

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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GEOTAB INC. AND GEOTAB USA, INC.  
Petitioners,

v.

FRACTUS, S.A.,  
Patent Owner.

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Case No. IPR2025-01027  
Patent 11,349,200

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**PATENT OWNER'S PRELIMINARY RESPONSE**

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**EXHIBIT LIST**

<b>Exhibit No.</b>	<b>Title</b>
Ex. 2001	PACER Docket Reports from July 28, 2025 in <i>Fractus, S.A. v. Verizon Connect Inc. et al</i> , 2:24-cv-01009-JRG-RSP (E.D.Tex.) and <i>Fractus, S.A. v. Geotab Inc.</i> 2:24-cv-01008-JRG-RSP (E.D.Tex.)
Ex. 2002	Defendants' Preliminary Invalidity Contentions dated June 18, 2025 in 2:24-cv-01009-JRG-RSP (E.D.Tex.)
Ex. 2003	Invalidity Contentions for U.S. Patent No. 11,349,200 in 2:24-cv-01009-JRG-RSP (E.D.Tex.)
Ex. 2004	Amended Docket Control Order dated April 10, 2025 in 2:24-cv-01009-JRG-RSP (E.D.Tex.)
Ex. 2005	Complaint dated December 6, 2024 in 2:24-cv-01008-JRG-RSP (E.D.Tex.)
Ex. 2006	Docket Navigator Time to Trial Statistics for Judge Rodney Gilstrap (last accessed July 23, 2025)
Ex. 2007	Reexamination Certificate for U.S. Patent No. 11,349,200, issued October 18, 2024
Ex. 2008	Declaration of Mark J. DeBoy
Ex. 2009	DECLARATION IN SUPPORT OF PATENT OWNER'S MOTION FOR <i>PRO HAC VICE</i> ADMISSION OF LARRY L. SHATZER
Ex. 2010	Declaration of Hossein Hashemi, Ph.D.
Ex. 2011	Jack H. Winters, "Smart Antennas for Wireless Systems," IEEE Personal Communications, February 1998

Ex. 2012	3GPP TSG RAN Meeting #26, Document No. RP-040496, “Report of the 3GPP TSG RAN Long Term Evolution Work Shop,” 2 -3 November 2004, Toronto, Canada”
Ex. 2013	3GPP TSG-RAN meeting #28, Document No. RP-050371, “Presentation of Specification to TSG or WG,” Québec City, Quebec, 1–3 June 2005
Ex. 2014	3GPP TSG-RAN meeting #32, Document No. RP-060226, “List of CRs. Supplement to Report from RAN WG2,” Warsaw, Poland, 31 <sup>st</sup> May - June 2006
Ex. 2015	Hannes Ekstrom, et al. “Technical Solutions for the 3G long-term evolution,” IEEE Communications Magazine • March 2006
Ex. 2016	Takehiro Nakamura, et al., “Super 3G Technology Trends, Part 1: Super 3G Overview and Standardization Activities,” NTT DoCoMo Technical Journal Vol. 8, No. 1

**TABLE OF AUTHORITIES**

**Cases**

*Arthrex, Inc. v. Smith & Nephew, Inc.*, 35 F.4th 1328 (Fed. Cir. 2022).....27

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*In re Gordon*, 733 F.2d 900 (Fed. Cir. 1984) .....22

*KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398 (2007).....22

*Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc) ..... 14, 27

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## I. INTRODUCTION

Fractus, S.A. ("Patent Owner") requests that the Board decline to institute *inter partes* review ("IPR"), because the Petition's grounds of rejection fail to render obvious claims 1-20 of U.S. Patent 11,349,200 ("the '200 Patent"). Ground 1 of the Petition, alleging invalidity of claims 1-15, 17, and 19-20, is based on the purported obviousness of replacing the two antennas of the primary reference Dou with two copies of a single antenna described in the secondary reference, Jing.

The proposed substitution of Dou's antennas with two copies of Jing's antenna violates the express teachings of Dou and renders Dou's antenna system inoperable for its intended purpose. A principal objective of Dou's antenna architecture is to achieve "internal diversity, " including spatial diversity, between two antennas at opposite ends of a printed circuit board within a wireless device. EX1013 at 1 (Title, Abstract), [0017], [0022], [0023]; EX2010 at ¶ 34. Antenna spatial diversity improves communication of wireless signals by increasing the likelihood that at least one antenna is located where signal interference is relatively low. EX2010 at ¶ 33. Because closely spaced antennas operating at the same frequency tend to experience similar interference levels, spatial diversity requires separating antennas by a sufficient distance to make their interference levels different. *Id.* Consistent with well-known spatial diversity principles, Dou specifies a spacing between its two

antennas of at least a quarter-wavelength at the lowest frequency of the antennas. EX1013 at ¶ [0024].

By the very dimensions of the proposed Dou+Jing antenna spelled out in Ground 1 of the Petition, the spacing left between the two antennas is only a fraction of that specified by Dou's explicit at-least-a-quarter-wavelength requirement. A person having ordinary skill in the art (POSITA) would immediately recognize that this proposed modification would destroy the very spatial diversity that Dou's antenna design sought to achieve. Because Ground 1 is based on a proposed modification that renders Dou's antenna system inoperable for its intended purpose and leaves no reasonable expectation of anticipated success, Ground 1 fails to render obvious claims 1-15, 17, and 19-20 of the '200 Patent for this additional reason. EX2010 at ¶ 48.

Ground 2 purports to show the invalidity of claims 1-20 of the '200 Patent based on a pre-grant publication of an application within the '200 Patent's priority chain, U.S. Pre-Grant Publication No. 2008/0018543 to Baliarda *et al.* ("Baliarda-543"). Baliarda-543 and the '200 Patent share an identical disclosure. Petition at 81. The Petition, nevertheless, alleges that the '200 Patent is not entitled to its priority date, or even the filing date of Baliarda-543. *Id.* at 80-81. This allegation is specious. Petitioners argue that the '200 Patent is not entitled to its priority date because claims 1, 6, and 11 use the expression "4G communication standard." *Id.* Petitioners do *not*

argue that this expression is unsupported in the '200 Patent specification. The Petition instead argues that Patent Owner's litigation claim construction arguments have, somehow, expanded the scope of the term such that it is not supported as of the priority date for the '200 Patent. Patent Owner's litigation claim construction arguments were, however, based on how a POSITA would have understood "4G communication standard" in June of 2006. *Id.* In other words, the Petition attempts to recast a run-of-the-mill claim construction disagreement as a written description issue in an unsupported effort to convince the Board to deny the '200 Patent its priority date. Since the '200 Patent is entitled to the priority dates of its parent applications, Baliarda-543 is not prior art to the '200 Patent and Ground 2 fails to anticipate or render obvious any claim of the '200 Patent.

## **II. BACKGROUND**

### **A. The '200 Patent**

The '200 Patent is entitled "Multiple-Body-Configuration Multimedia and Smartphone Multifunction Wireless Devices," and issued on May 31, 2022. EX1003 at 1. The '200 Patent issued from U.S. Patent Application No. 17/246,192, filed on April 30, 2021, which is a continuation of U.S. Patent Application No. 16/832,820, filed on March 27, 2020 (now U.S. Patent No. 11,031,677), which is a continuation of U.S. Patent Application No. 15/856,626, filed on December 28, 2017 (now U.S. Patent No. 10,644,380), which is a continuation of U.S. Patent Application No.

14/738,090, filed on June 12, 2015 (now U.S. Patent No. 9,899,727), which is a continuation of U.S. Patent Application No. 14/246,491, filed on April 7, 2014 (now U.S. Patent No. 9,099,773), which is a continuation of U.S. Patent Application No. 11/614,429, filed on December 21, 2006 (now U.S. Patent No. 8,738,103), claiming benefit of U.S. Provisional Patent Application No. 60/831,544, filed on July 18, 2006 and U.S. Provisional Patent Application No. 60/856,410, filed on November 3, 2006.

The aforementioned priority application No. 11/614,429 was also published as U.S. Patent Publication No. 2008/0018543 on January 24, 2008, identified in the Petition as Baliarda-543. The subject matter disclosed in the '200 Patent is the same as that disclosed in its priority application Baliarda-543, *i.e.*, no continuation-in-part applications exist in the priority chain, and no new subject matter was ever added at any point in the priority chain. *See* Petition at 81.

The '200 Patent describes a wireless device having a multiband antenna system with two or more antennas, at least one of which has a complex shape that can be characterized by a set of complexity factors that relate to different structural and functional features of the antenna. By overlaying different-sized grids on a contour of an antenna and evaluating the number of cells within the grid spanned by the contour, attributes of the antenna's complexity can be determined. EX2010 at ¶ 30. For example, a complexity factor  $F_{21}$ , determined from the cell counts from grids with large-sized and medium-sized cells, characterizes the complexity and degree of

convolution of features of the antenna contour that appear when the contour is viewed at relatively coarser levels of scale. EX1003 at 19:26-29; EX2010 at ¶ 30. Consequently, complexity factor  $F_{21}$  tends to increase with the number of antenna portions within the structure of the antenna system, typically associated with more frequency bands or radiation modes. Ex1003 at 19:48-61; EX2010 at ¶ 30. A complexity factor  $F_{32}$ , determined from the cell counts from grids with medium-sized and small-sized cells, characterizes the complexity and degree of convolution of features of the antenna contour that appear when the contour is viewed at relatively finer levels of scale. EX1003 at 20:18-21. Consequently, complexity factor  $F_{32}$  tends to increase when the antenna contour includes a highly convoluted curve and reveals the degree of miniaturization achieved by the antenna system. EX1003 at 20:28-39; EX2010 at ¶ 30. Evaluating an antenna using such complexity factors reveals its suitability for specific applications. *See, e.g.*, EX1003 at 21:35-26:67.

The claims of the '200 Patent recite wireless devices including antenna systems with at least two antennas and which recite antenna structures that meet specific complexity factor requirements in distinctive combinations with particular frequency bands that are supported by the antenna systems. As will be evident from the arguments herein, the patentability of the subject matter of these claims is

reinforced by Petitioners' failure to identify prior art that establishes anticipation or obviousness.

**B. Technical Background – Antenna Spatial Diversity**

Spatial diversity is a technique in wireless communications that uses multiple antennas to improve signal reliability and performance by mitigating the effects of multipath fading and other interference. EX2010 at ¶ 33. Multipath fading occurs when a wireless signal propagates along multiple different paths of differing lengths because of interactions with obstacles, resulting in portions of the signal energy arriving at a receiver with different phases slightly offset in time. *Id.* The phase-shifted versions of the signal may result in constructive or destructive interference with each other. *Id.* Such interference is spatially dependent – it varies from one spot to another based on the relative phases of the phase-shifted versions of the signal at different locations. *Id.* Two locations separated by a small fraction of the wavelength of the wireless signal tend to experience similar fading and interference characteristics. *Id.* Consequently, two closely spaced antennas cannot provide effective spatial diversity. *Id.* Conversely, by providing sufficient spacing between two antennas, the likelihood increases that at least one of the antennas will be positioned at a location where the multipath or other interference is relatively low, thereby improving overall signal quality and reliability. *Id.* A commonly accepted rule of thumb is that at least a quarter-wavelength spacing between antennas is

necessary to provide effective spatial diversity and, in some contexts, a larger distance such as a half-wavelength spacing or more may be preferable. *Id.*; EX2011 at 23 (“quarter-wavelength spacing of the antennas is sufficient”).

### C. Petitioners' Art

#### i. Dou

U.S. Patent Application No. 11/361,860 to Dou *et al.*, entitled "Internal Diversity Antenna Architecture" ("Dou" or EX1013), was filed on February 24, 2006, and was published as U.S. Patent Publication No. 2007/0200773 on August 30, 2007. Dou is generally directed to an antenna architecture that includes first and second antennas located near opposite ends of a printed circuit board (PCB) such that the spacing between two antennas provides spatial diversity. EX2010 at ¶ 34. FIG. 2A of Dou shows an internal diversity antenna structure comprising first and second internal antennas 206, 208 on a PCB 204 within a wireless device 200. *Id.* The first internal antenna 206 is positioned near the top edge of the PCB 204, and the second internal antenna 208 is positioned near the bottom edge of the PCB 204. EX1013 at ¶ [0017]; EX2010 at ¶ 34. Dou explains that:

first internal antenna 206 and the second internal antenna 208 may be used **to implement various spatial diversity techniques** to improve communication of wireless signals across one or more frequency bands of wireless shared media.

*Id.* at ¶ [0022], emphasis added; *see also id.* at ¶¶ [0032], [0036] (describing other internal diversity embodiments).

Consistent with generally accepted spacing requirements to achieve spatial diversity, Dou specifies the following spacing dimensions:

In the embodiment shown in FIG. 2A, for example, the length (L) of the wireless device 200 may be greater than 0.3 wavelength ( $>0.3\lambda$ ) of the lowest frequency, **and the first internal antenna 206 and the second internal antenna 208 may be separated by a distance (D) that is no less than the quarter wavelength ( $\geq\lambda/4$ ) of the lowest frequency.**

*Id.* at ¶ [0024], emphasis added. *See also* EX2010 at ¶ 35.

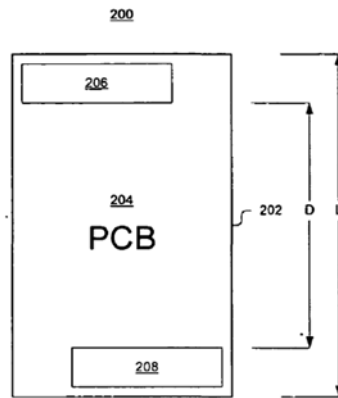


FIG. 2A

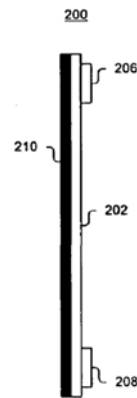


FIG. 2B

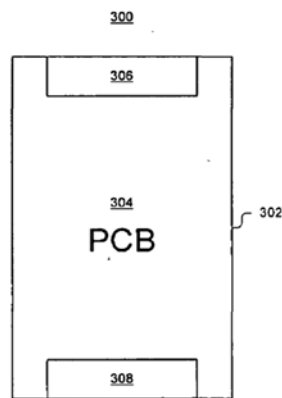


FIG. 3A

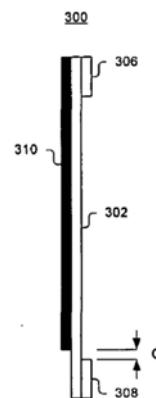


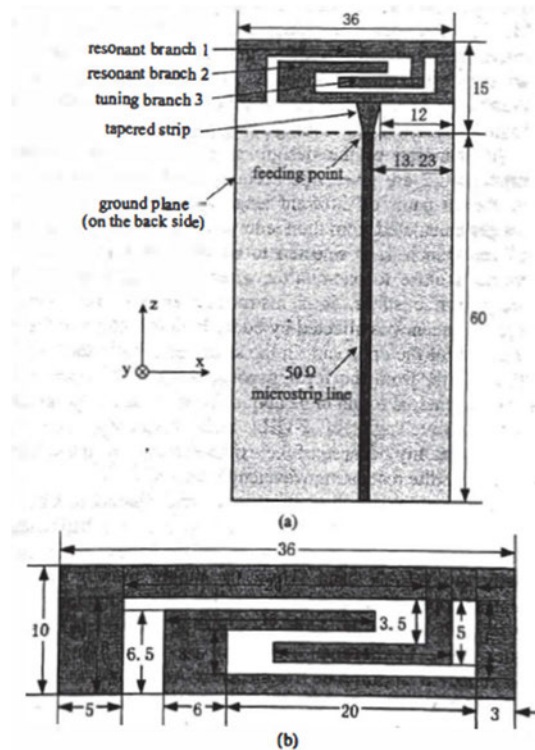
FIG. 3B

In Figs. 3A and 3B, Dou shows a wireless device 300 with a similar diversity antenna comprising first and second spaced-apart antennas 306 and 308 for achieving spatial diversity. *Id.* at ¶ [0032]. The primary difference between the embodiments shown in Figs. 2A-2B and those shown in Figs. 3A-3B is that the ground plane in the latter embodiment does not extend underneath the second antenna 308. *Id.* at ¶ [0034].

Applying Dou's antenna spacing requirements to a frequency of, for example, 900 MHz results in at least 83.3 mm of spacing between the antennas. EX2010 at ¶ 36. Specifically, the wavelength  $\lambda$  corresponding to a frequency of 900 MHz is 333.3 mm. *Id.* At this wavelength, the spacing  $D$  between Dou's first and second antennas, which Dou indicates should be  $\geq \lambda/4$ , must be at least 83.3 mm. *Id.*

**ii. Jing**

X. Jing *et al.* "Compact Planar Monopole Antenna for Multi-band Mobile Phones," *2005 Asia-Pacific Microwave Conference Proceedings*, vol. 4, pp. 2657-2660, IEEE, 2005 ("Jing" or EX1011), discloses a planar monopole antenna comprising a rectangular radiating patch with three branches, including two resonating branches and a tuning branch, allowing the antenna to resonate at three frequency bands. EX1011 at 2657; EX2010 at ¶ 37. As shown in Fig. 1, the antenna has an area of 36 x 15 mm<sup>2</sup> and is positioned adjacent to one end of a ground plane having a width of 36 mm and a length of 60 mm. EX1011 at 2658; EX2010 at ¶ 37. Jing identifies the lowest band of the antenna as 900-945 MHz, i.e., 900 MHz is the lowest frequency of the Jing antenna. EX1011 at 2658; EX2010 at ¶ 37.



Because Jing does not attempt to provide antenna diversity, Jing includes only a single antenna located at one of the short ends of the ground plane. Jing, consequently, does not contend with the issue of a suitable spacing between two such antennas to provide spatial diversity or whether the size and shape of such an antenna is practical to enable spatial diversity in a wireless device. EX2010 at ¶ 38.

### iii. Baliarda-543

U.S. Pre-Grant Publication No. 2008/0018543 to Baliarda *et al.* ("Baliarda-543") is the pre-grant publication of U.S. Application No. 11/614,429 (the "'429 Application"). The '429 Application is contained within the '200 Patent's priority chain:

This application is a continuation of U.S. patent application Ser. No. 16/832,820 filed Mar. 27, 2020, which is a continuation of U.S. patent application Ser. No. 15/856,626 filed Dec. 28, 2017, which is not U.S. Pat. No. 10,644,380, issued May 5, 2020, which is a continuation of U.S. patent application Ser. No. 14/738,090 filed Jun. 12, 2015, which is now U.S. Pat. No. 9,899,727, issued on Feb. 20, 2018, which is a continuation of U.S. patent application Ser. No. 14/246,491 filed Apr. 7, 2014, which is now U.S. Pat. No. 9,099,773, issued on Aug. 4, 2015, which is a continuation of U.S. patent application Ser. No. 11/614,429 filed Dec. 21, 2006, which is now U.S. Pat. No. 8,738,103, issued on May 27, 2014, which claims the benefit of U.S. Provisional Application No. 60/856,410, filed on Nov. 3, 2006, and claims the benefit of U.S. Provisional Application No. 60/831,544, filed on Jul. 18, 2006, the entire contents of which are hereby incorporated by reference. This patent application further claims priority from, and incorporates by reference the entire disclosure of European Patent Application No. EP 06117352.2, filed Jul. 18, 2006.

EX1003 at 1.

The Parties agree that the specifications of the '429 Application and Baliarda-543 are materially identical to that of the '200 Patent. Petition at 81.

### **III. CLAIM CONSTRUCTION**

Claims in this IPR are construed "using the same claim construction standard that would be used to construe the claim in a civil action under 35 U.S.C. 282(b), including construing the claim in accordance with the ordinary and customary meaning of such claim as understood by one of ordinary skill in the art." 37 C.F.R. § 42.100. Patent Owner does not necessarily agree with Petitioners' claim constructions as presented in the Petition (Petition at 11-30), or in any other proceeding, but any differences are not directly pertinent to any of the arguments Patent Owner is making in this Preliminary Response and, accordingly, are not

addressed. Patent Owner, however, reserves the right to challenge Petitioners' claim construction and to provide different and additional constructions if an IPR is instituted.

Patent Owner respectfully submits that for the purpose of this Preliminary Response the Board can resolve all issues without an explicit construction of any claim term – the plain and ordinary meaning of all terms amply illustrates that the invalidity grounds presented in the Petition fail to show a likelihood of invalidating any claim of the '200 Patent. Nevertheless, Patent Owner provides the following discussion of how a POSITA would have understood "4G communication standard" at the time of the earliest priority date for the '200 Patent.

Claim 1 recites "a first antenna ... configured to transmit and receive signals from a **4G communication standard**" and "a second antenna ... configured to receive signals from a **4G communication standard**." Claim 6 recites "a first antenna configured to provide operation in at least four frequency bands being used by **4G communication standards**" and "a second antenna configured to operate in at least one frequency band being used by a **4G communication standard**." Claim 11 recites "a first antenna configured to provide operation in at least three frequency bands being used by **4G communication standards**." Patent Owner's position has consistently been that "4G communication standard" should be given its ordinary and customary meaning under the *Phillips* claim construction standard, which

evaluates how the expression "4G communication standard" would have been understood by a POSITA as of the priority date of the application in light of the specification, claims, and prosecution history of the '200 Patent and appropriate extrinsic evidence. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1313 (Fed. Cir. 2005) (en banc).

To the extent, however, that a construction of the term is necessary for the Board's resolution of the issues in this proceeding, Patent Owner submits that a POSITA would have understood that "4G communication standard" refers to a technical specification related to the Fourth Generation (4G) of broadband cellular network technology, a position consistent with Patent Owner's position in the *ADT* litigation. *See* EX1017 at n. 9. A "first antenna configured to provide operation in at least four frequency bands being used by 4G communication standards," for example, would be an antenna configured to provide operation in at least four frequency bands being used by technical specifications related to the Fourth Generation (4G) of broadband cellular network technology.

The Specification of the '200 Patent explains that "4G standards" (which it sometimes calls "4G services") include "HSDPA, WiBro, WiFi, WiMax, UWB, or other high-speed wireless standards." EX1003 at 25:14-26. Thus, examples of the claimed "frequency bands being used by 4G communication standards" may include 1900-2170 MHz, 810-960 MHz, 1710-1990 MHz, or 2-11 GHz (including some of

its subregions such as 3-10 GHz, 2.4-2.5 GHz, and 5-6 GHz), as well as “additional frequency bands corresponding to said 4G standards.” *Id.* at 14-26.

This construction is, generally, consistent with the position taken by Petitioners in the Petition:

Thus, “*4G communication standard*” is met by a “wireless standard” for “4G services” and “*antenna... configured to... receive signals from a 4G communication standard*” is met by an antenna that is operable in a frequency range used by a “4G service,” where the “i.e.” signal means that the patent defines a “4G service” as “comprising 3G and **other advanced services** such as for instance **HSDPA, WiBro, WiFi, WiMAX, UWB or other high-speed wireless standards**[.]”

Petition at 28-29 (emphasis added).

As indicated in the emphases provided above, both Petitioners and Patent Owner agree that a “4G communication standard,” as understood at the time of the priority date of the '200 Patent, would have included “other high speed wireless standards” beyond HSDPA, WiBro, WiFi, WiMAX, or UWB. Petitioners reject the suggestion that such “other high speed wireless standards” would have been understood by a POSITA as including the Long Term Evolution or LTE standard. Petition at 74-75. The LTE standard, however, was essentially established before the 2006 priority date of the '200 Patent:

1. 3GPP, via the Technical Specification Group for the Radio Access Network (TSG RAN or RAN) defined the all-IP radio/Core split that would become LTE/EPC between 2004 and 2006. EX2012; EX2016 at 56.
2. A full requirements catalogue for the technology that would come to be known as "LTE" was approved at RAN #28 (June 2005). EX2013; EX2016 at 56.
3. In June 2006, a defined scope, objectives, schedule and the new specification list for the technology that became known as LTE was unanimously adopted by RAN. EX2014; EX2016 at 56.

In short: by June 2006, the LTE project within 3GPP TSG RAN shifted from study to reality. The 3GPP TSG RAN locked in the requirements for the technology, essentially laying down the architecture and performance foundation for LTE. Further, work understood as being representative of LTE was being performed prior to June 2006. EX2015, EX2016 at 56. Accordingly, by June 2006, prior to the earliest possible priority date for the '200 Patent, a POSITA would have understood that LTE was one of the "other high-speed wireless standards" disclosed in the '200 Patent. EX1003 at 25:15-17. Therefore, a "4G communication standard" would have been understood by a POSITA at the time of the '200 Patent's priority date as including LTE communication standards.

#### **IV. THE PERSON OF ORDINARY SKILL IN THE ART**

For purposes of this Preliminary Response only, Patent Owner assumes the POSITA definition asserted in the Petition. Petition at 11. Patent Owner, however, reserves the right to present its own definition in the event an IPR is instituted.

#### **V. ARGUMENT**

The Board may institute IPR of the claims of the '200 Patent only if the Petition "shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition." 35 U.S.C. § 314. The Petition has not met this threshold.

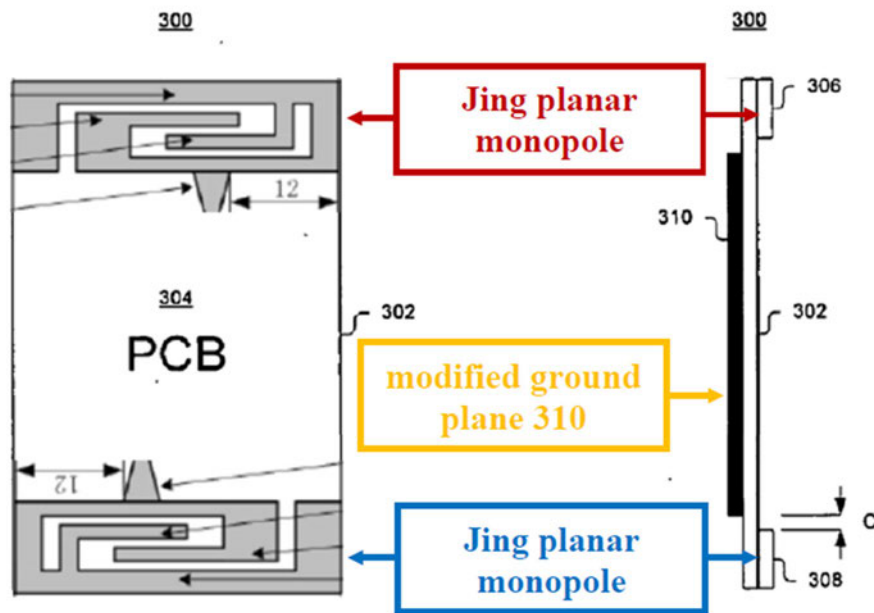
##### **A. Ground 1 – Claims 1-15, 17, and 19-20 are patentable over Dou in view of Jing**

The Petition alleges that claims 1-15, 17, and 19-20 would have been obvious to a POSITA at the time of invention based on the combined teachings of Dou and Jing. Because the proposed combination of Dou and Jing provided in the Petition directly contradicts the teachings of Dou, the combination would not have been obvious. Therefore, *inter partes* review should not be instituted based upon Ground 1.

An objective of Dou's antenna design is to achieve spatial diversity between two antennas. EX1013 at ¶¶ [0017], [0022], [0023]; EX2010 at ¶ 42. The combination of Dou and Jing proposed in the Petition would construct an antenna

that violates the explicit design constraints specified by Dou – design constraints that are well known in the art as being necessary to achieve the spatial diversity Dou's antenna design seeks. EX2010 at ¶ 42. Because the Petition modifies Dou's antenna in a way that is contrary to Dou's design constraints, the proposed combination would not have been obvious and a POSITA would not have had a reasonable expectation of success in implementing the combination. *Id.* at 42-49. Therefore, *inter partes* review should not be instituted based upon Ground 1 for this additional reason.

Dou's diversity antenna includes two antennas 306 and 308 located at opposite ends of a PCB 304 for the purpose of achieving spatial diversity. *See* Section II.C.i, *supra*; EX1013 at ¶ [0017]; EX2010 at ¶ 43. Relying on the embodiment shown in Figs. 3A and 3B of Dou, the Petition proposes to implement Patent Owner's claimed antenna system by replacing Dou's first antenna 306 with a first copy of Jing's single antenna and by replacing Dou's second antenna 308 with a second copy of Jing's single antenna. Petition at 33-36; EX2010 at ¶ 43. This implementation is illustrated in the annotated figure provided on page 36 of the Petition, reproduced below.



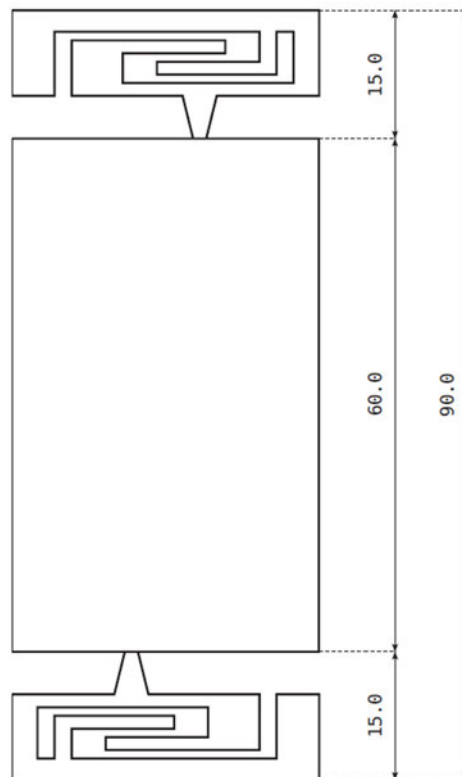
**FIG. 3A**

**FIG. 3B**

Absent from the Petition is any discussion of whether Dou's antenna arrangement – modified by substituting two copies of Jing's antenna – complies with Dou's specification of having at least a quarter-wavelength spacing between the two antennas to provide spatial diversity, an objective of Dou's antenna design. It does not. As explained in Section II.C.i, *supra*, Dou specifies that the first and second antennas be "separated by a distance (D) that is no less than the quarter wavelength ( $\geq \lambda/4$ ) of the lowest frequency." EX1013 at ¶ [0024]; EX2010 at ¶ 44. The lowest frequency of Jing's antenna is 900 MHz. EX1011 at 2658 EX2010 at ¶ 44. The wavelength  $\lambda$  corresponding to a frequency of 900 MHz is 333.3 mm, and a quarter of this wavelength – the minimum spacing specified by Dou to achieve spatial

diversity at this wavelength – is 83.3 mm. EX2010 at ¶ 44; *see also* Section II.C.i, *supra*.

In the proposed combination of Dou and Jing, the Petition further explains "[a]s shown in modified Dou Figs. 3A-3B (below), a POSA would have used Jing's ground plane dimensions of 36 x 60 mm<sup>2</sup>, and limited the extent of Dou's ground plane 310 so that it did not extend behind Jing's antenna at 306, just like Dou does not extend it behind antenna 308." Petition at 35. Thus, the recipe for combining Dou and Jing prescribed by the Petition results in the following structure:



EX2010 at ¶ 45.

The 60 mm spacing between the two antennas in the Petition's modified antenna is well short of the lower bound (83.3 mm) of the spacing specified by Dou to achieve spatial diversity at the antennas' lowest frequency (900 MHz). EX2010 at ¶ 46.

For completeness, Patent Owner notes that the separation constraints discussed above are described in Dou with reference to Figs. 2A and 2B, while Petitioners' invalidity ground is based upon Figs. 3A and 3B. As explained in Dou, however, "the wireless device 300 may be similar in some structural and operational aspects as wireless device 200, as described above." EX1013 at ¶ [0031]. Accordingly, a POSITA would understand that the design constraints described with respect to Figs. 2A and 2B apply with equal force to Figs. 3A and 3B. *See also id.* at ¶ [0035] ("FIG. 4A illustrates one embodiment of a wireless device 400 having an internal diversity antenna architecture. In various embodiments, the wireless device 400 may be similar in some structural and operational aspects as wireless device 200 and/or wireless device 300, as described above."). EX2010 at ¶ 47. Further, an antenna separation of no less than the quarter wavelength ( $\geq \lambda/4$ ) of the lowest frequency is a generally accepted requirement for an antenna diversity system. *Id.* Therefore, even absent the specific requirement for such separation in Dou, a POSITA would have nevertheless understood that such separation was required to implement the spatial diversity sought in Dou. *Id.*

Because the antenna spacing proposed in Ground 1 of the Petition is contrary to the express teachings of Dou (as well as the general understanding in the art at the time of invention), the combination proposed in the Petition would have eliminated effective spatial diversity, a feature Dou's antenna architecture seeks to provide. *Id.* at ¶ 48. The proposed modification, therefore, would not have been obvious to a POSITA at the time of invention of the '200 Patent. *Id.*; *see In re Gordon*, 733 F.2d 900, 902 (Fed. Cir. 1984) (finding that a modification that renders the invention inoperable for its intended purpose is not obvious because it teaches away from the invention); *see also Ex Parte Bjarne Harbo & Lucas Willemoes Hesselhof*, No. APPEAL 2024-002314, 2025 WL 2159181, at \*3 (P.T.A.B. July 25, 2025).

A POSITA, understanding that at least a quarter-wavelength spacing between antennas is implemented to achieve spatial diversity, and following Dou's express teaching of this spacing, would not have expected the combination proposed in Ground 1 of the Petition to successfully provide the spatial diversity Dou's antenna arrangement intended to provide. EX2010 at ¶ 49. Thus, the Petition fails to meet its burden of establishing that a POSITA would have been motivated to make such a combination, let alone yield predictable results doing so. *See KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 421 (2007) (noting that if an ordinarily skilled artisan would not believe that a particular combination would have a reasonable expectation of "anticipated success," the combination may not be obvious). The combination of

Dou and Jing proposed in Ground 1 of the Petition, consequently, would not have been obvious to a POSITA at the time of invention. EX2010 at ¶ 49. Accordingly, there is no reasonable likelihood that Petitioners would prevail with respect to invalidating claims 1, 6, and 11 or their dependent claims under Ground 1.

**B. Ground 2 – Claims 1-20 are patentable over Baliarda-543**

Ground 2 is based upon Baliarda-543. *See* Section I, *supra*. Contrary to the allegations in the Petition, Baliarda-543 is not prior art to the '200 Patent.

The Parties agree that the application that published as Baliarda-543, U.S. Application No. 11/614,429 (the "'429 Application), is contained within the '200 Patent's priority chain:

This application is a continuation of U.S. patent application Ser. No. 16/832,820 filed Mar. 27, 2020, which is a continuation of U.S. patent application Ser. No. 15/856,626 filed Dec. 28, 2017, which is not U.S. Pat. No. 10,644,380, issued May 5, 2020, which is a continuation of U.S. patent application Ser. No. 14/738,090 filed Jun. 12, 2015, which is now U.S. Pat. No. 9,899,727, issued on Feb. 20, 2018, which is a continuation of U.S. patent application Ser. No. 14/246,491 filed Apr. 7, 2014, which is now U.S. Pat. No. 9,099,773, issued on Aug. 4, 2015, which is a continuation of U.S. patent application Ser. No. 11/614,429 filed Dec. 21, 2006, which is now U.S. Pat. No. 8,738,103, issued on May 27, 2014, which claims the benefit of U.S. Provisional Application No. 60/856,410, filed on Nov. 3, 2006, and claims the benefit of U.S. Provisional Application No. 60/831,544, filed on Jul. 18, 2006, the entire contents of which are hereby incorporated by reference. This patent application further claims priority from, and incorporates by reference the entire disclosure of European Patent Application No. EP 06117352.2, filed Jul. 18, 2006.

EX1003 at 1.

The Parties agree that the specification of the '429 Application is materially identical to that of the '200 Patent (*see* Petition at 81) and Petitioners have not alleged that any new matter was added to the '200 Patent compared to any of the applications in its priority chain. U.S. Provisional Application No. 60/831,544 filed on July 18, 2006 is also materially identical to the disclosures of the '200 Patent and Baliarda-543.

Further, Petitioners do not allege that the term "4G communication standard" is unsupported by the specification of the '200 Patent. Quite to the contrary, Petitioners explicitly provide a construction for the term based on the intrinsic evidence provided in the specification of the '200 Patent, repeatedly citing the *Phillips* claim construction standard as the basis for its construction. Petition at 28 ("The '200 specification equates '4G standards' with '4G services' providing '4G features' . . . . The antecedent for 'said 4G standards' (EX1003, 25:20) is '4G services,' and the 'frequency bands corresponding to said 4G standards' comprise 'frequency bands of the 4G services[.]' EX1003, 25:15-30. The patent defines a '4G antenna' as an 'antenna covering one or more of the 4G services[.]' EX1003, 25:36-38; *Phillips*, 415 F.3d at 1316.").

Petitioners' argument that the '200 Patent is not entitled to its priority claim is based on an allegation that the '200 Patent purportedly fails to provide written

description support for the full scope of the term "4G communication standard." Specifically, Petitioners argue that Patent Owner's claim construction position in litigation that "the claimed '*4G communication standard*' is met by LTE" somehow expanded the scope of the term beyond how it would have been understood as of the '200 Patent's priority date, and therefore, the '200 Patent is not entitled to its priority date. Petition at 74-75.<sup>1</sup> Patent Owner's litigation positions are, however, based on Patent Owner's position regarding how the term "4G communication standard" would have been understood by a POSITA at the time of the 2006 priority date for the '200 Patent. *E.g.*, EX1017 at 19 ("**A POSITA reading the patents in 2006** would have been able to reference the specifications in order to determine what antenna functions satisfied the '4G communication standard(s)'."); *id* at 20-21 (citing

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<sup>1</sup> Petitioners' reliance on litigation statements is inappropriate for at least two reasons. First, the court in the litigation has not issued a claim construction. More importantly, it is improper to rely on such statements for the written description analysis Petitioners seek to undertake. *See Ariad Pharms. v. Eli Lilly*, 598 F.3d 1336, 1351 (Fed. Cir. 2010) (en banc) ("The test requires an objective inquiry into the **four corners of the specification** from the perspective of a [POSA] to show that the inventor actually invented the invention claimed.") (emphasis added).

evidence from 2006 explaining how a POSITA would have understood "4G communication standard.") (emphasis added).

In other words, the Parties agree that the terms of the '200 Patent should be interpreted as understood by a POSITA no later than its priority date, and the Parties agree that the term "4G communication standard" would have been understood by a POSITA at this time based on *at least* the intrinsic evidence provided in the Specification. *E.g.*, Petition at 28-29 ("Thus, '4G communication standard' is met by a 'wireless standard' for '4G services' and 'antenna ... configured to ... receive signals from a 4G communication standard' (or 'receive signals employing a 4G communication standard') is met by an antenna that is operable in a frequency range used by a '4G service,' where the 'i.e.' signal means that the patent defines a '4G service' as 'comprising 3G and other advanced services such as for instance HSDPA, WiBro, WiFi, WiMAX, UWB or other high-speed wireless standards[.]"). The only disagreement between the Parties is *how* "4G communication standard" would have been understood by a POSITA at the '200 Patent's priority date, not whether the '200 Patent's priority application provides written description support for "4G communication standard."

More specifically, Petitioners are limiting their interpretation of "4G communication standard" to the intrinsic evidence for the '200 Patent, while Patent Owner is including relevant extrinsic evidence available as of the '200 Patent's

priority date regarding the meaning of this technical term. *Phillips*, 415 F.3d at 1314 (sources of claim construction evidence include "extrinsic evidence concerning relevant scientific principles, the meaning of technical terms, and the state of the art"). Petitioners are attempting to twist a run-of-the-mill claim construction disagreement into a non-existent written description problem in order to strip the '200 Patent of its priority date.

The error in Petitioners' argument is readily apparent from the differences in the present case and the cases the Petition cites purportedly in support of its position. Consider, for example, *Arthrex, Inc. v. Smith & Nephew, Inc.*, 35 F.4th 1328 (Fed. Cir. 2022). In *Arthrex*, the subject patent's priority chain included *continuations-in-part*. Accordingly, the subject patent specification described embodiments that included both "flexible" and "rigid" eyelets, and generically claimed "an eyelet," encompassing both embodiments. *Id.* at 1340–42. The subject patent's priority chain, however, included a reference with a different disclosure that failed to provide written description support for the "flexible eyelet" embodiment, and instead discouraged the use of such flexible eyelets. *Id.* at 1342. Accordingly, the priority chain in *Arthrex* included applications having differing disclosures, some of which failed to provide written description for all the disclosed embodiments in the subject patent. In the current case, however, the '200 Patent, Baliarda-543, and their shared

priority application have *identical* disclosures, and, therefore, present a completely different posture.

Or consider *ICU Medical v. Alaris Med. Sys.*, 558 F.3d 1368 (Fed. Cir. 2009), in which every embodiment of the disclosed medical valve contained a "spike," and therefore, "a person of skill in the art would not understand the inventor of the ... patents to have invented a spikeless medical valve." *Id.* at 1378-79. As some claims of the patent in that case did not include a "spike," the court held that the subject patent failed to provide written description support for the full breadth of the "spikeless" claims. In contrast, in the present case, a POSITA would have understood the inventors of the '200 Patent to have invented "a first antenna ... configured to transmit and receive signals from a 4G communication standard." Here, the disagreement between the Parties is not whether a POSITA would have understood the inventors as being in possession of "a first antenna ... configured to transmit and receive signals from a 4G communication standard." It is clear from the specification of the '200 Patent that the inventors were in possession of such antennas due to the disclosure of multiple examples of 4G standards and their associated frequencies, as well as "other high speed wireless standards" and "additional frequency bands corresponding to said 4G standards." *E.g.*, EX1003 at 25:15-31; *see also, e.g.*, Petition at 28-29. Rather, the disagreement here is one of claim construction: how would a POSITA have understood a "4G communication standard" as of the priority

date for the '200 Patent, not whether the inventors were in possession of such an antenna at the relevant priority date.

Or consider *Google LLC v. Valtrus Innovations Ltd.*, IPR2022-01406, Paper 40 (Apr. 3, 2024), in which the claims explicitly recite "virtual machines," but the priority application "does not mention virtual machines and does not include Figure 7 or any of the other portions of the '005 patent pertaining to the virtual machine embodiment." *Id.* at 18. In contrast, in the present case, the '200 Patent and Baliarda-543 have identical disclosures that discuss "4G standards" and provide ample examples of 4G services and their associated frequencies. *E.g.*, EX1003 at 10:1-18; 25:15-23; *see also, e.g.*, Petition at 28-29. In the present case, reference to a "4G communication standard" is not new matter added in a later application.

There is a clear pattern to the cases cited by Petitioners – the claims of the patents deemed to lack written description all recite subject matter that is unambiguously broader than the disclosures of the priority applications. That is not the case in the present proceeding. The claims of the '200 Patent recite a "4G communication standard" and the priority applications for the '200 Patent provide sufficient disclosure of 4G standards and services such that a POSITA would have understood the inventors as being in possession of the claimed invention no later than July 18, 2006, the filing date of U.S. Provisional Application No. 60/831,544 and EP App. No. 06117352. This disagreement between the Parties lies in what those

terms meant as of the priority date for the '200 Patent, not whether the '200 Patent provides written description support for the term.

Therefore, the '200 Patent is entitled to its priority date, and Baliarda-543 is not prior art to the '200 Patent. Because Baliarda-543 is not prior art to the '200 Patent, there is no likelihood that Petitioners will succeed in invalidating any claim based on Ground 2.

## VI. CONCLUSION

In light of the foregoing, there is no "reasonable likelihood that Petitioners would prevail with respect to at least one of the claims challenged in the Petition," and *inter partes* review should not be instituted based upon the proposed invalidity grounds. Accordingly, pursuant to 35 U.S.C. § 314, Patent Owner respectfully requests that the Board refuse to institute *inter partes* review for the reasons stated herein.

Dated: October 1, 2025

Respectfully submitted,  
/Mark J. DeBoy/  
Mark J. DeBoy (Reg. 66,983)  
Attorney for Patent Owner  
Fractus S.A.

**CERTIFICATE OF SERVICE**

The undersigned certifies that pursuant to 37 C.F.R. § 42.6(e), a copy of the foregoing **PATENT OWNER'S PRELIMINARY RESPONSE** and accompanying **EXHIBITS** were served via email (as previously consented to by counsel) on October 1, 2025 to lead and backup counsel of record for Petitioners as follows:

AWichman-PTAB@wolfgreenfield.com  
MParsons-PTAB@wolfgreenfield.com  
RGiunta-PTAB@wolfgreenfield.com  
SLu-PTAB@wolfgreenfield.com

Dated: October 1, 2025

/Mark J. DeBoy/

Mark J. DeBoy (Reg. No. 66,983)  
Attorney for Patent Owner  
Fractus S.A.

**CERTIFICATE OF COMPLIANCE**

Pursuant to 37 C.F.R. § 42.24(d), the undersigned hereby certifies that this brief complies with the type-volume limitation of 37 C.F.R. § 42.24 because this brief contains 6608 total words.

Dated: October 1, 2025

By: /Mark J. DeBoy/  
Mark J. DeBoy (Reg. No. 66,983)  
Attorney for Patent Owner  
Fractus S.A.