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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte AMICHAÏ SANDEROVICH and ALON YEHEZKELY

Appeal 2018-004785
Application 14/325,346
Technology Center 3600

Before JOHN A. JEFFERY, JAMES R. HUGHES, and
BETH Z. SHAW, *Administrative Patent Judges*.

HUGHES, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Claims 1, 2, 4–7, 10–12, 14–17, 20, 21, and 23, are pending, stand rejected, are appealed by Appellant,¹ and are the subject of our decision under 35 U.S.C. § 134(a). *See* Adv. Act. 2; Final Act 1.² We have jurisdiction under 35 U.S.C. § 6(b).

¹ We use the word Appellant to refer to “applicant” as defined in 37 C.F.R. § 1.42(a). Appellant identifies the real party in interest as QUALCOMM Inc. *See* Appeal Br. 3.

² We refer to Appellant’s Specification (“Spec.”), filed July 7, 2014 (claiming benefit of US 61/843,741, filed July 8, 2013; US 13/729,553, filed Dec. 28, 2012; and US 61/643,438, filed May 7, 2012); Appeal Brief (“Appeal Br.”), filed Dec. 1, 2017; and Reply Brief (“Reply Br.”), filed Apr. 4, 2018. We also refer to the Examiner’s Final Office Action (“Final Act.”),

We REVERSE.

CLAIMED SUBJECT MATTER

The invention “relates generally to millimeter wave radio frequency (RF) systems and, more particularly, to operation of phased array antennas in such radio modules that . . . allow efficient signal propagation.” Spec. ¶ 2; *see* Spec. ¶¶ 20–25; Abstract. Claims 1, 11, 21, and 23 are independent. Claim 1, reproduced below, is illustrative of the claimed subject matter:

1. A method for operating a plurality of radiating elements of an apparatus, comprising:
 - receiving a signal from another apparatus;
 - measuring a phase and a gain of each of the plurality of radiating elements based on the signal;
 - determining a feed gain and a feed phase for each of the plurality of radiating elements based on the measured phase and the measured gain of a respective radiating element, wherein the gain and the phase of each of the plurality of radiating elements are measured as a function of a physical direction of the other apparatus with respect to the apparatus and a polarization of the signal; and
 - independently setting a gain of an amplifier and a phase of a phase shifter coupled to each of the plurality of radiating elements based on the determined feed gain and the feed phase.

Appeal Br. 13 (Claims App.).

REFERENCES

The prior art relied upon by the Examiner is:

Name	Reference	Date
Chang et al. (“Chang”)	US 5,103,232	Apr. 7, 1992
Shoki et al. (“Shoki”)	US 6,087,986	July 11, 2000
Choudhury et al. (“Choudhury”)	US 7,830,312 B2	Nov. 9, 2010

REJECTIONS³

1. The Examiner rejects claims 2, 5–7, 12, and 14–17 under 35 U.S.C. § 112(b) as being indefinite for failing to particularly point out and distinctly claim the subject matter which the inventor or a joint inventor regards as the invention.⁴ *See* Final Act. 8–9; Ans. 3–4.

2. The Examiner rejects claims 1, 2, 4, 5, 11, 12, 14, 15, 21, and 23 under 35 U.S.C. § 102(a)(1) as being anticipated by Shoki. *See* Final Act. 9–11.

3. The Examiner rejects claims 6, 7, 16, and 17 under 35 U.S.C. § 103 as being unpatentable over Shoki and Chang. *See* Final Act. 11.

4. The Examiner rejects claims 10 and 20 under

³ The Leahy-Smith America Invents Act (“AIA”), Pub. L. No. 112-29, 125 Stat. 284 (2011), amended 35 U.S.C. §§ 102, 103, and 112. The present application includes claims having an effective filing date after the AIA’s effective date for applications, this decision refers to the post-AIA versions of 35 U.S.C. §§ 102, 103, and 112, i.e., §§ 102(a)(1), 103, and 112(b).

⁴ Appellant canceled claims 3, 13, and 22 subsequent to the Final Office Action, and the Examiner withdrew certain rejections. *See* Adv. Act. 2. The Examiner reiterated the § 112(b) rejection in the Examiner’s Answer, but omitted claim 12 from the statement of the rejection. *See* Ans. 3. We find this omission to be a harmless error and correct the statement of rejection for clarity.

35 U.S.C. § 103 as being unpatentable over Shoki and Choudhury. *See* Final Act. 11–12.

OPINION

Indefiniteness Rejections of Claims 2, 5–7, 12, and 14–17

The Examiner makes three distinct indefiniteness rejections—rejecting claims 2 and 12 because “different characteristics” is unclear (*see* Final Act. 6–7; Ans. 3), rejecting claims 5–7 and 15–17 because the parameters α and β are unclear (*see* Final Act. 7; Ans. 4), and rejecting claim 14 because the claim fails to provide structural limitations (*see* Final Act. 7; Ans. 4). We address these rejections seriatim.

The Examiner rejects claims 2 and 12 as being indefinite because the language “different characteristics” is unclear as “such language . . . could encompass different types, different sizes, different uses, multiple antennas of an array, etc.” Ans. 3; *see* Ans. 9–10. Appellant contends the language is not indefinite. *See* Appeal Br. 8; Reply Br. 2. Specifically, Appellant contends the radiating elements or sub-arrays “may be implemented on different layers of a multi-layer substrate” having different properties or characteristics, which would have been “clear to a person of ordinary skill in the art.” Appeal Br. 8 (citing Fig. 4); *see* Reply Br. 2 (citing Spec. ¶ 51).

The Examiner rejects claims 5–7 and 15–17 as being indefinite because “the configurable parameters α and β are not clearly and distinctly defined.” Ans. 4; *see* Ans. 10. Appellant contends parameters are not indefinite. *See* Appeal Br. 8–9; Reply Br. 3. Specifically, Appellant contends the parameters are “coefficients of the equations for feed gain and feed phase, which [would have been] clear to a person of ordinary skill in the art.” Appeal Br. 8–9 (citing claim 5); *see* Reply Br. 3 (citing Spec. ¶ 68).

The Examiner rejects claim 14 as being indefinite because the claim “fails to clearly and distinctly define any further structural limitation to the independent claim.” Ans. 4; *see* Ans. 10. Appellant contends the claim is not indefinite. *See* Reply Br. 3. Specifically, Appellant contends the claim recites a processing system that is configured to perform certain functionality and where claim 14

further defines that “each feed gain is proportional to the measured gain and each feed phase has opposite polarity to the measured phase of each respective radiating element.” Thus, claim 14 further limits claim 11 in that the processing system is configured to determine a feed gain and a feed phase, and measure a phase and a gain, where the measured gain is proportional to the feed gain and the measured phase has opposite polarity as the feed phase of each respective radiating element.

Reply Br. 3 (citing Spec. ¶ 68) (emphasis omitted).

The essence of the requirement under 35 U.S.C. § 112, second paragraph, is that the language of the claims must make clear what subject matter the claims encompass—i.e., “whether those skilled in the art would understand what is claimed when the claim is read in light of the specification.” *Star Scientific, Inc. v. R.J. Reynolds Tobacco Co.*, 655 F.3d 1364, 1380 (Fed. Cir. 2011) (quoting *Orthokinetics, Inc. v. Safety Travel Chairs, Inc.*, 806 F.2d 1565, 1576 (Fed. Cir. 1986)); *see In re Packard*, 751 F.3d 1307, 1310–14 (Fed. Cir. 2014).

“[W]e apply the approach for assessing indefiniteness approved by the Federal Circuit in *Packard*, i.e., ‘[a] claim is indefinite when it contains words or phrases whose meaning is unclear.’ Put differently, ‘claims are required to be cast in clear—as opposed to ambiguous, vague, indefinite—terms.’” *In re McAward*, Appeal No. 2015-006416, 2017 WL 3669566, *5

(PTAB Aug. 25, 2017) (precedential) (quoting *In re Packard*, 751 F.3d at 1310, 1313–14) (citations omitted).

We find the language of claim 2, when properly construed, would be understood by those skilled in the art, and the language is clear. Although the terminology “different characteristics” may be broad, Appellant’s Specification (*see* Spec. ¶ 51; Fig. 4) explains that different radiating elements and sub-arrays may be of different types (having different characteristics). The Examiner apparently fails to appreciate the Appellant’s disclosure and does not explain why the disputed language would be unclear to one of ordinary skill in the art. In light of our findings and Appellant’s arguments, we find the Examiner fails to sufficiently explain why one of ordinary skill in the art would not understand claim 2.

Similarly, with respect to parameters of claim 5, we find these parameters would be understood by those skilled in the art, and the parameters are not unclear. Appellant’s Specification (*see* Spec. ¶¶ 65–68) explains that the configurable parameters are selected from preconfigured values and utilized in the feed gain and feed phase calculations. The Examiner apparently fails to appreciate the Appellant’s disclosure and does not explain why the disputed language would be unclear to one of ordinary skill in the art. In light of our findings and Appellant’s arguments, we find the Examiner fails to sufficiently explain why one of ordinary skill in the art would not understand claim 5.

With respect to claim 14, the Examiner’s basis for the rejection—that the claim does not further structurally limit the base claim—is not clear. The Examiner’s rejection does not explain how the claim language is ambiguous or vague. As pointed out by Appellant, base claim 11 defines the

structure (a processing system configured to perform certain functionality) and claim 14 further defines that functionality. *See* Reply Br. 3. In light of our findings and Appellant’s arguments, we find the Examiner fails to sufficiently explain why one of ordinary skill in the art would not understand claim 14.

Therefore, we do not sustain the Examiner’s indefiniteness rejections of claims 2, 5–7, 12, and 14–17.

Anticipation Rejection of Claims 1, 2, 4, 5, 11, 12, 14, 15, 21, and 23

The Examiner rejects independent claim 1 (as well as independent claims 11, 21, and 23, and dependent claims 2, 4, 5, 12, 14, and 15) as being anticipated by Shoki. *See* Final Act. 9–10; Ans. 4–7, 10–13. Appellant contends Shoki does not disclose the disputed limitations of claim 1. *See* Appeal Br. 9–11; Ans. 3–5. Specifically, Appellant contends, *inter alia*, that Shoki does not disclose

a gain and a phase of each of a plurality of radiating elements being **measured** as a function of a physical direction and a polarization. In other words, *Shoki* does not disclose taking a direction and polarization into account when performing the operation of measuring a gain and a phase of a signal. In fact, *Shoki* does not even mention a polarization of a signal at all.

Reply Br. 4.

We agree with Appellant that the Examiner-cited portions of *Shoki* do not describe “measuring a phase and a gain of each of the plurality of radiating elements” “as a function of a physical direction . . . and a polarization of the signal” as recited in claim 1. Even if, *arguendo*, direction and polarization are “operational propert[ies] of the signal at each antenna” as maintained by the Examiner (Ans. 11), it does not necessarily follow that measuring the gain and phase must inherently take these properties into

account. *Cf.* Final Act. 9–10; Ans. 4–7, 10–13; Appeal Br. 9–11; Ans. 3–5. Thus, we agree with Appellant that Shoki fails to disclose accounting for direction and polarization when performing the measurement operations (measuring a gain and a phase of a signal). Reply Br. 4.

Consequently, we are constrained by the record before us to find that the Examiner erred in finding that Shoki anticipates Appellant’s claim 1. Independent claims independent claims 11, 21, and 23 include limitations of commensurate scope. Claims 2, 4, 5, 12, 14, and 15 depend from and stand with claims 1 and 11, respectively.

Obviousness Rejections of Claims 6, 7, 10, 16, 17, and 20

The Examiner rejects claims 6, 7, 16, and 17, which depend from claims 1 and 11 (respectively), over Shoki and Chang. *See* Final Act. 10–11; Ans. 7–8, 13–14. The Examiner also rejects claims 10 and 20, which depend from claims 1 and 11 (respectively), as obvious in view of Shoki and Choudhury. *See* Final Act. 11; Ans. 8, 14.

The Examiner does not suggest, and we do not find, that the additional cited references (Chang or Choudhury) cure the deficiencies of Shoki (*supra*). Therefore, we reverse the Examiner’s obviousness rejections of dependent claims 6, 7, 10, 16, 17, and 20 for the same reasons set forth for their respective base claims (*supra*).

CONCLUSION

For the reasons discussed above, we determine that claims 2, 5–7, 12, and 14–17 are not indefinite; claims 1, 2, 4, 5, 11, 12, 14, 15, 21, and 23 are not anticipated by Shoki; and claims 6, 7, 10, 16, 17, and 20 are not obvious in view of the cited prior art.

Appellant has shown that the Examiner erred in rejecting claims 2, 5–7, 12, and 14–17 under 35 U.S.C. § 112(b), claims 1, 2, 4, 5, 11, 12, 14, 15, 21, and 23 under 35 U.S.C. § 102(a)(1), and claims 6, 7, 10, 16, 17, and 20 under 35 U.S.C. § 103.

We therefore reverse the Examiner’s rejection of claims 1, 2, 4–7, 10–12, 14–17, 20, 21, and 23.

DECISION SUMMARY

In summary:

Claims Rejected	35 U.S.C. §	Reference(s)/Basis	Affirmed	Reversed
2, 5–7, 12, 14–17	112(b)	Indefiniteness		2, 5–7, 12, 14–17
1, 2, 4, 5, 11, 12, 14, 15, 21, 23	102(a)(1)	Shoki		1, 2, 4, 5, 11, 12, 14, 15, 21, 23
6, 7, 16, 17	103	Shoki, Chang		6, 7, 16, 17
10, 20	103	Shoki, Choudhury		10, 20
Overall Outcome				1, 2, 4–7, 10–12, 14–17, 20, 21, 23

REVERSED