Trials@uspto.gov
Tel: 571-272-7822

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Entered: October 25, 2019

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

KATHREIN USA, INC., and
T-MOBILE US, INC,
Petitioner,

v.

FRACTUS S.A.,
Patent Owner.

Case IPR2019-00952
Patent 8,228,256 B2

Before JAMESON LEE, KARL D. EASTHOM, and
JOHN R. KENNY, *Administrative Patent Judges.*

Opinion for the Board filed by *Administrative Patent Judge* LEE.

Opinion Concurring filed by *Administrative Patent Judge* KENNY.

LEE, *Administrative Patent Judge*.

DECISION
Denying Institution of *Inter Partes* Review
35 U.S.C. § 314

I. INTRODUCTION

A. Background

On April 9, 2019, Kathrein USA, Inc. and T-Mobile US, Inc. (collectively, "Petitioner") filed a Petition to institute *inter partes* review of claims 1, 6, 7, 8, 11, 13, 14, 17, and 20 of U.S. Patent No. 8,228,256 B2 (Ex. 1001, "the '256 patent" or "challenged patent"). Paper 3 ("Pet."). Patent Owner, Fractus S.A., filed a Preliminary Response (Paper 14), Petitioner filed a Reply to address Patent Owner's arguments regarding discretionary denial pursuant to 35 U.S.C. § 314(a). Paper 16. Patent Owner filed a Sur-Reply. Paper 17.

To institute an *inter partes* review, we must determine that the information presented in 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(a). For the reasons discussed below, we determine that Petitioner has not shown a reasonable likelihood that it would prevail in establishing unpatentability of any one of claims 1, 6, 7, 8, 11, 13, 14, 17, and 20 on any ground.

Accordingly, the Petition is *denied*, and no *inter partes* review is instituted.

B. Related Matters

The parties identify these civil actions involving alleged infringement of the '256 patent: No. 2:18-cv-00135-JRG (E.D. Tex.); No. 2:18-cv-00136-JRG (E.D. Tex.); No. 2:18-cv-00137-JRG (E.D. Tex.); and No. 2:18-cv-00138-JRG (E.D. Tex.). Pet. x; Paper 5, 2. The parties further identify IPR2019-00953 as an *inter partes* review proceeding involving the '256 patent. Pet. xiii; Paper 5, 2.

C. The ’256 Patent

The ’256 patent is titled “Interlaced Multiband Antenna Arrays” and relates to “antenna arrays which can be operated simultaneously in various frequency bands,” namely, “Multiband Interleaved Array[s], MIA” Ex. 1001, code (54), 1:1–2, 20–41. “[M]ultiband interleaved arrays base their operation on the physical disposition,” i.e., the position, “of the [multiband antenna elements] which constitute them.” *Id.* at 5:11–14. The ’256 patent describes a process for determining “positions of [multiband antenna] elements in an MIA.” *Id.* at 5:15–29.

The ’256 patent generally describes “[t]he disposition of the elements that constitute the MIA is obtained from the juxtaposition of conventional mono-band arrays, employing as many mono-band arrays as frequency bands that it is wished to incorporate in the Multiband Interleaved Array.” *Id.* at 3:8–12. The ’256 patent further describes “[t]he positions of the elements in an MIA are determined from the positions of the elements in as many mono-band arrays as there are frequencies or frequency bands required . . . . The configuration of the MIA is obtained from the juxtaposition of the positions of the different mono-band arrays.” *Id.* at 5:15–23.

An example of how to determine the positions of the elements in the MIA is illustrated in Figure 1, reproduced below:

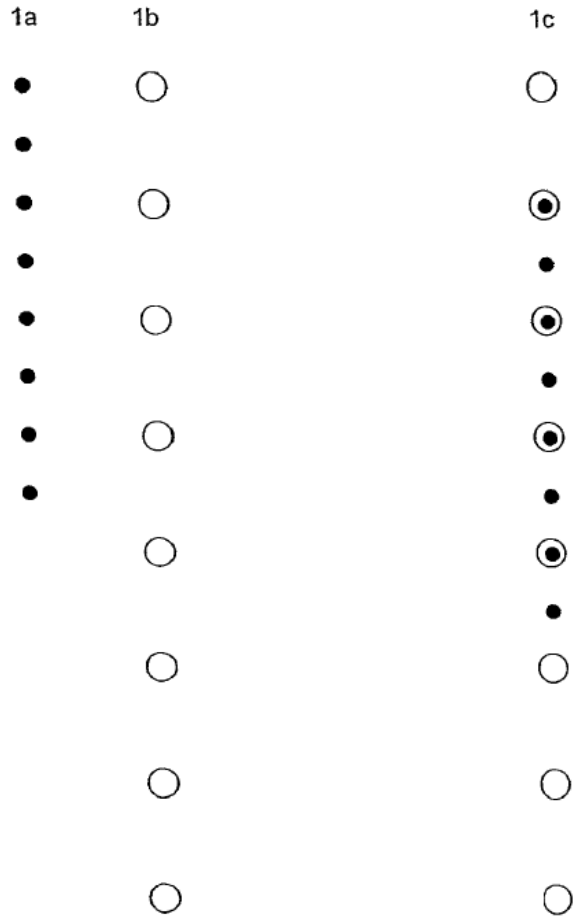

FIG. 1

Figure 1 illustrates two antenna arrays (1a and 1b) and a corresponding multiband antenna array (1c) that works in the same manner as the two antenna arrays 1a and 1b, but with a smaller number of total elements. Ex. 1001, 3:32–38. Figure 1 shows an example of how to arrive at the positions

of the elements in the multiband array 1c based on the positions of the elements in the antenna arrays 1a and 1b. *Id.* at 3:32–38, 5:30–31.

The ’256 patent describes the following:

> In the positions in which elements of the two conventional arrays (indicated in FIG. (1.3) by means of black circles located at the centre of a circumference) coincide, a multiband antenna is employed capable of working in the same manner (same impedance and pattern) on the frequencies (1.1) and (1.2). The remaining not common elements (indicated either by a black circle, or by a circumference) can be implemented either by means of the same multiband element employed in the common positions (and selecting the working frequency by means of the signal distribution network of the array), or by employing conventional mono-band elements.

Id. at 5:43–54. Thus, at positions where the antenna elements of the two conventional arrays coincide, a multiband antenna is employed capable of working with the same impedance and pattern on the frequencies at which the first and second array of antenna elements operate. *Id.* The first array of conventional antenna elements, shown as solid “circles” in above-produced Figure 1, operates at frequency *f* and the second array of conventional antenna elements operates at frequency *f/2*, shown as hollow “circumferences.” *Id.* at 5:36–57. The antenna elements of the first array and second array are placed at positions for operation at respective frequencies *f* and *f/2*. *Id.* at 5:39–43. The multiband interleaved array 1c “has a dual behaviour frequency-wise . . . working in the same manner as arrays [1a and 1b] but with a smaller total number of elements (12 instead of 16).” *Id.* at 5:54–57.

Claims 1 and 17 are independent. Each of claims 6, 7, 8, 11, 13, and 14 depends from claim 1. Claim 20 depends from claim 17. Claim 1 is reproduced below:

> 1. An interlaced multiband antenna array comprising:
>
> a plurality of antenna elements;
>
> wherein the interlaced multiband antenna array is configured to simultaneously cover a plurality of licensed cellular frequency bands;
>
> wherein positions of the plurality of antenna elements result from juxtaposition of at least a first antenna array operating in a first frequency band, and a second antenna array operating in a second frequency band;
>
> wherein the first antenna array comprises a plurality of first-band antenna elements, and the second antenna array comprises a plurality of second-band antenna elements;
>
> wherein the plurality of licensed frequency bands of the interlaced multiband antenna array includes said first frequency band and said second frequency band;
>
> wherein the interlaced multiband antenna array employs a single multiband antenna element in positions where said first-band antenna element and said second-band antenna element come together, and
>
> wherein the single multiband antenna element simultaneously covers at least said first frequency band and said second frequency band.

Ex. 1001, 10:42–64.

D. Evidence Relied Upon by Petitioner

Petitioner relies on the following references:[1]

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[1] The ’256 patent issued from an application that is a continuation of Application No. 12/476,308, which is a continuation of Application No. 11/803,782, which is a continuation of Application No. 10/988,261, which

Reference		Publication/Issue Date	Exhibit
Lindmark I	Björn Lindmark, *A Dual Polarized Dual Band Microstrip Antenna for Wireless Communications*, *in* 3 1998 IEEE Aerospace Conference Proceedings, 333–338 (1998).	Mar. 1998	1016
Lindmark II	Björn Lindmark et al., *Dual Band Base Station Antenna Systems*, *in* Broadband Radio Access Conference Proceedings, 69–74 (1998).	Oct. 1998	1017
Huynh	U.S. Patent No. 5,307,075	Apr. 26, 1994	1018
Shapiro	U.S. Patent No. 5,043,738	Aug. 27, 1991	1022

Petitioner also relies on a Declaration from David M. Pozar, Ph.D. (Ex. 1002).

E. Asserted Grounds of Unpatentability

Petitioner asserts the following grounds of unpatentability:

Ground	Claims Challenged	Statutory Basis	References
1	1, 13, and 14	35 U.S.C. § 102	Lindmark I
2	1, 6, 7, 8, 11, 13, and 14	35 U.S.C. § 103(a)	Lindmark I and Lindmark II
3	17 and 20	35 U.S.C. § 103(a)	Lindmark I, Lindmark II, and Shapiro
4	1, 6, 7, 11, 13 and 14	35 U.S.C. § 103(a)	Lindmark I and Huynh

is a continuation of Application No. 10/135,019, which is a continuation of Application No. PCT/ES99/00343, filed on Oct. 26, 1999.

Ground	Claims Challenged	Statutory Basis	References
5	17	35 U.S.C. § 103(a)	Lindmark I, Huynh, and Shapiro

II. ANALYSIS

A. Patent Owner's Arguments of Discretionary Denial under 35 U.S.C. § 325(d) and 314(a)

For various reasons, Patent Owner argues that we should exercise discretion under 35 U.S.C. § 325(d) and 35 U.S.C. § 314(a) not to institute review. Prelim. Resp. 14–50. As explained below in Section II.D., however, we exercise discretion under 35 U.S.C. § 314(a) not to institute review for a reason different from that asserted by Patent Owner. Consequently, we do not reach Patent Owner's arguments under either 35 U.S.C. § 325(d) or 35 U.S.C. § 314(a).

B. Claim Construction

For petitions filed on or after November 13, 2018, we use 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 and the prosecution history pertaining to the patent.[2] *See* Changes to the Claim Construction Standard

[2] Petitioner asserts that the level of ordinary skill in the art corresponds to that of one who had (1) "an accredited Master's degree in electrical engineering, applied physics, or any similar course of study, and a few years of experience related to the design and/or application of antennas," or (2) "a doctorate in electrical engineering, applied physics, or any similar course of study, with knowledge of electromagnetic theory as applied to design and/or application of antennas." Pet. 29. Patent Owner adopts

for Interpreting Claims in Trial Proceedings Before the Patent Trial and Appeal Board, 83 Fed. Reg. 51,340, 51,358 (Oct. 11, 2018) (amending 37 C.F.R. § 42.100(b) effective November 13, 2018) (now codified at 37 C.F.R. § 42.100(b) (2019)). The Petition here was filed on April 9, 2019. Paper 3. So we apply the claim construction standard from *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc) ("the *Phillips* standard").

Claim terms are generally given their ordinary and customary meaning as would be understood by one with ordinary skill in the art in the context of the specification, the prosecution history, other claims, and even extrinsic evidence including expert and inventor testimony, dictionaries, and learned treatises, although extrinsic evidence is less significant than the intrinsic record. *Phillips*, 415 F.3d at 1312–1317. Usually, the specification is dispositive, and it is the single best guide to the meaning of a disputed term. *Id.* at 1315.

The specification may reveal a special definition given to a claim term by the patentee, or the specification may reveal an intentional disclaimer or disavowal of claim scope by the inventor. *Id.* at 1316. If an inventor acts as his or her own lexicographer, the definition must be set forth in the specification with reasonable clarity, deliberateness, and precision. *Renishaw PLC v. Marposs Societa' per Azioni*, 158 F.3d 1243, 1249 (Fed. Cir. 1998). The disavowal, if any, can be effectuated by

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Petitioner's articulation of the level of ordinary skill. Prelim. Resp. 14. On this record, we have no basis to question Petitioner's articulation. Thus, we adopt the level of ordinary skill as articulated by Petitioner.

language in the specification or the prosecution history. *Poly-America, L.P. v. API Indus., Inc.*, 839 F.3d 1131, 1136 (Fed. Cir. 2016). "In either case, the standard for disavowal is exacting, requiring clear and unequivocal evidence that the claimed invention includes or does not include a particular feature." *Id.*

Only those claim terms that are in controversy need to be construed, and only to the extent necessary to resolve the controversy. *Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017); *Wellman, Inc. v. Eastman Chem. Co.*, 642 F.3d 1355, 1361 (Fed. Cir. 2011); *Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999).

For purposes of this Decision, we only need to address construction of the recited juxtaposition of antenna arrays and the term "juxtaposition" itself.

1. Juxtaposition Recitations

Independent claim 1 recites "juxtaposition of at least a first antenna array operating in a first frequency band, and a second antenna array operating in a second frequency band." Independent claim 17 recites "juxtaposition of at least a first antenna array operating in a first frequency band, a second antenna array operating in a second frequency band, and a third antenna array operating in a third frequency band." Petitioner requests that we construe these juxtaposition phrases as "simply refer[ing] to the positions of antenna elements in an interleaved multiband antenna array."[3]

[3] Petitioner indicates that its proposed construction is for the phrase "juxtaposition of a plurality of mono-band arrays." Pet. 32–34. Claims 1

Pet. 32. Petitioner states "the use of a multiband element in a position of the multiband antenna array is the result of the juxtaposition of two mono-band arrays." *Id.* To support this proposed construction, Petitioner cites this text in the Specification of the '256 patent: "The array configuration is described on a basis of the juxtaposition or interleaving of various conventional single-band arrays operating in the different bands of interest." Ex. 1001, 1:28–30 (cited at Pet. 32–33). Petitioner also states that according to the '256 patent, "Figure 2 shows a multiband interleaved array that results from a juxtaposition of mono-band arrays." Pet. 33 (citing Ex. 1001, 6:9–14).

These arguments by Petitioner do not persuade us that the juxtaposition recitations set forth above simply refer to the positions of antenna elements in an interleaved multiband antenna array. Rather, the cited text demonstrates that the positions of the elements in the multiband array are at least one step removed from juxtaposition of antenna arrays, i.e., they are determined on the basis of juxtaposition of antenna arrays, or they result from juxtaposition of antenna arrays. Facially, the juxtaposition recitations refer to the act of arranging the placement of the plurality of antenna arrays relative to each other.

The language of claims 1 and 17 supports our understanding. The full limitation in claim 1 with the juxtaposition recitation reads "wherein positions of the plurality of antenna elements result from juxtaposition of at

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and 17, however, do not recite such a phrase. In those claims, only the juxtaposition recitations, set forth above, include the term "juxtaposition." Accordingly, we assume that Petitioner's proposed construction is for the juxtaposition recitations of claims 1 and 17.

least a first antenna array operating in a first frequency band, and a second antenna array operating in a second frequency band." Similarly, the corresponding limitation in claim 17 reads "wherein positions of the plurality of antenna elements result from juxtaposition of at least a first antenna array operating in a first frequency band, a second antenna array operating in a second frequency band, and a third antenna array operating in a third frequency band."

Furthermore, the Specification of the '256 patent, as we have described above, supports our reading that the juxtaposition recitations refer to the act of arranging the placement of a plurality of antenna arrays relative to each other. While column 1c in Figure 1 depicts a multiband array resulting from juxtaposition of two antenna arrays, it is unclear what illustrates the juxtaposition of the antenna arrays. It is reasonable to read the multiband antenna array of column 1c as resulting from the two antenna arrays shown in columns 1a and 1b. Columns 1a and 1b in Figure 1 of the '256 patent can be viewed as together constituting juxtaposition of antenna arrays from which the multiband array of column 1c in Figure 1 results.

Based on the foregoing, we reject Petitioner's proposed construction for the juxtaposition recitations of claims 1 and 17.

Patent Owner proposes construing the juxtaposition recitations as "an arrangement of antenna elements where elements associated with a first working frequency are interleaved with elements associated with a second working frequency." Prelim. Resp. 10. As Patent Owner notes, the U.S. District Court for the Eastern District of Texas construed the term "juxtaposition" as "interleaving." *Id.* (citing Ex. 1076, 24). Although we agree with the district court's construction for "juxtaposition," which

essentially is what Patent Owner proposes, that still leaves the scope of the full juxtaposition recitations unclear as discussed below.

For reasons discussed below, on this record, we conclude that the juxtaposition recitations are such that they cannot be determined without "speculative assumption[s]" in the context of the '256 patent and the prior art of record. *See BlackBerry Corp. v. MobileMedia Ideas, LLC*, IPR2013-00036, Paper 65 at 19–20 (PTAB Mar. 7, 2014) (citing *In re Steele*, 305 F.2d 859, 862–63 (CCPA 1962)).

2. The Term Juxtaposition

As discussed above, the district court construed "juxtaposition" as "interleaving." Ex. 1076, 24. The district court did so largely on the basis that, on the record before the district court, it had not been shown that "juxtaposition" has any well-known meaning in the relevant art and because the Specification of the '256 patent appears to use the terms "juxtaposition" and "interleaving" interchangeably. *Id.* at 15–24. The record before us similarly demonstrates no well-known meaning for "juxtaposition" in the relevant art, and neither party makes such a contention. Further, we also read the Specification as using the terms "juxtaposition" and "interleaving" interchangeably. For instance, the '256 patent states "[t]he array configuration is described on a basis of the *juxtaposition or interleaving* of various conventional single-band arrays operating in the different bands of interest." Ex, 1001, 1:28–30 (emphasis added). We find no portions of the Specification that make a distinction between "juxtaposition" and "interleaving." Therefore, we agree with the district court's construction of "juxtaposition" as "interleaving." Ex. 1076, 24.

C. Ambiguous Claim Language

As discussed above, independent claim 1 recites "juxtaposition of at least a first antenna array operating in a first frequency band, and a second antenna array operating in a second frequency band." And independent claim 17 recites "juxtaposition of at least a first antenna array operating in a first frequency band, a second antenna array operating in a second frequency band, and a third antenna array operating in a third frequency band."

As noted above, we agree with the district court that the term "juxtaposition" means "interleaving." The '256 patent, however, does not define "interleave" or "interleaving." We consult a technical dictionary, which defines "interleave" as follows:

> **interleave (1)** To arrange parts of one sequence of things or events so that they alternate with parts of one or more sequences of things or events and so that each sequence retains its identity; for example, to alternately perform the steps of two different tasks in order to achieve concurrent operation of the tasks.
>
> (C/C) [20], [85]
>
> **(2) (software)** To alternate the elements of one sequence with the elements of one or more other sequences so that each sequence retains its identity; for example, to alternatively perform the steps of two different tasks in order to achieve concurrent operation of tasks.
>
> (C) 610.12-1990.
>
> **(3)** To arrange parts of one sequence of things or events so that they alternate with parts of one or more sequences of the same nature such that each sequence retains its identity; [f]or example, to assign successive addresses to physically separated storage locations in such a way to reduce access time.
>
> (C) 610.10-1994w.

IEEE 100: The Authoritative Dictionary of IEEE Standards Terms 577 (7th ed. 2000) ("IEEE Dictionary") (Ex. 3002). The juxtaposition of two antenna arrays as shown in Figure 1 of the '256 patent, i.e., columns 1a and 1b, which results in the positions of the elements in the multiband array shown in column 1c, however, is not consistent with the above-reproduced definition of "interleave." In that regard, we again reproduce Figure 1 of the '256 patent below:

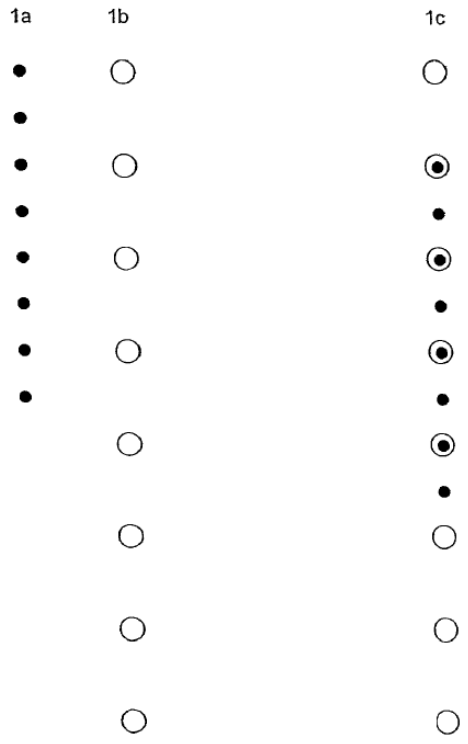

FIG. 1

Figure 1 illustrates two conventional antenna arrays (1a and 1b) and a corresponding multiband array (1c) that works in the same manner as the

two conventional antenna arrays but with a smaller number of total elements. Ex. 1001, 3:32–38. Figure 1 shows an example of how to arrive at the positions of the elements in the multiband array 1c based on the positions of the elements in the mono-band antenna arrays 1a and 1b. *Id.* at 5:30–57.

Columns 1a and 1b of Figure 1 show no *alternating* of the elements of the two mono-band antenna arrays, from which the positions of the elements in the multiband array can result or be determined. Rather, they illustrate only a side-by-side comparison of two mono-band antenna arrays, in parallel. Thus, the standard dictionary definition of "interleave" does not fit the illustration in columns 1a and 1b. But the Specification of the '256 patent provides no special definition for "interleave." We are lost, based on the Specification of the '256 patent, what "interleave" means, and in turn, what "juxtaposition" means. Although it is true that an inventor can be its own lexicographer, when the inventor acts as his or her own lexicographer, the definition must be set forth in the specification with reasonable clarity, deliberateness, and precision. *Renishaw PLC*, 158 F.3d at 1249. That is not the case here.

Additionally, claim 1 requires "[a]n interlaced multiband antenna array." As is the case with the term "interleave," the Specification provides no definition for the term "interlaced." We consult the IEEE Dictionary cited above for the term "interleave," which defines "interlace" as follows:

> **Interlace (A)** To arrange, access, select, or display in an alternating fashion. **(B)** To refresh a display device using two passes of the writing beam to complete the full display; the first pass draws every other line and the second fills in those skipped.
> (C) 610.10-1994.

Ex. 3002. Thus, like the term "interleave," the term "interlace" also requires an arrangement of elements in an alternating manner.

As noted above (Section I.C), the Summary portion of the Specification describes that in positions where the elements in the conventional arrays coincide and also in positions where the conventional elements do not coincide, the same multiband antenna element can be employed. *Id.* at 3:9–16. Such description allows for the same identical antenna element to be used at every location in the array.

Moreover, claim 6 of U.S. Patent No. 7,250,918 ("'918 patent") (Ex. 3003), which issued from an ancestral great-grand-parent application of the challenged patent, in a chain of continuation applications, conflicts with the construction of "juxtaposition." Claim recitations in related patents can be relevant for construing patent terms. *See In re Rambus*, 694 F.3d 42, 48 (Fed. Cir. 2012) ("The parties agree that 'unless otherwise compelled . . . the same claim term in the same patent or related patents carries the same construed meaning' . . . . In [a] related . . . [patent], . . . if a memory device were always a single chip there would be no need to use the word 'single' in claim 6, but not claim 1, regardless of any limitation regarding the substrate. Similarly claim 1 of [another] related [patent] refers to a memory device . . . ."); *Medtronic v. Boston Scientific Corp.*, 695 F.3d 1266, 1276 (Fed. Cir. 2012) ("inclusion of the express limitation . . . in claim 171 of the RE′897 Patent, a continuation of the RE′119 Patent, suggests that the other claims that do not recite such a limitation should not be so limited"), *rev'd* on other grounds, 571 U.S. 191 (2014).

Claim 6 of the ''918 patent requires that the same identical element be used at every location in its multiband antenna array. Ex. 3003, 11:37–

44. Independent claim 1 of the ’918 patent, from which claim 6 depends, recites “[a]n interlaced multiband antenna array . . . wherein positions of the plurality of antenna elements result from juxtaposition of a plurality of mono-band antenna arrays.” *Id.* at 10:52–59. Dependent claim 6 recites as follows:

> 6. The interlaced multiband antenna array of claim 1, wherein, *in positions wherein antenna elements* of a plurality of the plurality of mono-band antenna arrays *do not come together*, *a same* fractal, multilevel, multi-triangular, or stacked patch *multiband antenna* is employed *as in positions wherein* a plurality of *antenna elements* of the plurality of mono-band antenna arrays *come together*.

Ex. 3003, 11:37–44 (emphases added). The description in the Specification of the challenged patent and the recitation in claim 6 of the ’918 patent of using the same antenna in all positions of the array are contrary to the standard definition of “interlace” reproduced above. In this context, we do not know the meaning of “interlace” and thus also the term “interlaced multiband antenna array.” For similar reasons, the noted Summary portion of the Specification and claim 6 of the ’918 patent conflict with the construction of “juxtaposition.”

Further, independent claim 1 recites “positions of the plurality of antenna elements [of the multiband antenna array] *result from* juxtaposition of at least a first antenna array . . . and a second antenna array.” Ex. 1001, 10:47–50 (emphasis added). Independent claim 17 recites “positions of the plurality of antenna elements *result from* juxtaposition of at least a first antenna array operating in a first frequency band, a second antenna array operating in a second frequency band, and a third antenna array operating in a third frequency band.” Ex. 1001, 12:22–26 (emphasis added). The term

"result from" is not defined in the Specification of the '256 patent and does not even appear in the Specification outside of the claims. It does not appear to be a technical term, and we apply its plain and ordinary meaning (e.g., *result: . . . to proceed or arise as a consequence, issue, or conclusion*). *Merriam Webster's Collegiate Dictionary* 999, Tenth Ed. (1999) (Ex. 3004). Manifestly, the term does not limit or require the positions of the elements in the multiband array to be the same as the positions of each of the elements of the two mono-band arrays. The Specification confirms that understanding by disclosing that, in an embodiment, some elements of a mono-band antenna array would be moved to coincide with an element of another mono-band antenna array such that there would be no element in the multiband array at the position originally occupied by the mono-band elements that have been moved. Ex. 1001, 7:9–35.

The term "result from" would seem to cover directly or immediately result from, as well as indirectly or causally result from. We do not know to what extent the general "result from" step would limit the position of the elements in the multiband array. No particular algorithm or formula is recited. It appears that there is no limitation at all and all potential positions are available to be occupied or not occupied by elements in the resulting multiband array. We decline to read the "result from" step so broadly as though it imposes no limitation or restriction, as that would read out a limitation from the claim. *See Texas Instr. Inc. v. U.S. Int'l Trade Comm'n*, 988 F.2d 1165, 1171 (Fed. Cir. 1993) (holding that claim language cannot be mere surplusage and an express limitation cannot be ignored). Further, if these "result from" recitations are construed to be product-by-process

limitations, the recited processes are not specific enough to define a product, particularly because, *inter alia*, the Specification teaches that repositioning can occur after the juxtaposition.[4] Ex. 1001, 7:9–35. In addition, claim 11, which depends on claim 1, requires such repositioning. *Id.* at 11:44–47 ("wherein at least one first-band antenna element of the first antenna array is *repositioned* to coincide with a nearest second-band antenna element of the second antenna array") (emphasis added). Because there are no clear boundaries for the permitted repositioning, it would be difficult to ascertain the scope of the "results from" recitations. And if those recitations are construed to not be product-by-process limitations,[5] the recited juxtaposition is still not adequately defined, and the permitted subsequent repositioning still leaves the scope of the "result from" recitations difficult to ascertain. That leaves us with a high degree of uncertainty with regard to what restrictions are imposed by the "result from" limitation, especially when it is used to modify another phrase that we also determine above as involving ambiguity and speculation, i.e., "juxtaposition of a plurality of mono-band antenna arrays."

As discussed above, with respect to claims 1 and 17, three layers of ambiguity exist, one imposed on top of another. In light of these issues, it is highly speculative to determine whether the asserted prior art and prior art combinations disclose an "*interlaced*" multiband antenna array, wherein

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[4] The district court also indicated that the "results from" recitations encompass repositioning. Ex. 1076, 18–24.

[5] The district court held that these recitations are not product-by-process limitations. Ex. 1076, 23–24.

the positions of the plurality of antenna elements "*result from*" a "*juxtaposition of a plurality of mono-band antenna arrays*." Under 37 C.F.R. § 42.104(b)(3), the Petition must identify how to construe each challenged claim. In this case, the Petition does not address the issues discussed above sufficiently to eliminate uncertainty and speculation as to whether the claims read on the prior art.

D. Exercising Delegated Discretion Not to Institute Review

Even if Petitioner demonstrates a reasonable likelihood of prevailing with respect to one or more claims on one or more grounds, institution of review still is discretionary. *SAS Inst., v. Iancu*, 138 S. Ct. 1348, 1356 (2018). If we institute review at all, we are required to institute review on all challenged claims on all challenged grounds. *Id.* at 1359–60. Office Guidance issued June 5, 2018, states "[t]he panel will evaluate the challenges and determine whether, in the interests of efficient administration of the Office and integrity of the patent system (*see* 35 USC § 316(b)), the entire petition should be denied under 35 USC § 314(a)." SAS Q&A's Part D, Effect of SAS on Future Challenges that Could Be Denied for Statutory Reasons (June 5, 2018), available at https: //www.uspto.gov/sites/default/files/documents/sas_qas_20180605.pdf.

Because the claim language is ambiguous in numerous respects as discussed above, we have an inadequate basis to assess the merits of Petitioner's alleged grounds of unpatentability. If the scope of the claims cannot be determined without undue speculation, as it is the case here, the differences between the claimed invention and the prior art cannot be ascertained. *See BlackBerry Corp. v. MobileMedia Ideas, LLC*, IPR2013-00036, Paper 65 at 19–20 (PTAB Mar. 7, 2014) (citing *In re Steele*, 305

F.2d at 862–63 and reasoning that "the prior art grounds of unpatentability must fall, *pro forma*, because they are based on speculative assumption as to the meaning of the claims"). In other words, "[w]ithout ascertaining the proper claim scope, we cannot conduct a necessary factual inquiry for determining obviousness—ascertaining differences between the claimed subject matter and the prior art." *Id.* at 20 (citing *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966)).

Also, the difficulties and speculation we would encounter at trial if review is instituted, stemming from ambiguous claim language, substantially increase the resources and efforts required for reaching a resolution and thus weigh heavily against institution of review. In the circumstance here, reaching the merits of the alleged grounds of unpatentability, either before or after institution of review, involves substantial uncertainty and speculation. *See In re Steele*, 305 F.2d at 862–63.

For the foregoing reasons, we exercise our delegated discretion not to institute review. 35 U.S.C. § 314(a).

III. CONCLUSION

We exercise our delegated discretion not to institute review.

IV. ORDER

It is

ORDERED that the Petition is *denied*, and no *inter partes* review is instituted on any claim over any alleged ground of unpatentability.

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

KATHREIN USA, INC.,
T-MOBILE US, INC,
Petitioner,

v.

FRACTUS S.A.,
Patent Owner.

Case IPR2019-00946
Patent 7,250,256 B2

Before JAMESON LEE, KARL D. EASTHOM, and
JOHN R. KENNY, *Administrative Patent Judges.*

KENNY, *Administrative Patent Judge*, concurring.

I agree with my colleagues that we should deny institution. I differ, however, regarding some, but not all, of the majority's claim construction analysis for the juxtaposition limitations of claims 1 and 17.

I agree with my colleagues that: (i) the term "juxtaposition" should be construed as "interleaving," (ii) the Specification of the '256 patent does not define the term "interleave," but the IEEE Dictionary provides evidence of its ordinary meaning of the term (and hence the ordinary meaning of "juxtaposition") to a person of ordinary skill in the art, and (iii) the "results from" recitation is ambiguous. I, however, disagree with the majority's

determinations that: (i) the definition for "interleave" in the IEEE Dictionary conflicts with the Specification's use of the term and (ii) the recitation of claim 6 in the '918 patent conflicts with the "interleaving" or "interlacing" requirements of claim 1 of that patent.

I start with the IEEE Dictionary, which, with its first definition for "interleave," defines "interleave" as arranging parts of one sequence of things or events (i) so that they alternate with parts of one or more other sequences or things or events (ii) so that each sequence retains its identity. Ex. 3002. This definition is reproduced again below:

> **interleave (1)** To arrange parts of one sequence of things or events so that they alternate with parts of one or more sequences of things or events and so that each sequence retains its identity; for example, to alternately perform the steps of two different tasks in order to achieve concurrent operation of the tasks.
>
> (C/C) [20], [85]
>
> **(2) (software)** To alternate the elements of one sequence with the elements of one or more other sequences so that each sequence retains its identity; for example, to alternatively perform the steps of two different tasks in order to achieve concurrent operation of tasks.
>
> (C) 610.12-1990.
>
> **(3)** To arrange parts of one sequence of things or events so that they alternate with parts of one or more sequences of the same nature such that each sequence retains its identity; [f]or example, to assign successive addresses to physically separated storage locations in such a way to reduce access time.
>
> (C) 610.10-1994w.

Ex. 3002.

I do not believe that this definition conflicts with the disclosure of interleaving in the Specification of the ’256 patent. Figure 1 of the ’256 patent is reproduced again below:

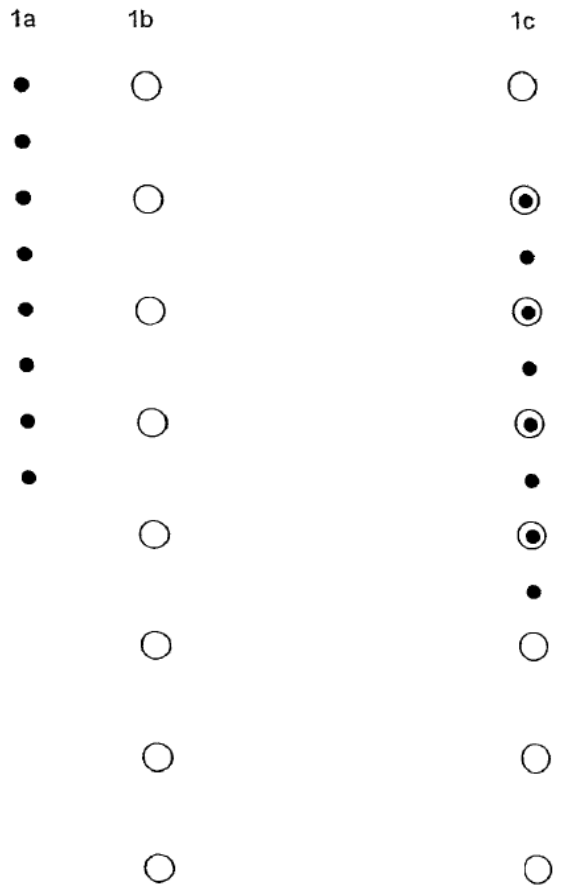

FIG. 1

Figure 1 illustrates two conventional arrays (1a and 1b) and a corresponding multiband array (1c) that results from interleaving or juxtaposing the two conventional arrays (1a and 1b). Ex. 1001, 3:29–34.

The interleaving of elements in multiband array 1c satisfies the IEEE definition for "interleave." First, the elements in the positions alternate. In particular, identifying the positions of multiband array 1c from top to bottom, the elements in positions 2–9 alternate between positions where elements of mono-band arrays 1a and 1b coincide (in positions 2, 4, 6, and 8) and positions where elements of only mono-band array 1a are present (in positions 3, 5, 7, and 9). We construe the claim term "juxtaposition" in view of its ordinary meaning in light of the Specification. *Samsung Electronics Co. v. Elm 3DS Innovations, LLC*, 925 F.3d 1373, 1377 (Fed. Cir. 2019); *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312–13 (Fed. Cir. 2005) (en banc). In this context, the alternation required by the ordinary meaning of the term "juxtaposition," as evidenced by the IEEE definition for "interleave," should be interpreted as encompassing the alternation illustrated in Figure 1. Therefore, in my opinion, multiband array 1c satisfies the alternation requirement of the IEEE definition.

Second, as shown in Figure 1, in multiband array 1c, the sequence of antenna elements from mono-band arrays 1a and 1b maintain their identities (i.e., the sequence of black circles in multiband array 1c looks like the sequence of black circles in mono-band array 1a, and the sequence of circumferences in multiband array 1c looks like the sequence of circumferences in mono-band array 1b). Therefore, interleaved, multiband array 1c satisfies both prongs of the IEEE definition. Accordingly, the Specification of the '256 patent's use of the term "interleave" is consistent with the IEEE definition for that term. For similar reasons, the Specification's use of the term "interlaced" is also consistent with the IEEE definition for that term.

I also do not find any conflict between claim 6 of the ’918 patent and the “interleaving” and “interlacing” requirements of claim 1 of that patent. As the majority notes, claim 6 requires that the same multiband antenna element be employed in positions where mono-band elements do not coincide as where mono-band elements coincide. Ex. 3003, 11:37–44. In other words, claim 6 requires that the same multiband antenna element be employed in all positions.

The Specification of the ’256 patent, however, teaches how the same multiband antenna element can be employed in all positions while still differentiating those positions (e.g., alternating the capabilities of the antennas in those positions). The following disclosure in the Specification describes using the same multiband antenna in all positions of the array: “In those positions in which one or various elements originating in the conventional mono-band arrays coincide, a single multiband antenna (element) shall be employed . . . . In the remaining non-concurrent positions, it can be chosen to employ also the same multiband antenna . . . .” *Id.* at 3:9–16. The next sentence in the Specification explains that the positions in the array can nevertheless be distinguished by means of the signal distribution network: “The excitation at one or various frequencies of each element of the array *depends therefore on the position of the element in the array* and is controlled by means of the signal distribution network.” *Id.* at 3:16–21 (emphasis added). Therefore, even if every position in the array has the same antenna element, the signal distribution network can cause the positions in the array to alternate between, for example, a position that can operate in just one band and a position that can operate in two bands (e.g., odd positions can be wired to operate in just one

band, even positions can be wired to operate in two bands—or software or circuitry can force such a distribution of signals).

This disclosed embodiment satisfies claim 6 of the ’918 patent (the same antenna elements are at each position) and the interleaving and interlacing requirements of claim 1 (the positions alternate between antennas that are connected to structures (e.g., wiring, controllers, software) that allow them to operate in one band versus antennas that connected to structures that allow them to operate in two bands). The description of Figure 1 in the Specification of the ’256 patent reinforces this disclosure. After describing the use of multiband antenna element in positions where the elements of the two conventional arrays coincide in Figure 1, the Specification discloses: “The remaining not common elements . . . can be implemented either by means of the same multiband element employed in the common positions *(and selecting the working frequency by means of the signal distribution network of the array)*, or by employing conventional mono-band elements.” Ex. 1001, 5:47–52 (emphasis added). In light of these disclosures in the Specification, I do not find any conflict between the interleaving and interlacing requirements of claim 1 and the recitation of claim 6, both of the ’918 patent.

As indicated above, I agree with the majority that the “result from” recitations are ambiguous. Further, in my opinion, Petitioner has not sufficiently shown that the asserted prior art teaches or suggests the recited *interlaced* multiband antenna array. In addition, Petitioner has not made an adequate showing with respect the “result from” recitation, irrespective of its scope, because Petitioner has not substantively addressed how the prior art structures actually “result from” the recited juxtaposition or would have

the same structure as a multiband antenna array that results from the recited juxtaposition. Accordingly, for these reasons, I concur in denying the Petition.

FOR PETITIONER:

Scott A. Burow
Matthew P. Becker
Binal J. Patel
John Harris Curry
Jordan Bodner
Shambhavi Patel
BANNER AND WITCOFF, LTD.
sburow@bannerwitcoff.com
mbecker@bannerwitcoff.com
bpatel@bannerwitcoff.com
jcurry@bannerwitcoff.com
jbodner@bannerwitcoff.com
spatel@bannerwitcoff.com

Brian Oaks
David Tobin
BAKER BOTTS L.L.P.
brian.oaks@bakerbotts.com
david.tobin@bakerbotts.com

FOR PATENT OWNER:

Jason Shapiro
Patrick Finnan
Mark J. DeBoy
EDELL, SHAPIRO, AND FINNAN LLC
js@usiplaw.com
pjf@usiplaw.com
mjd@usiplaw.com