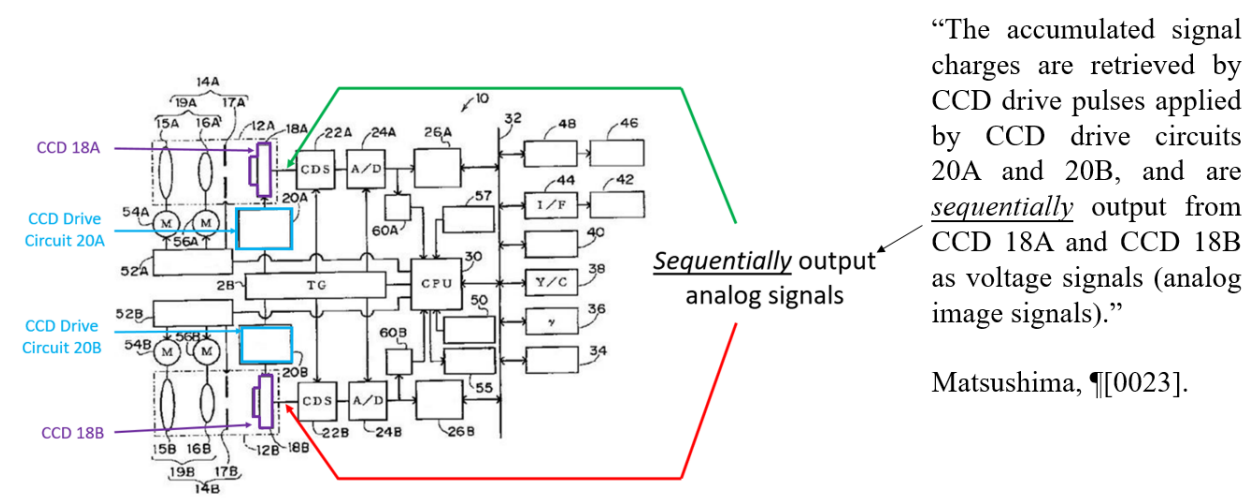
III. THE PETITIONER HAS FAILED TO PROVE THAT MATSUSHIMA EXPRESSLY DISCLOSES “INDEPENDENTLY CONTROLLING SIMULTANEOUS DATA ACQUISITION WITH EACH OF THE FIRST AND SECOND CHANNELS DURING A FRAME”

A. Matsushima Discloses Sequential Outputs From Its CCDs

Not only does Matsushima fail to disclose simultaneous data acquisition by its image sensors 18A and 18B, Matsushima points in the opposite direction by expressly disclosing that data is retrieved sequentially from the image sensors. From Matsushima:

The subject images formed on the light-receiving surfaces of CCD 18A and CCD 18B via their respective imaging optics 14A and 14B are subjected to signal charge conversion by each sensor in the CCD that corresponds to the amount of incident light. The accumulated signal charges are retrieved by CCD drive pulses applied by CCD drive circuits 20A and 20B, and are sequentially output from CCD 18A and CCD 18B as voltage signals (analog image signals). Ex. 1007, ¶[0023].

This aspect of Matsushima's disclosure is depicted in the annotated diagram of Figure 1 of Matsushima (annotations added by Patent Owner) shown below:



Neither Petitioner nor its declarant explains why Matsushima would sequentially output analog signals from its CCDs 18A and 18B to two separate downstream signal processing paths if the images on CCDs 18A and 18B were acquired simultaneously. In his Supplemental Declaration, Petitioner's declarant characterizes Patent Owner's “theory” of Matsushima as “illogical” because it renders “integration circuits 60A and 60B ... pointless.” Ex. 1069, ¶71. However, having separate “integration circuits 60A and 60B which perform downstream processing on the sequentially output analog signals from its CCDs 18A and 18B is consistent with Matsushima's overall architecture in which each of “the CDS circuits 22A and 22B, and the A/D converters 24A and 24B” (positioned between the CCDs 18A, 18B and the circuits 60A, 60B, respectively) “is driven synchronously by

timing signals applied from the timing signal generating circuit 28.” Ex. 1007, ¶[0027] (emphasis added). Matsushima’s two “integration circuits 60A and 60B” are also not “pointless.” In Matsushima’s architecture, the presence of two synchronously driven “circuits 60A and 60B” doubles the capability of Matsushima to perform “integration of the R, G, and B signals” in a frame. *Id.*, ¶[0034]. For example, if performing “integration of the R, G, and B signals” for a one frame took the same amount of time as it took to sequentially output analog a pair of analog signals from CCDs 18A and 18B, having two synchronously driven “circuits 60A and 60B” would allow Matsushima to perform “integration of the R, G, and B signals” at a rate that kept up with the analog signals being sequentially output by the CCDs.

B. The Petition Has Failed To Show That Matsushima Discloses Simultaneous Image Capture

Petitioner acknowledges that Matsushima never expressly states that it performs simultaneous image capture, and Petitioner also concedes that it does not argue that the subject limitation is inherent in Matsushima. Reply, 10, note 1. There is no daylight between these two admissions. If Matsushima neither expressly nor inherently discloses simultaneous image capture, then the reference fails to meet that feature.

Even though Matsushima does not expressly or inherently describe simultaneous image capture, the Reply (at 10) alleges that “Matsushima teaches simultaneous acquisition as understood by a POSITA.” This argument erroneously presupposes that a reference which neither expressly nor inherently discloses a feature can nonetheless “teach” the feature. The Reply cites no authority that supports this proposition because none exists. Instead, the Reply (at 10) cites to *In re Gleave*, 560 F.3d 1331, 1334 (Fed. Cir. 2009) for the irrelevant proposition that a reference need not use the exact words in the claim. That proposition would have been applicable here if, for example, Matsushima described “data acquisition with each of the first and second channels” that occurred at the “same time” as opposed to “simultaneous data acquisition with each of the first and second channels” as recited in the claim. But Matsushima says nothing of the sort. The Reply (at 10) also cites to *Sundance, Inc. v. DeMonte Fabricating Ltd.*, 550 F.3d 1356, 1361, n. 3 (Fed. Cir. 2008), which states that a prior art reference is interpreted from the perspective of one of ordinary skill in the art. *Sundance* does not state that a reference which neither expressly nor inherently discloses a feature can nonetheless “teach” the feature.

IV. THE PETITIONER HAS FAILED TO PROVE THAT MATSUSHIMA RENDERS OBVIOUS “INDEPENDENTLY CONTROLLING SIMULTANEOUS DATA ACQUISITION WITH EACH OF THE FIRST AND SECOND CHANNELS DURING A FRAME”

The Petition (at 21) made a conclusory argument that “Matsushima discloses *or renders obvious* ... simultaneous data acquisition with each of the first and second channels.” (emphasis added). More specifically, other than making the conclusory assertion at the beginning and end of its analysis of [22.3] and [1.2.2] that Matsushima “renders obvious” the limitation reciting “simultaneous data acquisition,” the Petition provided *no* further explanation *why* Matsushima renders this limitation obvious. *See*, Petition, at 21-30, 55-56.

The Reply (at 13-14) attempts to backfill that gap by way of a Supplemental Declaration that purports to offer a new obviousness rationale that proposes a POSITA would have *modified* Matsushima’s *sequential* operations with *simultaneous* ones based on Choi (Ex. 1008) and/or Weldy (1014),³ *neither of which were combined with Matsushima* in any of the *instituted grounds* challenging the independent claims of the ‘180 Patent. *See*, Ex. 1069, ¶49. The new rationale must be rejected because a Petitioner cannot use a Reply to advance a new obviousness

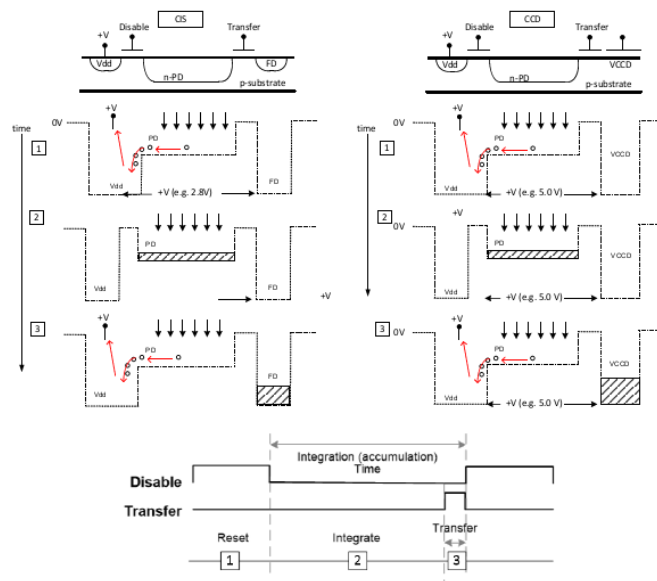
³ The Supplemental Declaration (Ex. 1069, ¶49) alleges that, “[e]ven if Matsushima did not expressly disclose ‘simultaneous’ acquisition,” Matsushima “renders obvious simultaneous acquisition” because Choi and Weldy taught “[i]t was well-known to perform simultaneous data acquisition in an imaging system ... such that there is no need for ‘compensating for errors caused by the time difference.’”

rationale where, as here, the Petition itself was devoid of any obviousness rationale whatsoever. Furthermore, the new rationale should be rejected because it is based on Choi (Ex. 1008) and/or Weldy (1014) which are not combined with Matsushima in any of the instituted grounds challenging the independent claims of the ‘180 Patent. This trial is limited to the instituted grounds, and the Petitioner is not permitted to plug holes in its chosen grounds by attempting to add new references to those grounds in its Reply.

V. THE PETITIONER HAS FAILED TO PROVE THAT MATSUSHIMA DISCLOSES CONTROLLING DATA ACQUISITION WITH EACH OF THE CHANNELS AT A POINT BETWEEN THE BEGINNING AND END OF THE EXPOSURE INTERVAL

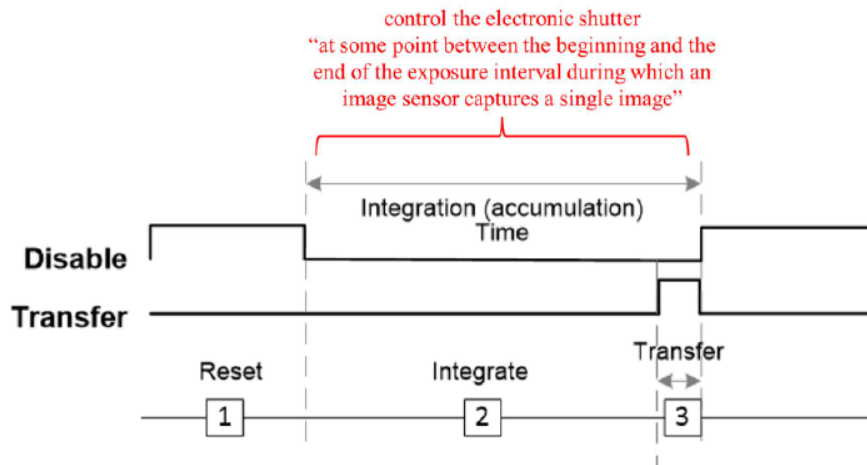
In the “Technical Background” section of his original declaration, under the heading “Exposure,” Petitioner’s declarant stated:

53. When a photodiode is disabled from collecting light, photoelectrons are still created from incident light, but they are continuously drained from the photodiode to a power supply connection in the pixel. Such periods do not affect the imaging result, and are not considered to be part of the integration time/exposure time/shutter speed. This is shown in the figures that I created below.



Ex. 1003, ¶53. Petitioner’s declarant provided no supporting citation to a source for any of the figures *he created*, nor did he assert that the information represented in the drawings constituted prior art to the ‘180 Patent. Also *missing* from his original declaration was any assertion that such information was *tethered in any way to Matsushima*.

In his Supplemental Declaration, Petitioner’s declarant uses an annotated version of the drawing that he previously created (reproduced below) to allege that Matsushima controls “the transfer of accumulated charges ... ‘at some point between the beginning and the end of the exposure interval.’”



Ex. 1069, ¶59. However, the specific timing diagram (above) created by Petitioner’s declarant (depicting an overlap between the integration time and the transfer period) is not disclosed in Matsushima, which says nothing of the sort. Nor is there even the conclusory allegation that the specific timing diagram created by Petitioner’s declarant is inherent in Matsushima, much less than factual support. Matsushima merely discloses that “CCD 18A and CCD 18B each have a shutter drain via a shutter gate, and the accumulated signal charges can be swept to the shutter drain by driving the shutter gates with shutter gate pulses.” Ex. 1007, ¶[0024]. The reference makes no mention whatsoever of any overlap between the integration time and the transfer period, and the drawings created by Petitioner’s declarant are neither prior art, nor evidence of any subject matter expressly or inherently disclosed in the reference.

Finally, even accepting for purposes of argument that Matsushima disclosed an overlap between the integration time and the transfer period during read out of

one of its CCDs, the Petitioner would still have failed to explain how that disclosure meets the claim language as a whole, which requires “independently controlling simultaneous data acquisition with each of the first and second channels.” As mentioned above, Matsushima expressly discloses that “[t]he accumulated signal charges are ... sequentially output from CCD 18A and CCD 18B as voltage signals (analog image signals).” Ex. 1007, ¶[0023]. The Reply fails to explain how Matsushima’s alleged control of sequential outputs from CCD 18A and CCD 18B constitute “independently controlling simultaneous data acquisition with each of the first and second channels,” as claimed.

VI. THE PETITIONER HAS FAILED TO PROVE THAT MATSUSHIMA APPLIES DIFFERENT EXPOSURE TIMES TO CCD 18A AND 18B

Matsushima makes clear that a single charge accumulation time is used for both CCD 18A and 18B in both imaging systems. Ex. 2020, ¶121. From Matsushima:

For AE control, the subject luminance (imaging EV value) is determined based on integration of the R, G, and B signals in a single frame by the integration circuits 60A and 60B, and the aperture value and shutter speed are determined based on this imaging EV value. The apertures 17A and 17B are driven via the drive circuits 52A and 52B, and the CCD 18A and CCD 18B charge accumulation time is controlled using an electronic shutter to reach the determined shutter speed. ...

During imaging and recording, the AF operation is performed when the release button is “half-pressed,” and the metering operation is repeated several times to obtain the exact imaging EV. The final aperture value and shutter speed for imaging is then determined based

on the imaging EV. The apertures 17A and 17B are then driven to the final aperture value when the release button is “fully press”, and the charge accumulation time is controlled by the electronic shutters at the determined shutter speed. Ex. 1007, [0034]-[0035] (emphasis added).

Matsushima’s reference to “the charge accumulation time” (in the singular) of both “the CCD 18A and CCD 18B” indicates that the same charge accumulation time is used for both devices. Ex. 2020, ¶122. Matsushima’s references to “the subject luminance” (singular), one EV value (singular), “the final aperture value” (singular) used for both apertures 17A and 17B, and “the determined shutter speed” (singular), likewise indicate that one luminance (EV value) is determined for the subject, and a common aperture value as well as a common shutter speed are used in both imaging systems. *Id.* Matsushima’s use of a common accumulation time for both of its CCDs fails to disclose “independently” controlling simultaneous data acquisition with each of the first and second channels,” as claimed. *Id.*

The Reply (at 21) suggests that Matsushima discloses independently controlling data acquisition based on the following passage from Matsushima:

... the CCDs 18 have a so-called electronic shutter function that controls the accumulation time (shutter speed) of the charge accumulated by each sensor via shutter gate pulses. Ex. 1007, [0024] (emphasis added).

Consistent with the other passages of Matsushima quoted above, the juxtaposition of “the CCDs” (plural) with “a so-called shutter function” (singular) indicates that common control -- rather than independent control -- is applied to

“each sensor.”

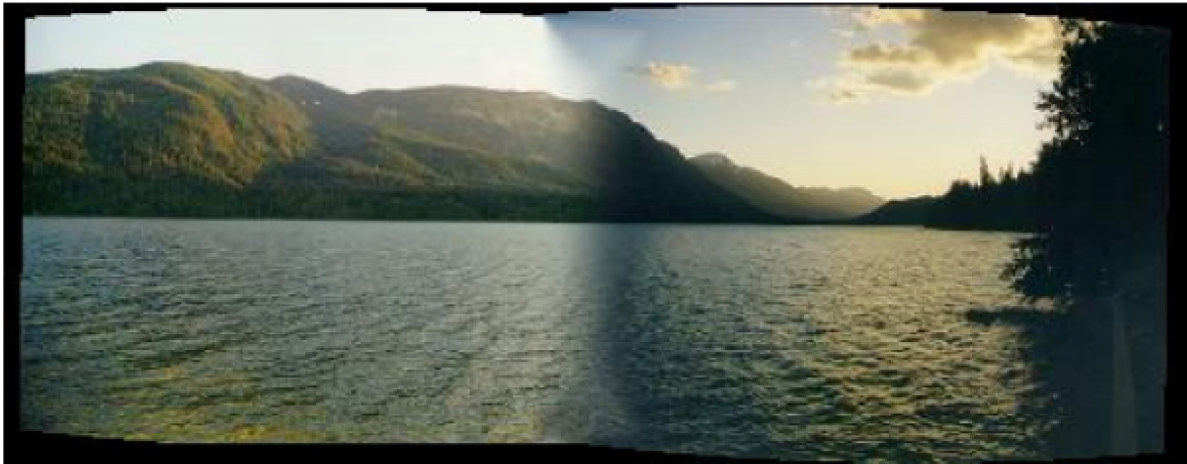
The Reply (at 21) also makes the unsupported allegation that in Matsushima “each system’s ‘**aperture value and shutter speed** are determined’ based on its imaging EV value” (emphasis in original). The Reply follows this allegation with citations to [0032] and [0034] of Matsushima, neither of which says what Petitioner alleges. Paragraph [0032] makes no mention of an “EV value,” and paragraph [0034] states that “the subject luminance (imaging EV value) is determined based on integration of the R, G, and B signals in a single frame by the integration circuits 60A and 60B, and the aperture value and shutter speed are determined based on this imaging EV value” (emphasis added). This disclosure indicates that one luminance (EV value) is determined for the subject, and a common aperture value as well as a common shutter speed are used in both imaging systems,” rather than “independently” controlling simultaneous data acquisition with each of the first and second channels,” as claimed.

VII. THE REPLY FAILS TO EXPLAIN HOW MATSUSHIMA COULD SYNTHESIZE IMAGES WITH DIFFERENT EXPOSURES

The Reply simply ignores that fact that synthesizing images with different exposures in a manner that resulted in a natural boundary was a known problem. As researchers from Harvard and Microsoft explained:

When capturing images to create mosaics, automatic cameras often change their exposure settings. Even if the images are blended in the areas of overlap, if the exposure difference between images is too high, it will give the panorama a creased look around the edges of the overlap. Feathering [10] the effect of the blend into the rest of the image will help remove creases, but the exposure change will still be too abrupt to appear natural. (Figure 7). Ex. 2012, 4 (emphasis added).

As shown in Figure 7(A) (below), the researchers applied blending and feathering (the same techniques disclosed in Matsushima) to two image images with different exposures in an attempt to create a single image with a natural boundary between the two images with different exposures. *Id.*, 4, 6. However, as shown below, the boundary is highly noticeable and far from a “natural” boundary.



(A)

Given the state of the art, and, in particular, the evidence shown above that blending and feathering images with different exposures resulted in a noticeable crease, the Reply fails to explain how Matsushima could have possibly combined images with different exposures and achieved the natural boundary described in the

reference. Thus, the only way to read Matsushima that is consistent with state of the art at the time, requires reading the reference as combining images with a common exposure, because the art lacked techniques for achieving a natural boundary between images with different exposures.

In his Supplemental Declaration, Petitioner's declarant makes the conclusory allegation that even "when combining images of different exposures" the "image data between A and B [the boundary]" in Matsushima is "almost continuous, thereby producing a natural boundary." Ex. 1069, ¶¶75, 84. Petitioner's declarant provides no citation to any authority or reference demonstrating that Matsushima itself, or in combination with Yu, could have achieved a natural boundary between images of different exposures -- a result that eluded researchers from Harvard and Microsoft at the time. Ex. 2012, 4. Simply put, the evidence demonstrates that the natural boundary that Matsushima achieved between images must have been predicated on combining images with a common exposure, and that modifying Matsushima with Yu as proposed in the Petition would have destroyed the natural boundary that Matsushima was designed to achieve.

Remarkably, Petitioner's declarant cites the paper from the researchers at Harvard and Microsoft discussed above (Ex. 2012) for the proposition that "a POSITA would have known how to eliminate exposure artifacts when combining images captured at different exposures and would have done so using established

techniques.” Ex. 1069, ¶76, *citing*, Ex. 2012. Of course, that paper says just the opposite! Ex. 2012, 4 (disclosing that even after blending and feathering, “the exposure change will still be too abrupt to appear natural”).

VIII. THE REPLY FAILS TO EXPLAIN HOW YU’S PIXEL TECHNIQUE FOR INCREASING DYNAMIC RANGE IS COMPATIBLE WITH THE IMAGES OF DIFFERENT FIELDS OF VIEW STITCHED TOGETHER IN MATSUSHIMA

As explained in the POR (at 53-58), Matsushima’s *image-stitching* technique for image synthesis is incompatible with Yu’s technique where a plurality of *spatially aligned pixels captured by different sensors* are used to expand the dynamic range. In Matsushima, the region in the center of the wide-angle image 62A is simply replaced by a scaled-down version of narrow-angle image 62B, and then a correction algorithm (that has nothing to do with increasing dynamic range) is applied in a narrow region on the seam where the images come together. Completely lacking from Matsushima’s techniques are *spatially aligned pixels captured by different sensors*, as needed to increase dynamic range in Yu.

The Reply (at 25) argues that the references need not be bodily incorporated. Maybe so, but it is still Petitioner’s burden to explain *how* a POSITA would have combined or modified the references and *how* the modified system *would have functioned*. The Petitioner fails to meet that burden. If the references were not bodily incorporated, then how would Matsushima’s *image-stitching* technique for image

synthesis be combined with Yu’s technique where a plurality of *spatially aligned pixels captured by different sensors* are used to expand the dynamic range, in a manner that meets the claim language? On this question, both the Petition and the Reply are silent.

The Reply (at 25) also argues that “techniques for combining images with different exposures, including the step to align pixels spatially, were well-known.” However, none of the Reply’s supporting citations explain *how* Matsushima’s image-stitching technique would be combined with Yu’s techniques that depend on spatially aligned pixels captured by different sensors, in a manner that meets the claim language.

IX. THE REPLY FAILS TO ESTABLISH THAT THE ‘180 PATENT IS NOT SUPPORTED BY THE PROVISIONAL APPLICATION

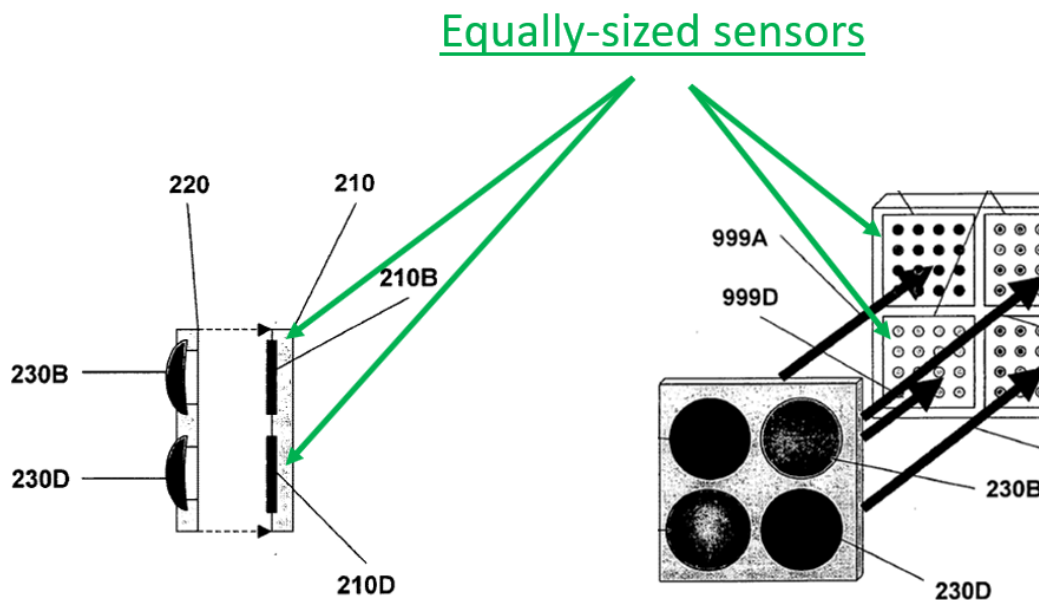
A. The Provisional Application Disclosed Different FOVs

The Reply (at 29-30) argues that the disclosure in the Provisional Application of lenses with different focal lengths does not necessarily result in different FOVs. Essentially, the Reply argues that because FOV is a function of both focal length and sensor size, it is possible that the disclosure of the Provisional Application is *limited* to an arrangement where a first lens with a first focal length (f_{lens1}) is precisely paired with a first sensor of a first size (K_{lens1}) and a second lens with a second (different) focal length (f_{lens2}) is precisely paired with a second sensor of different size (K_{lens2})

such that the following mathematical relationship could be satisfied, thereby resulting in both lens/sensor pairings having a common FOV:

$$\text{Common FOV} = 2 \arctan \frac{K(\text{lens1})}{2f(\text{lens1})} = 2 \arctan \frac{K(\text{lens2})}{2f(\text{lens2})}$$

However, the Provisional Application makes no mention of that equation and says nothing of the sort. Instead, the Provisional Application discloses that the sensor “arrays 210-210B may be of any size and shape” which includes sensors of equal size (Ex. 1040, 11), and similarly depicts in the figures sensors of equal size as shown below:



Even applying Petitioner’s equation, channels with different focal lengths and equally sized sensors will have different FOVs.

B. The Provisional Application Discloses Multiple Sensors

The Reply (at 30-31) argues that “each array (210A - 210D)” in the Provisional Application is not a sensor and that the Provisional Application is limited to “a single sensor, not multiple.” The Provisional Application defines an “array” as “a group of photo detectors, known as pixels, which operate in concert to create one image.” Ex. 1047, 8. The Reply fails to explain why separate arrays -- each of which includes its own group of photodetectors working in concert to create its own image -- are not multiple sensors.

X. THE REPLY’S NEW THEORY FOR GROUND 3 MUST BE REJECTED

In Ground 3, the Petition relied only on Yu for the limitation reciting “*independently* controlling simultaneous data acquisition with each of the first and second channels *during a frame*.” Pet., 84-85. As explained in the POR (at 41-42), there is no evidence that integration time control in Yu is applied “during the frame,” i.e., at a point between the beginning and the end of the exposure interval during which the image sensor captures an image. The Reply (at 31) pivots to a new theory, now arguing that the subject limitation is met by Choi. In addition to being belated, this new argument should be rejected because there is no evidence that integration time control in Choi occurs at a point between the beginning and the end of the exposure interval during which the image sensor captures an image.

XI. CONCLUSION

The Petitioner has failed to demonstrate that any Challenged Claims are unpatentable.

Respectfully submitted,

Dated: February 20, 2026

By: /Daniel H. Golub/
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*Counsel for Patent Owner
Intellectual Ventures II LLC*

CERTIFICATE OF COMPLIANCE WITH WORD COUNT

Pursuant to 37 C.F.R. § 42.24(d), I certify that this Sur-Reply complies with the type-volume limits of 37 C.F.R. § 42.24(b)(1) because it contains 5,575 words, excluding the parts of this Patent Owner's Sur-Reply that are exempted by 37 C.F.R. § 42.24(a), according to the word processing system used to prepare this Patent Owner's Sur-Reply.

Respectfully submitted,

Dated: February 20, 2026

By: /Daniel H. Golub/
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CERTIFICATE OF SERVICE,

The undersigned certifies that pursuant to 37 C.F.R. § 42.6(e), a copy of the foregoing **PATENT OWNER'S SUR-REPLY** was served via email (as consented to by counsel) on February 20, 2026 to lead and backup counsel of record for Petitioner as follows:

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