

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

ERICSSON INC.
NOKIA OF AMERICA CORPORATION
Petitioners

v.

XR COMMUNICATIONS, LLC, D/B/A VIVATO TECHNOLOGIES,
Patent Owner

IPR2024-00868
Patent No. 8,737,511

PATENT OWNER SUR-REPLY

TABLE OF CONTENTS

I.	INTRODUCTION	1
II.	ARGUMENT	3
	A. Petitioner’s Obviousness Theory is Incorrect and Unsupported	3
	B. Claim 20	9
	C. “Disclose” and “Teach”	9
	D. Reply Arguments Regarding Limitation [1a]	11
III.	CONCLUSION	13

PATENT OWNER'S EXHIBIT LIST

Ex.	Description
2001	<i>XR Communications LLC v. AT&T Services Inc., AT&T Mobility LLC, and AT&T Corp.</i> , Case 2:23-cv-00202-JRG-RSP (E.D. Tex.), Dkt. 89 (Joint Claim Construction Chart)
2002	<i>XR Communications LLC v. AT&T Services Inc., AT&T Mobility LLC, and AT&T Corp.</i> , Case 2:23-cv-00202-JRG-RSP (E.D. Tex.), Dkt. 95 (Amended Docket Control Order)
2003	Declaration of Todor V. Cooklev, Ph.D.
2004	<i>Curriculum vitae</i> of Todor V. Cooklev, Ph.D.
2005	"Wireless Communications", Cambridge University Press, 2005.
2006	"Fundamentals of Wireless Communication," Cambridge University Press, 2005.
2007	<i>XR Communications LLC v. AT&T Services Inc., AT&T Mobility LLC, and AT&T Corp.</i> , Case 2:23-cv-00202-JRG-RSP (E.D. Tex.), Dkt. 99 (<i>Markman</i> Order).

I. INTRODUCTION

The Board granted institution on two grounds of obviousness, both based on Trigui (Ex. 1004). Based on Patent Owner's additional arguments and evidence, including the testimony of Dr. Todor Cooklev (Ex. 2003), Petitioners have failed to establish obviousness of the challenged claims.

The '511 Patent (Ex. 1001) requires each MIMO transceiver to be configured to process exactly m different transmit signals, each corresponding to a beam, where m is the number of antenna arrays. The Petition refers to this as part of the "interconnection limitations," which it describes as "requir[ing] specific connections between MIMO transceivers and arrays." In the Petition's sole obviousness theory, $m = 2$; *i.e.*, there are supposedly 2 arrays, and thus each MIMO transceiver must be configured to process 2 transmit signals, which must correspond to 2 beams.

Conversely, each antenna array must be configured to produce n different beams, corresponding to the number of MIMO transceivers. The Petition selects $n = 2$. Under the Petition's theory, there are supposedly 2 MIMO transceivers, and each array produces 2 beams.

Trigui, in contrast to the '511 Patent, discloses an open-ended and non-specific system in which each of a plurality of modems can be connected to each of a plurality of MIMO chains, each MIMO chain contains an antenna array, and each MIMO chain can produce a plurality of beams. Trigui teaches no constraints on the

number of modems, the number of MIMO chains, or the number of beams, much less the specific structure claimed in the '511 Patent.

To bridge the differences between Trigui and the '511 Patent, the Petition posits a various and arbitrary set of modifications. The Petition starts with Trigui's Figure 10, which shows four MIMO chains (four antenna "sub-arrays") and one modem, with the modem connected to all four sub-arrays. Then the Petition posits at least three more steps. *First*, it declares that the four sub-arrays should be grouped into two "arrays" to match the '511 Patent claims. *Second*, the Petition adds a second modem, "Modem B." *Third*, it *disconnects* Modem A from two of the sub-arrays and connects Modem B to those sub-arrays. The Petition then declares each modem to be a "MIMO transceiver" meeting the claim limitations.

As explained in detail in the POR and the accompanying declaration of Dr. Cooklev, Petition's obviousness analysis is insufficient and fails to show unpatentability. Petitioner's Reply fails to cure these defects. As Dr. Cooklev explained, a POSITA would not consider the *four* "sub-arrays" to form *two* arrays as claimed. More critically, a POSITA would not be motivated to *disconnect* Modem A from two of the MIMO branches, as the Petition's theory requires. Rather, a POSITA would maintain Trigui's express disclosure that *all* modems are connected to *all* MIMO branches. The Petition's key contention—that there are "only two

possible ways to interconnect” the arrays of the modified Figure 10—is an unsupported premise and fails at the outset.

The “two possible ways” false dichotomy only arises *if one ignores Trigui’s express teaching* that each modem can and should be connected to all of the MIMO chains, which enables the greater flexibility that Trigui promises. The false dichotomy is a fundamental premise of the Petition’s obviousness theory. Because there are not only “two possible ways,” the obviousness theory and the entire Petition fails. Further, as discussed below, Petitioner’s Reply presents a number of irrelevant and incorrect arguments.

II. ARGUMENT

A. Petitioner’s Obviousness Theory is Incorrect and Unsupported

The Reply confirms Petitioner’s reliance on a hindsight-based reconfiguration of Trigui’s disclosures to form a very specific arrangement of two modems and four antenna arrays (which Petitioner identifies as two arrays). Petitioner concedes that Trigui does not contain any express or implicit disclosure of “two MIMO transceivers each connected to two beams (one from each array) . . . based upon two operators sharing the DIAA.” Reply at 16. Instead, the Petition relies on *ipse dixit* and conclusory statements that key limitations of the ’511 Patent would be obvious without sufficient evidentiary support in Trigui or anything else of record.

As a preliminary matter, the Petition assumes it would be obvious for each operator to have a separate modem (allegedly corresponding to the separate “MIMO transceivers” of the '511 Patent). Pet. at 39-41. The Petition’s sole citation is Dr. Negus’s assertion that “common sense would suggest that each of ‘Operator 1’ and ‘Operator 2’ would have its own respective ‘modem’ to process its own respective network traffic,” supposedly because the two operators’ traffic are “unrelated” to each other. Ex. 1003 ¶ 228. This is unsupported and insufficient. Dr. Negus doesn’t explain what he means by “unrelated,” nor does he provide evidentiary support that a POSITA would assume traffic is “unrelated” in some sense relevant to the modem. Nor does Dr. Negus explain why his “unrelated” assumption renders it obvious to provide operator-specific modems. Simply stating that a conclusion is “common sense” without a rational underpinning is insufficient to satisfy Petitioner’s burden, as many cases from the Board and the Federal Circuit have held.

The Petition also asserts without evidence that the four MIMO chains of Trigui’s Figure 10 correspond to *two* antenna arrays as claimed in the '511 Patent’s claim language, rather than either four arrays (corresponding to Trigui’s express disclosure of four “Passive Antenna Sub-Arrays”) or one array (corresponding to the entire system).

But the critical error of the Petition’s theory is its assumption that, when adding “Modem B” to Trigui’s Figure 10, a POSITA would be motivated to

disconnect Modem A from two of the four MIMO branches and would connect Modem B to only those two MIMO branches. Trigui explains that “flexibility” is important to its embodiments, and thus discloses connecting a *single* modem to all four subarrays of Figure 10, as Dr. Cooklev points out. POR at 25 (citing Ex. 2003, ¶ 123). Petitioner gives no reply to Dr. Cooklev’s statement that a POSITA would not be motivated to assign the 1st and 3rd branches specifically to one operator and the 2nd and 4th branches specifically to the other operator, which would reduce the flexibility of the system. Ex. 2003, ¶ 124.

Petitioner and Dr. Negus seem to assume that only one modem can be connected to each MIMO branch, i.e. that if Modem B is connected to the 2nd branch, then Modem A must be disconnected. This is unsupported and should be rejected, as the Petition itself illustrates. Trigui’s express disclosure is that *each* modem is connected to *all* of the MIMO branches. The Petition relies on Trigui’s Figure 2A to show “a single MIMO branch,” one of the four MIMO branches from Figure 10 that forms the basis of the Petition’s theory. Pet. at 34 (quoting Ex. 1004, [0036]-[0037]). The Petition itself explains: “Trigui states that the ‘I/Q signals 215 from *any of the modems*, as well as the beamforming weights 214, can be sent to *the other MIMO branches*’ for transmission.” *Id.* (quoting Ex. 1004, [0041]) (emphasis added). And the Petition *specifically annotates* Fig. 2A to emphasize the fact that *both* Modem A *and* Modem B are connected to the MIMO branch shown in Fig. 2A,

with corresponding red and blue arrows to Beamforming and Frequency Translation block 218. Pet. at 35.

Figure 2A and the accompanying disclosure, in the context of a four-branch embodiment such as Figure 10, shows the most flexible and preferred *express* disclosure of Trigui: connect each modem to all of the MIMO branches.

Trigui also expressly discloses that each MIMO branch supports multiple beams, for example as shown in Figures 4A and 4B. Pet. at 26. Petitioner expressly admits that “each of Trigui’s antenna arrays” as shown in Figures 4A and 4B “can produce multiple beams.” Reply at 7 (citing Pet. at 26).

In short, Trigui discloses an open-ended and non-specific system, where multiple operators (in the Petition’s theory) can share a plurality of MIMO branches, each of which can produce a plurality of beams. *See* Reply at 17 (emphasizing Trigui’s “focus on sharing between operators”). But as Petitioner recognizes, Trigui’s express disclosure of how to support multiple operators and multiple MIMO branches does not meet the ’511 Patent claims. In order to match the claims, the Petition says that it would be obvious to modify Trigui to provide a *less* flexible implementation that does *not* allow operators to share MIMO branches. Specifically

Instead, the Petition asserts that a POSITA would be motivated to select the *least* flexible possible arrangement, where each operator is limited to a single polarization and a single beam on each array. Specifically, the Petition requires that

each operator is precluded from using two of the four MIMO branches, and requires that each MIMO branch only produce a single beam, in contrast to the plurality of beams disclosed by Trigui. As Patent Owner explained previously, this arrangement *precludes* the sharing benefits provided by Trigui's express disclosure. POR at 25-26. To justify this, the Petition asserts that there are only "only two possible ways to interconnect the two arrays" of Figure 10 (actually four MIMO branches) "with the two disclosed independent 'modems.'" Pet. at 42. As Figures 2A and 10 and the Petition's own analysis show, this is simply incorrect. The *express disclosure* of Trigui is to connect *both* modems to *all four* MIMO chains, thus providing maximum flexibility and sharing.

Petitioner gives no explanation why a POSITA would prefer an inferior alternative over Trigui's express disclosure. Furthermore, the assumptions underlying the Petition's obviousness theory provide further motivation for using Trigui's expressly disclosed flexible arrangement, *not* the narrow fixed assignments of specific MIMO branches to specific modems. In order to motivate the POSITA to provide two independent modems, the Petition asserts that the POSITA "would understand that the network traffic through the DIAA system for operator 1 to its respective subscriber stations is unrelated to the network traffic for operator 2 to its respective subscriber stations." Pet. at 40. And yet, as Patent Owner and Dr. Cooklev point out, *this very assumption* undermines the obviousness theory. For example, if

the different operators are unrelated and there is no coordination among them, there is no reason to assume they would all use the exact same number of MIMO branches. POR at 20-21 (citing Ex. 2003, ¶¶ 107-108). But the Petition's obviousness theory requires a fixed assignment of two MIMO branches to each operator, decreasing the flexibility and sharing of the Trigui system relative to Trigui's actual disclosure.

Likewise, if the various operators' needs are unrelated and uncoordinated, a POSITA would be motivated to use Trigui's express disclosure of a flexible system in which all modems are connected to all MIMO branches, rather than the specific combination required by the Petition's theory, in which each modem is connected to a specific arbitrary sub-set of MIMO branches. *See* POR at 23-26.

Petitioner gives no reply to this critical deficiency, except to say that "[e]xtra teachings do not negate invalidating teachings." Reply at 18. But as Petitioner repeatedly argues throughout its Reply, the Petition's theory is not based on Trigui's actual express *teachings*, but on what a POSITA would find obvious. The Petition requires the POSITA to employ ignorance and shortsightedness, ignoring Trigui's express disclosure in favor of a modified arrangement that is plainly inferior to the preferred embodiment. The so-called "extra teachings" are probative as to what a POSITA would understand from Trigui and as to what a POSITA would (or would not be) motivated to modify. Here, they undermine the Petition's assertions.

Because the Petition does not show that a POSITA would be motivated to modify Trigui to form the precise system required to meet the '511 Patent claims, the Petition fails to show that any claim is unpatentable.

B. Claim 20

Petitioner asserts that Patent Owner “does not challenge” claim 20, apparently because Patent Owner inadvertently referred to claim 20 as a dependent claim. Reply at 2-3. But Patent Owner expressly stated that “[t]he same deficiencies [addressed for Claim 1] apply to all grounds and all challenged claims.” POR at 27. This includes Claim 20. It is simply not true that Patent Owner does not challenge the Petition’s Claim 20 theory.

All of the arguments discussed in the POR and below apply equally to Claim 20. In fact, the Petition’s theory for claim 20 is identical to its theory for claim 1. Pet. at 58-60. Patent Owner and Dr. Cooklev periodically refer to “bi-directional beams” or a “MIMO receiver,” limitations that do not appear in Claim 20, simply because those are the terms used by Petitioner and Dr. Negus. However, none of the differences between Claim 1 and Claim 20 are relevant to the arguments at issue.

C. “Disclose” and “Teach”

Petitioner argues that Patent Owner doesn’t address the Petition’s obviousness theories because the Patent Owner Response uses the word “disclose,” which Petitioner interprets as a reference to anticipation. Reply at 3. But as Petitioner points

out, the Petition itself uses the words “disclose” and “teach” throughout. Petitioner’s suggestion of some mismatch between the language of the Petition and of the POR is unsupported. Patent Owner responds to the Petition’s stated theory using, in most cases, the exact language the Petition itself deploys.

For example, the Petition asserts (incorrectly) that Trigui “*teaches* a ‘beamformer configured to produce’ multiple ‘different bi-directional beams using the plurality of antenna elements,’” Pet. at 27-28 (emphasis removed and added), and the POR responded, *inter alia*, that “Trigui *does not teach* any relationship between the number of beams and the number of MIMO transceivers” as claimed, POR at 18 (emphasis added). It is the same word: Petitioner says Trigui “teaches” the limitation, and Patent Owner says Trigui “does not teach” it.

Moreover, Patent Owner specifically addressed the Petition’s failure to show obviousness and continues to do so. *See* POR at 18 (“Nor does the Petition provide any obviousness theory or modification or expert testimony that would remedy the deficiency as to what Trigui discloses.”). Merely purporting to redefine the word “disclose” to mean “render obvious” does not satisfy Petitioner’s burden of proof. To the extent the Petition concedes that a limitation is not disclosed, it needs to articulate a theory of obviousness, including ascertaining the differences between the limitation and the prior art and showing why the limitation is obvious. But no proper obviousness theory was articulated or proven.

D. Reply Arguments Regarding Limitation [1a]

Petitioner argues that the Petition does not rely on Trigui's Figures 4A and 4B to teach "n different bidirectional beams." Reply at 7. If so, the Petition provides no evidence for the "n different bidirectional beams" limitation. Pet. at 26-27. The Petition cites Dr. Negus's declaration at ¶¶ 189, 192, which say nothing about beams, and which cross-reference to ¶¶ 112-13 and 121, which likewise say nothing about beams. Ex. 1003 at ¶¶ 112-13, 121, 189, 192. The Petition also cites Dr. Negus's ¶ 193, which refers in conclusory fashion to Fig. 6 disclosing a beamformer configured to produce 2 beams. This is unsupported and unexplained. Dr. Negus cites nothing supporting his $n=2$ interpretation. At most, Dr. Negus addresses the $n=2$ issue in ¶¶ 187-88 of his declaration, which rely in turn on Figures 4A and 4B and Trigui's description thereof—exactly the disclosures that Petitioner now disclaims. Petitioner's attempt to walk away from the Petition's express reliance on Trigui Figures 4A and 4B fails.

Petitioner argues that Trigui Figure 6 discloses $n=2$ beams. Reply at 7-8. Not so. Dr. Negus drew a box around a cluster of components and added the annotation "[$n=2$] different bi-directional beams," but that is not supported. Again, Petitioner cites paragraphs 189 and 192-193 of Dr. Negus's declaration, which give no explanation or evidence that Figure 6 (rather than Figures 4A/4B) discloses $n=2$ beams.

Petitioner further argues that the Petition points to multiple beams in Figure 6 in connection with “polarizations.” Reply at 9-10. This assertion relies on a single throw-away sentence on page 32 of the Petition, which is describing the MIMO transceivers (limitation [1b]), not the antenna arrays (limitation [1a]), and which itself cites no evidence in support. Pet. at 32. Petitioner now attempts to back-fill that lack of evidence with a string cite to unrelated portions of Dr. Negus’s declaration. Reply at 10 (citing Ex. 1003 ¶¶ 204, 233-237, 251-253). None of this is on point. In paragraph 204, Dr. Negus states that a sub-array with “similarly polarized” antenna elements discloses “different bi-directional beams.” This is saying that a single sub-array (polarization) can produce multiple beams, not that each polarization is a beam. This is the opposite of Petitioner’s new theory. Paragraphs 233-234 say nothing about beams; paragraphs 235-237 and 251-253 say nothing about polarization. In sum, nothing in Dr. Negus’s declaration adequately links “polarization” to “beam,” much less explains it. Even if Petitioner is permitted to assert a new “polarization” theory for limitation [1a] in its Reply, that new theory is unsupported by evidence.

Petitioner’s only remaining argument is that its failure to identify anything in Trigui about $n=2$ beams is somehow cured because “Figure 6 is used as part of an obviousness analysis using Trigui’s entire disclosure.” Reply at 9. But, as discussed above, merely uttering “obviousness” cannot fill in gaps in the prior art’s disclosures.

III. CONCLUSION

For the foregoing reasons, that the Board should find that the challenged claims of the '511 Patent have not been proven to be unpatentable.

Date: July 28, 2025

Respectfully submitted,

/ Reza Mirzaie /

Reza Mirzaie, Reg. No. 69,138
Philip X. Wang, Reg. No. 74,621
RUSS, AUGUST & KABAT
12424 Wilshire Blvd., 12th Fl.
Los Angeles, CA 90025
Tel.: 310-826-7474
rmirzaie@raklaw.com
pwang@raklaw.com
rak_vivato@raklaw.com

Counsel for Patent Owner

CERTIFICATION REGARDING WORD COUNT

Pursuant to 37 C.F.R. §42.24(d), I certify that there are 2,888 words in the paper excluding the portions exempted under 37 C.F.R. §42.24(a)(1).

Date: July 28, 2025

/ Reza Mirzaie /

Reza Mirzaie, Reg. No. 69,138

Philip X. Wang, Reg. No. 74,621

RUSS, AUGUST & KABAT

12424 Wilshire Blvd., 12th Floor

Los Angeles, CA 90025

Counsel for Patent Owner

CERTIFICATE OF SERVICE

Pursuant to 37 C.F.R. § 42.6(e)(1), I certify that the above document was served on July 28, 2025 by filing this document through the Patent Trial and Appeal Case Tracking System as well as delivering a copy via electronic mail upon the following attorneys of record for the Petitioner:

Patrick D. McPherson, Reg. No. 46,255
Kevin Anderson, Reg. No. 43,471
901 New York Ave., N.W., Suite 700 East
Washington, D.C. 20001
P: (202) 776-7800
F: (202) 776-7801
PDMcPherson@duanemorris.com
KPAnderson@duanemorris.com

Date: July 28, 2025

/ Reza Mirzaie /
Reza Mirzaie, Reg. No. 69,138
RUSS, AUGUST & KABAT

Counsel for Patent Owner