

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

VOLKSWAGEN GROUP OF AMERICA, INC.,
Petitioner

v.

CARUCEL INVESTMENTS, LP,
Patent Owner

Case IPR2019-01102
Patent 7,848,701

**PETITIONER VOLKSWAGEN GROUP OF AMERICA, INC.'S REPLY TO
PATENT OWNER'S RESPONSE**

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PETITIONER’S UPDATED EXHIBIT LIST

<i>Exhibit</i>	<i>Description</i>
1001	U.S. Patent No. 7,848,701 B2 to Gavrilovich (“the ’701 patent”)
1002	Prosecution File History of U.S. Patent No. 7,848,701 (“’701 Prosecution History”)
1003	Declaration of Mr. Denning in Support of Petition for <i>Inter Partes</i> Review of U.S. Patent No. 7,848,701 (“Denning Dec.”)
1004	Mr. Denning’s Curriculum Vitae
1005	U.S. Patent No. 5,276,686 to Ito (“Ito”)
1006	U.S. Patent No. 5,504,786 to Gardner (“Gardner”)
1007	U.S. Patent No. 5,109,390 to Gilhousen et al. (“Gilhousen390”)
1008	U.S. Patent No. 4,001,692 to Fenwick et al. (Fenwick)
1009	U.S. Patent No. 5,559,865 to Gilhousen (“Gilhousen865”)
1010	George Calhoun, <i>Digital Cellular Radio</i> , Artech House, Inc., 1988 (“Calhoun”)
1011	W.R. Young et al., “Advanced Mobile Phone Service: Introduction, Background, and Objectives,” <i>The Bell System Technical Journal</i> , vol. 58, no. 1, Jan. 1979; pp. 1-14. (accessible at https://archive.org/details/bstj58-1-1) (“Young”)
1012	V.H. Mac Donald et al., “Advanced Mobile Phone Service: The Cellular Concept,” <i>The Bell System Technical Journal</i> , vol. 58, no. 1, Jan. 1979; pp. 15-41. (accessible at https://archive.org/details/bstj58-1-15) (“Donald”)
1013	John Scourias, “Overview of the Global System for Mobile Communications,” May 19, 1995. (“Scourias”)
1014	“Advanced Communications Project, Technology Reference Document,” VisiCom Laboratories Inc., September 1993. (“VisiCom”)
1015	<i>Law Enforcement News</i> , vol. V, no. 20, Nov. 26, 1979. (accessible at https://archive.org/details/lawenforcementne20john_1/page/n15) (“News”)

<i>Exhibit</i>	<i>Description</i>
1016	Excerpts from <i>Mobile Radio Technology</i> , vol. 6, no. 8, August 1988 (accessible at https://archive.org/details/MRT08August1988?q=mobile+extender) (“Standard”)
1017	U.S. Patent No. 5,504,935 to Vercauteren (“Vercauteren”)
1018	A.S. Acampora and J. H. Winters, “System Applications for Wireless Indoor Communications,” <i>IEEE Communications magazine</i> , vol. 25, no. 5, August 1987; pp. 11-20. (“Acampora”)
1019	T. O. Mottl, “Dual-Polarized Channel Outages During Multipath Fading,” <i>The Bell System Technical Journal</i> , vol. 56, no. 5, May-June 1977; pp. 675-701. (accessible at https://archive.org/details/bstj56-5-675) (“Mottl”)
1020	Jack Salz, and Jack H. Winters, “Effect of Fading Correlation on Adaptive Arrays in Digital Mobile Radio,” <i>IEEE transactions on Vehicular Technology</i> , vol. 43, no. 4, Nov. 1994; pp. 1049-1057. (“Salz”)
1021	U.S. Patent No. 5,481,533 to Honig et al. (“Honig”)
1022	U.S. Patent No. 7,221,904 to Gavrilovich (“the ’904 patent”)
1023	Prosecution File History of U.S. Patent No. 7,221,904 (“’904 Prosecution History”)
1024	U.S. Patent No. 5,566,209 to Forssén et al. (“Forssén”)
1025	U.S. Patent No. 5,345,467 to Lomp et al. (“Lomp”)
1026	U.S. Patent No. 6,393,281 to Capone et al. (“Capone”)
1027	U.S. Patent No. 5,434,853 to Hemmady et al. (“Hemmady”)
1028	U.S. Patent No. 5,267,261 to Blakeney, II et al. (“Blakeney”)
1029	U.S. Patent No. 5,101,501 to Gilhousen et al. (“Gilhousen501”)
1030	U.S. Patent No. 4,539,706 to Mears et al. (“Mears”)
1031	U.S. Patent No. 5,509,028 to Marque-Pucheu (“Marque-Pucheu”)
1032	U.S. Patent No. 4,675,863 to Paneth et al. (“Paneth”)
1033	Excerpts from Webster’s New World Dictionary, 3 rd College Edition, Simon & Schuster, 1993. (“Webster”)
1034	Declaration of Scott A. Denning in Support of Petitioner’s Reply to Patent Owner’s Response (“Denning Reply Decl.”)

<i>Exhibit</i>	<i>Description</i>
1035	Declaration of Mark Lanning in Support of Defendants’ Responsive Claim Construction Brief, <i>Barkan Wireless IP Holdings v. Samsung Elecs. Co. Ltd.</i> , Case No. 2:18-cv-00028 (E.D. Tex.), filed December 21, 2018. (“Lanning Barkan Decl.”)
1036	Definitions of “automotive,” “vehicle,” and “traffic,” <i>Oxford Desk Dictionary</i> , Oxford University Press, 1995; pp. 38, 611, and 640. (“Oxford Desk Dictionary”)
1037	<i>Cessna Model 152 Information Manual</i> , Cessna Aircraft Company, July 1, 1979. (“Cessna”)
1038	“Digital Cellular Land Mobile Telecommunication Systems,” Rec. ITU-R M.1073-1, ITU Radiocommunication Assembly, 1994-1997. (“ITU”)
1039	Transcript of the Deposition of Mark R. Lanning, June 2, 2020.
1040	Transcript of the Deposition of Mark R. Lanning, June 3, 2020 (“Denning Depo. Tr.”)
1041	Transcript of the Deposition of Mark R. Lanning, June 4, 2020 (“Denning Depo. Tr.”)
1042	Transcript of the Deposition of Mark R. Lanning, June 5, 2020 (“Denning Depo. Tr.”)
1043	U.S. Patent No. 5,621,784 to Tiedemann, et al. (“Tiedemann784”)
1044	U.S. Patent No. 6,292,651 to Dapper, et al. (“Dapper”)
1045	Runway Safety: A Best Practices Guide to Operations and Communications, Federal Aviation Administration (“FAA Runway Safety”)
1046	U.S. Patent No. 5,289,527 to Tiedemann, Jr., et al. (“Tiedemann527”)
1047	Pyndiah, R., et al., “Performance of Block Turbo Coded 16-QAM and 64-QAM Modulations,” <i>Proceedings of GLOBECOM ’95</i> , Vol. 2, November 14-16, 1995; pp. 1039-1043. (“Pyndiah”)
1048	Jakubowski, R. J., “A New Generation of High-Power Cellular Repeaters,” <i>40th IEEE Conference on Vehicular Technology</i> , May 6-9, 1990; pp. 24-28. (“Jakubowski”)

I. INTRODUCTION

Patent Owner (“PO”) fails to overcome VWGoA’s showing that the challenged claims of the ’701 patent are unpatentable. EX1034, ¶¶10-13. PO does not rebut VWGoA’s arguments on their face, but instead relies on new interpretations of the claims to differentiate them from the art. In some instances, these interpretations take the form of explicit constructions, and in others PO merely argues (without construction) that the plain and ordinary meaning of a given term requires details only found in select embodiments in the specification, or in the prosecution history. PO’s interpretations are wrong.

PO’s primary argument is that the references fail to disclose the claimed “*mobile device*” because the devices disclosed in the references do not “register with [nor are] able to directly communicate with the cellular network.” Patent Owner’s Response, 13, 42, 49-50. This is the only element from the challenged independent claim that PO alleges to be missing from Grounds 1-2.

PO also argues that the references fail to disclose the claimed “*best signal*” because they do not disclose selection of a signal that “includes an analysis of the error rate in addition to the signal strength,” *id.*, 46, that Gilhousen865 does not disclose the claimed “*movable base station configured to move relative to Earth*,” because Gilhousen865’s airplane does not move with traffic on “predetermined roads,” *id.*, 47-49, and that Gilhousen865 and Gilhousen390 do not disclose the

claimed “*automotive vehicle*” because “*automotive vehicle*” is limited to an automobile (e.g., not an airplane). *Id.*, 51-52.

Each of PO’s arguments fail because they are based on improper attempts to rewrite and overly narrow the claims, well beyond what is disclosed in the specification and what a POSA would have understood these claims to mean. Indeed, none of these additional requirements are recited in the claims, nor are they consistently present throughout the embodiments of the specification. Therefore, PO has failed to demonstrate that a proper construction of the challenged claims includes any these details.

Because PO’s arguments each rely on these erroneous interpretations, PO’s arguments fail. The Board should therefore find that, when construed properly, the applied references disclose each of the challenged claims for at least the reasons presented in the Petition. Nonetheless, if the Board were to adopt PO’s interpretations, the asserted references still disclose and/or render obvious the challenged claims.¹

¹ Carucel does not challenge that claims 31 and 33-35 are unpatentable. See POR, 41, 47, 53. However, should the Board find that Carucel’s arguments cover these additional claims, then VWGoA’s arguments presented herein equally apply

II. CLAIM CONSTRUCTION

PO proposes constructions for five claim terms: “*fixed port*,” “*configured to*,” “*transmit radio frequency signals to a mobile device corresponding to the received fixed port signals*,” “*mobile device*,” and “*automotive vehicle*.” Notably, PO also relies on a new interpretation of the term “*best signal*.” However, because PO does not expressly construe this term, VWGoA addresses its meaning in the substantive discussion, below. *See infra*, Sec. III.A.2.

First, none of these terms require construction. EX1034, ¶16; Petition, 17; Institution Decision, 6-7. Specifically, claim terms in *inter partes* review are construed “in accordance with the ordinary and customary meaning of such claim[s] as understood by one of ordinary skill in the art and the prosecution history pertaining to the patent.” *See* 37 C.F.R. § 42.100(b); *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312-1314 (Fed. Cir. 2005). Here, each of the above claim terms are clear on their face, and none have a specific meaning in the art. Thus, a POSA would have understood the ordinary and customary meaning of all the above claim terms. EX1034, ¶14-17.

to those additional claims as well, and again demonstrate that they are unpatentable.

Additionally, the Board need not provide express constructions for at least the “*fixed port*” and “*transmit*” limitations, because such constructions are not needed to resolve a controversy. *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999); *see also Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (citing *Vivid Techs.* in the context of an *inter partes* review). Namely, PO does not rely on its proposed constructions of these terms to rebut any position taken by VWGoA.

Because PO’s proposed construction of “*configured to*” is consistent with the district court’s order, VWGoA does not dispute that construction. But, PO’s patentability arguments relating to this term imply an even narrower construction than that adopted by the district court. VWGoA expressly disagrees with this narrower implied construction as explained in Section III.B.1 below. VWGoA also disagrees with PO’s proposed constructions of “*mobile device*” and “*automotive vehicle*.”

A. “Mobile Device”

PO proposes construing “*mobile device*” to mean “a device that must register with and be able to directly communicate with the cellular network.”² POR, 13. PO

² On page 42 of the POR, PO appears to add a third requirement of a “mobile device” as being “capable of being switched back and forth between either a direct

frames this proposal as simply applying the “plain and ordinary meaning of the term.” *Id.* Yet PO proposes a convoluted construction that attempts to improperly import multiple requirements into the claim far beyond the plain and ordinary meaning of this term. PO’s overly-narrow construction should thus be rejected. *Superguide Corp. v. DirecTV Enters., Inc.*, 358 F.3d 870, 875 (Fed. Cir. 2004) (“[I]t is important not to import into a claim limitations that are not a part of the claim”); *E-Pass Techs., Inc. v. 3Com Corp.*, 343 F.3d 1364, 1369 (Fed. Cir. 2003).

VWGoA maintains that no construction of the term “*mobile device*” is needed for two reasons. First, not construing the term “*mobile device*” is consistent with the position that both PO and the district court for the Southern District of California agreed to in *Carucel Investments L.P. v. Novatel Wireless, Inc. et al.*, Case No. 3:16-cv-0118-H-KSC (S.D. Cal.), Markman Order, 20 (Sept. 19, 2016). Tellingly, PO argues that the Board should adopt the constructions for “*fixed port*,”

connection with the fixed base station or a connection with a moving base station.” This additional requirement does not appear to form the basis of any argument, and is not part of PO’s proposed construction. Nonetheless, the applied references also disclose this additional capability as set forth in the Petition, and as additionally discussed in Sections III.A.1 and III.B.2 below. *See* Pet., 36-37, 60; EX1034, Denning Reply Decl., ¶¶32-39, 55-60.

“*configured to*,” and “*transmit radio frequency signals...*” that were adopted in this prior district court case, but then takes the opposite position for “*mobile device*.” PO does not provide any explanation for these opposing positions, and as such, the Board should reject PO’s gamesmanship here.

Second, the challenged claims are not directed to the “*mobile device*,” which is merely ancillary to what is actually being claimed—the “*movable base station*.” EX1039, 163:18-164:7. A long held principle of claim construction states that “[i]nclusion of the material or article worked upon by a structure being claimed does not impart patentability to the claims.” *In re Otto*, 312 F.2d 937, 940 (C.C.P.A. 1963). The “*mobile device*” is not a positively recited element of the “*movable base station*,” but rather an external device upon which the claimed “*movable base station*” acts. Specifically, claim 10 recites “A *movable base station configured to move relative to Earth, the movable base station comprising:... a transmitter configured to transmit radio frequency signals to a **mobile device** corresponding to the received fixed port signals.*” Claim 10 does not require the transmitted radio frequency signals to be received or processed in any specific way by the “*mobile device*.” Thus, claim 10 does not require the “*mobile device*” to have any specific functionality if/when the “*mobile device*” bypasses the claimed “*movable base station*”—e.g., by communicating directly with the network. Thus,

the “*mobile device*” does not impart patentability to the claim, and its construction is immaterial and therefore unnecessary.

Even if the Board finds that “*mobile device*” needs construction, it should reject PO’s construction as it is wholly inconsistent with the intrinsic record. The claims of the ’701 patent do not require that the “*mobile device*” perform a “registration” or directly communicate with a cellular network. Instead, the claims recite a “*movable base station*” that is specifically configured to facilitate communications between the “*mobile device*” and the network. The independent claims of the ’701 patent recite the “*mobile device*” receiving and transmitting signals from/to the claimed “*movable base station*.” Each claim separately recites ***the “movable base station”*** as receiving and transmitting signals from/to a base station/fixed port. In this manner, the claims expressly require the “*movable base station*”—and not the “*mobile device*”—to communicate directly with the cellular network. Thus, the claims themselves directly contradict Carucel’s construction.

The specification of the ’701 patent also does not support PO’s construction and, in fact, directly contradicts the construction. The ’701 specification refers to a “mobile unit,” as opposed to a “*mobile device*.” To the extent that the disclosures relating to the “*mobile unit*,” which PO relies on to support its construction (*see, e.g.,* POR, p. 13 *citing* EX1001, 4:46-49 and 10:52-57), apply to the “*mobile device*,” these disclosures merely describe specific embodiments. Additionally,

PO's arguments overlook other portions of the specification where the mobile unit does not communicate directly with the network. *See, e.g.*, EX1001, 3:28-35 ("the higher power level signal will overpower the lower level signal such that **the mobile unit does not receive communications from the fixed radio port** but only from the movable base station. In the reverse direction, a low level of signal is transmitted from the mobile units to the movable base station and a high-level signal is transmitted from the base station to the fixed radio ports, **thereby eliminating any direct communication from the mobile unit to the fixed radio port.**"); 4:46-52). Thus, PO's attempt to limit "*mobile device*" to a specific embodiment(s) in the specification is improper. *See Superguide Corp.*, 358 F.3d at 875.

The prosecution history similarly does not support PO's construction for "*mobile device*." During prosecution of related Appl. No. 09/401,584 (now U.S. Patent No. 7,221,904), PO argued for a broader meaning: that "mobile units" include "telephones, radio modems, or other types of radios." EX1023, 108. PO cannot now limit the "*mobile device*" to a cellular capable device "that must register with and be able to directly communicate with the cellular network."

Thus, if "*mobile device*" requires construction, it should be construed in accordance with its ordinary and customary meaning to mean "a movable device capable of receiving and transmitting radio frequency signals." This construction is

not only consistent with the specification and the prosecution history, but is also consistent with the plain language of the claims, which merely require that a moving base station transmitter can “*transmit radio frequency signals to a mobile device*” (claim 10) and that a moving base station receiver can “*receive mobile device signals from a mobile device*” (claim 1).

Therefore, VWGoA maintains that no construction of the term “*mobile device*” is needed. EX1034, ¶¶18-27. But, should the Board decide to construe this term, the Board should construe this term to mean “a movable device capable of receiving and transmitting radio signals.”

B. “Automotive Vehicle”

PO construes “*automotive vehicle*” to mean “automobile.” VWGoA disagrees with this construction, and maintains that no construction is needed for this term. But, should the Board deem construction necessary, VWGoA submits that “*automotive vehicle*” should be construed in accordance with its ordinary and customary meaning to mean “a vehicle moving by means of its own power.” EX1003, ¶ 182.

It is well-settled that “Ordinary, simple English words whose meaning is clear and unquestionable, absent any indication that their use in a particular context changes their meaning, are construed to mean exactly what they say.” *Chef America, Inc. v. Lamb-Weston, Inc.*, 358 F.3d 1371, 1372 (Fed. Cir. 2004). Such

terms are presumed to be given their ordinary and customary meaning absent a clear disclaimer of that meaning. As VWGoA's expert Mr. Denning has already demonstrated, the plain and ordinary meaning of "*automotive vehicle*" is well-understood to mean a vehicle moving by means of its own power. EX1003, ¶ 182 *citing* EX1033, 93 (defining "automotive" and "vehicle"). PO's expert declined to provide an analysis of this term. *See* EX2100, ¶¶45, 145.

PO again attempts to subvert the plain language of the claim, and the ordinary and customary meaning of "*automotive vehicle*," by improperly importing limitations from the specification. PO points to the specification, which states that "[t]he moving base stations 30 may be moved by means of a...suitable conveying device which **may** include an automotive vehicle traveling on the roadway." POR, 16 (emphasis added). However, this language is not mandatory, but permissive. Therefore, it does not evidence that "[a]n 'automotive vehicle' **must** travel along the roadway." POR, p. 16-17. As such, it does not rise to the level of a "clear statement of intent by the inventor to equate 'automotive vehicle' with 'automobile.'" POR, 17. Accordingly, the Board should deny PO's attempt to import limitations from a particular embodiment in the specification into the claims. *Superguide Corp.*, 358 F.3d at 875; *E-Pass Techs.*, 343 F.3d at 1369.

PO next argues that the prosecution history of the '701 patent supports its construction. During prosecution, Applicant argued that "Charas discusses a

repeater on a train and does not suggest automobiles.” EX2107, 51. The Federal Circuit has held that a patent’s specification or prosecution history may only limit claim scope with “expressions of manifest exclusion or restriction, representing a clear disavowal of claim scope.” *Continental Circuits LLC v. Intel Corporation*, 915 F.3d 788, 797 (Fed. Cir. 2019) (emphasis added). PO’s statement here amounts to neither.

Therefore, VWGoA maintains that no construction of the term “*automotive vehicle*” is needed. EX1034, ¶¶28-31. But, should the Board decide to construe this term, the Board should construe this term in accordance with its ordinary and customary meaning to mean “a vehicle moving by means of its own power.” EX1003, ¶182.

III. The References Disclose the Alleged Missing Elements.

A. Ground 1: Ito in view of Gardner.

1. Ito discloses “a mobile device.”

Under the proper construction of the term, discussed above, PO does not appear to dispute that Ito discloses the claimed “*mobile device*” for at least the reasons set forth in the Petition. Pet., 36. Indeed, Ito discloses a portable device PSS (“mobile device”) that sends and receives radio frequency signals. *See* EX1005, 13:15-18, 11:65-12:1, FIG. 6 (annotated below).

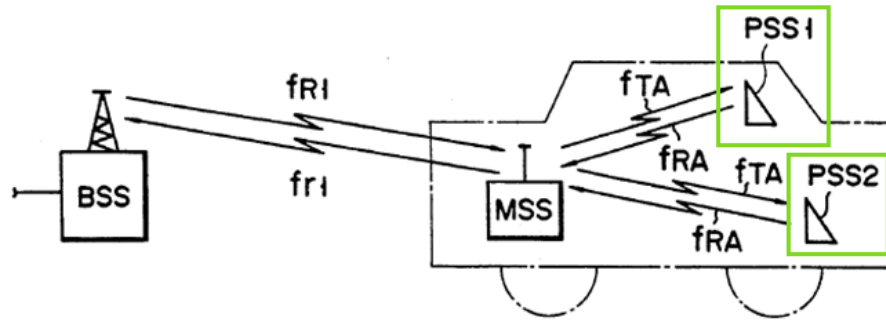


FIG. 6

EX1005, FIG. 6 (annotated).

Therefore, Ito discloses the claimed “*mobile device*” as properly construed—i.e., “a movable device capable of receiving and transmitting radio signals.”

PO’s argument that Ito does not disclose the claimed “*mobile device*” is based on its incorrect construction of that term, and a misunderstanding of Ito. Nonetheless, even if the Board adopts PO’s construction, which it should not, PO’s arguments fail because the references disclose a “*mobile device*” even under PO’s construction.

As a general matter, PO repeatedly distinguishes between the claimed “*mobile device*” and a “cordless telephone system” (*see, e.g.,* POR, 5: “The ’701 Invention is Not Directed Toward Cordless Phones”), and argues that Ito discloses the latter. POR, p. 41. However, PO never ties this alleged distinction to any claim limitation. Nonetheless, PO’s allegations are irrelevant because Ito discloses its cordless phone system as a mere *alternative* embodiment: “Alternatively in a

second possible application that uses a system according to the invention for a cordless telephone system...” EX1005, 3:36-41. Ito’s disclosure is directed to more than cordless phone implementations. *See id.*, 3:27-35. Thus, a POSA would have understood that Ito’s portable radio telephone device is not limited to a cordless phone.

PO also argues that Ito does not disclose the “*mobile device*” because “Ito does not disclose any ability of its portable device to register or directly communicate with a cellular network.” POR, 42-43. But PO’s argument overlooks key teachings in Ito. Specifically, Ito discloses that “radio transmission signals coming from said power amplifier 16 are forwarded to the antenna 18 [of the PSS (“*mobile device*”)], which sends them out **to a corresponding base station BSS.**” EX1005, 6:32-35 (emphasis added). Ito also discloses that the PSS includes a control system having an electric field strength sensor circuit 33, which “senses the received field strength of the electric wave transmitted **from the base station BSS it belongs.**” *Id.*, 6:65-7:1 (emphasis added). This sensor would be superfluous if Ito’s PSS only received signals from the mobile base device MSS. EX1034, ¶36. Therefore, Ito’s PSS is capable of directly communicating with its base station BSS.

Further, as would have been clear to a POSA, a mobile device that is capable of directly communicating with a base station is also able to register with the base station. EX1034, ¶37.

Even if Ito does not explicitly disclose that its PSS can directly communicate and register with the cellular network, a POSA would have recognized Ito as implying this functionality. For example, Ito discloses its invention in the context of known “cellular type automobile telephone system[s].” EX1005, 1:8-17. Ito also discloses that its MSS can designate a transmission frequency and time slot allocation to the PSS using the control channel. *Id.*, 11:39-44. This is also indicative of a cellular communication system. EX1034, ¶38. Thus, a POSA would have understood that Ito’s system could support cellular communications, which necessarily includes direct communication and registration with the cellular network.

Further, PO’s expert, Mr. Lanning, confirmed that the claimed “*mobile device*” is the same as that discussed in the Background section of the ’701 patent. *See* EX1039, 112:3-11; *see generally* EX1039, 104:12-116:19. Mr. Lanning relies on the Background disclosure to support PO’s proposed construction (EX2100, ¶52), and acknowledges that these mobile devices operate in a “conventional manner” (EX2100, ¶49). Thus, by Mr. Lanning’s own admissions, a POSA would

have known that the claimed “*mobile device*” is not new, and that such a conventional mobile device could be used in Ito’s system. EX1034, ¶39.

Therefore, Ito discloses the “*mobile device*” of claim 10 even under PO’s proposed construction. EX1034, ¶¶32-39.

2. Gardner discloses selecting a “best signal.”

Similar to its allegations relating to the “*mobile device*,” PO does not appear to dispute that Gardner discloses selecting a “*best signal*” under its ordinary and customary meaning, as set forth in the Petition. Pet., 38, 49. Rather PO argues, *without proposing an explicit construction*, that Gardner fails to disclose this limitation based on unclaimed details from the specification. This improper construction should be denied. *See Superguide Corp.*, 358 F.3d at 875. Nonetheless, even if these limitation were inherent in the “*best signal*” term as PO suggests, Gardner still discloses this limitation.

PO asserts that a “*best signal*” in the context of the ’701 Patent “includes an analysis of the error rate in addition to the signal strength.” POR, 46. First, PO’s reliance on the specification for this limitation is misplaced. *Id.* Indeed, the cited portion of the specification (column 10, lines 57-62) is unrelated to the claim limitation in question. Specifically, claim 15 recites that the “*movable base station*” of claim 10 further includes a controller configured to “*compare the received fixed port signals...and to select a best signal.*” ’701 patent, claim 15.

Meanwhile, the portion of the '701 patent cited by PO relates to handoff decision-making *at the mobile device*: “Each mobile unit monitors pilot signals from fixed and moving base station and synchronizes to the base station providing the best signal.” ’701 patent, 10:65-67. Thus, PO’s lone support does not relate to the claimed limitation, but rather to functions carried out by a **mobile device** determining whether to handoff.

PO has not rebutted Gardner’s disclosure of this limitation beyond its reliance on an erroneous interpretation of claim 15. Therefore, Gardner discloses this limitation for at least the reasons set forth in the Petition. Pet., 38, 49. Nonetheless, even if the Board adopts PO’s implied construction of “best signal,” Gardner would still render this limitation obvious. Specifically, Gardner discloses that “[t]here are many well known schemes for making use of the signals from the two antennas.” EX1006, 1:25-26. In one such scheme, Gardner discloses “maximal ratio coherent combining” in which signals from two antennas are “aligned in phase, **weighted with gains proportional to their signal voltage to noise power ratios**, and summed.” *Id.*, 1:32-34 (emphasis added). A POSA would have understood that signal voltage to noise power ratio is extremely similar to error rate in that it defines the relative power between the signal and error-inducing noise. EX1034, ¶45-46. Additionally, Gardner discloses analyzing signals using coherent demodulation schemes, which analyze symbol errors of the signal. EX1006, 1:28-

41; Appendix 1. Thus, it would have been obvious to a POSA to consider error rates of received signals based on Garnder's teachings EX1034, ¶¶40-47.

B. Ground 2: Gilhousen865 and Gilhousen390.

1. Gilhousen865 discloses "A movable base station configured to move relative to Earth."

As discussed above, PO argues that "*configured to*" means "constructed to move with the traffic at a rate of speed which is comparable to the speed of the traffic." POR, 47-48. PO argues that Gilhousen865's airborne apparatus fails to meet this requirement. *Id.*, 47-49. This, again, relies on PO's improper attempt to import limitations into the claims.

Specifically, PO argues that Gilhousen865's airborne apparatus "does not move with traffic as it is not bound to predetermined roads." *Id.*, 48-49. This attempt to inject "predetermined roads" into the claim is faulty for numerous reasons. First, PO has provided no support for doing so. PO relies solely on the declaration testimony of its expert, Mr. Lanning, to support this argument. But Mr. Lanning's declaration is devoid of any testimony to support "traffic" being limited to predetermined roads. Further, adding "predetermined roads" to the meaning of "traffic" is inconsistent with the '701 specification, which discloses embodiments involving other types of traffic, such as "pedestrian traffic." *See, e.g.,* '701 patent, 2:40-43, 3:15-19, 4:46-49.

Moreover, PO's position contradicts the ordinary and customary meaning of the term "traffic:" "vehicles moving on a public highway, **in the air**, or at sea." EX1036, Oxford Desk Dictionary, p. 611 (emphasis added). Gilhousen865's airplane certainly meets this definition. EX1034, ¶52.

Finally, even if the Board adopts PO's implied construction, this limitation still would have been obvious over Gilhousen865. First, airplanes often travel along predetermined roads, such as during taxi, takeoff and landing. Second, Gilhousen865's system is not unique to an airplane. Rather, Gilhousen865 discloses radio telephones on board a vehicle that communicate with a base station via a moving base station system having an antenna located on the outside of the vehicle. *Id.*, ¶53. In fact, Gilhousen865 discloses that the airborne system functions substantially the same as a ground-based system. EX1009, 2:37-42. Thus, a POSA would have recognized Gilhousen865's teachings to be equally applicable to other vehicles, including automobiles, and to have provided the same or similar benefits as the plane-based embodiments of Gilhousen865. EX1034, ¶53. Therefore, a POSA would have found it obvious to apply Gilhousen865's teachings to an automobile-based system for use on "predetermined roads." EX1034, ¶¶48-54.

2. Gilhousen865 discloses "a mobile device."

Gilhousen865 discloses the claimed "*mobile device*" under its ordinary and customary meaning for at least the reasons set forth in the Petition. Pet., p. 60. For

example, Gilhousen865 discloses that its radiotelephone is both movable and that it sends and receives radiofrequency signals. *See, e.g.,* EX1009, 2:37-41, 2:27-31, 2:45-52, 3:38-40. PO does not appear to dispute this, but rather argues this limitation based on PO's incorrect construction of that term, and a misunderstanding of Gilhousen865. However, even if the Board adopts PO's construction, Gilhousen865 would still disclose this limitation.

PO argues that "Gilhousen865 does not disclose a transmitter configured to transmit radio frequency signals to **a radiotelephone that registers with or is capable of directly communicating with the cellular network** as required by the limitation of a 'mobile device' in the context of the entire '701 patent." POR, pp. 49-50 (emphasis added). However, this argument overlooks key disclosures in Gilhousen865.

Gilhousen865 discloses that its radiotelephone registers with a base station: "This enables the radiotelephones to search for the strongest pilot signal of the next cell and **register with that base station.**" EX1009, 3:57-59; *see also* Abstract, 3:3-10, 4:1-5. This was confirmed by PO's expert ("I would say as far as the network is concerned...the radiotelephone is registered with the network...") EX1040, 334:12-335:5, *see also* EX1040, 343:5-9. Additionally, Gilhousen865 discloses that the radio telephone is capable of directly communicating with a base station.

EX1009, 2:24-31; *see also id.*, 1:17-23, 3:3-14. These disclosures satisfy PO's proposed construction. EX1034, ¶58.

But, even if Gilhousen865 does not explicitly disclose that its radiotelephones register and directly communicate with the cellular network, a POSA would have recognized Gilhousen865 as implying this functionality. For example, Gilhousen865 discloses that the radiotelephone operates using the Telecommunications Industries Association/Electronic Industries Association Interim Standard 95 (TIA/EIA/IS-95), a well-known cellular telephone standard at the time that enabled registration and direct communication with the cellular network. EX1009, 2:65-3:2; EX1034, ¶60. Additionally, Gilhousen865 discloses its system is a CDMA cellular radiotelephone system, EX1009, 2:13-15, which allows for communications with "ground based **cellular** radio systems," *Id.*, Abstract, having antennas that are "identical to typical cell site antennas that are well known to one skilled in the art." *Id.*, 2:34-37. Thus, a POSA would have understood that Gilhousen865's system could support cellular communications, which would necessarily include direct communication and registration with the cellular network. EX1034, ¶¶55-60.

3. Gilhousen865 discloses "automotive vehicle"

Gilhousen865 discloses the claimed "*automotive vehicle*" under its ordinary and customary meaning for at least the reasons set forth in the Petition. Pet., 62-63,

70. PO does not dispute that Gilhousen865 discloses the claimed “*vehicle*” of claim 17, but argues that Gilhousen865 does not disclose “*wherein the vehicle is an automotive vehicle*,” of claim 18. PO’s argument is based on its construction of “*automotive vehicle*,” which PO defines as “automobile.” POR, 51. As demonstrated above, this construction is erroneous and should not be adopted. However, even if adopted, Gilhousen865 still would have rendered obvious this limitation.

As discussed above, Gilhousen865’s system is not unique to an airplane. Rather, Gilhousen865 discloses radio telephones on board a moving vehicle that communicate with a base station via a moving base station system having an antenna located on the outside of the vehicle. EX1034, ¶62. This concept is equally applicable to other vehicles, including automobiles, and would have provided the same or similar benefits as the airplane-based system of Gilhousen865. *Id.* Therefore, a POSA would have found it obvious to apply Gilhousen865’s teachings to an automobile-based system. *Id.*

PO incorrectly argues that Mr. Denning does not appreciate any distinction between the “*vehicle*” of claim 17 and the “*automotive vehicle*” of claim 18. POR, 51-52. This is incorrect, and demonstrates PO’s misunderstanding of their claims. Claims 17 and 18 define a genus/species relationship between the terms “*vehicle*” and “*automotive vehicle*” because claim 18 recites that “*the vehicle* [(of claim 17)]

is an automotive vehicle.” Thus, to satisfy the “*automotive vehicle*” limitation of claim 18, an anticipating device must also, **by definition**, be a “*vehicle*,” as required by claim 17. Mr. Denning and VWGoA were fully cognizant of claim differentiation, and understood that many non-automotive vehicles existed (e.g., wagons, strollers, trailers, bicycles, etc.) that would satisfy claim 17 without satisfying claim 18. However, Mr. Denning identified Gilhousen⁸⁶⁵’s airplane as satisfying both. EX1034, ¶¶61-63.

IV. VWGoA HAS DEMONSTRATED A MOTIVATION TO COMBINE THE ASSERTED PRIOR ART REFERENCES

PO argues that VWGoA failed to demonstrate that a POSA would have been motivated to combine the various references. However, VWGoA laid out in significant detail in the Petition both why and how a POSA would have been motivated to combine the references as proposed. *See* Pet., 26-28, 51-55.

PO argues that VWGoA has failed to demonstrate that a POSA would have had a reasonable expectation of success in the proposed combinations. POR, 30-31. However, the Petition describes this expectation with respect to *each* proposed combination. For example, with respect to Ito and Gardner, VWGoA explained that a POSA would have recognized Gardner’s receiver to be modular and that modifying Ito based on the teachings of Gardner would have required minimal modifications. Pet, 27. VWGoA then not only illustrates precisely how a POSA could have modified Ito based on Gardner, but also explains that a POSA could

have made the proposed combination “by known methods, and the results of the combination would have been predictable to a POSITA.” *Id.*, 28. All of this demonstrates a POSA’s reasonable expectation of success. VWGoA made similar explanations for each of the other combinations.

PO also argues that VWGoA failed to sufficiently “explain how specific references could be combined.” POR, 31. PO’s arguments are focused on VWGoA’s alleged failure to address perceived “compatibility issues” that may be present in the combination. *Id.*, 33, *see also id.*, 34-35; EX1040, 320:9-321:14. However, *KSR* does not require VWGOA to combine references like perfectly fitting puzzle pieces. *ClassCo, Inc. v. Apple, Inc.*, 838 F.3d 1214, 1219 (Fed. Cir. 2016). Rather, *KSR* dictates a flexible approach to obviousness. *Id. citing KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 415 (2007). VWGoA has more than met this burden, demonstrating not only that the references disclose or otherwise teach the claim elements, but also setting forth in significant detail both how and why a POSA would have been motivated to combine the references as proposed to arrive at the claims. *See Pet.*, 26-28, 51-55.

A. Motivation to combine Gilhousen865 and Gilhousen390

PO asserts that Gilhousen865’s airborne system cannot properly be modified with CDMA (as taught by Gilhousen390) because Gilhousen865 will be unable to perform power control of the CDMA system due to the speed of the aircraft. POR,

38-41. But PO's argument overlooks that Gilhousen865's communication system *is* a CDMA communication system that uses a "CDMA-type radiotelephone." EX1009, 2:13-15; 2:46-52. As such, Gilhousen865's CDMA communication system would have considered the power control and other features of CDMA systems to operate in its preferred environment – on a plane. Notably, PO's argument is also based on a presumed rate of speed of an airplane (e.g., "500 miles-per-hour"). POR, 39. But this speed is significantly exaggerated. Mr. Lanning testified that a Cessna was exemplary as an airplane contemplated by Gilhousen865. EX1040, 378:2-5. At least one such Cessna, available at the time of the '701 patent, was capable of far lower speeds (e.g., "31 knots" (~36 MPH)) than suggested by PO. *See* EX1037, 69. This speed is even less than the "50 MPH" average speed of a vehicle deemed acceptable by Mr. Lanning. EX2100, ¶107. Thus, Gilhousen865, as admitted by PO's own expert, covers at least some types of airplanes that would not be subject to any of the compatibility issues alleged by PO. EX1034, ¶¶64-67.

V. THE TESTIMONY OF VWGoA'S EXPERT, MR. DENNING, IS ENTITLED TO MORE WEIGHT THAN THAT OF PO'S EXPERT, MR. LANNING.

PO argues that its expert, Mr. Lanning, is more reliable than VWGoA's expert and that his testimony is therefore entitled to more weight. But a review of the present record demonstrates this to be false.

First, PO argues that Mr. Lanning has more relevant experience than Mr. Denning. However, Mr. Lanning acknowledged that he has no experience designing or implementing moving base stations. EX1039, 61:18-22. Further, Mr. Lanning acknowledged that other experience is relevant to the present issues. EX1040, 403:11-14. Mr. Denning has demonstrated his qualifications, and his experience and background in the relevant technologies. EX1003, ¶¶ 6-12. Mr. Denning more than meets the definition of a POSA, as defined by the parties, and his other experiences further demonstrate his qualifications. Notably, PO does not identify a single argument of Mr. Denning's to be based on faulty or erroneous information.

Mr. Lanning, on the other hand, submitted multiple "references" in his declaration that lack foundation. *See* Paper 13, Petitioner's Objections to Evidence; EX2100, 66, 70. Additionally, Mr. Lanning's testimony often lacks any evidentiary support – a fact Mr. Lanning neither disputes nor regrets: "I did not provide any citations, I provided my experience of reading the patents and all of the different – the declaration says what it says. It's based on my own experience. I haven't provided any citations. **The board can either believe what I'm saying here or not.** It's up to the board." EX1040, 403:11-17 (emphasis added). Mr. Lanning's willingness to skirt supporting documentation in favor of a "take-it-or-leave-it"

approach should be met with reluctance and skepticism. Thus, Mr. Lanning's testimony should be given less weight than that of Mr. Denning.

VI. CONCLUSION

As demonstrated above, PO fails to overcome VWGoA's showing that the challenged claims of the '701 patent are unpatentable. Therefore, VWGoA requests that the challenged claims be found unpatentable.

Respectfully submitted,

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**CERTIFICATE OF COMPLIANCE WITH TYPE-VOLUME LIMITATION,
TYPEFACE REQUIREMENTS, AND TYPE STYLE REQUIREMENTS**

1. This Petitioner's Reply complies with the type-volume limitation of 5,600 words, comprising 5,433 words, excluding the parts exempted by 37 C.F.R. § 42.24(a).

2. This Petitioner's Reply complies with the general format requirements of 37 C.F.R. § 42.6(a) and has been prepared using Microsoft® Word 2010 in 14 point Times New Roman.

Respectfully submitted,

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CERTIFICATION OF SERVICE (37 C.F.R. § 42.6(e))

The undersigned hereby certifies that on June 26, 2020, true and correct copies of the foregoing **PETITIONER VOLKSWAGEN GROUP OF AMERICA, INC.'S REPLY TO PATENT OWNER'S RESPONSE** and Exhibits 1034-1048 were served electronically via e-mail in its entirety on the following counsel for Patent Owner:

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