

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

GEOTAB INC. AND GEOTAB USA, INC.,
Petitioners,

v.

FRACTUS, S.A.
Patent Owner.

Case No. IPR2025-01026
Patent No. 11,031,677

**PETITIONERS' REPLY TO PATENT OWNER'S
PRELIMINARY RESPONSE AS AUTHORIZED IN EXHIBIT 3001**

I. Fractus’s Sole Argument Challenging Grounds 1 and 2 Mischaracterizes Dou and the Petition’s Dou-Based Combinations.

Ground 1 combines EX1013 (“Dou”) and EX1009 (“Ciais-Quadband”) (Pet., 32-36). Ground 2 further combines them with EX1012 (“Nakano”) (Pet., 69-71). Fractus baselessly argues that a POSA would not have combined Dou and Ciais-Quadband because the combination purportedly violates “Dou’s design constraints” that allegedly require a certain amount of distance between the antennas to achieve “spatial diversity.” Paper 12 (“POPR”), 18-22 (Ground 1), 23-25 (Ground 2).

A. Dou Does Not Require Spatial Diversity.

Fractus’s argument fails because it *mischaracterizes Dou*. Dou, titled “Internal Diversity Antenna Architecture,” describes “[v]arious embodiments of a... diversity antenna architecture.” Dou, code(54), Abstract. Fractus does not dispute that antenna diversity means using multiple antennas to improve signal reliability and quality. Pet., 32 (citing EX1007, ¶113). Dou does not require its “diversity antenna architecture” to provide *spatial* diversity.

To the contrary, Dou describes spatial diversity as just one of several alternative “diversity techniques” for creating diversity between its antennas. For example, Dou describes an embodiment in which its antennas have *polarization* diversity, i.e., “one... diversity technique.” Dou, [0018] (“The first internal antenna 206 and the second internal antenna 208 may have varying polarities to implement one or more diversity techniques.”). Dou describes spatial diversity as a different,

optional, diversity technique. Dou, [0022] (antennas 206 and 208 “*may* be used to implement various spatial diversity techniques”) (emphasis added). Fractus does not dispute that POSAs knew that polarization diversity and pattern diversity were alternatives techniques that provide antenna diversity. Pet., 32 (citing EX1007, ¶113 (“A diversity architecture such as that described in Dou can be implemented in various forms: spatial diversity (using physically separated antennas), pattern diversity (using antennas with different radiation patterns), and/or polarization diversity (using orthogonally polarized elements.”)); Dou, [0018] (describing polarization diversity with one antenna vertically polarized and another antenna “vertically polarized with a cross-polarization component.”).

Fractus’s assertion that Dou *requires* spatial diversity as “emphasize[d]” by Dou’s claims is facially false. POPR, 8-9 (citing Dou claim 8), 19-20 (citing Dou claim 8 discussion in “Section II.C.i”), *see generally id.*, 18-22. While Dou’s dependent claim 8 recites at least a “quarter wavelength” separation between a first and second “diversity antenna” that Fractus calls a spatial diversity design constraint, Dou’s independent claims have no such requirement. This confirms that Dou’s invention does not *require* spatial diversity.

B. Fractus’s Argument Fails Because Even If Dou Required Spatial Diversity the Dou Combinations Provide It.

Even if Dou required quarter wavelength spacing between “diversity antenna[s]” (i.e., antennas 206 and 208) as Fractus alleges (POPR, 7-9, 19-21)—it

does not—the Dou combinations provide it. Fractus’s contrary argument depends on the false assertion that the combinations use Ciais-Quadband’s PCB with particular (40.5 mm × 105 mm) dimensions. POPR, 20. It does not.

Dou+Ciais-Quadband “implements Dou’s wireless device with Ciais’s quadband *antenna*,” not with Ciais-Quadband’s *PCB*. Pet., 36. Limitation [1.e] recites a “*rectangle enclosing the ground plane*.” Applying this claim language, the Petition cites Ciais-Quadband (and Dou) as teaching ground planes backing a rectangular PCB, which was common for mobile-phone PCBs. Pet., 45-46.

If Dou is read as requiring a spatial diversity design constraint (it does not), then Grounds 1 and 2 meet it because Dou and Ciais-Quadband are combined “according to ‘various performance and design constraints’ known to a POSA” including Dou’s quarter wavelength constraint. Pet., 36 (citing Dou, [0030]); Dou, [0030] (“[T]he specific implementation of [antennas 206 and 208] may vary depending upon such factors as the target operating frequencies,... a form factor of the wireless device,... and so forth.”). Fractus never argues that it was beyond a POSA’s skill to implement the Dou+Ciais-Quadband in a manner providing spatial diversity. Dou confirms it was not. Dou, [0012], [0024], [0030], [0039] (“[A]ny suitable topology...may be used... as desired for a given implementation.”), [0063].

II. Baliarda-543 Lacks Written Description for the Full Scope of Any of Claims 1-5 and 12-20.

Fractus does not dispute the Petition’s showing that EX1040 (“Baliarda-

543”)—the publication of the first non-provisional application in the ’677 patent’s priority chain—meets every limitation in claims 1-5 and 12-20. Pet., 89-100 (Ground 3). Fractus disputes only that Baliarda-543 is prior art to these claims.

The claims require an “*antenna... configured to support... at least one... frequency band[]... associated with a 4G communication standard*” (Limitations [1.c]-[1.d]) and an “*antenna... configured to transmit and receive signals from a 4G communication standard*” (Limitation [12.g]) (collectively “4G limitations”).

In litigation, Fractus argues the 4G limitations encompass an antenna supporting LTE Band 12 within the 698-806 MHz spectrum. Pet., 28-31, 91. Here, Fractus argues that “4G communication standards... includ[es] LTE communication standards.” POPR, 17. Fractus vaguely contends that Baliarda-543 provides “ample examples of 4G services and their associated frequencies.” POPR, 31. However, Fractus does not identify any written description within the four corners of Baliarda-543 of an antenna configured to support any LTE frequency band, let alone LTE Band 12, because there is none.

Fractus never explains how a POSA could have concluded that Fractus, when it filed Baliarda-543, possessed the idea of an antenna configured to support LTE Band 12 when there is no dispute that on December 21, 2006: (1) LTE frequency bands were undefined and an “open issue” (Pet., 92) and the LTE frequency bands were only defined years after Fractus filed Baliarda-543 (Pet., 91-97); (2) the 698-

806 MHz frequency range later assigned to LTE Bands 12-14 was allocated to television and unavailable for cellular communication (Pet., 92-94, 96-97); and (3) Baliarda-543 expressly distinguishes the claimed “*antenna system*” (Limitations [1.a], [12.a]) from antennas “for reception of TV” (Pet., 96-97 (citing Baliarda-543, [0096])). Baliarda-543 ***excluded*** antennas that would support LTE Band 12.

Not one of Fractus’s citations to working group materials (EX2012-EX2014) and trade papers (EX2015-EX2016) describing ***proposed*** LTE ***technology*** in 2006 (POPR, 16-17) identifies an LTE frequency band, let alone frequencies for LTE Band 12. Fractus’s evidence confirms the Petition’s showing that ***the LTE standard and its frequencies bands were undefined*** on December 21, 2006. Pet., 91-97.

Fractus’s suggestion that the Petition’s cases are distinguishable because the ’677 patent is a continuation from Baliarda-543 (rather than a CIP) is baseless. POPR, 29-31. When Fractus filed it on December 21, 2006, Baliarda-543 provided no written description supporting the full scope of the claims. Pet., 91-97. Without written description supporting the full scope of claims 1-5 and 12-20, Baliarda-543 is indisputable prior art to those claims and anticipates them.

Respectfully submitted,

Date: October 23, 2025

By: /Adam R. Wichman/
Adam R. Wichman, Reg. No. 43,988
WOLF, GREENFIELD & SACKS, P.C.

CERTIFICATE OF SERVICE UNDER 37 C.F.R. § 42.6 (e)(4)

I certify that on October 23, 2025, a copy of the foregoing document, including any exhibits filed therewith, is being served via electronic mail, as previously consented to by Patent Owner, upon the following:

Mark J. DeBoy	mdeboy@esfip.com
Patrick Finnan	pfinnan@esfip.com
Larry Shatzer	lshatzer@esfip.com
	Fractus_GeoTab_IPRs@esfip.com

Date: October 23, 2025

/Dara Del Rosario/
Dara Del Rosario
Paralegal
WOLF, GREENFIELD & SACKS, P.C.