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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte SVEN MATTISSON, PIETRO ANDREANI, and
DANIELE MASTANTUONO

Appeal 2016-004484
Application 13/503,168¹
Technology Center 2600

Before ERIC S. FRAHM, CATHERINE SHIANG, and
SCOTT E. BAIN, *Administrative Patent Judges*.

BAIN, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellants appeal under 35 U.S.C. § 134(a) from the Examiner's Final Rejection of claims 34–37, 40–44, 56, 57, 60, 62, 65, and 72–74, which constitute all claims pending in the application. Claims 1–33, 38, 39, 45–55, 58, 59, 61, 63, 64, and 66–71 have been cancelled. We have jurisdiction under 35 U.S.C. § 6(b).

We reverse.

¹ Appellants identify Ericsson Modems SA as the real party in interest. App. Br. 2.

STATEMENT OF THE CASE

The Claimed Invention

Appellants' invention relates to the field of radio communications, and in particular, to a passive mixer for minimizing signal distortion.

Abstract; Spec. 1. Claim 73 is representative of the invention and the subject matter of the appeal, and reads as follows:

73. A passive mixer, not comprising an active component biased by an external power source which is not an input signal, adapted to convert a first signal having a first frequency into a second signal having a second frequency by using a third signal having a third frequency, comprising:

a first cancellation component adapted to generate a first cancellation signal operative to substantially cancel second order intermodulation components by adding the first signal weighted by a predetermined cancellation value on the third signal; and

a mixing component having a first terminal adapted to receive the first signal, a second terminal adapted to output the second signal, and a third terminal adapted to receive the first cancellation signal, wherein the mixing component is adapted to provide the second signal as output at the second terminal by mixing the first signal provided as input at the first terminal and the first cancellation signal provided as input at the third terminal.

App. Br. 26–27 (Claims App'x).

Prior Art

The Examiner relies upon the following prior art:

Waugh et al.	US 5,060,298	Oct. 22, 1991
Zhou	US 2003/0162515 A1	Aug. 28, 2003
Sjoland et al.	US 2007/0072576 A1	Mar. 29, 2007
Mitomo et al.	US 2009/0075619 A1	Mar. 19, 2009
Cosand et al.	US 8,050,644 B1	Nov. 1, 2011

Appeal 2016-004484
Application 13/503,168

Rivera
Uzunov et al.

US 8,175,515 B1
US 2012/0161862 A1

May 8, 2012
June 28, 2012

The Rejections on Appeal

Claims 73 and 74 stand rejected under pre-AIA 35 U.S.C. § 103(a) as unpatentable over Waugh et al. (“Waugh”) and Cosand et al. (“Cosand”).
Final Act. 6–10.

Claims 34, 36, 37, 41–44, 56, 57, 60, and 62 stand rejected under pre-AIA 35 U.S.C. § 103(a) as unpatentable over Waugh, Cosand, and (Rivera or Uzunov et al. (“Uzunov”)). Final Act. 11–18.

Claims 40 and 65 stand rejected under pre-AIA 35 U.S.C. § 103(a) as unpatentable over Waugh, Cosand, (Rivera or Uzunov), and Sjoland et al. (“Sjoland”). Final Act. 18–19.

Claim 35 stands rejected under pre-AIA 35 U.S.C. § 103(a) as unpatentable over Waugh, Cosand, (Rivera or Uzunov), and Zhou. Final Act. 19–20.

Claim 72 stands rejected under pre-AIA 35 U.S.C. § 103(a) as unpatentable over Waugh, Cosand, (Rivera or Uzunov), and Mitomo, et al. (“Mitomo”). Final Act. 20–21.

ANALYSIS

We have reviewed the Examiner’s rejections in light of the arguments raised in the Briefs. On the record before us, we cannot sustain the Examiner’s rejections.

Appellants argue the Examiner erred in combining Waugh with Cosand.² App. Br. 9–18; Reply Br. 2–7. Appellants concede Waugh and Cosand each relates to mixer circuits to address distortion. App. Br. 12. Appellants argue, however, that Cosand’s teaching relied upon by the Examiner contradicts, and is inconsistent with, the teachings of Waugh, and a person of ordinary skill in the art would not have combined the two references. App. Br. 18. Specifically, Appellants argue Waugh teaches reducing intermodulation in a passive device, requiring *unbiased* terminals, whereas Cosand teaches a method for reducing intermodulation that *requires biasing* (by an external power source that is not the input signal). *Id.* at 12, 14, 15, 18 (citing Waugh col. 5, ll. 11–13, Cosand col. 5, ll. 40–44, col. 8, ll. 5–17); *see also id.* at 13 (citing Cosand col. 4, l. 61–col. 5, l. 9). Appellants, therefore, argue Waugh teaches away from Cosand. App. Br. 18. On the record before us, we are persuaded of error.

In rejecting claim 73, the Examiner relies on Waugh’s teachings of a passive mixer, mixing components, and terminals as recited in the claim, but acknowledges Waugh lacks any teaching of a “cancellation component” and “cancellation signal.” Final Act. 6–7. The Examiner finds the “cancellation component” and “cancellation signal” taught in Cosand, specifically, in Cosand’s description of an “RF input signal” that “cancels . . . contribution to the gate-source voltage.” Final Act. 7–8. The Examiner concludes:

[H]aving the disclosure of Cosand, *a person of ordinary skill would not be discouraged* from utilizing this specific feature of application of a portion of the input RF signal to the gates of FETs, which is independent from biasing, to cancel the

² Appellants argue the claims as one group; each rejection on appeal relies in whole or in part on the Waugh-Cosand combination. We choose claim 73 as representative of the group. *See* 37 C.F.R. § 41.37(c)(1)(iv).

contribution of the RF input signal's to the gate source voltage resulting in the largest distortion term, and thus would be well motivated to try applying this feature to the unbiased mixer of Waugh to further improve its linearity comparing to unmodified mixer.

Ans. 24 (emphasis added).

As Appellants argue, however, “not be[ing] discouraged,” *id.*, is insufficient rationale for a person of ordinary skill to combine references. *See KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 418–419 (2007). Although we may take account of the “inferences and creative steps a person of ordinary skill in the art would employ,” there must be “some articulated reasoning with some rational underpinning” to support the Examiner’s findings and conclusion of obviousness. *Id.* at 401, 418. We find no affirmative rationale on the record before us.³

Accordingly, on the record before us we cannot sustain the Examiner’s obviousness rejections.

DECISION

We REVERSE the Examiner’s rejections of claims 34–37, 40–44, 56, 57, 60, 62, 65, and 72–74.

REVERSED

³ We also note that the Examiner’s analysis in the Answer relies on a reference not of record and not part of the rejection on appeal. Ans. 18–19 (citing US 2003/0216128).