

its Registered Agent for Service of Process at 2908 Poston Avenue, Nashville, Tennessee 37203-1312.

3. On information and belief, VGACO is a Tennessee limited liability company with its headquarters and principal place of business located at 2200 Ferdinand Porsche Drive, Herndon, Virginia 20171. VGACO may be served with a copy of the Complaint and Summons through Corporation Services Company, its Registered Agent for Service of Process at 2908 Poston Avenue, Nashville, Tennessee 37203-1312.

JURISDICTION AND VENUE

4. This action includes a claim of patent infringement arising under the patent laws of the United States, 35 U.S.C. § 1 *et seq.*

5. Subject matter jurisdiction is proper in this Court under 28 U.S.C. §§ 1331 and 1338(a).

6. Venue in this District is proper under 28 U.S.C. § 1391 and 28 U.S.C. § 1400(b) against Defendants because, on information and belief, each Volkswagen Defendant (1) has committed acts of infringement in this District and (2) has a regular and established place of business in this District.

7. This Court has personal jurisdiction over Volkswagen. Defendants have continuous and systematic business contacts with the State of Tennessee. Specifically, Defendants conduct business and have committed acts of patent infringement and have induced acts of patent infringement by others in this District, the State of Tennessee, and elsewhere in the United States. Defendants, directly and through subsidiaries or intermediaries, have committed and continue to commit acts of infringement in this District by, among other things, designing, developing, manufacturing, importing, offering to sell, and selling products that infringe the asserted patents.

8. Defendants do and intend to do business in Tennessee and in this District, directly or through intermediaries, and offer their products and/or services, including those accused herein of infringement, to customers and potential customers located in Tennessee and in this District.

9. Defendants, both directly and through their subsidiaries or intermediaries (including distributors, retailers, and others), have purposefully and voluntarily placed one or more infringing products and/or services, as described below, into the stream of commerce with the expectation that those products will be purchased and used by customers and/or consumers in the Eastern District of Tennessee.

10. Defendants maintain facilities throughout the state of Tennessee, including at least the Chattanooga, Tennessee manufacturing plant spanning across 1,400 acres, with the facility's total area equating to upwards of 5,600,000 square meters, and employing at least 3,800 employees, which is also located within the Eastern District of Tennessee at 8001 Volkswagen Dr., Chattanooga, Tennessee.¹

11. According to VGA, the Chattanooga location is Volkswagen's U.S. Manufacturing Plant & North American Engineering & Planning Center.²

12. Defendants engage in all the main stations of the entire production process for at least the Passat, Atlas, and Atlas Cross Sport models in the Eastern District of Tennessee.³

¹ See <https://www.volkswagengroupofamerica.com/en-us/chattanooga-facts>; see also <https://www.volkswagen-newsroom.com/en/volkswagen-group-of-america-chattanooga-operations-llc-5900>.

² See <https://www.volkswagengroupofamerica.com/en-us/locations>.

³ See <https://www.volkswagen-newsroom.com/en/volkswagen-group-of-america-chattanooga-operations-llc-5900>.

13. These infringing products and/or services, among others, have been and continue to be made, used, sold, offered for sale, purchased, and/or imported by customers and/or consumers in the Eastern District of Tennessee.

14. Defendants have placed the Accused Products into the stream of commerce by selling and/or offering to sell the Accused Products in the Eastern District of Tennessee, shipping Accused Products into the Eastern District of Tennessee, and/or shipping Accused Products knowing that those products would be shipped into the Eastern District of Tennessee.

THE ASSERTED PATENTS

I. The '366 Patent

15. On June 18, 2013, the United States Patent and Trademark Office duly and legally issued U.S. Patent No. 8,467,366 (“the '366 patent”), entitled “Methods and Apparatus for Random Access in Multi-Carrier Communication Systems.” A copy of the '366 patent is attached as Exhibit 1.

16. The '366 patent issued from U.S. Patent Application 13/205,579, which was assigned from the inventors to Waltical Solutions, Inc. on April 8, 2005. The application was later assigned from Waltical Solutions, Inc. to Neocific, Inc. on December 14, 2005. The now-issued '366 patent was assigned from Neocific, Inc. to CFIP NCF LLC on November 22, 2019 before it was assigned to Neo Wireless LLC on January 23, 2020.

17. The '366 patent is valid and enforceable.

II. The '908 Patent

18. On April 17, 2018, the United States Patent and Trademark Office duly and legally issued U.S. Patent No. 10,833,908 (“the '908 patent”), entitled “Channel Probing Signal for a Broadband Communication System.” A copy of the '908 patent is attached as Exhibit 2.

19. The '908 patent issued from U.S. Patent Application 16/902,740, which was filed by Neo Wireless LLC on behalf of the inventors.

20. The '908 patent is valid and enforceable.

III. The '941 Patent

21. On September 11, 2018, the United States Patent and Trademark Office duly and legally issued U.S. Patent No. 10,075,941 (“the '941 patent”), entitled “Methods and Apparatus for Multi-Carrier Communications With Adaptive Transmission and Feedback.” A copy of the '941 patent is attached as Exhibit 3.

22. The '941 patent issued from U.S. Patent Application 15/082,878, which was filed by Neocific, Inc. on March 28, 2016. The now-issued '941 patent was assigned from Neocific, Inc. to CFIP NCF LLC on November 22, 2019 before it was assigned to Neo Wireless LLC on January 23, 2020.

23. The '941 patent is valid and enforceable.

IV. The '450 Patent

24. On October 15, 2019, the United States Patent and Trademark Office duly and legally issued U.S. Patent No. 10,447,450 (“the '450 patent”), entitled “Method and System for Multi-Carrier Packet Communication with Reduced Overhead.” A copy of the '450 patent is attached as Exhibit 4.

25. The '450 patent issued from U.S. Patent Application 15/676,421, which was filed by Neocific, Inc. on August 14, 2017. The now-issued '450 patent was later assigned from Neocific, Inc. to CFIP NCF LLC on November 22, 2019 before it was assigned to Neo Wireless LLC on January 23, 2020.

26. The '450 patent is valid and enforceable.

V. The '512 Patent

27. On March 30, 2021, the United States Patent and Trademark Office duly and legally issued U.S. Patent No. 10,965,512 (“the ’512 patent”), entitled “Method and Apparatus Using Cell-Specific and Common Pilot Subcarriers in multi-Carrier, Multi Cell Wireless Communication Networks.” A copy of the ’512 patent is attached as Exhibit 5.

28. The ’512 patent issued from U.S. Patent Application 17/012,813, which was filed by Neo Wireless on September 4, 2020.

29. The ’512 patent is valid and enforceable.

VI. The '302 Patent

30. On September 8, 2020, the United States Patent and Trademark Office duly and legally issued U.S. Patent No. 10,771,302 (“the ’302 patent”), entitled “Channel Probing Signal for a Broadband Communication System.” A copy of the ’302 patent is attached as Exhibit 6.

31. The ’302 patent issued from U.S. Patent Application 15/953,950, which was assigned from Neocific, Inc. to CFIP NCF LLC on November 22, 2019 before it was assigned to Neo Wireless LLC on January 23, 2020.

32. The ’302 patent is valid and enforceable.

33. Neo Wireless owns all rights, title, and interest in and to each of the ’366, ’908, ’941, ’450, ’512, and ’302 patents (the “Patents-in-Suit”) and possesses all rights of recovery.

FACTUAL ALLEGATIONS

34. Inventor Xiaodong (Alex) Li, Ph.D. founded Neocific Inc. in the early 2000s to design, develop, and implement a new wireless communication system. He and his co-inventors had extensive experience with wireless communications systems, including the development of the Wi-Max standards, and a deep understanding of the flaws in existing systems at the time. The

inventors saw an opportunity to create a new wireless communication system meant to address those flaws while incorporating cutting-edge Orthogonal Frequency-Division Multiple Access (OFDMA) based technologies, and, starting in the 2004-2005 timeframe, they filed patents on the work.

35. Dr. Li served as the President and Founder of Neocific. Dr. Li obtained his Ph.D. in electrical engineering from the University of Washington, his M.S. from Shanghai Jiao Tong University, and his B.S. from Tsinghua University. Dr. Li has authored more than 30 journal and conference papers in wireless communications, video coding, and networking. He has been granted more than 100 U.S. and foreign patents.

36. Dr. Titus Lo, Ph.D. is a founding employee of Neocific. Dr. Lo obtained his Ph.D. in electrical engineering from McMaster University and his B.S. from the University of British Columbia. Dr. Lo has authored more than 30 technical papers in international peer-reviewed journals and presented more than 50 times at industry events. He has been granted more than 100 U.S. and foreign patents.

37. The inventions in the Patents-in-Suit relate to various improvements in OFDMA networks and corresponding user equipment, and those improvements have since been incorporated into the 3GPP standards for 4G/LTE and 5G/NR networks.

38. Neo Wireless owns all substantial right, title, and interest in the Patents-in-Suit, and holds the right to sue and recover damages for infringement thereof.

39. David Loo is the CEO of Plaintiff Neo Wireless. Mr. Loo works and resides in Wayne, Pennsylvania. Mr. Loo has over a decade of experience as a licensing executive and patent attorney with a well-established track record of assisting companies, inventors and patent holders to ensure they are fairly compensated for their inventions.

40. The wireless communication industry has been developing rapidly since Bell Labs developed the First Generation of modern commercial cellular technology in 1984. Multiple wireless communication technologies designated by generations emerged and brought new capacities to people all over the world. In 2008, 3GPP created and finalized the LTE standards as an upgrade to 3G. The cellular industry recognized its major benefits, and virtually all cellular device manufacturers have embraced LTE as the next generation of commercial cellular technology and developed phones, hotspots, and other cellular-connectivity devices to utilize the 4G LTE technology.

41. In recent years, automakers have implemented this cellular communications technology into their vehicles. For example, telematics systems first debuted in 1996 through OnStar using analog cell networks, which allowed consumers to receive remote diagnostics, remotely unlock vehicles, and receive emergency services including aid after a collision. In 2007, 3G technology emerged bringing greater speed and capacity to these features allowing automakers to design more advanced functions.

42. When the technology emerged, Volkswagen began implementing the newest 4G LTE cellular technology into many of its products. 4G LTE technology provided for 10 times faster data speeds, increased responsiveness, and the ability to support voice and data connections simultaneously. 4G LTE connection further provides consumers with a variety of in-vehicle wi-fi hot spots and vast entertainment options. As a result, Volkswagen could better support a variety of wireless features including remote start, lock and unlock doors, honk the horn, flash the lights, family guardian alerts, driving diagnostics, safety alerts, wi-fi hotspot, etc.

43. Volkswagen provides 4G LTE connectivity in its various products via the Volkswagen Car-Net system integrated into the accused products.

44. Building on these 4G LTE capabilities, Volkswagen developed and utilizes the myVW App that enables its customers to interact with their vehicles from their cellular devices, using the cellular connectivity of the vehicles. Features on the myVW app include remote start, unlock and locking the vehicle, honk and flash features, last parked location, among others.

45. Volkswagen models that implement 4g/LTE communications—including but not limited to Passat, Tiguan, Atlas, Audi A3, Audi A6, Audi A7, Mulsanne, Macan and Cayenne models—as well as those that may in the future implement 4G/LTE or 5G/NR capabilities, are collectively referred to herein as the “Accused Products.”

46. As described further below, the Asserted Patents read onto portions of the LTE or 4G/5G standards, which Volkswagen implements in its Accused Products.

47. Volkswagen does not have any rights to the Patents-in-Suit.

48. Neo Wireless has complied with 35 U.S.C. § 287. Neo Wireless does not make, offer for sale, or sell within the United States any patented article under the Asserted Patents. Additionally, to the extent it was necessary, Neo Wireless provided Volkswagen with actual notice of its infringement prior to the filing of this lawsuit, or at a minimum by the filing of this Complaint.

49. In the interest of providing detailed averments of infringement, Neo Wireless has identified below at least one claim per patent to demonstrate infringement. However, the selection of claims should not be considered limiting, and additional claims of the Patents-in-Suit (including method, system, and apparatus claims) that are infringed by the Volkswagen Defendants will be disclosed in compliance with the Court’s rules related to infringement contentions.

VOLKSWAGEN'S ACTS OF PATENT INFRINGEMENT

50. Neo Wireless incorporates by reference the preceding paragraphs as if fully set forth herein.

51. As set forth below, Volkswagen's Accused Products incorporate, without any license from Neo Wireless, 4G/LTE and/or 5G/NR technology protected by patents owned by Neo Wireless. Neo Wireless respectfully seeks relief from this Court for Volkswagen's infringement.

52. Each Volkswagen entity has directly infringed, and continues to directly infringe, the Asserted Patents under 35 U.S.C. § 271(a) by making, using, selling and/or offering to sell, in this District and elsewhere in the United States, and/or importing into this District and elsewhere in the United States, one or more of Volkswagen's Accused Products, that is, certain infringing vehicles outfitted with instrumentalities that infringe the Asserted Patents, as further described in detail in Counts I-VI *infra*.

53. On information and belief, VGA directly or by controlling the activities of its subsidiaries, manufactures, makes, sells, offers for sale, uses, and imports the Accused Products in the United States. On information and belief, VGACO engages in the designing, developing, testing, and manufacturing of the Accused Products sold, used, and offered for sale in the United States, as well as the sales the Accused Products.

54. Each Volkswagen entity has indirectly infringed the Asserted Patents under 35 U.S.C. § 271(b) by inducing infringement by others, such as its subsidiaries, dealerships, distributors, retailers, and end-user customers, by, for example, implementing the infringing features in its cellular-capable products, encouraging its users to take advantage of LTE and/or NR features within the United States, and/or instructing, dictating, or training its dealerships and customers to use the infringing features.

55. Similarly, VGA and VGACO's advertising, sales, design, development and/or technical materials related to the 3GPP LTE/4G and/or 5G/NR standards associated with the Volkswagen Accused Products contained and continue to contain instructions, directions, suggestions, and/or invitations that invite, entice, lead on, influence, encourage, prevail on, move by persuasion, and/or cause its subsidiaries, distributors, retailers, dealerships, customers, and the public to directly infringe at least one claim of each of the Patents-in-Suit, either literally or under the doctrine of equivalents.

56. Volkswagen took the above actions intending to cause infringing acts by others.

57. Volkswagen received actual notice of its infringement as early as December 20, 2021 when Neo Wireless provided notice to Volkswagen's parent company, Volkswagen Group, and at least as early as the date of service of this Complaint. Therefore, each Volkswagen entity was or is now aware of the Asserted Patents or has willfully blinded itself as to the existence of the Asserted Patents and the Accused Products' infringement thereof.

58. Further, Volkswagen has made, used, sold, offered to sell, imported and/or encouraged the making, using, selling, offering to sell, or importing of Volkswagen's Accused Products despite knowing of an objectively high likelihood that its actions constituted infringement of the Asserted Patents at all times relevant to this suit. Alternatively, each Volkswagen entity subjectively believed there was a high probability that others would infringe the Asserted Patents but took deliberate steps to avoid confirming that it was actively inducing infringement by others.

59. For the reasons described above, Volkswagen's infringement of the Asserted Patents has been willful.

60. Volkswagen's acts of infringement have caused damage to Neo Wireless. Neo Wireless is entitled to recover from Volkswagen the damages incurred by Neo Wireless as a result of Volkswagen's wrongful acts.

COUNT ONE: INFRINGEMENT OF THE '366 PATENT

61. Plaintiff incorporates the allegations of all of the foregoing paragraphs as if fully restated herein.

62. As described above, each Volkswagen entity has infringed and continues to infringe the Asserted Patents by implementing and using 4G/LTE and/or 5G/NR cellular functionality in the Accused Products, and performing the acts of infringement described above.

63. Each of Volkswagen's Accused Products implements the portions of the 3GPP LTE standard specification that read on at least claim 1 of the '366 patent. *See* Exhibit 7.

64. Volkswagen's Accused Products therefore meet at least one claim of the '366 patent.

65. To the extent that Volkswagen releases any new version of Volkswagen's Accused Products, such instrumentalities will meet the claims of the '366 patent and infringe under 35 U.S.C. § 271(a)–(b) in ways analogous to Volkswagen's current infringement described above.

66. Neo Wireless has been damaged and continues to be damaged by Volkswagen's infringement of the '366 patent.

COUNT TWO: INFRINGEMENT OF THE '908 PATENT

67. Neo Wireless incorporates the allegations of the foregoing paragraphs as if fully restated herein.

68. As described above, each Volkswagen entity has infringed and continues to infringe the Asserted Patents by implementing and using 4G/LTE and/or 5G/NR cellular functionality in the Accused Products, and performing the acts of infringement described above.

69. Each of Volkswagen's Accused Products implements the portions of the 3GPP LTE standard specification that read on at least claim 11 of the '908 patent. *See* Exhibit 8.

70. Volkswagen's Accused Products therefore meet at least one claim of the '908 patent.

71. To the extent that Volkswagen releases any new version of Volkswagen's Accused Products, such instrumentalities will meet the claims of the '908 patent and infringe under 35 U.S.C. § 271(a)-(b) in ways analogous to Volkswagen's current infringement described above.

72. Neo Wireless has been damaged and continues to be damaged by Volkswagen's infringement of the '908 patent.

COUNT THREE: INFRINGEMENT OF THE '941 PATENT

73. Neo Wireless incorporates the allegations of the foregoing paragraphs as if fully restated herein.

74. As described above, each Volkswagen entity has infringed and continues to infringe the Asserted Patents by implementing and using 4G/LTE and/or 5G/NR cellular functionality in the Accused Products, and performing the acts of infringement described above.

75. Each of Volkswagen's Accused Products implements the portions of the 3GPP LTE standard specification that read on at least claim 13 of the '941 patent. *See* Exhibit 9.

76. Volkswagen's Accused Products therefore meet at least one claim of the '941 patent.

77. To the extent that Volkswagen releases any new version of Volkswagen's Accused Products, such instrumentalities will meet the claims of the '941 patent and infringe under 35 U.S.C. § 271(a)-(b) in ways analogous to Volkswagen's current infringement described above.

78. Neo Wireless has been damaged and continues to be damaged by Volkswagen's infringement of the '941 patent.

COUNT FOUR: INFRINGEMENT OF THE '450 PATENT

79. Plaintiff incorporates the allegations of all of the foregoing paragraphs as if fully restated herein.

80. As described above, each Volkswagen entity has infringed and continues to infringe the Asserted Patents by implementing and using 4G/LTE and/or 5G/NR cellular functionality in the Accused Products, and performing the acts of infringement described above.

81. Each of Volkswagen's Accused Products implements the portions of the 3GPP LTE standard specification that read on at least claim 7 of the '450 patent. *See* Exhibit 10.

82. Volkswagen's Accused Products therefore meet at least one claim of the '450 patent.

83. To the extent that Volkswagen releases any new version of Volkswagen's Accused Products, such instrumentalities will meet the claims of the '450 patent and infringe under 35 U.S.C. § 271(a)-(b) in ways analogous to Volkswagen's current infringement described above.

84. Neo Wireless has been damaged and continues to be damaged by Volkswagen's infringement of the '450 patent.

COUNT FIVE: INFRINGEMENT OF THE '512 PATENT

85. Plaintiff incorporates the allegations of all of the foregoing paragraphs as if fully restated herein.

86. As described above, each Volkswagen entity has infringed and continues to infringe the Asserted Patents by implementing and using 4G/LTE and/or 5G/NR cellular functionality in the Accused Products, and performing the acts of infringement described above.

87. Each of Volkswagen's Accused Products implements the portions of the 3GPP LTE standard specification that read on at least claim 15 of the '512 patent. *See* Exhibit 11.

88. Volkswagen's Accused Products therefore meet at least one claim of the '512 patent.

89. To the extent that Volkswagen releases any new version of Volkswagen's Accused Products, such instrumentalities will meet the claims of the '512 patent and infringe under 35 U.S.C. § 271(a)–(b) in ways analogous to Volkswagen's current infringement described above.

90. Neo Wireless has been damaged and continues to be damaged by Volkswagen's infringement of the '512 patent.

COUNT SIX: INFRINGEMENT OF THE '302 PATENT

91. Plaintiff incorporates the allegations of all of the foregoing paragraphs as if fully restated herein.

92. As described above, each Volkswagen entity has infringed and continues to infringe the Asserted Patents by implementing and using 4G/LTE and/or 5G/NR cellular functionality in the Accused Products, and performing the acts of infringement described above.

93. Each of Volkswagen's Accused Products implements the portions of the 3GPP LTE standard specification that read on at least claim 23 of the '302 patent. *See* Exhibit 12.

94. Volkswagen's Accused Products therefore meet at least one claim of the '302 patent.

95. To the extent that Volkswagen releases any new version of Volkswagen's Accused Products, such instrumentalities will meet the claims of the '302 patent and infringe under 35 U.S.C. § 271(a)–(b) in ways analogous to Volkswagen's current infringement described above.

96. Neo Wireless has been damaged and continues to be damaged by Volkswagen's infringement of the '302 patent.

PRAYER FOR RELIEF

WHEREFORE, Plaintiff respectfully requests the following relief:

- a. a judgment in favor of Plaintiff that Defendants have infringed, either literally and/or under the doctrine of equivalents, the Asserted Patents;
- b. a judgment that Defendants' infringement has been and is willful;
- c. a judgment and order requiring Defendants to pay Plaintiff its damages, costs, expenses, and any enhanced damages to which Plaintiff is entitled for Defendant's infringement;
- d. a judgment and order requiring Defendants to provide an accounting and to pay supplemental damages to Plaintiff, including without limitation, pre-judgment and post-judgment interest;
- e. a judgment and order requiring Defendants to pay ongoing royalties;
- f. a judgment and order finding that this is an exceptional case within the meaning of 35 U.S.C. § 285 and awarding Plaintiff its reasonable attorney fees against Defendants; and
- g. any and all other relief as the Court may deem appropriate and just under the circumstances.

DEMAND FOR JURY TRIAL

Pursuant to Fed. R. Civ. P. 38, Plaintiff hereby demands trial by jury on all claims and issues so triable.

DATED: March 29, 2022

Respectfully submitted,

/s/ Mark W. Lenihan

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