

UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE PATENT TRIAL AND APPEAL BOARD

Samsung Electronics Co., Ltd.,
Petitioner,

v.

One-E-Way, Inc.,
Patent Owner.

Case: IPR2025-01541
U.S. Patent No. 9,107,000

DECLARATION OF DR. JOSE LUIS MELENDEZ

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I. INTRODUCTION

1. My name is Dr. Jose Luis Melendez. I am an independent expert in the field of wireless technologies, and I reside in Mayagüez, Puerto Rico, USA. I have been asked to and have conducted a review of U.S. Patent Nos. 6,744,808 (“Walley”), 5,546,424 (“Miyake”), and 6,256,303 (“Drakoulis”), relevant sections of, “Wireless Communications: Principles & Practice” by Theodore S. Rappaport (1996) (“Rappaport”), and relevant sections of, “The Communications Handbook” (1997) by Jerry D. Gibson (“Gibson”) to determine whether or not these documents are invalidating prior art to Patent Owner’s United States Patent No. 9,107,000 (“’000 Patent”), including its related applications (e.g., the ’196-Publication). Additionally, I have reviewed the IPR2025-01541 petition (“Petition”) submitted by Samsung Electronics Co., Ltd. (“Petitioner” or “Samsung”) along with its exhibits, including the report of Michael Davies (“Davies Declaration”). In this report, I will address only certain aspects of the Petition, patent claims, and Davies Declaration that I believe will be of particular benefit to the Patent Trial and Appeal Board (“PTAB” or “Board”) in evaluating the Petition, in light of the record and totality of stakeholder arguments, and in coming to its final decision regarding the ’000 Patent in the context of the subject Petition.

2. My declaration highlights certain aspects of how the ’000 Patent invention differs from the references cited in the Petition in view of the arguments

presented in the IPR2025-01541 petition, the Davies Declaration, and in light of the '000 Patent itself. My declaration provides additional support for the arguments put forward in the One-E-Way Patent Owner Response to which it is appended.

3. This declaration is based on the information presently available to me. Should additional information become available, I reserve the right to supplement my opinion based upon information that may subsequently become available which may include a review of information that may be produced, or from testimony or depositions that are subsequently taken.

II. QUALIFICATIONS AND EXPERIENCE

A. EDUCATION AND WORK EXPERIENCE

4. I have most recently served as Professor of Computer Science and Engineering, and also Special Assistant to the Chancellor, at the University of Puerto Rico at Mayagüez. My responsibilities there included developing and teaching specialized courses and seminars, serving on graduate committees including PhD programs, defining and conducting research including students related generally to Computer Science and Engineering, and supporting university relationships with industry.

5. I hold a Doctor of Philosophy in Electrical Engineering from Stanford University (awarded January 6, 1994) with a Grade Point Average of 4.0/4.0. I have a Bachelor of Science in Electrical Engineering from the Massachusetts Institute of

Technology (awarded June 4, 1990) and graduated with a Grade Point Average of 5.0/5.0. I also obtained a Master of Science in Electrical Engineering and Computer Science from the Massachusetts Institute of Technology (awarded February 20, 1991) with a Grade Point Average of 4.8/5.0.

6. My doctoral thesis involved the definition, solution and validation of a stiffly coupled differential equation model for the formation of high-performance intelligent imaging systems. In performance of my doctoral thesis, I developed novel algorithms for the solution of the complex equations and implemented those algorithms in computer code. I verified the models and algorithms through experimentation including constructing and characterizing the sensing portions of electronic imaging devices.

7. My professional career began and continued within Texas Instruments where I first developed advanced electronic-based sensors and sensor systems. These sensor systems were architected to be deployed on communications networks including remotely and in handheld embodiments. Solutions included modulated carriers relating sensor samples transmitted via wireline and wireless communications modes for research, development, testing and deployment purposes.

8. I am co-inventor of patented technology related to the formation and maintenance of high data rate point-to-point, one-to one wireless data links. Devices

exhibiting 100 Mb/sec data rates utilizing the high data rate wireless technology were demonstrated publicly in 2001, and included real time, live transmission of a feature length film.

9. While at Texas Instruments, I managed the wireless infrastructure business that designed, tested, and marketed semiconductor components for use in infrastructure applications such as cellular networks. The business group I managed designed, developed and sold some of the very first radio components tested in emerging (at the time) generations of cellular systems first capable of transmitting high-speed, high quality images as data by way of digital transmissions (Multimedia Messaging Service – MMS) over mobile networks.

10. In 2002, I founded Commoca, Inc. (“Commoca”). Commoca developed hardware, embedded software (or “firmware”), and network services for the deployment of converged voice and data services over wired and wireless communications networks. Commoca developed and manufactured feature rich smart phones having built-in apps with convenient content/media services, and local search solutions tailored for a specific location. Commoca devices utilized IEEE 802.11 (“WiFi” or “Wi-Fi”) technology to connect touch screen telephones to access points and were believed to have been amongst the first of such devices to do so. Converged communications devices provided by Commoca were field tested by BellSouth Corporation at consumer locations in Florida and Georgia in 2006. My

company received grants from the National Science Foundation to develop the state-of-the-art Transactional Applications Delivery System (TADS) over the internet.

11. In 2008, while working as a research consultant for the University of Texas Southwestern Medical Center in Dallas (UTSW), I co-invented a novel multi-wavelength imaging system (US 8,838,211) and worked to develop and produce a product through a university spinoff company which I led. In early 2013, following successful clinical studies, the resulting system was cleared by the US Food & Drug Administration for use in the United States. The system captured and analyzed high resolution, uncompressed images and subsequently created pulsatility maps representative of the underlying physiology for use in evaluating deep tissue wounds. Resulting images were compressed, stored, and transmitted over a variety of communications networks.

12. As highlighted above, my professional experience and knowledge areas include wireless communication devices, related software, and networked computing systems as are relevant to the subject matter of this report. Also, as detailed in my CV in Exhibit A attached, I am an inventor of subject matter claimed in 28 U.S. Patents. Additional information concerning my background, qualifications, publications, conferences, honors, and awards are described in my CV. Because of my background, training, and experience, I am qualified as an

expert to opine as set forth herein, and am understanding of the views of a person of ordinary skill in the art.

B. COMPENSATION STATEMENT

13. My company, DRMTES LLC, is paid for my work concerning the subject *inter partes* review (IPR) in accordance with my current hourly rates. Neither my company's nor my compensation is dependent upon the outcome of the subject IPR. I may also be reimbursed for travel and other expenses that I incur in the course of my work on the subject IPR. I have no personal interest in the outcome of the subject IPR. I have been deposed previously as an expert involving infringement and validity of wireless patents including communications and aspects involving the internet.

14. The opinions I express in this report are based on my own personal knowledge and professional judgment in view of the evidence of record and documents submitted in this proceeding. If called as a witness during the proceedings in the subject IPR, I am prepared to testify competently about my opinions.

C. INFORMATION CONSIDERED IN FORMING OPINION

15. The documents upon which I rely for the opinions expressed in this declaration are documents identified in this declaration, including the subject Petition for *inter partes* review of U.S. Patent No. 9,107,000 (including exhibits),

the '000 Patent prosecution history (or at least the pertinent parts thereof), *One-E-Way, Inc. v. Apple Inc.*, No. 2022-2020, 2023 WL 5199501 (Fed. Cir. Aug. 14, 2023), and Patent Owner One-E-Way, Inc.'s Patent Owner Response (including exhibits). I have also relied on my own experiences and expert knowledge in the relevant technologies and systems that were in use (or were not in use) at the time of the invention. My scope of review and opinions are primarily for providing a technical interpretation of the claim limitations and the teachings of the subject patent and prior art from the perspective of a person of ordinary skill in the art, specifically opining on technical aspects, terminology, and the feasibility of combining references.

III. STATEMENT OF LEGAL AND CLAIM CONSTRUCTION PRINCIPLES

A. ANTICIPATION

16. I understand that for a patent claim to be valid, it must be novel under 35 U.S.C. §102. I also understand that the version of 35 U.S.C. §102 in effect prior to the American Invents Act is applicable for this IPR. I also understand that the version of 35 U.S.C. §102 in effect prior to the American Invents Act is applicable for this IPR. I understand that if each and every limitation of a claim is disclosed in a single prior art reference then the claimed invention is anticipated. I further understand that it is the Petitioner's burden to show that each and every element is described or embodied in the single prior art reference in order to establish

anticipation. I also understand that a prior art reference must be enabling in order to anticipate a claim.

B. OBVIOUSNESS

17. I understand that for a patent claim to be valid it must be non-obvious under 35 U.S.C. §103. I also understand that the version of 35 U.S.C. §103 in effect prior to the American Invents Act is applicable for this IPR. I further understand that where any single prior art reference discloses less than each and every limitation of a patent claim it is being used against, that patent claim is only invalid under 35 U.S.C. §103 if the differences between the claimed subject matter and that single prior art reference are such that the claimed subject matter as a whole would have been obvious at the time that the invention was made to a person having ordinary skill in the relevant art.

18. Typically, obviousness is shown using a combination of two or more prior art references that disclose all the limitations of the claimed invention. I understand that a claim may be held unpatentable as obvious under 35 U.S.C. § 103 only if the Petitioner demonstrates, by a preponderance of the evidence, that a person of ordinary skill in the art would have been motivated to combine the asserted prior art references in the manner recited by the challenged claims and would have had a reasonable expectation of success in doing so. *See In re Warsaw Orthopedic, Inc.*, 832 F.3d 1327, 1333 (Fed. Cir. 2016). I further understand that obviousness cannot

be established through hindsight, conclusory assertions, or the mere fact that each individual element of a claim can be found somewhere in the prior art; rather, the Petitioner must articulate a specific, evidence-based reason why a person of ordinary skill in the art would have selected the particular references and combined their teachings to arrive at the claimed invention. *In re Kahn*, 441 F.3d 977, 986–88 (Fed. Cir. 2006).

C. WRITTEN DESCRIPTION REQUIREMENT

19. I understand that 35 U.S.C. § 112(a) requires that a patent’s “specification shall contain a written description of the invention. . . to enable any person skilled in the art” to make and use the invention. I further understand, to satisfy the written description requirement, the specification must reasonably convey to a person of ordinary skill in the art, as of the filing date sought, that the inventor was in possession of the claimed invention. *See Ariad Pharm., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336, 1351 (Fed. Cir. 2010) (en banc). This is an objective inquiry confined to the four corners of the specification, viewed from the perspective of a person of ordinary skill in the art at the relevant time. *See id.*

20. I additionally understand that “by disclosing in a patent application a device that inherently performs a function, operates according to a theory, or has an advantage, a patent applicant necessarily discloses that function, theory, or

advantage.” *Kennecott Corp. v. Kyocera Int’l, Inc.*, 835 F.2d 1419, 1422 (Fed. Cir. 1987) (cleaned up).

D. CLAIM CONSTRUCTION LAW

21. I understand that a claim in an *inter partes* review proceeding is interpreted according to its ordinary and customary meaning as understood by a person of ordinary skill in art. I have been asked to apply this claim construction standard when I render my opinions on patentability set forth in this declaration.

22. I understand that the inventor may rebut that presumption by providing a definition of the term in the specification with reasonable clarity, deliberateness, and precision; and that a claim term is to be interpreted using its ordinary and customary meaning to a person of ordinary skill in the art in the absence of a specialized definition.

IV. CLAIM CONSTRUCTIONS

23. Further, for purposes of this declaration, I have been asked to assume the claim constructions set forth below. Thus, I have assumed the following claim constructions in this analysis:

Claim Term	Claim Construction
“reduce[d] intersymbol interference coding”	“coding that reduces intersymbol (intersymbol) interference”
The term “independent” in the context of “independent” CDMA communication	“performed independent of any central control”
“unique user code”	“fixed code (bit sequence) specifically associated with one user of a device(s)”
“direct conversion module”	“module for converting radio frequency to baseband or very near baseband in a single frequency conversion without an intermediate frequency.”
“audio source”	“a device for providing audio that has an analog headphone jack”
“transmitter”	“a device that can be connected into an analog headphone jack to wirelessly transmit an audio signal”

V. PERSON OF ORDINARY SKILL IN THE ART

24. It is my understanding that the claims and specification of a patent must be read and construed as a person of ordinary skill in the art (“POSA”), at the time of the priority date of the claims, would understand them.

25. I further understand that the following factors may be considered in determining the level of ordinary skill in the art: (a) the types of problems encountered by those working in the field and prior art solutions thereto; (b) the sophistication of the technology in question, and the rapidity with which innovations

occur in the field; (c) the educational level of active workers in the field; and (d) the educational level of the inventor.

26. I understand Petitioner has posited that a POSA of the '000 Patent would have possessed a

Bachelor of Science degree in electrical engineering or a related field, and approximately two years of experience in the design or implementation of wireless communications systems, or the equivalent. Alternatively, a POSA has approximately six years of experience in the design or implementation of wireless communications systems, or the equivalent.

Pet. at 4-5. For purposes of this declaration, I have assumed this characterization of a person of ordinary skill in the art of the '000 Patent.

VI. OVERVIEW OF THE '000 PATENT

27. The '000 Patent generally discloses a mobile wireless digital audio system utilizing a unique user code and audio signal representation in the form of packets. The unique user code is used to spread a spectrum of the signal and configured for “independent code division multiple access communication,” (CDMA) operation, “performed independent of any central control,” in accordance with the understood claim construction for this term.

28. Critically, all claims of the '000 Patent claim independent CDMA communication, and thus require communication, “performed independent of any

central control.” This is an affirmative limitation explicitly recited in each claim given that every independent claim includes the “independent code division multiple access communication” limitation. EX1001, 4:55, 5:8-9, 5:46-47, 6:1, 7:16-17, 9:29, 10:22-23 (independent claim elements [1P], [2P], [3C], [5P], [8B], [9P] and [10B] claiming use of “independent code division multiple access communication”). As explained below, I understand that the term “independent” in the context of “independent” CDMA communication should be construed to mean, “performed independent of any central control.”

29. As used in the claims of the ’000 Patent, “performed independent of any central control” means that the system operates without reliance upon a centralized entity—such as a base station or central controller—to coordinate, assign, and manage communication resources. The system is inherently distributed, with devices operating autonomously or in a peer-to-peer fashion, such that, for example, audio signals of a user transmitted and received are independent of the audio signals transmitted and received by another user.

30. This limitation is not merely a description of a feature that could be added or removed; it is a defining characteristic of the claimed inventions of the ’000 Patent. As explained below, a system that requires central control—where a centralized entity must assign codes and manage interference—falls outside the scope of the claims.

VII. SUPPORT FOR THE CHALLENGED CLAIMS IN THE 2003 APPLICATION AS FILED

31. In light of the established technical landscape as of the '000 Patent, a POSA would have recognized direct conversion architectures, intersymbol interference (ISI) mitigation strategies, and differential phase shift keying (DPSK) as foundational elements of the general knowledge in the art of the '000 Patent. Consequently, a disclosure directed to a low-cost, spread spectrum communication system inherently contemplates these elements, as they represented the contemporary standard for minimizing hardware complexity and optimizing power efficiency in the context of the claimed inventions.

32. I understand that according to the written description requirement of 35 U.S.C. §112, the specification need not explicitly recite such well-known components where the identified functional goals—namely, robust interference-free signaling in a multi-user environment using simplified receiver architectures—necessarily point to their inclusion. Thus, the deliberate selection and disclosure of a spread spectrum framework for decentralized or low-cost, battery-operated applications in the 2003 application serves as an implicit or inherent disclosure of these underlying methodologies or structures to one skilled in the art, who would understand them as the essential, integrated means for achieving the described technical objectives.

33. As explained below, a POSA would understand the 2003 application to inherently disclose a “direct conversion module,” “differential phase shift keying (DPSK),” and “reduced intersymbol interference coding,” as claimed in the ’000 Patent and as explained below.

A. Disclosure of a “Direct Conversion Module” in the 2003 application.

34. A POSA would understand “direct conversion module” as inherently disclosed in light of at least the disclosures below given that direct conversion receivers were known (1) to benefit battery operated devices, and (2) to be more power efficient than active intermediate stage receivers (e.g., power hungry superheterodyne intermediate frequency receivers as discussed in the Petition). *See* Pet. at 50 (“A POSA would have understood that a receiver, such as wireless headphones would benefit from a component suitable for ‘low power consumption and low cost’ designs.”).

The *battery powered transmitter* 20 may have a transmitting antenna 24 that may be omni-directional for transmitting a coded digital modulated signal to a receiving antenna 52 of a *battery powered receiver* 50 that may be a headphone receiver.

...

[T]he digital modulated signal *from transmit antenna 24 may be received by receiving antenna 52 and then demodulated.*

EX1005 at 0005 (¶¶0009-10) (emphasis added). A POSA would understand that implementation of a direct conversion module in the context of the inventions of the '062 Patent would be the natural choice of architecture as it is less expensive and advantaged, requiring less components and complexity.

35. A POSA would also understand, from the demodulation disclosure above, that a signal from “transmit antenna 24” that is received by “receiving antenna 52” (EX1005 at 0005 (¶¶0009-10)) is known to be inclusive of an RF (radio frequency) carrier signal, and that the demodulation of such a signal involves down converting the RF carrier signal to baseband or very near baseband. As noted above, in Section IV, I understand the construction of the term “direct conversion module” to be a “module for converting radio frequency to baseband or very near baseband in a single frequency conversion without an intermediate frequency.”.

B. Disclosure of a “Differential Phase Shift Keying (DPSK)” in the 2003 application.

36. A POSA would understand “differential phase shift keying (DPSK),” a digital modulation technique, as inherently disclosed in the 2003 application. DPSK, having been developed several decades earlier, was a standard, textbook modulation scheme by 2003 and DPSK chips and reference designs were commercially mature by 2003. The 2003 application explains that claimed inventions “may utilize Manchester encoding/decoding schemes.” EX1005 at 0007 (¶0014). A POSA would understand that there were multiple types of known Manchester encoding schemes,

including Differential Manchester encoding. A POSA would recognize Differential Manchester encoding as a specific form of bi-phase signaling that is logically and functionally analogous to Differential Phase Shift Keying (DPSK). Specifically, just as DPSK encodes information by shifting the phase of a carrier wave relative to the phase of the preceding signal—rather than relying on an absolute phase reference—Differential Manchester encodes data based on the presence or absence of a transition at the start of a bit interval relative to the prior state. Consequently, a POSA would understand that both techniques share the same ‘differential’ logic to resolve the technical challenge of signal polarity inversion (or 180° phase ambiguity), characterizing Differential Manchester as an implementation of the same principles of DPSK modulation. Additionally, a POSA would recognize Differential Manchester encoding as a ‘bi-phase’ signaling architecture. *See, e.g.*, EX2016 at 4 (Appendix 1) (defining “biphase” as “[a] term used to signify two-phase (+/-90°) phase shift keying”).

37. The description in the 2003 application would convey to a POSA that “differential phase shift keying (DPSK)” was at least inherently disclosed in the 2003 application.

C. Disclosure of “Reduced Intersymbol Interference Coding” in the 2003 Application.

38. A POSA would understand “reduce[d] intersymbol interference [coding]” as inherently disclosed at least in light of the disclosure in the 2003

application that “[t]o reduce the effects of *channel noise*, the battery powered transmitter 20 may use *convolutional encoding, and interleaving*.” EX1005 at 0005 (¶0009) (emphasis added). The digital modulated signal is coded for private reception and that would be understood to, at least, remove multiple copies of signal interference from transmitters.

39. Furthermore, a POSA would understand that the disclosed convolutional encoding, and interleaving is for reducing intersymbol interference in the channel by adding coding gain redundancy and improving resistance to fading, respectively.

40. Petitioner’s Gibson reference discloses, for example, interleaving coding to mitigate intersymbol interference, “[i]nterleaving the bits to be transmitted over two time slots is introduced to diminish the effects of short deep fades.” EX1022 at 142 (p. 1254).

41. A POSA would further understand that partial response signaling (PRS) utilizes convolutional encoding to process a signal to reduce intersymbol interference.

42. Similarly, a POSA would have understood that time hopping spread spectrum (THSS) was capable of contributing to the reduction of intersymbol interference by spreading pulses in time and reducing systematic overlap.

D. Summary for Support in the 2003 Application.

43. After reviewing the initially filed 2003 application, my opinion is that a POSA would have recognized a direct conversion module, DPSK, and reduced intersymbol interference [coding] to be inherently disclosed as these represented parts of an industry-standard “toolkit” for low-cost, spread spectrum systems. My understanding is that under the written description requirement of 35 U.S.C. §112, a specification need not explicitly recite these ubiquitous components when the functional goals—robust, interference-free signaling in a multi-user environment using simplified receiver architectures—necessarily point to their integrated use. To a POSA, a disclosure of the broader system serves as an enabling description of these underlying methodologies and architectures, which would have been understood as the essential, standardized means for mitigating intersymbol interference and noise inherent to such spread spectrum modulation system.

VIII. MIYAKE AND WALLEY DO NOT TEACH “INDEPENDENT CDMA”

A. The '000 Patent's Discussion of Multiple Users Operating Wireless Transmission Devices

44. The '000 Patent discloses and claims spread spectrum modulated receivers and transmitters for personal area wireless applications “for private listening without interference where multiple users occupying the same space are operating wireless transmission devices,” independently. EX1001, 1:44-46. Thus, the claimed audio transmitter and audio receiver of a user must be able to operate

without interference from other transmitters that are operated by other users occupying the same space and perform code division multiple access communication independently of any central control. *Id.* A POSA would understand that prior art spread spectrum code division multiple access system implementations comprised centrally controlled downlink transmission at the base station serving multiple user receivers in order to provision orthogonal spreading codes for user wireless receivers occupying the same service space, and that maintaining code orthogonality for transmissions is essential to minimizing interference from other transmission signals.

45. In the '000 Patent, “[e]ach of the digital audio transmitter and receiver is configured for *code division multiple access* (CDMA) communication. The wireless digital audio system allows private audio enjoyment without interference from other users of *independent* wireless digital transmitters and receivers sharing the same space.” EX1001, Abstract (emphasis added). In the '000 Patent, claimed independent “code division multiple access (CDMA) may be used to provide each user *independent* audible enjoyment.” EX1001, 3:22-24 (emphasis added); *see also id.*, 4:55, 5:8-9, 5:46-47, 6:1, 7:16-17, 9:29, 10:22-23 (independent claim elements [1P], [2P], [3C], [5P], [8B], [9P] and [10B] claiming use of “independent code division multiple access communication”). A POSA would understand that prior art spread spectrum code division multiple access types and implementations utilized

centrally controlled transmissions to manage spreading codes so as to maintain orthogonality between user receivers, and as such, would not be applicable for the need addressed by the '000 Patent for multiple, independent user-controlled transmitters.

B. Independent CDMA is Not Taught in Miyake

46. The primary innovation in Miyake relates to its central controller assigning spreading codes to each user together with assigning spreading codes according to an attribute to indicate different types of user services or data transmission requirements. *See, e.g.*, EX1016, Abstract, 2:28-36, 5:12-29. Miyake discloses a spread spectrum communication system using fixed-length spreading codes.

47. Miyake does not teach how to manage variable-length code orthogonality without central control. That problem is not addressed in Miyake, as the reference is limited to fixed-length codes and Miyake's filing date is 5 years before Walley.

48. Even if Miyake's system could theoretically be implemented without central control, the reference itself only teaches central control for code assignment using codes already known to be orthogonal. *See, e.g.* EX1016, 5:12-29.

49. Petitioner's argument regarding alleged disclosure of the independent code division multiple access communication limitation by Miyake makes reference

only to (1) Miyake’s description of its *receiver* (EX1016 at 6:63-7:18) and (2) the bare statement in Petitioner’s Davies Declaration that it is so. EX1012 at ¶255. Even while ignoring the description of Miyake’s *transmitter*, Petitioner’s cited Miyake passage concerning its receiver makes clear that the *transmitter* supports “other channel users who also use this communication system.” Pet. at 46; EX1016 at 6:63-7:18. Miyake discloses that “[a] spreading process is performed with a *spreading code assigned to each user* and a spreading code assigned according to an attribute, and the resultant signal is modulated on the transmitter side.” EX1016 at Abstract (emphasis added). Miyake’s “transmission station” provides the disclosed “spreading code assigned to each user.” *Id.* at 2:27-28, 2:48-58, 3:4-8.

50. The assignment of different orthogonal codes for different users is a requirement of Miyake’s one-to-many system (controller-to-users), and without it there would be no assurance of orthogonality. In contrast to the assertion in the Davies Declaration, Miyake does not disclose a one-to-one relationship between Miyake’s receiver and transmitter that does not require any centralized control. *See* EX1012 at ¶255. This, is a clear indication that Miyake’s base station (“transmission station”) based spread spectrum communication system is not *independent* code division multiple access, since a POSA would understand from Miyake that its transmitter is centrally controlled for the proper functioning of all of its users’ receivers, and not that a user controls the transmitter from which it receives. EX1016

at 1:12-24. A POSA would understand that Miyake's *transmitter* modulates the "resultant signal" that includes transmission signals for all users that are then separable at a given user receiver using the base station assigned spreading code. *Id.*

51. Turning to Miyake's description of its *transmitter*, Miyake discloses two alternative arrangements of its modulator circuit on the transmission side. EX1016 at 5:36-6:13, 8:61-9:12, Fig. 3, Fig. 8. In regards to the transmission arrangement shown in Fig. 3, Miyake discloses that

[T]he spreading code supplied to the mixer 31 is what is obtained by mixing a spreading code from the first spreading code generator 32, which produces spreading codes *specific to individual users*, with a spreading code output from the second spreading code generator 33, which produces spreading codes assigned according to the attributes, so that the service desired by each user is assigned

EX1016 at 5:50-58 (emphasis added). This clearly indicates system performance dependent upon the central control of the transmission codes and transmissions to each user. The embodiment of Miyake Fig. 8, is merely an alternative arrangement to that of Fig. 3, where information and spreading modulation are performed separately, but not changing the fact that the performance of the Miyake system is dependent upon central control for its user code assignments. EX1016 at 8:61-67.

52. In the context of the Miyake receiver, Petitioner quotes that Miyake teaches that "the spreading code set on the transmitter side should coincide with the

spreading code set on the receiver side” and that “those spreading codes should differ from those for the other channel users who also use this communication.” Pet. at 46; EX1016 at 6:63-7:18. Yet, in Miyake these codes are determined and assigned by the central transmission controller of the system, and this does not indicate a one-to-one relationship independent of any central control. *Id.* at 2:27-28, 2:48-58, 3:4-8.

53. Miyake explains that in its system “a plurality of users [] perform communication while sharing one wide frequency band on a *time and spatial basis*.” EX1016 at 1:13-14 (emphasis added). This description of sharing a frequency band on a time and spatial basis in the context of Miyake’s system would be understood by a POSA to require the involvement of a central controller in order to perform the requisite allocation of respective time slots (time basis) to the different users in what would be understood to be a time division multiple access (“TDMA”) communication method.

54. Miyake’s discussion of power control in the context of the “number of allowable users” of its spread spectrum communication system would further suggest to a POSA the involvement of a central controller in Miyake’s system. EX1016, 4:1-11. Miyake states that “the number of users which can be accommodated in the system is maximum when signals sent from respective users have an equal reception power P .” *Id.*, 4:8-10. A POSA would understand this discussion of managing the reception power as an indication of the use of a central

controller in Miyake's system because this balancing of power would be understood to involve TDMA because each transmitter would transmit at an allotted time, instead of all at once.

C. Independent CDMA is Not Taught in Walley

55. In regards to Walley, Petitioner states, "Walley teaches that an orthogonal code is used to separate the transmissions of interest from the rest, so that the receiver only communicates with the transmitter of interest," making reference to Petitioner's Davies Declaration. Pet. at 46 (citing EX1012 at ¶¶250-255). However, ¶¶250-255 of Petitioner's Davies Declaration does not provide sufficient explanation or support for Petitioner's assertion that Walley's "receiver only communicates with the transmitter of interest," *without central control. Id.*

56. The primary innovation in Walley relates to the adjustment of data rates by varying the spreading code length while keeping the overall transmission bandwidth constant. *See, e.g.,* EX1015 at Abstract, 4:18-24, 8:8-14. Shorter assigned codes enable higher data rates while longer assigned spreading codes provide for greater interference resistance at the cost of lower data rates. *Id.* The Walley central system controller determines code length based on the type of data being transmitted and its overall communication environment. *Id.* The adjustment is used to manage how many users can be on the system at once.

57. While Walley does not explain how orthogonality is maintained when spreading code lengths are varied, a POSA would understand that maintaining orthogonality in a communications environment that utilizes varying code length would not be possible without a base unit controller to govern which codes could be used (e.g., elimination of grandparent, parent, or child codes of codes that would no longer be orthogonal to shorter spreading codes). In other words, in a system with varying length codes, orthogonality is maintained only if no two active codes share a parent-child relationship. This means that if a shorter code is in use, none of its child (longer) codes can be used simultaneously, and vice versa.

58. A POSA at the time of Walley (1999), would be aware of, for example, Orthogonal Variable Spreading Factor (OVSF) codes, which are organized in a code tree structure where shorter codes are parent nodes and longer codes are child nodes, and the requirement to dynamically and centrally manage assignment of these varying length codes in order to preserve orthogonality. For example, “The Communications Handbook - Second Edition” (2002) by Jerry D. Gibson (“Gibson 2d ed.”) teaches that, “[on] the forward link orthogonal, variable rate codes, C_{ch} , are used to separate channels.” EX2021 at 17. A POSA would understand from this textbook teaching that variable rate codes would imply variable code lengths as in Walley, and the required use of a base station (i.e. “forward link”). *Id.*

59. Walley does not teach a “one-to-one” relationship and requires central control to maintain orthogonality. The specification and claims of Walley make clear that code assignment must be managed by a centralized entity. *See, e.g.*, EX1015, 7:36-40, 10:23-26, 11:23-26, 11:61-66. Without central control, a distributed system would inevitably assign codes that violate orthogonality constraints, leading to catastrophic interference.

60. A POSA reading Walley would understand that central control is not merely a preferred implementation—it is essential to the system’s operation. Omitting central control from Walley’s teachings would render the system inoperable for its intended purpose of supporting variable length spreading codes with maintained orthogonality.

IX. THE COMBINATION OF WALLEY AND MIYAKE

61. A POSA would not have been motivated to combine Miyake with Walley. As discussed above, Walley’s approach utilized variable length PN codes while Miyake teaches assignment of multiple fixed-length spreading codes comprised of two fixed-length sub portions; these are two fundamentally different approaches that a POSA would not have understood to be compatible or able to be adapted to operate together without first conducting a large amount of experimentation. A POSA would not have expected a predictable benefit from combining Walley’s variable length PN codes adaptation with Miyake’s service- and

user-discriminating spreading-code architecture because the two disclosures address different problems under conflicting design constraints and combining them would defeat Miyake's core goal of simplified multi-user/service management.

62. As discussed above, Walley's system is directed to optimizing link performance in consumer-device contexts by dynamically altering at least PN code length to maximize throughput or extend range in the context of a fixed bandwidth budget. *See, e.g.*, EX1015, 4:17-24, 3:19-33, 8:62-65. The problem Walley is trying to solve is adapting to changing conditions within an application—e.g., increasing throughput when signal is strong, or extending range when signal is weak—while still utilizing the same hardware for each scenario.

63. As discussed above, Miyake's disclosure is directed to simplifying multi-user and multi-service management in a shared-bandwidth system by structuring spreading codes into hierarchical layers—i.e. user-specific and attribute-specific—so that services and users can be managed separately. *See, e.g.*, EX1016, 2:23-26, 3:15-19. Miyake explains that the problem is that “if the number of users and/or the number of services is increased, the managing system for the users and services which are managed together as well as the management of those spreading codes becomes complicated.” *Id.*, 2:14-19.

64. A POSA would recognize that these are different engineering problems: Walley addresses link-level throughput and range adaptation, while

Miyake addresses system-level code and service management. Further, the introduction of Walley's dynamic PN-length control would introduce variability into each link that would complicate code management and frustrate Miyake's stated objective of simplifying that management.

65. I understand that a reference teaches away when it "criticizes, discredits, or otherwise discourages" investigation into the claimed solution. *Meiresonne v. Google, Inc.*, 849 F.3d 1379, 1382 (Fed. Cir. 2017). Walley teaches away from a system utilizing independent CDMA in two critical respects: (1) Walley does not merely prefer central control; central control is essential to the system's operation; and (2) a POSA reading Walley would understand that omitting central control would render the system inoperable. This strongly discourages any attempt to implement Walley's variable-length code benefits without central coordination.

66. Also, a POSA would not look to Walley for the benefits of variable-length spreading codes and to Miyake for spreading code assignment techniques to combine them to achieve the system claimed by the '000 Patent at least because that combination would not eliminate central control. As discussed above, Walley's variable-length code system requires central control to maintain orthogonality, thus any combination that incorporates Walley's core teachings would necessarily include central control.

X. INDEPENDENT CLAIMS 1, 2, 5, AND 9: “INDEPENDENT OF THE OPERATION OF ANOTHER HEADPHONE[/RECEIVER]”

67. The “independent CDMA” limitation and “independent of the operation of another headphone[/receiver]” limitation found in the preambles of independent claims 1, 2, 5, and 9 are meaningfully distinct as the two limitations concern different technical features or functions of the claimed inventions. The claim term “independent CDMA communication” describes how the signal is separated mathematically in space, whereas “independent of the operation of another headphone[/receiver]” describes how the hardware is isolated operationally from another user’s hardware, e.g. a peer. Neither Petitioner nor the Davies Declaration provide any argument for or sufficient description of the disclosure of the “independent of the operation of another headphone[/receiver]” limitation in Walley, Miyake, or the other cited prior art and neither does the cited prior art disclose such regardless.

68. A POSA would understand claims 1, 2, 5, and 9 to distinguish between these two separate requirements present in the claims: (1) the requirement that the system be “configured to use independent CDMA communication” and (2) the requirement that the headphone[/receiver] operate “independent of the operation of another headphone[/receiver]” of a separate user. It would be incorrect to conflate these terms and a POSA would not understand their common usage of the word “independent” to justify doing so. A POSA would understand that the “independent

CDMA” limitations and “independent of the operation of another headphone[/receiver]” limitations govern entirely different layers of the communications architecture.

69. The claim phrase “configured to use independent CDMA communication” encompasses the mathematical and algorithmic methodology used to encode and separate signals sharing the same wireless spectrum, more specifically the type of signaling mechanism employed to maintain channel separation in a shared radio frequency environment. A POSA would understand that this limitation requires the communication link to utilize code-based division principles, wherein digital isolation is achieved through the application of unique, orthogonal, or pseudo-random coding sequences to differentiate user paths. The term “independent” in this context would be understood to modify the communication channels themselves and signify that the unique coding sequence assigned to a specific user link allows it to coexist with other active links on the same frequency without mutual interference, mathematically reducing competing transmissions to negligible background noise.

70. Conversely, the claim phrase “independent of the operation of another headphone[/receiver]” dictates a strict operational constraint regarding inter-headphone[/receiver] autonomy and establishes a structural requirement of operational autonomy between peer headphone[/receiver] units. For a

headphone[/receiver] to teach or satisfy this claim element, its capacity to initialize, decode an incoming signal, and process data would need to be isolated from, and unconditioned upon, the active operational state, control decisions, or simultaneous behavior of any other headphone[/receiver] in the same space. This requirement could distinguish claims 1, 2, 5, and 9's architecture from cooperative headphone[/receiver] topologies, where a given headphone's[/receiver's] ability to function is structurally contingent upon a secondary headphone/[receiver]'s active coordination, relaying, or state-sharing.

71. This technical distinction between these two claim elements is important because they represent non-redundant engineering requirements. For example, a particular communication system may be configured to utilize an independent code-division protocol to separate channels, but nonetheless fail to satisfy the headphone[/receiver]-level independence requirement if the individual headphones[/receivers] of that communication system must actively coordinate with one another to manage their reception windows, handoffs, or local interference mitigation.

72. By explicitly requiring *both* headphone-to-headphone[/receiver-to-receiver] operational autonomy and code isolation at the signaling layer, claims 1, 2, 5, and 9 capture a distinct, highly resilient system architecture. Prior art that merely discloses unique code generation or general channel division does not

inherently teach or render obvious a headphone[/receiver] that operates structurally independent of the operation of another headphone[/receiver].

73. I hereby declare all statements made herein are of my own knowledge and are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both under 18 U.S.C. §1001.

74. In signing this declaration, I recognize that the declaration will be filed as evidence in a contested case before the PTAB. I also recognize that I may be subject to cross-examination in the case and that cross-examination will take place within the United States. If cross-examination is required of me, I will make myself reasonably available to appear for cross-examination within the United States during the time allotted for cross-examination.

75. I declare under the penalty of perjury that the foregoing is true and correct.

Executed: May 22, 2026 in Mayagüez, Puerto Rico, USA.

A handwritten signature in blue ink, appearing to read "J. L. Melendez", with a stylized flourish at the end.

Dr. Jose Luis Melendez

DR. JOSE LUIS MELENDEZ

Resident of Mayagüez, Puerto Rico, USA

E-Mail: jose@drmtes.com

Mobile: 214-686-8896

BIOGRAPHICAL DATA

Birthdate: October 22, 1968

Birthplace: Fort Dix, United States Army Installation, New Jersey

Citizenship: United States of America

Personal: Married with Children

EDUCATION

Doctor of Philosophy in Electrical Engineering from Stanford University
(January 6, 1994) with a Grade Point Average of 4.0/4.0.

Master of Science in Electrical Engineering and Computer Science from the
Massachusetts Institute of Technology (February 20, 1991) with a Grade Point
Average of 4.8/5.0.

Bachelor of Science in Electrical Engineering from the Massachusetts Institute of
Technology (June 4, 1990) with a Grade Point Average of 5.0/5.0.

PROFESSIONAL CONSULTING AND INTERESTS (Alphabetical Order)

Computer Networking

Data Visualization

Document Management and Control

E-Commerce

Imaging Devices and Systems

Integrated Photonic Circuit Subsystems

Internet

Mobile Cellular Systems and Devices

Mobile Computing

Micro-Electro Mechanical Systems (MEMS)

Local Area Networks (e.g. WiFi)

Nanotechnology

Optical Systems

Personal Area Networks (e.g. Bluetooth)

Perspective Science (Judgement and Decision Making/Artificial Intelligence)

Radio Frequency Collision Avoidance

Remote Systems Management

Semiconductor Devices and Manufacturing

Solid State Lighting Subsystems

Spectroscopic Analysis and Measurement

Voice Over Internet Systems

Wireless Systems, Devices, and Standards

Cases (6 Years) on behalf of party indicated in bold.

Retained for reports on infringement/non-infringement, validity/invalidity, declarations, testimony at depositions, and/or tutorials:

Monument Peak Ventures, LLC v. Open Text Corp.	EDTX
2:25-cv-00521 2025	
Via Vadis, LLC et al. v. Amazon.com, Inc.	WDTX
1-14-cv-813 2020	
Via Vadis, LLC et al. v. Blizzard Entertainment, Inc.,	WDTX
1-14-cv-810 2020	
Appliance Computing III, Inc. v. Redfin Corporation	WDTX
6-20-cv-00376 2020	
Human Differential Intelligence LLC v. CVS Health Corp.	WDTX
6-20-cv-00311 2020	
Human Differential Intelligence LLC v. Bed Bath & Beyond	WDTX
6-20-cv-00310 2020	
Human Differential Intelligence LLC v. The Gap, Inc.	WDTX
6-20-cv-00307 2020	
Human Differential Intelligence LLC v. Cigna Corporation	WDTX
6-20-cv-00305 2020	
Monument Peak Ventures, LLC v. Hitachi Kokusai Electric	EDTX
2-20-cv-00098 2020	
Verizon Business Network Services v. Huawei Technologies	EDTX
2:20-cv-00030 2020	
Huawei Technologies v. Verizon Communications Inc.	EDTX
2:20-cv-00030 2020	
Bandspeed LLC v. Cypress Semiconductor Corporation	WDTX
1-19-cv-00936 2019	
Bandspeed, LLC v. Curtis International Ltd.	WDTX
1-19-cv-00225 2019	
Parity Networks, LLC v. Zyxel Communications, Inc.	CDCA
8:20-cv-00697 2020	
Parity Networks, LLC v. Moxa Inc. et. al.	CDCA
8:20-cv-00698 2020	
Parity Networks, LLC v. Edgecore USA Corporation	CDCA
8:20-cv-00697 2020	

EX/INTER PARTES REVIEW

Have provided expert declarations and/or testimony at depositions.

Represented Party: Keysoft, Inc.

Requester: Unified Patents LLC

Control No. 90019835

Represented Party: Bytemark, Inc.

Petitioner: Xerox Corp., ACS Transport Solutions, Inc., et al. IPR2022-00621

Represented Party: Rembrandt Wireless Technologies, LP

Petitioner: Qualcomm Incorporated

IPR2020-00510

Petitioner: Qualcomm Incorporated

IPR2020-00509

Represented Party: Mimzi, LLC

Petitioner: Microsoft Corporation, Google LLC, et. al.

IPR2019-01516

Petitioner: Foursquare Labs, Inc.

IPR2019-01287

Petitioner: Tripadvisor, LLC

IPR2019-01080

Represented Party: KOM Software, Inc.

Petitioner: NetApp, Inc.; HP Enterprise Company

IPR2019-00608

Petitioner: NetApp, Inc.; HP Enterprise Company

IPR2019-00607

Petitioner: NetApp, Inc.; HP Enterprise Company

IPR2019-00606

Petitioner: NetApp, Inc.; HP Enterprise Company

IPR2019-00605

Petitioner: NetApp, Inc.; HP Enterprise Company

IPR2019-00604

Petitioner: NetApp, Inc.; HP Enterprise Company

IPR2019-00603

Petitioner: NetApp, Inc.; HP Enterprise Company

IPR2019-00601

Petitioner: NetApp, Inc.; HP Enterprise Company

IPR2019-00600

Petitioner: NetApp, Inc.; HP Enterprise Company

IPR2019-00598

Petitioner: NetApp, Inc.; HP Enterprise Company

IPR2019-00597

Petitioner: NetApp, Inc.; HP Enterprise Company

IPR2019-00594

Petitioner: NetApp, Inc.; HP Enterprise Company

IPR2019-00592

Petitioner: NetApp, Inc.; HP Enterprise Company

IPR2019-00591

Represented Party: Parity Networks, LLC

Petitioner: Juniper Networks, Inc.	IPR2018-01587
Petitioner: Juniper Networks, Inc.	IPR2018-01590
Petitioner: Juniper Networks, Inc.	IPR2018-01623
Petitioner: Juniper Networks, Inc.	IPR2018-01635
Petitioner: Juniper Networks, Inc.	IPR2018-01644
Petitioner: RPX Corporation et al	IPR2018-00099
Petitioner: RPX Corporation et al	IPR2018-00100

Represented Party: Bandspeed, Inc.

Petitioner: Qualcomm Incorporated	IPR2016-00620
Petitioner: Qualcomm Incorporated	IPR2016-00623

WORK EXPERIENCE

2018-Present: DRMTES LLC (Expert Consulting Services)

2018–2023: Professor, Department of Computer Science and Engineering,
University of Puerto Rico at Mayagüez

2019-2022: Special Assistant of Chancellor, University of Puerto Rico Mayagüez

2015-2022: DRMArts LLC, Managing Member (Artistic Endeavors)

2010-2022: Chief Executive Officer, Patent Calls, Inc. (Analytics)

2002-2018: Professional Consulting (Technology)

2013-2014: Patentiquity, Inc. (Patent Analytics)

2009-2013: Founder & Chief Scientist, Spectral MD, Inc. (publicly traded
company - medical imaging systems)

2007-2011: Board Director, Sand 9, Inc. (Nanotechnology)

2002-2007: Co-Founder and Executive, Commoca Inc., (smart phones,
applications, networks, and services).

2001-2002: General Manager, Wireless Infrastructure, Texas Instruments, Inc.
(wireless infrastructure systems, devices and software)

1999-2001: General Manager, Optical Products, High Performance Analog,
Texas Instruments, Inc. (wireless communications, sensors, storage, and micro-
electromechanical systems)

1997-2000: Affiliate Professor, Department of Electrical Engineering and
Computer Science, University of Washington.

1997-1999: Director/Department Manager, Microcomponents Technology Center,
Texas Instruments, Inc. (semiconductor devices, sensors and manufacturing).

1988-1996: Branch Manager / Member Technical Staff / Intern, Sensor and
Infrared Laboratory, Central Research Laboratory, Texas Instruments, Inc.
(sensors, devices, process development).

1987: Intern – Data Center, Honeywell Electro-Optics Division, Massachusetts.

PATENTS ISSUED – NAMED INVENTOR

US 8,838,211 Multi-wavelength diagnostic imager

US 8,606,344 Integrated Patient Bed System

US 7,203,425 Optical wireless link

US 7,035,546 Optical wireless multiport hub

US 6,813,446 System for acquiring and maintaining reliable optical wireless links

US 6,752,962 Miniaturized integrated sensor platform

US 6,714,336 Packaged micromirror assembly with in-package mirror position feedback

US 6,692,697 Versatile flow cell front-end for optically-based integrated sensors

US 6,690,888 Method for establishing and maintaining optical, open-air communications link

US 6,657,832 Mechanically assisted restoring force support for micromachined membranes

US 6,635,919 High Q large tuning range Micro-Electro Mechanical System (MEMS) varactor for broadband applications

US 6,525,396 Selection of materials and dimensions for a micro-electromechanical switch for use in the RF regime

US 6,415,235 Fixed optic sensor system and distributed sensor network

US 6,376,787 Microelectromechanical switch with fixed metal electrode/dielectric interface with a protective cap layer

US 6,374,845 System and method for sensing and controlling beverage quality

US 6,326,612 System and method for optical sensing utilizing portable, detachable sensor cartridge

US 6,326,210 Method of making and connecting a miniaturized integrated sensor

US 6,191,847 Fixed optic sensor system and distributed sensor network

US 6,183,696 Optically based miniaturized sensor with integrated fluidics

US 6,111,652 High throughput surface plasmon resonance analysis system

US 6,111,248 Self-contained optical sensor system

US 6,097,479 Critical angle sensor

US 6,045,756 Miniaturized integrated sensor platform

US 6,024,923 Integrated fluorescence-based biochemical sensor

US 5,946,083 Fixed optic sensor system and distributed sensor network

US 5,922,285 Integrated fluorescence-based biochemical sensor

US 5,912,456 Integrally formed surface plasmon resonance sensor

US 5,898,503 Surface plasmon resonance sensor with interchangeable optical element

PROFESSIONAL AND SOCIETY MEMBERSHIPS (Past & Present)

Association for the Advancement of Artificial Intelligence

Member, IEEE Engineering in Medicine and Biology Society

Member, Society of Photo-Optical Instrumentation Engineers

OTHER HONORS

Panelist, Taking your Expertise Beyond the Job, IP Summit, SHPE National Convention, 2020.

Moderator, Intellectual Property Panel, Hispanic National Bar Association National Conference, Dallas, Texas, 2011

Moderator, Non Practicing Entity Panel, TechNet IP Forum, New York, New York, 2010

Invited Speaker: “Increasing Developing Countries’ Local and International Investments in Innovative Technologies”, Association of University Technology Managers, San Juan, Puerto Rico, June 2009

Wireless Design and Development Technology Award – 100Mbps Wireless Reference Design

HISPANIC BUSINESS® Magazine: Youngest person named to Hispanic Corporate Elite featuring Hispanic executives from Fortune 500 companies

Electronics Design Magazine – 1999 New Product of Year - Spreeta®

Popular Science® Cover Story – June 1998 – TI Sensors

Luminary Panelist - Electronic Design Automation’s Executive Business Forum 2000

Forbes, May 28, 2001, p. 89, “...Jose Meléndez...helping TI move up to the next generation.”

USA Today, February 16, 1998, Cover of Business Section, “Hot Tech ...”

Exhibit A
Curriculum Vitae of Dr. Jose Luis Melendez

Hispanic Engineering National Achievement Award for Most Promising Scientist of 1997

National Science Foundation Fellow

Stanford Center for Integrated Systems Fellow

CIVIC ACTIVITIES

Sponsor of Perspectivas Globales, 2019-Present

School Board Trustee, Texas CAN! Academy, 2009-2012

Board Member, Puerto Rico Research and Commercialization Alliance, 2004-2005