

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

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

v.

CELLECT, LLC,
Patent Owner.

Case IPR2020-00512
U.S. Patent No. 9,186,052

PATENT OWNER'S REQUEST FOR REVIEW BY THE DIRECTOR

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Patent Owner (“PO”) Collect LLC requests rehearing under 37 C.F.R. § 42.71(d)(2) of the finding in the Board’s Final Written Decision (“FWD”) entered on August 17, 2021 in IPR2020-00512 (Paper 32) that claim 2 (the “Challenged Claim”) of U.S. Patent No. 9,186,052 (Ex. 1001, “the ’052 Patent”) is unpatentable. FWD at 2. Petitioner requests review by the Director under the Board’s interim Director review guidance and *Arthrex* FAQ A3 and in accordance with *United States v. Arthrex, Inc.*, 141 S. Ct. 1970 (June 21, 2021), because the Board made several material errors of law and overlooked material facts.

The FWD held the Challenged Claim unpatentable because the claimed invention ***could have*** been made by a person of ordinary skill in the art, ***and not based on whether it would have*** been obvious to a person of ordinary skill in the art. FWD at 33-34. In applying this flawed analysis, the FWD misstates Patent Owner’s (“PO”) analysis of the *Swift* reference as only showing a CCD embodiment to support the false premise that the Challenged Claim is invalid if the *Swift* reference discloses a CMOS image sensor. *Id.* By mischaracterizing PO’s argument and applying the wrong legal standard, the Board forced PO to show that it was not possible make the claimed invention. This was legal error and improperly shifted the burden of persuasion to PO.

Further compounding this legal error, the Board failed to view the asserted references from the perspective of a person of ordinary skill in the art (“POSITA”).

The Board ignored (i) the express teaching in *Swift* to utilize Dr. Fossum's CMOS/APS article for camera-on-a-chip APS CMOS image sensor and (ii) an alternate embodiment that utilized a CCD image sensor as evidenced by the architecture and higher voltage levels — neither of which disclose the claimed invention. *Swift* at 10:4-6 (citing Dr. Fossum's article in Laser Focus World); FWD at 34 (Ex. 2088 ¶¶ 97-98). PO submitted numerous contemporaneous references showing that a POSITA understood Dr. Fossum's APS CMOS image sensor cited in *Swift* utilized a camera-on-chip design. *Id.* The Board improperly ignored this evidence that informed the understanding of a POSITA.

Further, the Board improperly rejected PO's record evidence and expert testimony because PO did not show the claimed APS CMOS image sensor only "***could be used with Swift.***" See, e.g., FWD at 33 (emphasis added). By applying the wrong legal standard and focusing on what ***could*** be done rather than what ***would*** be done by a POSITA, the Board ignored evidence showing a POSITA would not have combined the *Swift* reference with the *Ricquier* and *Suzuki* references in Ground 1, and the additional *Larson* reference in Ground 2.

Review of the FWD is needed to correct the improper legal standards and approach adopted by the Board and to find the Challenged Claims patentable.

I. BACKGROUND

1. The '512 Patent

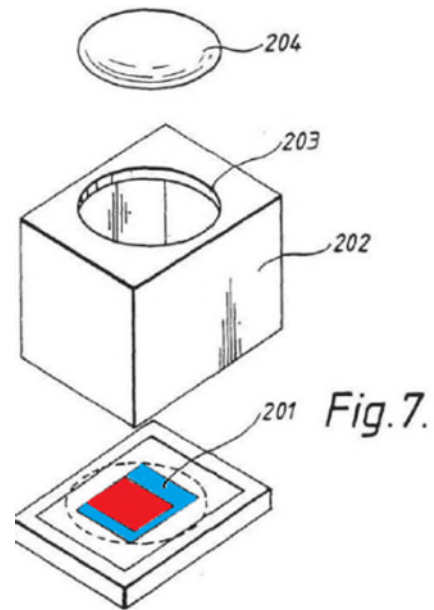
The Challenged Claim of the '512 Patent disclose a CMOS active pixel image sensor (referred to as APS CMOS) with image processing circuitry separate from the image sensor. This design was a novel departure from APS CMOS camera-on-a-chip devices at the time, which had pixels and processing on the same plane and circuit board. *See* '512 Patent at Abstract.

2. Instituted Grounds and Asserted References

Claim 2 of the '512 Patent was challenged as obvious under 35 U.S.C § 103 based on WO Application Publication No. 95/34988, issued to *Swift* (Ex. 1005), in view of *Ricquier*, "CIVIS Sensor: A Flexible Smart Imager with Programmable Resolution," (Exs. 1038 and 1033) and US Patent 5,233,426, issued to *Suzuki* (Ex. 1015) in Ground 1. Claim 2 was also challenged as obvious under § 103 based on US Patent 5,541,640, issued to *Larson* (Ex. 1029), as an additional reference in Ground 2.

3. The Swift Application (Ex. 1005)

Swift is an abandoned application for a miniature camera used for security systems. *Swift* states that the camera preferably uses an APS CMOS image sensor and explicitly refers to an article regarding Dr. Fossum's camera-on-chip design for the CMOS sensor. *Swift* provides a figure showing this image sensor in **Figure 7**, which a POSITA would understand to be a camera-on-chip design. Ex. 1005 at Fig. 7 (highlighting added).



Swift also discloses an alternate embodiment which PO's expert Dr. Lebby explained, based on numerous figures and circuitry, used the conventional CCD off-chip architecture that was readily available at the time. *Lebby*, ¶¶ 97-98.

4. Ricquier (Ex. 1033)

Ricquier discloses a test setup for a dedicated imager demonstrating proof of concept for using a low cost *passive* CMOS sensor for specific machine vision applications. Ex. 1033 (*Ricquier*) at 10. *Ricquier* did not use the more complex and costly APS CMOS sensor which provides better image quality, and rejected the use of standard CCD image sensors which provided even better image quality “because it offers the selective addressability **together with the possibility of**

further cointegration of processing electronics on the same chip.” *Id.*; *Lebby*, ¶ 99. Ricquier’s use of off-chip clocks, which are only a part of the timing and control circuitry, was used because it was a test bench setup for optimizing the pixel configuration for a machine vision application (not a camera used for taking photographs). In fact, such off-chip timing control causes well-known problems that limit the “read-out frame rate.” *See Lebby*, ¶ 102 (citing Ex. 1033 at 10 (disclosing a single output amplifier); Ex. 2034 at 1:44–62 (discussing the negative impact of using a single output amplifier on an imager’s frame rate)).

5. Suzuki (Ex. 1015)

Suzuki describes a solid-state image pickup device that includes a solid-state image pickup chip 221 and a circuit module 222. Ex. 1015. A POSITA would understand Suzuki to be a CCD device, as Suzuki refers to a solid-state imager and describes a conventional CCD device design used in 1991 (when *Suzuki* was filed). The fact that *Suzuki*’s circuit board 227 includes “a circuit for **driving** the solid-state image pickup chip 221 and a circuit for **amplifying** the video signal from the solid-state image pickup chip 221” separate from the image pickup chip tells a POSITA that *Suzuki* describes a CCD imaging sensor. *Lebby*, ¶ 104 (citing Ex. 1015 at 2:51-54 (emphasis added)).

6. Larson (Ex. 1029)

Larson teaches a videophone that “includes a video camera for transducing

and digitizing images at a station and connected to a video processor for compressing and encoding the digitized images into video data.” Ex. 1029 (*Larson*), Abstract. *Larson* reveals an embodiment of packaging a display within the same housing as the image sensor and related circuitry. *Id.* at 26:43-54. *Larson* describes a CCD camera in a “housing 131 for the CCD camera lens 44A and the LCD panel 56B.” *Id.* at Fig. 8B1; *Lebby*, ¶ 105.

II. ARGUMENT

1. The FWD Failed to Apply the Proper Legal Standard

The Board found the Challenged Claims unpatentable based on the Board’s assertion that a POSITA *could have* combined *Swift* in view *Ricquier* and *Suzuki* – not that a POSITA *would have* modified and these three- and four- (Ground 2) reference combinations, and despite the lack of any technical benefits in combining the references and numerous technical problems. FWD at 35. This approach by the Board is reversible error. *Belden Inc. v. Berk-Tek LLC*, 805 F.3d 1064, 1073 (Fed. Cir. 2015) (“[O]bviousness concerns whether a skilled artisan not only *could have made* but *would have been motivated* to make the combinations or modifications of prior art to arrive at the claimed invention.”) (emphasis original); *Personal Web Techs., LLC v. Apple, Inc.*, 848 F.3d 987, 993-994 (Fed. Cir. 2017) (that two references *could be* combined is “not enough” to “imply a motivation to pick out those two references and combine them to arrive at the claimed

invention”). An obviousness determination requires “more than a mere showing that the prior art includes separate references covering each separate limitation in a claim.” *Unigene Labs., Inc. v. Apotex, Inc.*, 655 F.3d 1352, 1360 (Fed. Cir. 2011).

PO introduced expert testimony and contemporaneous articles into the record explaining why a POSITA would not have combined or modified *Swift* (or *Larson*) in view of *Ricquier* and *Suzuki*. In particular, *Swift* states that the image sensor in the miniature camera is *preferably* an APS CMOS imager sensor and points to the APS CMOS camera-on-a-chip sensor designed by Dr. Fossum (referred to as the “Fossum APS CMOS camera-on-a-chip”). Ex. 1005 at 10:5-6. A POSITA would not have modified the Fossum APS CMOS camera-on-a-chip, which was the leading technology at the time, with *Ricquier’s passive* (Non-APS) CMOS image sensor designed for low quality machine vision application in a bench test setup. PO Sur-Reply. at 1, 15, 19, 22. Further, this combination of references would not have been further modified in the claimed manner based on the off-chip CCD architecture of *Suzuki*. PO Resp. (Paper 18) at 19-20.

In the FWD, however, the Board repeatedly stated that the motivations and rationale for combining these references hinged on the fact that *Swift could* have covered other CMOS designs. FWD at 33-35, 37. In basing its analysis on what *could* have been done, the FWD applied the wrong legal standard. Indeed, the FWD repeatedly stated that PO’s expert Dr. Lebby and the record evidence

submitted by PO failed to show that the claimed *Swift could only* be used as a camera-on-chip design. FWD 33-34. PO, however, was not required to show that *Swift could only* be a Fossum APS CMOS camera-on-a-chip, but rather how *Swift* would be understood. *Personal Web Techs.*, 848 F.3d at 993-994. Further, PO was not required to show that *Swift* could not be combined with *Ricquier* and *Suzuki*, but only that a POSITA would not have combined these references as claimed. *Id.*

Additionally, the Board dismissed PO's record evidence without contrary support. For example, PO explained that a POSITA would not have combined or modified the Fossum APS CMOS camera-on-a-chip cited in *Swift* with the passive (Non-APS) CMOS sensor in *Ricquier* because it would have resulted in a design with poorer performance and no benefits for the intended use as a miniature cameras (primarily for security systems). *Lebby*, ¶¶ 6-13. Indeed, the Board cites to no testimony or evidence that contradicts Dr. Lebby's testimony that combining these references provided no advantages. This was legal error as well. *See In re Omeprazole*, 536 F.3d 1361, 1380 (Fed. Cir. 2008) (rejecting argument that it would be obvious to combine references where additional steps and components are needed with no appreciable benefits); *See also*, MPEP § 2143 (Example 3 citing *In re Omeprazole*).

For example, the Board disregards the undisputed testimony of Dr. Lebby that the Fossum camera-on-chip APS CMOS sensor (and other CMOS sensors) is

X-Y addressable and there was no advantage in combining *Swift* with *Ricquier* to obtain a purported advantage of being X-Y addressable because the APS CMOS sensor in *Swift* was already X-Y addressable. FWD at 35. The Board improperly ignored PO's record evidence, consisting of numerous contemporaneous articles, with no evidence to the contrary. *Id.* This approach also was legal error and should be reversed.

Further, the Board's purported reasons and motivations for combining *Swift* with *Ricquier* and *Suzuki* simply focus on what was *possible* (because *Swift* did not have to be limited to Fossum's camera-on-a-chip design), rather than what a POSITA *would have* done. It is akin to saying that a skilled artisan, once presented with *Swift*, *Ricquier* and *Suzuki*, would have understood that they *could* be combined as proposed. *See* FWD at 28. Precedent firmly states that this "could have" standard is not enough. *Personal Web Techs.*, 848 F.3d at 993-994; *Belden*, 805 F.3d at 1073. This erroneous approach in the FWD that repeatedly applied the wrong legal standard for obviousness by focusing on what a POSITA could have done versus what a POSITA would have done is a fundamental legal error that warrants reversal of the FWD.

PO submitted expert testimony and record evidence which demonstrate that a POSITA would understand that *Swift* expressly discloses Fossum's camera-on-a-chip design and an alternate embodiment with a CCD off-chip circuit design. *See*,

e.g., FWD at 38-39. The Board is not free to ignore evidence of the understanding of a POSITA at the time of the invention. *See In re Kotzab*, 217 F.3d 1365, 1369 (Fed. Cir. 2000) (“A critical step in analyzing the patentability of claims pursuant to section 103(a) is casting the mind back to the time of invention, to consider the thinking of one of ordinary skill in the art, guided only by the prior art references and the then-accepted wisdom in the field.”); *In re Dembiczak*, 175 F.3d 994, 999 (Fed. Cir. 1999) (“Measuring a claimed invention against the standard established by section 103 requires the oft-difficult but critical step of casting the mind back to the time of invention”). Rather than address PO’s expert testimony and evidence as to how a POSITA **would** understand *Swift*, instead the Board’s analysis applied the erroneous “could” standard to find it sufficient that *Swift could* be an off-chip CMOS device. FWD at 32-33.

Further, the Board’s purported motivation to combine *Swift* with *Ricquier* and *Suzuki* also relies on the same flawed rationale (could have rather than would have). For example, the FWD relies on Petitioner’s argument that a person of ordinary skill would have been motivated to use *Ricquier* bench test setup to locate image processing off-chip. FWD at 22. In adopting Petitioner’s argument, the Board reasons that “Patent Owner does not cite to any expert testimony that supports the position that a CMOS imager with off-chip circuitry was inoperative, unworkable, or undesirable. FWD at 22. This illustrates the Board’s legal error

that components *could be* placed on other circuit boards, but not whether they would be placed on other circuit boards. *In re Kotzab*, 217 F.3d at 1369.

Moreover, the Board's statement that PO did not submit expert testimony that it would be undesirable to use CMOS imager with off-chip circuitry" ignores the entirety of PO arguments and record evidence. *See* FWD at 22, 37.

Indeed, the Board's statement that PO does not account for basic skills or fundamental engineering principles of offloading some components to another chip or another circuit board would decrease the required size for the containing chip or circuit board and "does not identify any contrary testimony from its expert" is wrong and ignores a mountain of record evidence to contrary. FWD at 23. For example, PO submitted testimony from Dr. Lebby that factors relating to design needs and intended applications, such as improved performance and cost savings, all support PO's argument that a POSITA would not have off-loaded circuitry because it was believed at the time that the key to miniaturization was achieved by implementing the camera-on-the-chip design. PO Sur-Reply (Paper 24) at 17-18; Lebby Decl. ¶¶ 109-112 (citing numerous articles and journals showing integration of components reduced size – not separation of components). In other words, PO submitted evidence why a POSITA would not have combined the references and the Board simply took the approach that they could be combined.

Similarly, the Board applied the "could have" standard by arguing that

Suzuki could be CMOS because it refers to solid state image pickup. FWD at 41-42. The Board also improperly disregards evidence that *Suzuki* was a CCD imager based on the supporting off-chip driving circuitry and amplification because it “can refer to a driving circuit for power,” which ignores how a POSITA *would* understand *Suzuki* and simply relies on what “*can*” (*i.e.*, what could) be done. FWD 40-41.

2. The Board Ignores Patent Owner’s Evidence

The Board compounded its legal error by ignoring PO’s evidence of how a POSITA would understand *Swift*, *Ricquier*, *Suzuki* and *Larson*. Indeed, the Board’s entire analysis and rationale in finding the Challenged Claims obvious rests on how *Swift could* be combined. For example, the Board states that “Patent Owner does not dispute that Swift and Ricquier combined suggest limitation 2.d. PO Resp. 19–38.” FWD at 47. That is wrong. PO submitted record evidence that a POSITA would not combine *Ricquier* and *Suzuki* achieve the claim’s timing and control circuitry in element 2d. *See, e.g.*, PO Sur-Reply at 16-17. For example, PO explicitly stated:

However, because a POSITA never would have moved *Swift’s* timing and control circuitry off chip in the first place (absent the teachings of the ’052 Patent), Petitioner’s arguments directed to the alleged “flexibility” afforded by the proposed modification are the product of hindsight. *Metalcraft of Mayville, Inc. v. The Toro Co.*, 848 F. 3d 1358, 1367 (Fed. Cir. 2017) (“Without any explanation as to how or why the

references would be combined to arrive at the claimed invention, we are left with only hindsight bias that *KSR* warns against.” (citing *KSR Int’l Co. v. Teleflex, Inc.*, 550 U.S. 398, 421 (2007)).

PO Response (Paper 18) at 30.

To the contrary, a POSITA understands that if the goal was to reduce noise, it would be beneficial to “place[] the timing and control ***circuits on the same planar structure with the pixel array.***” ’052 Patent at 9:45–47 (emphasis added). Accordingly, Petitioner’s proposed combination of *Swift* and *Ricquier*, which involves placing *Ricquier*’s off-chip timing unit on the opposite side of the circuit board supporting the pixel array would be ***counterproductive*** to the goal of noise reduction. *Lebby*, ¶ 119 (citing Petition at 23). Accordingly, in order to reduce noise a POSITA would maintain *Swift*’s timing and control circuitry on-chip rather than placing it on the opposite side of the circuit board, as asserted in the Petition.

PO Response (Paper 18) at 32.

The FWD contains numerous other examples of how the Board ignored PO’s record evidence and failed to view the references from the perspective of a POSITA. For example, the Board argued that “Patent Owner does not dispute that *Swift* and *Ricquier* combined teach limitation 2.c. PO Resp. 19–38.” FWD at 48. That is wrong too. PO expressly disputed that *Swift* and *Ricquier* would be combined in a device with “*a plurality of CMOS pixels within said array of CMOS pixels each include an amplifier.*” In particular, PO repeatedly argued that a POSITA would not combine a Fossum APS CMOS camera-on-a-chip sensor with

Ricquier's passive CMOS pixels for a multitude of reasons. *See* PO Resp. 19-38.

In another example, the Board states that PO does not dispute the circuit boards would be combined in as stacked arrangement. FWD. 51-53. That is wrong. PO repeatedly argued that a POSITA would not look to *Suzuki* or modify the non-stacked arrangement in *Swift* because it would not provide the purported advantages and would have negative impacts on overall size. PO stated:

Petitioner's contention (Reply at 8) that a POSITA would have been motivated to apply the teachings of *Suzuki* to stack separate circuit boards is also contrary to the understanding of a POSITA. It was widely accepted at the time that the best way to reduce system size and cost was to integrate as much of the system circuitry onto a single integrated circuit ("IC"). Lebbly Decl. ¶¶ 110-12. Petitioner neither rebuts the record evidence showing that the overall size and space is reduced by using a camera-on-a-chip design, which allows for a more compact design and better performance (eliminating excessive connections and capacitance). Lebbly Decl. ¶ 109.

PO Sur-Reply 17-18.

Petitioner does not and cannot explain what modifications to *Swift* would result in an imager with the dimensions of *Suzuki*....Petitioner fails to explain which elements of *Swift's* circuit board 52 would be moved to a different circuit board, per *Suzuki*, in order to achieve *Suzuki's* dimensions while also satisfying the language of the claims. *See* Petition at 24-27. That is, even granting Petitioner's assertion that a POSITA would modify *Swift* such that "circuit board 53 is oriented

parallel to circuit board 52,” that modification *would not change* the dimensions of circuit board 52, which is far larger than 12mm. *See Swift* at 11 (disclosing a minimum dimension of 38mm); *Lebby*, ¶ 115 PO Resp. at 22.

As shown above, the Board did not properly weigh the evidence on key issues in this proceeding, but instead simply dismissed numerous arguments by PO. In failing to consider PO’s expert testimony and supporting record evidence in the context of a POSITA, the Board simply relied on what a POSITA could have been done and not what a POSITA would have done. This approach by the Board also was legal error. *See, e.g., Plas-Pak Industries, Inc. v. Sulzer Mixpac AG*, 600 F. App’x 755, 758 (Fed. Cir. 2015) (“Such a change in a reference’s ‘principle of operation’ is unlikely to motivate a person of ordinary skill to pursue a combination with that reference.”); *Arctic Cat Inc. v. Polaris Indus., Inc.*, 795 F. App’x 827, 833 (Fed. Cir. 2019) (“For the obviousness inquiry, “the Board must weigh the benefits and drawbacks of the modification against each other, to determine whether there would be a motivation to combine.”)

III. CONCLUSION

For the foregoing reasons, PO requests the Director grant a rehearing and find the Challenged Claims patentable.

Respectfully submitted,

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CERTIFICATE OF COMPLIANCE WITH 37 C.F.R. § 42.24(a)(1)(v)

This paper complies with the type-volume limitation of 37 C.F.R. § 42.24(a)(1)(v). The paper includes 15 pages. 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.

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