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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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*Ex parte* SATISH V. UPPATHIL, NIKOLAUS KLEMMER,  
and FIKRET DULGER

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Appeal 2019-003865  
Application 14/811,618  
Technology Center 2600

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Before ROBERT E. NAPPI, JEAN R. HOMERE, and  
JAMES R. HUGHES, *Administrative Patent Judges*.

HUGHES, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Claims 1, 3, and 8 are pending, stand rejected, are appealed by  
Appellant,<sup>1</sup> and are the subject of our decision under 35 U.S.C. § 134(a).<sup>2</sup>

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<sup>1</sup> 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 Texas Instruments Incorporated. *See* Appeal Br. 2.

<sup>2</sup> Claims 1–20 are pending, claims 9–20 have been allowed by the Examiner, and dependent claims 2 and 4–7 are objected to as being dependent upon a rejected base claim (independent claim 1). *See* Final Act. 1, 5; Appeal Br. 2.

See Final Act. 1, 5; Appeal Br. 2.<sup>3</sup> We have jurisdiction under 35 U.S.C. § 6(b).

We REVERSE.

#### CLAIMED SUBJECT MATTER

The claimed subject matter relates to “systems and techniques” for “multiplexing and down-converting multiple reception channels of a front-end receiver (FER) for use in a broadband transceiver” (Spec. ¶ 4) and more specifically, integrated circuits comprising: a first mixer delivering a first down-converted signal by reducing a first carrier frequency of a first radio frequency (RF) signal to a baseband frequency; a second mixer delivering a second down-converted signal by reducing a second carrier frequency of a second RF signal to a baseband frequency; and a convergent node that receives the first down-converted signal when the first mixer is selected, and receives the second down-converted signal when the second mixer is selected. See Spec. ¶¶ 4–9; Abstract. Claim 1, reproduced below, is the sole independent claim and is illustrative of the claimed subject matter:

1. An integrated circuit comprising:
  - a first input port configured to receive a first radio frequency (RF) signal having a first carrier frequency;
  - a second input port configured to receive a second RF signal having a second carrier frequency;
  - a first mixer coupled with the first input port, the first mixer having a first output lead configured to deliver a first*

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<sup>3</sup> We refer to Appellant’s Specification (“Spec.”), filed July 28, 2015 (claiming benefit of US 62/033,403 (filed Aug. 5, 2014)); Appeal Brief (“Appeal Br.”), filed Dec. 18, 2018; and Reply Brief (“Reply Br.”), filed Apr. 22, 2019. We also refer to the Examiner’s Final Office Action (“Final Act.”), mailed Oct. 29, 2018; and Answer (“Ans.”) mailed Feb. 26, 2019.

*down-converted signal by reducing the first carrier frequency of the first RF signal to a baseband frequency;*

*a second mixer coupled with the second input port, the second mixer having a second output lead configured to deliver a second down-converted signal by reducing the second carrier frequency of the second RF signal to the baseband frequency; and*

*a convergent node coupled with the first output lead and the second output lead, the convergent node receiving the first down-converted signal only when the first mixer is selected, and the convergent node receiving the second down-converted signal only when the second mixer is selected.*

Appeal Br. 9 (Claims App'x.) (emphasis added).

#### REFERENCE

The prior art relied upon by the Examiner is:

Name	Reference	Date
Abdelgany et al. ("Abdelgany")	US 7,092,676 B2	Aug. 15, 2006

#### REJECTION<sup>4</sup>

1. The Examiner rejects claims 1, 3, and 8 under 35 U.S.C. § 102(a)(2) as being anticipated by Abdelgany. *See* Final Act. 3–5.

#### ANALYSIS

The Examiner rejects independent claim 1 (as well as dependent claims 3 and 8) as being anticipated by Abdelgany. *See* Final Act. 3–5; Ans. 4–5. Appellant contends that Abdelgany does not disclose the disputed

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<sup>4</sup> The Leahy-Smith America Invents Act ("AIA"), Pub. L. No. 112–29, 125 Stat. 284 (2011), amended 35 U.S.C. § 102. Because the present application has an effective filing date (Aug. 5, 2014) after the AIA's effective date, this decision refers 35 U.S.C. § 102(a)(2).

limitations of claim 1. *See* Appeal Br. 4–7; Reply Br. 2–3. Specifically, Appellant contends, *inter alia*, that the Examiner misconstrues Abdelgany, in that Abdelgany teaches alternate embodiments of down-conversion to an intermediate frequency and down-conversion to a baseband frequency—“the Examiner suggested that the system as shown in [Abdelgany’s] FIG. 3 could have been modified to perform ‘direct conversion’ to ‘baseband signals’” (Appeal Br. 4); however, Abdelgany “specifically teaches the direct baseband down-conversion to be performed by the ‘**alternative embodiments**’ as shown in FIGS. 7–11, but not the embodiments as shown in FIG. 3” (Appeal Br. 5). Appellant further contends that the “embodiment as shown in FIG. 3 is not, and **cannot be used**, for direct down-conversion” (Appeal Br. 5) because “the system as shown in FIGS. 7–11 does not . . . share the same circuit configuration as the system in FIG. 3” (Appeal Br. 6). *See* Appeal Br. 4–7; Reply Br. 2–3.

We agree with Appellant that the Examiner-cited portions of Abdelgany (*see* col. 8, l. 14–col. 12, l. 37; col. 17, ll. 5–12; Figs. 3, 7–11) do not explicitly or inherently describe the display functionality required by Appellant’s claim 1. Specifically, Abdelgany describes a receiver (24) including two mixers (CDMA receive downconverter mixer (96) and GSM receive downconverter mixer (172)) that down-convert radio-frequency (RF) signals to intermediate-frequency (IF) signals. *See* Abdelgany, col. 8, l. 42–col. 9, l. 14; col. 10, l. 67–col. 11, l. 42; Fig. 3. The IF output of the mixers is filtered and passed to a switch (first receive IF switch (206)). *See* Abdelgany, col. 9, ll. 4–14; col. 11, ll. 29–42; Fig. 3. The intermediate-frequency information signal (Receive IF information signal (34)) is then sent to the demodulator (28) to produce base band information signals (120).

*See* Abdelgany, col. 9, ll. 15–30; col. 11, ll. 47–64; Fig. 3. Abdelgany does not describe the mixers of this embodiment (Fig. 3) directly down-converting radio-frequency signals to baseband signals. The Examiner relies on Abdelgany’s disclosure that “FIGS. 3–6 illustrate embodiments . . . which utilize modulation to, and demodulation from, an IF frequency, in alternative embodiments direct conversion may be employed” where “receive RF information signals are down[-]converted and demodulated directly to baseband.” Abdelgany, col. 17, ll. 5–11; *see* Final Act. 4; Ans. 5.

Abdelgany describes these alternate embodiments (alternate transceiver circuits), which “utilize a direct launch technique” (Abdelgany, col. 17, ll. 14–15) in Figures 7–11. *See* Abdelgany, col. 17, ll. 5–16. In particular, Abdelgany’s Figures 10A–10D, 11, and 12 illustrate “a multi-mode transceiver **10** that receives RF signal transmissions and generates baseband signals” (Abdelgany, col. 20, ll. 61–63) where the transceiver (10) includes an integrated receiver (1000) that performs direct down-conversion and a demodulator (1028) to produce quadrature information (baseband) signals (IQ signals). *See* Abdelgany, col. 20, l. 61– col. 23, l. 63; Figs. 7–11.

The Examiner has not shown, in a single embodiment, mixers performing direct down-conversion coupled to a convergent node (as recited in claim 1). At best, the Examiner has shown two distinct embodiments that must be combined in order to disclose the recited features. As pointed out by Appellant, the transceiver of Abdelgany’s Figure 3 does not perform direct down-conversion and none of the transceivers depicted in Figures 7–11 include a convergent node. *See* Appeal Br. 5–6; Reply Br. 2–3. As further pointed out by Appellant, anticipation requires that the identical elements be arranged as in the claim. *See* Appeal Br. 6–7; Reply Br. 2

(citing *In re Bond*, 910 F.2d 831 (Fed. Cir. 1990); *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236 (Fed. Cir. 1989); *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631 (Fed. Cir. 1987); MPEP § 2131).

To anticipate a prior art reference must “disclose all elements of the claim within the four corners of the document, and it must disclose those elements arranged as in the claim.” *Microsoft Corp. v. Biscotti, Inc.*, 878 F.3d 1052, 1068 (Fed. Cir. 2017) (internal quotations and citations omitted). Alternately, “a reference can anticipate a claim even if it does not expressly spell out all the limitations arranged or combined as in the claim, if a person of skill in the art, reading the reference, would at once envisage the claimed arrangement or combination.” *Id.* (internal quotations and citations omitted). The Examiner has not provided a reference that discloses the disputed features in a single embodiment as recited in claim 1, nor has the Examiner provided a sufficiently persuasive explanation of how one of ordinary skill in the relevant art would *at once envisage* how to combine the disparate embodiments.

Consequently, we are constrained by the record before us to find that the Examiner erred in finding Abdelgany anticipates Appellant’s claim 1. Claims 3 and 8 depend from and stand with claim 1. Accordingly, Appellant’s contentions persuade us of error in the Examiner’s anticipation rejection of representative independent claim 1 and we reverse the Examiner’s rejection of claims 1, 3, and 8.

#### CONCLUSION

Appellant has shown that the Examiner erred in rejecting claims 1, 3, and 8 under 35 U.S.C. § 102(a)(2). We, therefore, do not sustain the Examiner’s rejection of claims 1, 3, and 8.

DECISION SUMMARY

In summary:

<b>Claims Rejected</b>	<b>35 U.S.C. §</b>	<b>Reference(s)/ Basis</b>	<b>Affirmed</b>	<b>Reversed</b>
1, 3, 8	102(a)(2)	Abdelgany		1, 3, 8
<b>Overall Outcome</b>				<b>1, 3, 8</b>

REVERSED