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EXAMINER

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL
AND APPEAL BOARD

Ex parte JONATHAN M. ROTHBERG, WOLFGANG HINZ,
KIM L. JOHNSON, and JAMES BUSTILLO

Appeal 2014-006889
Application 13/554,895
Technology Center 2800

Before BEVERLY A. FRANKLIN, KAREN M. HASTINGS and JAMES
C. HOUSEL, *Administrative Patent Judges*.

FRANKLIN, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellants seek our review under 35 U.S.C. § 134 of the Examiner's decision rejecting claims 1–9. We have jurisdiction over the appeal under 35 U.S.C. § 6(b).

STATEMENT OF THE CASE

Claim 1 is illustrative of Appellants' subject matter on appeal and is set forth below (with text in bold for emphasis):

1. **A method for operating an array of sensors** arranged in rows and columns, a row including a plurality of sensors, each sensor in the plurality including a chemically-sensitive field effect transistor (chemFET) having an output, configured to use the chemFET to produce a signal on the output in response to a row select signal, **and a plurality of column output circuits coupled to the outputs of a column of sensors in the array, the method comprising:**

providing a reference voltage to the plurality of column output circuits during a calibration operation; and

using outputs of the plurality of column output circuits in response to the provided reference voltage to compensate for variances among the column output circuits.

The Examiner relies on the following prior art references as evidence of unpatentability:

Eversmann et al.	US 2005/0017190 A1	Jan. 27, 2005
Levon et al.	US 2005/0230271 A1	Oct. 20, 2005
Dubin et al.	US 2005/0221473 A1	Oct. 6, 2005

THE REJECTIONS

1. Claims 1–3 and 6 are rejected under 35 U.S.C. § 103(a) as being obvious over Eversmann.

2. Claims 5 and 7–9 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Eversmann in view of Levon.
3. Claim 4 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Eversmann in view of Dubin.

ANALYSIS

We select claim 1 as representative of all the claims on appeal, based upon Appellants' presented arguments. 37 C.F.R. § 41.37(c)(1)(iv) (2014).

In dispute in this case is whether Eversmann suggests the claimed method steps of “providing a reference voltage to the plurality of column output circuits during a calibration operation; and using outputs of the plurality of column output circuits in response to the provided reference voltage to compensate for variances among the column output circuits”.

Appellants argue that Eversmann does not suggest these steps for the reasons set forth on pages 15–19 of the Appeal Brief. It is the Examiner's position that Eversmann does suggest these method steps as outlined on pages 1–4 of the Final Office Action and on pages 2–5 of the Answer.

More specifically, Appellants state that Eversmann is concerned with compensating for the variance of each individual sensor elements and this does not suggest compensating “for variances among the column output circuits”. Appeal Br. 18. Appellants also discuss their Figure 9 on pages 7 and 9 of the Appeal Brief, and reproduce Figure 9 on page 8 of the Appeal Brief.

Paragraph [00139] on page 37 of Appellants' Specification discloses that in Appellants' Figure 9, the column bias/readout circuitry 110j also

includes sample/hold and buffer circuitry to provide an output signal V_{COLj} from the column. In particular, after one of the pixels 105_1 through 105_n is enabled or selected via the transistors Q2 and Q3 in each pixel, the output of the amplifier 107A (A1), i.e., a buffered V_{sj} , is stored on a column sample and hold capacitor C_{Sh} via operation of a switch (e.g., a transmission gate) responsive to a column sample and hold signal COL SH. The sampled voltage is buffered via a column output buffer amplifier 111j (BUF) and provided as the column output signal V_{COLj} . To compensate for variances among the column output circuits, “a reference voltage V_{REF} may be applied to the buffer amplifier 111j, via a switch responsive to a control signal CAL, to facilitate characterization of column to-column non-uniformities due to the buffer amplifier 111j and thus allow post-read data correction.” Spec. para. [0139]. In this manner, the column output signal V_{COLj} is defined and this is pertinent regarding the claimed phrase “using outputs of the plurality of column output circuits in response to the provided reference voltage to compensate for variances among the column output circuits.”

While Appellants argue that Eversmann is concerned with compensating for the variance of each individual sensor element, paragraph [0129] of Eversmann discloses the following:

[t]he sensor array 1300 has a plurality of biosensor circuit arrangements 1303 which are arranged essentially in matrix form in crossover regions of row lines 1301a, 1301b, 1301c, 1301d and column lines 1302 and are connected up to the row and column lines 1301a, 1301b, 1301c, 1301d, 1302. As already in the case of the exemplary embodiments described above, each biosensor circuit arrangement 1303 has a sensor element having a physical parameter and a calibration device which is set up in such a way that it can be

used to at least partly compensate for an alteration of the value of the physical parameter of the sensor element. The sensor element of the biosensor circuit arrangement 1303 has an electrically conductive electrode 1304 that can be coupled to a substance to be examined (not shown in the figure). Furthermore, the sensor element of the biosensor circuit arrangement 1303 has a measuring transistor 1305, the gate terminal 1305a of which is coupled to the electrically conductive sensor electrode 1304 (via a further transistor 1311 described further below). Furthermore, in FIG. 13, a voltmeter 1306 for detecting an electrical sensor voltage is provided for each column line 1302, which voltmeter 1306 can be coupled to a first source/drain terminal 1305b of the measuring transistor 1305.

Moreover, paragraph [131] of Eversmann also discloses:

The calibration device is set up in such a way that, in a first operating state, a sensor signal dependent on the physical parameter of the sensor element (that is to say the threshold voltage of the measuring transistor **1305**) can be impressed into the sample-and-hold element **1309** and can be provided to the second input **1308b** of the differential amplifier **1308**. Furthermore, the calibration device is set up in such a way that, in a second operating state, a signal that is characteristic of the physical parameter of the sensor element can be provided to the first input **1308a** of the differential amplifier **1308**. The calibration device is furthermore set up in such a way that a sensor signal, an electrical voltage, independent of the value of the physical parameter of the sensor element can be provided at the output **1308c** of the differential amplifier **1308**, as a result of which the alteration of the value of the physical parameter is at least partly compensated for.

As indicated by the aforementioned disclosure of Eversmann, voltmeter 1306 is provided for each biosensor circuit arrangement 1303 in a similar manner as Appellants' column output signal V_{COLj} is provided for respective circuitry 110j. Thus, as recited in Appellants' claim 1, and as Appellants disclose in their Specification, Eversmann provides a reference

voltage to amplifier 1308 of each column to compensate for variances among the column output circuits. In this manner, we agree with the Examiner that Eversmann discloses every limitation of claim 1 (Ans. 3). It is well settled that “anticipation is the epitome of obviousness.” *In re McDaniel*, 293 F.3d 1379, 1385 (Fed. Cir. 2002) (quoting *Connell v. Sears Roebuck & Co.*, 722 F.2d 1542, 1548 (Fed. Cir. 1983)); *In re Fracalossi*, 681 F.2d 792, 794 (CCPA 1982).

In view of the above, we affirm Rejection 1, as well as Rejections 2 and 3.¹ However, because we rely upon some fact finding/reasoning that differs from the Examiner’s, we denominate our affirmance as involving a new ground of rejection pursuant to our authority under 37 C.F.R. § 41.50(b).

DECISION

The Examiner’s decision is affirmed but a new ground of rejection is entered pursuant to our authority under 37 C.F.R. § 41.50(b).

This decision contains a new ground of rejection pursuant to 37 C.F.R. § 41.50(b), which provides that a “new ground of rejection pursuant to this paragraph shall not be considered final for judicial review.”

37 C.F.R. § 41.50(b) also provides that the appellant, WITHIN TWO MONTHS FROM THE DATE OF THE DECISION, must exercise one of

¹ We affirm Rejections 2 and 3 for the same reasons because Appellants rely upon the same arguments for claims 2–9 as for independent claim 1. Appeal Br. 20.

the following two options with respect to the new ground of rejection to avoid termination of the appeal as to the rejected claims:

(1) Reopen prosecution. Submit an appropriate amendment of the claims so rejected or new evidence relating to the claims so rejected, or both, and have the matter reconsidered by the examiner, in which event the proceeding will be remanded to the examiner. . . .

(2) Request rehearing. Request that the proceeding be reheard under § 41.52 by the Board upon the same record. . . .

Should Appellants elect to prosecute further before the Examiner pursuant to 37 C.F.R. § 41.50(b) (1), to preserve the right to seek review under 35 U.S.C. §§ 141 or 145 with respect to the affirmed rejection(s), the effective date of the affirmance is deferred until conclusion of the prosecution before the Examiner unless, as a mere incident to the limited prosecution, the affirmed rejection is overcome.

If Appellants elect prosecution before the Examiner and this does not result in allowance of the application, abandonment, or a second appeal, this case should be returned to the Patent Trial and Appeal Board for final action on the affirmed rejection, including any timely request for rehearing thereof.

TIME PERIOD FOR RESPONSE

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).

Appeal 2014-006889
Application 13/554,895

DECISION

Each rejection is affirmed.

ORDER

AFFIRMED; NEW GROUND OF REJECTION