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Cirrus Logic c/o Jackson Walker LLP c/o Jackson Walker, L.L.P. 100 Congress Avenue Suite 1100 Austin, TX 78701			GANNON, LEVI	
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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte RAMIN ZANBAGHI, AARON J. BRENNAN,
JOHN L. MELANSON, and MIKEL ASH

Appeal 2018-006587
Application 15/336,995
Technology Center 2800

Before WESLEY B. DERRICK, MICHELLE N. ANKENBRAND, and
AVELYN M. ROSS, *Administrative Patent Judges*.

ROSS, *Administrative Patent Judge*.

DECISION ON APPEAL¹

Appellant² appeals under 35 U.S.C. § 134(a) from a final rejection of claims 1–13, 16–31, 34–38, 40, and 41. We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

¹ In our Decision we refer to the Specification filed October 28, 2016 (“Spec.”), the Final Office Action appealed from dated October 6, 2017 (“Final Act.”), the Appeal Brief filed March 6, 2018 (“Appeal Br.”), the Examiner’s Answer dated April 19, 2018 (“Ans.”), and the Reply Brief filed June 11, 2018 (“Reply Br.”).

² We use the word “Appellant” to refer to “applicant” as defined in 37 C.F.R. § 1.42. Appellant identifies the real party in interest as Cirrus Logic, Inc. Appeal Br. 2.

STATEMENT OF THE CASE

The subject matter on appeal generally relates to circuits for audio devices and more specifically to “systems and methods for enhancing a dynamic range of an audio signal path in an audio device while reducing the existence of audio artifacts when switching between dynamic range enhancement modes.” Spec. 1:18–20. The system of the instant application includes “an open-loop modulator, a closed-loop modulator, and a control subsystem” where

[t]he open-loop modulator may be configured to receive an input signal and generate an output signal based on the input signal when the open-loop modulator is selected as a selected path. The closed-loop modulator may be configured to receive the input signal and generate a closed-loop output signal based on the input signal when the closed-loop modulator is selected as the selected path. The control subsystem may be configured to select one of the open-loop modulator and the closed-loop modulator as the selected path based on one or more characteristics of the input signal.

Id. at 3:6–13. According to the Specification, the use of an open-loop modulator and a closed-loop modulator increases the dynamic range because lower magnitude signals, which are more susceptible to noise, may be processed by an open-loop modulator, which has greater immunity to noise as compared to a closed-loop modulator and because higher magnitude signals, which are not as susceptible to noise, may be processed by a closed-loop modulator, which may have more desirable transfer characteristics at higher magnitudes than that of an open-loop modulator. *Id.* at 10:6–12, 11:28–12:2.

Claims 1 and 19, reproduced below, are the sole independent claims and are illustrative of the claimed subject matter:

1. A system comprising:
 - an open-loop modulator configured to receive an input signal and generate an output signal based on the input signal when the open-loop modulator is selected as a selected path;
 - a closed-loop modulator configured to receive the input signal and generate a closed-loop output signal based on the input signal when the closed-loop modulator is selected as the selected path; and
 - a control subsystem configured to select one of the open-loop modulator and the closed-loop modulator as the selected path based on one or more characteristics of the input signal.

Appeal Br. 10 (Claims App'x).

19. A method comprising:
 - selecting one of an open-loop modulator and a closed-loop modulator based on one or more characteristics of an input signal;
 - generating an output signal based on the input signal by the open-loop modulator when the open loop modulator is selected as a selected path; and
 - generating an output signal based on the input signal by the closed-loop modulator when the closed-loop modulator is selected as a selected path.

Id. at 13 (Claims App'x).

REJECTIONS

The Examiner maintains the following rejections:

- A. Claims 1–13, 16–31, 34–38, 40, and 41 are rejected on the ground of nonstatutory double patenting over claims 1–36 of U.S. Patent No. 9,503,027. Final Act. 4.

- B. Claims 1, 16, 19, and 34 stand rejected under 35 U.S.C. § 102(a) as anticipated by Fujiwara.³ *Id.* at 5.
- C. Claims 1, 9, 19, and 27 stand rejected under 35 U.S.C. § 102(a) as anticipated by Lim.⁴ *Id.* at 7.
- D. Claims 1, 7–9, 16, 19, 25–27, and 34 stand rejected under 35 U.S.C. § 102(a) as anticipated by Shi.⁵ *Id.* at 8.
- E. Claims 37, 38, 40, and 41 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Fujiwara. *Id.* at 10.
- F. Claims 37, 38, 40, and 41 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Lim. *Id.* at 13.
- G. Claims 4 and 22 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Shi. *Id.* at 15.

Appellant seeks our review of Rejections A–G. *See generally* Appeal Br. Appellant separately, albeit briefly, argues Rejections B, C, and D on the basis of independent claims 1 and 19 together, as each contain the same disputed limitation, i.e., an open-loop modulator. *See id.* at 4–5. Therefore, consistent with the provisions of 37 C.F.R. § 41.37(c)(1)(iv) (2013), we limit our discussion to claims 1 and 19, and each other claim stands or falls together with the claim from which it depends.

³ Fujiwara et al., US 7,216,249 B2, issued May 8, 2007 (“Fujiwara”).

⁴ Lim et al., US 2006/0056491 A1, published March 16, 2006 (“Lim”).

⁵ Shi et al., US 2014/0184332 A1, published July 3, 2014 (“Shi”).

OPINION

We review the appealed rejections for error based upon the issues identified by Appellant and in light of the arguments and evidence produced thereon. *Ex parte Frye*, 94 USPQ2d 1072, 1075 (BPAI 2010) (precedential) (*cited with approval in In re Jung*, 637 F.3d 1356, 1365 (Fed. Cir. 2011) (“[I]t has long been the Board’s practice to require an applicant to identify the alleged error in the examiner’s rejections”)). After considering the evidence presented in this Appeal and each of Appellant’s arguments, we are persuaded that Appellant identifies reversible error in the Examiner’s prior art rejections, but not in the Examiner’s double patenting rejection.

We add the following.

A. Nonstatutory Double Patenting Rejection

The Examiner rejects claims 1–13, 16–31, 34–38, 40, and 41 as unpatentable on the ground of nonstatutory double patenting over claims 1–36 of U.S. Patent No. 9,503,027. Final Act. 4. Appellant does not advance any argument in opposition to the Examiner’s double patenting rejection of claims 1–13, 16–31, 34–38, 40, and 41. *See generally* Appeal Br. Therefore, because Appellant does not identify reversible error in the Examiner’s rejection, we summarily sustain the rejection on the ground of nonstatutory double patenting.

B. Prior Art Rejections

The Examiner finds that each of Fujiwara, Lim, and Shi teaches the limitations of claims 1 and 19. Final Act. 5–10. Relevant to Appellant’s arguments, the Examiner finds that Fujiwara’s frequency divider 16(d), Lim’s voltage controlled oscillator 404, and Shi’s analog amplifier 11, each

correspond to the claimed “open-loop modulator.” *Id.* at 5, 7, 8, 16; Ans. 5. The Examiner’s findings are based on the Examiner’s construction of “open-loop modulator” and in particular, the term “modulator” to mean “an item that exerts a modifying or controlling influence.” Final Act. 16; Ans. 5. The Examiner states that this interpretation of “modulator” is based on the claims and the Specification which are “drawn to electronic circuits capable of receiving and generating electronic signals.” Advisory Action Before Appeal, filed December 7, 2017, 2 (“Advisory Action”). The Examiner acknowledges that the term “modulator” has a “general definition . . . as commonly understood by one skilled in the art,” i.e., “a device for adding information/data to a carrier for signal transmission.” Ans. 4. The Examiner, however, does not apply that definition of modulator “because the application does not use this definition.” *Id.* The Examiner explains that, according to the instant application, “[t]here is only one input signal present [and] [t]here is no combination of carrier signal with a data/information signal.” *Id.*

Appellant asserts that, under the proper definition of “open loop modulator,” Fujiwara’s frequency divider 16(d), Lim’s voltage controlled oscillator 404, and Shi’s analog amplifier 11 are not “modulators” and, therefore, Fujiwara, Lim, and Shi cannot anticipate claim 1. Appeal Br. 4–5. Appellant explains that the Examiner errs in relying on a definition of “modulator” that is so broad that “almost any circuit or circuit element, no matter how simple or complex, could be considered a modulator.” *Id.* at 5. Appellant explains that the breadth of the Examiner’s definition places no “practical limit on a claim term [and] is, quite simply, not reasonable.” *Id.* at

6. Appellant asserts that the commonly understood definition of modulator (*see* Ans. 4), that is, one that includes transmission of information on a carrier signal, is consistent with the claims, the Specification, and the understanding of those of skill in the art. Reply Br. 3 (“Suffice it to say that the specification of the present application clearly and unequivocally contemplates modulation as such term is understood by those of skill in the art.”).

We construe the terms of a patent as one of ordinary skill in the art would have understood them *at the time of the invention* in light of the disclosure. *See E.I. du Pont De Nemours & Co. v. Unifrax ILLC*, 921 F.3d 1060, 1068 (Fed. Cir. 2019) (“The purpose of claim construction is to give meaning to the claim terms according to how [ordinarily skilled artisans] would have understood them *at the time of the invention* in light of the entire patent, including the claims in which the terms appear and the specification.”) (emphasis added). We give claim terms the broadest reasonable interpretation consistent with the Specification. *See In re Morris*, 127 F.3d 1048, 1054 (Fed. Cir. 1997).

On this record, we agree with Appellant. Any claim construction analysis must begin with the words of the claim. *See Vitronics Corp. v. Conceptor, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996). Here, Appellant chose to use the word “modulator”—not the broader term “electronic circuit.” The Examiner and Appellant each agree, that the ordinarily skilled artisan would have understood “modulator” to mean “a device for adding information/data to a carrier for signal transmission.” *See* Ans. 4; *see also* Reply Br. 3 (“Suffice it to say that the specification of the present

application clearly and unequivocally contemplates modulation as such term is understood by those of skill in the art”). However, the Examiner departs from the ordinary meaning and construes the term “modulator” to mean “an electronic circuit that receives an input signal, exerts a modifying or controlling influence on the input signal, and outputs a signal based on the input signal.” Ans. 5; *see also* Advisory Action 2 (“the ‘modulators’ of the specification and claim 1 are drawn to electronic circuits capable of receiving and generating electronic signals.”). According to the Examiner, the general definition of “modulator” does not apply “because the application does not use this definition.” Ans. 4 (citing pages 6–7 of the Specification and identifying element 22 as the modulator). However, as Appellant explains, “the Specification of the present application meets the commonly understood definitions the Examiner recites on Page 5 [sic] of the Answer.” Reply Br. 3. In particular, the Specification states that

open-loop modulator 22 may include a digital equalization filter 28 having response $d(z)$ and a digital pulse-width modulation (PWM) signal generator 30. The response $d(z)$ of digital equalization filter 28 may be selected as to match a transfer function of open-loop modulator 22 to a transfer function of closed-loop modulator 24. . . . Digital PWM signal generator 30 may include any system, device, or apparatus configured to generate a periodic signal V_{IN_D} having a pulse width which is a function of the magnitude of digital audio input signal DIG_IN as filtered by digital equalization filter 28. For example, the pulse width of periodic signal V_{IN_D} may increase as the magnitude of digital audio input signal DIG_IN increases, and vice versa.

Spec. 6:24–7:3 (emphasis added). The Specification makes clear that the open-loop modulator includes a pulse-width generator to generate a periodic

signal. *Id.*; *see also* Fig. 2 (same). That periodic signal is in addition to the digital audio input signal supplied to block 20. Spec. 6:24–7:3; *see also* Fig. 2 (same). Thus, rather than invoke an unconventional meaning for the term “modulator,” the Specification uses the term “modulator” in a manner consistent with the ordinary and customary meaning of the term ascribed by those skilled in the art. *Brookhill-Wilk 1, LLC v. Intuitive Surgical, Inc.*, 334 F.3d 1294, 1298 (Fed. Cir. 2003) (explaining that a patentee must indicate an intent to depart from the ordinary and accustomed meaning of a term).

Because the Examiner has not shown that the art of record discloses an “open-loop modulator” as properly construed, and provided no reasoning to modify the art to include such, we reverse the Examiner’s rejections of claims 1, 4, 7–9, 16, 19, 22, 25–27, 34, 37, 38, 40, and 41.

CONCLUSION

Appellant failed to identify a reversible error in the Examiner’s rejection of claims 1–13, 16–31, 34–38, 40, and 41 on the ground of nonstatutory double patenting over claims 1–36 of U.S. Patent No. 9,503,027.

Appellant identified a reversible error in the Examiner’s rejection of claims 1, 16, 19, and 34 under 35 U.S.C. § 102 as anticipated by Fujiwara.

Appellant identified a reversible error in the Examiner’s rejection of claims 1, 9, 19, and 27 under 35 U.S.C. § 102 as anticipated by Lim.

Appellant identified a reversible error in the Examiner’s rejection of claims 1, 7–9, 16, 19, 25–27, and 34 under 35 U.S.C. § 102 as anticipated by Shi.

Appellant identified a reversible error in the Examiner’s rejection of claims 37, 38, 40, and 41 under 35 U.S.C. § 103 as unpatentable over Fujiwara.

Appellant identified a reversible error in the Examiner’s rejection of claims 37, 38, 40, and 41 under 35 U.S.C. § 103 as unpatentable over Lim.

Appellant identified a reversible error in the Examiner’s rejection of claims 4 and 22 under 35 U.S.C. § 103 as unpatentable over Shi.

DECISION

For the above reasons, the Examiner’s rejection of claims 1–13, 16–31, 34–38, 40, and 41 is affirmed as summarized below.

Claims Rejected	35 U.S.C. §	Reference(s)/Basis	Affirmed	Reversed
1–13, 16–31, 34–38, 40, 41		Nonstatutory Double Patenting	1–13, 16–31, 34–38, 40, 41	
1, 16, 19, 34	102	Fujiwara		1, 16, 19, 34
1, 9, 19, 27	102	Lim		1, 9, 19, 27
1, 7–9, 16, 19, 25–27, 34	102	Shi		1, 7–9, 16, 19, 25–27, 34
37, 38, 40, 41	103	Fujiwara		37, 38, 40, 41
37, 38, 40, 41	103	Lim		37, 38, 40, 41
4, 22	103	Shi		4, 22
Overall Outcome			1–13, 16–31, 34–38, 40, 41	

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1).

AFFIRMED