UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/849,761	03/25/2013	Garritt W. Foote	6150-52400	1011

35690 7590 02/23/2018

MEYERTONS, HOOD, KIVLIN, KOWERT & GOETZEL, P.C.
P.O. BOX 398
AUSTIN, TX 78767-0398

EXAMINER
YENINAS, STEVEN LEE

ART UNIT	PAPER NUMBER
2868	

NOTIFICATION DATE	DELIVERY MODE
02/23/2018	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patent_docketing@intprop.com

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte GARRITT W. FOOTE

Appeal 2017-006225
Application 13/849,761
Technology Center 2800

Before ROMULO H. DELMENDO, KAREN M. HASTINGS, and JAMES C. HOUSEL, *Administrative Patent Judges*.

PER CURIAM.

DECISION ON APPEAL

The Appellant[1] appeals under 35 U.S.C. § 134(a) from the Primary Examiner's final decision to reject claims 1–27.[2] We have jurisdiction under 35 U.S.C. § 6(b).

We affirm.

---

[1] The Appellant is the Applicant, National Instruments Corporation, which, according to the Brief, is the real party in interest. Appeal Brief filed on June 29, 2016, hereinafter "Appeal Br.," 2.

[2] Appeal Br. 4–22; Final Office Action (notice emailed on January 6, 2016) hereinafter "Final Act.," 2–23; Examiner's Answer (notice emailed on January 3, 2017), hereinafter "Ans.," 2–24; Reply Brief filed on March 3, 2017, hereinafter "Reply Br.," 2–10.

I. BACKGROUND

The inventor states that the accuracy of electronic components used in common measurement devices, such as current transformers in current-monitoring circuits, can vary. Specification filed on March 25, 2013, hereinafter "Spec.," ¶ 5. This, according to the inventor, is a result of power transfers via the magnetic flux of the transformer core not being 100% efficient and error free. *Id.* The inventor states that modern power measurement devices have various options to address this issue, but these options include physically large current transformers or multiple current transformers. *Id.* In view of this, the inventor discloses a measurement circuit having many of the benefits of closed-loop magnetic sensor designs but not the increased size and cost due to an extra winding and magnetic sensor. *Id.* ¶ 44.

Representative claim 1 is reproduced from page 2 of the Response to Notification of Non-Compliant Appeal Brief filed September 12, 2016, as follows (emphases added):

> 1. A feedback circuit comprising:
>
> a first terminal configured to couple to a first end of two ends of a conductor winding; and
>
> a second terminal configured to couple to a second end of the two ends of the conductor winding;
>
> *wherein the feedback circuit is configured to*:
>
> reduce an error current to at least a specified level in the conductor winding at AC frequencies by driving a secondary current in the conductor winding; and
>
> *eliminate a DC current flux from the feedback circuit at low frequencies*.

II. REJECTIONS ON APPEAL

On appeal, the Examiner maintains two rejections under post-AIA 35 U.S.C. § 103, as follows (Ans. 2; Final Act. 6–23):

A. Claims 1–7, 9–16, 19–25, and 27 as being unpatentable over Edel[3] in view of Mende;[4] and

B. Claims 8, 17, and 26 as being unpatentable over Edel in view of Mende and further in view of Gibellini.[5]

III. DISCUSSION

Rejection A

Claims 1–7, 9–16, 19–25, and 27 are rejected under 35 U.S.C. § 103 as being unpatentable over Edel in view of Mende. The Appellant provides arguments under multiple sub-headings identified by various claim(s). Appeal Br. 4–21. We address claims separately from representative claim 1 only to the extent that they have been argued separately pursuant to 37 C.F.R. § 41.37(c)(1)(iv).

Claim 1

The Examiner finds Edel discloses a feedback circuit that includes a first terminal (the terminal located near the "+" sign for voltage V2 in Figure 3, which is labeled as "PRIOR ART") and a second terminal (the terminal located near the "-" sign for voltage V2 in Figure 3), wherein the feedback circuit is configured to reduce an error current to at least a specified level at AC frequencies by driving a secondary current in a conductor winding, as

[3] US 6,954,060 B1, issued on Oct. 11, 2005.
[4] US 6,836,107 B2, issued on Dec. 28, 2004.
[5] US 7,525,297 B2, issued on Apr. 28, 2009.

required by claim 1. Final Act. 6–7. The Examiner finds Edel's Figure 3 disclosure differs from claim 1's subject matter in that it does not disclose that the feedback circuit is configured to eliminate a DC current flux from the feedback circuit at low frequencies, as recited in claim 1. *Id.* at 7.

The Examiner finds Mende discloses a device that eliminates DC current flux from a feedback circuit at low frequencies. *Id.* The Examiner concludes it would have been obvious to one of ordinary skill in the art to have modified Edel's feedback circuit in view of Mende to improve current transformer accuracy, as an application of "conventional DC blocking methods well established in the art." *Id.* at 7–8.

The Appellant contends: Mende does not teach or suggest a device functioning to "eliminate a DC current flux from the feedback circuit at low frequencies," as recited in claim 1; the Examiner misinterprets individual features in the systems of Edel and Mende; the Examiner relies upon knowledge gleaned only from the inventor's disclosure; and, in view of these arguments, there would have been a lack of reason to modify Edel in view of Mende. Appeal Br. 5–8; Reply Br. 2–4. Specifically, the Appellant asserts that Edel and Edel '517[6] warn again the complete cancellation of the loop impedance (i.e., the elimination of the current flux) and that Edel and Mende address different deficiencies and relate to different techniques, so one of ordinary skill in the art would have lacked a reason to modify Edel in view of Mende. Appeal Br. 8–13; Reply Br. 4–9.

---

[6] Edel, US 6,522,517 B1, issued Feb. 18, 2003 ("Edel '517"). Edel cites and incorporates by reference Edel '517 in its discussion of the embodiment depicted in Figure 3. Edel 5:12–17.

The Appellant's arguments are unpersuasive. Consistent with the Examiner's findings, we find Edel discloses a circuit that includes a transformer CT1, a current-sensing resistor R1, and a controllable voltage device 5B. Edel 9:59–10:2. The controllable voltage device 5B is connected to the secondary winding of the transformer CT1 via the terminals identified by the Examiner. *Id.* at Fig. 3. Edel discloses that the circuit generates a compensation voltage to drive secondary current so that flux changes in the current transformation core are reduced. *Id.* at 5:18–26, 7:26–35.

Mende discloses a coupling circuit 60 connected to a current probe 12 (i.e., a transformer). Mende 3:46–52, Fig. 2. The coupling circuit 60 includes, among other things, a shunt capacitor and a termination resistor 70. *Id.* at 3:58–63, Fig. 2. Mende discloses that the capacitor is part of a resistive-capacitive network that has a low frequency cutoff (e.g., less than 10 hertz) and is coupled to a resistive-inductive network "for terminating DC and low frequency signal components of the current output signal below the low frequency cutoff of the resistive-capacitive network." *Id.* at 3:3–11. Thus, Mende discloses a structure for eliminating a DC signal component.

Further, Edel recognizes problems due to a DC signal component by disclosing it "causes the magnetic core to experience a large magnetomotive force, which can cause the core to saturate, and thereby cause severe distortion of the secondary current" and that this results in error. Edel 3:23–28, 4:13–21. Mende also recognizes this problem by disclosing that its circuit acts "to prevent transformer saturation of the current measurement probe" (i.e., the transformer). Mende 3:11–14. Therefore, the disclosures of Edel and Mende support the Examiner's conclusion it would have been

obvious to modify the circuit depicted in Edel's Figure 3 in view of Mende to terminate a DC current component and improve the accuracy of Edel's circuit. *See* Final Act. 7–8; Ans. 8, 20–22.

The Appellant's arguments regarding the differences between Edel and Mende, such as differences in the problems they address and differences in how their circuits function, do not identify a reversible error in the Examiner's rejection. As noted above, Mende discloses a structure for terminating a DC signal component and, thus, provides a means to address the problem recognized by Edel. To the extent the Appellant's arguments note differences between Edel and Mende, the arguments do not explain why the structure disclosed by Mende would not function in the circuit of Edel and act to terminate a DC signal component, as taught by Mende.

For instance, the Appellant argues Mende's AC-coupling circuit does not function to eliminate a DC current flux from a feedback circuit at low frequencies "but to filter out a DC component of a measured current when measuring relatively small AC signal." Appeal Br. 11–12. The Appellant further asserts that "[e]liminating the DC component of a measured signal is not the same as eliminating a DC current flux from a feedback circuit at low frequencies" and that Mende's circuit uses a constant impedance, not an impedance that varies over frequency. Reply Br. 9 (emphasis omitted).

These arguments do not sufficiently explain why the structure disclosed by Mende would not function to eliminate a DC current flux in Edel, as recited in claim 1. For instance, the Appellant does not explain why the Mende's structure filters or eliminates a DC component but would not eliminate a DC current flux. As noted above, Edel and Mende recognize problems caused by the DC component of a signal. Mende discloses a

structure for terminating the DC component of a signal that includes a capacitor and a resistor 70, and this structure would reasonably be expected to terminate a DC signal component if implemented in Edel. Mende 3:3–11, 3:58–63, Fig. 2. Further, the Appellant's arguments focusing on Figure 18 regarding the different direction Edel discloses for addressing its stability problem (Appeal Br. 9–10) do not demonstrate a lack of reason to combine. This is because Edel's Figure 3 depicts a functional, useful current transformer circuit—albeit in the context of Edel's discussion of prior art. Something that is known or obvious does not become patentable simply because it has been described as somewhat inferior to some other product for the same use. *In re Gurley*, 27 F.3d 551, 553 (Fed. Cir. 1994).

To the extent Mende does not explicitly disclose that its structure eliminates a DC current flux, as recited in claim 1, the Examiner articulated a sufficient reason (i.e., to eliminate a DC signal component and, thus, improve current transformer accuracy) for combining Edel and Mende in the manner claimed by the inventor. The fact that the inventor discovered an additional or related advantage (elimination of DC current flux) does not necessarily confer patentability absent a showing that the advantages actually obtained would have been considered unexpected by a person skilled in the relevant art. *Ex parte Obiaya*, 227 USPQ 58, 60 (BPAI 1985) ("The fact that appellant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious."); *In re Kubin*, 561 F.3d 1351, 1357 (Fed. Cir. 2009) ("Even if no prior art of record explicitly discusses the [limitation], [applicant's] application itself instructs that [the limitation] is not an additional requirement imposed by the

claims on the [claimed invention], but rather a property necessarily present in [the claimed invention].").

The Appellant argues Edel and Edel '517 warn against the "*complete cancellation of the loop impedance*, i.e. the elimination of the current flux." Appeal Br. 9 (emphasis added). However, as stated by the Appellant (*id.*), Edel '517 states "[c]are must be exercised, however, because if the gain is set to compensate for *more than* the total secondary circuit impedance, then the system becomes unstable and current will increase to the limit of the amplifier output circuit." Edel '517, 38:1–5 (emphasis added). Thus, Edel '517 cautions against compensating for *more than* the secondary circuit impedance, not against complete cancellation of the loop impedance, as argued by the Appellant.

For these reasons and those set forth in the Examiner's Answer, the Appellant's arguments do not identify a reversible error in the Examiner's rejection of claim 1. The Appellant does not provide any argument in support of the separate patentability of claims 2, 3, 5–7, 9–12, 14–16, 19–21, 23–25, and 27 pursuant to the requirements set forth in 37 C.F.R. § 41.37(c)(1)(iv). Appeal Br. 14–16, 18. Therefore, we sustain the rejection of these claims for the same reasons discussed for claim 1.

Claims 4, 13, and 22

Claims 4, 13, and 22 respectively depend from claims 1, 10, and 19. Due to the similarity of the arguments presented for these claims, we address the arguments together for purposes of efficiency.

The Appellant asserts the amplifiers of Edel and Mende differ and provide different functions and, therefore, it would not have been obvious to modify Edel in view of Mende. *Id.* at 17–21. These arguments are

unpersuasive. The Appellant's Specification, paragraph 47, states a capacitance and resistance function to eliminate DC flux and to force DC current to zero. As discussed above, Edel and Mende provide a sufficient reason to arrive at a circuit encompassed by claim 1. To any extent Mende does not explicitly disclose that its structure does not force a DC current to zero, as recited in claims 4, 13, and 22, the result recited in these claims would naturally follow from the prior art's motivation to combine.

For these reasons and those discussed in the Examiner's Answer, we uphold the Examiner's § 103 rejection of claims 1–7, 9–16, 19–25, and 27 over Edel in view of Mende.

Rejection B

Claims 8, 17, and 26 are rejected under 35 U.S.C. § 103 as being unpatentable over Edel in view of Mende and further in view of Gibellini.

The Appellant does not present any arguments in support of the separate patentability of claims 8, 17, and 26. Rather, the Appellant merely reiterates the arguments set forth in support of the patentability of claims 1, 10, and 19. Appeal Br. 21–22. For the reasons set forth above, those arguments do not identify a reversible error.

For these reasons and those discussed in the Examiner's Answer, we uphold the Examiner's § 103 rejection of claims 8, 17, and 26 over Edel, Mende, and Gibellini.

IV. SUMMARY

The Examiner's decision to reject claims 1–27 is affirmed.

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

AFFIRMED