UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SAMSUNG ELECTRONICS CO., LTD., AND
SAMSUNG ELECTRONICS AMERICA, INC.,
Petitioner,

v.

CELLECT, LLC,
Patent Owner.

Case IPR2020-00561
U.S. Patent No. 6,982,742

PATENT OWNER'S PRELIMINARY RESPONSE

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On February 16, 2020, Samsung Electronics Co., Ltd., and Samsung Electronics America, Inc., ("Samsung" or "Petitioner") submitted a Petition to institute *inter partes* review ("IPR") of U.S. Patent No. 6,982,742 (Ex. 1001, "the '742 Patent"), challenging claims 42, 58 and 66 ("the Challenged Claims"). Cellect, LLC, ("Cellect" or "Patent Owner") requests that the Board deny institution of *inter partes* review under 35 U.S.C. § 325(d) based on the advanced stage of the co-pending litigation, under 35 U.S.C. § 314(a) because the same or similar arguments were previously presented to the Office, and on the merits because the cited references fail to disclose all elements of the challenged claims.

I. INTRODUCTION

Petitioner requests that the Board overturn twenty-years of prosecution history surrounding this family of patents, in which the United States Patent and Trademark Office ("Office") considered references that address arguments raised by Petitioner, and render any additional references cited by Petitioner cumulative, at best. Indeed, the Office confirmed the patentability of core concepts in the claimed invention over Harris (Ex. 1052), the same reference cited by Petitioner. Petitioner's reliance on additional references in combination with Harris is futile and merely rehashes arguments that were repeatedly considered and overcome. Specifically, the Office found that the references of record, including Harris, did

not anticipate the Challenged Claims, and further considered other combinations of references, including CMOS imaging devices. For example, the Office previously considered Harris in combination with other PDA wireless communication devices such as Jacobsen, used for conducting video conferencing. Ex. 1002 at 117, 120. Notwithstanding, the Office found that these references did not render obvious the Challenged Claims. *Id*. at 120. Thus, Harris in view of additional CMOS and CCD references, Swift, Ricquier, Tanaka, and Tran, are of no moment and are merely cumulative.

Beyond the Harris reference already considered by the Office, the two primary references cited against the Challenged Claims in this proceeding are Swift and Ricquier, both of which lack any detail regarding the critical claim elements. Swift attempts to describe a security camera that could lower manufacturing costs and be made smaller by swapping newly-developed CMOS image sensors into old CCD camera architectures, which were characterized by large, bulky circuit boards that limited their applicability in size-critical applications. But the CMOS imagers of Swift could not simply be plugged directly into a CCD system given CMOS' *on chip* integration of circuitry required to be *off chip* in CCD cameras, and Swift provides no detail on how the "circuitry means for converting said pre-video signal to a post-video signal for direct reception by a

standard video device," in the Challenged Claims can be implemented. Ricquier describes a CMOS prototype designed for bench testing and development work. Not surprisingly, Ricquier does not provide relevant details on how the specific components are circuitry are packaged as Ricquier describes components in a test environment, and expressly states that CMOS images sensors were selected because all the components are capable of "cointegration of processing electronics on the same chip" — teaching away from the Challenged Claims and teaching away from the combination of references proposed by Petitioner. Ex. 1033 at 10; *id.* at 11 (development of a sensor system on a single-chip).

Swift and Ricquier fail to disclose or contemplate *modifying* the imagers referenced therein to meet the Challenged Claims, and Petitioner's arguments fail to address, let alone wrangle with, the fundamental difference between these early attempts to implement CMOS camera on a chip technology.

The Board should also deny this Petition pursuant to 35 U.S.C. § 325(d) because Petitioner's grounds are substantially similar to grounds already considered and dismissed by the Office. The Office has already considered references that purport to implement a CMOS "camera on a chip" imager in the system architecture of a CCD camera. Furthermore, Petitioner fails to address the

prosecution history of the '742 family of patents, including its parent applications which issued as the '369 Patent and '839 Patent.

The Petition also should be denied under 35 U.S.C. § 314(a) because by waiting until the very end of the period prescribed by 35 U.S.C. § 315(b), Samsung has allowed the co-pending litigation reach an advanced stage, and the Scheduling Order demonstrates that by the time the Board determines whether to institute trial in this case fact and expert discovery will have concluded, and the court will have held the pre-trial conference. In contrast, any trial instituted based on this Petition would not conclude until September 2021. Furthermore, the grounds raised in this Petition are cumulative to those raised in the co-pending district court case, so instituting IPR would duplicate those efforts.

Although there are a variety of reasons why the '742 Patent is valid over Petitioner's asserted references, this Preliminary Response focuses on only limited reasons why *inter partes* review should not be instituted. *See Travelocity.com L.P. v. Cronos Techs., LLC*, Case CBM2014-00082, Paper 12 at 10 (PTAB Oct. 16, 2014) ("[N]othing may be gleaned from the Patent Owner's challenge or failure to challenge the grounds of unpatentability for any particular reason.").

II. Patent-In-Suit Overview

The ’742 Patent discloses various inventions, describing different techniques for customizing the form factor of image sensors to reduce the desired image profile. The ’742 Patent takes a unique approach by separating various components and describes alternate embodiments. The Challenged Claims, for example, describe separation of the pixel arrays from timing and control circuitry and processing circuitry onto two or three different planes. Although the claims are directed to the use of the invention in personal digital assistant (“PDA”), the claims are written in Jepson format and the critical aspects are highlighted in exemplary claim 42 copied below:

> 42. In a PDA having capability to transmit and receive data in a communications network, the improvement comprising:
>
> a video system integral with said PDA for receiving and transmitting video images, and for viewing said images, said video system comprising:
>
> a camera module housing an image sensor therein, **said image sensor lying in a first plane and including an array of pixels** for receiving images thereon, said image sensor producing a pre-video signal, **a first circuit board lying in a second plane** and electrically coupled to said image sensor, **said first circuit board including circuitry means for timing and control of said array of pixels and circuitry means for processing and converting said pre-video signal to a desired video format,** a transceiver radio element communicating with said firs circuit board for transmitting said converted pre-video signal;
>
> a transceiver radio module mounted in said PDA for wirelessly receiving said converted pre-video signal; and

> a video view screen attached to said PDA for viewing said video images, said video view screen communicating with said transceiver radio module, and displaying video images processed by said first circuit board.

Ex. 1001 (emphasis added.)

III. CLAIM CONSTRUCTION

The Board should deny institution because Petitioner takes no claim construction positions on claim terms central to its varying invalidity positions—including a term that it **has** argued requires construction in the co-pending district court litigation. The Board's rules require that the Petitioner establish "[h]ow the challenged claim is to be construed" and "[h]ow the construed claim is unpatentable." 37 CFR 42.104(b). Having failed to meet its burden to construe a claim term that it admits may or may not be met by the combination of references cited in Ground 1—and in particular a claim term that it argued required a specific instruction in the co-pending litigation—the Board should deny the Petition. *See Orthopediatrics Corp. v. K2M, Inc.*, IPR2018-01548, Paper 9 at 9–11 (PTAB Mar. 1, 2019) (denying institution where petitioner failed to propose a construction for a term expected to be in dispute).

A. "pre-video signal"

In the pending district court action, Petitioner proposed a narrow construction for the term "pre-video signal," arguing that it is limited to "an ***analog*** image signal transmitted by the image sensor." (emphasis added). Ex. 2005. Notwithstanding this narrow construction, which Patent Owner disputes, Petitioner fails to address the construction and whether the references relied upon Petitioner disclose an ***analog*** image signal.

B. "a desired video format"

In the pending district court action, Petitioner proposed a narrow construction for the term "a desired video format," arguing that it is limited to "a format for a video signal that is ready for ***directly*** viewing on the claimed video view screen." (emphasis added). Ex. 2005. Notwithstanding this narrow construction, which Patent Owner disputes, Petitioner fails to address the construction and whether the references relied upon Petitioner disclose an video for directly viewing and whether additional processing of the image signal is permitted.

C. "timing and control means," and "circuitry means . . . for timing and control of said array of pixels"

The terms "timing and control means" and "circuitry means… for timing and control" (referred to as "timing and control circuitry") are governed by 35

U.S.C. § 112(6). The function of these terms is "controlling release of the image signal from the pixel array." The function proposed by Patent Owner is set forth in the '742 Patent which states,

> The terms "timing and control circuits" or "timing and control circuitry" as used herein refer to the electronic components which control the release of the image signal from the pixel array

Ex. 1001 ('742 Patent) at 5:2-5.

The '742 Patent describes that the components which control the release of the image signal from the pixel array include:

> "The timing and control circuits **92** are used to control the release of the image information or image signal stored in the pixel array….The information released from the column or columns is also controlled by a series of latches **102**, a counter **104** and a decoder **106**.

Ex. 1001 ('742 Patent) at 16:9-67.

Petitioner's proposed construction, however, does not reflect the meaning for this term in the context of the '742 Patent. In particular, Petitioner's contends that the function of "timing and control means" is timing and control. Petitioner's construction does not explain what is being controlled and how. Further, the structure identified by Petitioner is not sufficient for controlling the image sensor and lacks the necessary latches, decoders and counters specifically identified in the

'742 Patent and which are needed to control the release of the signals from the image sensor.

D. "said circuitry means for timing and control placed … on a second plane"

In the pending district court action, Petitioner proposed a narrow construction for the term "said circuitry means for timing and control placed … on a second plane," arguing that it is limited to "said circuitry means for timing and control placed in a ***stacked arrangement*** with the image sensor."). Ex. 2005. Notwithstanding this narrow construction, which Patent Owner disputes, Petitioner fails to address the construction and whether the references relied upon Petitioner disclose a ***stacked arrangement***.

E. "a first circuit board … lying in a third plane"

In the pending district court action, Petitioner proposed a narrow construction for the term "a first circuit board … lying in a third plane," arguing that it is limited to "a first circuit board placed in a stacked arrangement with the image sensor." Ex. 2005. Notwithstanding this narrow construction, which Patent Owner disputes, Petitioner fails to address the construction and whether the references relied upon Petitioner disclose a ***stacked arrangement***.

F. "a first circuit board lying in a second plane"

In the pending district court action, Petitioner proposed a narrow construction for the term "a first circuit board lying in a second plane," arguing that it is limited to "a first circuit board placed in a ***stacked arrangement*** with the image sensor and the circuitry means for timing and control." Ex. 2005. Notwithstanding this narrow construction, which Patent Owner disputes, Petitioner fails to address the construction and whether the references relied upon Petitioner disclose a ***stacked arrangement***.

IV. OVERVIEW OF THE ASSERTED REFERENCES

A. Harris

Harris describes a fundamentally different configuration than what is described in the Challenged Claims. Harris is a handheld telephone or a PDA using "any conventional CCD camera." Ex. 1052 (Harris) at 6:1-2. Harris does not teach the critical claim elements and Petitioner concedes this point. Petition at 14. Moreover, Harris was carefully considered in multiple examinations as described in Section V. *See* Ex. 1077.

B. Swift

Swift, an abandoned PCT application that states that its image sensor "is **preferably** of a CMOS/Aps (Active Pixel Sensor) type," Swift's description of its

system architecture betrays the reality that the author merely contemplated placing a CMOS imager within the incompatible CCD system architecture. Swift at 10 (emphasis added). Yet the author presumably gave no thought to the fact that the two systems are incompatible, let alone plug and play, in the way contemplated in Swift. *See* '742 Patent at 1:14-50. Further, there is no description or detail regarding the timing and control circuitry and whether the circuitry is in the same plane or a separate plane from the pixel array. Lacking this critical information, Swift is of little relevance and cumulative of references already considered.

C. Ricquier

Ricquier discloses a dedicated imager (camera) for machine vision applications. Ex. 1033 at 10. The imager includes a 256 x 256 pixel array on the sensor plane, fabricated using 1.5 um CMOS technology. *Id.* The imager was developed as part of the "CIVIS project" with the goal to "acquire data only from a specific region of interest and this with a variable resolution." *Id.* Ricquier describes a test platform for the various components with no description on the configuration or physical layout of the components, which is a core feature of the Challenged Claims.

Critically, having considered CCD-based cameras for this application, the authors instead chose to use CMOS technology "because it offers the selective

addressability **together with the possibility of further cointegration of processing electronics on the same chip**." *Id.* Indeed, the authors explicitly stated that their work was focused on "emphasizing the development of a multi-purpose flexible sensor architecture that can be used as a module in further sensor systems **on a single chip**."

Additionally, Ricquier describes a pixel array with portions of the timing and control circuitry on the same plane as the pixel array (shown in Figure 1).

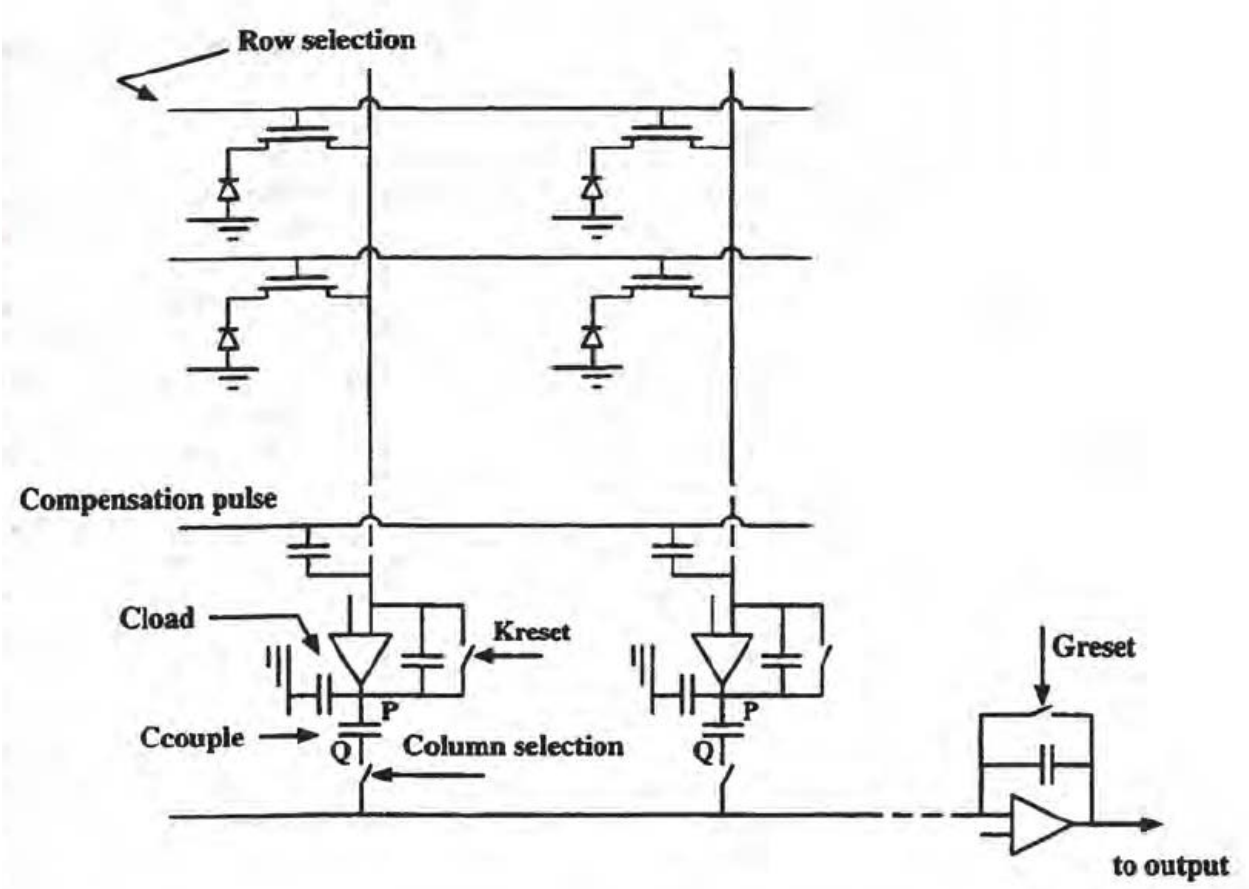


Figure 1: Schematic representation of the sensor architecture

Ex. 1033 at 11.

In addition, Ricquier describes control pulses generated by an external driving unit and states the "signals" can be seen in Figure 1 above. Ex. 1033 at 11. Ricquier further explains that the "off-chip driving unit" is the timing controller for generating the pulse signals trigger the K_{reset} switch and G_{rest} switch which control the release charge and image signal. *Id*. at 12. Ricquier explains that important components of the pixel array include couple capacitors C_{couple} and C_{load} also shown in Figure 1, confirming that the K_{reset} switch and G_{rest} switch are included in the pixel array, contrary to Petitioner's depiction of pixel array (Petition at 40, 46) .:

> ***The pixel array consists of*** 256 by 256 square pixels arranged on a pixel pitch of 19 µm and realised in a 1.5 µm n-well CMOS technology.… The technology used offers two metal layers and two poly layers. ***The second poly layer was exclusively used for the realisation of compact, linear capacitors (0.5 fF / µm2) : the integration capacitors at the output amplifier, the couple capacitors C_{couple} and the load capacitors C_{load} (see figure 1)***. .

Ex. 1033 at 13.

Petitioner's argument that **"**timing and control means," and "circuitry means . . . for timing and control" in Ricquier are "off-chip" is not correct. Ricquier only states that the driving unit and clock signals used for timing and control are placed

off chip. *Id*. at 11. The critical latches, decoders and switches, however, are shown in the same plane as the pixel array, contrary to the Challenged Claims. *Id*. at 13, Figure 1.

As discussed in more detail below, a person having ordinary skilled in the art ("POSITA") would not have modified Harris (or Swift, Tanaka, and Tran) with Ricquier's test bench setup, and Petitioner provides no motivation for doing so.

D. Tanaka

Tanaka discloses an imager with the ability to generate color difference signal and luminance signals. Tanaka fails to describe the details regarding separation of timing and control circuitry, and depicts functional blocks with description of the configuration of pixel array, timing and control circuitry and processing circuitry. Further, as discussed below, Tanaka is cumulative of references already considered.

E. Tran

Tran discloses a CCD imager and describes a "portable computer [that] can communicate data directly with another computer or over the Internet using wireless media such as radio and infrared frequencies or over a landline." Ex. 1051 at 2:55-58. Tran fails to describe the details regarding separation of timing and control circuitry. Like Harris, Tran merely describes the same ability to wirelessly

transmit CCD image data and is cumulative of Harris as described in more detail below.

V. THE BOARD SHOULD DENY THE PETITION PURSUANT TO 35 U.S.C. § 325(D)

The Board should exercise its discretion to deny institution of the *inter partes* review of the Challenged Claims of the '742 Patent under 35 U.S.C. § 325(d). The prior art relied on by Petitioner was previously considered and distinguished during prosecution of the '742 Patent and the arguments presented by Petitioner add nothing new from what was already known and considered by the Examiner during prosecution.

The Board uses the following two-part framework: (1) whether the same or substantially the same art or arguments previously were presented to the Office; and (2) if either condition of the first part of the framework is satisfied, whether Petitioner has demonstrated that the Office erred in a manner material to the patentability of the Challenged Claims. *Advanced Bionics, LLC v. MED-EL Elektromedizinische Geräte GmbH*, IPR 2019-01469, Paper 6 at 8-9, (PTAB Feb. 13, 2020) (precedential) (setting forth the two-part framework to demonstrate "a commitment to ***defer to previous Office evaluations*** of the evidence of record ***unless material error is shown***") (emphasis added).

Here, the same or substantially the same art and arguments were previously presented to the Office as evidenced by the prosecution histories of '742 Patent and its related patents, and the Petitioner failed to demonstrate that the Office materially erred in the patentability of the Challenged Claims.

A. Petitioner Presents the Same Prior Art or Arguments That Were Previously Considered by the Office

The Board reviews the following relevant factors, identified in *Becton, Dickinson, & Co. v. B. Braun Melsungen AG*, IPR2017-01586, Paper 8, at 17-18 (PTAB Dec. 15, 2017), to determine if the same prior art or arguments were previously considered: factor (a) the similarities and material differences between the asserted art and the prior art involved during examination; factor (b) the cumulative nature of the asserted art and the prior art evaluated during examination; and factor (c) the extent of the overlap between the arguments made during examination and the manner in which Petitioner relies on the prior art or Patent Owner distinguishes the prior art. *Id*.

To provide "useful insight into how to apply the framework under 35 U.S.C. § 325(d)," the Board in *Advanced Bionics* advanced these three factors. *Id*. at 9-10. These three factors are "read broadly" and apply to "prior art previously presented to the Office during ***any*** proceeding." *Id.* at 10 (emphasis added).

A. References Involved During Examination.

1. The Prior Art

During prosecution of U.S. Patent Application No. 09/935,993 ("'993 Application"), which later issued as the '742 Patent, the Examiner rejected claims under § 102(e) as being allegedly anticipated, but was overcome as described further below.

During the prosecution of the parent patents of the '742 Patent, U.S. Patent Application Nos. 09/638,976 and 09/175,685, which later issued as the U.S. Patent Nos. 6,424,369 ("'369 Patent") and 6,043,839 ("'839 Patent") respectively, the Examiner rejected claims under § 103 as being allegedly obvious and those rejections were overcome as well. These references considered by the Office during prosecution describe the exact same subject matter relied on by Petitioner and are a part of the intrinsic record of the '742 Patent. *See E.I. du Pont De Nemours & Co. v. Unifrax I LLC*, 921 F.3d 1060, 1070 (Fed. Cir. 2019) (statements made in parent application involving common subject matter with the terms at issue are intrinsic evidence and relevant to construction of terms in child patent).

The Examiner's rejections are summarized in the following tables:

Prior Art References	Exhibit	Patent/Printed Publication
Jacobsen	2026	U.S. Patent No. 6,073,034
Harris	1052	U.S. Patent No. 6,009,336
Upton	2027	U.S. Patent No. 6,141,037
Drottar	2028	U.S. Patent No. 6,147,366
Pelchy	2006	U.S. Patent No. 5,754,313
Zarnowski	2007	Zarnowski & Pace, *Imaging Options Expand with CMOS Technology*, LASER FOCUS WORLD (June 1997)
Danna	2008	U.S. Patent No. 4,491,86
Lenhardt	2009	U.S. Patent No. 5,453,785

Rejection Grounds	References	Statutory Basis	'742 Patent Claims
1	**Jacobsen**	§ 102(e)	78-86[1]
2	**Harris** in view of **Upton**	§ 103	N/A[2]
3	**Harris** in view of **Upton** and **Drottar**	§ 103	N/A[3]
4	**Harris** in view of **Jacobsen**	§ 103	N/A[4]
5	**Harris** in view of **Jacobsen** and **Upton**	§ 103	N/A[5]
6	**Harris** in view of **Upton** and **Jacobsen**	§ 103	N/A[6]

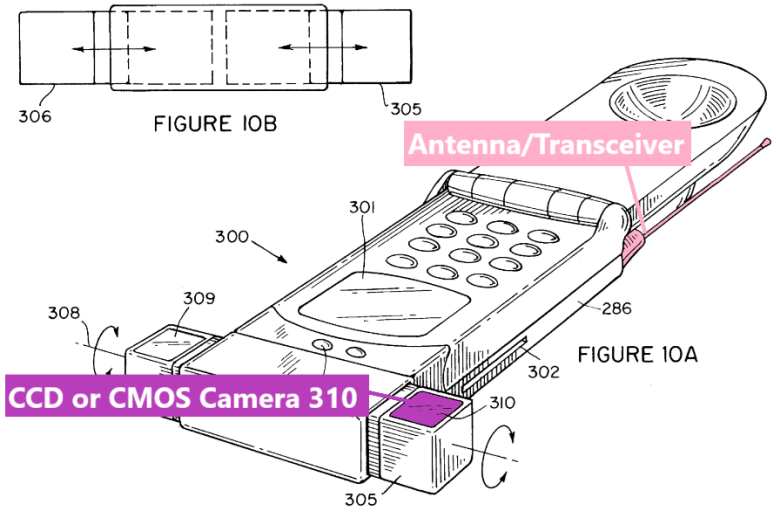
[1] Ex. 1002 at 116-20.
[2] Ex. 1077 at 100-17.
[3] *Id.* at 117-19.
[4] *Id.* at 119-123.
[5] *Id.* at 123-24.
[6] *Id.* at 124-26.

Rejection Grounds	References	Statutory Basis	'742 Patent Claims
7	**Pelchy** in view of **Zarnowski**	§ 103	N/A[7]
8	**Pelchy** in view of **Zarnowski** & **Danna**		N/A[8]
9	**Lenhardt** in view of **Zarnowski**		N/A[9]

a. Jacobsen

Jacobsen describes "a hand-held communication system such as . . . a wireless mobile telephone" that "can be equipped with a camera or solid state imaging sensor so that images can be generated and transmitted to a remote location and/or viewed on the display." Ex. 2026 at 2:26-7; 242:44. A portable phone implementation "can optionally also include a CCD or CMOS camera 310 in module 305." *Id.* at 13:60-14:2. The wireless transmission can be "a transceiver system within the housing that received audio and image data." *Id.* at 18:19-20.

[7] *Ex.* 1003 at 100.
[8] *Id.* at 110, 116-17.
[9] *Id.* at 148.



Id. at Figs. 10A, 10B.

b. Harris

Harris describes a communication device, such as a handheld telephone or a PDA, with a CCD camera in one housing and display in a second housing. Ex. 1052 at 1:23-28; 1:43-45. Harris notes that either the camera housing or the screen housing can be detachable. The communication device in Harris is capable of transmitting and receiving audio and image data via transceivers and both wireless communication within the device and external communication with another device. Ex. 1052 at 3:9-18.

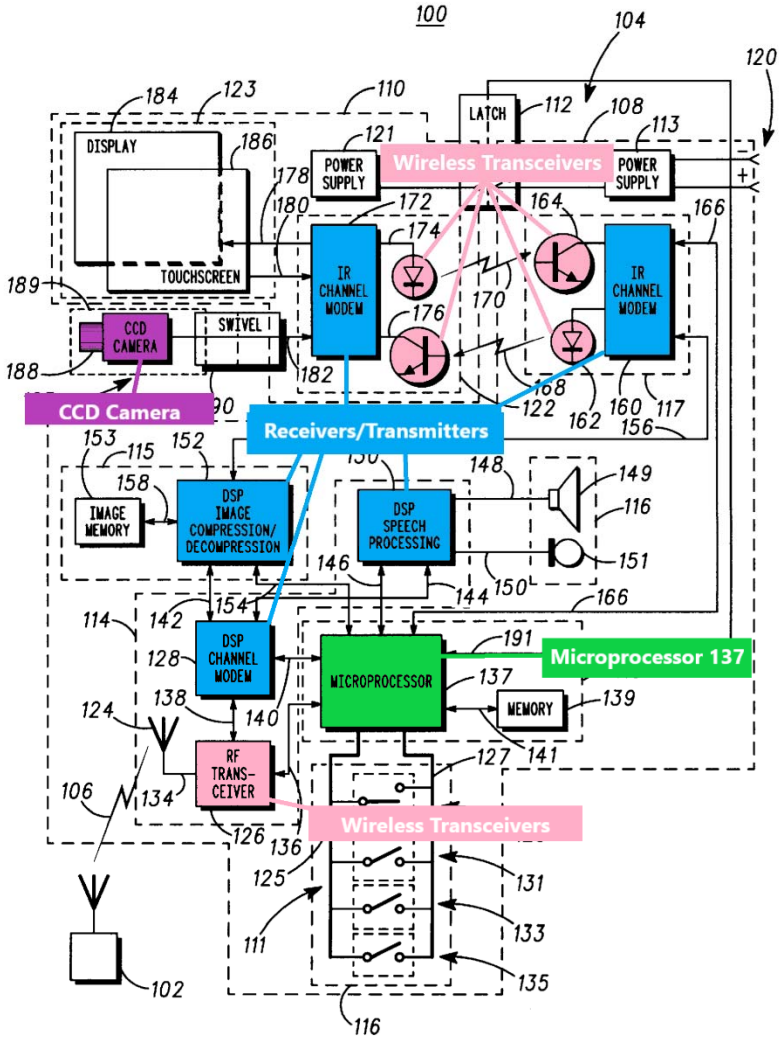


FIG. 1

Ex. 1052 at Fig. 1.

c. Upton

Upton describes an endoscopic video camera with a solid state imager where the "imager 32 is an imager which has suitable low power characteristics, such as a CMOS imager, which typically requires only about 30 mW to operate." Ex. 2027

at 1:23-27; 6:1-3. Upton provides no description of a CMOS implementation other than a reference to the CMOS camera on a chip design. *Id.* at 6:5-12. As shown below, Upton teaches a remote "camera control unit . . . [that] receives signals from the imager which are processed for video display." *Id.* at 1:30-33.

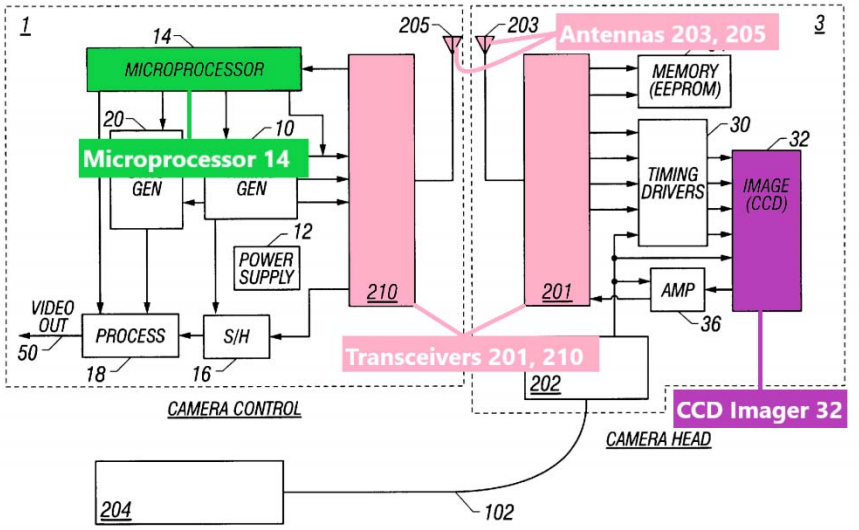


FIG. 6

Id. at Fig. 6.

d. Drottar

Drottar describes "using CMOS and CMOS-compatible fabrication techniques to form an optical device . . . on a substrate along with associated CMOS circuitry, e.g., a processor, which can be a microprocessor such as a digital signal processor or DSP. The processor receives and transmits information using the on-chip optical devices." Ex. 2028 at 2:20-27. The optical device can be either

CCD or CMOS. *Id.* at 2:66-3:1; 4:40-42. As illustrated below, Drottar describes a camera on a chip design which had on chip processing.

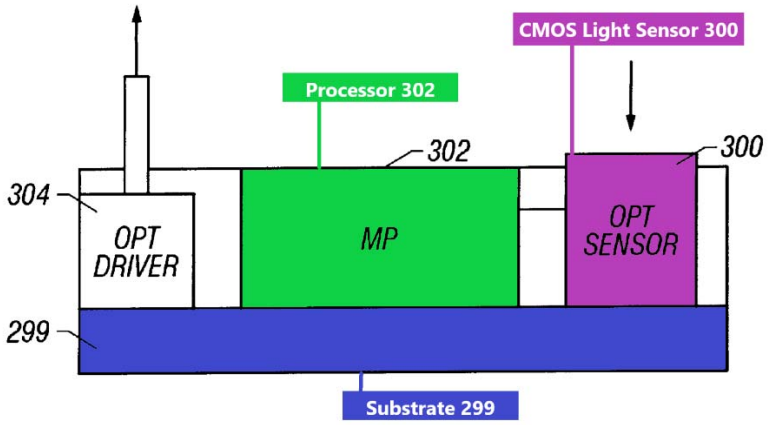


FIG. 3

Id. at Fig. 3.

e. Pelchy

Pelchy describes an image sensor assembly as "[a] solid state imager assembly for use in an insertion tube of a video endoscope" that "includes a CCD imager," and notes that "CCD or CMOS technologies has surpassed the ability of conventional wire bonding techniques to take full advantage of the space savings afforded by these small imagers," although providing no details for CMOS implementation. Ex. 2006 at Abstract, 1:8-12, 3:46-50. As illustrated below, Pelchy also teaches that the CCD (or CMOS) image sensor "is connected to parallelly align circuit boards 27 and 28 mounted beneath the imager in general

perpendicular alignment therewith." *Id.* at 3:54-57. "Circuitry [such as timing and control circuitry] is mounted on the opposed inside surfaces of the boards." *Id.* at Abstract.

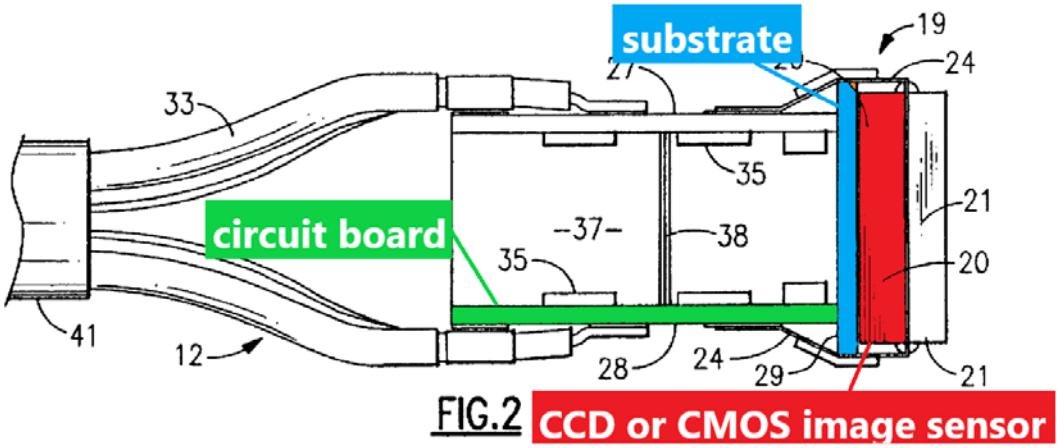


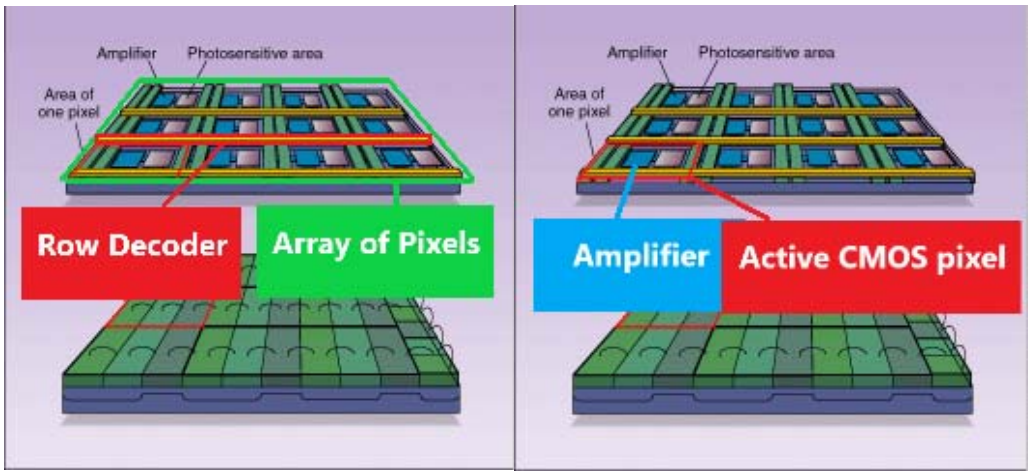
FIG.2

Id. at Fig. 2.

f. Zarnowski

Zarnowski describes how, "[b]y shifting imager designs to CMOS processing [from traditional solid-state imager technologies, e.g., CCD, CID, and PDA], designers can implement many camera functions on-chip." Ex. 2007 at 1. Another section in Zarnowski describes CMOS imagers that "incorporate an amplifier at or near the pixel site, so only one row and column are necessary to address a pixel (*see* Fig. 1 [reproduced further below])." *Id.* at 2 Fig. 1. These "CMOS imagers can be further classified as active- or passive-pixel sensors. An active-pixel sensor (APS) consists of randomly addressable pixels with an

amplifier at each pixel site." *Id.* at 2. Zarnowski provides several images of CMOS imager as illustrated below.

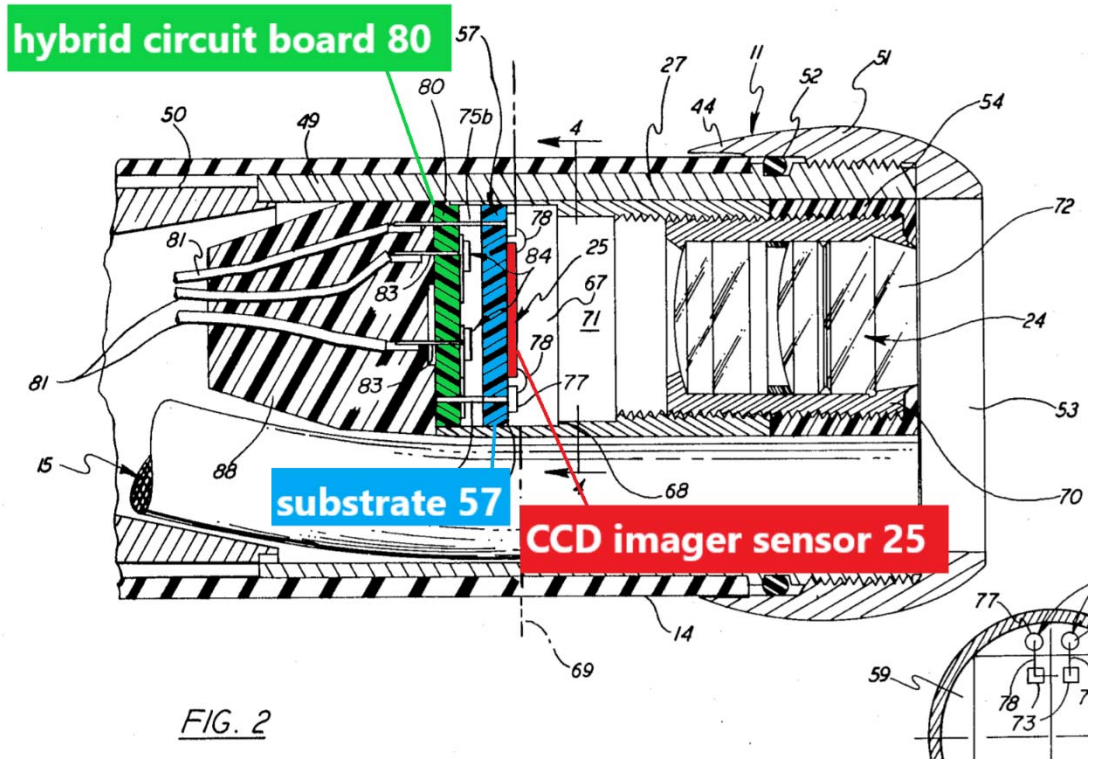


Ex. 2007 at Fig. 1 (top image depicting a CMOS active-pixel sensor (APS)).

g. Danna

Danna describes "a compact image sensor package for use in an endoscope or borescope," including "a solid state sensor 25," which "[i]n practice, the imager sensor is a charge coupled device (CCD)." Ex. 2008 at Abstract, 2:62-65. Danna discloses that "[t]he solid state image sensor 25 is mounted upon the front surface of [a circular or disc-like substrate 57] with the image recording surface of the sensor being supported in coplanar relationship with the [image sensor]." *Id.* at 4:7-11. In particular, Danna describes that "a hybrid circuit board 80 is also mounted . . . immediately behind the support substrate" and "the circuit board contains circuitry for supporting the operation of the image sensor and for

processing signal information that is exchanged between the sensor and the external electrical section." *Id.* at 4:33-39. Danna's CCD imager design is illustrated below.



Ex. 2008 at Fig. 2.

h. Lenhardt

Lenhardt describes a measuring camera which "[f]or the contactless measurement of length in two-dimensional and three-dimensional space." Ex. 2009 at 1:13-14. The camera uses a semiconductive image sensor 4, preferably a CCD image sensor. *Id.* at 6:39-40. Indeed, "[t]he readout of the image sensor 4

and the preparation of the image signals for the signal processing and evaluation is effected in the manner known for CCD video cameras and which have proved to be satisfactory." *Id.* at 6:41-45. Specifically, Lenhardt shows "five printed circuit boards 21 onto which the active and passive electronic components are affixed" placed in parallel with image sensor 4. *Id.* at 6:47-50. Lenhardt's CCD image sensor and board circuitry orientation is illustrated below.

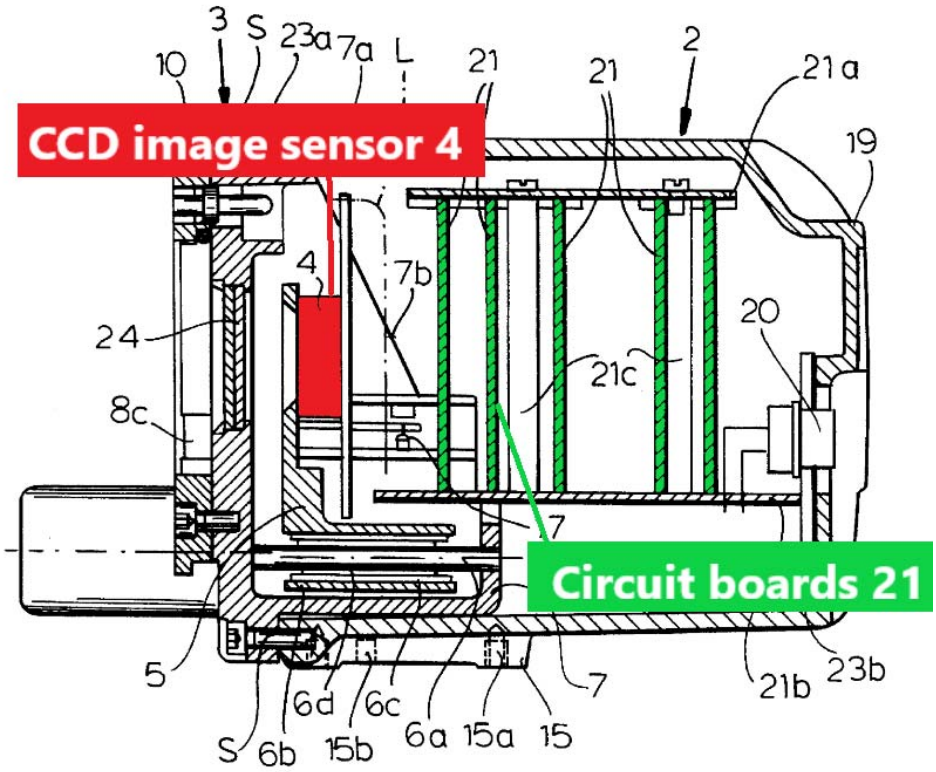


FIG.2

Ex. 2009 at Fig. 2.

2. Similarities Between, and the Cumulative Nature of, the Asserted Art and the References from Examination

Petitioner asserts references that contain substantial similarities to, and no material differences from, the references evaluated by the Examiner during prosecution. In this case, Petitioner relies on the following asserted references and grounds against Claims 42, 58, and 66, as summarized in the following charts:

References

Asserted Reference	Exhibit	Patent/Printed Publication
Harris	1052	U.S. Patent No. 6,009,336
Swift	1018	WO Application Publication No. 99/18613
Ricquier	1033, 1038	Ricquier, N., *et al.*, *CIVIS Sensor: A Flexible Smart Imager with Programmable Resolution*, PROC. SPIE CHARGE-COUPLED DEVICES & SOLID STATE OPTICAL SENSORS IV (Feb. 1994).
Tanaka	1009	US. Patent No. 4,700,219
Tran	1051	U.S. Patent No. 6,202,060

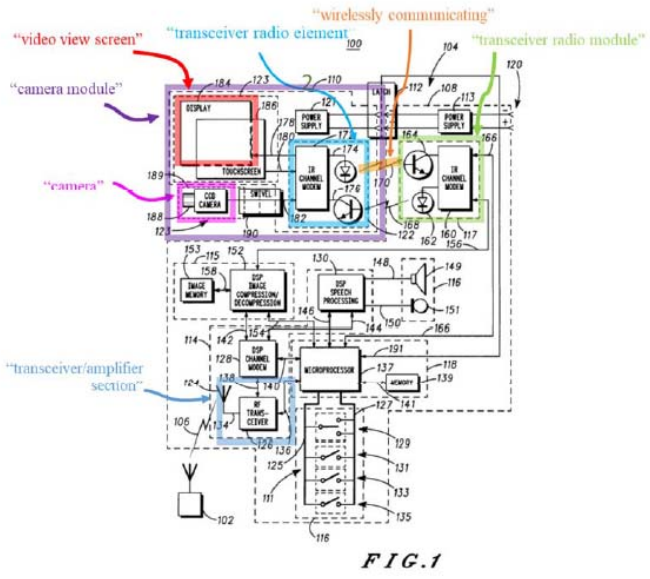
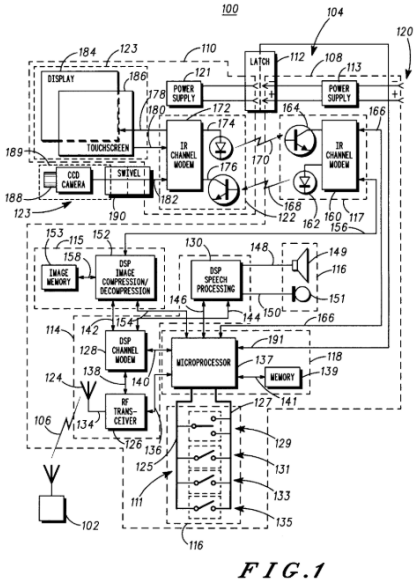
Grounds

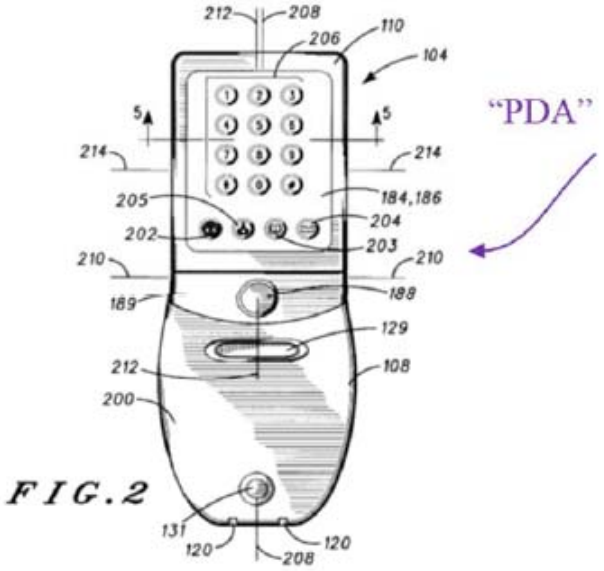
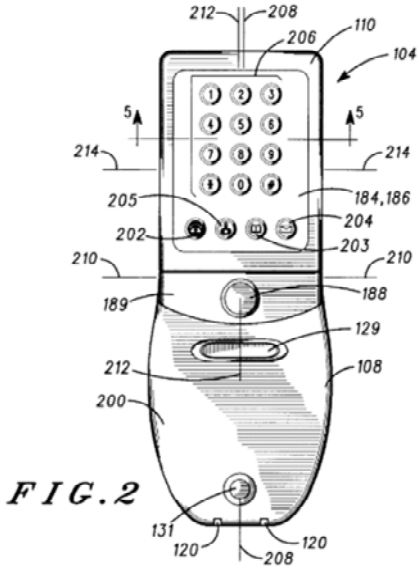
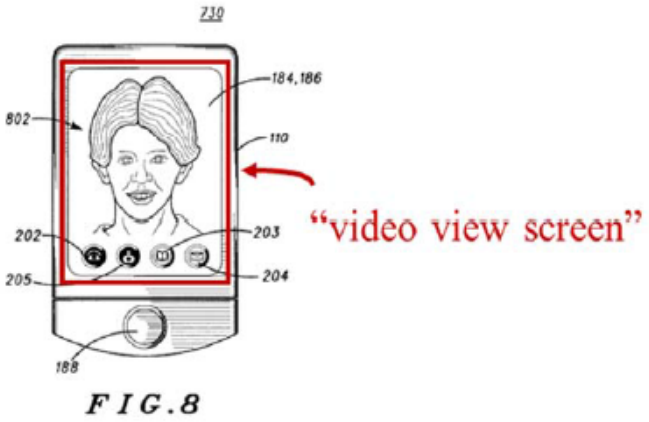
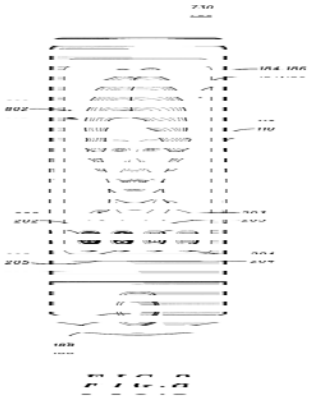
Ground No.	Asserted Grounds	Statutory Basis	Claims
1	**Harris** in view of **Swift** in further view of **Ricquier**	§ 103	42, 58, 66
2	**Harris** in view of **Swift** in further view of **Ricquier** and **Tanaka**		
3	**Harris** in view of **Swift** in further view of **Ricquier** and **Tran**		66
4	**Harris** in view of **Swift** in further view of **Ricquier**, **Tran**, and **Tanaka**		

a. Grounds 1 and 2: References Used Against Claims 42, 58, and 66

(i) Harris Compared to Harris

Harris was expressly considered and overcome during the prosecution of the ’742 Patent and its parent, the ’369 Patent. Therefore, the Harris reference Petitioner asserts is not merely similar—it is exactly the exact same reference that the claims of the ’742 Patent were granted over, by the same Examiner, in multiple related patent applications, including the ’742 and ‘369 Patents. Ex. 1002 at 125 and Ex. 1077 at 128. The table below illustrates these similarities.

Harris Asserted in Petition	**Harris Considered During Prosecution**
 FIG.1	 FIG.1
Ex. 1052 at Fig. 1.	Ex. 1052 at Fig. 1.

Harris Asserted in Petition	Harris Considered During Prosecution
 FIG. 2 Ex. 1052 at Fig. 2.	 FIG. 2 Ex. 1052 at Fig. 2.
 FIG. 8 Ex. 1052 at Fig. 8.	 FIG. 8 Ex. 1052 at Fig. 8.

(ii) Swift Compared to Danna and Pelchy

One of the primary references relied upon by Petitioner, Swift, demonstrates key similarities in image sensor-circuit board orientation with Pelchy and Danna.

Swift describes a miniature camera that can use a **CMOS/APS image sensor** carried on a **circuit board**, which is mounted on a chassis. Swift at Abstract. In particular, Swift refers to a CMOS APS imager developed by Eric Fossum and described in Ex. 2004—the same Eric Fossum whose CMOS imagers are repeatedly referred to in the '839 Patent prosecution history and related patents. As shown in Swift's Figs. 2 and 4, Swift describes an image sensor/circuit board design and orientation in which an **image sensor**, referred to as preferably a CMOS imager, is carried on **a circuit board** and mounted at an orthogonal angle to a **second circuit board**. *See id.* at 11-16. Various **circuitry components** are mounted on the **second orthogonal circuit board** to provide power to the **image sensor** as well as to host the video processor circuitry. *Id.* at 11.

Patent Owner notes that in addition to describing a CMOS/APS image sensor as described in a June 1993 *Laser Focus World* article by Eric Fossum, Swift describes that the image sensor is preferably, but not necessarily, a CMOS image sensor. The application claims in Swift similarly recite the camera device with and without the sensor being a CMOS sensor. This is consistent with the state of imager sensors in 1994, when Swift was filed, and still in 1997—the priority date for the '839 Patent. In that 1993–97 time frame, it was well-established that CCD image sensors were the dominant technology used in such security

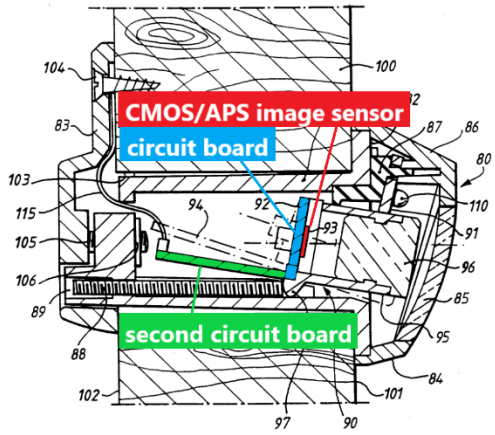
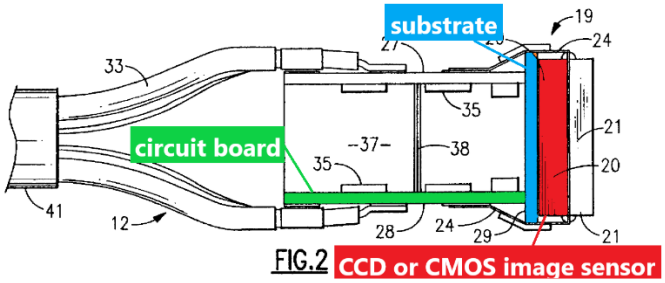
surveillance applications. *See* Ex. 2036 at 224 (CCD was dominant technology for security and surveillance camera systems in 2007).

During prosecution of the '839 Patent, Dr. Jack Baird addressed this very same issue. Reviewing Armstrong—a *Business Week* article describing a CMOS image sensor developed by Eric Fossum (Ex. 1060)—combined with Pelchy, Dr. Baird provided a declaration explaining the problems with the combination, including that "standard CCD technology [from Pelchy] is impractical for making a reasonably small CCD imaging device with all imaging elements on a single plane," as would be the design for the Fossum CMOS imager. Ex. 1003 at 91. Further, Dr. Baird explained that "on-chip processing [taught in the Fossum CMOS imager] impractical with standard CCD technology . . . . In fact, the CCD process is so unique that it simply is not possible to put timing and control circuits co-planar with the pixel array." *Id.* at 92. In other words, Dr. Baird explained that the Armstrong article was correct—it was known to those skilled in the art that CMOS technology was synonymous with a camera-on-a-chip architecture—an incompatible design with CCD devices that separated the CCD pixel array from other off-chip circuitry.

Just as Dr. Baird explained that Pelchy's separate pixel array and off-chip circuitry reflected a conventional CCD design and was, in fact, a CCD device, the

same analysis applies here. The design of Swift, if not using a CMOS APS image sensor, reflects a standard CCD imager design with off-chip circuitry, such as the video processor on separate, parallel circuit boards. On the other hand, given that Swift utilizes Fossum's CMOS APS imager, the off-chip circuitry described in Swift is implemented *on chip* in the CMOS embodiments, as also disclosed and explained in Zarnowski. *See* § III.A.2.a.ii, *infra*.

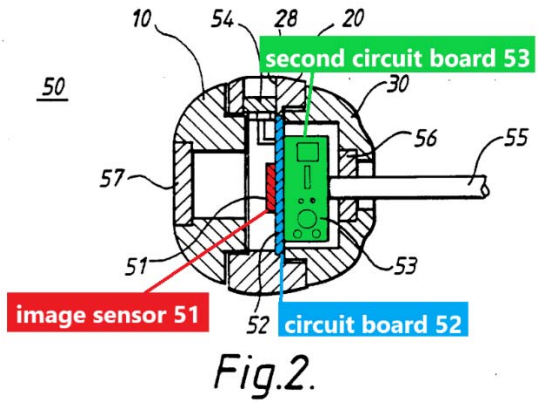
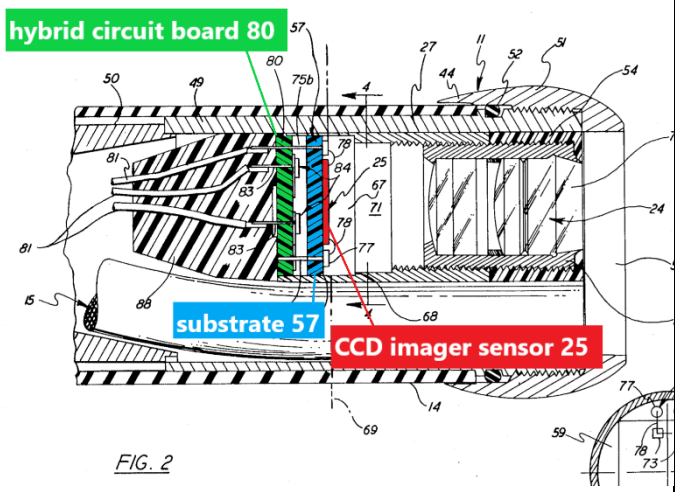
The table below illustrate the similarities between Swift and Pelchy.

Swift	Pelchy
 Fig.4. Ex. 1005 at Fig. 4.	 FIG.2 Ex. 2006 at Fig. 2.

Similar to Swift's image sensor, Pelchy teaches **an imager package** that includes **a CCD or CMOS image sensor**. Pelchy at 1:8-12; 3:46-50. Just as Swift's **image sensor** is mounted to a **circuit board**, Pelchy describes that the

image sensor is mounted upon a **substrate** via various attachment means. *Id.* at 3:66-4:2; *see also id.* at 6:1-10 (epoxy resin). Also as Swift discloses various circuitry components mounted on a **second orthogonal circuit board**, Pelchy describes mounting circuit components 35 on the inside face of **one of two parallel boards (e.g., circuit board 28),** which are perpendicular to the image sensor. Pelchy at 4:17-21. As shown in Fig. 2, Pelchy shows the **substrate** coupled to **the circuit board** in an orthogonal fashion.

The table below illustrates these similarities between Swift and Danna.

Swift	Danna
 Fig.2. Swift at Fig. 2.	 FIG. 2 Danna at Fig. 2.

Similar to Swift's image sensor, Pelchy teaches an imager package that includes a CCD or CMOS image sensor. Pelchy at 1:8-12; 3:46-50. Just as Swift's image sensor is mounted to a circuit board, Pelchy describes that the image

sensor is mounted upon a substrate via various attachment means. *Id.* at 3:66-4:2; *see also id.* at 6:1-10 (epoxy resin). Also as Swift discloses various circuitry components mounted on a second orthogonal circuit board, Pelchy describes mounting circuit components 35 on the inside face of one of two parallel boards (e.g., circuit board 28), which are perpendicular to the image sensor. Pelchy at 4:17-21. As shown in Fig. 2, Pelchy shows the substrate coupled to the circuit board in an orthogonal fashion.

Like Swift's non-CMOS embodiment, Danna teaches **a CCD image sensor** mounted upon the front surface of the **substrate** with the image recording surface of the sensor. *See* Danna at 4:4-12. As shown in Fig. 2, Danna describes **a hybrid circuit board**, containing circuitry thereon, mounted within the image sensor housing immediately behind the support **substrate** for the image sensor. *See* Danna at 4:33-41, fig. 2. Fig. 2 shows an exemplary orientation in Danna such that the **circuit board** is parallel to the **CCD image sensor** mounted on the **substrate**. *See* Danna at 4:33-41, fig. 2.

(iii) Swift Compared to Zarnowski

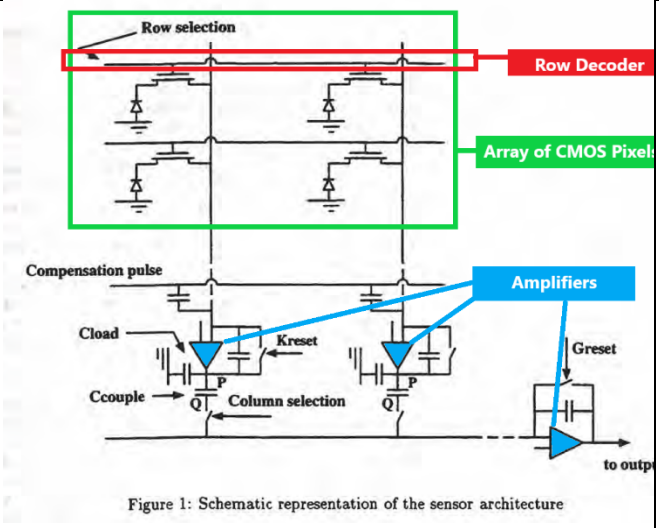
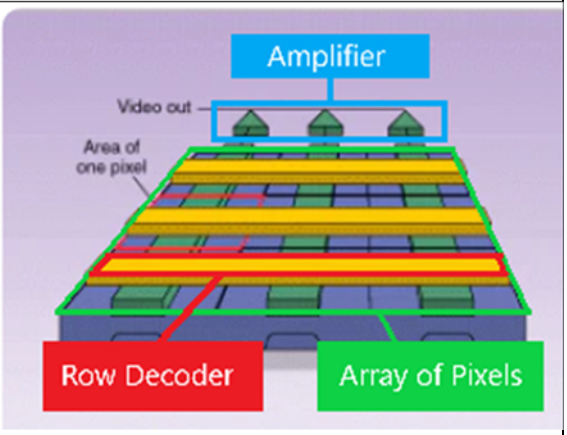
Swift describes a CMOS APS image sensor as set forth in the 1993 *Laser Focus World* article by Eric Fossum. Eric Fossum was a recognized inventor of CMOS imager technology and emphasized the camera-on-a-chip design which

featured on-chip integration. Fossum at 4. This same CMOS APS imager technology is also disclosed in Zarnowski. Indeed, Swift's citation of Eric Fossum's article *Active-Pixel Sensors Challenge CCDs* in the context of CMOS/APS sensors indicates that Swift's teaching and usage of CMOS/APS image sensors are directed to a camera-on-a-chip-based design. *See id.* at 12; Fossum at 2 (demonstrating a clear motivation to combine APS sensors with on-chip electronics), 4 (same). Zarnowski thus speaks to the very same subject matter as Swift/Fossum.

(iv) Ricquier Compared to Zarnowski

Another primary reference relied upon by Petitioner—Ricquier—also demonstrates crucial resemblances in CMOS image sensor technology with Zarnowski, already considered during prosecution. The table below illustrates these similarities. Ricquier describes a CMOS-camera-on-a-chip technology that "offers the selective addressability together with the possibility of further *cointegration of processing electronics on the same chip*." Ex. 1033 at 8 (emphasis added). Ricquier's work is closely related to this research of "processing circuitry [being] integrated at the edges of the photodiode array exploiting the possibility to access a whole row of data at once"—*i.e.*, "the development of a multi-purpose flexible sensor architecture that can be used as a

module in further *sensor systems on a single chip*." *Id.* at 9 (emphasis added). As shown in Fig. 1, Ricquier provides an X-Y addressable pixel architecture and "[b]ased on X-Y addresses and control pulses generated by an external driving unit, [i.e., "processing electronics" "***cointegrat[ed] . . . on the same chip***,"] two decoders drive one particular row selection and column selection signal." *Id.* at 8-9 (emphasis added). In Fig. 1, Ricquier lays the **pixel structure** and the different read out stages of the pixel charges. *Id.* For instance, "[t]he readout of the charge packets . . . proceeds as follows. After selecting one particular row of **pixels**, these charges are converted simultaneously to a voltage at the output of the different charge sensitive **amplifiers** located at the end of the column readout lines." *Id.*

Ricquier	**Zarnowski**
 Figure 1: Schematic representation of the sensor architecture Ricquier at Fig. 1.	 Zarnowski at 2 Fig. 2 (the bottom image depicting a CMOS passive pixel sensor).

Like Ricquier, Zarnowski teaches a CMOS passive-pixel imager in Fig. 2 featuring "randomly addressable pixels with **amplifiers** at the end of the columns." *Id.* at 7 Fig. 2. Zarnowski states that "Passive CMOS sensors use standard CMOS processes with on-chip video amplification. To overcome the lower biasing requirements and improve noise characteristics of passive pixels, photogates or photodiodes feature an amplifier at the end of each row or column, along with FPN correction circuitry." *Id.* at 5.

(v) Tanaka Compared to Upton

As Petitioner claims, Tanaka describes "a video processor, including a 'white-balancing circuit' that converts the 'output signal of an imaging device' into a 'composite color video signal." Petition at 51 (citing Ex. 1009 at Abstract, 1:66-2:6, 2:65-3:6, 3:48-53, 4:40-53). However, Upton contains the same disclosure—"Those skilled in the art will recognize that . . . [r]esponsive to [which balance signal or electronic exposure control], at least one of the following signals or combination of signals would be generated and then transmitted to the control unit . . . the pre-video or composite video signal, the luminance and chrominance video signals, or a digital video signal." Ex. 2027 at 9:56, 10:13-22. Therefore,

disclosure of Tanaka is cumulative over the disclosure of Upton that was considered and overcome during prosecution of the '742 and '369 Patents.

b. Grounds 3 and 4: References Used Against Claims 66

(i) Harris Compared to Harris

See the above analysis in subsection 1(b)(i)(1), *supra*.

(ii) Swift Compared to Danna and Pelchy

See the above analysis in subsection 1(b)(i)(2), *supra*.

(iii) Swift Compared to Zarnowski

See the above analysis in subsection 1(b)(i)(3), *supra*.

(iv) Ricquier Compared to Zarnowski

See the above analysis in subsection 1(b)(i)(4), *supra*.

(v) Tanaka Compared to Upton

See the above analysis in subsection 1(b)(i)(5), *supra*.

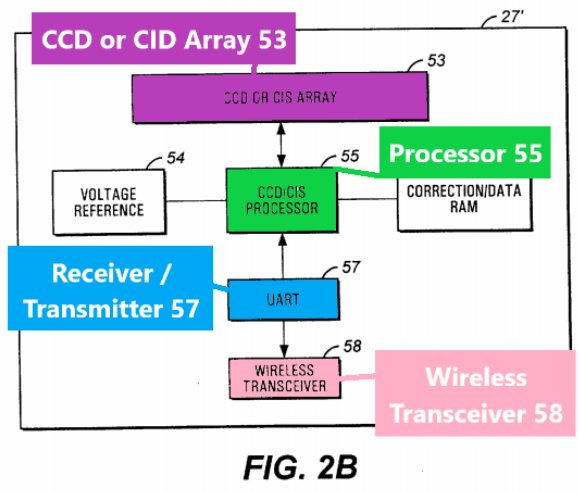
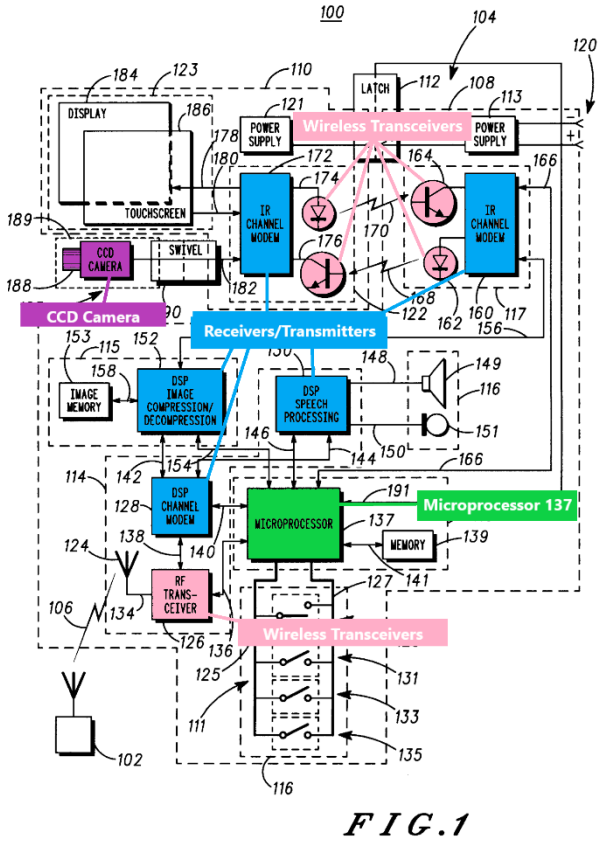
(vi) Tran Compared to Harris and Jacobsen

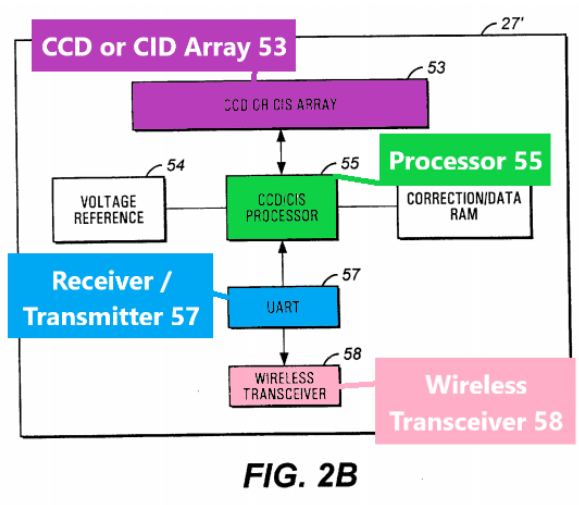
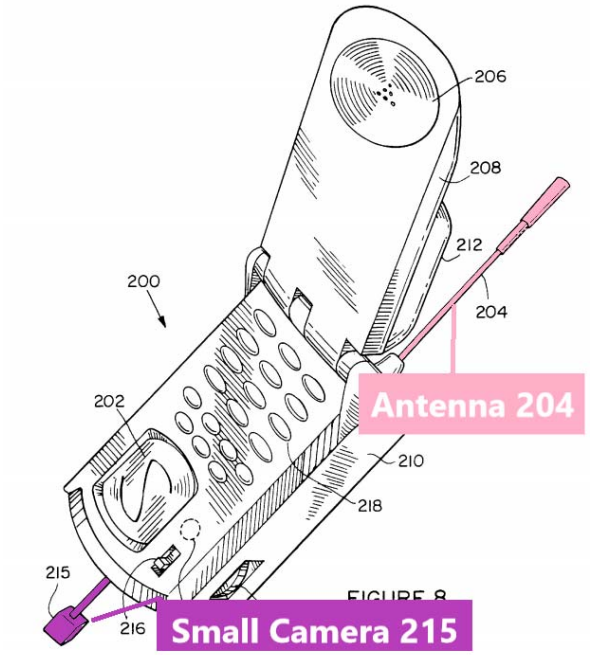
Another primary references relied upon by Petitioner, Tran, demonstrates crucial Another primary references relied upon by Petitioner, Tran, demonstrates crucial resemblances in transceiver technology described in Harris and Jacobsen, previously considered during prosecution of the parent '369 Patent. The tables below illustrates these similarities. Tran discloses a CCD imager and describes a "portable computer [that] can communicate data directly with another computer or

over the Internet using wireless media such as radio and infrared frequencies or over a landline." Ex. 1051 at 2:55-58. Tran notes that "the two-way communication device 31 can be substituted with a cellular telephone." Ex. 1051 at 7:59-63. However, like Harris and Jacobsen, Tran describes substantially the same ability to wirelessly transmit CCD image data. For example, to quote Petitioner, Harris "teaches an 'antenna 124' and an 'RF transceiver 126' electrically coupled to the 'wireless data transceiver 117' of the PDA for amplifying and further transmitting the video signals originating from the camera, and for receiving and converting 'incoming RF signals of the communication link 106' into 'electrical receive signals' which contain 'image data [and] speech data.' Ex. 1052 3:40-49, 3:50-58, 3:59-65.

Similarly, Jacobsen describes " a hand-held communication system such as . . . a wireless mobile telephone" that "can be equipped with a camera or solid state imaging sensor so that images can be generated and transmitted to a remote location and/or viewed on the display." Ex. 2026 at 2:26-7, 2:42-44. As recited in by Jacobsen claim 1, the wireless transmission can be "a transceiver system within the handset housing that receives audio and image data." *Id.* at 18:19-20. As shown in Figure 8, Jacobsen describes "a cellular telephone 200 having a magnified micro display in accordance with the invention. . . . An antenna 204 can telescope out of

the base for improved wireless reception. . . . Additionally, a small camera 215 such as a charge coupled device (CCD) or other solid state imaging sensor can be mounted on a telescoping element to provide an imaging or video-conferencing capability." *Id.* at 12:25-46. Therefore, Tran described nothing beyond the CCD imagers in Harris and Jacobsen, as well as the same ability to support wireless transmission by these devices.

Tran Cited by Petitioner	Harris Considered by Office
 FIG. 2B Ex. 1051 at Fig. 2B.	 FIG. 1 Ex. 1052 at Fig. 1.

Tran Cited by Petitioner	Jacobsen Considered by Office
 FIG. 2B Ex. 1051 at Fig. 2B.	 Ex. 2026 at Fig. 8. "A wireless **telephone** having a display panel comprising: . . . **a transceiver system** within the handset housing that **receives** audio and image data." Ex. 2026 at Claim 1.

The foregoing substantial similarities between, and the cumulative nature of, the asserted art and the prior art involved during examination, causes this factor to weigh heavily in favor of a determination that the asserted art is the same as the references that were previously considered by the Office.

B. The Extent of the Overlap Between the Arguments Made During Examination and the Manner in Which Petitioner Relies on the Prior Art or Patent Owner Distinguishes the Prior Art.

1. Examiner's Arguments

During prosecution of the '742 Patent, the Examiner considered Harris and Jacobsen as prior art (Ex. 1002 at 125), allowed claims 1-77 (*Id.* at 120), and rejected claims 78-86 over Jacobsen (*Id.* at 116-20), as summarized in the following charts:

Prior Art References	Exhibit	Patent/Printed Publication
Jacobsen	2026	U.S. Patent No. 6,073,034, to Jacobsen et al.

'742 Patent Rejection Grounds	References	Statutory Basis	Claims
1	**Jacobsen**	§ 102(e)	78-86

See Ex. 1002 at 125.

The Examiner allowed application claims 1-77 over numerous references including Harris, because the independent claims recited a video system having a camera module that was not obvious nor anticipated over the art of record. Ex. 1002 at 120. The key claim language recited:

> a PDA for conducting wireless telephonic communications, the improvement comprising:

> ***a video system integral with said telephone*** for receiving and transmitting video images, and for viewing said video images, said video system comprising:
>
> ***a camera module housing an image sensor therein***, said image sensor including an array of pixels for receiving images thereon, said image sensor further including circuitry means on said first plane and coupled to said array of pixels for timing and control of said array of pixels, said image sensor producing a pre-video signal, a first circuit board mounted in said camera module adjacent said image sensor and electronically coupled to said image sensor, said first circuit board including circuitry means for converting said pre-video signal to a desired video format, said camera module further including a transceiver radio element mounted therein and electrically communication with said first circuit board to transmit said converted pre-video signal . . .which "is a feature that is ***not obvious nor anticipated over the art of record***."

Id. at 120 (emphasis added). Indeed, inapposite with the above claimed improvement of a video system ***integral with the PDA***, Petitioner admits that Harris teaches "a PDA with a ***detachable*** camera module," which contains a CCD camera. Petition at 23; Ex. 1052 at 5:45-57, Fig. 1.

As a result, Patent Owner was granted the Challenged Claims.[10]

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[10] Regarding claims 78-86, the Examiner recognized that Jacobsen describes a PDA capable of conducting video conferencing communications through a communications network and discloses transmission of video images from a CMOS pixel array. *See, e.g.*, Ex. 1002 at 117 (citing to Ex. 2026, 12:38-46, 14:1-10). Patent Owner traversed the Examiner's rejection, arguing "Jacobsen does not disclose any form of a PDA that can be physically separated or disconnected from a PDA yet still provide capability for the user to take video images." Ex. 1002 at

2. Examiner's Arguments in Related Prosecution Matters

a. '369 Patent

During prosecution of the '742 Patent and its parent patent application, which issued as the '369 Patent, the Examiner rejected claims under § 103 as being allegedly obvious over Harris and Jacobsen as well as other references, as summarized in the following charts:

Prior Art References	Exhibit	Patent/Printed Publication
Jacobsen	2026	U.S. Patent No. 6,073,034, to Jacobsen et al.
Harris	1052	U.S. Patent No. 6,009,336, to Harris et al.
Upton	2027	U.S. Patent No. 6,141,037, to Upton et al.
Drottar	2028	U.S. Patent No. 6,147,366, to Drottar et al.

'369 Patent Rejection Grounds	References	Statutory Basis	Claims
1	**Harris** in view of **Upton**	§ 103	1-3, 5, 8-9, 13-19, 21, 24, 29-35, 37, 40, 45-66

162. Indeed, Patent Owner pointed out that Jacobsen only discloses a camera that "is physically connected to the communication device housing and further, there is no disclosure whatsoever of wireless transmission of the video images for processing/viewing" as recited in those claims (which are not the Challenged Claims). *Id.*

'369 Patent Rejection Grounds	References	Statutory Basis	Claims
2	**Harris** in view of **Upton** in further view of **Drottar**	§ 103	10-11, 26, 27, 42-43
3	**Harris** in view of **Jacobsen**	§ 103	67-68, 70-75
4	**Harris** in view of **Jacobsen** in further view of **Upton**	§ 103	69
5	**Harris** in view of **Upton** in further view of **Jacobsen**	§ 103	9, 12, 25, 28, 41, 44

The Examiner recognized that Harris describes "a PDA having a capability to transmit data between a personal computer connected to a global communications network . . . However, Harris fails to discloses [sic] that this embodiment with the camera module would have a CMOS sensor as in [the] claim . . ." *See, e.g.*, Ex. 1077 at 113-14 (citing to Ex. 1052, 1:40-5). The Examiner then argued that combining Harris with Upton would satisfy that limitation. *Id.* at 114. According to the Examiner, given Upton's teaching of an "image sensor . . . including circuitry means on said first plane . . . for timing and control of said array of CMOS pixels, said image sensor producing a pre-video signal, a first circuit board lying [in] a second plane . . . having circuitry means for converting said pre-video signal to a desired video format, a transceiver/amplifier section . . . for

transmitting, receiving, and amplifying said video and audio signals . . . it would have been obvious for one of ordinary skill in the art to incorporate the Upton CMOS camera into Harris PDA/telephone . . . " *See, e.g.*, *id.* at 114-15. The Examiner further argued that Drottar discloses that each pixel of the CMOS sensor has a photo diode for producing photo electrically generated signals, access transistors, and amplifiers. *See, e.g.*, *id.* at 117.

Patent Owner overcame these rejections, resulting in the issued claims of the '369 Patent.

b. '839 Patent

During prosecution of '685 Application, which later issued as the '839 Patent, the Examiner rejected claims 1, 4, 30, and 32 (now claims 1, 4, 28, and 30, respectively) over the combinations of several references, as summarized in the following chart:

Rejection Grounds	References	Statutory Basis	Claims
1	**Pelchy** in view **Zarnowski**	§ 103	1
2	**Pelchy** in view of **Zarnowski** & **Danna**		4
3	**Lenhardt** in view of **Zarnowski**		1, 4, 30, & 32 (issued as 1, 4, 28, & 30)

See Ex. 1003 at 100, 110, 116.

The Examiner recognized that Pelchy describes "a video endoscope that includes a TAB imager package," Pelchy at Abstract, but "the use of a TAB imager could be also apply [sic] [to a] CMOS based imager." *See, e.g.*, Ex. 1003 at 100-01 (citing to Ex. 2006, 1:7-10). To the extent that Pelchy "fails to disclose the [sic] that the image sensor further includes timing and control circuitry means on said first plane and coupled to said pixel array such as a CMOS imager," the Examiner argued that combining Pelchy with Zarnowski would satisfy that limitation. *Id.* at 101. According to the Examiner, "given [Zarnowski's] teaching of advantageously using a passive CMOS image sensor, it would have been obvious for one of ordinary skill in the art to modify the Pelchy apparatus by incorporating [Zarnowski's] disclosed passive CMOS imager for the standard Pelchy imager . . . in order to minimize power consumption." *See, e.g.*, *id.* at 101.

The Examiner also focused on the fact that the **Pelchy-Zarnowski** combination "fails to disclose the parallel positioning of the circuit boards with the image sensor board." *Id.* at 112. The Examiner offered Danna for "the parallel arrangement of an image sensor and a circuit board in an endoscopic imaging housing in order to make the imaging head more compact . . . in order to reduce patient discomfort." *Id.* at 112 (citing Danna, 2:35-45, 4:20-68). The Examiner

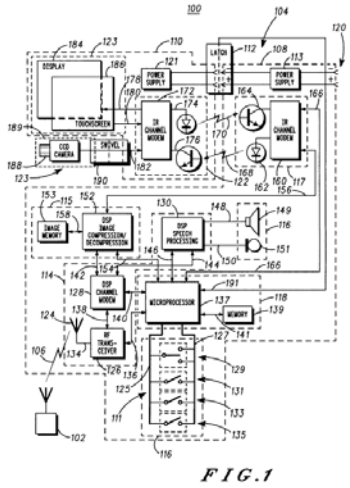
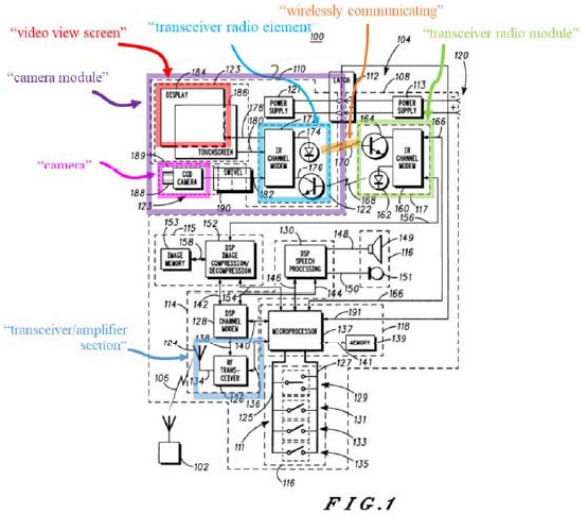
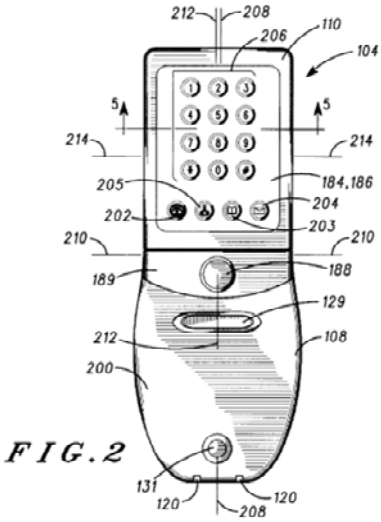
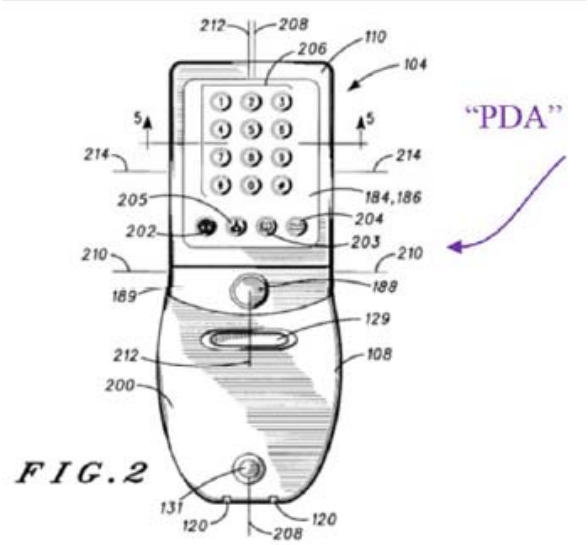
found "it would have been obvious for one of ordinary skill in the art to modify the Pelchy-[Zarnowski] apparatus to have its CMOS imager and circuitry boards aligned in a parallel fashion as taught by Danna in order to reduce patient discomfort suffering to the larger arrangement as taught by the primary reference (Pelchy: figures 6-7)." *Id.* at 112.

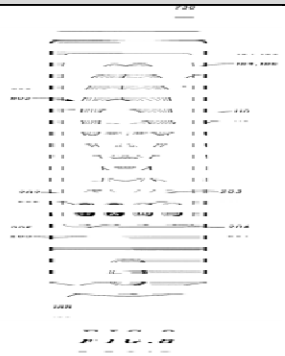
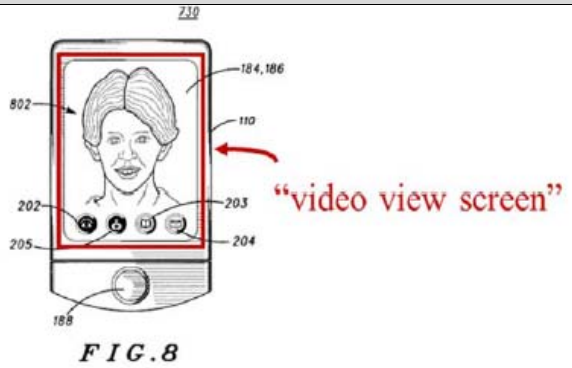
The Examiner also considered Lenhardt, which describes a measuring camera that has a camera housing and further includes a semiconductive image sensor 4, "preferably a CCD image sensor," parallel to five printed circuit boards 21 onto which the active and passive electronic components are affixed. *See, e.g.*, *id.* at 148 (citing Lenhardt, 6:39-50). To the extent that Lenhardt "fails to disclose the [sic] that the image sensor further includes timing and control circuitry means on said first plane and coupled to said pixel array such as a CMOS imager," the Examiner argued that a **Lenhardt-Zarnowski** combination would satisfy that limitation. *See, e.g.*, *id.* at 149. Again, according to the Examiner, "given [Zarnowski's] teaching of advantageously using a passive CMOS image sensor, it would have been obvious for one of ordinary skill in the art to modify the Lenhardt apparatus by incorporating [Zarnowski's] disclosed passive CMOS imager for the standard Lenhardt imager . . . in order to minimize power consumption." *See, e.g.*, *id.* at 149.

Patent Owner overcame these rejections, resulting in the issued claims of the '839 Patent.

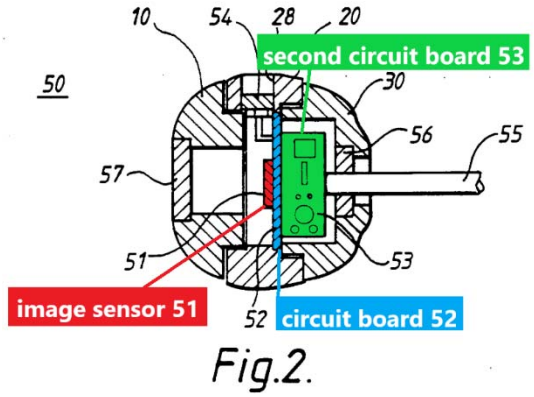
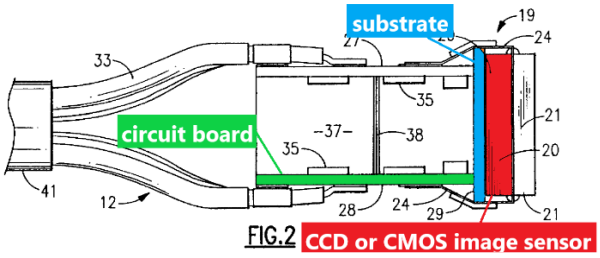
3. Petitioner's Arguments

Here, Petitioner recites substantially the same arguments in its Petition. For claim 42, 58, and 66—similar to the Examiner's **Harris-Upton** CCD/CMOS combinations during prosecution of the '742 Patent and its related patents, Petitioner introduces and heavily relies upon **Harris** in view of **Swift** and **Ricquier** for combining **Harris's** CCD imager PDA with a detachable camera module with Swift's CMOS camera on a chip and **Ricquier's** CMOS pixel array and timing and control disclosure. Petition at 18-19. Petitioner's conventional CCD devices and CMOS imager devices describe off-chip and on-chip integration combinations, respectively, are the exact same combinations of conventional CCD and CMOS image devices already considered by the Office. As explained previously, the **Harris** Patent was expressly considered and overcome—it is the exact same reference—as illustrated below.

Asserted Art	Examined Prior Art
Harris	Harris
 FIG. 1	 FIG. 1
Ex. 1052 at Fig. 1	Ex. 1052 at Fig. 1
 FIG. 2	 FIG. 2
Ex. 1052 at Fig. 2	Ex. 1052 at Fig. 2

Asserted Art	Examined Prior Art
Harris	**Harris**
 Ex. 1052 at Fig. 8	 FIG. 8 Ex. 1052 at Fig. 8

Also for Claims 42, 58, and 66, similar to the Examiner's **Pelchy-Zarnowski** CCD/CMOS combination, Petitioner introduces and heavily relies upon **Swift** in view of **Ricquier** for combining either **Swift's** "preferably" CMOS image sensor with **Ricquier's** passive pixel imaging system using a "CMOS pixel array." Petition at 19 ("**Swift** describes a CMOS imaging device where the image sensor lies in a first plane and converting circuitry connected to the image sensor lies in a second, parallel plane behind the image sensor."), 20-48. Thus, the **Swift-Ackland** Combination overlaps with the same subject matter and argument used in prosecution to combine CMOS camera on chip technology (*e.g.*, Zarnowski) with a CCD or CMOS device (*e.g.*, Pelchy).

Asserted Art	Examined Prior Art
Swift	**Pelchy**
 Fig.2. Ex. 1005 at Fig. 2.	 Ex. 2006 at Fig. 2.

To the extent **Harris** as modified by **Swift** does not describe "circuitry means for converting said pre-video signal to a desired video format," Petitioner depends on **Tanaka** for providing the disclosure. Petition at 50-55. However, the Examiner already evaluated Petitioner's argument using the **Harris-Upton** combination because **Upton** discusses achieving a desired video format through its video processing disclosure which is substantially similar to the video processing disclosure in **Tanaka**. Ex. 1077 at 101 (citing Upton at 10:60-68).

C. Petitioner Failed to Sufficiently Demonstrate Error by the Office.

Having met the first prong of *Advanced Bionics*, the second prong requires that if the "same or substantially the same art or arguments previously were

presented to the Office," then the Board will determine whether Petitioner made a "showing that the Office erred in evaluating the art or arguments." *Advanced Bionics*, Paper 6 at 8. That is, if ***either*** condition of the first part of the framework ***is satisfied***, the Petitioner ***must*** point out sufficiently ***how the examiner erred*** in its evaluation of the asserted prior art. *Id.* (citing *Becton, Dickinson*, Paper 8 at 24). Regarding the second prong, the relevant *Becton, Dickinson* factors are: factor (c)—the extent to which the asserted art was evaluated during examination, including whether the prior art was the basis for rejection; factor (e)—whether Petitioner has pointed out sufficiently how the Examiner erred in its evaluation of the asserted prior art; and factor (f)—the extent to which additional evidence and facts presented in the Petition warrant reconsideration of the prior art or arguments. *Becton, Dickinson*, Paper 8 at 17-18.

To provide "useful insight into how to apply the framework under 35 U.S.C. § 325(d)," the Board in *Advanced Bionics* advanced these three factors—factor (c), in particular, which "focuses on the record developed by the Office in reviewing the art or arguments"—as they "relate to whether the petitioner has developed a material error by the Office." *Advanced Bionics*, Paper 6 at 9-10. Once the Board reviews factor (c), the Board's review informs Petitioner's burden to produce "evidence of previous Office error" set forth in factors (e) and (f). *Id.* at 10. For

instance, "if the alleged error is a disagreement with a specific finding of record by the Office," then "the petitioner's required showing of material error ***must overcome persuasively*** that specific finding of record." *Id.* at 10-11 (emphasis added).

As a preliminary matter, Petitioner must show that the Office erred "in a manner material to patentability." *Advanced Bionics*, Paper 6 at 8. "An example of a material error may include misapprehending or overlooking specific teachings of the relevant prior art where those teachings impact patentability of the challenged claims." *Id.* at 8-9 n.9. "Another example may include an error of law, such as misconstruing a claim term, where the construction impacts patentability of the challenged claims." *Id.* Here, Petitioner made no showing that the Office erred at all, much less "in a manner material to patentability."

D. The Extent to Which the Asserted Art Was Evaluated During Examination, Including Whether the Prior Art Was the Basis for Rejection.

Here, the exact same reference, Harris, was considered during examination. Although Petitioner's other references are not the exact references used as the basis for the obviousness rejection during examination, as described above, the other asserted references are completely cumulative, and as a result, substantially the

same art is advanced in the Petition as was evaluated during examination. *See* Subsection A.1, *supra*.

E. Whether Petitioner has Pointed Out Sufficiently How the Examiner Erred in its Evaluation of the Asserted Prior Art.

The Examiner correctly evaluated the very same subject matter and arguments during prosecution, as explained above. Further, Petitioner makes no effort to point out—much less sufficiently point out—how the Examiner erred in its evaluation of the asserted prior art. Not once does Petitioner in the 87-page Petition say or explain how the Examiner erred in his analysis, or failed to appreciate the key features of Harris or Jacobsen, such as the descriptions of CCD imagers, transceivers, and amplifiers implemented in a PDA or including a video system integral with a telephone. As explained in Section A, *supra*, Petitioner makes use of substantially the same, cumulative references as the prior art evaluated during examination, as well as the same arguments.

If Petitioner can only show that "reasonable minds can disagree regarding the purported treatment of the art or arguments," then Petitioner has failed to show that the Office erred "in a manner material to patentability." *Advanced Bionics*, Paper 6 at 9. That is the case here. "If a condition in the first part of the framework is satisfied and the petitioner fails to make a showing of material error,

the Director generally will exercise discretion not to institute *inter partes* review." *Id.* at 8-9 (exercising discretion where "Petitioner has not pointed to error by the Examiner"). Here, Petitioner has not pointed to error by the Examiner. If anything, Petitioner merely shows that the very arguments advanced here were fully considered and rejected during prosecution.

Thus, the Director should exercise discretion not to institute *inter partes* review on the basis of Section 325(d).

VI. THE BOARD SHOULD DENY THE PETITION PURSUANT TO 35 U.S.C. § 314(A) BASED ON THE ADVANCED STAGE OF THE CO-PENDING DISTRICT COURT LITIGATION

The Board should exercise its discretion under § 314(a) and deny the Petition because institution of this proceeding would not be consistent with the objective of the AIA to "provide an effective and efficient *alternative* to district court litigation." *NHK Spring Co., Ltd. v. Intri-Plex Techs., Inc.*, IPR2018-00752, Paper 8 at 20 (PTAB Sept. 12, 2018) (precedential) (denying IPR institution where prior art previously considered and co-pending district court proceeding nearing completion).

Petitioner's filing of this Petition, along with 19 other petitions challenging Patent Owner's patents, demonstrates a volume-based, litigation-focused approach, rather than a substance-based tactical challenge on validity. However, volume

alone cannot compensate for the lack of substantive merit in each of Samsung's IPR petitions, including this one. As set forth in detail in § III, the subject matter of the references and arguments in each of Petitioner's IPR Petitions has already been considered, rejected and overcome during the course of a twenty-year period of review by the Office. During this twenty year period, the applications, including the underlying application here, were thoroughly examined, and ultimately allowed. *See* Section V. This litigation-based decision to file 20 IPR petitions is not an attempt to provide an effective and efficient *alternative* to district court litigation—it is just another litigation strategy.

In addition to rehashing old prior art and arguments in the district court and IPR petitions, Samsung's invalidity contentions challenged the Asserted Patents on 35 U.S.C. §101 and 35 U.S.C. §112, grounds that can only be resolved in district court. *See* 35 U.S.C. § 311(b) (restricting the scope of IPR petitions to anticipation and obviousness grounds). Moreover, pursuant to the Scheduling Conference in the parallel proceeding, Patent Owner is permitted to substitute any of the asserted claims at any time, so long as there is a rational basis for the substitution. *See* Ex. 2010 at 21:25-22:5. As a result, Patent Owner can assert claims in district court that are not and will not be subject to any IPR proceeding, significantly reducing

the likelihood that institution of IPR on any of the challenged claims will simplify matters.

When determining whether to exercise discretion under § 314(a), the Board "takes a holistic view" and balances the following "considerations of system efficiency, fairness, and patent quality" as recently applied in a Precedential Order from the PTAB:

> (1) whether the court granted a stay or evidence exists that one may be granted if a proceeding is instituted; (2) proximity of court's trial date to the Board's projected statutory deadline for a final written decision; (3) investment in the parallel proceeding by the court and the parties; (4) overlap between issues raised in the petition and in the parallel proceeding; (5) whether the petitioner and the defendant in the parallel proceedings are the same party; and (6) other circumstances that impact the exercise of discretion, including the merits.

Apple Inc. v. Fintiv, Inc., IPR2020-00019, Paper 15, at 7-8 (PTAB May 13, 2020) (precedential). As explained herein, the 314(a) factors weigh plainly in favor of denial of this Petition.

A. Factors That Favor Discretionary Denial

1. Factor 2: Proximity of Court's Trial Date to the Board's Projected Statutory Deadline for a Final Written Decision

The advanced stage of the proceedings here weighs heavily in favor of denying institution. The parallel proceeding has been pending for over a year. During that time, the court set a case schedule and the pretrial conference is set for August 17, 2020. *See* Ex. 2011, 26-27. Further, based on the court's guidance, a trial date is likely to be set for the end of 2020 or early 2021 at the pretrial conference, thus resulting in a quick resolution of this dispute by the district court. *See* Ex. 2011, 15 ("The parties should expect to be given a firm trial setting that is 90 to 120 days from the date of the final pretrial conference, and should be available for trial accordingly.").

In contrast, an institution decision will issue on or around August 21, 2020, and if the Board institutes trial, a final written decision would likely issue in September 2021. *See* 37 C.F.R. §§ 42.100(c), 42.200(c) and 42.300(c). After a final written decision is provided by the PTAB, the parties have the right to appeal that decision to the Federal Circuit, a process that can take more than an additional year and a half to conclude, thus likely extending the matter into 2023. 35 U.S.C. § 141(c). As a result, this factor weighs in favor of discretionary denial. *See, e.g.*,

E-One, Inc. v. Oshkosh Corp., No. IPR2019-00161, Paper 16 (PTAB May 15, 2019) (denying institution under due to a parallel district court trial scheduled eleven months away); *Next Caller Inc. v. TRUSTID, Inc.*, No. IPR2019-00961, Paper 10 (PTAB Oct. 16, 2019) (denying institution where the district court trial was set for nine months in the future and the prior art asserted substantially overlapped with the parallel district court litigation).

2. Factor 3: Investment in the Parallel Proceeding by the Court and the Parties

The parties and the court have heavily invested time and resources in the parallel proceeding. *See* Section B above. On February 14, 2019, Patent Owner filed its Complaint for infringement. Ex. 2011 at 1. On May 28, 2019, Petitioner filed a motion to dismiss, which the court denied on October 2, 2019. *See* Ex. 2011 at 16, 37. Following a hearing on June 10, 2019, the court entered a Scheduling Order. Ex. 2011 at 27. Pursuant to that Order, Patent Owner served its preliminary infringement contentions on November 21, 2019, including 113 claim charts and accompany document production. On January 21, 2020, Petitioner served its Invalidity Contentions, along with 29 invalidity charts. On March 13, 2020, Patent Owner served its Response to Petitioner's Invalidity Contentions.

To date, Patent Owner has served requests for production and interrogatories. Ex. 2012, Caplan Decl. ¶¶ 2-3. Petitioner has responded to both. *Id*. at ¶¶ 10-11. Petitioner served two sets of interrogatories and requests for production. *Id*. at ¶¶ 4-6. Patent Owner has responded to both. *Id*. at ¶¶ 7-9. Between August 26, 2019 and May 7, 2020, Patent Owner made seven document productions, including conception and reduction to practice documents, non-disclosure and licensing agreements. Between October 1, 2019 and May 8, 2020, Petitioner made nine document productions, including extrinsic evidence support for claim construction, user manuals, 3D CAD/CAM models, and technical documents such as image sensor specifications, camera module specifications, and processor specifications. *Id*. at ¶ 12.

The parties are now working on claim construction that will be fully briefed within a month—by June 23, 2020. Ex. 2003 at 11. Fact discovery is closing shortly thereafter—in June 2020 or 60 days after the court's Claim Order. *Id.* at 11. Expert discovery is expected to close in October 2020. *Id.* at 12-13. In light of the extreme investment in the district court litigation by the parties and the court, this factor weighs in favor of discretionary denial. *See Cisco Sys., Inc.*, *v. Ramot At Tel Aviv Univ. Ltd.*, IPR2020-00122, Paper 15 (PTAB May 15, 2020) (finding this

factor weighing in favor of discretionary denial of institution in nearly identical circumstances).

3. Factor 4: Overlap Between Issues Raised in the Petition and in the Parallel Proceeding

Petitioner asserts substantially the same references in the district court action as it raises in this case:

Alleged Prior Art Asserted in District Court	**Alleged Prior Art Asserted in IPR Petition**
Harris – U.S. 6,009,336 **Swift - WO Application No. 95/34988** **Tanaka – U.S. 4,700,219** **Adair – WO Application No. 99/18613** **CU-SeeMe - Publication** **Ackland - U.S. 5,835,141** **Suzuki - U.S. 5,233,426** **BusinessWeek – Publication** **Fossum – U.S. 5,665,959** **Stam – U.S. 5,837,994** **Chamberlain – U.S. 5,221,964** **Sharp YH-7B12/8B12 – Publication** **Hurwitz - Publication**	Harris – U.S. 6,009,336 Swift – WO Application No. 95/34988 Tanaka – U.S. 4,700,219 Tran – U.S. 6,202,060 Ricquier – Publication

Alleged Prior Art Asserted in District Court	**Alleged Prior Art Asserted in IPR Petition**
Larson – U.S. 5,541,640 **Yakida – U.S. JPH 08140143** **Wakabayashi – U.S. 5,903,706**	

Ex. 2037. There is, therefore, substantial overlap between the art and issues raised in the Petition and in the district court proceeding. This factor weighs very heavily in favor of discretionary denial. *Cisco Sys. , Inc., v. Ramot At Tel Aviv University Ltd.*, IPR2020-00122, Paper 15 (PTAB May 15, 2020).

4. Factor 5: Whether the Petitioner and the Defendant in the Parallel Proceedings Are the Same Party

The parties in the district court proceeding are the same parties in this IPR proceeding. This factor weighs in favor of discretionary denial. *See Apple Inc. v. Fintiv, Inc.*, IPR2020-00019, Paper 15 (PTAB May 13, 2020).

5. Factor 6: Other Circumstances That Impact the Exercise of Discretion

Although not explicitly a *Fintiv* factor, Petitioner's lack of delay in filing this, and the 19 other petitions for IPR of the asserted patents should weigh in favor of discretionary denial under § 314(a). Indeed, at least one decision of the

PTAB has indicated that "the Petitioner's diligence in filing its Petition" should be considered "as an 'other circumstance' under this *Fintiv* factor." *Cisco*, IPR2020-00122, Paper 15 at 12 (Crumbly, APJ, dissenting). In this case, Petitioner in delayed filing this Petition until February 15, 2020, almost exactly one year after service of the Complaint—the last day to do so under § 315(b). *See* Ex. 2002 (Complaint served on Feb. 19, 2019). And contrary to the *Cisco* case, this Petition was filed well *after* the Petitioner filed its invalidity contentions. Accordingly, Petitioner's lack of diligence in filing this Petition is another factor that weighs in favor of discretionary denial under § 314(a).

B. Factor That is Neutral

1. Factor 1: Whether the Court Granted a Stay or Evidence Exists That One May Be Granted If a Proceeding Is Instituted

Immediately upon filing its 20 IPRs, Petitioner filed a motion to stay the district court litigation. *See* Ex. 2011 at 56. That motion was fully briefed on April 15, 2020, and remains unresolved. This factor is therefore at least neutral.

Given the likely completion of the parallel proceeding months before the final written decision, the overlap between the issues in the parallel proceedings and this IPR, and the unlikelihood this IPR will streamline the parallel proceeding, institution of this proceeding would not be consistent with the objective of the AIA

to "provide an effective and efficient *alternative* to district court litigation." *NHK Spring Co., Ltd. v. Intri-Plex Techs., Inc.*, IPR2018-00752, Paper 8 at 20 (PTAB Sept. 12, 2018) (precedential). Accordingly, the Board should exercise its discretion and deny institution under § 314(a).

VII. CLAIMS 42, 58 AND 66 ARE PATENTABLE

A. Ground 1: Claims 42, 58 and 66 are Patentable Over Harris in View of Swift and Ricquier

1. Timing and Control Circuitry Means on a First Circuit Board in a Second Plane

Despite citing to multiple references and combinations, no reference (or combination) relied upon by Petitioner provides any description or detail regarding the planar arrangement and relationship between the pixel array, timing and control circuitry and processing circuitry. Indeed, Harris, Swift and Ricquier do not indicate whether timing and control circuitry is on the same plane as the pixel array or processing circuitry — the critical elements of the Challenged Claims. Compounding these gaping holes in the references, Petitioner incorrectly argues that a POSITA would have modified these references by taking components from CMOS sensors and using them with CCD sensors , technologies that are incompatible, as stated in the references themselves and the '742 Patent. Ex. 1033 (Ricquier) at 10 (CCD architecture has inherent difference from CMOS

architecture); Ex. 1001 ('742 Patent) at 1:48-50. Accordingly, Ground 1 provides no basis for institution.

Petitioner admits that Harris (a PDA with a CCD imager) fails to disclose where and how the pixel array, timing and control circuitry and processing circuitry are arranged. Petition at 41, 22-23. Petitioner's reliance on Swift and Ricquier does not cure these deficiencies as Petitioner admits that Swift also fails to disclose how timing of its pixels are controlled or the arrangement. Petition at 26, 42, 44.

Instead, Petitioner relies on Ricquier, a presentation describing prototype development in a bench-test environment and which fails to describe the configuration of pixel array, timing and control circuitry and processor. As described above, Ricquier describes a prototype "Sensor Concept" in a bench-testing environment and portions of the timing and control circuitry are shown in the same plane as the pixel array, including critical capacitors and switches (as shown in Figure 1 of Ricquier). Ex. 1033 at 11. Other portions, such as the programmable clock and pulse generator, are described as being "in an off-chip driving unit." *Id*. at 12. As such, Ricquier fails to disclose timing and control circuitry that is in a different or second plane from the pixel array as recited in the Challenged Claims.

Additionally, Petitioner fails to provide any basis for combining and modifying both Harris – a wireless PDA with a CCD imager in view of Swift – a security camera with a Fossum APS CMOS sensor, and in further view of Ricquier which was a prototype CMOS "Sensor Concept" where a portion of the timing and control circuity was removed to facilitate testing and development. Ex. 1033 at 10. Rather, a POSITA would understand that Ricquier was an early development prototype that expressly states the goal of in selecting CMOS "because it offers the selective addressability **together with the possibility of further cointegration of processing electronics on the same chip**." Thus, Petitioner's arguments that Ricquier would have motivated a POSITA to modify the CCD imager in Harris or imager in Swift to use an off-chip design lacks credibility and is contrary to the stated goal of Ricquier.

2. Processing on a First Circuit Board in a Second Plane

As explained above, Harris, Swift and Ricquier provide no description of the configuration or arrangement of critical elements in the Challenged Claims. Petitioner admits that Harris does not teach the configuration of processor on a first circuit board in a second plane. Petition at 41. Petitioner's contention that Swift cures this defect is flawed.

Swift discloses utilizing the APS-type sensors disclosed in the "Laser Focus World" article referenced therein. *See* Ex. 1005 at 10; Ex. 2007.[11] The APS sensors refer to the same "camera[s] on a chip" referenced in the Background of the Invention section of the '742 Patent, which differ from the prior art CCD imagers because they "incorporate a number of other different electronic controls that are usually found on multiple circuit boards of much larger size." '742 Patent at 1:57-55.

One of the "electronic controls" found on Fossum's APS-type sensor is the claimed circuitry means:

> Their device, a type of "active pixel sensor," has more in common with a computer chip than with a conventional CCD. Since it's made on standard semiconductor production lines, it taps into enormous economies of scale and should cost much less than CCDs. One chip can incorporate all manner of electronic controls that are usually on multiple chips, from timing circuits to zoom and anti-jitter controls. By consolidating many functions and reading images in a more efficient way, it requires one-hundredth the power of a CCD-based system. **And the chip does its own conversion from analog to digital for output**

[11] Petitioner omits citation to the Laser Focus World article cited in Swift despite citing thirty-one other exhibits in support of its Petition.

> **on computer monitors or disk storage**. About all it needs is a power source and a lens to focus light on it.

Ex. 1060 at 1; *see also* Ex. 20x07 (Laser Focus World) (disclosing that CMOS is the "preferred choice for implementation of on-chip signal processing"); *see also* '742 Patent at 1:57-66 (discussing Fossum's "camera on a chip"). Because Fossum's (and therefore Swift's) "camera on a chip" includes the "circuitry means for converting said pre-video signal to a post-video signal for direct reception by a standard video device," Swift does not disclose the claimed "timing and circuitry means" located on a first circuit board lying in a second plane.

Petitioner asserts that Swift's circuitry component mounted on circuit board 53 that is used to "process image signals received" from the image sensor is the claimed "circuitry means." Petition at 37 (citing Swift at 9:5-10). Petitioner's argument ignores its own evidence (and the Laser Focus World article referenced in Swift), which demonstrates that Swift's "APS-type sensor" includes the claimed "circuitry means" *on chip*. Ex. 1060 at 1. Because the APS-type image sensor discussed in Swift already "does its own conversion from analog to digital for output on computer monitors or disk storage," the "image signal" received by Swift's circuitry component used to "process image signals" received from the image sensor cannot be a pre-video signal, as recited in independent claim 1.

And while Petitioner asserts that "Swift's "single circuit board"/"circuit board 53" that includes a "video processor"/"circuitry components" performs the same function disclosed in the '742," the cited evidence demonstrates nothing of the sort. Petition at 43-44. The evidence cited in the Petition only states that Swift's **camera** outputs a signal that may be viewed on a monitor, not that the circuitry component mounted on circuit board 53 is responsible for converting a pre-video signal to a post-video signal. *See* Petition at 43 (citing Swift at 15:7-8, 3:31-4:4, 9:5-13, 17:34-18:3, 18:8-11). In Swift, that is done *on chip*, and any further processing carried out by the circuitry on circuit board 53 is performed on a signal already suitable "for output on computer monitors or disk storage." Ex. 1060 at 1; Ex. 1005 at 10.

Accordingly, Swift fails to disclose circuitry means for processing and converting a pre-video signal to a desired format for direct reception by a standard video device on a first circuit board lying in a different plane than the image sensor because Swift's "circuitry means" are on the same chip as the image sensor.[12]

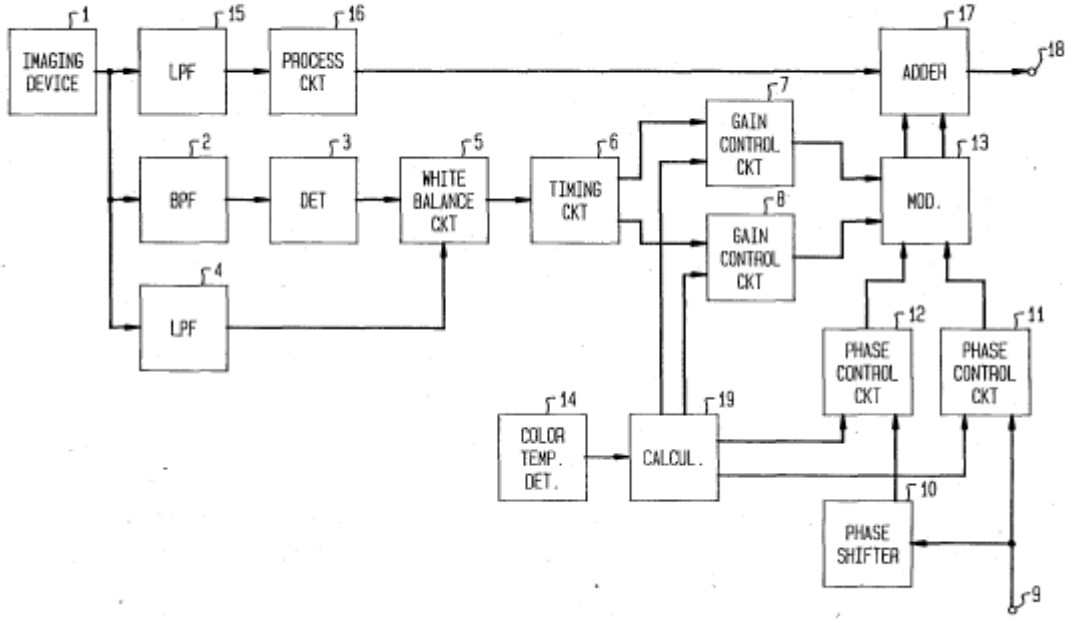
[12] Petitioner does not contend that Ricquier cures the defect in with respect to processing pre-video to post video.

For at least the forgoing reasons, Petitioner has not demonstrated a reasonable likelihood that claims 42, 58, and 66 are unpatentable over Harris in view of Swift, and Ricquier because the proposed combination fails to disclose discloses timing and control circuitry means and

B. Ground 2: Claims 42, 58, and 66 are Patentable over Harris in View of Swift, Ricquier, and Tanaka

Petitioner cites Tanaka, a fourth reference, for purpose of providing additional disclosure of circuitry means for processing and converting pre-video signal to a desire video format. Petition at 80-81. Tanaka, however, does not disclose processing and converting means on a first circuit board in a second plane from the image sensor. Instead, Tanaka discloses nothing more than function block diagrams of different mechanisms for generating luminance signal and color difference signals and fails to teach or suggest the configuration of these functional block diagrams, including, for example, Figure 2 copied below. *See e.g.*, Ex. 1009 at Fig. 2.

FIG. 2



Additionally, Petitioner fails to provide a credible basis for why a POSITA would modify and combine the three other references. Petitioner's hindsight analysis should be rejected.

Because Tanaka fails to cure the deficiencies in Harris, Swift and Ricquier, explained in Ground 1, the Board should find that Petitioner has not raised a reasonable likelihood that Claims 42, 58 and 66 of the '742 Patent are unpatentable under Ground 2.

C. Grounds 3: Claim 66 is Patentable over Harris in View of Swift, Ricquier, and Tran

Petitioner cites Tran added to the combination of Harris, Swift and Ricquier, another four-reference combination, to plug in additional disclosure regarding amplifying video and audio signal transmitted by another party for Claim 66. Petition at 78-80. Even with four-references, however, Tran fails to cure the deficiencies in Harris, Swift and Ricquier as discussed in Ground 1 above, and the Board should find that Petitioner has not raised a reasonable likelihood that Claims 66 of the '742 Patent is unpatentable under Ground 3.

D. Ground 4: Claim 66 is Patentable Over Harris in View of Swift, Ricquier, Tran, and Tanaka

Petitioner cites Tanaka with the combination of Harris, Swift, Ricquier, and Tran, now a combination of five references. Petition at 80-81. Because Tanaka fails to cure the deficiencies in Harris, Swift, Ricquier and Tran, as discussed in Ground 2, the Board should find that Petitioner has not raised a reasonable likelihood that Claim 66 of the '742 Patent is unpatentable under Ground 4.

VIII. Conclusion

Petitioner has not established a reasonable likelihood that it will prevail in establishing that claims 42, 58, and 66 are invalid. Patent Owner accordingly requests that the Board deny institution of *inter partes* review of the '742 Patent.

Respectfully submitted,

Dated: May 21, 2020

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Attorneys for Patent Owner

(Case No. IPR2020-00561)

PATENT OWNER'S EXHIBIT LIST

EXHIBIT NO.	DESCRIPTION
Exhibit-2001	Complaint for Patent Infringement in *Cellect, LLC v. Samsung Electronics Co., LTD and Samsung Electronics America, Inc.,* 1:19-cv-00438, dated February 14, 2019.
Exhibit-2002	Proof of Service for Summons and Complaint, dated February 19, 2019.
Exhibit-2003	Scheduling Order in a Patent Case in *Cellect, LLC v. Samsung Electronics Co., LTD and Samsung Electronics America, Inc.,* 1:19-cv-00438, dated June 10, 2019.
Exhibit-2004	E. Fossum, *Active-pixel sensors challenge CCD,* Laser Focus World, pp. 83-87, June 1993 ("Fossum").
Exhibit-2005	Parties' Joint Claim Construction Chart in *Cellect, LLC v. Samsung Electronics Co., LTD and Samsung Electronics America, Inc.,* 1:19-cv-00438, dated May 8, 2020.
Exhibit-2006	U.S. Patent No. 5,754,313 ("Pelchy").
Exhibit-2007	Zarnowski and Pace, *Imaging options expand with CMOS technology*, Laser Focus World, June 1997 ("Zarnowski")
Exhibit-2008	U.S. Patent No. 4,491,865 ("Danna").
Exhibit-2009	U.S. Patent No. 5,453,785 ("Lenhardt").
Exhibit-2010	Hearing Transcript before Judge Hegarty, dated July 10, 2019.
Exhibit-2011	*Cellect, LLC v. Samsung Electronics Co., LTD and Samsung Electronics America, Inc.,* 1:19-cv-00438 Docket Sheet.
Exhibit-2012	Declaration of Jonathan S. Caplan, dated March 17, 2020.
Exhibit-2026	U.S. Patent No. 6,073,034 ("Jacobson").

EXHIBIT NO.	DESCRIPTION
Exhibit-2027	U.S. Patent No. 6,141,037 ("Upton").
Exhibit-2028	U.S. Patent No. 6,147,366 ("Drottar").
Exhibit-2029	U.S. Patent No. 5,929,901 ("Adair").
Exhibit-2030	PCT WO 90/10361 ("Ullman").
Exhibit-2031	PCT WO 95/15044
Exhibit-2032	U.S. Patent No. 5,896,375 ("Dent").
Exhibit-2033	U.S. Patent No. 6,590,928 ("Haartsen").
Exhibit-2034	U.S. Patent No. 5,471,515 ("Fossum '515").
Exhibit-2035	U.S. Patent No. 5,986,693 ("Adair '693").
Exhibit-2036	Image Sensors, OIDA's Global Optoelectronics Industry Market Report and Forecast, October 2007.
Exhibit-2037	Samsung's Invalidity Contentions, dated January 21, 2020.
Exhibit-2039	Armstrong, *NASA's Tiny Camera has a wide-angle future*, BusinessWeek, pp. 54-55, March 6, 1995. ("Armstrong").
Exhibit-2040	U.S. Patent No. 5,879,289 ("Yarush").
Exhibit-2041	U.S. Patent No. 7,369,176 ("Sonnenschein").
Exhibit-2042	File History of U.S. Patent No. 6,752,255
Exhibit-2043	U.S. Patent No. 5,986,693 ("Adair '693").

CERTIFICATE OF COMPLIANCE WITH 37 C.F.R. § 42.24

This paper complies with the type-volume limitation of 37 C.F.R. § 42.24. The paper includes 12,995 words, excluding the parts of the paper exempted by § 42.24(a).

This paper also complies with the typeface requirements of 37 C.F.R. § 42.6(a)(ii) and the type style requirements of § 42.6(a)(iii)&(iv).

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CERTIFICATE OF SERVICE

The undersigned certifies, in accordance with 37 C.F.R. § 42.6(e), that service was made on the Petitioner as detailed below.

Date of service	May 21, 2020
Manner of service	Electronic Mail (scott.mckeown@ropesgray.com; james.l.davis@ropesgray.com, carolyn.redding@ropesgray.com, Samsung-Cellect-IPR@ropesgray.com)
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