

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

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

Petitioners,

v.

APEX BEAM TECHNOLOGIES LLC,

Patent Owner.

Patent No. 10,944,527
Filing Date: June 3, 2019
Issue Date: March 9, 2021

Inventor: Xiaobo Zhang
Title: METHOD AND DEVICE FOR MULTI-ANTENNA
TRANSMISSION IN UE AND BASE STATION

PATENT OWNER'S SUR-REPLY

Case No. IPR2023-00603

TABLE OF CONTENTS

	<u>Page(s)</u>
I. THE BOARD MUST RESOLVE THE CLAIM CONSTRUCTION DISPUTES BECAUSE THEY ARE RELEVANT TO THE OUTCOME.....	1
A. “the first radio signal is transmitted by K antenna port groups of the base station”	1
B. “time resource pool”	2
II. THE AUTHORIZED GROUNDS DO NOT RENDER OBVIOUS THE CHALLENGED CLAIMS	3
A. Claims 1, 4-6, 9-11, 14-16, and 19-20 Are Not Obvious Over Any Combination of Kim, Zhang, and Kang.....	3
1. Any Combination of Kim, Zhang, and Kang Does Not Disclose “ <i>wherein the first radio signal is transmitted by K antenna port groups of the base station</i> ”	3
2. Any Combination of Kim, Zhang, and Kang Does Not Disclose “ <i>the first signaling is used to determine a first time resource pool</i> ”	4
III. MR. GOMEZ IS QUALIFIED TO OFFER EXPERT TESTIMONY FROM THE PERSPECTIVE OF AN ORDINARILY SKILLED ARTISAN	6
IV. CONCLUSION.....	9

TABLE OF AUTHORITIES

	Page(s)
Cases	
<i>SEB S.A. v. Montgomery Ward & Co.</i> , 594 F.3d 1360 (Fed. Cir. 2010)	8
<i>Sundance, Inc. v. DeMonte Fabricating Ltd.</i> , 550 F.3d 1356 (Fed. Cir. 2008)	8
<i>Yorkey v. Diab</i> , 601 F.3d 1279 (Fed. Cir. 2010)	9

EXHIBIT LIST

Exhibit No.	Description of Document
2001	Defendants' Patent L.R. 3-3 Invalidity Contentions and Subject Matter Ineligibility Contentions, <i>Apex Beam Technologies LLC v. Samsung Electronics Co., Ltd. et al.</i> , Case No. 2:22-cv-00188-JRG, served March 2, 2023
2002	Order Denying Motion to Stay Pending <i>Inter Partes</i> Review, Dkt. 55, <i>Apex Beam Technologies LLC v. Samsung Electronics Co., Ltd., et al.</i> , Case No. 2:22-cv-00188-JRG (E.D. Tex. June 14, 2023)
2003	Redline Comparison of the Declaration of Apostolos Kakaes, Ph.D. (Ex. 1003) to the Petition
2004	Declaration of Miguel Gomez ("Gomez Decl."), dated January 12, 2024 and Exhibit A, Curriculum Vitae of Miguel Gomez
2005	Deposition of Apostolos Kakaes, taken in <i>Samsung Elecs. Co., Ltd. and Samsung Elecs. America, Inc. v. Apex Beam Techs. LLC</i> , IPR2023-00603, on December 19, 2023 ("Kakaes Depo.")

I. THE BOARD MUST RESOLVE THE CLAIM CONSTRUCTION DISPUTES BECAUSE THEY ARE RELEVANT TO THE OUTCOME

A. “the first radio signal is transmitted by K antenna port groups of the base station”

Petitioner’s Reply (Paper 15, “Reply”) confirms the existence of a genuine controversy regarding how to construe “the first radio signal is transmitted by K antenna port groups of the base station.” There is no question that the parties dispute the meaning of this term, which will affect the Board’s findings on whether the prior art teaches numerous limitations.

Petitioner has improperly construed “the first radio signal is transmitted by K antenna port groups of the base station” to read out the fact that at least 2 groups of antennas of the base station are collectively responsible for transmitting the claimed first radio signal. Ex. 2004, ¶ 27.

Patent Owner’s proposal to construe this limitation to mean “the first radio signal is collectively transmitted by K groups of antenna ports of the base station” provides clarity and removes any ambiguity regarding how many groups of antennas are responsible for transmitting the first radio signal. Petitioner’s attempt to inject ambiguity by treating the construction term “collectively” in isolation from the remainder of the limitation lacks merit. Mr. Gomez confirmed that the use of the term “collectively” refers to the responsibility for transmission, not the timing of the

transmission, of the radio signal. Ex. 1036 at 32:11-33:7. Petitioner’s immaterial questioning on timing (*e.g.*, “simultaneously” and “at the same time”) as it relates to the construction term “collectively” is an obvious red herring designed to distract from the stated issue of responsibility of transmission. *Id.*

Petitioner confirms its strategy of broadening the “K antenna port groups” to address “only one antenna port.” Reply at 5. Petitioner’s citation to a different singular term for group is immaterial to the plurally recited groups and fails to conform to the plain meaning of the term.

B. “time resource pool”

Petitioner’s Reply confirms the existence of a genuine controversy regarding how to construe “time resource pool.” There is no question that the parties dispute the meaning of this term, which will affect the Board’s findings on whether the prior art teaches numerous limitations.

Petitioner’s implied construction reads out the word “pool” from “time resource pool.” Ex. 2004, ¶ 33. Patent Owner proposes that “time resource pool” be construed as “collection of time resources for a shared use.” *Id.* Patent Owner’s proposal is consistent with the patent specification and the testimony of both competing experts in this proceeding.

II. THE AUTHORIZED GROUNDS DO NOT RENDER OBVIOUS THE CHALLENGED CLAIMS

A. Claims 1, 4-6, 9-11, 14-16, and 19-20 Are Not Obvious Over Any Combination of Kim, Zhang, and Kang

1. Any Combination of Kim, Zhang, and Kang Does Not Disclose “*wherein the first radio signal is transmitted by K antenna port groups of the base station*”

Kim does not disclose “wherein the first radio signal is transmitted by K antenna port groups of the base station,” “the antenna port group includes a positive integer number of antenna port(s),” “a first antenna port group is one of the K antenna port groups,” and “the K is a positive integer greater than 1.” Pet. at 17-20; Ex. 2004, ¶ 38.

The Board should adopt the construction “the first radio signal is *collectively* transmitted by K groups of antenna ports of the base station.”

Petitioner’s Reply confirms their contention that Kim’s CSI-RS is the claimed “first radio signal.” Pet. at 17 (Kim discloses that the CSI-RS (first radio signal) is transmitted by K antenna port groups of the base station.”). Ex. 2004, ¶ 40. But Kim teaches away from the required collective transmission of the CSI-RS by K groups of antenna ports. *Id.* Kim teaches that only one of multiple CSI-RSs each correspond to an antenna port group (“CSI-RSs . . . are transmitted to each UE for each group of multiple antennas”) and are each transmitted by a respective antenna group of an allocated transmission time interval for that antenna group (“each

antenna group transmits a CSI-RS in each transmission interval”). Kim explicitly describes transmission of a different CSI-RS (not just one radio signal – “the first radio signal”) from each of its disclosed antenna groups in contravention of Claim 1’s requirement that “the first radio signal is *collectively* transmitted by K groups of antenna ports of the base station.” *Id.* Petitioner’s attempt to rely on new disclosure from various distinct embodiments unrelated to the selected CSI-RS at Pet. 17 should be rejected. Petitioner’s immaterial contention on timing (*e.g.*, “simultaneously” and “at the same time”) as it relates to the construction term “collectively” is an obvious red herring designed to distract from the stated issue of responsibility of transmission. Indeed, Mr. Gomez testified that the claim requires that the one first radio signal must be transmitted by all the K antenna port groups. Ex. 1036 at 35:2-21.

2. Any Combination of Kim, Zhang, and Kang Does Not Disclose “*the first signaling is used to determine a first time resource pool*”

Kim does not disclose “the first signaling is used to determine a first time resource pool.” Pet. at 20-22; Ex. 2004, ¶ 42.

Patent Owner proposes that “time resource pool” be construed as “collection of time resources for a shared use.” Ex. 2004, ¶ 33. This construction is helpful to clarify that the word “pool” cannot be disregarded.

The Petition improperly ignores the term “pool,” contending that “*Kim* discloses that the control information includes ‘positions of time and frequency resources at which a CSI-RS for each antenna group is transmitted.’” Pet. at 20 (citing *Kim*, ¶ [0069]); Ex. 2004, ¶ 43. *Kim*, at most, only discloses separate time resources. Ex. 2004, ¶ 43. Ex. 2004, ¶ 44; Pet. at 21 (“*Kim* show[s] that CSI-RSs for each antenna port group are transmitted over *separate time resources (subframes)*.”) (emphasis added); *see also* Ex. 1004, ¶¶ [0060], [0082]-[0083].

The shared use of the time resource pool described in the ’527 Patent refers to the shared collection of time resources for transmission by all K antenna port groups. *Kim* contradicts that “shared use” when it discloses that “*CSI-RSs for each antenna port group are transmitted over separate time resources (subframes)*.” Ex. 2004, ¶ 45; Pet. at 21. This point is not addressed by Petitioner’s new specification of *Kim* FIGS. 5 and 7 which fails to consider the description identifying the CSI-RS mapped to the first signal. Petitioner’s Reply confirms their strategy to read out the claimed requirement of “shared use” among all K antenna port groups rather than simply one group as Petitioner alleges. Petitioner’s reliance on unrelated claim limitations should be rejected, and Petitioner’s reliance on FIG. 9 is misguided. During his deposition, Mr. Gomez confirmed that FIG. 9 does not teach any signals being transmitted over a time resource pool or when in time any transmission occurs within a time resource pool. Ex. 1036 at 34:5-24. Petitioner should not be permitted to

supplement the reference.

III. MR. GOMEZ IS QUALIFIED TO OFFER EXPERT TESTIMONY FROM THE PERSPECTIVE OF AN ORDINARILY SKILLED ARTISAN

Although the parties agree that “[a]dditional relevant work experience can compensate for less education,” Petitioner does not clarify what the metes and bounds of that “additional work experience” might be in their Reply. Even after the Board noted that “Petitioner’s last sentence regarding additional relevant work experience compensating for less education and *vice versa*, [] is vague,” Petitioner’s Reply provides no further clarification or rebuttal of Patent Owner’s proposed “additional relevant work experience” outside of stating that the technological experience should be limited to MIMO instead of telecommunications even though MIMO is a small subset of telecommunications. Reply at 23-24. Since Patent Owner provided the only definition of a person of skill in the art with a clear scope, Patent Owner’s definition should be adopted. Mr. Gomez satisfies Patent Owner’s proposed definition (as well as Petitioner’s proposed definition, despite its lack of clarity). In addition to a Bachelor of Science Degree from Yale University in Electrical Engineering, Mr. Gomez has over “thirty five years of experience in the design and development of hardware and software technology used in telecommunications, data communications, wireless transmission and related protocols.” See Ex. 2004, Exhibit A, at 1, 3. Mr. Gomez has considerable

experience designing products that utilize the underlining technologies of Spread Spectrum (802.11a,b,g,n), LTE, OFDM, RF Transmission and reception, which are in turn utilized by LTE and by 5G NR. *Id.* at 2. Specifically, the following work experiences listed in Mr. Gomez’s CV are highly pertinent to the field of “telecommunications systems,” which Petitioner agrees is the relevant field. Pet. at 13.

Mr. Gomez’s work experience began in 1983 at ROLM Corporation where he designed *transmission protocols for business telephone equipment*. Ex. 2004, Exhibit A, at 6. Later, in 1985, Mr. Gomez was a founding member of Stratacom, Inc. where he designed long haul voice and *data routing equipment*, and developed compression algorithms for *voice communications*. *Id.* Mr. Gomez’s work at Stratacom also included designing methods to include data on the *voice transmission paths that later became known as Frame Relay*. *Id.* In 1990, as a consultant, Mr. Gomez worked on circuit design in “*computing, telephony and data systems*.” *Id.* at 5 (emphasis added). At ActSolar, from August 2006 to March 2009, Mr. Gomez was Vice President and tasked with implementing both power conversion circuitry, as well as *a radio system*, to convey the health status of the solar array to a web server. *Id.* at 3. Petitioner’s allegations that Mr. Gomez is not a POSITA in the field of wireless communications are therefore meritless and should be rejected.

Moreover, Petitioner’s arguments attacking Mr. Gomez’s qualifications are based on an incorrect heightened standard that “[t]he Board should give no weight to the testimony of Mr. Gomez because he does not qualify as a POSITA.” Reply at 23. In fact, the Board explicitly states that “[a] person *may not need to be a person of ordinary skill in the art* in order to testify as an expert under Rule 702, but rather must be ‘qualified in the pertinent art’” and that there is “no requirement of a perfect match between the expert’s experience and the relevant field.” Patent and Appeal Board Consolidated Trial Practice Guide (“Trial Practice Guide”) (Nov. 2019), at 34 (citing *Sundance, Inc. v. DeMonte Fabricating Ltd.*, 550 F.3d 1356, 1363–64 (Fed. Cir. 2008) and *SEB S.A. v. Montgomery Ward & Co.*, 594 F.3d 1360, 1373 (Fed. Cir. 2010)) (emphasis added).

As described above, Mr. Gomez not only provides sufficient qualifications in the field of wireless networking but also meets the parties’ agreed upon definition of a POSITA. And, Mr. Gomez has previously been recognized as having sufficient qualifications in the field of wireless networking. For example, as an expert, Mr. Gomez has been engaged in several cases relating to OFDM. Between September 2012 and August 2013, in the case of *WiLAN Inc. v. HTC Corp.* (2:11-CV-68-JRG), Mr. Gomez supported WiLAN investigating VHDL, Verilog, C, and C++ source code that implemented *OFDM and SC-OFDMA*. Ex. 2004, Ex. A at 13-14 (emphasis added). Between May 2009 and March 2011, Mr. Gomez also

investigated OFDM implementations used in 802.11a,b,g,n in the case of *WiLAN v. Acer* (2:07-CV-473). *Id.* at 18-19. In this case, Mr. Gomez also supported WiLAN investigating Verilog, C, and C++ source code that implemented **OFDM**. *Id.* (emphasis added).

Therefore Mr. Gomez easily meets the level of requisite experience for a POSITA. Mr. Gomez also responded to every question posed by Petitioner’s counsel at his depositions, and Petitioner cannot point to an instance where Mr. Gomez could not respond for lack of relevant technical experience. *See generally* Ex. 1024.

The Board has broad discretion to assign weight to be accorded expert testimony. Trial Practice Guide at 35 (citing *Yorkey v. Diab*, 601 F.3d 1279, 1284 (Fed. Cir. 2010)). Such broad discretion certainly extends here, where an expert, like Mr. Gomez, provides “testimony that is helpful to the Board” and is qualified in the pertinent art of wireless networking. *Id.* at 34 (“[T]he absence of an advanced degree in a particular field may not preclude an expert from providing testimony that is helpful to the Board, so long as the expert’s experience provides sufficient qualification in the pertinent art.”).

IV. CONCLUSION

The Board should issue a Final Written Decision finding the Challenged Claims not unpatentable.

Respectfully submitted,

Dated: May 17, 2024

By: /Vincent J. Rubino, III /
Vincent J. Rubino, III (Reg. No. 68,594)
Lead Counsel for Patent Owner
FABRICANT LLP
411 Theodore Fremd Avenue
Suite 206 South
Rye, New York 10580
Tel. 212-257-5797
Fax. 212-257-5796
Email: vrubino@fabricantllp.com

CERTIFICATE OF WORD COUNT

The undersigned hereby certifies that the portions of the above-captioned PATENT OWNER'S SUR-REPLY specified in 37 C.F.R. § 42.24 has 2,062 words in compliance with the 5,600 word limit set forth in 37 C.F.R. § 42.24. This word count was prepared using Microsoft Word for Office 365.

Respectfully submitted,

May 17, 2024

By: /Vincent J. Rubino, III /
Vincent J. Rubino, III (Reg. No. 68,594)
Lead Counsel for Patent Owner
FABRICANT LLP
411 Theodore Fremd Avenue
Suite 206 South
Rye, New York 10580
Tel. 212-257-5797
Fax. 212-257-5796
Email: vrubino@fabricantllp.com

CERTIFICATE OF SERVICE

A copy of the foregoing Patent Owner's Sur-reply has been served on
Petitioner's counsel of record as follows:

Joshua L. Goldberg
Email: joshua.goldberg@finnegan.com
Nicholas A. Cerulli
Email: nicholas.cerulli@finnegan.com
Mingji Jin
Email: mingji.jin@finnegan.com
Chen Zang
Email: chen.zang@finnegan.com
**FINNEGAN, HENDERSON, FARABOW,
GARRETT & DUNNER, LLP**
901 New York Avenue, NW
Washington, DC 20001-4413

Kevin D. Rodkey
Email: kevin.rodkey@finnegan.com
**FINNEGAN, HENDERSON, FARABOW,
GARRETT & DUNNER, LLP**
271 17th Street NW, Suite 1400
Atlanta, GA 30363-6209

Yi Yu
Email: yi.yu@finnegan.com
**FINNEGAN, HENDERSON, FARABOW,
GARRETT & DUNNER, LLP**
1875 Explorer Street
Reston, VA 20190-6023

*Attorneys for Samsung Electronics Co., Ltd. and
Samsung Electronics America, Inc.*

May 17, 2024

/Vincent J. Rubino, III /
Vincent J. Rubino, III (Reg. No. 68,594)
Lead Counsel for Patent Owner
FABRICANT LLP
411 Theodore Fremd Avenue,
Suite 206 South
Rye, New York 10580
Tel. 212-257-5797
Fax. 212-257-5796
Email: vrubino@fabricantllp.com