

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

DISH NETWORK CORPORATION; DISH NETWORK L.L.C.; AND DISH
NETWORK SERVICE L.L.C.,

Petitioners

v.

ENTROPIC COMMUNICATIONS, LLC,

Patent Owner.

PTAB Case No. IPR 2023-00391

Patent No. 7,130,576

PETITIONERS' REQUEST FOR REHEARING

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I. INTRODUCTION

Petitioners presented un rebutted evidence that a POSITA would have been motivated to modify the Williams prior art based on Pugel’s teachings about using digital signal processing to replace costly analog tuning and signal processing circuitry. Unable to rebut Petitioners’ evidence, PO’s preliminary response mostly argued for discretionary denial under Section 325(d) based on assertions that the same or similar prior art was considered during prosecution and reexamination. To the extent PO also disputed motivation to combine, it did so only with unsupported attorney argument that ignored, rather than rebutted, Petitioners’ evidence.

Notwithstanding Petitioners’ un rebutted evidence, a series of legal and factual errors led the Board to wrongly conclude there was insufficient motivation to combine Williams and Pugel. First, the Board fixated on the problem addressed by each prior art reference rather than considering their teachings as a whole. Second, although obviousness is to be determined at the time the claimed invention was made, the Board focused here on an earlier point in time—when the prior art references were filed. Third, the Board ignored Petitioners’ un rebutted evidence of specific technologies that were known and available by the time of the invention to modify Williams to use digital, rather than analog, signal processing.

Petitioners’ un rebutted expert testimony and corroborating documentary evidence was more than sufficient to show a motivation to combine the prior art and

a reasonable likelihood of prevailing as to at least one challenged claim. Accordingly, Petitioners request rehearing and institution of the Petition.

II. FACTUAL BACKGROUND

A. The State of the Art

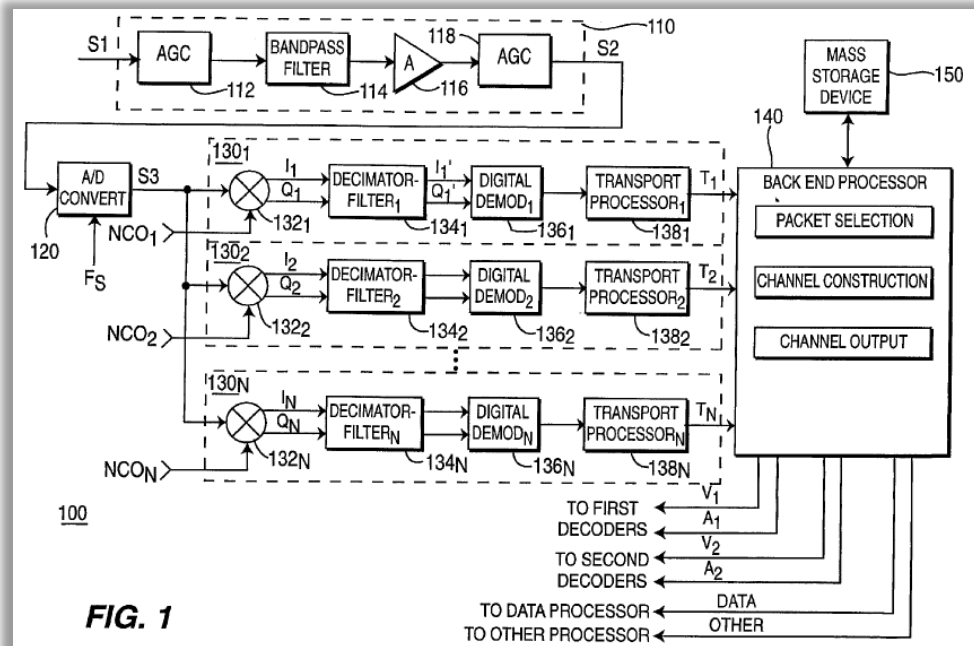
By the late 1970s, electronic systems started to migrate from analog to digital technology. (Ex. 1002, ¶ 71.) While analog signals could offer greater precision, they degraded when transmitted over distances or stored over time, whereas digital signals could be reproduced with exact precision. (*Id.*) Satellite distribution systems were not excepted from this digitization trend. The 1992 textbook cited in the '576 patent's background section for its description of satellite systems (*see* Ex. 1001 at 2:48-50) discussed “considerable advantages gained by changing to the digital concept,” including reduced component costs, increased bandwidth, error reduction, and optimized distribution. (Ex. 1010 at 88-89; Pet. at 12-13; Ex. 1002, ¶ 93.)

The Petition identified, and Dr. Schonfeld discussed, several exemplary prior art references disclosing digitization and digital processing of broadband analog signals. (Pet at 13 (citing, Ex. 1002, § IV(E).) For example, Hentschel (Ex. 1028), published in 1999, discloses a software radio receiver that digitizes an analog RF signal for processing. (Ex. 1002, ¶¶ 73-74.) Lovinggood (Ex. 1028), filed in 1999, describes a digital channelizer. (Ex. 1002, ¶ 75.) Dr. Schonfeld also discussed Davis

(Pet. at 22.) However, Williams' system also includes decoders 56, packetizers 58, and cable encoders 60 which operate on packets of digital data. (Pet. at 25 (citing Ex. 1003, 9:39-10:39; Ex. 1002, ¶ 113).)

2. Pugel

Pugel discloses a system for digitizing an analog input signal containing a plurality of carrier signals and then digitally processing some or all of the carrier signals. (Ex. 1004, Abstract, ¶¶ 5, 16; Pet. at 23-24; Ex. 1002, ¶ 109.) As shown in Fig. 1, after being conditioned by processor 110, the analog input signal is converted by a high-speed A/D converter 120 to "a bit stream S3 that is representative of the 16 channels in digital format." (Ex. 1004, ¶¶ 16-20.)



Each of a plurality of digital channel processors 130₁ to 130_N operates in parallel to extract and process a respective channel and to output a corresponding transport

stream or stream portions. (Ex. 1004, ¶¶ 26, 40.) Backend processor 140 receives stream portions from the channel processors and combines them into one or more transport streams for storage and/or decoding and playback. (*Id.*)

Pugel specifically touts that its digital channel processing receiver removes the “typical analog conversion stage,” *i.e.*, the “analog mixers and oscillators,” typically found “in a direct conversion receiver.” (Pet. at 24; Ex. 1004, ¶ 51.) Pugel’s digital approach also avoids the “high-cost tuning and processing arrangement” associated with simultaneous multi-channel processing in the analog domain. (Ex. 1004, ¶ 52; Ex. 1002, ¶ 110.)

C. Motivation to Combine

Both Williams and Pugel disclose systems for receiving broadband analog satellite signals and extracting and processing transponder channels for subsequent decoding and playback. (Pet. at 25; Ex. 1002, ¶ 112.) Pugel highlights cost-reduction benefits of digitizing the input signal and digitally processing the carrier signals. (Ex. 1004, ¶¶ 51-52.) Accordingly, the record is unequivocal that it would have been obvious from Pugel’s teachings to modify Williams so as to digitize the analog broadband input signal and perform its simultaneous multi-channel signal processing in the digital domain to achieve these same benefits. (Pet. at 27 (citing Ex. 1002, ¶¶ 114-119.) In particular, the record evidence demonstrated that inserting Pugel’s high-speed A/D converter 120 at the front-end of Williams’ system would

reduce costs by enabling elimination of Williams’ set of analog tuners 54. (Pet. at 26-27; Ex. 1002, ¶¶ 114, 118.)

In addition to these cost-reduction benefits, a POSITA would have understood that modifying Williams’ system to use digital rather than analog signal processing technologies would yield (a) improved reproducibility of digital signals, (b) greater flexibility to modify the system over time, and (c) simplified signal selection. (Ex. 1002, ¶ 115; *see also id.*, ¶ 93 (discussing generally understood benefits of digital vs. analog processing).) As discussed below in Section III(C), by the time of the invention, it would have been within the knowledge and skill of a POSITA to modify Williams to replace analog signal processing components with digital equivalents. (Pet. at 28-29; Ex. 1002, ¶¶ 120-122; *see also id.*, §§ IV(E)-(F).)

III. ARGUMENT

A. The Board Erroneously Focused on the Specific Problems Addressed by the Prior Art References.

The Board erroneously accepted PO’s argument that “Williams and Pugel are directed to solving different problems, so one of ordinary skill in the art would not have been led to combine them.” (Paper 10 at 22 (citing Prelim. Resp. at 55-56); *see also id.* at 26-27 (“Based on the problems addressed, one of ordinary skill in the art would not have been led to combine the references.”).)

That two references address different problems does not mean that a POSITA would not have combined them, however. As the Board has explained, “the

motivation to combine inquiry focuses on whether one of ordinary skill would have been motivated to combine the teachings of both references as a whole, ***not whether the problems solved by the prior art are the same.***” *Google LLC v. Virentem Ventures, LLC*, IPR2019-01247, Paper 34 at 35-36 (PTAB Mar. 5, 2021).¹

In *KSR*, the Supreme Court held that the Federal Circuit erred in finding a POSITA would not have combined the Asano and Engelgau references because they addressed different problems. *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 414 (2007) (explaining that “the Court of Appeals found, the Asano pedal was designed to solve the ‘constant ratio problem’ ... whereas Engelgau sought to provide a simpler, smaller, cheaper adjustable electronic pedal”); *id.* at 420 (“The second error of the Court of Appeals lay in its assumption that a person of ordinary skill attempting to solve a problem will be led only to those elements of prior art designed to solve the same problem.”). The court explained that “[t]he idea that a designer hoping to make an adjustable electronic pedal would ignore Asano because Asano was designed to solve the constant ratio problem makes little sense[,]” because a POSITA “is also a person of ordinary creativity, not an automaton.” *Id.* at 420-21.

The Board has routinely rejected arguments that references addressing different problems would not have been combined. For example, in *Samsung*

¹ Unless otherwise indicated, all bold and italics has been added by Petitioner.

Electronics. Co., Ltd. v. ProMOS Technologies., Inc., an argument that two references would not have been combined “because they address completely different problems” was deemed “not persuasive.” IPR2017-00037, Paper 41 at 31, 32 (PTAB Apr. 11, 2018). The Board explained that “[p]rior art references *must be considered as a whole for all that they teach, regardless of the specific problems to which they are directed.*” *Id.* at 32-33 (citing *KSR*, 550 U.S. at 420-21, other citations omitted); *see also, e.g., Apple Inc. v. Universal Secure Registry, LLC*, IPR2018-00812, Paper 9 at 10 (PTAB Nov. 7, 2018).

Had the Board considered the teachings of each prior art reference as a whole rather than fixating on the problem addressed, the Board would have recognized that Pugel’s teachings about avoiding analog tuning and signal processing provides a motivation to modify Williams as Petitioners proposed. *See supra* § II(C).

B. The Board Erroneously Assessed Obviousness When the Prior Art Was Filed Rather Than When the Invention Was Made.

The ’576 patent’s earliest-claimed priority date is November 7, 2001. (Ex. 1001.) In discussing the Williams and Pugel combination, Dr. Schonfeld explained that, by November 2001, digitization technology had progressed to the point where it had become practical to digitize broadband analog TV signals. (Ex. 1002, ¶ 117.)²

² Petitioner did not suggest this technology became available only *in November 2001* as the Board suggests. (Paper 10 at 27.) Petitioner simply asserted that this

PO did not dispute this point. Nevertheless, the Board rejected Petitioners' evidence because Petitioners made "no showing that this [digitization] technology existed *when Williams and Pugel were filed.*" (Paper 10 at 27.)

The Board erred by focusing on obviousness *when the prior art patents were filed*, rather than at the time of the claimed invention. Pre-AIA Section 103(a) precludes the patenting of an invention "if the differences between the subject matter sought to be patented and the prior art are such that *the subject matter as a whole would have been obvious at the time the invention was made* to a person having ordinary skill in the art to which said subject matter pertains." The relevant timeframe is thus the date of invention. *Millennium Pharms., Inc. v. Sandoz Inc.*, 862 F.3d 1356, 1367 (Fed. Cir. 2017) ("Those charged with determining compliance with 35 U.S.C. § 103 are required to place themselves in the minds of those of ordinary skill in the relevant art *at the time the invention was made*, to determine whether that which is now plainly at hand would have been obvious at such earlier time.") (quoting *Interconnect Planning Corp. v. Feil*, 774 F.2d 1132, 1138 (Fed. Cir. 1985)).

improved digitization technology was available *by November 2001* when PO's earliest-cited priority application was filed.

In *Ex Parte Tulloch*, the Board affirmed the examiner’s rejections based on a combination of a 1999 article by Martinez and certain treatment guidelines published by the American Academy of Pediatrics (AAP) in 2004. Appeal No. 2017-000889, 2018 WL 3646670 (PTAB July 11, 2018). The appellant argued the examiner should have focused on earlier AAP guidelines published in 1994 “because those were the guidelines in effect at the time Martinez was published” in 1999. *Id.* at *4. The Board correctly rejected this argument, explaining “[t]he standard for obviousness is ***not what would have been obvious at the time a prior art reference was published*** but whether ‘the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made.’” *Id.* Because “[t]he effective filing date of the instant application [wa]s Dec. 1, 2011, ... obviousness is assessed of that date, not based on the time Martinez was published.” *Id.*; see also, e.g., *Ex Parte Scheffold*, Appeal No. 2020-004003, 2021 WL 755344, at *10 (PTAB Feb. 25, 2021) (explaining that “***obviousness is not assessed as of the date of the prior art*** but rather as of the date of filing”).

Here, Petitioners rightly focused on obviousness at the time of the alleged invention, *i.e.*, November 2001. Petitioners had no reason or obligation to address obviousness as of January 1998 or August 2001 when Williams and Pugel were filed, and the Board was wrong to reject Petitioners’ evidence on this basis.

C. The Board Ignored Petitioners’ Evidence Regarding the Known Digital Equivalents of Williams’ Analog Components.

The Board also rejected Petitioners’ argument that a POSITA would have known how to perform equivalent tuning, frequency translation, and signal combining in the digital domain, because the Board found that Petitioners’ did “not identify adequately what these digital equivalents are and whether they were available at the time of the ’576 patent.” (Paper 10 at 25) Notably, while PO generally attacked Petitioners’ arguments as hindsight-based, PO did not actually dispute that a POSITA would have known the digital equivalents for performing these functions. (*See* Paper 6 at 48-54.) Petitioners’ evidence, including Dr. Schonfeld’s detailed expert testimony addressing this issue, was un rebutted.

Contrary to the Board’s finding, Petitioners specifically identified and discussed the known technologies for performing tuning, frequency translation, and signal combining in the digital domain. With respect to tuning, for example, the Petition noted the ’576 patent’s admission that digital filters were “well known.” (’576 patent at 5:12-30; Pet. at 13.) The Petition also identified Lovinggood and Pugel as exemplary prior art disclosing the use of digital filters for channel selection. (Pet. at 7 (citing Ex. 1023 at 5:3-25 and Ex. 1004 at ¶¶ 6, 18); *see also* Ex. 1002, ¶ 75 (discussing Lovinggood), ¶ 109 (discussing Pugel).) Far from rebutting any of this evidence, Patent Owner conceded Pugel discloses digital tuning. (Paper 6 at 27

(describing Pugel’s “parallel channel processors 130 that tune and demodulate the output of the ADC for each transponder channel”).)

Regarding frequency translation, the Petition again pointed to Lovinggood and Pugel as evidence that performing frequency translation in the digital domain was known. (Pet. at 8.) In Section IV(E) of his declaration, Dr. Schonfeld discussed Lovinggood’s disclosure of using numerically-controlled oscillators (NCOs) to perform frequency translation of digital signals. (Ex. 1002, ¶ 75; Pet. at 13 (citing Ex. 1002, § IV(E)).) Pugel also discloses using NCOs for frequency translation. (Ex. 1004, ¶ [0022]; Pet. at 7-8.) Dr. Schonfeld explained that “[u]sing an NCO to select signals in the digital domain and translate them to a desired output frequency would have been within the skill and knowledge of a POSITA at least by the November 2001 priority date of the ’576 patent.” (Ex. 1002, ¶ 75.) Again, Petitioners’ evidence was un rebutted. Patent Owner opted not to address NCOs or to dispute Dr. Schonfeld’s testimony that using NCOs to perform frequency translation in the digital domain was known in the art.

The Petition again cited Lovinggood and Pugel as evidence that digitally combining signals was already known. (Pet. at 8 (citing Ex. 1023 at 9:58-67; Ex. 1004, ¶ 26.) Lovinggood describes a “digital adder 690,” which combines digital signals extracted from wideband RF signals. (Ex. 1023 at 9:58-67; Ex. 1002 ¶ 75.) Dr. Schonfeld testified that such digital adders were known in the art. (Ex. 1002

¶ 75.) Again, Petitioners’ evidence was un rebutted. PO’s response said nothing about digital adders or Lovinggood’s disclosure of them.³

Finally, in addition to this digital hardware, Dr. Schonfeld explained that “the digital counterpart of analog switches 53, tuners 54, and variable frequency upconverted 66 can be implemented ... *in software using a general purpose processor*, thus offering an inexpensive implementation of these functionalities, while providing the flexibility to modify and enhance the system in the future.” (Ex. 1002, ¶ 121; *see also id.*, ¶ 130; Pet. at 28 (citing Ex. 1002, ¶¶ 120-122).) PO did not dispute this testimony either.

In summary, Petitioners and Dr. Schonfeld specifically identified digital equivalents of Williams’ analog components and presented *unrebutted evidence* that these digital technologies were known by the time of the invention. The Board’s finding to the contrary was clearly erroneous.

³ The Board’s assertion that “Pugel does not disclose a digital combiner” (*see* Paper 10 at 26) was also incorrect. Pugel’s “Summary of the Invention” mentions “a processor, for combining at least portions of the data extracted from at least two carrier signals to produce a complete bitstream” (Ex. 1004, ¶6; *see also, e.g., id.* at claim 25 (claiming such a processor).) This “processor” is the same backend processor 140 discussed in ¶ 26 cited by Petitioner. (*See* Pet. at 8 (citing 1004, ¶ 26).)

D. The Board’s Remaining Reasons Fail to Rebut Petitioners’ Evidence.

Setting aside the defective reasons discussed above, the Board’s conclusion of insufficient motivation to combine cannot stand. Indeed, none of the Board’s remaining reasons are supported by any record evidence whatsoever.

The Board suggested that a POSITA might not move Pugel’s ADC to an outdoor system because the circuitry would have to be “appropriately rated and protected for outdoor use.” (Paper 10 at 26.) But neither PO nor the Board cited any evidence to suggest that moving circuitry from an indoor environment to an outdoor environment would have been beyond the abilities of a POSITA. *See KSR*, 550 U.S. at 420-21 (“A person of ordinary skill is also a person of ordinary creativity, not an automaton.”). Notably, Williams itself says nothing about any of its circuitry being rated for outdoor use. (*See* Ex. 1003.)

The Board’s suggestion that Petitioners should have specifically addressed the added costs or complexity from Pugel’s analog preprocessor, additional ADCs, or an added digital combiner at most suggests there may have been some tradeoffs in making the proposed modification. (Paper 10 at 24-26.) As an initial matter, the digital combiner would replace Williams’ numerous adders. (*See* Ex. 1003, Fig. 3.) More importantly, though, “it is well established that tradeoffs regarding costs or manufacturability do not necessarily obviate a proposed modification.” *Intuitive Surgical, Inc. v. Rex Med., L.P.*, IPR2020-00152, Paper 35 at 46-47 (PTAB Mar. 26,

2021) (citation omitted); *see also Allied Erecting and Dismantling Co. v. Genesis Attachments, LLC*, 825 F.3d 1373, 1381 (Fed. Cir. 2016) (“A given course of action often has simultaneous advantages and disadvantages, and this does not necessarily obviate motivation to combine.”).

Neither PO nor the Board cites any evidence indicating these added costs would have offset the cost savings from eliminating the “high cost tuning and processing arrangement” in Williams’ system. (Ex. 1004, ¶ 52; Ex. 1002, ¶ 110.) Indeed, Pugel specifically touts its system, which includes the analog preprocessor 110 as well as backend processor 140 for combining digital video stream data from various transponder channels, as cost-effective relative to analog signal processing implementations. (Ex. 1004, ¶¶ 52.) Finally, cost reduction was not the sole motivation proffered for the proposed combination; Petitioner and Dr. Schonfeld also explained that the digital equivalents “were generally more efficient, reliable, [and] flexible ... than their analog counterparts.” (Pet. at 28; Ex. 1002, ¶¶ 120-22.)

IV. CONCLUSION

For the foregoing reasons, Petitioner respectfully requests rehearing and institution of *inter partes* review.

Dated: Oct. 16, 2023

Respectfully submitted,

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⁴ On Sept. 11, 2023, Petitioners filed an updated Power of Attorney and Mandatory Notices listing Mr. McKeever as lead counsel, along with a request for authorization to file a motion to withdraw and substitute counsel. On Sept. 12, 2023, authorization was granted by the Board via email. On Sept. 13, 2023, Petitioners filed a motion to withdraw and substitute counsel.

CERTIFICATE OF SERVICE

The undersigned hereby certifies that a true copy of this **PETITIONER'S REQUEST FOR DIRECTOR REVIEW** has been served by electronic mail to the attorneys of record for Patent Owner:

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